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- The public may also watch, listen to, or participate in the meeting live by visiting <https://us02web.zoom.us/j/89255646791> or by telephoning 1-253-215-8782 and entering Meeting ID 892 5564 6791.
- The public is encouraged to comment via email to cityclerk@cityofanacortes.org or via written comment addressed to City Clerk, P.O. Box 547, Anacortes, WA 98221. Public comments received by the [City Clerk](#) prior to 3:00 p.m. the day of the meeting will become part of the record for the meeting, just as if presented in person.
- Complete guidelines for virtual participation in Anacortes City Council meetings are available [here](#). View the quick video example for connecting to the meeting [here](#).



Anacortes City Council
Municipal Building Council Chambers
904 6th Street

September 12, 2022
6:00 PM

PRELIMINARY AGENDA
[Packet Materials](#) / [Watch Meeting](#)

1. **Call to Order**
2. **Pledge of Allegiance**
3. **Announcements and Committee Reports**
 - a. Finance Committee (Report)
 - b. Planning Committee (Report)
 - c. Fiber Committee (Report)
4. **Public Comment**
5. **Consent Agenda**
 - a. Minutes of September 6, 2022 (Action)
 - b. Approval of claims in the amount of \$999,030.09 (Action)
6. **Public Hearings**
 - a. * Ordinance 4030, An Ordinance of the City of Anacortes, Washington, Amending Chapter 10.12. Regarding Stopping, Standing, and Parking (Discussion/Action)
7. **Other Business**
 - a. Shoreline Master Program Periodic Update - Draft 3 Discussion (Discussion)
 - b. R Avenue Long Term Improvements Project National Highways Freight Program Grant Acceptance (Discussion/Possible Action)
8. **Adjournment**

Per Resolution 3051, citizens wishing to comment on items not on the agenda may do so under Public Comment. Citizens wishing to comment on items indicated with an asterisk () may do so as those items are considered by Council during the course of the meeting.*

The City of Anacortes is committed to making public meetings available and accessible to all members of the community.
For assistance with special needs, please contact the City Clerk at 360-299-1960 in advance of the meeting.

Anacortes City Council Minutes - September 6, 2022

Call to Order

Mayor Matt Miller called to order the Anacortes City Council meeting of September 6, 2022 at 6:00 p.m. Councilmembers Jeremy Carter, Anthony Young, Carolyn Moulton, and Amanda Hubik were present. Councilmembers Christine Cleland-McGrath and Bruce McDougall participated in the meeting remotely via Zoom. Councilmember Ryan Walters was absent.

Pledge of Allegiance

The assembly joined in the Pledge of Allegiance.

Announcements and Committee Reports

Mayor Miller reminded the public that school started today and encouraged drivers to be vigilant for pedestrians and cyclists in school zones and throughout the City.

Tommy Thompson Trestle Fire Update

Mayor Miller thanked the many community members who reached out to offer support following the Tommy Thompson Trestle fire, and expressed optimism that the community would rally to repair the damage done. Mayor Miller introduced Fire Chief, Bill Harris, and Parks and Recreation Director, Jonn Lunsford, who provided a status update on the Tommy Thompson Trestle, which sustained fire damage on August 30, 2022. Chief Harris summarized the incident response and damage details, which were included in a slide presentation. He encouraged the public to report any tips regarding the cause of the fire to an anonymous tip line at 360-299-1985. Mr. Lunsford updated the trail status as closed indefinitely from the RV Park to March's Point Road. He mentioned that the Parks Foundation are accepting online donations on their website (www.anacortesparksfoundation.org). An investigation into the cause of the fire and a damage assessment are currently in progress.

Mr. Young asked if the anonymous tip line was just for this investigation or other matters. Police Chief, Dave Floyd, responded that it is the anonymous tip line for the Anacortes Police Department Investigations Division. Mr. Young then asked if there were any plans to make bicycle travel along State Route 20 safe. Mr. Lunsford replied that the City is discussing the matter with the Washington State Department of Transportation, though the focus currently is on investigating the cause of the fire and associated damage assessment.

Ms. Moulton cautioned against cyclists traveling against traffic on State Route 20 after transiting eastbound on Fidalgo Bay Road as an alternate route while the trestle remains unavailable. She encouraged cyclists to follow the current available legal route along State Route 20, which allows for cyclists to exit the highway west of the roundabout and use a lighted crossing and connector route north of the Swinomish Golf Course to Reservation Road for eastbound travel.

Fiber Committee

No Councilmembers who attended the Fiber Committee meeting were available to report. Mayor Miller directed that the report be moved to the September 12th City Council meeting agenda.

Public Works Committee

Ms. Moulton reported from the Public Works Committee meeting held earlier in the evening. The topics discussed included the outfall project and associated delays due to project complexity and permitting challenges, R Avenue improvements including a planned roundabout at 30th Street, and a reminder that this Saturday, September 10th is free garbage day for Anacortes residents from 9am - noon.

Museum Committee

Mr. Carter reported from the Museum Committee meeting held the previous month. The topics discussed included opening hours for school field trips, QR codes added to sites and murals around town, the availability

of digital copies of the *Anacortes American* back to 1890, augmenting the Museum's social media profile with additional digital photos and stories published on YouTube, and an operations update that the Maritime Heritage Center will stay open year around while the WT Preston will have limited opening hours due to scheduled maintenance.

Parks and Recreation Committee

Ms. Hubik reported from the Parks and Recreation Committee meeting held on August 23, 2022. The topics discussed included the skate park renovation, the *A-Town is Our Town* newsletter, fall sports season, and an update on the Grand View Cemetery phase 2 project, and the Anacortes Senior Activity Center hosting a vaccine clinic in October.

Public Safety Committee

Ms. Hubik reported from the Public Safety Committee meeting held earlier in the evening. The topics discussed related to law enforcement included the Tommy Thompson Trestle fire, recruitment for a records support position, officer recruiting, and ongoing preparations for Oyster Run. The topics related to the Fire Department included Fire Station 3 feasibility study progress report, upcoming Federal Emergency Management Agency presentation for Emergency Operations Center drills, pending delivery of a ladder truck in December 2023, possible locations for displaying an antique fire engine, and ongoing updates to the Capital Facilities Plan.

Port - City Liaison Committee

Mr. Young reported from the Port-City Liaison Committee meeting held earlier that morning. The topics discussed included the North Basin development project, possible modifications and improvements to T Dock, assistance with the repair of the Tommy Thompson Trestle, a discussion of the Islands Inn proposal to become affordable housing, and Port consideration of possible uses for the Rockwell property near the airport. Mayor Miller added that the main issue related to T Dock is the weight bearing capacity for trucks, that Dungeness crab and shrimp are the leading revenue producers for the facility, and that the committee discussed the relinquishment of utility easements that would be discussed later on in the meeting.

Economic Development Committee

Mr. Young reported from the Economic Development Committee meeting which met earlier in the morning. The topics discussed included the committee structure, identifying community partners, forming steering committees to address relevant issues, and determining focus areas and accompanying legislative efforts. Ms. Cleland-McGrath added that the committee is taking a holistic approach, including discussions with local stakeholders to avoid duplication of efforts, possible advocacy for land improvements and emphasized that the committee is open to additional community stakeholders.

Public Comment

Mayor Miller invited the public to comment on any item not on the agenda. No one present wished to address the Council on any topic not already on the agenda.

Consent Agenda

Ms. Moulton moved, seconded by Mr. Carter, to approve the following Consent Agenda items. The motion carried unanimously by voice vote.

- a. Minutes of August 22, 2022
 - b. Approval of claims in the amount of \$724,226.30
- The following vouchers/checks were approved for payment:

EFT numbers: 104110 through 104166, total \$559,884.19

Check numbers: 104109 through 104186, total \$150,425.51

Wire transfer numbers: 307463 through 309784, total \$13,916.60

Other Business

Resolution 3097: Declaring Certain Retained Utility Easements to Be Surplus in favor of the Port of Anacortes

City Attorney, Darcy Swetnam, re-introduced Resolution 3097, Declaring Certain Retained Utility Easements to be Surplus in favor of the Port of Anacortes in a slide show presentation that was included in the packet materials for the meeting. She detailed changes to the draft resolution as discussed with the Port project manager, Brad Tesch, including a commitment from the Port to grant the City an easement for the existing water line within 60 days of adoption of Resolution 3097. She then detailed the reasons that the relinquishment is in the best interest of the City including attaining the aforementioned waterline easement, allowing the Port to obtain grant funds from the Recreation and Conservation Office, and satisfying the conditions of the related Conditional Use Permit.

Mr. Young expressed appreciation for the visual depiction of the area in question and declared that this resolution is in the best interest of the Port, the City and the citizens of Anacortes.

ANTHONY YOUNG moved, seconded by AMANDA HUBIK, to adopt Resolution 3097, declaring certain retained utility easements to be surplus to the needs of the City and directing the Mayor to execute the Relinquishment of Retained Utility Easements. Vote: Ayes - JEREMY CARTER, ANTHONY YOUNG, CHRISTINE CLELAND-MCGRATH, CAROLYN MOULTON, BRUCE MCDUGALL, AMANDA HUBIK. Nays - None. Result: Passed

Opioid Settlement Agreement

City Attorney, Darcy Swetnam, introduced the Opioid Settlement Agreement referring to a presentation from the State Attorney General's Office that was included in the packet materials for the meeting. Ms. Swetnam outlined the requirements for the settlement to go into effect, which requires all 37 jurisdictions that filed a lawsuit to join and the participation of 90% of the local governments with a population of over 10,000 that did not file a lawsuit. It requires the Council to authorize the Mayor to sign the participation form not later than September 23, 2022. Ms. Swetnam concluded that the City would receive \$324,000 over 17 years and recommended that the City accept the settlement agreement. Mayor Miller recounted that the City joined the lawsuit two years ago and that this is the result of those efforts and that the funding could be used to support a police canine and distribution of Narcan.

Mr. Carter asked if there was any negative point to proceeding with the settlement. Ms. Swetnam responded that the City could no longer pursue legal action against the named opioid producers, but could still pursue action against others not named in this suit.

Ms. Cleland-McGrath asked if there are other agencies in Skagit County participating and if settlement resources could be pooled. Ms. Swetnam responded that Skagit County, City of Burlington, City of Mount Vernon, Sedro-Woolley School District and others are also participating and that discussions did occur regarding formalization of collective use of the settlement resources among local jurisdictions.

JEREMY CARTER moved, seconded by ANTHONY YOUNG, to authorize Mayor Miller to execute the Distributor Settlement Agreement on behalf of the City of Anacortes. Vote: Ayes - JEREMY CARTER, ANTHONY YOUNG, CHRISTINE CLELAND-MCGRATH, CAROLYN MOULTON, BRUCE MCDUGALL, AMANDA HUBIK. Nays - None. Result: Passed

Adjournment

There being no further business, at approximately 6:50 p.m. the Anacortes City Council meeting of September 6, 2022 was adjourned.

The following claims against the City of Anacortes have been preaudited and certified by the Clerk-Treasurer as ready for City Council approval at the September 12, 2022 City Council meeting:
[Download this file in OpenDocument spreadsheet format.](#)

Invoice Doc #	Invoice Date	Invoice #	Vendor Full Name	Description	Total Amount	Approval Queue
310150	1/17/2022	8748	GEOGRAPHIC INFORMATION	2021-2022 GIS SUPPORT	\$ 93.13	pw1
310151	2/14/2022	9150	GEOGRAPHIC INFORMATION	2021-2022 GIS SUPPORT	\$ 201.40	pw1
310075	5/3/2022	1241	PETEK PH D, THOMAS C	PYSCH EXAM: MILLER, DOLAN, BOWEN.	\$ 1,925.00	medic
310082	7/3/2022	07/03/2022	POLLACK, JORDAN D	WILDLAND REFRESHER	\$ 2,595.00	medic
310104	7/19/2022	257180	SIGNATURE FORMS, INC	COURT RETURN ENVELOPES	\$ 155.26	finance
310149	7/28/2022	20INV000188390	TOTER LLC	32 GALLON GARBAGE TOTES	\$ 6,833.73	pw1
310131	7/29/2022	281742	U.S. MOWER	MOWER HEAD PURCHASE	\$ 12,204.47	pw1
310103	7/31/2022	471317	POTELCO, INC.	INTAKE STATION POWER POLE REPLACEMENT	\$ 36,667.70	dwtpt
310107	7/31/2022	471318	POTELCO, INC.	WTP ELECTRICAL SYSTEM: INTAKE TRANSFORMER REPLACEMENT	\$ 42,873.26	dwtpt
309971	8/1/2022	300000290043	PUGET SOUND ENERGY INC	LED CHANGEOUT PH 4 6/2-6/30/22	\$ 4,076.51	dshop
310089	8/2/2022	799	CAPITOL ASSET & PAVEMENT SVCS	2022 PAVEMENT MANAGEMENT UPDATE	\$ 23,500.00	pw1
310106	8/11/2022	257612	SIGNATURE FORMS, INC	COURT WINDOW ENVELOPES	\$ 219.90	finance
309966	8/11/2022	9328187238	GRAYBAR ELECTRIC COMPANY, INC	DROP HANDHOLES	\$ 2,403.83	fiber
309847	8/12/2022	89678300	EMERALD RECYCLING SVCS INC	WASTE OIL RECYCLING #90009	\$ 102.14	dshop
310129	8/12/2022	AR226488	ELECTRONIC BUSINESS MACHINES	MAINTENANCE/COPIES 5/12 - 8/11/22	\$ 292.47	medic
310113	8/15/2022	0001337	CITY OF BURLINGTON	DARK FIBER & RACK SPACE	\$ 275.00	fiber
309958	8/19/2022	663601	BLADE CHEVROLET, INC	LIGHT #178	\$ 222.72	dshop
309943	8/19/2022	9328317317	GRAYBAR ELECTRIC COMPANY, INC	TRAYS FOR FIBER OPTIC SPLICE CLOSURES	\$ 413.88	fiber
309799	8/21/2022	ReimbFarnsworth	FARNSWORTH, DIANA	MILEAGE ECCC	\$ 41.60	publib
310093	8/23/2022	14382	ENVIROCARE INTERNATIONAL, INC,	WWTP VENTURIPAK SCRUBBER CAUSTIC SYSTEM - DESIGN - AUGUST 2022	\$ 528.90	dwwtp
309884	8/23/2022	20204	SEASIDE AUTO BODY	REPAIR UTILITY BOX #195	\$ 1,591.74	dshop
310112	8/23/2022	2215	THE CLEAN TEAM	2022 JANITORIAL SERVICES - CITY HALL & SENIOR CENTER 8/15-8/19/22	\$ 600.00	pw1
310094	8/23/2022	INV-122222	DUDE SOLUTIONS INC	SMARTGOV SOFTWARE FOR PCED	\$ 4,341.12	plan

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309892	8/24/2022	138947	SUMMIT LAW GROUP, PLLC	LEGAL SERVICES, POLICE BARGAINING UNIT	\$ 1,687.50	hr
309772	8/24/2022	MVCS0349019	N C MACHINERY COMPANY	OPERATING SUPPLIES #414	\$ 2,480.79	dshop
309954	8/25/2022	021972784	GALLS, LLC.	UNIFORM PANTS; CAP PRUIETT	\$ 97.77	apd
309834	8/25/2022	47968	SCRAP-IT	SCRAP RV 393RJQ	\$ 1,571.88	dshop
309835	8/25/2022	47969	SCRAP-IT	SCRAP RV 7891VF	\$ 1,138.66	dshop
309796	8/25/2022	7238370-02	TURF STAR WESTERN	MISC FILTERS #7000	\$ 92.73	dshop
309773	8/26/2022	0289682-IN	REISNER DISTRIBUTOR INC	LUBE OIL - SHOP STOCK	\$ 868.04	dshop
309804	8/26/2022	221052	T-SHIRTS BY DESIGN	REC PROGRAM SHIRTS	\$ 652.80	pkrec
309800	8/26/2022	47041	VALLEY ATHLETICS	PARKS FIELD MAINTENANCE SUPPLIES	\$ 1,952.62	parks1
310130	8/26/2022	48342	TRAILER BOSS	PARKS TILT TRAILER REPLACEMENT	\$ 10,879.04	pw1
310098	8/26/2022	9914459976	VERIZON WIRELESS	WTP SCADA 7/27-8/26/22	\$ 528.30	dwtpt
309953	8/28/2022	360-293-4900-0912865	ZIPLY FIBER	APD BAC LINE 8/28-9/27/22	\$ 91.42	apd
309843	8/28/2022	360-293-6427-0218975	ZIPLY FIBER	CITY HALL 911 8/28-9/27/22	\$ 85.00	finance
310091	8/28/2022	360-293-9063-0926075	ZIPLY FIBER	STA 3 WIFI: 8/28-9/27/22	\$ 94.47	medic
309844	8/28/2022	360-299-0813-1017915	ZIPLY FIBER	WWTP 8/28-9/27/22	\$ 328.27	dwwtp
310100	8/28/2022	360-299-2484-0726025	ZIPLY FIBER	LIBRARY PHONE 8/28-9/27/22	\$ 62.08	publib
309849	8/28/2022	360-299-3674-0214175	ZIPLY FIBER	OPS 8/28-9/27/22	\$ 75.73	dshop
309952	8/28/2022	360-299-6615-0615165	ZIPLY FIBER	APD 911 LINE 8/28-9/27/22	\$ 78.72	apd
309950	8/28/2022	360-588-9248-0619005	ZIPLY FIBER	APD BACKUP LINE 8/28-9/27/22	\$ 211.68	apd
309802	8/28/2022	71239804	INGRAM LIBRARY SERVICES, LLC	ADULT BOOKS	\$ 97.22	publib
310116	8/28/2022	INV1718	CARTEGRAPH SYSTEMS LLC	SEE-CLICK-FIX FOR CARTEGRAPH ASSET MANAGEMENT SYSTEM - 8/21/22-1/20/23	\$ 4,166.67	pw1
309797	8/29/2022	20357368	PACWEST MACHINERY, LLC	WHISKER SENSOR #859	\$ 1,062.73	dshop
309832	8/29/2022	220015149234	PUGET SOUND ENERGY INC	81547 S MARCHS POINT RD 7/29-8/29/22	\$ 139.81	dshop
309770	8/29/2022	273235	NAPA	FUEL FILTER	\$ 14.69	dshop
309886	8/29/2022	40860	ZUMAR INDUSTRIES, INC.	SPEED LIMIT SIGNS	\$ 248.06	dshop
309778	8/29/2022	410501-22	IDENTIFIX	IDENTIFIX GOV SUBSCRIPTION	\$ 1,428.00	dshop

Invoice Doc #	Invoice Date	Invoice #	Vendor Full Name	Description	Total Amount	Approval Queue
310118	8/29/2022	IN947231	NOANET	MUNICIPAL FIBER NETWORK COORDINATED SERVICES - GUEMES VIEW - AUGUST 2022	\$ 1,187.45	fiber
310121	8/29/2022	IN947242	NOANET	MUNICIPAL FIBER NETWORK COORDINATED SERVICES - PER DIEM FOR AUGUST 2022	\$ 780.00	fiber
309893	8/30/2022	10511729	NAVIA BENEFIT SOLUTIONS, INC	FLEXIBLE SPENDING PARTICIPANT FEE	\$ 124.50	hr
309836	8/30/2022	13221032	HACH COMPANY	OPERATING SUPPLIES	\$ 1,390.41	dwwtp
309883	8/30/2022	15-88462	CUMMINS, INC.	REPAIRS EQUIP 9-910	\$ 595.01	dshop
309833	8/30/2022	273450	NAPA	COUPLING #859	\$ 4.04	dshop
309846	8/30/2022	273470	NAPA	FUEL LINE HOSE #859	\$ 7.13	dshop
310080	8/30/2022	7230280758	CARDINAL HEALTH 110, INC.	PHARMA: ADENOSINE, ETOMIDATE, MGS04.	\$ 323.43	medic
309792	8/30/2022	E 202208300047	SIMPLIFILE, LC	GINNETTI FIBER EASEMENT - 3407 H AVENUE	\$ 216.38	fiber
309807	8/30/2022	E 202208300332	SIMPLIFILE, LC	MURPHY FIBER EASEMENT - 4012 PETERS LANE	\$ 217.38	fiber
309837	8/30/2022	I6198598	HD FOWLER COMPANY INC	MAINTENANCE SUPPLIES	\$ 305.41	dwwtp
309798	8/30/2022	RefundMay	MAY, CHRISTOPHER	WA PARK CAMPING REFUND	\$ 12.00	parks1
309848	8/30/2022	U2216041201	ICONIX WATERWORKS INC	8 JM ULTRA BLUE AWWA PVCO PIPE	\$ 2,611.20	wdist
309891	8/30/2022	WAANA143906	FASTENAL COMPANY	MAINTENANCE SUPPLIES	\$ 49.96	dwwtp
310134	8/31/2022	0257947	FERGUSON ENTERPRISES, INC	STRAP WRENCH	\$ 42.31	dwtp
309890	8/31/2022	0290124-IN	REISNER DISTRIBUTOR INC	INCINERATOR FUEL	\$ 2,352.01	dwwtp
310110	8/31/2022	03-0822ANCTWQAP-P2	CONFLUENCE ENGINEERING GROUP L	WATER QUALITY ASSESSMENT AND PLANNING - AUGUST 2022	\$ 10,425.50	dwtp
310090	8/31/2022	0822	NELSON, BONNIE	AGING MASTERY PROGRAM ADMINISTRATION - AUGUST 2022	\$ 537.50	pkrec
310132	8/31/2022	10626019	LANGUAGE LINE SERVICES, INC	TELEPHONE INTERPRETER SERVICES	\$ 15.09	court
310095	8/31/2022	11022	PETDATA, INC	PETDATA LICENSING FEES AUGUST	\$ 79.80	finance
310101	8/31/2022	200000666863	PUGET SOUND ENERGY INC	LIBRARY 10TH STREET LED 8/2-8/31/22	\$ 9.86	publib
310102	8/31/2022	200000667218	PUGET SOUND ENERGY INC	LIBRARY 10TH & M ST 8/2-8/31/22	\$ 20.51	publib
309885	8/31/2022	2080120	UTILITIES UNDERGROUND LOCATION	AUGUST LOCATE TICKETS	\$ 286.38	dshop
310162	8/31/2022	209160	LAKE SIDE INDUSTRIES, INC.	5/8" & 3/4" ROCK SALES/ DUMP FEES	\$ 303.08	wdist

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310114	8/31/2022	2132-6	MAKERS ARCHITECTURE	AFFORDABLE HOUSING ACTION PLAN - JULY 2022	\$ 8,275.10	plan
310083	8/31/2022	219544	INFOSEND, INC.	AUGUST 2022 PROCESSING	\$ 3,816.17	finance
309961	8/31/2022	220025931985	PUGET SOUND ENERGY INC	STREET LIGHTS: 8/2-8/31/22	\$ 7.79	dshop
310119	8/31/2022	248 984 6277 5	CASCADE NATURAL GAS CORP.	WTP 8/2-8/30/22	\$ 753.10	dwtpt
310123	8/31/2022	27063-1	OMEGA MEDICAL MECHTRONICS	AUTOClave ANNUAL SERVICE CONTRACT	\$ 897.60	dwwtpt
309845	8/31/2022	273522	NAPA	BRAKE CLEANER - SHOP	\$ 248.06	dshop
309894	8/31/2022	31397	ORCA INFORMATION, INC	BACKGROUND CHECKS	\$ 902.00	hr
309839	8/31/2022	773062	REECE, STORMIE	DEPOT JANITORIAL SERVICES	\$ 1,166.00	parks1
310097	8/31/2022	AUG 2022	KORTERUD, WAYNE D	INDIGENCY SCREENING	\$ 415.00	court
309970	8/31/2022	CL48378	REISNER DISTRIBUTOR INC	VEHICLE FUEL - AUG 2022	\$ 36,357.67	finance
309842	9/1/2022	03188	SKAGIT COUNTY SHERIFF'S OFFICE	JAIL TAX PAYMENT PER CONTRACT	\$ 94,553.44	finance
310087	9/1/2022	10624	PORT OF ANACORTES	SEPT. MARINE 29 MOORAGE, ELECTRICITY.	\$ 385.61	medic
309895	9/1/2022	111883	WALTON BEVERAGE COMPANY, INC	CITY HALL BREAK ROOM SUPPLIES	\$ 220.00	finance
309888	9/1/2022	111884	WALTON BEVERAGE COMPANY, INC	OPS: BREAK ROOM SUPPLIES	\$ 203.00	dshop
309969	9/1/2022	1387	LAW OFFICE OF CARA LORENZO	PUB DEF CONFL	\$ 45.00	court
310079	9/1/2022	1388	LAW OFFICE OF CARA LORENZO	PUB DEF CONFL	\$ 127.50	court
310074	9/1/2022	1389	LAW OFFICE OF CARA LORENZO	PUB DEF CONFL	\$ 112.50	court
310076	9/1/2022	1390	LAW OFFICE OF CARA LORENZO	PUB DEF CONFL	\$ 22.50	court
310072	9/1/2022	1391	LAW OFFICE OF CARA LORENZO	PUB DEF CONFL	\$ 97.50	court
310077	9/1/2022	1392	LAW OFFICE OF CARA LORENZO	PUB DEF CONFL	\$ 67.50	court
310078	9/1/2022	1393	LAW OFFICE OF CARA LORENZO	PUB DEF CONFL	\$ 90.00	court
310084	9/1/2022	1395363-0043-8	WASTE MANAGEMENT	AUGUST 2022 CONTRACTED SERVICES	\$ 130,050.13	finance
310117	9/1/2022	200012505505	PUGET SOUND ENERGY INC	WTP 8/1-8/31/22	\$ 96,071.92	dwtpt
310138	9/1/2022	2022-06	MERRIMAN MUNICIPAL	BANKING SERVICES PROCUREMENT 2022	\$ 1,150.00	finance
310115	9/1/2022	2022-2282	THE WATERSHED COMPANY	SHORELINE MASTER PROGRAM (SMP) USER GUIDE & WEBSITE PROJECT - AUGUST 2022	\$ 417.50	plan
309841	9/1/2022	21-043-FIN-001	ANACORTES FAMILY CENTER	AFFORDABLE HOUSING TAX PAYMENT	\$ 37,698.97	finance
309840	9/1/2022	21-247-FIN-001	ANACORTES HOUSING AUTHORITY	AFFORDABLE HOUSING TAX PAYMENT	\$ 37,698.97	finance
310124	9/1/2022	2492	OAB ENGINEERING, LLC	STA 3 WIFI: SEPTEMBER	\$ 150.00	medic
309960	9/1/2022	273683	NAPA	SPARK PLUG #11960	\$ 8.64	dshop
310136	9/1/2022	2981	DEPARTMENT OF HEALTH	LOAN DM16-952-025/2981	\$ 315,883.73	finance

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309965	9/1/2022	300000290043	PUGET SOUND ENERGY INC	STREET LIGHTS 7/1-8/1/22	\$ 13,689.38	dshop
309963	9/1/2022	300000325005	PUGET SOUND ENERGY INC	STREET LIGHTS: 7/8- 8/5/22	\$ 79.15	dshop
309962	9/1/2022	300000340004	PUGET SOUND ENERGY INC	STREET LIGHTS: 7/29- 8/29/22	\$ 81.39	dshop
310120	9/1/2022	360-293-0045-0223175	ZIPLY FIBER	STA 1 BACK UP LINES: 9/1-9/30/22	\$ 166.07	medic
310096	9/1/2022	427720	THE LANGUAGE EXCHANGE INC	INTERPRETER SERVICES IN COURT SESSIONS	\$ 247.50	court
309948	9/1/2022	5065448862	RICOH USA, INC	S/N C86138600 APD HALLWAY 6/1-8/31/22	\$ 31.15	apd
309949	9/1/2022	5065448977	RICOH USA, INC	S/N C86138599 APD FRONT OFFICE COPIES 8/1-8/31/22	\$ 32.80	apd
309944	9/1/2022	5065449096	RICOH USA, INC	S/N C86079893 LIBRARY PUBLIC 6/1-8/31/22	\$ 206.57	finance
309945	9/1/2022	5065449098	RICOH USA, INC	S/N C86111493 COURT 6/1-8/31/22	\$ 86.64	finance
309946	9/1/2022	5065449104	RICOH USA, INC	S/N C86152062 HR COPIES 8/1-8/31/22	\$ 6.69	finance
309947	9/1/2022	5065449322	RICOH USA, INC	S/N C86150637 CARNEGIE 6/1-8/31/22	\$ 217.24	finance
310126	9/1/2022	AN 873824	CENTRAL WELDING SUPPLY CO, INC	AMBULANCE O2	\$ 106.58	medic
309882	9/1/2022	ANA-1219073	ANACORTES AMERICAN	OPS 9/21-9/2023	\$ 71.55	dshop
309898	9/1/2022	E 202209010055	SIMPLIFILE, LC	HARDISON FIBER EASEMENT - 4015 PETERS LANE	\$ 216.38	fiber
309887	9/1/2022	INV-23517	IMAGE360	CUSTOM FIRE DEPT LOGOS #2002	\$ 564.27	dshop
310125	9/2/2022	100124	USA BLUE BOOK	CALCIUM STANDARD SOLUTION	\$ 39.89	dwtpt
310122	9/2/2022	13227857	HACH COMPANY	REPAIR - SELF CLEANING HEAD	\$ 475.13	dwtpt
310105	9/2/2022	220330	INFOSEND, INC.	OPEN STREETS INSERT	\$ 658.71	pw1
309959	9/2/2022	273789	NAPA	OIL FILTER #517	\$ 47.51	dshop
309964	9/2/2022	300000006951	PUGET SOUND ENERGY INC	STREET LIGHTS: 7/29-8/29/22	\$ 457.65	dshop
309973	9/2/2022	8498 30 017 0319913	COMCAST	LIBRARY INTERNET ACCESS 9/9-10/8/22	\$ 185.14	fiber
309957	9/2/2022	RefundBassetti	BASSETTI, JULIE	WA PARK REFUND	\$ 24.00	parks1
310111	9/5/2022	T21-003.08ASB	TUTTLE ENGINEERING AND MGMT	GRAND VIEW CEMETERY EXPANSION - PHASE 2 - JULY 1-AUGUST 31, 2022	\$ 1,327.00	parks1
310109	9/6/2022	205853	OASYS INC	PLOTTER CHARGE BASE AND CONTRACT 9/9-10/8/22	\$ 68.87	pw1
310143	9/6/2022	22-094-WTR-0011	IMCO GENERAL CONSTRUCTION	RETAINAGE RELEASE	\$ 2,225.00	pw1

Invoice Doc #	Invoice Date	Invoice #	Vendor Full Name	Description	Total Amount	Approval Queue
310145	9/6/2022	22-097-WTR-0011	IMCO GENERAL CONSTRUCTION	RETAINAGE RELEASE	\$ 2,000.00	pw1
310148	9/6/2022	22-098-WTR-0011	IMCO GENERAL CONSTRUCTION	RETAINAGE RELEASE	\$ 2,437.50	pw1
310153	9/6/2022	22-110-WTR-0011	LARRY BROWN CONSTRUCTION INC	RETAINAGE RELEASE	\$ 10,548.51	pw1
310081	9/6/2022	E 202209060030	SIMPLIFILE, LC	ZIMMERMAN REVOCABLE FAMILY TRUST FIBER EASEMENT - 2416 37TH STREET	\$ 216.38	fiber
310135	9/6/2022	E 202209060066	SIMPLIFILE, LC	VIEW RIDGE LLC CORRECTED EASEMENT	\$ 216.38	fiber
310139	9/6/2022	E 202209060067	SIMPLIFILE, LC	GIBONEY DISCLAIMER TRUST FIBER EASEMENT - 3806 LEEWARD LANE	\$ 216.38	fiber

Total

\$ 999,030.09



City Council Agenda Bill

Meeting Date: September 12,
2022

Agenda Item: 6.a.

Agenda Item Title: Ordinance 4030: An Ordinance of the City of Anacortes, Washington, Amending Chapter 10.12. Regarding Stopping, Standing, and Parking

Staff Contact(s): DON MEASAMER

<u>Approved for Submittal to Council by</u>	<u>Action Type</u>
DON MEASAMER	Public Hearing

Item Summary: Amending AMC Section [10.12.020](#) to include 5th Street as a maximum 2 hour parking limit based on business request and review and recommendation by the Traffic Safety Committee to include 5th Street.

Budget Impact:
NA

Previous Action: Adoption of [Ordinance 4012](#) amending certain parking areas

Recommended Motion: Motion to approve Ordinance 4030 as presented

Alternative Actions: Revisions to Ordinance 4030 as needed

Attachments (listed in order presented):

1. Ordinance 4030 5th Street Parking

ORDINANCE NO. 4030

**AN ORDINANCE OF THE CITY OF ANACORTES, WASHINGTON,
AMENDING CHAPTER 10.12 REGARDING STOPPING, STANDING, AND PARKING**

WHEREAS, the City has authority over all City rights-of-way pursuant to RCW 35A.11.020; and

WHEREAS, the Traffic Safety Committee has recommended that the City update Chapter 10.12 of the Anacortes Municipal Code regarding stopping, standing, and parking to address community concerns and updated impacts on City infrastructure; and

WHEREAS, the City Council desires to follow recommendations made by the Traffic Safety Committee as well as the advice of the City Public Works Director to amend chapter 10.12 regarding stopping, standing, and parking; and

NOW, THEREFORE, the City Council of the City of Anacortes does ordain as follows:

- Section 1. Chapter 10.12 of the Anacortes Municipal Code is amended as described in Attachment A. All remaining sections of Chapter 10.12 AMC will remain in effect.
- Section 2. This ordinance shall take effect five (5) days from and after its passage, approval, and publication in the manner required by law.

PASSED AND ADOPTED this 12th day of September 2022.

CITY OF ANACORTES, WASHINGTON

By: _____
Matt Miller, Mayor

ATTEST:

By: _____
Steven D. Hoglund, City Clerk

APPROVED AS TO FORM:

By: _____
Darcy Swetnam, City Attorney

Attachment A

Chapter 10.12 - STOPPING, STANDING AND PARKING is hereby amended as follows:

Section 10.12.020- Restricted during business hours.

Section 10.12.030- Restricted from certain locations.

Section 10.12.035- Limited parking time- specific locations.

Section 10.12.150- Established.

Section 10.12.200- Permit- Display.

Section 10.12.210- Exemptions.

Section 10.12.220- Violation- Penalty.

SECTION 10.12.020 Restricted during business hours.

No person shall stand, stop or park a vehicle, or allow a vehicle to be parked for a continuous period in excess of two hours between the hours of eight a.m. and six p.m. from Monday through Saturday of each week, within the following described area: Commercial Avenue from the south line of 3rd Street to the north line of 12th Street; the south side of 4th Street from the intersection of 4th Street and Commercial Avenue easterly to a point half-way between Commercial Avenue and “Q” Avenue; 5th Street, 6th Street, 7th Street, and 8th Street between the west line of “Q” Avenue and the east line of “O” Avenue, except portions of said streets adjacent to property used exclusively for residential purposes; the west side of Commercial Avenue between 2nd Street and 3rd Street and; the south side of 2nd Street from Commercial Avenue west to mid-block; and, further no person shall stand, stop or park a vehicle or allow a vehicle to be parked for a continuous period in excess of fifteen minutes between the hours of eight a.m. and six p.m. from Monday through Saturday of each week within the following described areas:

1. Commercial Avenue from the north line of 6th Street northerly to a point midway between the north line of 6th Street and the south line of 5th Street on the east side of said street, adjacent to the U.S. Post Office; and
2. The north side of 6th Street from the east line of Commercial Avenue to a point one hundred thirty-five feet east of said line.

SECTION 10.12.030- Restricted from certain locations.

A. No person shall stop, stand, or park a vehicle, or allow a vehicle to be parked, or any part thereof, along the following portions of the described streets and avenues, which constitute a bike path: the southerly side of 12th Street from D Avenue westerly to A Avenue, the southerly side of Oakes Avenue from A Avenue westerly to Hartford Avenue, and the southerly side of Burrows Bay Road from Hartford

Avenue westerly to the intersection with Ferry Terminal Road, and the westerly side of Ferry Terminal Road from its intersection with Burrows Bay Road to the terminus of the bike path.

B. No person shall stand, stop or park a vehicle, or allow a vehicle to be parked on St. Mary's Drive between Hillcrest Terrace and the north edge of Lot 1, Highland's First Addition to the city.

C. No person shall stand, stop, or park a trailer as defined in RCW [46.04.620](#) in the following locations: Q Avenue from 9th Street to 11th Street, the west side of Q Avenue from 14th Street to 15th Street, 10th Street from Commercial Avenue to Q Avenue, 11th Street from Commercial Avenue to Q Avenue and 13th Street from Commercial Avenue to Q Avenue.

D. No person shall stand, stop, or park a vehicle along the east side of Skyline Way between Kingsway and Hughes Lane.

E. No person shall stand, stop, or park a vehicle or allow a vehicle to be parked on the north side of Hughes Lane between Skyline Way and the west right-of-way line of the cul-de-sac at the west end of Hughes Lane.

F. No person shall stop, stand, or park a vehicle, or allow a vehicle to be parked, or any part thereof, along the following portions of the described streets and avenues: both sides of Q Avenue and cross-over from Q Avenue to R Avenue, and R Avenue from the south line of 17th Street to the north line of 22nd Street.

G. No person shall stand, stop, or park a vehicle, or a trailer as defined in RCW [46.04.620](#), or allow a vehicle, or a trailer to be parked on the easterly side of Q Avenue between 11th Street and 13th Street.

H. No person shall stand, stop, or park a vehicle, or a trailer as defined in RCW [46.04.620](#), or allow a vehicle, or a trailer to be parked on the westerly side of Commercial Avenue between 30th Street and 35th Street.

I. No person shall stand, stop or park a vehicle, or a trailer as defined in RCW [46.04.620](#), or allow a vehicle or a trailer to be parked on the easterly or westerly side of G Avenue between 7th Street and 8th Street.

J. No person shall stand, stop or park a vehicle, or a trailer as defined in RCW [46.04.620](#), or allow a vehicle, or a trailer to be parked on the west side of Q Avenue from 13th Street to 14th Street.

K. No person shall stand, stop or park a trailer as defined in RCW [46.04.620](#), or allow a trailer to be parked on 9th Street from Q Avenue to R Avenue and on R Avenue from 7th Street to 9th Street.

L. No person shall stand, or stop or park a vehicle or trailer, or allow a vehicle or trailer to be parked on 30th Street from the east line of T Avenue to the end of W Avenue. The east side of 2900-3000 block of W Avenue will be a 15-minute loading and unloading zone.

M. No person shall stand, or stop or park a vehicle or trailer, or allow a vehicle or trailer to be parked on Ferry Terminal Road.

N. It is unlawful to park a motor vehicle other than a passenger car or pick-up truck on 30th Street between R Avenue and T Avenue.

O. No person shall park a vehicle or trailer on the entirety of Beachwood Lane.

SECTION 10.12.035 Limited parking time- specific locations.

A. No person shall stand, stop, or park a vehicle, or allow a vehicle to be parked, for a continuous period in excess of two hours between the hours of eight a.m. and six p.m. from Monday through Saturday of each week, within the following described area: The north side of 4th Street from the west line of Commercial Avenue to a point midway between the west line of Commercial Avenue and the east line of O Avenue.

Violation of the ordinance codified in this subsection shall constitute a traffic infraction and shall be punishable upon a finding of “committed” by a fine of up to two hundred fifty dollars.

B. Parking of vehicles on the north side of 20th Street between I Avenue and J Avenue shall be limited to not more than fifteen minutes from Monday through Friday between the hours of seven a.m. and six p.m.

C. No person shall stand, stop or park a vehicle, or allow a vehicle to be parked for a continuous period in excess of thirty minutes between the hours of eight a.m. and six p.m. from Monday through Saturday of each week, within the following described area: the west side of Commercial Avenue from the north line of 22nd Street northward to the south line of the alley located in said block; the north side of 7th Street from the east line of O Avenue westerly to a point one hundred feet easterly of said east line of O Avenue.

D. No person shall stand, stop or park a vehicle or trailer for a period longer than two hours on the west side of Commercial Avenue between the south line of 14th Street and the north line of 17th Street.

E. No person shall stand, stop or park a vehicle or trailer on T Avenue between the south line of 22nd Street and the north line of 24th Street if extended.

F. No person shall stand, stop or park a vehicle or trailer for a period longer than two hours at Kiwanis Waterfront Park parking lot located on the north side of 6th Street.

Section 10.12.150 Established Residential Parking Zones.

There is established a residential parking zone in the following two areas:

Area A: 17th Street from “J” to “K” Avenue;
“I” and “J” Avenues between 20th and 22nd Streets;
20th Street between “H” and “K” Avenues;
“K” Avenue between 17th and 22nd Street;

“J” Avenue between 18th and 17th Streets;
and

Area B: 6th Street between “H” and “J” Avenues.

SECTION 10.12.160 Restrictions.

Area A. No person, except for those possessing and properly displaying valid residential or guest permits as hereinafter provided, shall park a vehicle within the residential parking zone for a period in excess of one hour between the hours of seven a.m. and three p.m. on days when the Anacortes High School is in session.

Area B. No person, except for those possessing and properly displaying valid residential or guest permits as hereinafter provided, shall park a vehicle for any length of time within the residential parking zone at all hours of all days of the week in Area B.

Appropriate traffic-control signs shall be posted in the residential parking zones so as to give notice to operators of vehicles of the parking restrictions imposed by this section.

SECTION 10.12.200 Permit - Display.

Residential permits shall be permanently affixed to the inside of the lower left driver’s side area of the front windshield. Guest permits shall be hung from the rear-view mirror or displayed on the driver’s side area of the front windshield.

SECTION 10.12.210 Exemptions.

Any vehicle bearing a valid and properly displayed residential permit or guest permit shall be permitted to park in the residential parking zone for which it is valid; provided, however that such vehicles shall be subject to all other regulations and ordinances of the city pertaining to the parking of vehicles.

SECTION 10.12.220 Violation – Penalty.

It is unlawful for any person to use or obtain a residential or guest permit or to allow another person to use or obtain a residential or guest permit in any manner other than as authorized by this chapter. Such violations shall be infractions and punishable by revocation of the permit and a monetary penalty of fifty dollars. Violation of the parking provisions of this chapter shall constitute an infraction with a monetary penalty of fifty dollars.



City Council Agenda Bill

Meeting Date: September 12,
2022

Agenda Item: 7.a.

Agenda Item Title: Shoreline Master Program Periodic Update - Draft 3 Discussion

Staff Contact(s): LIBBY GRAGE

Approved for Submittal to Council by **Action Type**

LIBBY GRAGE

Discussion

DON MEASAMER

Item Summary: Per City Council request, the Watershed Company and city staff have developed a 3rd Draft of AMC 19.72 Shoreline regulations for City Council review and feedback. The draft incorporates the Planning Commission's recommendations and includes other minor clarifying revisions. A revised draft of the Shoreline Element of the Comprehensive Plan is also included in the packet. Any Council-directed changes will be incorporated into the documents prior to release for a final public comment period.

Background:

The City is in the process of conducting a periodic review and update of the Anacortes Shoreline Master Program pursuant to WA State Shoreline Management Act requirements. The update includes codification of the shoreline regulations into AMC 19.72 Shorelines, and migration of the shoreline policies to the Comprehensive Plan.

The Department of Ecology issued an initial determination of concurrence for the SMP updates, subject to several revisions. The Planning Commission recommended approval of the proposed updates with several recommended changes.

Budget Impact:

Previous Action: Contracts:

[Agreement 19-111-PLN-001](#) with The Watershed Company - Periodic Review of the Shoreline Master Program

[Modification 01](#); [Modification 02](#); [Modification 03](#); [Modification 04](#)

Meetings:

[7/22/20 Planning Commission \(PC\) Meeting](#)

[8/26/20 PC Meeting](#)
[10/14/20 PC Meeting](#)
[12/9/20 PC / Ecology Joint Public Hearing](#)
[3/10/21 PC Meeting](#)
[2/9/22 PC Meeting](#)
[2/23/22 PC Meeting](#)
[4/13/22 PC Meeting](#)
[5/16/22 City Council \(CC\) Meeting](#)
[5/23/22 CC Meeting](#)

Recommended Motion: N/A

Alternative Actions:

Attachments (listed in order presented):

1. AMC 19.72 - Shoreline Regulations - City Council Discussion Draft (8/9/22)
2. Shoreline Element - Comprehensive Plan - City Council Discusison Draft
3. Comments - Evergreen Islands
4. Comment Response Matrix
5. Anacortes SMP - Cannery Scenario_Rev
6. SMP Presentation_CC_2022.09.12_DRAFT

Date: August 9, 2022

Yellow highlights correspond to changes made since 2nd Draft

AMC TITLE 19 DIVISION 7 - ENVIRONMENT

Chapter 19.72, Shorelines, is amended as follows:

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CHAPTER 19.72 – SHORELINE MASTER PROGRAMS

Article I. ~~Scope, Jurisdiction, and Exemptions~~ General Master Program Provisions

19.72.010 – ~~Title~~ Authority & Scope

This chapter is adopted as part of the Shoreline Master Program for the City. It is adopted under the authority of Chapter 90.58 RCW and Chapter 173-26 WAC.

Chapter 19.72 AMC, in combination with the Goals and Policies of the Shoreline Element of the Anacortes Comprehensive Plan, are known and may be cited as the City of Anacortes Shoreline Master Program. The regulations within this chapter may be referred to as “this SMP” or ~~the~~ “this Master Program”.

19.72.015 – Purpose

~~A. The Shoreline Management Act defines a Master Program as a “comprehensive use plan for a described area.” The shoreline planning process differs from the more traditional planning process in that the emphasis is on protecting the shoreline environment through management of uses.~~

The purposes of this Master Program are:

1. To carry out the responsibilities imposed on the City of Anacortes by the Washington State Shoreline Management Act (RCW 90.58).
2. To promote uses and development of the Anacortes shoreline consistent with the Anacortes Comprehensive Plan while protecting and restoring environmental resources.
3. To promote the public health, safety, and general welfare by providing a guide and regulation for the future development of the shoreline resources of the City of Anacortes.

19.72.020 - Applicability

- A. All proposed uses and development occurring within shoreline jurisdiction must conform to chapter 90.58 RCW, the Shoreline Management Act and this Master Program. All uses, even those not meeting the definition of development, are subject to the provisions and development regulations of this SMP, even though a permit may not be required.
- B. Any person ~~wishing proposing any new use, activity, development or structure; or any change, modification, addition or alteration to an existing use, activity, development or structure to undertake activities constituting “development”~~ within shoreline jurisdiction must apply to the Shoreline Administrator for a Shoreline Permit. ~~Based on~~ In accordance with the provisions of this Master Program, the Shoreline Administrator must determine if a Letter of Exemption, a Substantial Development Permit, a Shoreline Conditional Use Permit, and/or a Shoreline Variance is required. Substantial development must not be undertaken within the jurisdiction of the Act and this Master Program UNLESS a Substantial Development Permit has been obtained and the appeal period has been completed and any appeals have been resolved and/or the project proponent is allowed to proceed under the provisions of the Shoreline Management Act or by court order. "Substantial

development" must be defined as it is by the Act (§90.58.030 RCW) and supplementing provisions of the Washington Administrative Code (§173-27-040 WAC).

- C. Developments exempt from a Substantial Development Permit, ~~which are~~ outlined in [Section 2.4-E AMC 19.72.0350\(E\)](#) of this Master Program, ~~must~~ requires a Letter of Exemption. A project that qualifies as "exempt development" may also require a Shoreline Conditional Use Permit, and/or a Shoreline Variance from Master Program provisions.
 - 1. Exempt developments must not be undertaken within the jurisdiction of the Act and this Master Program UNLESS a Letter of Exemption has been obtained documenting that the development is consistent with the policies and procedures of the Act, all applicable state regulations and this Master Program.
 - 2. The request for the Letter of Exemption must be in writing, on forms required by the Shoreline Administrator, and include the information required by the Shoreline Administrator.
- D. This Master Program ~~must will apply~~ applies to every individual, firm, partnership, association, organization, corporation, local or state governmental agency, public or municipal corporation, or other entity which develops, owns, leases or administers lands, wetlands or waters that fall under the jurisdiction of the Act.
- E. The "policies" in the [Shoreline Element of the Comprehensive Plan](#) ~~is Master Program~~ provide broad guidance and direction and will be used by the City in applying the "regulations."
- F. Applicability of this Master Program to federal lands and agencies must be consistent with WAC 173-27-060 as currently exists or is hereinafter amended.

19.72.025 – Anacortes Shoreline Jurisdiction

- A. This Master Program ~~must apply~~ applies to all the lands and waters in the City of Anacortes that fall under the jurisdiction of the Shoreline Management Act. Shorelines include the waters within the City limits together with the lands underlying them and all lands extending landward 200 feet in all directions as measured on a horizontal plane from the ordinary high water mark together with any associated wetlands. [Shoreline jurisdiction includes all marine waters within the City of Anacortes and the freshwaters of Little Cranberry, Heart, and Whistle Lakes, in addition to a portion of Lake Erie, see SMP Map for details.](#)
- B. There is hereby made a part of this Master Program a map, illustrating the shoreline designations and the approximate location of the upland extent of the shoreline jurisdiction in Anacortes. The area of shoreline jurisdiction extends waterward to the Anacortes City Limits. The actual landward extent of shoreline jurisdiction will be determined on a case-by-case basis. Where uncertainty or conflict may occur in the exact location of boundaries designating shoreline environments (pursuant to ~~Chapter 5~~ [AMC 19.72.310-3605](#)), the map, designation purpose, and designation criteria must be used.
- C. Given that the Shoreline Designation Map is an integral part of this Master Program, no part of the map may be altered or revised unless a Master Program amendment has been approved by the City Council and the Washington State Department of Ecology (RCW 90.58.090).
- D. Associated wetlands that are included in the shoreline jurisdiction are those that influence or are influenced by the regulated waters. In general, a wetland is "associated" if all or a portion of the wetland falls within that area that is 200 feet from the ordinary high water mark. A wetland outside of this area may also be associated if it is in proximity to the shoreline and there is a demonstrated

Commented [LG1]: Gap Analysis: Table 2-1 2007b

influence between the wetland and the shoreline. Such influence can include hydraulic continuity, such as a surface or groundwater connection (See Chapter 173-22 WAC).

- E. Where a substantial development is proposed which would be partly within and partly without shoreline jurisdiction, a shoreline substantial development permit must be required for the entire development. The regulations of this Master Program must apply only to that part of the development which occurs within shoreline jurisdiction.

19.72.030– Relationship to Other Plans and Regulations

A. The Anacortes Shoreline Master Program consists of the following components:

1. AMC Chapter 19.72 Shoreline Master Program;
2. Shoreline Goals and Policies found in the Shoreline Element of the Comprehensive Plan;
3. Shoreline Map, Figure XXX in the Shoreline Element of the Comprehensive Plan.

B. Uses, developments and activities regulated by this Shoreline Master Program may also be subject to the provisions of the City of Anacortes Comprehensive Plan, the Washington State Environmental Policy Act (“SEPA”, Chapter 43.21C RCW and Chapter 197-11 WAC), the City of Anacortes Municipal Code, and various other provisions of local, state and federal law, as may be amended.

1. Project proponents must comply with all applicable laws prior to commencing any use, development or activity.
2. In the event a conflict occurs between the provisions of this Master Program and the laws, regulations, codes or rules of any other authority having jurisdiction within the City, the regulations that provide more protection to the shoreline area will apply, EXCEPT when constrained by federal or state law, or where specifically provided otherwise in this Master Program.
3. At the time of an initial inquiry or when a permit application is submitted, the Shoreline Administrator should inform an applicant of those regulations and statutes that may be also applicable to the proposed project to the best of the administrator's knowledge, provided, that the final responsibility for determining the applicability and complying with such other statutes and regulations must rest with the applicant.
4. Other activities that could occur along the shoreline (starting bonfires, disposing or spilling/releasing of regulated or hazardous waste products, use of pesticides, activities within wetlands) may require other permits, review, or approval not identified here.

19.72.035~~30~~ - Uses Not Constituting “Development” and Exemptions from Substantial Development Permit Requirements

- A. Applicability to uses not constituting development. All uses within shoreline jurisdiction must be consistent with the regulations of this Master Program whether or not they require a Shoreline Substantial Development Permit. If an activity does not meet the definition of “Development”, it still may require a [Letter of](#) shoreline exemption. Activities in shoreline critical areas must request a letter of shoreline exemption or substantial development permit, regardless of whether they are exempt under provisions AMC 19.70.035 Critical Areas Review or AMC 19.70.040, Permitted Alterations. Furthermore, Shoreline Conditional Use and/or Shoreline Variance permits may still be required of development that is not substantial development. An exemption from the Substantial Development Permit requirements does not constitute an exemption from the policies and use

regulations of the Shoreline Management Act, the provisions of this Master Program, and other applicable City, state, or federal permit requirements.

WAC 173-27-140(1): *"No authorization to undertake use or development on shorelines of the state shall be granted by local government unless upon review the use or development is determined to be consistent with the policy and provisions of the Shoreline Management Act and the master program."* ~~(Bold emphasis added.)~~

~~A.C.~~ Letters of Shoreline Exemptions. All applications for letters of shoreline exemptions must be made on a form provided by the Shoreline Administrator and accompanying material as required. All exemptions ~~must~~ will be construed narrowly. The Shoreline Administrator may attach conditions to the approval of exempted developments, uses, and/or activities as necessary to assure consistency of the project with the Shoreline Management Act and this Master Program. A Letter of Exemption must expire one year after the date of issuance unless otherwise specified in the Letter of Exemption. The same measures used to calculate time periods for Shoreline Permits as set forth in WAC 173-27-090(3) must be used for Letters of Exemptions.

~~B.D.~~ Whenever a development falls within the exemption criteria listed in ~~2.4~~ AMC 19.72.030(E): below and is subject to a U.S. Army Corps of Engineers Section 10 or Section 404 Permit, the Shoreline Administrator must prepare a Statement of Exemption and send a copy of this statement to the Washington Department of Ecology.

~~C.E.~~ Incremental exemptions – Letters of Shoreline Exemptions must not be issued for a series of inter-dependent activities that in sum would require a permit (i.e., a project cannot be submitted in a piece-meal fashion to avoid the requirement for a substantial development permit).

~~D.F.~~ The following must not be considered substantial development for the purpose of this Master Program:

1. Any development of which the total cost or fair market value, whichever is higher, does not exceed ~~seven thousand forty seven (\$7,047)~~ eight thousand five hundred and four dollars (\$8,504), or as periodically adjusted per RCW 90.58.030(3)(e), if such development does not materially interfere with the normal public use of the water or shorelines of the state. The dollar threshold established in this subsection must be adjusted for inflation by the office of financial management every five years, beginning July 1, 2007, based upon changes in the consumer price index during that time period. "Consumer price index" means, for any calendar year, that year's annual average consumer price index, Seattle, Washington area, for urban wage earners and clerical workers, all items, compiled by the Bureau of Labor and Statistics, United States Department of Labor. The office of financial management must calculate the new dollar threshold and transmit it to the office of the code reviser for publication in the Washington State Register at least one month before the new dollar threshold is to take effect. For purposes of determining whether or not a Substantial Development Permit is required, the total cost or fair market value must be based on the value of development that is occurring on shorelines of the state as defined in RCW 90.58.030 (2)(c). The total cost or fair market value of the development must include the fair market value of any donated, contributed or found labor, equipment or materials;
2. Normal maintenance or repair of existing structures or developments, including damage by accident, fire, or elements. "Normal maintenance" includes those usual acts to prevent a decline, lapse, or cessation from a lawfully established condition. "Normal repair" means to restore a development to a state comparable to its original condition within one year after decay or partial destruction except where repair causes substantial adverse effects to the shoreline resource or environment. Replacement of a structure or development may be

Commented [LG2]: DOE updated threshold effective 7/1/22

authorized as repair where such replacement is the common method of repair for the type of structure or development and the replacement structure or development is comparable to the original structure or development including but not limited to its size, shape, configuration, location and external appearance and the replacement does not cause substantial adverse effects to shoreline resources or environment;

3. Construction of the normal protective bulkhead common to single-family residences. A "normal protective" bulkhead includes those structural and nonstructural developments installed at or near, and parallel to, the ordinary high water mark for the sole purpose of protecting an existing single-family residence and appurtenant structures from loss or damage by erosion. A normal protective bulkhead is not exempt if constructed for the purpose of creating dry land. When a vertical or near vertical wall is being constructed or reconstructed, not more than one cubic yard of fill per one foot of wall may be used as backfill. When an existing bulkhead is being repaired by construction of a vertical wall fronting the existing wall, it must be constructed no further waterward of the existing bulkhead than is necessary for construction of new footings. When a bulkhead has deteriorated such that an ordinary high water mark has been established by the presence and action of water landward of the bulkhead then the replacement bulkhead must be located at or near the actual ordinary high water mark. Beach nourishment and bioengineered erosion control projects may be considered a normal protective bulkhead, consistent with WDFW's Marine Shoreline Design Guidelines, when any structural elements are consistent with the above requirements and when the project has been approved by the Department of Fish and Wildlife;
4. Emergency construction necessary to protect property from damage by the elements. An "emergency" is an unanticipated and imminent threat to public health, safety, or the environment, which requires immediate action within a time too short to allow full compliance with the Act or this Master Program. Emergency construction does not include development of new permanent protective structures where none previously existed. Where new protective structures are deemed by the Shoreline Administrator to be the appropriate means to address the emergency situation, upon abatement of the emergency situation the new structure must be removed or any permit which would have been required, absent an emergency, obtained. As a general matter, potential flooding or other seasonal events that can be anticipated and may occur but that are not imminent are not an emergency;
5. Construction and practices normal or necessary for farming, irrigation, and ranching activities, including agricultural service roads and utilities on shorelands, construction of a barn or similar agricultural structure, and the construction and maintenance of irrigation structures including but not limited to head gates, pumping facilities, and irrigation channels: Provided, that a feedlot of any size, all processing plants, other activities of a commercial nature, alteration of the contour of the shorelands by leveling or filling other than that which results from normal cultivation, ~~must~~will not be considered normal or necessary farming or ranching activities. A feedlot ~~must~~is be an enclosure or facility used or capable of being used for feeding livestock hay, grain, silage, or other livestock feed, but must not include land for growing crops or vegetation for livestock feeding and/or grazing, nor ~~must~~does it include normal livestock wintering operations;
6. Construction or modification of navigational aids such as channel markers and anchor buoys;
7. Construction on shorelands by an owner, lessee, or contract purchaser of a single-family residence for their own use or for the use of their family, which residence does not exceed

a height of thirty-five (35) feet above grade level and meets all requirements of the state agency or local government having jurisdiction thereof, other than requirements imposed pursuant to chapter 90.58 RCW. "Single-family residence" means a detached dwelling designed for and occupied by one family including those structures and developments within a contiguous ownership which are a normal appurtenance. An "appurtenance" is necessarily connected to the use and enjoyment of a single-family residence and is located landward of the ordinary high water mark and the perimeter of a wetland. On a statewide basis, normal appurtenances include a garage; deck; driveway; utilities; fences; installation of a septic tank and drainfield and grading which does not exceed two hundred fifty cubic yards and which does not involve placement of fill in any wetland or waterward of the ordinary high water mark. Local circumstances may dictate additional interpretations of normal appurtenances which must be set forth and regulated within the applicable master program. Construction authorized under this exemption must be located landward of the ordinary high water mark;

8. Construction of a dock, including a community dock, designed for pleasure craft only, for the private noncommercial use of the owner, lessee, or contract purchaser of single-family and multiple-family residences. A dock is a landing and moorage facility for watercraft and does not include recreational decks, storage facilities or other appurtenances. This exception applies if either:
 - a. In salt waters, the fair market value of the dock does not exceed two thousand five hundred (\$2,500) dollars; or
 - b. In fresh waters the fair market value of the dock replacement does not exceed twenty two thousand five hundred (\$22,500), and are of equal or lesser square footage than the existing dock being replaced, or
 - c. New docks constructed in fresh waters do not exceed eleven thousand two hundred (\$11,200) dollars,
 - d. However, subsequent construction having a fair market value exceeding the amount above occurs within five years of completion of the prior construction, the subsequent construction ~~must~~will be considered a substantial development for the purpose of these regulations.

For purposes of this section, saltwater ~~must~~will include the tidally influenced marine and estuarine water areas of the state including the Pacific Ocean, Strait of Juan de Fuca, Strait of Georgia and Puget Sound and all bays and inlets associated with any of the above;

9. Operation, maintenance, or construction of canals, waterways, drains, reservoirs, or other facilities that now exist or are hereafter created or developed as part of an irrigation system for the primary purpose of making use of system waters, including return flow and artificially stored ground water from the irrigation of lands;
10. The marking of property lines or corners on state-owned lands, when such marking does not significantly interfere with the normal public use of the surface of the water;
11. Operation and maintenance of any system of dikes, ditches, drains, or other facilities existing on and in use since September 8, 1975, which were created, developed or utilized primarily as part of an agricultural drainage or diking system;
12. Any project with certification from the governor pursuant to Chapter 80.50 RCW;
13. Site exploration and investigation activities that are prerequisite to preparation of an application for development authorization under this chapter, if:

- a. The activity does not interfere with the normal public use of the surface waters;
- b. The activity will have no significant adverse impact on the environment including but not limited to fish, wildlife, fish or wildlife habitat, water quality, and aesthetic values;
- c. The activity does not involve the installation of any structure, and upon completion of the activity, the vegetation and land configuration of the site are restored to conditions existing before the activity;
- d. A private entity seeking development authorization under this section first posts a performance bond or provides other evidence of financial responsibility to the local jurisdiction to ensure that the site is restored to preexisting conditions; and
- e. The activity is not subject to the permit requirements of RCW 90.58.550.

14. The process of removing or controlling aquatic noxious weeds, as defined in RCW 17.26.020, through the use of an herbicide or other treatment methods applicable to weed control that are recommended by a final environmental impact statement published by the department of agriculture or the department of ecology jointly with other state agencies under chapter 43.21C RCW;

15. Watershed restoration projects as defined herein. Local government must review the projects for consistency with the Shoreline Master Program in an expeditious manner and ~~must~~will issue its decision along with any conditions within forty-five (45) days of receiving all materials necessary to review the request for exemption from the applicant. No fee may be charged for accepting and processing requests for exemption for watershed restoration.

- a. "Watershed restoration project" means a public or private project authorized by the sponsor of a watershed restoration plan that implements the plan or a part of the plan and consists of one or more of the following activities:
 - 1. A project that involves less than ten miles of stream reach, in which less than twenty-five cubic yards of sand, gravel, or soil is removed, imported, disturbed or discharged, and in which no existing vegetation is removed except as minimally necessary to facilitate additional plantings;
 - 2. A project for the restoration of an eroded or unstable stream bank that employs the principles of bioengineering, including limited use of rock as a stabilization only at the toe of the bank, and with primary emphasis on using native vegetation to control the erosive forces of flowing water; or
 - 3. A project primarily designed to improve fish and wildlife habitat, remove or reduce impediments to migration of fish, or enhance the fishery resource available for use by all of the citizens of the state, provided that any structure, other than a bridge or culvert or instream habitat enhancement structure associated with the project, is less than two hundred square feet in floor area and is located above the ordinary high water mark of the stream.
- b. "Watershed restoration plan" means a plan, developed or sponsored by the Department of Fish and Wildlife, the Department of Ecology, the Department of Natural Resources, the Department of Transportation, a federally recognized Indian Tribe acting within and pursuant to its authority, a city, a county, or a conservation district that provides a general program and implementation measures or actions for the preservation, restoration, re-

creation, or enhancement of the natural resources, character, and ecology of a stream, stream segment, drainage area, or watershed for which agency and public review has been conducted pursuant to chapter 43.21C RCW, the State Environmental Policy Act;

16. A public or private project that is designed to improve fish or wildlife habitat or fish passage, when all of the following apply:

- a. The project has been approved in writing by the Department of Fish and Wildlife;
- b. The project has received hydraulic project approval by the Department of Fish and Wildlife pursuant to Chapter 77.55 RCW; and
- c. The Shoreline Administrator has determined that the project is substantially consistent with this Master Program. The Shoreline Administrator must make such determination in a timely manner and provide it by letter to the project proponent.

Fish habitat enhancement projects that conform to the provisions of RCW 77.55.181 are determined to be consistent with local shoreline master programs, as follows:

i. In order to receive the permit review and approval process created in this section, a fish habitat enhancement project must meet the criteria under (16)(c)(i)(I) and (2) of this subsection:

- a. A fish habitat enhancement project ~~must~~will be a project to accomplish one or more of the following tasks:
 - (a) Elimination of human-made fish passage barriers, including culvert repair and replacement;
 - (b) Restoration of an eroded or unstable streambank employing the principle of bioengineering, including limited use of rock as a stabilization only at the toe of the bank, and with primary emphasis on using native vegetation to control the erosive forces of flowing water; or
 - (c) Placement of woody debris or other instream structures that benefit naturally reproducing fish stocks.

The Washington Department of Fish and Wildlife ~~must~~will develop size or scale threshold tests to determine if projects accomplishing any of these tasks should be evaluated under the process created in this section or under other project review and approval processes. A project proposal ~~must~~will not be reviewed under the process created in this section if the department determines that the scale of the project raises concerns regarding public health and safety; and

- b. A fish habitat enhancement project must be approved in one of the following ways:
 - (a) By the Washington Department of Fish and Wildlife pursuant to chapter 77.95 or 77.100 RCW;
 - (b) By the sponsor of a watershed restoration plan as provided in chapter 89.08 RCW;
 - (c) By the Washington Department of Fish and Wildlife as a Washington Department of Fish and Wildlife-sponsored fish habitat enhancement or restoration project;

- (d) Through the review and approval process for the jobs for the environment program;
 - (e) Through the review and approval process for conservation district-sponsored projects, where the project complies with design standards established by the conservation commission through interagency agreement with the United States Fish and Wildlife Service and the Natural Resource Conservation Service;
 - (f) Through a formal grant program established by the legislature or the Washington Department of Fish and Wildlife for fish habitat enhancement or restoration; and
 - (g) Through other formal review and approval processes established by the legislature.
4. Fish habitat enhancement projects meeting the criteria of (16)(c)(i) of this subsection are expected to result in beneficial impacts to the environment. Decisions pertaining to fish habitat enhancement projects meeting the criteria of (16)(c)(i) of this subsection and being reviewed and approved according to the provisions of this section are not subject to the requirements of RCW 43.21 C.030 (2)(c).
 5. A hydraulic project approval permit is required for projects that meet the criteria of (16)(c)(i) of this subsection and are being reviewed and approved under this section. An applicant must use a joint aquatic resource permit application form developed by the Office of Regulatory Assistance to apply for approval under these regulations. On the same day, the applicant must provide copies of the completed application form to the Washington Department of Fish and Wildlife and to each appropriate local government. Local governments must accept the application as notice of the proposed project. The Washington Department of Fish and Wildlife ~~must~~will provide a fifteen-day comment period during which it will receive comments regarding environmental impacts. Within forty-five days, the Washington Department of Fish and Wildlife must either issue a permit, with or without conditions, deny approval, or make a determination that the review and approval process created by this section is not appropriate for the proposed project. The Washington Department of Fish and Wildlife must base this determination on identification during the comment period of adverse impacts that cannot be mitigated by the conditioning of a permit. If the Washington Department of Fish and Wildlife determines that the review and approval process created by this section is not appropriate for the proposed project, the Washington Department of Fish and Wildlife must notify the applicant and the appropriate local governments of its determination. The applicant may reapply for approval of the project under other review and approval processes.
 6. Any person aggrieved by the approval, denial, conditioning, or modification of a permit under this section may formally appeal the decision to the hydraulic appeals board pursuant to the provisions of these regulations.
 7. No local government may require permits or charge fees for fish habitat enhancement projects that meet the criteria of (16)(c)(i) of this subsection and that are reviewed and approved according to the provisions of this section.

- F. Before issuing a shoreline ~~statement~~-letter of exemption, the Shoreline Administrator must review the Master Program to determine if the proposed development requires a Shoreline Conditional Use Permit and/or a Variance. It may be necessary for the Shoreline Administrator to conduct a site inspection to ensure that the proposed development meets the exemption criteria. Application information must include those items listed in WAC 173-27-180 and as contained within the Anacortes Municipal Code for Substantial Development Permits unless otherwise waived.

19.72.040~~35~~ – Developments not Required to Obtain Shoreline Permits or Local Reviews

- A. Requirements to obtain a Substantial Development Permit, Conditional Use Permit, Variance, letter of exemption, or other review to implement the Shoreline Management Act do not apply to projects listed under WAC 173-27-044 and -045, as amended, including, but not limited to the following:
1. Remedial actions. Pursuant to RCW 90.58.355, any person conducting a remedial action at a facility pursuant to a consent decree, order, or agreed order issued pursuant to chapter 70.105D RCW, or to the department of ecology when it conducts a remedial action under chapter 70.105D RCW.
 2. Boatyard improvements to meet NPDES permit requirements. Pursuant to RCW 90.58.355, any person installing site improvements for storm water treatment in an existing boatyard facility to meet requirements of a national pollutant discharge elimination system storm water general permit.
 3. WSDOT facility maintenance and safety improvements. Pursuant to RCW 90.58.356, Washington State Department of Transportation projects and activities meeting the conditions of RCW 90.58.356 are not required to obtain a Substantial Development Permit, Conditional Use Permit, Variance, letter of exemption, or other local review.
 4. Projects consistent with an environmental excellence program agreement pursuant to RCW 90.58.045.
 5. Projects authorized through the Energy Facility Site Evaluation Council process, pursuant to chapter 80.50 RCW.

~~19.72.040 – Relationship to Other Plans and Regulations~~

~~A. In addition to compliance with the provisions of the Shoreline Management Act of 1971 and the state Shoreline Master Program Guidelines, the Anacortes Shoreline Master Program must be consistent with local plans and policy documents, specifically, the Anacortes Comprehensive Plan and the City's critical areas regulations. The Master Program must be consistent with the regulations developed by the City to implement its plans, such as the zoning code and subdivision code, as well as regulations relating to building construction and safety.~~

~~— Uses, developments and activities regulated by this Shoreline Master Program may also be subject to the provisions of the City of Anacortes Comprehensive Plan, the Washington State Environmental Policy Act ("SEPA", Chapter 43.21C RCW and Chapter 197-11 WAC), the City of Anacortes Municipal Code, and various other provisions of local, state and federal law, as may be amended.~~

- ~~9. Project proponents must comply with all applicable laws prior to commencing any use, development or activity.~~

Commented [GL3]: Moved this section up.

~~10. In the event a conflict occurs between the provisions of this Master Program and the laws, regulations, codes or rules of any other authority having jurisdiction within the City, the regulations that provide more protection to the shoreline area must will apply, EXCEPT when constrained by federal or state law, or where specifically provided otherwise in this Master Program.~~

~~11. At the time of an initial inquiry or when a permit application is submitted, the Shoreline Administrator should inform an applicant of those regulations and statutes that may be also applicable to the proposed project to the best of the administrator's knowledge, provided, that the final responsibility for determining the applicability and complying with such other statutes and regulations must rest with the applicant.~~

~~12. Other activities that could occur along the shoreline (starting bonfires, disposing or spilling/releasing of regulated or hazardous waste products, use of pesticides, activities within wetlands) may require other permits, review, or approval not identified here.~~

19.72.045 – Moratoria ~~Authority~~ and Interim Controls

A. The City has authority to adopt a moratorium control or other interim control on development under RCW 90.58.590.

~~E.~~**B.** To adopt a moratorium control or other interim control, the City must:

~~1.a.~~**1.a.** Hold a public hearing on the moratorium or control. The public hearing must be held within sixty days of the adoption of the moratorium or control;

~~2.b.~~**2.b.** Adopt detailed findings of fact that include, but are not limited to justifications for the proposed or adopted actions and explanations of the desired and likely outcomes;

c. Notify the department of Ecology of the moratorium or control immediately after its adoption. The notification must specify the time, place, and date of any public hearing.

~~3.d.~~**3.d.** Provide that all lawfully existing uses, structures, or other development shall continue to be lawful conforming uses and may continue to be maintained, repaired, and redeveloped, so long as the use is not expanded under the terms of the land use and shoreline rules and regulations in place at the time of the moratorium.

~~F.~~**C.** A moratorium or control adopted under this section may be effective for up to six months if a detailed work plan for remedying the issues and circumstances necessitating the moratorium or control is developed and made available for public review.

~~G.~~**D.** A moratorium or control may be renewed for ~~one or two more~~ six-month periods if the City complies with the requirements in subsection (B) above before each renewal.

Commented [AC4]: Gap Analysis: Table 2-1 2009c

Article 2. Administrative Provisions

19.72.210 – Application Requirements and Procedures

A. An application for a shoreline permit must be submitted to the Department on forms provided by the Department and include applicable fees and all required information in the application submittal checklist.

Commented [GL5]: Relocated from AMC 18.16

B. Shoreline permit applications are reviewed per the review classification and process matrix in AMC Table 19.20.030-1 and the administrative provisions outlined in this Article 2.

C. Multiple Shoreline Permits. When multiple shoreline permit types are required for a development, the applicant must submit all shoreline permit requests simultaneously and they must be processed simultaneously by the City.

D. The City will conduct permit reviews for WSDOT projects involving state highways within 90 days pursuant to RCW 47.01.485.

Commented [GL6]: Gap Analysis: Table 2-1, 2015a

19.72.215 – Substantial Development Permits

Commented [GL7]: Relocated from AMC 18.16

A. Permit Required. A substantial development permit is required for all proposed use and development of shorelines unless the proposal is specifically exempt pursuant to this Chapter or Chapter 90.58 RCW and Chapter 173-26 WAC, as amended.

B. Review Criteria. A substantial development permit must be granted only when the development proposed is consistent with:

1. The policies and procedures of the Shoreline Management Act;

2. The provisions of WAC 173-27; and

3. The Anacortes Shoreline Master Program.

19.72.22+0 – Conditional Use Permits

B.A. Purpose. The purpose of a Shoreline Conditional Use Permit is to allow flexibility in varying the application of the use regulations of the Master Program in a manner consistent with the policies of RCW 90.58.020; provided that Shoreline Conditional Use Permits should also be granted in a circumstance where denial of the permit would result in a thwarting of State policy enumerated in RCW 90.58.020. In authorizing a conditional use, special conditions may be attached to the permit by the City of Anacortes or by the Department of Ecology to prevent undesirable effects of the proposed use and/or to assure consistency of the project with the Act and this Master Program. Certain alterations of wetlands as outlined in ~~Chapter 6~~ AMC 19.72.435 of this Master Program may also require a Shoreline Conditional Use Permit.

~~C.B.~~ Classification of Uses. Uses that are classified by ~~Table 5-1~~ AMC 19.72.365(A) as conditional uses must obtain a Conditional Use Permit.

Uses that are not classified in ~~AMC 19.72.365(A)~~ ~~Table 5-1~~ or in specific use and modification sections contained in ~~Chapters 8 and 9~~ AMC 19.72.510-660 may be authorized as conditional uses provided the applicant can demonstrate compliance with the criteria listed below and all other applicable policies and regulations of this Master Program.

Uses that are specifically prohibited by the Master Program may not be authorized by a Conditional Use Permit.

~~D. Shoreline Conditional Use Permit Process. Shoreline Conditional Use Permits will be processed subject to public notice, comment, and a public hearing pursuant to AMC. Conditional Use Permits must meet the approval criteria listed in Section AMC 19.72.210(D) below. The Shoreline Administrator must will be as provided in the Anacortes Municipal Code.~~

Commented [GL8]: Addressed in application requirements above.

~~E.C.~~ Criteria for Granting Shoreline Conditional Use Permits. Uses classified as conditional uses may be authorized provided that the applicant can demonstrate all of the following:

1. That the proposed use will be consistent with the policies of RCW 90.58.020 and the policies of the Master Program;
2. That the proposed use will not interfere with the normal public use of public shorelines;
3. That the proposed use of the site and design of the project will be compatible with other authorized uses within the area and with uses planned for the area under the comprehensive plan and this Master Program;
4. That the proposed use will cause no significant adverse effects to the shoreline environment in which it is to be located; and
5. That the public interest will suffer no substantial detrimental effect. In the granting of all Conditional Use Permits, consideration must be given to the cumulative impact of additional requests for like actions in the area. For example, if Conditional Use Permits were granted for other developments in the area where similar circumstances exist, the total impacts from the conditional uses must also remain consistent with the policies of RCW 98.58.020 and must not produce substantial adverse effects to the shoreline environment.

~~F. Filing Shoreline Conditional Use Permits with the Department of Ecology Review of Conditional Use Permits. After the decision maker has made a final decision on a Conditional Use Permit application, the Administrator must will file the Permit with the Department of Ecology for its approval, approval with conditions, or denial. A permit data sheet in the form provided under WAC 173-27-990 must be submitted to the Department of Ecology with each Conditional Use Permit. The Department of Ecology will issue its decision on a Conditional Use Permit within thirty (30) days of filing. Filing is not complete until all the required documents have been received by the Department of Ecology.~~

Commented [GL9]: Addressed in 19.72.235 below

~~Upon receipt of the Department of Ecology's decision, the Administrator must will notify those interested persons who requested notification of such decision.~~

~~Development authorized by a Conditional Use Permit must not begin until twenty-one (21) days from the date the Department of Ecology renders a decision on the Conditional Use Permit and transmits that decision to the Administrator (date of filing). The Department of Ecology must will notify the Administrator of the date of filing on an individual Conditional Use Permit. In the event of an appeal refer to the provisions of RCW 90.58.140 for when construction work may begin.~~

19.72.225-15 - Variances

- A. Purpose. The purpose of a Variance Permit is strictly limited to granting relief to specific bulk, dimensional, or performance standards set forth in the Master Program where there are extraordinary circumstances relating to the physical property or configuration of property such that the strict implementation of the Master Program would impose unnecessary hardships on the applicant, including but not limited to denying reasonable use of a property. Shoreline uses specifically listed as "prohibited" ~~must~~ are not ~~be~~ eligible for consideration as a Shoreline Variance.

~~B. Shoreline Variance Process~~

- ~~1. Description. Variances are requests to adjust the applicable setback and/or bulk and dimensional requirements established by this Shoreline Master Program. Use variances are prohibited.~~
- ~~2. Process. Shoreline Variance Permits will be processed by the Administrator subject to public notice, comment, and a public hearing. The decision maker must will be as provided in the Shoreline Master Program of the Anacortes Municipal Code.~~

Commented [GL10]: Addressed in 19.72.225(A) and AMC 19.72.210

~~3. Application. An application for a Shoreline Variance must be submitted on a form provided by the Administrator and accompanying material provided as required.~~

~~4. An applicant for a Substantial Development Permit who wishes to also request a Variance must submit the Variance application and the Substantial Development Permit application simultaneously.~~

G.B. Variance Approval Criteria. The following criteria must be used in evaluating Variance applications:

1. Criteria for Granting Upland Variances. Variance Permits for development that will be located landward of the ordinary high water mark, including those areas designated by the Department of Ecology as wetlands pursuant to WAC 173-22, may be authorized provided the applicant can demonstrate all of the following:
 - a. That the strict requirements of the bulk, dimensional, or performance standards set forth in the Master Program preclude or significantly interfere with a reasonable use of the property not otherwise prohibited by the Master Program.
 - b. That the hardship described in subsection (a) above is specifically related to the property, and is the result of unique conditions such as irregular lot shape, size, or natural features and the application of the Master Program, and not, for example, from deed restrictions or the applicant's own actions.
 - c. That the design of the project will be compatible with other authorized uses in the area and will not cause adverse effects to adjacent properties or the shoreline environment.
 - d. That the variance requested will not constitute a grant of special privilege not enjoyed by the other properties in the area;
 - e. That the variance requested is the minimum necessary to afford relief;
 - f. That the public interest will suffer no substantial detrimental effect.
2. Criteria for Granting Variances Waterward of Ordinary High Water. Variance Permits for development that will be located either waterward of the ordinary high water mark (OHWM) or within wetlands as designated in WAC 173-22, may be authorized provided the applicant can demonstrate the following:
 - a. That the public rights of navigation and use of the shorelines will not be adversely affected by granting the Variance;
 - b. That the strict application of the bulk, dimensional or performance standards set forth in the Shoreline Master Program precludes all reasonable use of the property;
 - c. That the proposal is consistent with the criteria established under subsection 1.b. through 1.f. of this section.
3. In the granting of all Variances, consideration must be given to the cumulative impact of additional requests for like actions in the area. For example, if Variances were granted to other developments in the area where similar circumstances exist, the total of the Variances should also remain consistent with the policies of RCW 90.58 and should not produce substantial adverse effects to the shoreline environment.
4. Requests for varying the use to which a shoreline area is to be put are not requests for variances, but rather requests for conditional uses. Such requests must be evaluated using the

Conditional Use Permit criteria set forth above, but are limited to uses classified as such or for uses that are not listed.

D. Filing Variance Permits with the Department of Ecology – Review of Variance Permits

Commented [GL11]: Addressed in AMC 19.72.235

- ~~1. After the decision maker has made a final decision on a Variance Permit application, the Administrator must file the Permit with the Department of Ecology for its approval, approval with conditions, or denial. A permit data sheet in the form provided by WAC 173-27-990 must be submitted to the Department of Ecology with each Variance Permit. The Department of Ecology will issue its decision on a Variance Permit within thirty (30) days of filing. Filing is not complete until all the required documents have been received by the Department of Ecology and the Attorney General.~~
- ~~2. Upon receipt of the Department of Ecology's decision, the Administrator must notify those interested persons who requested notification of such decision.~~
- ~~3. Development authorized by a Variance Permit will not begin until twenty-one (21) days from the date of filing (the date the Department of Ecology renders a decision on the Variance Permit and transmits that decision to the Administrator). The Department of Ecology must notify the Administrator of the date of filing on an individual Variance Permit. In the event of an appeal refer to the provisions of RCW 90.58.140 for when construction work may begin.~~

19.72.230 – Conditions Authorized and Bonding

Commented [GL12]: From AMC 18.16

- A. When an application does not substantially comply with criteria imposed by this Master Program and the Shoreline Management Act of 1971, the application may be denied or made subject to any terms or conditions that are deemed suitable and reasonable to affect the purpose and objectives of this Master Program.
- B. Bonds. An applicant may be required to post a bond or other acceptable financial guarantee in favor of the City of Anacortes to assure full compliance with any terms and conditions imposed on any shoreline permit. Said financial guarantee must be in an amount to reasonably assure the City that any deferred improvement will be carried out within the time stipulated.

19.72.235 – Permit Filing Procedures & Appeals

Commented [GL13]: From AMC 18.16

- A. Each permit for a substantial development, conditional use, or variance issued must contain a provision that construction pursuant to the permit must not begin and is not authorized until 21 days from the date of filing as defined in RCW 90.58.140(6) and WAC 173-27-130. In the event of an appeal refer to the provisions of RCW 90.58.140 for when construction work may begin.
- B. After all local permit administrative appeals or reconsideration periods are complete and the permit documents are amended to incorporate any resulting changes, the City will mail the permit using return receipt requested mail to the Department of Ecology regional office and the Office of the Attorney General. Projects that require both Conditional Use Permits and or Variances must be mailed simultaneously with any Substantial Development Permits for the project.
 1. The permit and documentation of the final local decision will be mailed together with the complete permit application; a findings and conclusions letter; a permit data form (cover sheet); and applicable SEPA documents.
- C. Appeals. Consistent with RCW 90.58.140(6), the state's Shorelines Hearings Board twenty-one day appeal period starts with the date of filing, which is defined below:

1. For projects that only require a Substantial Development Permit: the date that Ecology receives the City's decision.
2. For a Conditional Use Permit (CUP) or Variance: the date that Ecology's decision on the CUP or Variance is transmitted to the applicant and the City.
3. For SDPs simultaneously mailed with a CUP or Variance to Ecology: the date that Ecology's decision on the CUP or Variance is transmitted to the applicant and the City.

19.72.240 – Permit Revisions

Commented [GL14]: From AMC 18.16

- A.** When an applicant proposes changes to the design, terms, or conditions of an approved permit, the applicant must submit a request for permit revision. Changes are "substantive" if they materially alter the project in a manner that relates to its conformance to the terms and conditions of the permit, this master program, or the Act. If the administrator determines that the changes proposed are not "substantive," he or she may waive the requirement for approval of the revisions.
- B.** When a permit revision is required, the applicant shall submit detailed plans and text describing the proposed changes. If the administrator determines that the revisions proposed are within the scope and intent of the original permit, consistent with WAC 173-27-100, the administrator may approve the revision. "Within the scope and intent of the original Permit" means all of the following:
1. No additional over-water construction is involved, except that pier, dock, or float construction may be increased by five hundred square feet or ten percent, whichever is less;
 2. Ground area coverage and height is not increased more than ten percent;
 3. The revision does not authorize development to exceed height, setback, lot coverage, or any other requirement of the City of Anacortes Shoreline Master Program. Exceeding these standards requires approval of a variance;
 4. Additional or revised landscaping is consistent with any conditions attached to the original permit and this master program;
 5. The use authorized by original permit is not changed;
 6. No significant adverse environmental impact will be caused by the project revision; and
 7. If the sum of the proposed revision and any previously approved revisions do not meet the criteria above, an application for a new shoreline permit must be submitted. If the revision involves a conditional use or variance, which was conditioned by the Department of Ecology, the revision also must be reviewed and approved by the Department of Ecology (see WAC 173-27-100).
- C.** Notice of Revisions and Decisions. Parties of record shall be provided notice of any proposed revision as well as the final decision on any revision application.
- D.** Appeals. The City of Anacortes or the Department of Ecology decision on permit revisions may be appealed within twenty-one days of such decision, in accordance with RCW 90.58.180 and WAC 173-27-100(8).
- E.** Revised permits are effective immediately upon final decision of the administrator and/or the Department of Ecology. Construction allowed by the revised permit, that is not authorized under the original permit, is undertaken at the applicant's own risk until the expiration of the appeals deadline. Approvals of revisions shall not extend the effective date of the permit.

19.72.245 - Nonconforming Development

Nonconforming development includes shoreline uses and structures which were lawfully constructed, established, or created prior to the effective date of the Act or the Master Program, or amendments thereto, but which do not conform to present regulations or standards of the Master Program or policies of the act. In such cases, the following standards under AMC 19.72.250-260~~35~~ must will apply.

19.72.250 – Nonconforming Uses

- A. Nonconforming uses includes shoreline uses which were lawfully established prior to the effective date of the Act or the Master Program, or amendments thereto, but which do not conform to present regulations or standards of the Master Program or policies of the Act. Any nonconforming use may be continued subject to the following standards:
1. Change of ownership, tenancy, or management of a nonconforming use must will not affect its nonconforming status; provided, that the use does not significantly change or intensify;
 2. Additional development of any property on which a nonconforming use exists must require that all new uses conform to this Master Program and the Act;
 3. If a nonconforming use is converted to a conforming use, no nonconforming use may be resumed;
 4. A nonconforming use which is moved any distance must be brought into conformance with the Master Program and the Act;
 5. If a nonconforming use is discontinued for a period of 365 or more consecutive calendar days, it must will lose its nonconforming status, and the continued use of the property must be required to conform to the provisions of this Master Program and the Act.
- B. A nonconforming use which is destroyed or substantially damaged by fire or other act of nature (or accident) may be resumed provided that any structure occupied by the nonconforming use may be rebuilt to the same or smaller configuration existing immediately prior to the time the structure was destroyed.
- C. The change from one nonconforming use to another use not permitted in the shoreline environment may be authorized as a Conditional Use Permit if it is determined that the new use is no more detrimental to the property in the shoreline environment and vicinity than the existing use, the existing structures are unsuited for a use permitted in the environment, and the criteria for a Conditional Use Permit are met.

19.72.255~~350~~ - Nonconforming Structures

- A. Nonconforming structures include shoreline structures which were lawfully constructed or placed prior to the effective date of the Act or the Master Program, or amendments thereto, but which do not conform to present bulk, height, dimensional, setback, or density requirements. Nonconforming structures may continue even though the structures fail to conform to the present requirements of the environment designation in which they are located. A nonconforming structure may be maintained as follows:
1. A nonconforming structure which is destroyed by fire or other act of nature (or accident) may be rebuilt to the same or smaller configuration existing immediately prior to the time the

structure was destroyed, provided that such rebuilding must be completed within two years of destruction, unless an extension for just cause is granted, and the replacement structure does not warrant new shoreline armoring.

2. A nonconforming building or structure may be repaired and maintained as provided in and as limited by this section. The maintenance of such building or structure must include only necessary repairs and incidental alterations, which alterations, however, must not increase the nonconformity of such building or structure in any direction; provided, that necessary alterations may be made as required by other law or ordinance.
3. The Shoreline Administrator ~~must~~will determine the replacement cost of a structure.
4. A building or structure, nonconforming as to the bulk, dimensional and density requirements of this title, may be added to or enlarged if such addition or enlargement conforms to the regulations of the shoreline environment in which it is located. In such case, such addition or enlargement must be treated as a separate building or structure in determining conformity to all of the requirements of this title.
5. A structure for which a variance has been issued ~~must~~will be considered a legal nonconforming structure and the requirements of this section must apply as they apply to preexisting nonconformities.
- 5.6. State Ferry Terminal; the existing developed footprint, except for infill between the toll booth area in the lowest parking lot, hillside walking paths, and a hillside side slope along the western side of the main terminal parking lot, and including all associated parking, at the Washington State Ferry Terminal facility, must not be increased. Redevelopment may occur provided there is no net loss of ecological function and value in the adjacent buffer areas for Cannery Pond and Ship Harbor Interpretive Preserve wetlands.

Commented [LG15]: Ecology Initial Determination

19.72.260~~3540~~ – Nonconforming Lots

- A. Undeveloped lots, tracts, parcels, or sites located landward of the ordinary high water mark that were established prior to the effective date of the Act and the Master Program, but that do not conform to the present lot size or density standards, are considered nonconforming lots of record and are legally buildable subject to the following conditions:
 1. Consolidation Clause. Where two or more contiguous lots of record are under one ownership and one or more of the lots is nonconforming, they are considered to be consolidated and may not be sold or otherwise separated so as to create any resulting nonconforming lots.
 2. Exemptions. The following ~~must~~will be exempt from the nonconforming lot consolidation requirements set forth in section 19.72.250.
 - a. Any transfer, sale or conveyance of a nonconforming lot or lots for the purpose of acquisition of property to preserve environmentally sensitive areas;
 - b. Any transfer, sale or conveyance of a nonconforming lot or lots to the City of Anacortes;
 - c. Any transaction for the sale or conveyance of a nonconforming lot or lots where the parties executed a real estate purchase and sale agreement, real estate contract or other legally valid transaction document on or before the 1994 Zoning Ordinance adoption date of April 4, 1994;

- d. Any transfer, sale or conveyance of a fully developed nonconforming lot that is contiguous with another fully developed lot under the same ownership, conforming or nonconforming; provided, that both lots were fully developed prior to April 4, 1994.
3. All new structures or additions to structures on any lot must meet all buffer, setback, height and other construction requirements of the Master Program, the Act, and must also comply with all applicable engineering design standards.
4. A lot line adjustment or restrictive covenant approved by the City must be required prior to issuance of a building permit when a nonconforming lot or lots and a conforming lot are contiguous and owned by the same person(s)/entity.
5. Notwithstanding this section, for any lots created by platting prior to 1937 (the effective date of the State Subdivision Act, RCW 58.17), the City may require compliance with RCW 58.17 and AMC for Land Divisions prior to issuing building permits for the development of lots in common ownership. The applicant must comply with the requirements of AMC Chapter 19.32 AMC, Land Divisions.

19.72.2450 – Permit Filing Procedures

Commented [GL16]: Relocated, above to 19.72.235

~~A. After all local permit administrative appeals or reconsideration periods are complete and the permit documents are amended to incorporate any resulting changes, the City will mail the permit using return receipt requested mail to the Department of Ecology regional office and the Office of the Attorney General. Projects that require both Conditional Use Permits and or Variances must be mailed simultaneously with any Substantial Development Permits for the project.~~

- ~~1. The permit and documentation of the final local decision will be mailed together with the complete permit application; a findings and conclusions letter; a permit data form (cover sheet); and applicable SEPA documents.~~
- ~~2. Consistent with RCW 90.58.140(6), the state's Shorelines Hearings Board twenty-one day appeal period starts with the date of filing, which is defined below:~~
 - ~~a. For projects that only require a Substantial Development Permit: the date that Ecology receives the City's decision.~~
 - ~~b. For a Conditional Use Permit (CUP) or Variance: the date that Ecology's decision on the CUP or Variance is transmitted to the applicant and the City.~~
 - ~~c. For SDPs simultaneously mailed with a CUP or Variance to Ecology: the date that Ecology's decision on the CUP or Variance is transmitted to the applicant and the City.~~

19.72.245 – WSDOT Project Procedures

~~The City will conduct permit reviews for WSDOT projects on state highways within 90 days, pursuant to RCW 47.01.485.~~

Article 3. Shoreline Environments & Regulations

19.72.310 – Introduction **Applicability**

The intent of designating shoreline environments is to encourage development that will enhance the present or desired character of the shoreline. To accomplish this, segments of shoreline are given an

environment designation based on existing development patterns, the biological and physical character of the shoreline, and the aspirations of the local community as expressed through the comprehensive plans and criteria of the Guidelines – Chapter 173-26 WAC.

Environment designations are categories that reflect the type of development that has, or should take place in a given area. The scheme of classifications represents a relative range of development, from high to low intensity land use, and targets types of development to specific areas. The environment classification scheme is intended to work in conjunction with local comprehensive planning and zoning.

Management policies are an integral part of the environment designations and are used for determining uses and activities that can be permitted in each environment. Specific development regulations specify how and where permitted development can take place within each shoreline environment.

Development regulations in this [chapter-article](#) generally govern use, height limits, and setbacks.

Additional policies and development regulations are provided for specific situations, uses and developments in other [chapters-articles](#) of this Master Program.

19.72.315 – Authority

Local governments are required, under the Washington State Shoreline Management Act of 1971 through WAC 173-26, to develop and assign a land use categorization system for shoreline areas as a basis for effective shoreline master programs. The state's Shoreline Master Program Guidelines describe the purpose of environment designations in WAC 173-26-191(1)(d):

Shoreline management must address a wide range of physical conditions and development settings along shoreline areas. Effective shoreline management requires that the shoreline master program prescribe different sets of environmental protection measures, allowable use provisions, and development regulations for each of these shoreline segments.

The method for local government to account for different shoreline conditions is to assign an environment designation to each distinct shoreline section in its jurisdiction. The environment designation assignments provide the framework for implementing shoreline policies and regulatory measures specific to the environment designation.

19.72.320 – Shoreline Environment Designations

The Anacortes classification system consists of six shoreline environments that are consistent with, and implement the Washington State Shorelines Management Act (Chapter 90.58 RCW), the Shoreline Master Program Guidelines (Chapter 173-26 WAC), and the City of Anacortes Comprehensive Plan. These environment designations have been assigned consistent with the corresponding designation criteria provided for each environment. In delineating environment designations the City of Anacortes aims to assure that existing shoreline ecological functions are protected with the proposed pattern and intensity of development. Such designations should also be consistent with policies for restoration of degraded shorelines. The six shoreline environments are:

- A. Aquatic (AMC 19.72.[2335](#))
- B. Natural (AMC 19.72.[2340](#))
- C. Conservancy (AMC 19.72.[2345](#))
- D. Shoreline Residential (AMC 19.72.[2350](#))
- E. Urban (AMC 19.72.[2355](#))
- F. Urban Maritime (AMC 19.72.[2360](#))

These shoreline environments are based on those provided in the state Shoreline Master Program Guidelines and include designation criteria and management policies that recognize the unique characteristics of Anacortes and specific areas of the shoreline. Undesignated areas within shoreline jurisdiction shall be considered "Conservancy".

19.72.325 – Official Shoreline Environments Designation Map

- A. Map Established. The location and extent of areas under the jurisdiction of this Master Program, and the boundaries of the various shoreline environments affecting the lands and waters of the City shall be as shown on the map, entitled, "Official Shoreline Environments Designation Map, City of Anacortes, Washington." The official shoreline map and all the notations, references, and amendments thereto and other information shown thereon are hereby made a part of this Master Program, just as if such information set forth on the map were fully described and set forth herein.
- B. File Copies. The official shoreline map shall be kept on file in the office of the City of Anacortes Planning Department, the Washington State Department of Ecology, and the Washington State Code reviser. Unofficial copies of the map may be prepared for administrative purposes.
- C. Map Amendments. The designation map is an integral part of this Master Program and may not be amended except upon approval by the City and the Washington State Department of Ecology, as provided under the Shoreline Management Act.
- D. Boundary Interpretation. Where uncertainty or conflict may occur in the exact location of a jurisdictional or shoreline designation boundary line, the Shoreline Administrator shall rely upon the criteria contained in RCW 90.58.030(2) and chapter 173-22 WAC pertaining to determinations of shorelands, as amended, rather than the incorrect or outdated map. Undesignated shorelines will be designated Conservancy.

19.72.330 - Shorelines of Statewide Significance

- A. Introduction. The Shoreline Management Act designates certain shoreline areas as "shorelines of statewide significance." The state puts added emphasis on these areas to ensure that they are protected for the long-term interests of the people of the state. The Shoreline Management Act states that the interests of all of the people of the state shall be paramount in the management of Shorelines of Statewide Significance.
- B. Areas Designated. Within the Anacortes shoreline jurisdiction, the waters of Puget Sound and Strait of Juan de Fuca lying seaward from the line of extreme low tide are designated as Shorelines of Statewide Significance. Padilla Bay, from March Point to William Point, is also identified as a specific estuarine area and is considered a Shoreline of Statewide Significance waterward from the ordinary high water mark and all associated shorelands.

19.72.335 – Aquatic

[A. Applicability.](#) In addition to the aquatic policies and regulations set forth below, proposals involving areas seaward of extreme low tide must comply with the policies for Shorelines of Statewide Significance (section 19.72.330 above [and the Shoreline Element of the Comprehensive Plan](#)).

- A. Purpose. The purpose of the Aquatic designation is to protect, restore and manage the unique characteristics and resources of marine waters, including habitat, ecology, navigation and public enjoyment.
- B. Designation Criteria. The Aquatic environment designation is the area located waterward of the ordinary high-water mark. An Aquatic environment designation should be assigned to marine

waters and lands waterward of the ordinary high-water mark. The Aquatic environment includes the water surface together with the underlying lands and the water column of such areas.

C. Rationale. The Aquatic shoreline environment allows specific control over potential in-water uses and developments.

D. Development Regulations

I. Uses

a. Prohibited, ~~conditionally permitted~~, and allowed uses are generally identified in Table 5-19.72.365(A) in ~~Section 5-12~~ AMC 19.72.365 of this Master Program. In addition:

Commented [GL17]: Gap Analysis: Table 5-1, #3

i. Water-dependent uses (e.g., water-dependent recreation and moorage) that are neither prohibited by the adjoining upland environmental designation nor associated with over-water structures are allowed. (For uses involving over-water structures see "New over-water structures" and "Historic Reuse of Over-Water Structures" above and below).

ii. Water-oriented ~~recreational~~ uses must be low to moderate in intensity.

Commented [GL18]: Gap Analysis: Table 5-1, #3

b. The over-water footprint ~~shall~~ must be designed and located to reduce associated environmental impacts. Strategies may include limiting the size of the footprint to that necessary to support the structure's intended use and/or extending the structure waterward to avoid shading of critical habitat.

c. Where feasible, over-water facilities ~~shall~~ must be designed to accommodate multiple uses consistent with the Aquatic designation as a means of reducing the cumulative effects of numerous structures; cost factors are to be included in the definition of feasible.

2. Reuse of Historic Over-water Structures. The Shoreline Management Act allows for protection and restoration of historical buildings and the City of Anacortes Comprehensive Plan encourages adaptive reuse of historically significant structures. Several such structures exist along the City's shoreline. These structures include traditional over-water structures (e.g., Nelbro Cannery). The following regulations apply to proposals involving a new, water-enjoyment and/or water-oriented use on an existing structure. (See also AMC 19.72.2250245 - .2350260 and 19.72.915- Definitions).

Commented [GL19]: Gap Analysis: Table 5-1 #3

a. Water-enjoyment uses open to the general public may be permitted as a conditional use on historic over-water structures provided the following conditions are met:

i. The structure is documented on the City's local historic register as a contributing structure.

ii. Whenever redevelopment is proposed, the redevelopment proposal must have overall environmental benefits that are greater after the redevelopment or expansion than before, and the applicant shall document how the development will improve shoreline ecological functions. The historic overwater footprint may be altered provided that the revised footprint reduces associated environmental impacts (e.g., a reduced footprint, a design incorporating grates to allow light to penetrate, or even extension of the dock). Minor expansion of existing over-water structures may be permitted when necessary to provide public access where it is currently lacking, for environmental restoration, to preserve historic elements of the structure, or to meet building safety codes.

- iii. The redevelopment will not result in a reduction in the amount of physical public access to and over the water that currently exists.
 - iv. Where new buildings are proposed on existing or reconstructed historic over-water structures:
 - (1) At least one third of the over-water structure, including a perimeter walkway, is dedicated for public access and enjoyment of the shoreline.
 - (2) The other two thirds must comply with the following: WAC 173-26-231(3)(b) states that water-related and water enjoyment use may be allowed as part of a mixed-use development on over-water structures where they are clearly auxiliary to and in support of water-dependent uses, provided the minimum size requirement needed to meet water-dependent use is not violated and the proposal provides improved shoreline ecological functions.
 - (3) The design must be approved by appropriate historic preservation agencies as being compatible with and reinforcing of the architectural integrity of the historic district.
 - v. All public access provisions shall be completed and available for public use upon completion of the first component of development.
 - vi. The City of Anacortes shall be a party to a binding agreement or other mechanisms will be utilized to guarantee the public access and enjoyment provisions are continuously maintained.
 - vii. Any proposed non-water-dependent commercial use must be associated with a water-dependent use and designed to provide for the public's interaction and enjoyment of the shoreline and provide ecologic restoration.
 - viii. To encourage the preservation of privately owned historic over-water structures and to encourage public access to such structures, commercial uses catering to the general public may be allowed if the structures are part of a mixed use that includes water-dependent uses and provides a significant public benefit with respect to the Shoreline Management Act's objectives. Such uses include shops, restaurants, specialty stores, small boat rental, visitor moorage, transient lodging, etc. Limited commercial office uses may also be considered.
 - ix. Residential development (e.g., private residences, condominiums, apartments) is not a preferred use of over-water structures and ~~shall be~~ prohibited on any new or refurbished historical over-water structures.
 - b. Re-use of historic structures for aquaculture purposes shall must be consistent with provisions under AMC 19.72.525, Aquaculture, and WAC 173-26-241(3)(b) Aquaculture Standards, which minimizes overall visual impact to the greatest extent possible.
3. Design Elements for all over-water structures
- a. All structures that could interfere with navigation shall be marked in accordance with the Coast Guard Private Aids to Navigation.
 - b. Aquatic developments shall not be approved in narrow channels, shipping lanes, or in other areas where they are a significant hazard to navigation.

Commented [GL20]: Gap Analysis: Table 5-1, #3; Port of Anacortes Comment

- c. Structures placed in the Aquatic designation shall blend into the surroundings to the greatest extent feasible utilizing appropriate color(s), texture, non-reflective materials, and other design characteristics; cost factors are to be included in the definition of feasible.
 - d. All feasible methods shall be employed to minimize over-water noise generation and pollution; cost factors are to be included in the definition of feasible.
 - e. Structures shall be designed with sensitivity to ecological processes and/or function.
 - f. Structures placed in the Aquatic designation shall minimize interference with surface navigation, and shall be designed so as to consider impacts to public views and to allow for the safe, unobstructed passage of fish and wildlife, particularly those species dependent on migration.
 - g. New structures and uses in the Aquatic designation shall prevent water quality degradation and alteration of natural hydrographic conditions, and shall result in no net loss of ecological functions.
4. Conditions of Approval
- a. Approval of new over-water structures shall include a condition that structures, equipment, and materials shall be removed as soon as practicable upon the cessation of a project's operation or a structure's useful life. Any structure that is damaged or breaks away in the water shall be repaired or removed by the permittee as soon as practicable. Permittees who anticipate a temporary interruption of the use of a facility or structure may be allowed to keep it in its permitted location provided they notify and receive written concurrence from the Administrator. Any structure not utilized for over one (1) year shall be removed by the owner regardless of future anticipated use unless prior permission has been granted by the City's Shoreline Administrator upon showing of good cause (e.g., environmental benefit, potential for reuse consistent with historic character, removal may result in environmental degradation).
 - b. Permittees shall be liable for all damages to public and private property resulting from their activities and development within the Aquatic designation. The City may require liability insurance beyond that required by the State if it is determined that state requirements are not adequate to cover damages.

19.72.340 - Natural

- A. Purpose. The purpose of the Natural designation is to protect those shoreline areas that are relatively free of human influence or that include intact or minimally degraded shoreline functions intolerant of human use. These systems require that only very low intensity uses be allowed in order to maintain the ecological functions and ecosystem-wide processes. Consistent with the policies of the designation, the Shoreline Master Program should include planning for restoration of degraded shorelines within this environment.
- B. Designation Criteria. The Natural designation includes those areas that can only accommodate very low intensity uses to maintain the ecological functions and ecosystem-wide processes. A Natural designation should be considered for shoreline areas if any of the following characteristics apply:
 - 1. The shoreline is ecologically intact and therefore ecological functions must be maintained;
 - 2. The shoreline is considered to represent ecosystems and geologic types that are of particular scientific and educational interest;

3. The shoreline is unable to support new development or uses without significant adverse impacts to ecological functions or risk to human safety; or
 4. Such shoreline areas include largely undisturbed portions of shoreline areas such as lakes, wetlands, estuaries, unstable bluffs, coastal dunes, spits, and ecologically intact shoreline habitats.
 5. Ecologically intact shorelines, as used here, means those shoreline areas that retain the majority of their natural shoreline functions, as evidenced by the shoreline configuration and the presence of native vegetation. Generally, but not necessarily, ecologically intact shorelines are free of structural shoreline modifications, structures, and intensive human uses. Recognizing that there is a continuum of ecological conditions ranging from near natural conditions to totally degraded and contaminated sites, this term is intended to delineate those shoreline areas that provide valuable functions for the larger aquatic and terrestrial environments which could be lost or significantly reduced by human development.
- C. Rationale. The Natural-designated areas in the City of Anacortes remain in a relatively natural state and perform important ecological functions.
- D. Development Regulations
- I. Uses
 - a. Prohibited and allowed uses are generally identified in Table ~~5-1~~[19.72.365\(A\)](#) in ~~Section 5-12~~[AMC 19.72.365](#) of this Master Program. In addition:
 - i. Any development that would substantially degrade ecological functions or the natural character of the shoreline (e.g., armoring of the shoreline that would interrupt habitat forming processes taking place within drift cells) is prohibited.
 - ii. Upgrades of existing public facilities where no feasible alternative exists are permitted.
 - b. Uses that result in restoration of ecological functions and/or fish and wildlife habitat are encouraged if the use is otherwise compatible with the character of the area.
 2. Height Limitations. No new or expanded building or structure is permitted except as allowed in ~~DR 5-7~~[AMC 19.72.340.DF\(1\)](#) and Table ~~5-1~~[AMC 19.72.365\(A\)](#), and would be subject to the height limits identified in ~~DR 5-12.B~~[AMC 19.72.365\(B\)\(2\)](#) and Table ~~5-2~~[19.72.365\(B\)](#).
 3. Setbacks. Unless otherwise specified herein, permanent structures, storage, and hard surfaces are prohibited.
 4. Design Elements. Within the Natural designation, removal of vegetation and topsoil is strictly regulated under the Vegetation Conservation provisions of ~~Section 6-5~~[AMC 19.72.445](#).
- E. Legal Description
1. Washington Park: Beginning at the intersection of Parcel #32465 or 5919 Cabana Lane and Parcel #32464, thence West and North along the shoreline 6,760 feet to the intersection of Parcel #32393 and Parcel #31552. This area is all within 200 feet of the OHWM.
 2. Washington Park – North Side: Beginning at a point West of the intersection of Parcel #31552 and Parcel #31551, 919 feet, thence East along the shoreline 1,883 feet to a point 829 feet East of the intersection of Parcel #31552 and Parcel #31551. This area is all within 200 feet of the OHWM.

3. Shannon Point – West Side: Beginning at the intersection of Parcel #331554 and Parcel #31556, thence North along the shoreline 2,317 feet to the intersection of Parcel #31555 and Parcel #31547. This area is all within 200 feet of OHWM.
4. Shannon Point – Lake Shannon: Beginning at the intersection of Parcel #31547 and Parcel #31548, thence South and East along the shoreline 1,077 feet to a point 748 feet West of in the intersection of Parcel #31577 and Parcel #31576. Jurisdiction is 200-feet landward of the OHWM and included the associated wetland (Lake Shannon wetland).
5. Ship Harbor Wetland: Beginning at a point 636 West along the shoreline of the intersection of Parcel #31668 and Parcel #31667, thence East along the shoreline 1,442 feet to the intersection of Parcel #31667 and Parcel #31666. Jurisdiction is 200-feet landward of the OHWM and included the associated wetland (Ship Harbor wetland).
6. Cap Sante - SE: Beginning at the intersection of Parcel #56851 the South line of 6th Street Right of Way, thence South and West along the shoreline 2,534 feet to the intersection of Parcel #56906 and Parcel #56905. This area is all within 200 feet of the OHWM.
7. Little Cranberry Lake: The Western, Southern and Eastern shoreline of Little Cranberry Lake and entire shoreline of Big Beaver Pond a distance of 12,210 feet. Jurisdiction is 200-feet landward of the OHWM and included the associated wetland.
8. Heart Lake: The Western half of the Heart Lake shoreline a distance of 5,056 feet. This area is all within 200 feet of the OHWM.
9. Whistle Lake: The Western, Southern and Eastern shoreline of Whistle Lake a distance of 7,634 feet. This area is all within 200 feet of the OHWM.
10. Lake Erie: Beginning at the intersection of Parcel #19038 and Parcel #19044 and traveling Southeast along the shoreline of Lake Erie 1,335 feet to the intersection of Parcel #19044 and Parcel #19152. This area is all within 200 feet of the OHWM.

19.72.345 – Conservancy

- A. Purpose. The Conservancy designation is intended to protect and restore the public benefits and ecological functions of open space, floodplain, natural areas and other sensitive lands (e.g., valuable historic, educational, or scientific research areas, areas of high scenic value) where they exist within the City, while allowing a variety of compatible uses. It is the most suitable designation for shoreline areas that possess a specific resource or value that can be protected without excluding or severely restricting all other uses. It should be applied to those areas that would most benefit the public if their existing character is maintained, but which are also able to tolerate limited or carefully planned development or resource use. Permitted uses may include recreational, cultural, and historic uses provided these activities are in keeping with the goals of protection and restoration as stated herein.
- B. Designation Criteria. The Conservancy designation consists of valuable natural, cultural, or historical resources or environmental conditions that should be protected, conserved, and managed so that those resources and areas remain available for the benefit of the public. The Conservancy designation is assigned to appropriate shoreline areas, that is, those planned for development that are compatible with maintaining or restoring ecological functions of the area, and that are generally not suitable for water-dependent uses, if any of the following characteristics apply:
 1. They are suitable for water-related or water-enjoyment uses;
 2. They are open space, floodplain or other sensitive areas that should not be more intensively developed;

3. They have potential for ecological restoration;
 4. They retain important ecological functions, even though partially developed; or
 5. They have the potential for development that is compatible with ecological restoration.
- C. Rationale. The Conservancy-designated areas in the City of Anacortes are preserved areas of open space that support outdoor recreational uses. Their lack of intense development affords the opportunity for ecological restoration. They also include cultural and historic resources that should be preserved for continued public access.
- D. Development Regulations
- I. Uses
 - a. Prohibited and allowed uses are generally identified in Table ~~5-1~~ [19.72.365\(A\)](#) in ~~Section 5-12~~ [AMC 19.72.365](#) of this Master Program. In addition:
 - i. Any development that would reduce the capability of vegetation to perform normal ecological functions or that would have a significant ecological impact on the area is prohibited;
 - ii. The subdivision of property to support additional residential, commercial or industrial uses that would require significant vegetation removal or shoreline modification within the Conservancy designation (i.e., subdivisions lying partially within the Conservancy designation) must ensure that uses and modifications proposed within the Conservancy designation are consistent with this section and that the overall subdivision results in no net loss of ecological functions.
 - iii. As indicated in Table ~~5-1~~ [19.72.365\(A\)](#), development of one residential dwelling unit may be allowed as a conditional use. This provision applies only to existing platted lots and only if the intensity of such use is limited as necessary to protect ecological functions.
 - iv. New roads and utility extensions may be approved as a conditional use only where no feasible alternative exists. Cost factors are to be included in the mitigation sequencing.
 - b. Uses that result in restoration of ecological functions and/or enhance fish and wildlife habitat are permitted if the use is otherwise compatible with the character of the area.
 2. Setbacks
 - a. Unless otherwise specified herein or in Table [AMC 19.72.365\(B\)](#) ~~5-2~~, permanent structures, storage, and hard surfaces shall be set back a minimum of one hundred (100) feet from the ordinary high water mark. Setbacks are measured landward, on a horizontal plane, perpendicular to the ordinary high water mark.
 - i. To prevent denying reasonable use of a parcel in violation of constitutional or statutory requirements, a single residential dwelling may be allowed within the setback, provided that placement of structures, storage, and impervious surfaces shall be limited to the minimum necessary to allow for reasonable use of the property and impacts to wetlands and habitat functions are mitigated through the Shoreline Variance process.
 - ii. Developments consisting of public access and low-moderate intensity water-oriented recreational uses are not required to meet the one hundred (100) foot setback, but shall be approved through the Shoreline Variance process. However, where such development may be approved within the setback, the placement of structures, storage,

and hard surfaces shall be limited to the minimum necessary for the successful operation of the use.

- iii. Development of public roads, utility corridors, and parking areas that cannot be located outside of Conservancy-designated shorelines are not required to meet the one hundred (100) foot setback, but shall require a Conditional Use Permit. However, further application proposals must include an analysis of alternative locations for siting the proposed development to ensure that all other locations outside of the setback and within the vicinity of the project site have been evaluated. Where such improvements may be approved within the setback, the placement of structures, storage, and impervious surfaces shall be limited to the minimum necessary for the successful operation of the use.
- b. Any other deviations from the required setback shall be reviewed on an individual basis through the Shoreline Variance permit process.
- c. Within the Conservancy designation, removal of vegetation and topsoil is strictly regulated under the Vegetation Conservation provisions of ~~Section 6.5~~ [AMC 19.72.445](#).

E. Design Elements

- I. For all residential development within shoreline jurisdiction, the area of impervious surfaces (including parking areas, but excluding required right-of-way improvements) to be developed within shoreline jurisdiction shall be limited by the slope of the lot as specified in the following table. Preferential use of Low Impact Development (LID) in sensitive shorelines areas shall be required. The lot calculation includes the subject property within shoreline jurisdiction landward of the ordinary high water mark.

- a. Table 19.72.345 – Impervious limits based upon percent slope

Slope	Impervious limit (expressed as a percentage of actual land area)
15% or less	30%
15-30	25%
Greater than 30%	20%

- b. Areas waterward of the ordinary high water mark and areas of marine bluffs, steep slopes, and wetlands shall not be included to calculate land area. For example, only the buildable remaining area landward of the marine bluff edge shall be used in the calculation. Any increases beyond these percentages of impervious surfaces shall require a Shoreline Variance.

F. Legal Description

1. Washington Park: Beginning at the intersection of Parcel #32393 and Parcel #31552, thence North and East along the shoreline 383 feet to a point West of the intersection of Parcel #31552 and Parcel #31551, 919 feet. This area is all within 200 feet of the OHWM.
2. Washington Park – Boat Launch: Beginning at a point 829 feet East of the intersection of Parcel #31552 and Parcel #31551, thence North along the shoreline 1,692 feet to the intersection of Parcel #31554 and Parcel #31556. This area is all within 200 feet of the OHWM except for the north 315 feet which is the only area within 100 feet of the OHWM.

Commented [GL21]: Gap Analysis: Table 5.1, #11

Commented [GL22]: Gap Analysis: Table 5.1, #11

3. Shannon Point: Beginning at the intersection of the Southwest corner of Parcel #31555 and Parcel #31547, thence East along the shoreline 650 feet to a point 730 feet Northwest of the intersection of Parcel #31547 and Parcel #31548 at Lake Shannon. This area is all within 200 feet of the OHWM.
4. Guemes Channel – West of Lovrics: Beginning at a point 565 feet West of the intersection of Parcel #31575 and City Right of Way, thence North and East along the shoreline 6,740 feet to a point at the intersection of Parcel #31732 and Parcel #31739. This area is all within 100 feet of the OHWM.
5. Guemes Channel – East of Lovrics: Beginning at the intersection of Parcel #31705 and Parcel #31703, thence North and East along the shoreline 1,878 feet to the intersection of Parcel #31538 and Parcel #31532. The West 1,403 feet are within 150 feet of the OHWM. The East 475 feet are within 25 feet of the OHWM.
6. Guemes Channel – Guemes Ferry: Beginning at the intersection of Parcel #31530 and Parcel #56024, thence North and East along the shoreline 703 feet to a point 114 feet West of the intersection of Parcel #31523 and Parcel #31540. This area is all within 200 feet of the OHWM.
7. Cap Sante -SW: Beginning at the intersection of Parcel #56906 and Parcel #56905, thence West and North along the shoreline 2,280 feet to a point at the intersection of Parcel #56900 and Parcel #56897. This area is all within 200 feet of the OHWM.
8. Fidalgo Bay – North of Weaverling Spit: Beginning at the intersection of Parcel #33198 and Parcel #33210, thence South and East along the shoreline 2,880 feet to the intersection of Parcel #33202 and Parcel #33203. This area is all within 200 feet of the OHWM.
9. Fidalgo Bay: Beginning at the intersection of Parcel #33440 and Parcel #33439, thence Southeast and Northwest along the shoreline 2,878 feet to a point at the intersection of Parcel #33445 and Parcel #112900. This area is all within 200 feet of the OHWM except for the West 462 feet that are within 150 feet of the OHWM.
10. Fidalgo Bay: Beginning at the intersection of Parcel #33271 and Parcel #33268 thence South, East and North to the City limits line on March Point along the shoreline 15,800 feet. This areas is all within 200 feet of the OHWM.
11. Padilla Bay: Beginning at a point 454 feet West of the intersection of Parcel #19709 and Parcel #19707, thence Southeast along the shoreline 2,000 feet to a point at the intersection of Parcel #19707 and the Anacortes City Limits. Jurisdiction is 200-feet landward of the OHWM and included the associated wetlands in Parcel #19676.
12. Little Cranberry Lake: The Northern shoreline of Little Cranberry Lake a distance of 1,548 feet. This area is all within 200 feet of the OHWM.
13. Heart Lake: The Eastern half of the Heart Lake shoreline a distance of 4,295 feet. This area is all within 200 feet of the OHWM.
14. Whistle Lake: The Northern shoreline of Whistle Lake a shoreline distance of 782 feet. This area is all within 200 feet of the OHWM.
15. Lake Erie: The southernmost point of City Limits, extending 200 feet east from the Lake Erie OHWM to capture portions of Parcels #19152 (5022 Lake Erie Way Anacortes, WA 98221) and #19152.

Commented [GL23]: Gap Analysis: Table 4-1 #2

Commented [GL24]: Gap Analysis: Table 4-1 #4

19.72.350 – Shoreline Residential

- A. Purpose. The purpose of the Shoreline Residential designation is to accommodate residential development and associated structures that are consistent with the Shoreline Management Act, this Master Program, and the protection and restoration of ecological functions. An additional purpose is to provide appropriate public access and recreational uses.
- B. Designation Criteria. The Shoreline Residential designation is appropriate for shoreline areas that are planned and platted for residential development. Appropriate infrastructure either exists within these areas or is planned to be extended for the purpose of serving residential development.
- C. Rationale. The Shoreline Residential-designated areas are privately owned lands zoned for residential development and have become established as residential neighborhoods. The Shoreline Residential designation is an area of low- and moderate-intensity residential land that maintains significant natural features. Infrastructure either exists or is planned to extend to these areas for the purpose of serving residential development.
- D. Development Regulations
 - 1. Uses
 - a. Prohibited and allowed uses are generally identified in Table ~~5-1~~ [19.72.365\(A\)](#) in ~~Section 5-12~~ [AMC 19.72.365](#) of this Master Program.
 - b. Limited non-residential uses, such as community clubhouse, day cares, home occupation businesses, churches, and bed and breakfasts, may be allowed, provided they are consistent with the residential character and the underlying zoning.
 - 2. Height Limitations
 - a. New or expanded structures shall be limited to maximum heights as specified in Table [19.72.365\(B\)](#) ~~5-2~~, except the height limit shall not apply to television antennas, chimneys, flagpoles, public utilities, private residential wind-powered generators, and similar appurtenances.
 - b. Fill shall not be used as a means to increase the allowable height. See Table ~~5-2~~ [19.72.365\(B\)](#) and ~~Chapter 12~~ [AMC 19.72.915](#) for height definition.
 - 3. Setbacks
 - a. Shoreline Setback - Permanent buildings and structures including common appurtenant structures such as garages and decks over 30 inches above grade shall be set back a minimum of sixty (60) feet from the ordinary high water mark, except for the shoreline along Burrows Bay between the east extent of Croatian Way and Skyline Way which shall have a minimum setback of twenty-five (25) feet from the ordinary high water mark. Patios, decks under 30 inches, or other structural or impervious surfaces, shall be limited to no more than 150 square feet and intrude no more than 10 feet into the shoreline setback. Pathways providing access to the shoreline, not including trams, are allowed but shall utilize pervious materials. Setbacks are measured landward, on a horizontal plane, perpendicular to the ordinary high water mark. Setback requirements shall apply to non-water-dependent structures and uses and do not apply to piers, ramps or docks.
 - b. Exceptions from the Shoreline Residential setback may be granted through an administrative approval. Any restrictions or conditions which are tied to the parcel through this exception process shall be recorded on a revised Notice on Title. Such exceptions include:

i. For areas with a setback of 60 feet, reductions of up to twenty-five (25) percent of the standard setback, may be approved if the applicant demonstrates that either:

- (1) enhancing the setback (by removing invasive plants, planting native vegetation, installing habitat features such as downed logs or snags, or other means) will result in a reduced setback that functions at a higher level than the existing standard setback; or
- (2) conditions (existing uses or developments) exist within the site's shoreline setback, which substantially prevent or impair delivery of most riparian functions.

ii. If the applicant can demonstrate that a single-family residence or otherwise allowed non water-oriented use cannot be accommodated or accomplished outside of the standard or standard reduced setback, a reduction in the setback width not exceeding fifty (50) percent may be approved administratively. Adequate space for a single-family residence and associated yard is considered to be available when the buildable lot depth is eighty (80) feet or greater as measured from the ordinary high water mark. The approved reduction may be no more than that necessary to accommodate the allowed use. These modifications of standards may be approved with either a Shoreline Substantial Development Permit or, if applicable, a shoreline [letter of exemption](#).

iii. where the modification is consistent with underlying zoning regulations and are not anticipated to have adverse impacts on adjacent properties. In such cases, for either single family residences or non-water oriented uses, the City may allow a decrease in front yard setback or side yard setback standards if those actions will reduce or eliminate the need for the shoreline setback reduction. However, any deviation in front yard setback or side yard setback beyond already specified limits may require a zoning variance.

iv. The applicant must submit a mitigation plan that addresses the specific habitat components and/or ecological functions that may be lost as a result of either reduction mechanism. Such a mitigation plan shall document how the proposed mitigation accounts for no net loss of ecological functions. Mitigation plan elements, including monitoring and maintenance, shall be included in the plan consistent with mitigation plan requirements outlined in the City of Anacortes shoreline-specific critical areas regulations (see SMP [Chapter 6 AMC 19.72.435](#)). Plan elements may include one or more of the following:

- (1) Restoration of the reduced setback as needed with native vegetation, including trees and shrubs found in undisturbed riparian areas of Fidalgo Island.
- (2) Removal of all or portions of existing shoreline armoring located at, below, or within 5 feet landward of the ordinary high water mark and subsequent restoration of the shoreline to a natural or semi-natural state, including restoration of topography, aquatic and upland habitat features, and beach/substrate composition as appropriate.
- (3) Opening of previously piped on-site watercourse to allow potential rearing opportunities for anadromous fish. Opened watercourses must be provided with a native planted setback at least ten (10) feet wide on either side of the stream, and must not encumber adjacent properties without express written permission of the adjacent property owner.

- (4) Installation of biofiltration/infiltration mechanisms, such as bioswales, created and/or enhanced wetlands, or ponds, that exceed standard stormwater requirements.
- (5) Installation of pervious materials for driveway, parking or road construction.

~~iv.~~v. Where a residential setback was established as part of the approval of a residential subdivision, the established subdivision setback shall take precedence except when such setback has expired or no longer exists per RCW 58.17.170.

~~v.~~vi. For developed single-family residential waterfront lots, beach stairs may be allowed where they do not interfere with other areas of public access, do not extend waterward of the ordinary high water mark, and do not impair visual access of the shoreline from neighboring lots.

- c. Deviations from the required setback beyond the allowed exceptions described above shall be reviewed on an individual basis. A request for such a deviation shall be considered a variance following the procedures established under ~~Section 3.2~~AMC 19.72.220+5 and will be subject to the variance review criteria established under ~~Section 3.2~~AMC 19.72.220+5.C of this Master Program.
- d. Developments consisting of water-dependent scientific, historical, cultural, educational research uses, public access, low-moderate intensity water-oriented recreation open to the general public and ecological restoration are not required to meet the setback requirement. However, where such development may be approved within the setback, the placement of structures, storage, and impervious surfaces shall be limited to the minimum necessary for the successful operation of the use.
- e. Removal of vegetation and topsoil is strictly regulated under ~~Section 6.5~~AMC 19.72.445, Vegetation Conservation.

4. Design Elements

- a. For all residential development within shoreline jurisdiction, the area of impervious surfaces (including parking areas, but excluding required right-of-way improvements) to be developed within shoreline jurisdiction shall be limited by the slope of the lot as specified in the following table. The lot calculation includes the subject property within shoreline jurisdiction landward of the ordinary high water mark.

Table ~~9~~19.72.350-3 ~~(A)~~ - Impervious limits based upon percent slope

Slope	Impervious limit (expressed as a percentage of actual land area)
15% or less	30%
15-30	25%
Greater than 30%	20%

Commented [GL25]: Gap Analysis: Table 5-1, #11

- i. Areas waterward of the ordinary high water mark and areas of marine bluffs, steep slopes, and wetlands shall not be included to calculate land area. For example, only the ~~buildable~~ remaining area landward of the marine bluff edge shall be used in the calculation. A Shoreline Variance is required for reduction of dimensional standards.

Commented [GL26]: Gap Analysis: Table 5-1, #11

- b. Where riparian vegetation does not exist or is degraded, a minimum of fifteen percent (15%) of the total lot area shall be retained or replanted in native vegetation. Areas to be retained or replanted shall include the largest contiguous, and/or most waterward blocks of native vegetation located on site. If few or no areas of native vegetation remain, the vegetation retention area shall be replanted with species native to shoreline areas of Fidalgo Island. For additions and expansions of existing developments, replanting shall be commensurate with the degree of impact resulting from the new development. For lots which border the OHWM, all revegetation shall take place within the shoreline setback in order to provide the greatest benefit.

E. Accessory Uses Supporting Existing Overwater Structures

Commented [AC27]: Ecology Initial Determination

1. Guemes Channel, between H Avenue and B Avenue, contains two existing overwater structures within the adjacent Aquatic designation. Accessory uses necessary to support water-oriented use of these existing over-water structures may be located in the adjacent Shoreline Residential environment, subject to the following standards, in addition to conformance with all other applicable SMP goals, policies and regulations:

The accessory use and associated improvements must:

- a. Be demonstrably subordinate and incidental to the permitted primary water-oriented use of the over-water structure and functionally support its activity;
- b. Be located on land under the same ownership or leasehold as the over-water structure the accessory use is supporting;
- c. Conform to the applicable standards in AMC 19.72.365 Table(B) Shoreline Development Standards Matrix, EXCEPT that accessory uses are not subject to maximum impervious surface limits, and the minimum setback for non-water-dependent accessory uses is 25';
- d. For accessory parking, the applicant must provide a public access easement in a form acceptable to the Shoreline Administrator;
- e. The shoreline permit process for the accessory use must follow that as shown in AMC 19.72.365 Table(A) Shoreline Use and Modification Matrix for the primary water-dependent or water-oriented use within the Aquatic shoreline environment designation.

G.F. Legal Description

1. Skyline Area: Beginning at the city limits line along Burrows Bay, and inside Flounder Bay a length of 9,860 feet along the shoreline to a point at the intersection of Parcel #60074 or 5801 Kingsway and Parcel #60075 or 1901 Skyline Way. This area is all within 200 feet of the OHWM.
2. Washington Court: Beginning at the intersection of Parcel #31554 and Parcel # 31557, thence North 315 feet to the intersection of Parcel #31554 and Parcel #31556. This area is 100 feet inland of the OHWM and 100 feet deep.
3. Guemes Channel – West of Lovrics: Beginning at a point 525 feet West of the intersection of Parcel #101413 and City Right of Way, thence North and East 7,210 feet to a point 510 feet East of the intersection of Parcel #31732 and Parcel #31739. This area is 100 feet inland of the OHWM and 100 feet deep.
4. Guemes Channel – East of Lovrics: Beginning at the intersection of Parcel #31705 and Parcel #31703, thence North and East 4,602 feet to the intersection of Parcel #31523 and Parcel

Commented [GL28]: Gap Analysis: Table 4-1, #3

#31540. The West 1,413 feet are 150 feet off the OHWM and 50 feet deep. The East 562 feet are 50 feet off the OHWM and 150 feet deep. The East 2,627 feet is all within 200 feet of the OHWM.

5. Cap Sante – NE: Beginning at the intersection of Parcel #32871 and the East line of the “U” Avenue Right of Way, thence East and South along the shoreline 3,100 feet to the intersection of Parcel #56851 and the South line of the 6th Street Right of Way. This area is all within 200 feet of the OHWM.

Commented [GL29]: Gap Analysis: Table 5-1, #3, Response to Public Comment

19.72.355 – Urban

- A. Purpose. The purpose of the Urban designation is to provide for commercial, industrial, and recreational uses; residential uses in some locations; and public land uses while seeking opportunities for protection and restoration of ecological functions.
- B. Designation Criteria. The Urban designation is appropriate for areas that currently support or are planned for general commercial or industrial development. The Urban designation is located landward of the ordinary high water mark.
- C. Rationale. The Urban-designated areas are zoned for industrial and commercial uses. Existing and planned uses in the Urban designation represent a variety of water-oriented and non-water-oriented uses. In addition, current zoning allows for retail businesses, professional offices, hotels, restaurants, personal service shops, recreational uses, marinas, and residential uses. The state ferry terminal at Ship Harbor is included in this designation.
- D. Development Regulations
 - I. Uses
 - a. Prohibited and allowed uses are generally identified in Table ~~5-1~~ [19.72.365\(A\)](#) in ~~Section 5-12~~ [AMC 19.72.365](#) of this Master Program. In addition:
 - i. Mini-storage is prohibited.
 - ii. Radio and television towers as a primary use are prohibited.
 - b. Development that can be classified as a water-dependent, water-related, or water-enjoyment use shall be permitted.
 - c. A limited range of non-water-oriented development, open to the general public, while not preferred, may also be authorized as a conditional use provided said development:
 - i. Conforms with the criteria set forth for conditional uses in ~~Section 3-1~~ [AMC 19.72.2+20](#);
 - ii. Is designed and located in manner that capitalizes on shoreline views and is compatible with water-oriented uses;
 - iii. Makes provisions for the public access and enjoyment consistent with this Master Program; and
 - iv. Is part of a mixed-use development or the parcel is separated from the water. (See WAC 173-26-211(5)(d)(ii)(A)).
 - d. Multi-family residential or transient accommodation (hotel and motel) uses may be permitted provided they meet the requirements for non-water-oriented uses listed in

subsections (ia)-(ivd) of ~~DR-5.10.3~~ [AMC 19.72.355\(c\)](#) and further that said use meets the following terms:

- i. Public access and enjoyment shall be the primary design consideration. Private and public space shall be appropriately separated through sensitive design.
- ii. The development shall be a mixed use project.
- iii. A maximum of 50% of total floor area may be devoted to multifamily residential and/or transient accommodations; provided that up to an additional 25% of total floor area may be devoted to multifamily residential and/or transient accommodations upon obtaining a waiver under section [vi.f](#) below.
- iv. The floor area not devoted to multifamily residential and/or transient accommodations shall be used as follows:
 - (1) No less than 25% of the total floor area of the development shall be devoted to water-oriented uses unless a Conditional Use Permit is obtained under section ([vi.f](#)) below.
 - (2) The remaining floor area shall be devoted to non-water-oriented uses accessible to the general public (e.g., retail, personal services, recreational and cultural uses) excluding transient accommodations.

v. ~~Ground floor residential uses must meet zoning code compliance under AMC 19.61. Block Frontage Standards may only be placed above a commercial ground floor.~~

Commented [GL30]: Gap Analysis: Table 4-1, #6

vi. Restoration/Public Access Incentive – the increase in non-water-oriented use in ([iii.e](#)) and the minimum water-oriented use in ([iv.d](#))([Li](#)) of this section may be applied through a Conditional Use Permit when the proposal provides restoration of ecological functions, habitat enhancement, and/or provision of public access improvements (e.g., parks, esplanades; etc.), that constitute a significant improvement.

The following criteria shall apply:

- (1) The proposal will provide 'significant improvements' consistent with this Master Program without additional probable significant adverse impacts to public health, safety or the environment, that cannot be adequately mitigated.
- (2) Items that may constitute a 'significant improvement' include; but, are not limited to, (1) preservation of critical shoreline habitat, (2) restoration of impaired ecological functions, (3) dedication to the City of land for a public park or open space, (4) preservation of scenic resources, (5) enhanced public access amenities, and (6) educational opportunities which broaden the public's understanding of the maritime world.

vii. Residential and transient accommodation uses must not intrude on the public's use and enjoyment of the shoreline:

viii. designs that step back from the public area are encouraged (e.g., upper floors step back from the public area).

e. Additional allowed, conditional, and prohibited uses for the Urban designation are listed in Table ~~5.1~~ [19.72.280\(A\)](#).

2. Height Limitations. New or expanded structures shall be limited to maximum heights as specified in Table [19.72.280\(B\) 5-2](#).
3. Setbacks.
 - a. New, permanent buildings and structures shall be set back a minimum of twenty-five (25) feet from the ordinary high water mark. Setbacks are measured landward, on a horizontal plane, perpendicular to the shoreline. Shoreline setback requirements shall apply to non-water-dependent structures and uses.
 - b. Developments consisting of water-dependent scientific, historical, industrial, cultural, or educational research uses, public access, water-oriented recreation and ecological restoration are not required to meet the shoreline setback requirements, nor are piers, ramps or docks.

E. Legal Description

1. Skyline Area: Beginning at the intersection of Parcel #60074 or 5801 Kingsway and Parcel #60075 or 1901 Skyline Way, thence following the shoreline around Flounder Bay and Burrows Strait a length of 6,462 feet to the intersection of Parcel #32465 or 5919 Cabana Lane and Parcel #32464. This area is all within 200 feet of the OHWM.
2. Ship Harbor: Beginning at the intersection of Parcel #31667 and Parcel #31666, thence East along the shoreline of Guemes Channel 554 feet to a point 803 feet West of the intersection of Parcel #31666 and Parcel #31669. This area is all within 200 feet of the OHWM.
3. Guemes Channel – Lovric: Beginning at the intersection of Parcel #31732 and Parcel #31739, thence East along the shoreline of Guemes Channel to the intersection of Parcel #31705 and Parcel #31703. This area is all within 200 feet of the OHWM except for the West 500 feet which is only 100 feet off the OHWM.
4. Cap Sante Basin – Fidalgo Bay - South to 34th St.: Beginning at the intersection of Parcel #56900 and Parcel #56897, thence North, West, and South along the shoreline 11,733 feet to a point at the intersection of Parcel #119601 and Parcel #33196. This area is all within 200 feet of the OHWM.
5. Fidalgo Bay - Weaverling Spit – North Side: Beginning at the intersection of Parcel #33202 and Parcel #33203, thence South and East along the shoreline 1,770 feet to a point at the intersection of Parcel #33440 and Parcel #33439. This area is all within 200 feet of the OHWM.
6. Fidalgo Bay - Weaverling Spit – South Side: Beginning at the intersection of Parcel #33445 and Parcel #112900, thence West and South along the shoreline 670 feet to a point at the intersection of Parcel #33271 and Parcel #33268. This area is all within 200 feet of the OHWM except for the East 462 feet that are off the OHWM 150 feet and 50 feet deep.
7. Padilla Bay – South March's Point Road Beginning at the intersection of Parcel #19713 and March's Point Road, thence East and North approximately 1,750 feet along the shoreline to a point at the intersection of Parcel #19676 and #19761.

Commented [GL31]: Removed "Ferry Terminal" description. Gap Analysis: Table 4-1, #2

Commented [GL32]: Removed "Guemes Channel B-H Ave. description. Gap Analysis: Table 5-1, #3, Response to public comment

Commented [GL33]: Gap Analysis: Table 2-1 2007b

19.72.360 – Urban Maritime

- A. Purpose. The purpose of the Urban Maritime designation is to preserve a variety of water-dependent, water-oriented, and water-related public, commercial, and industrial uses such as those associated with the Port of Anacortes.

B. Designation Criteria. The Urban Maritime designation is appropriate for high intensity urban uses that are currently zoned Manufacturing/Shipping.

C. Development Regulations

1. Prohibited and allowed uses are generally identified in Table 5-1 19.72.365(A) in Section 5-12 AMC 19.72.365 of this Master Program.
2. Where applicable, require new development to include environmental cleanup (e.g. removal of contaminated soils) and restoration of the shoreline in compliance with state and federal laws.
3. No net loss of shoreline ecological function ~~must~~will result from new development.
4. Any impacts to ecological functions must be fully mitigated with the mitigation sequencing defined in Chapter 12 AMC 19.72.915. If mitigation is required for water-dependent use, off-site mitigation in conjunction with appropriate on-site mitigation would be most appropriate.
5. Redevelopment and renewal of substandard, degraded, or obsolete urban shoreline areas must be encouraged in order to make maximum use of the available shoreline resources and to accommodate future water-oriented uses.
6. Residential or transient accommodation uses are prohibited in the Urban Maritime designation.
7. Ensure that, where applicable, improvements are reviewed for consistency with the Design Standards codified in the zoning code.
8. Height Limitations. New or expanded structures ~~must~~will be limited to maximum heights as specified in Table 5-2 19.72.365(B).
9. Setbacks
 - a. New, permanent buildings and structures must be set back a minimum of twenty-five (25) feet from the ordinary high water mark. Setbacks are measured landward, on a horizontal plane, perpendicular to the shoreline. Setback requirements ~~must~~will apply to non-water-dependent structures and uses.
 - b. Developments consisting of water-dependent scientific, historical, industrial, commercial, cultural, or educational research uses, public access, water-oriented recreation and ecological restoration are not required to meet the setback requirements, nor are piers, ramps or docks.

D. Legal Description

1. Guemes Channel – Guemes Ferry East to “U” Ave.: Beginning at a point 114 feet West of the intersection of Parcel #31523 and Parcel #31540, thence East along the shoreline of Guemes Channel 6,493 feet to the intersection of Parcel #32871 and the East line of the “U” Avenue Right of Way. This area is all within 200 feet of the OHWM.
2. Fidalgo Bay – 34th to Fidalgo Bay Rd.: Beginning at the intersection of Parcel #119601 and Parcel #33196, thence South along the shoreline 1,097 feet to a point at the intersection of Parcel #33198 and Parcel #33210. This area is all within 200 feet of the OHWM.

19.72.365 – Shoreline Use and Modification Matrix and Development Standards

A. Shoreline Uses and Modifications Matrix

1. Table [19.72.365\(A\)5-1](#) identifies new land uses and shoreline modifications in the shoreline jurisdiction and the type of use approval required. Additional detail that supplements Table [5-1](#), [19.72.280\(A\)](#) may be found in [Chapters 5](#), [AMC 19.72.310-365](#), [8-AMC 19.72.510-575](#), and [AMC 19.72.610-660](#). Uses, developments or modifications not listed in [Table 19.72.365\(A\) Table 5-1](#) or otherwise permitted in the applicable sections of this Master Program ~~must~~will be considered 'unclassified' and ~~must~~will be processed as Conditional Uses. Accessory uses ~~must~~will be subject to the same shoreline permit process as its primary use, unless explicitly stated otherwise in [Table 19.72.365\(A\) Table 5-1](#) or in [AMC 19.72.510-575](#), and [AMC 19.72.610-660](#) [Chapters 8 or 9](#). Where there is a conflict between the chart and the written provisions in this SMP, the most protective of shoreline resources ~~must~~will apply.
2. An accessory use ~~must~~will not be established on a property independent of its primary use.
3. Permitted uses and modifications are only allowed in shoreline jurisdiction where the underlying zoning allows for it and subject to the policies and regulations of this SMP.
4. Uses and modifications identified as "Permitted" require either a Substantial Development Permit or may be exempt from the requirement to obtain a Substantial Development Permit, as outlined in [Section 2.4](#), [AMC 19.72.0340](#). Exempted uses and modifications, however, are not exempt from the Act or this SMP, and must be consistent with the applicable policies and provisions.
5. If any part of a proposed development is not eligible for Shoreline [Letter of Exemption](#), then a Substantial Development Permit is required for the entire proposed development project.
6. In all cases, the permit processes identified below are for new uses and modifications and do not contradict the exemptions which allow for such actions as normal repair and maintenance or emergency measures. For example, while a new road may be prohibited in the Natural environment, repair of existing roads is allowed.
7. A development or use that is listed as a conditional use pursuant to this SMP or is an unlisted use, must obtain a Conditional Use Permit even though the development or use does not require a Substantial Development Permit.
8. When a development or use is proposed that does not comply with the shoreline setback, lot frontage, side yard setback, and other dimensional performance standards of this SMP not otherwise allowed by administrative reduction, such development or use can only be authorized by approval of a Shoreline Variance.
9. Except as otherwise stated, the comprehensive plan, zoning regulations, subdivision regulations, health regulations, and other adopted regulatory provisions apply within shoreline jurisdiction. In the event the provisions of this SMP conflict with provisions of other responsible local government regulations, the more protective of shoreline resources ~~must~~will prevail.
10. Where a use or modification may occur in the Aquatic environment as indicated in Table [5-1](#), [19.72.365\(A\)](#) and in the corresponding regulations for that use, it ~~must~~will also be subject to any more restrictive permit processes or prohibitions on that use or modification as indicated for the adjacent shoreland environment, except for the re-use of historic overwater structures.

Commented [GL34]: Gap Analysis: Table 5-1 #3

Table 19.72.365(A) Shoreline Use and Modification Matrix

The chart is coded according to the following legend. P = Permitted, when meeting requirements for that use and shoreline area, may be subject to Shoreline Substantial Development Permit or shoreline letter exemption requirements C = Conditional Use, when approved by the City and Department of Ecology X = Prohibited; the use is not eligible for a Variance or Conditional Use Permit						
	Natural	Conservancy	Shoreline Residential	Urban	Urban Maritime	Aquatic
Shoreline Uses						
Advertising and Signs	X	P	P	P	P	P
Agriculture	X	X	X ¹	X ¹	X	X
Aquaculture						
Non-commercial aquaculture for recovery of a native population	C	C	P	P	P	P
All other aquaculture	X	X	X	C	C	X ⁵
Commercial Development						
Water-dependent	X	X	P ³	P	P	C
Water-related	X	X	P ³	P	P	C
Water-enjoyment	X	X	P ³	P	P	C
Non-water-oriented	X	X	P ³	C	C	X
Forest Practices ⁶	X	C	X	X	X	X
Industrial and Port Facilities						
Water-dependent	X	X	X	P	P	P
Water-related	X	X	X	P	P	C
Non-water-oriented	X	X	X	C	C	X
Marinas	X	X	X	P	P	P
Mining	X	X	X	X	X	X
Parking Facilities						
Primary	X	X	X	P	P	X
Accessory	X	C	P ⁷	P	P	X
Recreational Facilities						
Water-dependent (e.g., public access piers)	X	P	P	P	P	P
Water-related	X	P	P	P	P	P
Water-enjoyment (e.g., pedestrian trails)	C	P	P	P	P	P
Nonwater-oriented	X	X	C	C	C	X
Residential Development						
Single-family	X	C	P	P	X	X
Multi-family	X	X	P	P	X	X
Scientific, Cultural and Educational Facilities	C	P	P	P	P	P
Transportation Facilities						
Water-dependent (e.g., ferry terminal)	X	X	X	P	P	P
Water-related (e.g., ferry loading area)	X	X	X	P	P	P
Roads and associated facilities (e.g., sidewalks, bike lanes, storm drainage, etc.)	X	C	P	P	P	X
Other non-water-oriented	X	X	X	X	X	X
Utilities (Primary)						
Major	X	C	P	P	P	C
Minor	X	P	P	P	P	C
Shoreline Modifications						
Boat Launches						

Commented [AC35]: Gap Analysis: Table 5-1 #3

Commented [AC36]: Gap Analysis: Table 2-1 2017e

The chart is coded according to the following legend.

P = Permitted, when meeting requirements for that use and shoreline area, may be subject to Shoreline Substantial Development Permit or shoreline letter exemption requirements						
C = Conditional Use, when approved by the City and Department of Ecology						
X = Prohibited; the use is not eligible for a Variance or Conditional Use Permit						
	Natural	Conservancy	Shoreline Residential	Urban	Urban Maritime	Aquatic
Public	X	C	C	P	P	P
Private	X	X	C	P	P	P
Breakwaters ²	X	C	C	C	C	C
Docks, Piers and Floats						
Public	X	C	P	P	P	P
Private	X	X	P ⁴	P	P	P
Dredging and Dredge Spoil Disposal						
Dredging or in-water disposal associated with restoration	P	P	P	P	P	P
Other dredging	X	C	P	P	P	P
Other in-water disposal	X	X	X	X	X	X
Upland disposal	X	C	P	P	P	--
Fill						
In-water or upland restoration	P	P	P	P	P	P
Other in-water fill	X	C	C	C	C	C
Other upland fill	X	C	P	P	P	--
Jetties and Groins	X	X	C ²	C ²	C ²	C ²
Mooring Buoys	X	C	P	P	P	P
Shoreline Habitat and Natural Systems Enhancement Projects	P	P	P	P	P	P
Shoreline Stabilization						
Bioengineering or other soft structural stabilization technique	P	P	P	P	P	P
Hard structural stabilization	X	C	C	P	P	P

¹ Home gardens associated with a single-family residence are allowed in the Shoreline Residential and Urban environment.

² Those structures installed to protect or restore ecological functions may be processed as a Substantial Development Permit.

³ Except for marinas, only commercial uses that are incidental to the primary residential use and are compatible with the residential character of the neighborhood, such as home occupations and bed and breakfast inns, may be permitted.

⁴ Private piers are only permitted in single-family residential use areas within Flounder Bay and along Cap Sante. All other residential piers are prohibited.

⁵ Some above-water aquaculture projects may be allowed as a conditional use in limited circumstances per [SMP Section 8.4 AMC 19.72.525](#).

⁶ A forest practice that only involves timber cutting is not a development under the act and does not require a shoreline Substantial Development Permit or a shoreline [letter of exemption](#). A forest practice that includes activities other than timber cutting may be a development under the act and may require a Substantial Development Permit, as required by [WAC 222-50-020](#).

⁷ So long as provisions within AMC Chapter 19.64, Parking are met, and a public access easement, to the satisfaction of the Shoreline Administrator, is provided.

Commented [GL37]: Gap Analysis: Table 5-1 #3

Commented [AC38]: Gap Analysis: Table 2-1 2017e

B. Development Standards

1. Table [5-2 19.72.365\(B\)](#) establishes development standards, specifically lot size, lot coverage, height limits, and shoreline setbacks. The standards contained in Table [5-2 19.72.365\(B\)](#) are minimum requirements unless otherwise specified by this Master Program. In addition,

shoreline developments must comply with all density, lot area, setback and other dimensional requirements of the responsible local government zoning and subdivision codes. Variances may be granted to avoid denying “reasonable use of private property” in violation of constitutional or statutory limitations on regulation. Applicants are encouraged to setback further and to allow opportunity for restoration of impaired ecological functions.

2. **Building Height.** No building or structure in shoreline jurisdiction may exceed the height limits indicated in **Table 5-2 19.72.365(B)**, except as allowed per subsection (2)(g). In calculating the height of a building, the following measurement methods must be used:
 - a. For a lot that slopes uphill from, or remains at the same elevation as, the property line at the front (street) of the building, the building height is measured to the highest point of the structure from the average of the natural or existing topography at the foundation at the front (street side) of the building.
 - b. For a lot that slopes downhill from the property line at the front (street) of the building, the building height is measured to the highest point of the building from the average grade level directly under the building.
 - c. For a lot that has frontage on two or more streets and the lot slopes downhill from the property line on either street frontage, the building height is measured to the highest point of the building from the average of the natural grade directly under the building.
 - d. For purposes of a-c above:
 - i. Calculation of the average topography is made by averaging the elevations of the center of all exterior walls of the proposed structure.
 - ii. Natural or existing topography is the topography of the land immediately prior to any site preparation, grading, excavation, or filling. Where land is regraded for purpose of a land division, the “natural or existing topography” is the grades as they exist at the time of recording of the final plat.
 - e. For over-water structures, height is measured to the highest point of the structure from the ordinary high water mark elevation.
 - f. For wireless service facilities and emergency communication facilities, structure height is measured from the lowest pre-existing ground level within the footprint of the facility to the highest point on the facility, including but not limited to the antenna or antenna array.
 - g. Exceptions: The following structures may be erected above the height limits established in **Table 5-2 19.72.365(B)** below:
 - i. Cranes, gantries, mobile **and fixed** conveyors and similar equipment necessary for the functions of marinas, marine manufacturing, permitted commercial, industrial or port activities and servicing vehicles.
 - ii. Flagpoles or masts, transmission towers, chimneys, smokestacks, aerials or stairwells, when part of a permitted use.
 - iii. Belfries, monuments, spires or steeples, transmission towers, provided such structures must be designed to minimize obstruction of views.
 - iv. In mixed use and industrial zones, covers for elevator and other mechanical equipment and monitors for light and ventilation are permitted when occupying less than 15% of

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Commented [AC40]: Ecology Initial Determination

the total roof area and less than 5% of lot coverage and extending not more than 10 feet above roof level.

- h. When considering allowance of the structures (listed in this subsection (g)) to exceed the height limitations, the decision-maker ~~will~~ must consider:
 - i. View obstruction;
 - ii. Alternate siting outside shoreline areas;
 - iii. Significance of alteration of existing skyline profile.
 - iv. ~~The Shoreline Variance criteria in Section 3.2(C) of this SMP.~~

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Table 19.72.365(B) Shoreline Development Standards Matrix

Environment Designation	Min. Resid. Lot Size (sq.ft.)	Lot Coverage % of Area ¹	Max. Height	Setback ²	
				Water-Dependent	Non-Water-Dependent
Shoreline Residential					
Burrows Bay (between east end of Croatian Way and Skyline Way)	7,500	35% ³	35'	0'	25'
All other remaining areas	6,000 or 7,500	35% ³	35'	0'	60' ⁵
Urban					
Burrows Bay (Skyline Marina to Washington Park)	Per Zoning	50%	35'	0'	25'
All other remaining areas	Per Zoning	50%	50' ⁶	0'	25'
Urban Maritime	NA	50%	50' ⁶	0'	25'
Conservancy	Per Zoning	25% ³	25'	0'	100'
Natural	NA	NA	NA	0'	100'
Aquatic	NA	NA	-- ⁴	NA	NA

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¹ Lot Coverage: Buildings or structures in the Shoreline Area must not occupy a greater percentage of a lot than indicated.

² Setback: Setback must be the minimum distance measured in feet from the ordinary high water mark on a horizontal plane perpendicular to the shoreline.

³ The impervious surface limits on residential development located in ~~Chapter 5, Sections 5.8~~ [AMC 19.72.345](#) and [AMC 19.72.350](#) ~~5.9~~, supersede general lot coverage standards in this table. [Parking lots, if permitted under AMC Table 19.72.365\(A\) and AMC 19.72.350\(E\) as accessory to legally existing adjacent to pre-developed Aquatic Designations containing overwater structures or uses in the Aquatic Designation, are exempt from this requirement.](#) ~~Parking lots, if permitted under Table 5.1 as adjacent to pre-developed Aquatic Designations containing overwater structures, are exempt from this requirement.~~

Commented [AC43]: Ecology Initial Determination

⁴ See adjacent upland designation.

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⁵ See ~~DR-5.9~~ [AMC 19.72.350\(D\)](#) for setback reduction criteria, if applicable.

⁶ ~~Structures over 35 feet must demonstrate that they will not~~ [No permit shall be issued pursuant to Table 5.2 for any new or expanded building or structure of more than thirty five feet above average grade level on shorelines of the state that will obstruct the view of a substantial number of residences on areas adjoining such shorelines, except where a master program does not prohibit the same and then only when overriding considerations of the public interest will be served.](#) ~~Per consistent with RCW 90.58.320 and View Protection/Aesthetics regulation DR-6.4.18~~ [AMC 19.72.425 A.6\(c\).](#)

Commented [AC45]: Gap Analysis: Table 5-1 #4, Ecology Initial Determination

Article 4. Environmental Protection General Regulations

19.72.410 – ~~Introduction~~ Applicability

The intent of these regulations is to provide policies and regulations that protect the shoreline environment as well as the critical areas found within the shoreline jurisdiction. These policies and regulations apply to all uses, developments and activities that may occur within the shoreline jurisdiction regardless of the Shoreline Master Program environment designation. They are to be implemented in conjunction with the specific use and activity policies and regulations found in this Master Program.

The Shoreline Management Act (SMA) mandates the preservation of the ecological functions of the shoreline by preventing impacts that would harm the fragile shorelines of the state. The SMA also mandates that local master programs include goals, policies and actions for the restoration of impaired shoreline ecological functions to achieve overall improvements in shoreline ecological functions over time (WAC 173-26-201(2)(f)).

The environment protection policies and regulations of this Master Program address general environmental impacts, ~~and~~ critical areas, and sea level rise due to climate change. General environmental impacts include effects upon the elements of the environment listed in the State Environmental Policy Act (SEPA) (WAC 197-11-444). These regulations are not intended to limit the application of SEPA.

Commented [LG46]: 2022 Public Comment

The Anacortes Critical Area Regulations are incorporated within the SMP under ~~Section 6.6~~ AMC 19.72.435, Critical Areas—~~General~~. The City recognizes that there are inherent conflicts between water-dependent uses and the desire for shoreline setbacks. These conflicts are addressed in the Fidalgo Bay habitat plan of 2005 titled: *Plan for Habitat Protection, Restoration and Enhancement Fidalgo Bay and Guemes Channel*, which strives to balance these conflicting goals. When any provision of this Master Program conflicts with any other provision of this Master Program, the provision which provides more protection to critical areas and the environment must apply.

19.72.415 – Organization

These regulations first present general environmental ~~policies and~~ regulations including analysis of impacts, mitigation, bonding, and monitoring. Second, ~~policies and~~ regulations protecting the broad elements that comprise the shoreline environment (e.g., earth, air, and water) are provided. Third, this article presents ~~general and~~ specific ~~policies and~~ regulations for “critical areas” including: wetlands, geologically hazardous areas, frequently flooded areas, and fish and wildlife habitat conservation areas, ~~including exclusions where the AMC 19.70, Ordinance #, dated , Critical Areas Regulations do not apply within shoreline jurisdiction,~~ as described under ~~Section 6.6~~ AMC 19.72.435 Critical Areas—~~General~~. Regulations for the protection of critical aquifer recharge areas are ~~dealt with~~ addressed under ~~AMC Chapter 19.70, Ordinance #, Critical Areas Regulations~~ AMC 19.72.435 Critical Areas, as well. And finally, this article presents policies and regulations for conservation of vegetation in shoreline jurisdiction.

Commented [AC47]: Gap Analysis: Table 3-1 #1, Table 3-1 #3, Ecology Initial Determination

19.72.420 – Impacts, Mitigation, Bonding

A. Development Regulations

I. General

- a. All shoreline development and activity must be located, designed, constructed, and managed in a manner that avoids, minimizes and/or mitigates adverse impacts to the environment.

The preferred mitigation sequence (avoid, minimize, rectify, reduce, or compensate for the environmental impact) must follow that listed in WAC 173-26-201((2)(e), see also definition of "Mitigation" listed in this Master Program, ~~Chapter 12~~ [AMC 19.72.915](#)).

- b. In approving shoreline developments, the City of Anacortes must ensure that shoreline development, use, and/or activities will result in no net loss of ecological functions necessary to sustain shoreline resources, including loss that may result from the cumulative impacts of similar developments over time to the extent consistent with constitutional and statutory limitations on the regulation of private property. To this end, the City may require modifications to the site plan and/or adjust or prescribe project dimensions, intensity of use, and screening as deemed appropriate. If impacts cannot be avoided through design modifications, the City will require mitigation commensurate with the project's adverse impacts.
- c. Identified significant short term, long term, or cumulative adverse environmental impacts lacking appropriate mitigation will be sufficient reason for permit denial consistent with constitutional and statutory limitations on such denials.
- d. Wood treated with creosote or pentachlorophenol is prohibited. Use of other wood treatments must be minimized to the extent practicable.

2. Mitigation

- a. In addition to the requirements for critical areas reports contained in the Critical Areas Regulations, ~~Ordinance #XX, dated XX, found under AMC 19.70~~ [AMC 19.72.435](#), the mitigation plan must address the following:
 - i. Inventory existing shoreline environment including the physical, chemical and biological elements and provide an assessment of their condition.
 - ii. A discussion of the project's impacts and their effect on the ecological functions necessary to support existing shoreline resources.
 - iii. A discussion of any federal, state, or local special management recommendations which have been developed for wetlands or nearshore species or habitats located on the site;
 - iv. An assessment of habitat recommendations proposed by resource agencies and their applicability to the proposal;
 - v. A discussion of measures to preserve existing habitats and opportunities to restore habitats that were degraded prior to the proposed land use activity.
 - vi. Planting and soil specifications; success standards; and contingency plans;
 - vii. A discussion of proposed measures which mitigate the impacts of the project to ensure no net loss of shoreline ecological functions, value, and proposed success criteria;
 - viii. An evaluation of the anticipated effectiveness of the proposed mitigation measures to ensure no net loss of ecological functions;
 - ix. A discussion of proposed management practices which will protect fish and wildlife habitat both during construction, and after the project site has been fully developed, including proposed monitoring and maintenance programs;
 - x. Contingency plan if the mitigation fails to meet established success criteria;

Commented [AC48]: Gap Analysis: Table 3-1 #1

- xi. Any additional information necessary to determine the impacts of a proposal and mitigation of the impacts.

Mitigation plans and/or critical areas reports must be forwarded to the appropriate state and/or federal resource agencies and affected Tribes for review and comment.

- b. Compensatory mitigation in the immediate vicinity of the impact ~~must~~will be the preferred mitigation option, except where off-site mitigation can be demonstrated to be more beneficial to shoreline ecological functions; for example, mitigation off-site may be the better choice if large, cohesive areas are available off-site while only small fragmented areas are available on-site for mitigation.
 - c. If off-site mitigation is implemented, the applicant must demonstrate to the satisfaction of the Shoreline Administrator that that the mitigation site will be protected in perpetuity. This may be accomplished through various means including but not limited to dedication of a permanent easement to the City or approved non-profit entity; participation in a publicly sponsored restoration or enhancement program or purchase of credits from a state certified mitigation bank in accordance with Chapter 90.84 RCW (Wetlands Mitigation Banking). Any restrictions, conditions, or easements which are tied to the parcel through off-site mitigation must be recorded on a revised Notice on Title.
 - d. Where feasible, replacement mitigation must be required prior to impact and, at a minimum, prior to occupancy.
3. Bonding. Except for projects undertaken by public entities, performance or maintenance bonds or other security must be required by the City to assure that work is completed, monitored, and maintained.
4. Monitoring
- a. As a condition of approval, the City must require periodic monitoring for up to five years from the date of completed development to ensure the success of required mitigation. The monitoring period may be extended if the success criteria set forth in the approved mitigation plan fail to be accomplished, or the mitigation plan has a longer horizon.
 - b. Monitoring plans must be forwarded, for review and comment, to state and/or federal resource agencies and affected Tribes with jurisdiction.

19.72.425 – Environmental Elements

A. Development Regulations

1. Air.

- a. In approving shoreline development, uses or activities, the Planning Commission, City Council, or Hearing Examiner may apply conditions to control emissions, including any compounds, chemicals, pollutants, odors, fugitive dust, or vehicle exhaust with the intent of avoiding significant adverse impacts to the legal use of adjoining properties and ensuring adherence to the guidelines, policies, standards and regulations of applicable air quality management programs and related regulatory agencies.

2. Earth

- a. All shoreline uses and activities must be located, designed, constructed and managed to minimize interference with beneficial natural shoreline processes such as littoral drift, sand

and gravel movement, erosion, and accretion. For projects proposing clearing and grading see [AMC 19.72.445](#) ~~Section 6.5~~ Vegetation Conservation, ~~Chapter 9~~ [AMC 19.72.610-660](#) Specific Modification Policies and Development Regulations.

- b. Gravel and sand bars and other accretion shore forms are naturally unstable environments. They are valued for recreation and in some cases may provide habitat. Therefore, new development on these shore forms is prohibited and modification must be allowed only to protect existing occupied structures. Furthermore, developments that could disrupt the processes benefiting these shore forms must be carefully evaluated and allowed only when the impacts of such disruption can be adequately mitigated, and where there is a demonstrated public benefit.
- c. An erosion and sedimentation control plan must be submitted with a permit application for activities that involve the removal of vegetation, stockpiling of earth or other materials, or any activity that could result in shoreline erosion or siltation. Said program must conform to AMC 19.76, Stormwater, and AMC 19.78, Clearing and Grading, to utilize Best Management Practices (BMPs) to prevent shoreline erosion and siltation.

3. Noise.

- a. Noise emanating from a shoreline use/activity must be muffled so as to not to interfere with the designated use of adjoining properties. This determination must take into consideration ambient noise levels, intermittent beat, frequency, and shrillness. Shoreline developments/activities must comply with the maximum permissible noise levels and time limits set forth in Anacortes Municipal Code Chapter 19.69, Standards, Generally. Exception: This regulation does not apply to fog horns, tsunami warning or other emergency warning systems.

Commented [AC49]: Gap Analysis: Table 4-1 #10

19.72.430 – Archaeological/Historical/Cultural Impacts.

- A. Applicability: The following provisions apply to archaeological and historic resources consistent with state law.
 - l. All shoreline permits must contain provisions that require developers to comply with all applicable state law requirements regarding preservation of archaeological and historic resources, including provisions to stop work and notify the appropriate agencies should protected resources be uncovered during excavation.
 - c. Archaeological sites located both in and outside shoreline jurisdiction are potentially subject to chapter 27.44 RCW (Indian graves and records) and chapter 27.53 (Archaeological sites and records) and chapter 25.48 WAC (Archaeological excavation and removal permits) as well as the provisions of this section.
 - d. Where archaeological or historic sites have been identified, the City may require public access consistent with constitutional and statutory limitations, provided the development is consistent with the provisions for public access and provided further it is determined that public access to the site will not damage or reduce the cultural value of the site.

19.72.435 – Critical Areas ~~–General~~

- A. General Regulations. The City's Critical Areas Regulations as adopted under Ordinance #[3064](#), dated [July 26, 2021](#), and AMC 19.70 are hereby incorporated into this Master Program by reference with the following exclusions:

Commented [GL50]: Gap Analysis: Table 3-1 #1

1. 19.70.035, Critical Areas Review
2. 19.70.040, Exempt Activities
3. 19.70.045, Permitted Alterations
4. 19.70.050, Reasonable use exception and critical area variance
5. 19.70.225(B) Wetlands – General Development Standards, Exemptions ~~and allowed activities~~
6. 19.70.230 Wetlands – Specific Wetland Category Development Standards. These allowances can be utilized in instances where water-related development is proposed by the applicant.
7. 19.70.325(B) Fish and wildlife habitat – General Development Standards for all FWHCAs, Exemptions.
8. 19.70.330(C), Fish and wildlife habitat – Specific Standards for streams, Buffer Reduction Standards,
9. 19.70.330(E), Fish and wildlife habitat – Specific Standards for streams, Functionally Separated and Isolated Stream Buffers.
- 7,10. 19.70.425(B) Geologically hazardous areas – General development standards, Exemptions.
- 8,11. Any provision of the Critical Areas Regulations that is not consistent with the Shoreline Management Act Ch. 90.58 RCW, and supporting Washington Administrative Code chapters, does not apply in shoreline jurisdiction. Non-applicable provisions include those related to procedural/permit processes, non-conforming structures/uses, appeals, and enforcement.

Commented [AC51]: Ecology Initial Determination

Commented [AC52]: Gap Analysis Table 3-1 #1

Commented [LG53]: This section will need to be updated to reflect appropriate critical areas regulations ordinance number(s), adoption date, and updated section numbering, in place at time of SMP adoption

B. Fish and Wildlife Habitat Conservation Areas

1. Applicability. This section provides ~~policies and~~ regulations that apply to fish and wildlife habitat conservation areas, including critical saltwater and freshwater habitats as defined by WAC 173-26-221(2)(c)(iii) and (iv). These ~~policies and~~ regulations apply in addition to the shoreline-specific critical areas protection standards for fish and wildlife habitat conservation areas found in the Critical Areas Regulations referenced within ~~Section 6.6~~ AMC 19.72.435(A), Critical Areas ~~General~~, for Fish and wildlife habitat.
 - a. Kelp beds, eelgrass beds, herring spawning and holding areas, smelt and sand lance spawning and holding areas and other critical saltwater habitats are classified as “critical saltwater habitats” in the Shoreline Master Program Guidelines, WAC 173-26-221(2)(iii). The Guidelines also classify subsistence, commercial and recreational shellfish beds, mudflats, intertidal habitats with vascular plants, and areas with which priority species have a primary association as “critical saltwater habitat”. The Department of Fish and Wildlife has identified the following habitats of special concern: kelp beds, eelgrass beds, herring spawning areas, sand lance spawning areas, smelt spawning areas, juvenile salmonid migration corridors, rock sole spawning beds, rockfish settlement and nursery areas, and lingcod settlement and nursery areas.
 - b. In addition, it is important to give special consideration to conservation or protection measures necessary to preserve or enhance anadromous fish stocks, such as salmon (RCW 36.70A.172), some of which are classified as “Threatened” under the Endangered Species Act. Fish and wildlife habitat conservation areas include, but are not limited to, areas with which endangered, threatened, and sensitive species have a “primary association” (see WAC

Commented [AC54]: Gap Analysis Table 3-1 #1

365-130-080). Critical Saltwater Habitats include these “primary association” areas. Examples of “primary association” areas include, but are not limited to, the following:

- i. Shallow water/low gradient habitats along shorelines
 - ii. Migratory corridors that allow juvenile salmon to move within and between habitats (e.g., beaches, as well as eelgrass, kelp, etc.). In addition, a diversity of shoreline habitats is essential for providing adequate functions for juvenile salmon.
 - c. AMC Section 19.70.625(B), Frequently Flooded Areas – Critical Areas Report Additional Requirements provides the minimum report requirements for a Floodplain Habitat Assessment and Mitigation Plan, as required by FEMA Region X, 2013, or hereafter amended. In addition, the *Northern Skagit County Bays and Shoreline Habitat Conservation and Restoration Blueprint 2005 Update* describes protection measures for critical salt-water habitats addressing these areas within City.
2. Development Regulations
- a. Water-dependent development and uses, including marinas, docks, piers, mooring areas, underwater parks, utility crossings, and shoreline modifications, must not intrude into or be built over critical saltwater habitat unless the applicant can show that all of the following criteria can be met:
 - i. The use preference listing in RCW 90.58.020 for uses in Shoreline of Statewide Significance must be adhered to.
 - ii. The public’s need for such a structure is clearly demonstrated and an alternative alignment or location on the applicant’s property that would avoid impacts to critical saltwater habitats is not feasible or would result in unreasonable and disproportionate cost to accomplish the same general purpose. An alternatives analysis will be required for any non-exempt project proposed within FWHCAs. The analysis should include in part, shoreline bathymetry, shoreline features at the site, and substrate composition.
 - iii. The project is consistent with the state’s interest in resource protection and species recovery.
 - iv. Impacts to critical saltwater habitat functions are mitigated to result in equal or better ecological function.
 - b. Except as a habitat improvement or restoration measure, aquatic herbicide treatments, mechanical removal of vegetation and aquatic pesticide treatments must not be used on critical salt-water habitats.
 - c. Sand, gravel or other materials must neither be added nor removed from critical salt-water habitats, except when part of an approved restoration effort or beach nourishment program or as allowed in DR-6.7.1, above.
 - d. New outfalls (including stormwater and sewer outfalls) and discharge pipes must not be located in critical saltwater habitats or areas where outfall or discharge will adversely affect critical saltwater habitats unless the applicant can show that all of the following can be met:
 - i. There is no alternative location for the outfall or pipe.
 - ii. The outfall or pipe is placed below the surface of the beach or bed of the water body.
 - iii. The outfall discharges waterward of the intertidal zone

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- iv. The disturbed area will be revegetated with native plants.
- v. The discharge point(s) on the outfall or discharge pipe is located so the discharges, including nutrients in the discharge and currents, do not adversely affect critical salt-water habitats.

e. The City must maximize the use of existing outfalls.

f. In addition to requiring compliance with ~~DR-6.5.9~~ [AMC 19.72.445](#) for certain types of developments and uses (e.g., minimum ten-foot wide planting bed(s) of riparian vegetation along marine shorelines), the City must require the establishment of buffer areas for activities adjacent to fish and wildlife habitat conservation areas on a case by case basis through a critical area report when needed to protect such habitat conservation areas. The applicant ~~shall~~ [must](#), with assistance of a licensed professional, determine the buffer(s) necessary, as applicable, depending upon the number of species present and the presence of existing habitat corridors to be preserved. The critical area report needs to reflect the nature of the existing vegetation, sensitivity of the habitat, and the type and intensity of human activity proposed to be conducted nearby. Habitat conservation areas and their buffers must be preserved in perpetuity using native growth protection easements and critical area tracts. In order to determine the need or extent of a buffer, critical area reports must be required for all development in or adjacent to a habitat conservation area, utilizing [AMC 19.70.320, Fish and wildlife habitat - Mapping](#).

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3. Until an inventory of critical saltwater habitat is done, prior to construction all over water and near-shore developments must conduct an inventory of site and adjacent beach sections to assess the presence of critical saltwater habitats and functions. The methods and extent of inventory must be consistent with accepted research methodology. New studies will be developed only where existing information is inadequate or does not exist.

C. Frequently Flooded Areas and Tsunami Inundation Areas

- 1. Portions of Anacortes' shoreline are subject to periodic flooding that may result from factors including, but not limited to, unusual amount of rainfall over a short period of time, high tides, and wind driven waves. Tsunamis also pose a less frequent, but potentially more hazardous, type of flooding event.
- 2. Development Regulations. All new development and new uses within the jurisdiction of this Master Program must comply with the provisions of [City Critical Areas Regulations](#) referenced within ~~6.6~~ [AMC 19.72.435](#), Critical Areas – General, [AMC 19.70.600-625](#), and Floodplain Management Regulations, [AMC Chapter 19.74](#).

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D. Geologically Hazardous Areas

1. ~~Introduction~~ [Applicability](#).

- a. Geologically hazardous areas are areas susceptible to severe erosion; slide activity, or other geologic events. In the Anacortes shoreline, high marine bluffs are the most visible type of geologically hazardous area, although seismic, tsunami and erosion hazards have also been mapped.
- b. The more severe hazard areas are not suitable for placing structures or locating intense activities or uses due to the inherent threat to public health and safety. Vegetation removal during construction and development of adjacent properties alters surface runoff and ground water infiltration patterns that can lead to increased slope instability.

- c. A certain level of erosion of shorelines and marine bluffs is natural to the Puget Sound area. Erosion from “feeder bluffs” is the primary source of sand and gravel found on beaches including accretion beaches (gravel bars, sand pits and barrier beaches). Extensive “hardening” of feeder bluff areas can eventually starve beaches down drift of the bluff, resulting in lowered beach profiles and the potential for increased erosion. Changes in the beach substrate resulting from reduced sediment deposition may result in negative habitat impacts. Erosion and accretion are natural processes that provide ecological functions and thereby contribute to sustaining the natural resource and ecology of the shoreline.

2. Development Regulations

- a. Applicability. Regulations for Geologically Hazardous Areas are set forth in the Critical Areas Regulations referenced within [Section 6.6 AMC 19.72.435](#), Critical Areas – General and contained in AMC 19.70.400-450. Note that in addition to the buffers applied therein, vegetation preservation may be required by [Section 6.5 AMC 19.72.445](#) Vegetation Conservation and [Chapter 9 Article 6 \(AMC 19.72.610-660\)](#) Specific Shoreline Modification Policies and Development Regulations.
 - i. The following activities are allowed in geologically hazardous areas specifically mapped and designated by ordinance of the city council pursuant to allowed activities of this section and do not require submission of a critical area report [for geologically hazardous areas](#), so long as they meet all applicable provisions of the SMP:
 - ii. Erosion and Landslide Hazard Areas. Only those activities approved and permitted consistent with an approved critical area report in accordance with this master program, in addition to shoreline permit provisions under [AMC 19.20](#), ~~must~~ [may](#) be allowed in erosion or landslide hazard areas.
 - iii. Seismic, Mine, and Tsunami Hazard Areas. The following activities are allowed within seismic, mine, and tsunami hazard areas [and do not require a critical areas report for geologically hazardous areas](#):
 - (1) Construction of new buildings with less than two thousand five hundred square feet of floor area or roof area, whichever is greater, and which are not residential structures or used as places of employment or public assembly;
 - (2) Additions to existing single-story residences that are two hundred fifty square feet or less; and
 - (3) Installation of fences;
 - (4) Maintenance, replacement, or repair of existing utility and transportation facilities.

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Commented [AC61]: Ecology Initial Determination

Commented [AC62]: Gap Analysis: Table 3-1 #1. Appendix A

E. Wetlands

- I. ~~Introduction~~ [Applicability](#). Wetlands are those areas that are inundated or saturated by ground or surface water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. A wetland directly impacts water quality and stormwater control by trapping and filtering surface and ground water. Wetlands also provide valuable habitat for fish and wildlife. Because of the difficulty in replacing these rare and valuable areas, these regulations control development adjacent to and within wetlands, and limit the amount of wetlands, which may be altered. The purpose of these regulations is to protect the public from harm by preserving the functions of wetlands and streams as recharge for ground water, flood storage, floodwater

conveyance, habitat for fish and wildlife, sediment control, pollution control, surface water supply, aquifer recharge and recreation. Wetlands in Anacortes are characterized by hydric soils, water-tolerant plants (hydrophytes), and surfaces that are either saturated or inundated with water for a specified period of time.

2. Development Regulations.

a. Applicability. See regulations set forth in the Critical Areas Regulations referenced within Section ~~6.6~~ [AMC 19.72.435\(A\)](#), Critical Areas—~~General~~, for activities impacting wetlands proposed within shoreline jurisdiction.

b. Prohibit alteration of wetlands and their buffers unless:

~~a. Doing so will constitute a violation of constitutional or statutory limitations on regulations of private property or~~

i. The proposal is a water-oriented use and the proponent can conclusively demonstrate that impacts are unavoidable and that mitigation measures have been applied via mitigation sequencing, as defined in ~~Chapter 12, Definitions~~ [AMC 19.72.915](#), and WAC 173-26-201(2)(e).

~~ii. Other~~ ~~development~~ proposals that cannot meet requirements outlined within ~~Section 6.6~~ [AMC 19.72.435](#), Critical Areas – General, ~~and/or this regulation, must apply for~~ ~~may seek relief through~~ a Shoreline Variance, per ~~Section 3.2~~ [AMC 19.72.220+5](#), Variances. In either case, the proponent shall provide mitigation to achieve no net loss of wetland function or value, according to an approved mitigation plan prepared consistent with this Master Program, ~~and~~ the Critical Areas Regulations, AMC 19.70.

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19.72.440 – Shoreline Public Access

A. Introduction. Shoreline public access is the physical ability of the general public to reach and touch the water's edge or the ability to have a view of the water and the shoreline from upland locations. There are a variety of types of public access, including docks and piers, boat launches, pathways and trails, promenades, street ends, picnic areas, beach walks, viewpoints and others.

An important goal of the Shoreline Management Act is to protect and enhance public access to the state's shorelines. Specifically, the SMA states:

RCW 90.58.020: “[T]he public’s opportunity to enjoy the physical and aesthetic qualities of natural shorelines of the state shall be preserved to the greatest extent feasible consistent with the overall best interest of the state and the people generally.”

“Alterations of the natural conditions of the shorelines of the state, in those limited instances when authorized, shall be given priority for...development that will provide an opportunity for substantial numbers of people to enjoy the shorelines of the state.”

Public access and use of the shoreline is supported, in part, by the Public Trust Doctrine. The essence of the doctrine is that the waters of the state are a public resource owned by and available to all citizens equally for the purposes of navigation, conducting commerce, fishing, recreation and similar uses, and that this trust is not invalidated by private ownership of the underlying land. The doctrine limits public and private use of tidelands and other shorelands to protect the public's right to use the waters of the state. The Public Trust Doctrine does not allow the public to trespass over privately owned uplands to access the tidelands. It does, however, protect public use of navigable waterbodies.

Requiring public access on privately owned property as a condition of development has been the subject

of considerable legal review. Our state Constitution and the U.S. Constitution provide both the authority for conducting the activities necessary to carry out the Shoreline Management Act and significant limitations on that authority. While the SMA stresses the need for public access, our state and the U.S. Constitutions provide for protection of certain private property rights. Where public access is required as a permit condition, the courts have stated that there must be a rational and roughly proportionate connection between the project's impact on public access and the public access requirement. Certain state statutes also impose limitations on the regulation of private property.

A. Background. This Public Access Chapter is preceded by several planning efforts to maintain and enhance public access to the shoreline in Anacortes. The public access policies and strategies included in this Master Program build on those established in past planning documents.

Anacortes is a uniquely situated jurisdiction. An attractive destination for travelers because of the geography and historic setting, it is also a stop along the state highway linking to Whidbey Island, the San Juan Islands, Vancouver Island, and points north and east. The State Parks, the Waterfront Festival, and the Arts Festival, among others, attract large numbers of visitors from far and wide annually. Inarguably, the economic vitality of the City is bolstered by the public access to and enjoyment of the shorelines.

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~~19.72.400—Background~~

~~F. This Public Access Chapter is preceded by several planning efforts to maintain and enhance public access to the shoreline in Anacortes. The public access policies and strategies included in this Master Program build on those established in past planning documents.~~

~~19.72.410—Public Access Development Regulations~~

~~G.C.~~ General Requirements

1. Developments, uses, and activities must be designed and operated to avoid significantly blocking, reducing, or adversely interfering with the public's visual or physical access to the water and the shorelines.
2. Except as provided in regulations [AMC 19.72.440.A\(4\)](#) and [AMC 19.72.440.A\(5\)](#), shoreline substantial developments or conditional uses must provide public access where any of the following conditions are present:
 - a. Where a development or use will create increased demand for public access to the shoreline, the development or use must provide public access to mitigate this impact.
 - b. Where a development or use will interfere with an existing or potential public access way, the development or use must apply mitigation sequencing principles and provide public access to address the impact.
 - c. Where a non-water-enjoyment use is converted to a water-enjoyment use by the addition of substantial opportunity for public access. For example, a restaurant may qualify as a water-enjoyment use when located, designed and operated to assure the public's ability to interact with the shoreline.
 - d. Where land is subdivided into five or more parcels.
 - e. Where a development or use is located on public land or is managed by a public entity, unless access is incompatible with safety, security, or environmental protection.
3. Required public access must include the preservation of shoreline views, the establishment of public access easements to and along the shoreline, enhancement of an adjacent street-end or park, or other consideration commensurate with the degree of impact caused by the development.
4. Public access is not required if the applicant can demonstrate to the satisfaction of the City that constitutional and or statutory limitations would be violated by the provision of such access. Nor is public access required for individual single-family residences which are not part of a development planned for more than four parcels.
5. Alternatives to on-site, physical access to the shoreline may be approved if the applicant can demonstrate to the satisfaction of the City that one or more of the following conditions exist:
 - a. Unavoidable health or safety hazards to the public exist which cannot be prevented by any practical means;
 - b. Access is not feasible due to the configuration of existing parcels and structures, such that access areas are blocked in such a way that cannot be reasonably remedied by the proposed development;

- c. Inherent security requirements of the proposed development or use cannot be satisfied through the application of alternative design features or other solutions;
- d. The cost of providing on-site access, easement, or an alternative amenity is unreasonably disproportionate to the total long-term cost of the proposed development;
- e. Unacceptable environmental harm which cannot be mitigated, such as damage to spawning areas or nesting areas, will result from the public access; or
- f. Significant undue and unavoidable conflict between the proposed access and adjacent uses would occur and cannot be mitigated.

Provided further, that the applicant has first demonstrated and the City has determined that all reasonable alternatives have been exhausted, including, but not limited to:

- g. Regulating access by such means as limiting hours of use to daylight hours, or allowing public access to only a portion of the site.
 - h. Designing separation of uses and activities, using such means as terracing, hedges, and landscaping.
6. When on-site public access is not required under [AMC 19.72.440.A\(5\)](#)~~DR 7.4.5~~, alternative shoreline access must result in an equal or greater public benefit. Alternatives may include but are not limited to:
 - a. Publicly accessible rooftop decks.
 - b. Off-site public access, such as improvements to a nearby street end, an offsite viewpoint, or a trail system, purchase of land or an easement at a location appropriate for future access improvements.
 - c. A payment in lieu agreement with the City in accordance with RCW 82.02.020 (relating to fees associated with development).
 7. Off-site public access, when required, must meet the same standards and requirements as on-site public access.
 8. In providing visual access to the shoreline, significant vegetation removal of native vegetation must not occur, including by clearing or by topping. (Note: Trimming of trees and vegetation may be allowed, pursuant to ~~Section 6.5~~ [AMC 19.72.445](#) -of this Master Program).
 9. When required, public access sites must be fully developed and available for public use at the time of occupancy or use of the development or activity, except where the decision maker determines an appropriate mechanism for delayed public access implementation is necessary for practical reasons. If on or over the water, development must be constructed to minimize interference with physical access along the beach and views from surrounding properties to the shoreline and adjoining waters, including locating structures as far landward as feasible.

H.D. Physical Access and Easements

1. Where on-site physical access is appropriate, the development must dedicate, improve, and provide maintenance for a pedestrian easement that provides area sufficient to ensure usable access to and along the shoreline for the general public.
2. Public access easements must be designed to accommodate the anticipated intensity of use, generally ranging from a minimum 12-foot width easement in less traveled residential areas to a

minimum 25-foot width in more intensely urbanized areas. Where deemed necessary to protect environmental functions, the easement must accommodate an area of native vegetation between the OHVM and the public access walkway/viewpoint

3. A reduced width access easement may be allowed to facilitate redevelopment of existing structures that encroach into the easement area, provided that the easement and design of the access is sufficient to provide safe access or alternative shoreline access is provided.
4. Public access easements and permit conditions must be recorded in an appropriate manner, such as on the deed where applicable or on the face of a plat or short plat as a condition running in perpetuity with the land. Said recording with the Auditor's office must occur at the time of permit approval (RCW 58.17.110; relating to subdivision approval or disapproval) and prior to the issuance of any land disturbing or construction permits.
5. The standard state approved logo or other approved signs that indicate the public's right of access and hours of access must be constructed, installed, and maintained by the applicant in conspicuous locations at public access sites. Signs must be designed to distinguish between public and private areas. In accordance with the regulations in this section, signs controlling or restricting public access may be approved as a condition of permit approval.
6. Future actions by the applicant or other parties must not diminish the usefulness or value of the public access site.

Design

1. Public access sites must be connected directly to the nearest public area (e.g., street, public park, or adjoining public access easement). Where connections are not currently possible, the site must be designed to accommodate logical future connections. In either case, the design must take into consideration the priority placed on protecting physical access along the beach (i.e., boardwalk connections that interfere with physical access along the adjoining beach area are discouraged).
2. Public access sites must be made barrier free for the physically disabled, where feasible, and designed consistent with the Americans with Disabilities Act.
3. Public access landscape design must use native vegetation in the shoreline setback and predominantly native vegetation (i.e., 80% or greater) in the remainder of shoreline jurisdiction, particularly drought-resistant and, along marine shorelines, saline-tolerant plant species. Landscape plantings may be required where desirable to provide public/private space separation.
4. Public access must be designed to achieve no net loss of ecological functions. Where impacts are identified, mitigation must be required. Materials must be:
 - a. Consistent with the character of the shoreline and the anticipated intensity of use. For example "formal" (e.g. concrete sidewalks, colonnade) elements in the downtown or "informal" design elements (e.g. log benches, dune grass and gravel paths) along the Guemes Channel.
 - b. Durable, capable of withstanding exposure to the elements; and
 - c. Wherever financially feasible and practical, environmentally friendly materials and technology in such things as building materials, paved surfaces, porous pavement, etc., ~~must~~will be used. Creosote-treated timber must not be used within the shoreline jurisdiction.

Public/Private Separation

1. Public access facilities must look and feel welcoming to the public, and not appear as an intrusion into private property.
2. Natural elements such as logs, grass, shrubs, and elevation separations are encouraged as means to define the separation between public and private space.
3. New residential development bordering public spaces that contain adjacent pathways must be designed to provide a visual privacy separation between uses.

K.G. Amenities

1. Furniture used in public access areas must be appropriate for the proposed level of development, and the character of the surrounding district.
2. The City may require the installation of benches; bicycle racks; pet waste, garbage and recycling receptacles; educational signage; and other street furniture at shoreline public access points commensurate with the degree of project impact. Where required:
 - a. Benches must be set back from a walkway or path so pedestrians will still have room to walk by when the benches are in use. At least four (4) feet of unobstructed pathway width must remain where benches are placed on pathways. Benches may be built without backs and must be at least 4 to 5 feet in length.
 - b. Provisions for maintenance must be required as a condition of permit approval.
 - c. Educational signage must be used to identify unique natural features, maritime uses and historical landmarks.

L.H. Parking

Parking associated with Public Access must comply with applicable parking requirements in ~~Chapter 8~~[AMC 19.72.550, Specific Use Policies and Development Regulations, Section 8.9](#)[Parking Facilities, Section 8.11](#)~~AMC 19.72.550.B.3(g)~~ includes specific development regulations for vista parking facilities.

19.72.445 – Vegetation Conservation

A. ~~Introduction~~[Applicability](#).

1. Vegetation conservation includes activities to protect and restore vegetation along or near marine and freshwater shorelines that contribute to the ecological functions of shoreline areas. Vegetation conservation provisions include the prevention or restriction of plant clearing and earth grading, vegetation restoration, and the control of invasive weeds and nonnative species.
2. Unless otherwise stated, vegetation conservation does not include those activities covered under the Washington State Forest Practices Act, except for conversion to other uses and those other forest practice activities over which local governments have authority. Vegetation conservation provisions apply even to those shoreline uses and developments that are exempt from the requirement to obtain a permit. Vegetation conservation standards do not apply retroactively to existing uses and structures.
3. The City's Tree Preservation requirements (Title 16, Ordinance No. 2756, as amended) limits the removal of trees in all parts of the City, including shorelines of statewide significance.

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- B. Regulations. Note that all clearing, grading and vegetation removal activities must also be consistent with the environmental protection regulations in the remainder of ~~Chapter 6~~ [AMC 19.72.410-460](#), when applicable.
1. Forest practices not covered by the Forest Practices Act ~~must be~~ [are](#) prohibited.
 2. Alteration of the natural landscape must only be allowed as set forth below:
 - a. Landscaping or maintenance associated with an existing legal use or new permitted shoreline use or development.
 - b. Removal of noxious weeds, as listed by the state in Chapter 16-750 WAC, ~~provided such so~~ [long as the activity must will be is](#) conducted in a manner consistent with best management practices and the City's engineering design standards and native vegetation is promptly reestablished in the disturbed area.
 - c. Modification of vegetation in association with a legal, non-conforming use provided that said modification is conducted in a manner consistent with this Master Program and results in no net loss to ecological functions or critical fish and wildlife conservation areas.
 3. All clearing and grading activities must be limited to the minimum necessary for the intended development.
 4. Exposed soils must be immediately developed or revegetated to prevent erosion.
 5. Exposed soils must be replanted such that complete coverage of exposed soils is attained within one growing season, or otherwise stabilized using mulch or other similar BMPs.
 6. In all cases where clearing is followed by revegetation, native plants ~~must be~~ [are](#) preferred. Lawns are discouraged due to their limited erosion control value, limited water retention capacity, and associated chemical and fertilizer applications.
 7. Clearing and grading within shoreline jurisdiction ~~must may~~ only be permitted upon approval of a detailed landscape plan for revegetation. Any restrictions or conditions which are tied to the parcel through the development of a landscape plan must be recorded on a revised Notice on Title. The landscape plan must include:
 - a. A map illustrating the distribution of existing plant communities in the area proposed for landscaping. The map must be accompanied by a description of the vegetative condition of the site, including plant species, plant density, any natural or man-made disturbances, overhanging vegetation, and the functions served by the existing plant community (e.g., fish and wildlife habitat values, slope stabilization).
 - b. A description of the shade conditions created by existing vegetation. This description must include an inventory of overhanging vegetation as well as a determination of how much shade is created by standing trees, during midday at midsummer.
 - c. A detailed landscape map indicating which areas will be preserved and which will be cleared, including tree removal.
 - d. Drawings illustrating the proposed landscape scheme, including the species, distribution, and density of plants. Any pathways or nonvegetated portions must be noted.
 - e. A description of any vegetation introduced for the purposes of fish and wildlife habitat. Loss of wildlife habitat must be mitigated on-site. If on-site mitigation habitat is not possible, off-

site mitigation ~~must~~ may be permitted at a minimum replacement ratio of 1 to 1.25 ~~one-to-one and a quarter (1.25)~~ (habitat lost to habitat replaced).

- f. The revegetation landscaping required by this regulation must meet the following standards:
 - i. At the time of planting, shrubs must be ~~eighteen (18)~~ inches high. Shrubs must be planted such that within two years the shrubs will cover at least ~~thirty percent (30%)~~ of the area that would be covered when the shrubs have attained a mature size.
 - ii. At the time of planting, deciduous trees must be at least ~~two (2)~~ inches in caliper as measured ~~one (1)~~ foot above grade, and coniferous trees must be at up to ~~eight (8)~~ feet in height.
 - iii. The applicant may be required to install and implement an irrigation system to insure survival of vegetation planted. For remote areas lacking access to a water-system, an alternative method (e.g., hand watering) may be approved.
 - iv. For a period of ~~two (2)~~ years after initial planting, the applicant must replace any unhealthy or dead vegetation planted as part of an approved landscape plan.
- 8. As part of meeting project site area landscaping requirements, and in coordination with any buffer requirements, the applicant for a proposed new development, expansion, or redevelopment project of a non-water-dependent use other than public shoreline access trails that will abut the City's marine shorelines must submit a landscaping plan for approval specifying protection of existing native riparian vegetation within fifteen feet of the OHWM. If native vegetation within fifteen feet of the OHWM has been destroyed or significantly degraded, the landscaping plan must specify replacement by installation of dense native riparian vegetation consisting of trees, shrubs, and groundcovers within and along portions of the fifteen-foot wide strip of land lying immediately landward of the line of ordinary high water (OHW) for currently unarmored shorelines, or the landward edge of existing shoreline armoring for currently armored shorelines. Water-dependent uses and public access trails that will abut the City's marine shorelines are exempt from the locational requirements of planted areas but must provide a landscaping/mitigation plan that provides equal to or greater environment function than already exists. Riparian vegetation should be encouraged, but not required, elsewhere on the site for aesthetic continuity with the riparian vegetation required along the shoreline. ~~DR-5.9.1+AMC 19.72.350.D.4(b)~~ also requires additional enhancement in the Residential environment. Any restrictions or conditions which are tied to the parcel through the development of a landscape plan must be recorded on a revised Notice on Title. The landscaping plan must also meet the following requirements:
 - a. Locations and Sizes of Required Shoreline Planting Areas. The landscaping plan must specify (a) particular species of salt-tolerant riparian vegetation that are to be planted preferably at existing ground-level, or if that is not feasible, then in raised planting beds. Each planting area must be a minimum of ten feet in width and a minimum of ten feet in length (a minimum of one-hundred square feet). The total minimum linear footage of riparian vegetation to be protected and/or replaced along the project's shoreline must be fifty percent of the project's shoreline length in the case of new development projects and twenty-five percent of the project's shoreline length in the case of redevelopment of already-developed project sites. Subdivision of property must be in a configuration that will not require significant (greater than 25%) native vegetation removal and shoreline modification, and will not adversely impact ecological functions;

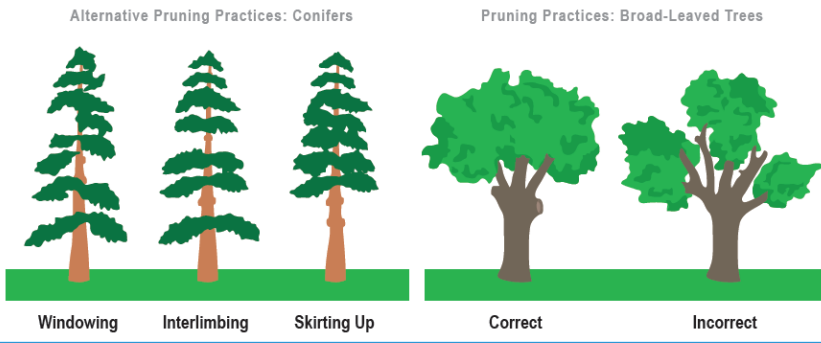
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Commented [AC67]: Gap Analysis: Table 5-1 #5

- b. **Plant Selection.** The native riparian plant species must be specified on the landscaping plan. The suitability of the species must be reviewed and approved by a biologist/riparian plant specialist. The plant names listed on the landscaping plan must comply with the names generally accepted in the riparian plant nursery trade. The plan must further specify that (a) all plant materials must be true to species and variety and legibly tagged, and (b) riparian plant materials must be nursery grown in the Puget Sound area of Washington except that dug plants may be used upon approval of the biologist/riparian plant specialist;
 - c. **Plant Sizes.** The landscaping plan must specify the sizes of the riparian plants to be installed. The plan may also specify that larger stock may be substituted provided that (a) it has not been cut back to the specified size, and (b) the root ball is proportionate to the size of the plant. Because smaller stock may be acceptable based upon site-specific conditions, the plan may specify that the biologist/riparian plant specialist may make field determinations to substitute smaller stock for the stock size set forth on the plan.
 - d. **Site Preparation.** The landscaping plan must specify that (a) an amended planting soil must be placed in the planting beds if needed, (b) all existing exotic vegetation must be removed from the planting beds, and (c) the project biologist/riparian plant specialist may make field determinations for the installation of barriers to limit Canada geese intrusion and feeding on installed plants;
 - e. **Plant Monitoring.** The landscaping plan must specify that five-year monitoring will be conducted to ensure the long-term survival and stability of the riparian planting beds, with the elements of the monitoring to be (a) annual inspections of the plants, (b) replacement of failed riparian plants, (c) removal of exotic invasive species that may have become established, and (d) photographic documentation of planting success;
 - f. **Criteria for Success.** The landscaping plan must specify that, at the end of the fifth year of the monitoring, the riparian planting beds ~~must~~will be considered successful if the following performance standards are met: (1) a minimum eighty percent survival rate of the riparian vegetation within the planting beds; and (2) a minimum of fifty percent cover within the planting beds by riparian vegetation four feet tall or taller.
9. Trimming of trees and vegetation is allowed within shoreline setback areas, under authorization of a ~~shoreline exemption~~clearing and grading permit, provided:
- a. This provision is not interpreted to allow clearing of vegetation,
 - b. Trimming does not include topping, stripping or imbalances; a minimum of 75% of the original crown must be retained to maintain tree health,

Figure 19.72.445(B)(9)(b)

Tree trimming best practices.



- c. Trimming impacts to the following critical areas may require evaluation and a report prepared by a qualified professional to demonstrate:
 - i. No direct impact on the nearshore functions and values including fish and wildlife habitat,
 - ii. It is not within a wetland or wetland buffer, and
 - iii. It does not impact soil stability in landslide and erosion hazard areas.
- d. Trimming is for view preservation, not view creation. Trimming cannot be for more than 25% of limbs in a five-year period, so long as ~~DR-6.5.AMC 19.72.445.B.9(b)~~ is also met, whichever is more restrictive. Photo documentation must accompany the shoreline permit application before with flagging showing limb(s) requested for removal.
- e. A photo of the tree is required as an as-built submittal, post permit issuance.
- f. Hazardous trees, or those identified as an extreme public nuisance by the Shoreline Administrator, may be removed under an ISA Tree Risk Assessment by a qualified arborist.
- g. Hand-held equipment removal of invasive or non-native shoreline vegetation, or noxious weeds (WAC 16-750) must be re-planted with the equivalent square footage of native vegetation in the disturbed area. If nonnative tree(s) are removed in shoreline jurisdiction, it shall be replaced with native trees at least a 1:1 ratio, in addition to the requirements within Title 16, Tree Preservation, along with Table 16.50.070.(D)3 – Tree Unit Credits. This clearing must occur with hand-held equipment within the shoreline setback. A plan can be drawn by the applicant, so long as it is to scale, showing native species proposed, for permit submittal.
- h. Ground based motorized equipment may be used if accompanied by a professionally drawn plan showing requirements of ~~DR-6.5.H.AMC 19.72.445.B(11)~~ and other applicable SMP and development regulations, to re-establish native vegetation, and with prior written approval of the Shoreline Administrator. If nonnative tree(s) are removed in shoreline jurisdiction, it shall be replaced with native trees at a 1:1 ratio, in addition to the requirements within Title 16, Tree Preservation. The ground based motorized equipment must only be operated by a licensed professional, if within the shoreline setback.

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Commented [AC70]: Duplicate of DR-6.5.12 below.

10. Stabilization of exposed erosional surfaces along shorelines must, whenever feasible, utilize soil bioengineering techniques.
11. All shoreline development and activity must use effective measures to minimize increases in surface water runoff that may result from clearing and grading activity. The applicant must implement best management practices in compliance with the City's stormwater, clearing and grading regulations in AMC 19.76 Stormwater and 19.78 Clearing and Grading. Submittal requirements may include a plan addressing species removal, revegetation, irrigation, erosion and sedimentation control, and other methods of nearshore/riparian corridor protection in accordance with the City's Engineering Design Standards.
12. The Shoreline Administrator may require a performance bond as a condition of a clearing a grading permit, shoreline letter of exemption or shoreline permit approval, to ensure compliance with this Master Program.

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19.72.450 – Water Quality

A. Regulations.

1. The bulk storage of oil, fuel, chemicals, or hazardous materials, on either a temporary or a permanent basis, ~~must~~ may not occur in shorelines without adequate secondary containment and an emergency spill response plan in place.
2. All development activities approved under this Shoreline Master Program must be designed and maintained consistent with the City's Stormwater Management Regulations and Engineering Design Standards.
3. As a condition of approval of a permit issued in accordance with this Master Program, the Shoreline Administrator may apply the following conditions to protect water quality:
 - a. The development, use or activity must utilize Best Management Practices (BMPs) to minimize any increase in surface runoff and to control, treat and release surface water runoff to protect the quality and quantity of surface and ground water. Such measures may include, but are not limited to, catch basins or settling ponds, installation and required maintenance of oil/water separators, biofiltration swales, interceptor drains and landscaped shoreline setbacks.
 - b. The release of oil, chemicals (including pesticides and herbicides), fertilizer or hazardous materials onto land or into the water is prohibited within the shoreline jurisdiction.
 - c. Equipment for the transportation, storage, handling, or application of such materials must be maintained in a safe and leak-proof condition. If there is evidence of leakage, the further use of such equipment must be suspended until the deficiency has been satisfactorily corrected.

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B. Pesticides and Fertilizers, Application of: (Pesticides include herbicides and algacides)

1. Chemical pesticides using aerial spraying techniques within the shoreline jurisdiction, including over waterbodies or wetlands, ~~must-be~~ are prohibited unless specifically permitted by the Washington Departments of Agriculture or Public Health.
2. Pesticides, organic or mineral-derived fertilizers, or other hazardous substances, if necessary ~~must~~ will be restricted in accordance with the a) state Department of Fish and Wildlife Management Recommendations b) the regulations of the state Department of Ecology as the Environmental Protection Agency's delegated authority and permitting body for the application

of pesticides and herbicides to the waters of Washington State, and c) pesticide labels as per the authority of the state Department of Agriculture.

3. Pesticides ~~must~~will be used, handled, and disposed of in accordance with provisions of the Washington State Pesticide Application Act (RCW 17.21) and the Washington State Pesticide Control Act (RCW 15.58) to prevent contamination and sanitation problems.
4. Pesticide products commercially applied for terrestrial use usually include information on how far to stay away when applying near water. If there were a chance of a product entering the water, the product must be labeled for aquatic use. Only products approved by the Washington State Departments of Agriculture, and Ecology for aquatic use can be applied to Washington State waters. Activities to be conducted using these products must take place under one of the Department of Ecology's general NPDES permits for aquatic pesticides. In some cases labeling information for commercial products may indicate the need for larger shoreline setbacks and other restrictions when used near salmon-bearing waters.
5. Application of pesticides by commercial applicators requires licensing through the Washington State Department of Agriculture.
6. Integrated Pest Management (IPM) principles must be used when applying pesticides and herbicides within the shoreline jurisdiction of the SMP. Application of pesticides to areas outside of the SMP shoreline jurisdiction that might have an affect on this jurisdiction must also follow these practices. IPM can be defined as a coordinated decision-making and action process that uses the most appropriate pest control methods and strategy in an environmentally and economically sound manner to meet pest management objectives.

19.72.455 – Public Health & Safety

All shoreline developments must be located, designed, constructed, and operated so as not to be a hazard to public health and safety.

19.72.460 – View Protection/Aesthetics

- A. The protection of public views of the shoreline is an important shoreline management objective, although provisions of adequate shading of surf smelt spawning grounds must also be viewed as a priority. View protection can include preventing view blockage through height limitations or requiring aesthetic enhancement with landscaping. View protection does not justify the excessive removal of vegetation to create views or enhancing partial existing views. Retaining vegetation and “windowing” or other pruning techniques ~~must~~will always be preferred options over vegetation removal. Please refer to [Section 6.5AMC 19.72.445](#), Vegetation Conservation and ~~Chapter 7AMC 19.72.440~~, Public Access.
- B. New development must be located and designed to mitigate adverse impacts to views from public vista points.
- C. No permit ~~must~~will be issued pursuant to this Master Program for any new or expanded building or structure of more than thirty-five feet above average grade level on shorelines of the state that will obstruct the view of a substantial number of residences on areas adjoining such shorelines except where this Master Program does not prohibit the same and then only when overriding considerations of the public interest will be served. This protection does not extend to existing

residences in previous phases of the proposed development. Private views of the shoreline, although considered during the review process, are not expressly protected. Property owners concerned with the protection of views from private property are encouraged to obtain view easements, purchase intervening property and/or seek other similar private means of minimizing view obstruction.

- D. Where lighted signs and illuminated areas are permitted, such illuminating devices must be shaded and directed so as to minimize, to the extent practicable, light and glare from negatively impacting neighboring properties, streets, public areas or water bodies
- E. New development, uses and activities must locate and screen trash and recycling receptacles, utility boxes, HVAC systems, electrical transformers, fences and other appurtenances to minimize interference with public views.

Article 5. Specific Use ~~Policies and~~ Development Regulations

19.72.510 – Introduction

- A. Development and use proposals may involve a number of *uses* and shoreline *modifications* and must comply with the policies and regulations for each. For example, uses associated with a new marina may include boat launches, industrial and port facilities, parking facilities, and recreational facilities. Construction of a marina may involve numerous shoreline modifications, including dredging, dredge spoil disposal, a jetty, and perhaps landfill. Each project is reviewed for compliance with the applicable “*use*” policies and regulations in these regulations and with the applicable “*modification*” policies and regulations in ~~Chapter 9~~ [AMC 19.72.610-660](#).

All shoreline developments and uses must comply with the standards of this Master Program whether or not a shoreline substantial development permit is required. Specific conditions that ensure such compliance may be attached as a condition of permit approval of a shoreline permit or shoreline [letter of](#) exemption.

Shoreline uses specifically listed as “prohibited” ~~shall~~ [are](#) not ~~be~~ eligible for consideration as a Shoreline Variance or Shoreline Conditional Use Permit. If the use is not specifically prohibited, deviations from the minimum performance standards may be approved under a Shoreline Variance unless specifically stated otherwise.

The performance standards contained herein augment standards established through other land development regulations. Where conflict arises between these and other applicable controls, the regulations that provide more protection to the shoreline area ~~shall~~ [apply](#).

This ~~chapter~~ [article](#) provides specific policies and regulations for the following types of specific uses. Refer to ~~Chapter 9~~ [AMC 19.72.610-660](#) for shoreline modifications:

1. Advertising and Signs
2. Agriculture
3. Aquaculture
4. Commercial Development

5. Industrial and Port Facilities
6. Marinas
7. Mining
8. Parking Facilities
9. Recreational Facilities
10. Residential Development
11. Scientific, Cultural and Education Facilities
12. Transportation Facilities
13. Utilities (Primary)

Uses not classified (i.e., “unclassified uses”) under this Master Program ~~shall~~will be processed as conditional uses.

19.72.515 – Advertising and Signs

A. Applicability. Outdoor advertising and signs include publicly displayed messages on signs, billboards, placards, or buildings that direct attention to promotion of a business, service, or product, or for public notice, transportation, or direction.

~~Outdoor advertising is regulated by the Anacortes sign code.~~

Commented [DN73]: This seems irrelevant with A.1 below

A. Development Regulations

1. Outdoor advertising and signs ~~shall~~must be in conformance with the City of Anacortes sign regulations codified in Chapter ~~19.67.17~~ of the Anacortes Municipal Code.
2. Signs facing the water ~~shall~~will be limited to:
 - a. Directional signage associated with a marina or boatyard, and
 - b. Signage on buildings with a waterside entrance.
3. Over-water signs or signs on floats or pilings (signs in all areas below OHWM) ~~shall~~must be limited to those that are a necessary part of approved in-water or over-water uses and ~~shall~~must generally be limited to signs for navigation, safety, identification, or public information.
4. Artificial lighting for signs ~~shall~~must be directed or beamed away from the water, public streets, or adjacent premises so as to not cause glare reflection that may constitute a traffic or boating hazard or nuisance.
5. Flashing and blinking signs are not permitted in the shoreline area. No sign or part thereof ~~shall~~will consist of banners, posters, streamers, spinners, or other similar moving devices.
6. No signs ~~shall~~will be constructed or operated in a manner that obscures or detracts from the effectiveness of navigational aids.
7. Billboards are prohibited within shoreline areas of the City and at upland locations which would obstruct existing visual access to the shorelines.
8. Free-standing signs are permitted provided they are no larger than thirty-two square feet in area on any one face.

Commented [AC74]: Table 4-1 #8

19.72.520 – Agriculture

A. Agriculture includes the cultivation of soil, production of crops, or the raising of livestock.

B. Development Regulations.

1. Agriculture in all shoreline areas is prohibited.

Commented [AC75]: Consistent with Shoreline Use Table AMC 19.72.365(A)

19.72.525 – Aquaculture

A. Introduction

Aquaculture is the farming or culturing of aquatic organisms. Aquaculture encompasses a wide variety of activities including hatching, seeding, planting, cultivating, feeding, raising, and harvesting of aquatic plants and animals. These activities may have widely differing impacts on the aquatic and shoreline environment.

Harvesting by Tribal entities is exempt from compliance with the City's Shoreline Master Program pursuant to Tribe treaties.

Aquaculture can be carried out in subtidal, intertidal, upland, and fresh water areas. The subtidal area is seaward of the line of extreme low tide. The intertidal area is seaward of the ordinary high water mark and landward of the line of extreme low tide. The upland area is landward of the ordinary high water mark.

B. Development Regulations

1. Shellfish seeding/culturing may be permitted when conducted for native population recovery in accordance with a government/Tribal approved plan. All other aquaculture developments and activities, including ~~fish pens and~~ commercial shellfish seeding/culturing, are limited to the Urban, ~~Urban Maritime, shoreline environment and those adjacent~~ Aquatic designated areas over water only.
2. Aquaculture facilities ~~shall~~must be located and designed to avoid:
 - a. loss of ecological functions,
 - b. impacts to native eelgrass and macroalgae,
 - c. significant conflict with navigation and water-dependent uses,
 - d. the spreading of disease,
 - e. introduction of non-native species, or
 - f. impacts to shoreline aesthetic qualities.
3. Mitigation sequencing ~~shall~~must be followed.
4. Aquaculture that involves little or no substrate modification ~~shall~~must be given preference over those that involve substantial modification. The applicant/proponent ~~shall~~must demonstrate that the degree of proposed substrate modification is the minimum necessary for feasible aquaculture operations at the site.
5. New aquatic species that are not previously cultivated in Washington State ~~shall~~will not be introduced into City saltwaters or freshwaters without prior written approval of the Director

Commented [AC76]: Gap Analysis: Table 5-1 #3

of the Washington State Department of Fish and Wildlife and the Director of the Washington Department of Health. In saltwaters, the City ~~shall-will~~ not issue permits for projects that include the introduction of such organisms until it has also received written comment from the Marine Resources Committee, and the local tribes, provided that such comment is received in a timely manner.

6. No processing of any aquaculture product, except for the sorting or culling of the cultured organism and the washing or removal of surface materials or organisms after harvest, ~~shall-will~~ occur in or over the water unless specifically approved by permit. All other processing and processing facilities ~~shall-must~~ be located on land and ~~shall-will~~ be subject to the policies and regulations of this SMP.
7. Aquaculture wastes ~~shall-must~~ be disposed of in a manner that will ensure strict compliance with all applicable governmental waste disposal standards, including but not limited to the Federal Clean Water Act, Section 401, and the Washington State Water Pollution Control Act (RCW 90.48). No garbage, wastes or debris ~~shall-must~~ be allowed to accumulate at the site of any aquaculture operation.

8. In-water aquaculture is prohibited in the Aquatic Designation, except non-commercial aquaculture for recovery of a native population.

Commented [GL77]: Gap Analysis: Table 5-1 #3

8.9. Over-water aquaculture projects using legal above-water structures may be permitted, subject to the provisions under AMC 19.72.335, Aquatic. Applicants must include a narrative of their aquaculture proposal for a shoreline permit, consistent with the following:

- a. Operations must maintain or improve overall water quality of the affected waterway, as applicable.
- b. Identify antibiotics, vaccines, growth stimulants, anti-fouling agents or other chemicals the applicant anticipates using. Such materials must not be used until approval is obtained from all appropriate state and federal agencies, including but not limited to the U.S. Food and Drug Administration, the Washington State Department of Ecology, Fisheries and Wildlife, Agriculture and Department of Health.
- c. Identify noise generation associated with the project, including boat or vehicle traffic that will occur during anticipated regular operation.
- d. Subtidal, intertidal, floating, and upland structures and apparatus associated with the aquaculture proposal must be designed and maintained to avoid adverse shoreline ecological impact.
- e. Aquaculture use and development must be sited so that shading and other adverse impacts to existing eelgrass, kelp, or native shellfish beds are avoided, minimized, and mitigated consistent with AMC 19.72.525.B(3).
- f. For aquaculture projects using overwater structures, tool and other essential apparatus storage seaward of the OHWM where a pre-existing legal structure does not already exist must be limited to a container three (3) feet height, measured from the raft or adjacent pier surface.
- i. Increases above three (3) feet in container height may be considered by the Shoreline Administrator without a shoreline variance, given a visual impacts analysis is provided by the applicant. A visual impact analysis can be prepared the applicant themselves, so long

as it is substantially complete, to scale and has the proper photo point of references from nearby properties.

ii. Height limitations do not apply to materials and apparatus that are removed daily.

g. Aquaculture equipment must be of sound construction, and contain the owners' identifying marks where feasible. Abandoned or unsafe structures and equipment must be promptly removed or repaired by the owner.

~~Fish net pens and rafts shall meet the following criteria in addition to the other applicable regulations of this section:~~

- ~~a. Fish net pens shall meet, at a minimum, State approved administrative guidelines for the management of net pen cultures. In the event there is a conflict in requirements, the more restrictive requirement shall prevail.~~
- ~~b. Fish net pens shall not occupy more than 2 surface acres of water area, excluding booming and anchoring requirements. Anchors that minimize disturbance to substrate, such as helical anchors, shall be employed. Such operations shall not use chemicals or antibiotics.~~
- ~~c. Net cleaning activities shall be conducted on a frequent enough basis so as not to violate state water quality standards. When feasible, the cleaning of nets and other apparatus shall be accomplished by air drying, spray washing, or hand washing.~~

~~All floating and submerged aquaculture structures and facilities in navigable waters shall be marked in accordance with U.S. Coast Guard requirements.~~

10. All geoduck aquaculture must adhere to the provisions of WAC 173-26-241(3)(b). The definition of aquaculture and its associated provisions does not include the harvest of wild geoduck associated with the state managed wildstock geoduck fishery.

Commented [AC78]: Gap Analysis: Table 2-1 2011b

19.72.530 – Commercial Development

Commercial development means those uses and facilities that are involved in wholesale or retail trade or other business activities. Examples include, but are not limited to, hotels, motels, grocery stores, restaurants, shops, offices, and indoor recreation facilities.

A. Development Regulations

- I. Over-water construction of commercial uses is prohibited except as follows:
 - a. The development of docks, piers, boat launch ramps, or other similar shoreline access facilities for marinas, related facilities, and port facilities.
 - b. Reconstruction of existing over-water buildings and associated structures may be allowed to facilitate development of non-water-dependent commercial uses in the limited instances where they are auxiliary to and necessary in support of water-dependent uses, provided that reuse or reconstruction of the existing structure or the addition of new structures will result in no net loss of ecological functions and provide public access and ecological restoration.
 - c. Minor commercial uses that are accessory and clearly incidental to an allowed use may be provided on publicly owned docks and piers (e.g., espresso stand at the ferry terminal; authorized ticket sales for a temporary, marine-oriented event).

- d. Minor commercial uses that are accessory and clearly incidental to an allowed use may be provided on privately owned or publicly owned marina docks and piers (e.g., marine fuel-related sales including boater convenience store, vessel-chartering services, boat maintenance and security services, marina security services, waiting area for float plane and/or ferry services).
2. Commercial development ~~shall~~will be subject to the design review provisions of the Anacortes ~~Zoning~~Unified Development Code (Title ~~19.7~~19.7 ~~AMC, specifically Chapters AMC 19.61, Block Frontage Standards, through AMC 19.69, Standards, Generally~~). Commented [AC79]: Table 4-1 #9
3. All commercial development/redevelopment requiring a Substantial Development or Conditional Use Permit within shoreline jurisdiction ~~shall~~must provide for public visual and physical access to the shoreline in accordance with ~~Chapter 7~~AMC 19.72.440, Shoreline Public Access, taking into consideration constitutional and statutory limitations. Such provisions could be the preservation of shoreline views, the establishment of public access easements across and to the shoreline, enhancement of an adjacent street-end or park or other consideration commensurate with the degree of impact caused by the development. Ecological restoration ~~shall~~must also be considered as potential mitigation of impacts to shoreline resources and values for all non-water-dependent commercial development unless demonstrated to be infeasible or inappropriate.
4. Bed and Breakfast establishments are required to meet the policies and regulations for both Residential and Commercial use.
5. Warehousing is permitted in shoreline areas as an accessory use only if it is auxiliary to and necessary in support of a water-dependent use.
6. Water-enjoyment and water-related commercial uses must be designed to avoid impacts to existing navigation, recreation, and public access.
7. Priority ~~shall~~must first be given to water-dependent commercial uses over non-water-dependent commercial uses; second, preference to water-related and water-enjoyment commercial uses over non-water-oriented commercial uses.
8. Non-water-oriented commercial uses in shoreline jurisdiction ~~shall~~will be prohibited unless they meet the following criteria:
 - a. The use is part of a mixed-use project that includes water-dependent uses and provides a significant public benefit with respect to the Shoreline Management Act's objectives such as providing public access and ecological restoration; or
 - b. Navigability is severely limited at the proposed site and the commercial use provides a significant public benefit with respect to the Shoreline Management Act's objectives such as providing public access and ecological restoration.
9. In areas designated for commercial use, non-water-oriented commercial development may be allowed if the site is physically separated from the shoreline by another property or public right of way.

19.72.535 – Industrial and Port Facilities

A. Introduction

Industry applies to those businesses or uses involved in the production, processing, manufacturing, or fabrication of goods. Warehousing and storage of materials or products is considered part of the

industrial process. Water-dependent industries are those that require location adjacent to the shoreline by reason of the intrinsic nature of their business. Ports are a specialized subcategory of general industrial use. Port facilities are centers of water-borne traffic and commerce. Industry and ports are both covered in this section.

Some port and industrial developments are often associated with a number of uses and modifications that are identified separately in this Master Program (e.g., parking, dredging). Each use activity and every type of shoreline modification should be carefully identified and reviewed for compliance with all applicable sections.

Port and industrial facilities are intensive and have the potential to negatively impact the shoreline environment. When impacts cannot be avoided, they must be mitigated to assure no net loss of the ecological function necessary to sustain shoreline resources. Please refer to ~~Chapter 6~~[Article 4 \(AMC 19.72.410-460\)](#), *Environmental Protection General Regulations*.

B. Development Regulations

I. General

- a. Preference ~~shall~~[will](#) be given to water-dependent industrial uses over non-water-dependent industrial uses; and second, give preference to water-related industrial uses over non-water-oriented industrial uses.
- b. Non-water-oriented industrial uses in shoreline jurisdiction ~~shall~~[will](#) be prohibited unless they meet the following criteria:
 - i. The use is part of a mixed-use project that includes water-dependent uses and provides a significant public benefit with respect to the Shoreline Management Act's objectives such as providing public access and ecological restoration; or
 - ii. Navigability is severely limited at the proposed site and the commercial use provides a significant public benefit with respect to the Shoreline Management Act's objectives such as providing public access and ecological restoration.

In areas designated for industrial use, non-water-oriented industrial development may be allowed if the site is physically separated from the shoreline by another property or public right of way.

- c. Only water-dependent industrial and water-dependent port facilities ~~shall~~[will](#) be permitted over water.
- d. Storage and/or disposal of industrial wastes are prohibited within shoreline jurisdiction, unless specifically listed herein.
- e. Solid waste disposal and solid waste disposal sites are prohibited within shoreline jurisdiction.
- f. The following uses may be permitted as a conditional use:
 - i. Bulk storage of oil, fuel, chemicals, or hazardous materials, on either a temporary or a permanent basis, provided that:
 - (1) Secondary containment and an emergency spill response plan are included in the proposal.
 - (2) Alternate inland areas are unavailable.

(3) The storage is directly related to a water-dependent use.

ii. Wastewater treatment and reclamation systems accessory to a permitted use (also see "Utilities"), provided that:

(1) Alternate inland areas are unavailable and;

(2) The proposed location, design and operation are compatible with existing and planned water-oriented uses.

2. Design

a. Industrial and port facilities ~~shall~~must be located, designed, constructed, and operated so as to minimize impacts to shoreline resources and adjacent property owners, as well as adjacent shoreline or water uses. To this end, applications for industrial/port facilities must demonstrate conformance with the following criteria. The proposal ~~shall~~must:

i. Comply with all federal, state, regional, and local requirements regarding air and water quality.

ii. All new or expanded industrial development ~~shall~~must be set back and buffered from adjacent shoreline properties that are used for or zoned for non-industrial purposes. Such buffering or greenbelt ~~shall~~must include landscaping, shrubs, trees and native vegetation as found to be appropriate depending on the impact

iii. Maximize joint use of accessory facilities - industrial/port facilities ~~shall~~must be designed and operated to promote joint use of over-water and accessory facilities such as piers, docks, storage, and parking whenever practicable.

iv. Protect public views of harbor areas and other officially delineated vistas. Private views of the shoreline, although considered during the review process, are not expressly protected. Property owners concerned with the protection of views from private property are encouraged to obtain view easements, purchase intervening property and/or seek other similar private means of minimizing view obstruction.

v. Make adequate provision for fire and safety hazards -

(1) The storage and handling of inflammable liquids, liquefied petroleum gases and explosives ~~shall~~must comply with rules and regulations falling under the jurisdiction of the City fire chief, the laws of the state and other local ordinances;

(2) Bulk storage of inflammable liquids below ground ~~shall~~will be permitted, and the tank ~~shall~~must be located not closer to the property line than the greatest dimension (diameter, length, or height of the tank).

(3) Adequate fire fighting, fire prevention and safety equipment ~~shall~~must be provided as necessary to handle materials stored or used on the site.

(4) Flammable/explosive/hazardous materials ~~shall~~must be kept removed from adjacent activities to a distance that is compatible with the potential danger involved.

(5) Provisions ~~shall~~must be made to minimize the probability of spills of fuel or other toxic substances and to handle accidental spills that occur.

(6) Emission of dangerous radioactivity ~~shall~~must be prohibited.

- vi. Prevent interference. - Provide for necessary shielding or other measures to prevent on-site mechanical or electrical equipment from interfering with the use of electrical apparatus off-site.
- vii. Exterior lighting ~~shall~~must not be used in such a manner that produces nuisance glare.
- viii. Noxious odors ~~shall~~must be eliminated to the extent practicable.
- ix. Assure no net loss of ecological functions.

3. Public Access

- a. Port and industrial facilities ~~shall~~must provide public access to shoreline areas in accordance with ~~Chapter 7~~AMC 19.72.440, Shoreline Public Access, taking into consideration constitutional and statutory limitations, public safety, health, and security. Where industrial use is proposed for location on land in public ownership, public access ~~shall~~must be required in the general vicinity of the impact. Such provisions could be the preservation of shoreline views, the establishment of public access easements across and to the shoreline, enhancement of an adjacent street-end or park or other consideration commensurate with the degree of impact caused by the development. In this regard the *Port of Anacortes' Integrated Approach to Marine Public Access, October 2003* is incorporated by reference into this SMP.
- b. The Port of Anacortes and City ~~shall~~must coordinate the cooperative multiple use of publicly owned piers, docks, and parking facilities.

19.72.540 – Marinas

A. Introduction

For the purpose of this ~~chapter~~article, marinas are defined as facilities that provide launching, storage, supplies, moorage, and other services for five or more pleasure and commercial watercraft. Commercial development, not accessory to the operation of a marina, ~~shall~~must comply with ~~Section 8.5~~AMC 19.72.530 "Commercial Development." Shoreline modifications associated with marinas, including docks, piers, and floats, ~~shall~~must also comply with ~~Chapter 9~~Article 6 (AMC 19.72.610-660) ~~Specific Shoreline Modifications Policies and Development Regulations~~. Marinas are restricted to suitable environmental designations (Table ~~5-1~~19.72.365(A)).

B. Development Regulations

- 1. The following uses ~~shall~~must be prohibited at marinas:
 - a. Floating buildings, except that floating shelters for boats may be allowed in a marina for community and/or youth boating programs operated by nonprofit organization or public agencies.
- 2. Marina expansions, new mooring buoy fields, and new marinas, ~~shall~~must be located, designed, constructed, and operated so as to minimize impacts to shoreline resources and adjacent residential property owners, as well as adjacent shoreline or water uses. To this end, applications for such facilities must demonstrate conformance with the following criteria. The proposal ~~shall~~must:
 - a. Locate with regard to favorable conditions related to wind, current, bathymetrics, and for overnight moorage facilities, adequate flushing action.

- b. Comply with all federal, state, regional, and local requirements regarding water quality, including, but not limited to, Department of Health standards and environmental policies and regulations contained in ~~Chapter 6~~ [Article 4 \(AMC 19.72.410-460\)](#), *Environmental Protection General Regulations*.
 - c. Provide for adequate upland support facilities (e.g., restrooms, dumpsters, etc.)
 - d. Provide accessory parking and loading areas - said facilities ~~shall~~[must](#) be located well away from the water's edge and ~~shall~~[must](#) be designed in accordance with ~~Section 8.9~~[AMC 19.72.550](#), *Parking Facilities*.
 - e. Facilitate orderly launching, retrieval, and storage of boats as well as circulation of vehicles and pedestrians in the vicinity of the marina.
 - f. Marinas ~~shall~~[must](#) make provisions to minimize the probability of fuel spills during handling or storage.
 - g. Make provisions to handle accidental spills that do occur.
 - h. Except for mooring buoy fields, provide pump-out and on-shore sewage and waste disposal facilities, with or without charge.
 - i. Ensure that navigation rights are protected.
 - j. Demonstrate compliance with mitigation sequencing techniques. When impacts cannot be avoided, impacts must be mitigated to assure no-net-loss of ecological function necessary to sustain shoreline resources.
3. Marina development ~~shall~~[must](#) comply with all applicable local, state, and federal regulations and requirements, including those of the Washington State Department of Fish and Wildlife.
 4. Placement of breakwaters, jetties, groins, bulkheads, and landfills, and dredging activities associated with marina construction ~~shall~~[must](#) comply with regulations contained in this Master Program pertaining to those activities.
 5. Marinas ~~shall~~[must](#) provide parking facilities adequate to meet demand/need analysis projections.
 6. Marinas ~~shall~~[must](#) be supplied with restroom and solid waste receptacles to accommodate marina users, and ~~shall~~[must](#) have facilities and established procedures for the discharge of solid waste or sewage, other than discharge into the water.
 7. Marinas ~~shall~~[must](#) have facilities and established procedures for the disposal or discarding of fish or shellfish cleaning waste, scrapfish, viscera, or unused bait in or near the marina.
 8. Marinas ~~shall~~[must](#) have facilities and established procedures for the containment and recovery of spilled petroleum or toxic projects.
 9. Marinas ~~shall~~[must](#) provide view points and regulated pedestrian access areas which will allow the public to view marina activity.
 10. Marinas ~~shall~~[must](#) provide pump-out, holding and/or treatment facilities for sewage contained on boats or vessels.
 11. Marinas ~~shall~~[must](#) implement a landscaping plan which addresses impacts on adjacent properties, views from upland areas, and topography of the area.

12. Accessory uses at marinas ~~shall~~must be limited to those uses that are water-dependent or directly serve needs of marina users and ~~shall~~must comply with the regulations contained in the Master Program pertaining to those activities.
13. Over-the-water parking facilities are prohibited.
14. Space for transient moorage ~~shall~~must be encouraged.
15. Applicants for new marinas and marina expansions must demonstrate the following:
 - a. The proposed design will meet the State Water Quality Standards.
 - b. The proposed design will minimize significant interference with geohydraulic processes and disruption of existing shore forms;
 - c. The proposed design will minimize impediments to fish migration;
 - d. The proposed facility will not impact shellfish or finfish habitat, including spawning, feeding and rearing areas, unless mitigation consistent with the requirements of the mitigation element of the *Revised Integrated Fidalgo Bay Plan & EIS, 2000* has been provided.
16. Marina construction ~~shall~~must conform to the tabular requirements established in Table [19.72.280\(B\)](#)~~5-2~~ except as provided below:
 - a. Structures for upland boat storage ~~shall~~must comply with height, bulk and setback requirements for buildings in the underlying zone.
17. Viewpoints and public access to new and expanded marina areas ~~shall~~must be included in marina plan and design, particularly where water-enjoyment uses are associated.

19.72.545 – Mining

A. Introduction

Mining is the removal and primary processing of naturally occurring materials from the earth for economic use. For purposes of this Master Program, "processing" includes screening, crushing, and stockpiling of materials removed from the site. Mining activities also include in-water dredging activities related to mineral extraction. Processing does not include general manufacturing, such as the manufacture of concrete. Removal of intertidal/subtidal bottom materials for beach nourishment purposes or habitat restoration purposes is not to be considered mining.

B. Development Regulations

- I. Mining in all shoreline areas is prohibited.

19.72.550 – Parking Facilities

A. Introduction

Parking is the use of land for storage of motor vehicles, motorized equipment, or accessory units, such as trailers. Land used for this purpose is leveled, cleared, and often covered with an impermeable surface. Parking includes areas for scenic vista parking.

B. Development Regulations

Parking for specific land use activities within the City of Anacortes is subject to the requirements and standards set forth in the Anacortes Zoning Code, in addition to the regulations of this section.

1. Parking in shoreline areas must directly serve an approved shoreline use.
2. Parking as a principal use (i.e., not accessory to an authorized use) is prohibited, except when provided as part of a public scenic vista.
3. Parking ~~shall~~must comply with the following design standards as applicable (e.g., items a, b, e and f would not apply to over-water ferry terminal parking):
 - a. Parking ~~shall~~must be located on the landward side of the development unless contained within a permitted structure.
 - b. Where there is no existing structure, parking ~~shall~~must extend no closer to the shoreline than a permitted structure.
 - c. The design and construction of parking facilities ~~shall~~must assure that surface water runoff will not pollute adjacent waters or cause soil or beach erosion. Oil separators and detention facilities ~~shall~~must be required for new parking facilities. Alternatives to conventional storm water treatment, such as use of pervious materials, ~~shall~~must be considered where appropriate in order to minimize impacts due to runoff and/or the need for storm water treatment.
 - d. Security lighting associated with parking facilities ~~shall~~must be beamed, hooded, or directed so as to not cause nuisance glare.
 - e. Parking facilities ~~shall~~must be separated from residential, recreation, and natural areas (e.g., the shoreline) by landscaping and/or screening in accordance with the Parking Facilities Landscaping requirements of the Anacortes Municipal Code, Title 19.7. The landscaping ~~shall~~will, preferably, consist of native vegetation. The requirement for screening may be waived or modified by the Shoreline Administrator, where screening would obstruct a significant view from public property or public roadway or to address public safety concerns.
 - f. All landscaping must be maintained in a neat and orderly manner. In no event ~~shall~~will such landscape areas be used for the storage of materials or parking of automobiles, or recreational or other vehicles.
 - g. Vista parking facilities ~~shall~~must include a significant public view and provide recreational opportunities such as picnic tables or viewing benches.

19.72.555 – Recreational Facilities

A. Introduction

Recreational development provides opportunities for play, sports, relaxation, amusement, or contemplation. It includes facilities for passive recreational activities, such as hiking, photography, viewing, and fishing. It also includes facilities for active or more intensive uses such as parks, campgrounds, public and private marinas, and golf courses. This section applies to both publicly- and privately-owned shoreline facilities intended for use by the public or a private club, group, association, or individual. Commercial recreational development must be consistent with the provisions of this section and the provisions of ~~Section 8.5~~AMC 19.72.53.530 for commercial uses.

This Master Program gives priority to recreational development that is primarily related to access to, enjoyment of, and use of the water and shorelines of the state as reflected in the Table ~~5.1~~19.72.365(A) Shoreline Use and Modification Matrix.

B. Development Regulations

1. Table [19.72.365\(A\)5+](#) generally identifies allowed and prohibited recreation developments by environment designation. In addition, the following recreational uses and developments are prohibited:
 - a. Use of recreational off-road vehicles in shoreline areas, except by public agencies for maintenance, operations and emergency services;
2. Recreational facilities ~~shall~~[will](#) make adequate provisions for:
 - a. Vehicular and pedestrian access, both on-site and off-site;
 - b. Vehicular traffic, both inside and outside the facility;
 - c. Vehicular parking;
 - d. Water supply, sewage disposal, and garbage collection;
 - e. The control of fires both within recreational facilities and between recreational facilities and adjacent private or public lands;
 - f. The prevention of overflows and trespasses onto adjacent properties;
 - g. Screening, planting strips, fences, and signs to prevent park overflow and to protect the value and enjoyment of adjacent or nearby private or public properties;
 - h. Enforcement of laws and regulations associated with use of the facilities being proposed;
 - i. Security; and
 - j. Maintenance.
3. Valuable shoreline resources and fragile or unique areas, such as wetlands and accretion shore forms, ~~shall~~[must](#) be used only for non-intensive recreation activities.
4. Waterward of the ordinary high water mark, no recreational buildings or structures ~~shall~~[will](#) be built, except water-dependent and/or water-enjoyment structures as follows: docks, bridges, piers, public boat launches, marinas, and viewing platforms.
5. For recreation developments, such as playing fields that require the use of fertilizers, pesticides, or other chemicals, the applicant ~~shall~~[must](#) submit plans demonstrating the methods to be used to prevent these chemical applications and resultant leachate from entering adjacent water bodies and wetlands. Natural vegetation planting strips ~~shall~~[will](#) be required between the shoreline waters and recreation developments that use fertilizers, pesticides, or other chemicals. The planting strips ~~shall~~[must](#) not be less than fifty (50) feet wide, measured on a horizontal plane, perpendicular to the edge of the ordinary high water mark. The proponent ~~shall~~[will](#) also be required to leave a chemical-free swath at least one hundred (100) feet in width next to waterbodies and wetlands.
6. Encourage recreational facilities to provide signage and enforce regulations that prohibit tree cutting and limit the taking of marine life, driftwood, and the like.
7. Signs associated with recreational facilities ~~shall~~[must](#) be kept to a minimum in number and size and ~~shall~~[will](#) be erected as informational or directional aids only.

19.72.560 – Residential Development

A. Introduction

Residential development refers to one or more buildings, structures, lots, parcels, or portions of parcels that are used or intended to be used to provide a dwelling for human beings. Residential development includes single-family residences, duplexes, other detached dwellings, multifamily residences, apartments, townhouses, mobile home parks, group housing, condominiums, subdivisions, planned unit developments, and short subdivisions. Residential development also includes accessory uses and structures such as garages, sheds, tennis courts, swimming pools, driveways, parking areas, fences, cabanas, and saunas, but not guest cottages, when allowed by the underlying zoning. Residential development does not include hotels, motels, or camping facilities. Bed and Breakfast establishments proposed within a Residential zoning district are required to meet the policies and regulations for both Residential and Commercial use.

Note: A Substantial Development Permit may not be required for construction of a single-family residence by an owner, lessee, or contract purchaser for his own use or the use of his family. However, such construction and all normal appurtenant structures must otherwise conform to this Master Program and obtain a Letter of Exemption. In addition, when applicable, all residential development is subject to the variance and conditional use requirements of this Master Program. For example, a Variance will be required for any residential development that proposes to locate within the shoreline environment setbacks established in [Chapter 5 Article 3 \(AMC 19.72.310-365\)](#) of this Master Program.

Uses and facilities associated with residential development, which are identified as separate use activities or modifications in this Master Program, such as clearing, grading and fill, are subject to the regulations established for those uses in addition to this section.

B. Development Regulations

1. Clearing and grading associated with a single-family residence may be exempted from the Shoreline Substantial Development Permit requirement, provided the conditions identified in [Section 2.4 AMC 19.72.030\(E\)\(7\)](#) are met.
2. Residential and accessory structures, including floating homes (except that floating shelters for boats may be allowed in a marina for community and/or youth boating programs operated by nonprofit organization or public agencies), but not including permitted piers, docks, or floats, ~~shall~~[must](#) not be located in areas waterward of the ordinary high water mark, areas subject to flooding or tidal inundation, or within wetlands, habitat conservation areas, flood hazard areas, landslide hazard areas or their respective buffers.
3. Residential development ~~shall~~[must](#) be:
 - a. Located and designed to avoid the need for structural shore defense and flood protection works in the foreseeable future.
 - b. Designed to minimize potential conflicts with the use of adjacent public lands and areas of public access. This may include providing a physical separation to reinforce the distinction between public and private space, achieved by providing adequate space, through screening with landscape planting or fences, or other means.
4. Subdivisions:
 - a. ~~Shall~~[Must](#) comply with local plans, codes, and ordinances
 - b. ~~Shall~~[Must](#) be designed to exemplify the definition and policy of the applicable shoreline designation as well as the environmental and physical capabilities of the subject site. Parcels ~~shall~~[must](#) not be created for residential construction that would require shoreline stabilization for the foreseeable future.

- c. ~~Shall~~Must be prohibited if flood control or shoreline protection measures are necessary to create a residential lot or site area.
 - d. May be required to cluster residential units and structures to avoid wetlands, habitat conservation areas or landslide hazards that are located on the development site.
 - e. ~~Shall~~Must be designed to minimize potential conflicts with the use of adjacent public lands and areas of public access. This may include providing a physical separation to reinforce the distinction between public and private space, achieved by providing adequate space, through screening with landscape planting or fences, or other means.
 - f. ~~Shall~~Must comply with the applicable policies and performance standards of this Master Program, with regard to roads, utilities, and other improvements.
 - g. Plats that preclude or reduce the need for roadways are encouraged.
 - h. New subdivided lots ~~shall~~must be designed to prevent the loss of ecological functions at full build-out; ~~shall~~must prevent the need for new shoreline stabilization or flood hazard reduction measures; and ~~shall~~must be consistent with applicable SMP environment designations and standards.
5. Public Access
- a. Public access to publicly owned shorelines ~~shall~~must be maintained.
 - b. Public access improvements ~~shall~~must be designed to include measures to prevent overflow usage from common and public areas upon privately owned shore lands and uplands. Appropriate measures may include fences or landscaping.
 - c. Developments of more than four (4) dwelling units adjacent to the waterfront ~~shall~~must dedicate, improve, and provide maintenance provisions for a pedestrian easement that provides area sufficient to ensure usable access to the shoreline for all residents of the development and the general public. When required, public access easements ~~shall~~must be a minimum of twenty-five (25) feet in width and ~~shall~~must comply with the public access standards contained in this Master Program (see ~~Chapter 7~~AMC 19.72.440, "Shoreline Public Access").
 - d. New construction or expansion of existing piers, bulkheads or fills to provide for over-water residential development is prohibited.
 - e. Single-family subdivisions and multi-family residences on waterfront property ~~shall~~must provide for regulated public access to the water or to water view sites.
 - f. Liveaboards are restricted to marinas with facilities adequate to accommodate them.
6. Environmental Protection
- In addition to all relevant provisions of ~~Chapter 6~~Article 4 (AMC 19.72.410-460), residential development ~~shall~~must comply with the following standards:
- a. Engineered storm drainage and treatment facilities ~~shall~~will be required by the City for proposals of five (5) or more dwellings. Drainage facilities ~~shall~~must be separate from sewage disposal facilities. Drainage systems ~~shall~~must include provisions to prevent the direct entry of uncontrolled and untreated surface water runoff into receiving waters. Such provisions may include retention ponds, vaults, vegetated swales, and artificial wetlands.

- b. Developments containing wetlands ~~shall~~must use those areas only in association with parks, open space, or passive recreational facilities. Such use ~~shall~~must be consistent with the ~~shoreline-specific~~City's Critical Areas Regulations ~~referenced under AMC 19.72.435, Critical Areas , Ordinance No. XX, dated XX, found in Appendix A~~referenced under AMC 19.72.435, Critical Areas , Ordinance No. XX, dated XX, found in Appendix A ~~AMC 19.70, in addition to the applicable provisions of this Master Program.~~
- c. Alteration of topography for building sites, access roads, and utilities ~~shall~~must be conducted in compliance with the applicable policies and performance standards of this Master Program.
- d. Sewage disposal systems ~~shall~~must not be located within wetlands, habitat conservation areas, landslide hazard areas, or their buffers, or in the floodplain.

Commented [AC80]: Table 3-1, #1

19.72.565 – Scientific, Cultural and Educational Facilities

A. Introduction

Scientific, cultural and educational facilities include those sites, structures, or facilities that provide unique insight into our natural or cultural heritage.

B. Development Regulations

- 1. No development or substantial development ~~shall~~must be undertaken with regard to a site or structure that has probable historical, scientific, or archaeological significance until an evaluation of the site or structure has been made by an authority judged competent in such matters by the Shoreline Administrator.
- 2. All feasible means ~~shall~~must be employed to ensure that data, structures, and sites having historical, scientific, educational, or archaeological significance are extracted, preserved, or used in a manner commensurate with their importance.
- 3. Consistent with constitutional and statutory limitations, public and private developments ~~shall~~must be located and designed to prevent destruction and alteration of sites having significant historic, cultural, scientific, or educational value.
- 4. All shoreline permits ~~shall~~must contain provisions that require developers to immediately stop work if cultural resources protected by state law are uncovered during excavation. In such cases, the developer ~~shall~~must provide for site inspection and evaluation by a professional archaeologist.
- 5. The establishment, restoration, or revitalization of historical, archaeological, scientific, or educational facilities ~~shall~~must be done in such a manner that would cause minimal disturbance to adjacent properties as well as natural features of the shoreline.
- 6. Excavation of Indian artifacts ~~shall~~must be conducted in compliance with the Washington State Archaeological Sites and Resources Act (RCW 27.53).
- 7. Excavation activities ~~shall~~must be conducted in compliance with the applicable policies and standards of this Master Program.
- 8. Archeological and historic site development is permitted as a conditional use in shoreline areas designated Natural subject to relevant shoreline regulations.
- 9. Such developments which are intended for commercial purposes ~~shall~~must comply with policies and regulations for Commercial Development.

10. Evaluations of archeological finds protected by state law ~~shall~~must be done promptly by a qualified archeologist and ~~shall~~must be done so as to avoid excessive delays to construction.
11. All permits issued in areas documented to contain archaeological resources require a site inspection or evaluation by a professional archaeologist in coordination with affected Indian Tribes.

19.72.570 – Transportation Facilities

A. Introduction

Transportation facilities are those structures and developments that aid in land and water surface movement of people, goods, and services. They include roads and highways, bridges and causeways, ferry terminals, railroad facilities, boat and floatplane terminals, and parking. Under this Master Program, bikeways, walkways and trails are addressed under ~~Section 8-10~~AMC 19.72.555 “Recreational Facilities”.

B. Development Regulations

1. When practicable, major highways and railroads ~~shall~~must be located away from shoreline areas.
2. Whenever possible, roads ~~shall~~must be located on natural benches, ridge tops, or other areas where alteration of natural features such as soils will be minimal.
3. Roads ~~shall~~must be located to avoid critical areas and their buffers. Fill for transportation facility development is prohibited in water bodies, associated wetlands and their buffers, except when there is a demonstrated purpose and need, and alternatives to accomplish the same purpose have been shown to be infeasible. Such fill may be permitted by a Conditional Use Permit and must comply with the provisions of ~~Section 9.7~~AMC 19.72.640, Fills.
4. Roads and waterway crossings ~~shall~~will be prohibited within wetlands or critical fish and wildlife conservation areas and associated buffers except when all upland alternatives have been proven impracticable and the transportation facilities are necessary to support uses consistent with this program. When permitted, these facilities ~~shall~~must be:
 - a. The minimum width to accommodate the anticipated use.
 - b. Designed so the integrity of the naturally occurring geohydraulic process is maintained.
 - c. Designed to provide minimal disturbance to banks.
5. Culverts, bridges and similar devices ~~shall~~must be designed to pass water, sediment, and debris loads anticipated under appropriate hydraulic analysis and ~~shall~~will not impede the migration of anadromous fish.
6. All roads and drainage systems ~~shall~~must be maintained to prevent erosion and/or water quality degradation.
7. Mechanical apparatus or hand removal, rather than chemicals, ~~shall~~must be used for brush clearing maintenance wherever practicable.
8. Herbicides used for maintenance along roads and drainage systems ~~shall~~must follow the performance standard outlined in ~~Section 6.4~~AMC 19.72.425, Environmental Elements.
9. To the greatest extent practicable, organic, nontoxic, methods and BMPs should be utilized for maintenance along roads and drainage systems in the vicinity of critical fish and wildlife habitats.

10. Street vacations ~~shall~~must comply with applicable state laws, including statutory provisions relating to vacations of right of way which abut a body of salt or fresh water.
11. Limited food and retail service may be allowed as an accessory use within the waiting area of a publicly owned and operated ferry terminal. Said facilities ~~shall~~must be limited in size to serve passengers and employees.
12. Roads and Railroads
 - a. New railroad and road developments, to the extent consistent with public safety, may be required to provide public access opportunities, and to maintain existing pedestrian access to shorelines.
 - b. Road and railroad development ~~shall~~must be coordinated with the various governing bodies, and where possible, development ~~shall~~must be designed to accommodate varied modes of transportation.
 - c. Design of roadways on shorelines ~~shall~~must provide for pedestrian and bicycle routes.

19.72.575 – Utilities (Primary)

A. Introduction

Utilities are services and facilities that produce, transmit, carry, store, process, or dispose of electric power, water, sewage, communications, oil, gas, stormwater, and the like. The provisions in this section apply to primary use and activities such as sewage treatment plants, sewer lift pumps, stormwater outfalls and fuel storage facilities. On-site utility features serving a primary use, such as water, sewer or gas line to a residence, are "accessory utilities" and ~~shall~~will be reviewed as appurtenances to the primary use (in this example, the residential use).

Utilities are further described as major and minor to allow for a simplified permit process for minor utility improvements. As used in this Master Program, major utilities include substations, pump stations, treatment plants, sanitary sewer outfalls, regional stormwater outfalls, electrical transmission lines greater than 55,000 volts, water, sewer or storm drainage mains greater than eight (8) inches in diameter, major recycling facilities (as defined by the AMC), gas and petroleum transmission lines, macro wireless facilities, and submarine telecommunications cables. Minor utilities include local public water, minor storm sewer outfalls, electric, minor recycling facilities (as defined by the AMC), natural gas distribution, public sewer collection, cable and telephone service, micro and mini wireless facilities, and appurtenances.

B. Development Regulations

1. General

- a. Utility development ~~shall~~must, through coordination with local government agencies, provide for compatible, multiple uses of sites and rights-of-way.
- b. Utilities ~~shall~~must be designed and installed to meet future needs when possible.
- c. Personal wireless facilities ~~shall~~must comply with the City's "Wireless Communications Towers and Antennas" ordinance codified in Chapter 17 of the Anacortes Municipal Code.

2. Uses

- a. The following utilities are prohibited within the shoreline jurisdiction:

- i. Solid waste disposal and transfer facilities, other than minor recycling facilities as defined by the AMC.
 - ii. Fuel storage facilities (excepting fuel storage that is accessory to a permitted use).
 - iii. Use of creosote or pentachlorophenol treated timber is prohibited.
 - b. Minor utilities are allowed as a permitted use provided that, within the Natural and Conservancy designations, it has been determined that no other feasible alternative exists
 - c. Upgrades to existing major utilities are permitted.
 - d. The following new major utility facilities may be permitted in shoreline jurisdiction if it can be shown that no practicable alternative exists outside of shoreline jurisdiction.
 - i. Electrical energy generating plants, substations, and transmission lines greater than 55,000 volts;
 - ii. Sanitary sewer outfalls;
 - iii. Sewage system mains, interceptors, pump stations, and treatment plants;
 - iv. Storm drainage mains and regional outfalls;
 - v. Submarine telecommunications cables; and
 - vi. Water lines and water system treatment plants.
 - e. All impacts to fish and wildlife resources ~~shall~~ **must** be fully mitigated.
3. Applications
- a. Applications for the installation of major utility facilities ~~shall~~ **must** include the following:
 - i. Description of the proposed facilities;
 - ii. Reasons why the utility facility requires a shoreline location;
 - iii. Alternative locations considered and reasons for their elimination;
 - iv. Location of other utility facilities in the vicinity of the proposed project and any plans to include the other types of utilities in the project;
 - v. Plans for reclamation of areas disturbed both during construction and following decommissioning and/or completion of the useful life of the utility;
 - vi. Plans for control of erosion and turbidity during construction and operation; and
 - vii. Identification of any possibility for locating the proposed facility at another existing utility facility site or within an existing utility right-of-way.
4. Location
- a. Utilities ~~shall~~ **must** be located adjacent to or within existing utility or circulation easements or rights-of-way whenever feasible. Joint use of rights-of-way and corridors is encouraged.
 - b. Sewage treatment, water reclamation, desalinization, and power plants ~~shall~~ **must** be located to minimize interference with adjacent uses of the water and shore lands.
5. Public Access

When feasible, utility development ~~shall~~must include public access to the shoreline, trail systems, and other forms of recreation, providing such uses will not unduly interfere with utility operations, or endanger the public health, safety, and welfare. Public access easements ~~shall~~must be a minimum of twenty-five (25) feet in width and ~~shall~~must comply with the public access standards contained in this Master Program (see [AMC 19.72.440](#) ~~Chapter 7~~, “Public Access”).

6. Environmental Protection

In addition to the general environmental policies and regulations of ~~Chapter 6~~ [AMC 19.72.410-460](#), utilities ~~shall~~must comply with the following standards:

- a. Utilities ~~shall~~must be located, designed, constructed, and operated so as to assure no net loss of shoreline ecological functions, preserve the natural landscape, and minimize conflicts with present and planned land and shoreline uses.
- b. To protect aesthetic qualities of the shoreline, new utility lines including electricity, communications, and fuel lines ~~shall~~must be located underground, except where the presence of bedrock or other obstructions make such placement infeasible.
- c. Utility developments ~~shall~~must be located and designed so as to avoid, to the extent practicable, the need for any structural or artificial shoreline modification works for the life of the project.
- d. Utilities should be avoided in floodplains to the greatest extent practicable; if necessary, flood protection structures ~~shall~~must not increase flood hazards in other areas along the waterbody.
- e. Underwater construction of utilities or construction in adjacent wetlands ~~shall~~must be timed to avoid fish and wildlife migratory and spawning periods.
- f. Installation of utilities ~~shall~~must assure the prevention of siltation or beach erosion.
- g. Upon completion of installation/maintenance of utilities in shorelines, the land/substrate ~~shall~~must be restored to its pre-project configuration, replanted with native species as appropriate, and be provided with maintenance care until the newly planted vegetation is established.
- h. When feasible, utilities within the shoreline area ~~shall~~will be placed underground, and utility corridors ~~shall~~will be used for shoreline access.
- i. Undergrounding of utilities across a water body ~~shall~~must comply with all applicable local, state, and federal agency regulations and requirements; a shoreline permit is required.

Article 6. Specific Shoreline Modification ~~Policies and~~ Development Regulations

19.72.610 – Applicability

~~What is a shoreline modification?~~

- A. Shoreline modification activities are structures or actions that permanently change the physical configuration or quality of the shoreline, particularly at the point where land and water meet.

Shoreline modifications include, but are not limited to, structures such as dikes, breakwaters, weirs, dredge basins, fill, bulkheads and piers and actions such as clearing, grading, and removing vegetation. Generally, shoreline modifications are undertaken for the following reasons:

1. To prepare for a shoreline use;
 2. To support an upland use; or
 3. To provide shoreline stabilization or defense from erosion.
- B. A single shoreline use may require several different shoreline modification activities. For example, a new boat storage yard may require clearing and grading of the upland yard and construction of a jetty and docks in the water.
- C. Proposals for shoreline modifications are to be reviewed for compliance with the applicable “use” policies and regulations in ~~Chapter 8~~[AMC 19.72.510-575](#) and the applicable “modification” policies and regulations of this ~~Chapter~~[Article](#).
- D. Shoreline modifications listed as “prohibited” are not eligible for consideration as a Shoreline Variance. Deviations from the minimum performance standards may be approved under a Shoreline Variance unless specifically stated otherwise.

19.72.615 – General Regulations

- A. Regulations applicable to all shoreline modifications
1. Shoreline modification activities that do not support a permitted shoreline use are considered “speculative” and are prohibited by this Master Program, unless it can be demonstrated, to the satisfaction of the Shoreline Administrator that such activities are necessary and in the public interest for the maintenance of shoreline environmental resource values.

19.72.620 – Boat Launches

- A. Boat launches are slabs, pads, planks, rails, cranes or graded slopes used for launching boats by means of a trailer, hand, or mechanical device.
- A. Development Regulations
1. General
 - a. Boat launches for Port, commercial, or public recreational uses may be permitted in all shoreline environments except Natural. Boat launches in the Conservancy and Shoreline Residential environments require a Shoreline Conditional Use Permit.
 - b. Launches associated with single-family residences for private use are prohibited.
 2. Design Standards
 - a. Boat launches and ancillary facilities ~~shall~~[must](#) be located, designed, constructed, and operated as to:
 - i. Minimize adverse affects of fish, shellfish, wildlife, water quality, and existing geohydraulic shoreline and stream processes. When impacts cannot be avoided, impacts must be mitigated to assure no-net-loss of ecological function necessary to sustain shoreline resources;
 - ii. Be clearly separated from nearby swimming areas;

- iii. Provide adequate on-shore sewage and waste disposal facilities and a means for effective operation; and
- iv. Be compatible with adjacent uses and avoid or mitigate aesthetic impacts.
- v. Ensure that navigation rights are protected.
- vi. Not impede the along shore flow of sand and gravel.
- b. Associated docks and floats ~~shall~~must conform to the applicable policies and performance standards of this Master Program.
- c. Associated parking areas ~~shall~~must:
 - i. Comply with the City of Anacortes' Parking Code;
 - ii. Provide adequate off-road parking and loading areas;
 - iii. Facilitate orderly launching and retrieval of boats, as well as the movement of vehicles and trailers in the launching area;
 - iv. Provide ample room for the handling and maneuvering of boat trailers;
 - v. Be located at least 25 feet landward of the OHWM; and
 - vi. Ensure that surface runoff does not pollute adjacent waters or cause soil or beach erosion. Low Impact Development provisions should be emphasized.
- d. Preferred ramp designs, in order of priority, are:
 - i. Open grid designs with minimum coverage of beach substrate.
 - ii. Seasonal ramps that can be removed and stored upland.
 - iii. Structures with segmented pads and flexible connections that leave space for natural beach substrate and can adapt to changes in beach profile.
- e. Ramps ~~shall~~must be placed and maintained near flush with the foreshore slope.
- f. Maintenance and repair of existing ramps ~~shall~~must minimize impacts to shoreline areas.

19.72.625 – Breakwaters

A. Introduction

Breakwaters are protective structures usually built offshore and aligned parallel to the shore to protect development and uses associated with beaches, bluffs, dunes, moorages and developed harbor areas from wave action. However, because offshore breakwaters are costly to build, they are seldom constructed to protect natural features alone, but are generally constructed for navigational purposes. Breakwaters can be either rigid or floating and may be connected to the shore or not. Rigid breakwaters, which are usually constructed of riprap or rock, have both beneficial and detrimental effects on the shore. All breakwaters eliminate wave action and thus protect the shore or structures immediately behind them. Breakwaters along Anacortes' shorelines are intended primarily to protect waterfront industrial activity and recreational activity (pleasure boat moorage).

The following policies are provided as a guide to future breakwater activity along Anacortes' shoreline:

B. Regulations

1. Breakwater design and construction should be such that alterations to the movement of sand, circulation of water, and biological communities are minimized and mitigated.
2. Applications for breakwaters ~~shall~~must provide the following information:
 - a. Purpose of breakwater
 - b. Construction material
 - c. Method of construction
 - d. Direction of net long shore drift (when appropriate)
 - e. Seasonal wind data
3. The City ~~shall~~must require sufficient geotechnical, hydrological, and biological studies to analyze the impacts of the proposal.
4. Design considerations:
 - a. Breakwaters ~~shall~~must minimize alterations to shore sand and gravel transport unless such impediment is found to be beneficial. The effect of proposed breakwaters on sand movement ~~shall~~must be evaluated during permit review.
 - b. Breakwaters ~~shall~~must meet requirements of state and federal agencies with jurisdiction over in-water construction.
 - c. New or expanded breakwaters ~~shall~~must be designed by a registered civil engineer with expertise in such design.
 - d. Breakwaters ~~shall~~must be designed and constructed in a manner that minimizes significant adverse impacts on water circulation and aquatic life. The design ~~shall~~must also minimize impediments to navigation and to visual access to the shoreline.
 - e. Floating breakwaters ~~shall~~must be preferred over solid breakwaters where they can withstand anticipated wave action.
5. A Conditional Use Permit ~~shall~~will be required for construction or expansion of a breakwater, except for those structures installed to protect or restore ecological functions.
6. Breakwaters ~~shall~~will be allowed only for water-dependent uses, public access, shoreline stabilization, or other specific public purpose.
7. The design and construction of breakwaters ~~shall~~must address impacts to, and protect, ecological functions and critical areas. Mitigation sequencing and appropriate mitigation ~~shall~~will be required.

19.72.630 – Docks, Piers, and Floats

A. Development Regulations

1. The following dock, pier, and float developments are prohibited in the shoreline jurisdiction:
 - a. Piers, docks, boat houses, and floats used for residential purposes. Boats that are occupied ~~shall~~will ~~are~~ not ~~be~~ permitted to moor at piers, docks, or floats longer than three (3) days unless pump-out facilities are available.

- b. Fill waterward of the ordinary high water mark or within a wetland to accommodate a dock, pier, or float.
 - c. Docks, piers, and floats associated with the upland Natural environment designation.
 - d. Docks, piers, and floats associated with single-family residences located outside of Flounder Bay along Burrow's Bay and Cap Sante.
 - e. Piers, docks, floats and other overwater structures associated with multi-family uses serving less than five watercraft.
2. Prior to granting a permit for a pier, dock or float, the effects of the structure upon adjacent shoreline ~~shall~~must be determined, and disposition of the permit by the City ~~shall~~must reflect such determination.
3. Design and construction of all piers and docks (and floats) are required to mitigate for impacts to ecological processes and functions.
4. The design, location, and construction of docks, floats, and piers, as well as their subsequent use and operation, ~~shall~~must:
 - a. Minimize adverse effects on fish, shellfish, wildlife, water quality, and geohydraulic processes. Methods include, but are not limited to: limiting the footprint of the structure to that which is necessary to serve the intended water-dependent use and minimizing the use of materials hazardous to the environment.
 - b. Be capable of withstanding expected environmental conditions.
 - c. Minimize hazards to users.
 - d. Minimize interference with adjacent water uses and navigation.
5. All docks, piers and floats ~~shall~~must adhere to the following design standards:
 - a. Railings, if provided, ~~shall~~must be of clear or open framework design and conform to the Building Code where required.
 - b. Utility service on docks and piers ~~shall~~must be placed on or under the deck. Overhead utility service is prohibited. Floodlighting ~~shall~~must be shielded to prevent unnecessary glare.
 - c. Appropriate marking ~~shall~~must be provided as necessary to avoid hazardous conditions for water surface users.
 - d. Piers, docks and floats ~~shall~~must be constructed of materials that comply with requirements of federal and state regulations. Treated wood materials may be utilized on pilings in repair projects for timber structures, provided the BMPs for the use of Treated Wood in Aquatic and Sensitive Environments, Western Wood Preservers Institute/Wood Preservation Canada/Southern Pressure Treaters' Association/Timer Piling Council, are specified and met. The conditions found in *An Agreement Concerning the Use of Treated Wood in Aquatic Areas* between Ecology and Department of State Fish & Wildlife dated August, 1995, also fulfill this requirement. ~~However, use of treated wood should be minimized wherever practicable.~~
6. New piers and docks ~~shall~~will be allowed only for water-dependent uses or public access.
7. Water-related and water-enjoyment uses may be allowed as part of a mixed-use development on over-water structures where they are clearly auxiliary to and in support of water-dependent

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uses, provided the minimum size requirement needed to meet the water-dependent use is not violated.

8. Upland boathouses ~~shall~~must meet the setbacks required for non-water-dependent structures in the applicable shoreline designation.
9. Docks, piers and floats ~~shall~~must not extend beyond the inner harbor line, unless approved by WDNR.
10. Piers and docks may be restricted in areas of substantial littoral drift or significant historic/scenic values. In these areas open piling or floating structures may be required.
11. Pier and dock construction ~~shall~~must be restricted to the minimum size necessary to meet the needs of the proposed water-dependent use. For piers, docks and floats not associated with a single-family residence (including joint-use dock shared by two residences), the applicant must demonstrate that there is a specific need for the new or expanded pier, dock or float. Dimensional requirements for the structure will be based upon that need and the general criteria included in this section.
12. When permitted, new residential development of more than two dwellings is required to provide joint use or community docks, rather than individual docks.
13. The following requirements apply to new, expansion, and replacement piers, docks and floats associated with a single-family residence.
 - a. Pier width (single use): 6 feet or less
 - b. Pier grating: Grating of the full pier surface area is required on piers wider than 4 feet.
 - c. Pier width (joint use): 8 feet or less.
 - d. Floating dock dimensions: For a single-use residential structure, float width may not exceed 8 feet and float length may not exceed 30 feet. For a shared joint-use residential structure, float width may not exceed 8 feet and float length may not exceed 60 feet.
 - e. ~~d~~Floating dock grating: Floats 6 feet wide or less are required to contain at least 30% functional grating. Floats wider than 6 feet are required to contain at least 50% functional grating.
 - f. ~~e~~Floating dock orientation: The float must be installed in a north-south orientation to the maximum extent practicable.
14. Repair– The following actions will be considered minor repairs for single-family residential use and are permitted, consistent with all other applicable codes and regulations. If cumulative repairs of an existing pier or dock over three years would make a proposed repair exceed the threshold established below, the repair proposal must meet the standards for a new pier or dock.
 - a. Replacing decking with grated decking;
 - b. Replacing decking substructure, including floats;
 - c. Pile replacement.
 - i. Replacing less than 50% of existing piles supporting a fixed-pile pier. All such pile replacements must use steel piles.

ii. Replacing piling associated with a floating dock. All pile replacements must use steel piles.

iii. Replacing creosote piles with steel piles.

- ~~a. Repair proposals which replace only decking or decking substructure and less than 50 percent of the existing piles subsections shall will be considered minor repairs and are permitted, consistent with all other applicable codes and regulations. If cumulative repairs of an existing pier or dock over three years would make a proposed repair exceed the threshold established above, the repair proposal shall must be reviewed as a new pier or dock.~~

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15. Existing legal non-conforming floating docks for single family residences are allowed to retain their present configuration for repair proposals meeting AMC 19.72.360(A)(14), so long as the following are met:

- a. Piers and/or gangways connecting to floats must be a maximum of 4-feet in width for the first 30-feet waterward of the OHWM (nearshore area);
- b. The gangway connected to the floating dock must be composed of grated decking;
- c. Proof of WDNR aquatic use authorization will be required for piers and docks within public aquatic areas.

~~14.16.~~ New docks, piers, and floats associated with single-family residences along Cap Sante shall will be are encouraged to use joint-use structures serving at least two but no more than four waterfront lots.

19.72.635 – Dredging and Dredge Spoil Disposal

A. Introduction

Dredging is the removal of material from the bottom of a stream, river, lake, bay or other water body. The purposes of dredging might include: deepening a navigational channel, berth, or basin; streambed maintenance; use of dredged material for fill or habitat enhancement (effective reuse); and removal of contaminated sediments.

B. Development Regulations:

- I. Applications for dredging operations (non-maintenance) ~~shall~~must include the following information:
 - a. Location, depth, width, and total volume of material to be dredged;
 - b. Projected frequency and quantity of maintenance dredging;
 - c. Information on stability of bedlands adjacent to the proposed dredge area;
 - d. Timing and method of dredging and dredged material disposal;
 - e. Dredged material disposal area (non – PSDDA site): location, size, capacity; methods of stabilization; hydrology of site;
 - f. Dredged materials; existing biological communities or resources in areas to be dredged, and the physical, chemical, and biological makeup of the dredged materials;
 - g. Hydraulic analysis, including tidal flows and potential impacts on ecological functions; and

- h. Description of conformance with the no net loss standard for ecological processes and functions, including impact avoidance and minimization measures consistent with mitigation sequencing principles, and a description of any necessary mitigation.
2. Dredging ~~shall~~will be permitted for the following purposes, dredging for other purposes is prohibited:
 - a. To improve water quality or aquatic habitat;
 - b. To establish, expand, or relocate or reconfigure navigation channels and basins where necessary for assuring safe and efficient accommodation of existing or proposed navigational uses, such as marinas and port/water-dependent industrial development, and then only when significant ecological impacts are minimized and when mitigation is provided.
 - c. To maintain previously dredged and/or existing authorized location, depth, and width of established navigation channels and basins.
 - d. To mitigate conditions that could endanger public safety;
 - e. To obtain fill material only when the fill material is necessary for restoration of ecological functions and only when the fill is placed waterward of the ordinary high water mark; and
 - f. To create or improve public recreational opportunities.
 3. Proposals for dredging and dredge spoil disposal, when permitted, ~~shall~~must:
 - a. Be kept to the minimum necessary to accommodate the proposed use.
 - b. Include all feasible mitigating measures to protect habitats and to minimize adverse impacts such as turbidity, release of nutrients, heavy metals, sulfides, organic materials, or toxic substances, depletion of oxygen, disruption of food chains, loss of benthic productivity, and disturbance of fish runs and important localized biological communities;
 - c. Be scheduled so as to not materially interfere with the migratory movements of anadromous fish;
 - d. Utilize techniques that cause minimum dispersal and broadcast of bottom material; hydraulic dredging ~~shall~~must be used wherever feasible in preference to agitation dredging;
 - e. Not interfere with geohydraulic processes;
 - f. Be found, through analysis by qualified personnel, to be minimally or nonpolluting; and
 - g. Meet all requirements of applicable regulatory agencies.
 4. New development ~~shall~~must be sited and designed to avoid or, if that is not possible, to minimize the need for new and maintenance dredging.

19.72.640 – Fills

A. Development Regulations

1. Fill for water-dependent uses and for public use ~~shall~~will be given priority.
2. Fill ~~shall~~must be permitted only when in conjunction with a proposal or activity otherwise permitted under the SMP.

3. Fill waterward of the ordinary high water mark is permitted by Shoreline Conditional Use Permit only when necessary to accommodate water-dependent uses, and for maintenance and repair of existing structures; expansion or alternation of transportation facilities of statewide significance currently located on the shoreline and then only upon a demonstration that alternatives to fill are not feasible; a transportation facility, utility, or navigational structure with no feasible alternative; cleanup and disposal of contaminated sediments as part of an interagency environmental clean-up plan; disposal of dredged material considered suitable under and conducted in accordance with the Dredged Material Management Program of the Department of Natural Resources; mitigation or compensation actions and ecological restoration including beach nourishment or enhancement projects when significant impacts can be mitigated; and public access.
4. Projects ~~shall~~must be located and designed to minimize the area of fill necessary to accommodate the use.
5. Applications for fill ~~shall~~must address impacts to wetlands and streams; aquatic habitats; flooding; sediment transport; navigation, and public access. The following information may be required: physical and biological characteristics of the fill site, source and quality of fill material, grading plan showing the site, adjacent properties and waters, method of placement and compaction, type of proposed surfacing and runoff control, method of erosion control and stabilization, and proposed use of the fill area. Fill that will result in significant adverse impacts that cannot be mitigated is prohibited.
6. Fill ~~shall~~will be provided with some means for erosion control and/or shoreline stabilization consistent with the policies and regulations of ~~Section 9.11~~AMC 19.72.660, *Shoreline Stabilization Measures and Flood Protection Works*.
7. Fill material ~~shall~~will be sand, gravel, soil, rock, or similar material. Clean dredge material from a permitted dredging operation ~~shall~~will be permitted except for capping project(s) approved for clean-up under applicable federal and state regulatory programs.
8. Excavation of beach material for the primary purpose of obtaining fill material is prohibited. When practical and where it would not result in significant adverse impacts, excess beach material from construction of utilities or other allowed improvements ~~shall~~must be used for beach enhancement and/or environmental restoration projects, rather than fill.
9. Fills ~~shall~~must be located, designed, and constructed to protect shoreline ecological functions and ecosystem-wide processes.

19.72.645 – Jetties and Groins

A. Development Regulations

1. Jetties and groins are only allowed waterward of the ordinary high water mark for water-dependent uses, public access, shoreline stabilization, or other specific public purpose. Except for structures installed to protect or restore ecological functions, jetties and groins require a Shoreline Conditional Use Permit.
2. New residential groins are prohibited in the marine environment at locations that will alter longshore drift, and are only allowed when demonstrated to be necessary for shoreline stabilization.
3. New jetties and groins are prohibited in areas containing critical fish and wildlife habitats and ~~shall~~must not be located on shorelines where valuable geohydraulic or biological processes are

sensitive to alteration or development such as feeder bluffs, marshes, wetlands and accretion shoreforms such as spits, hooks, bars, or barrier beaches.

4. New jetty or groin proposals must incorporate cumulative effects analysis to determine how the project may affect adjacent beaches updrift and downdrift of the site. Cumulative effects analysis must be evaluated by utilizing expertise in several different fields of study (e.g., geologists, marine biologists, hydrologists). The assessment must be site-specific and scientifically rigorous to fully document the need for the jetty or groin.
5. Repair or replacement of existing jetties and groins is allowed, provided:
 - a. A licensed engineering geologist with experience evaluating projects in marine areas determines that removing the structure will cause more damage to the beach than letting it remain, or, if it is determined that significant impacts will occur to life or property if the groin is removed. Typical beach erosion, i.e., erosion rates occurring along adjacent beaches near the property, will not be considered a significant impact.
 - b. The replacement structure is designed in such a manner to allow uninhibited passage of longshore sediment movement.
 - c. The footprint on beach and bed areas is minimized to the greatest extent possible.
6. All projects must utilize standard mitigation sequencing techniques to avoid and minimize impacts, and any impacts must be fully mitigated. Mitigation measures must incorporate principles of landscape connectivity and consider the impacts to ecosystem-wide processes and ecological functions as they may extend outside of the project boundaries.

19.72.650 – Mooring Buoys

A. Introduction

Mooring buoys are anchored devices in waterbodies used for the mooring of watercraft. If 12 or more buoys are proposed, the proposal must also comply with policies and regulations under Section 8.7 “Marinas,” above.

B. Development Regulations

1. Applications for public mooring buoys ~~shall~~must include an enforcement and management plan that describes rules and regulations for public use.
2. Buoys may only be installed after the Administrator issues a Letter of Exemption or shoreline permit PROVIDED that the buoys meet all applicable requirements for a shoreline letter of exemption or permit.
3. Mooring buoys ~~shall~~must comply with the following design standards:
 - a. Land based retrieval lines from mooring buoys ~~shall~~will be prohibited.
 - b. Buoys must float at least 12" above the water and be a light or bright color.
 - c. Mooring buoys ~~shall~~will be located no closer than 100 feet from navigation channels, another mooring buoy, dock, pier, float, or other fixed navigational obstruction, unless there is a written agreement allowing for the encroachment with the parties affected, including the subtidal property owner.

- d. Buoys ~~shall~~must be marked with the responsible agency's name, address, and telephone number. WDFW is an additional agency that can provide information to limit the impact of buoys.
 - e. Buoys ~~shall~~must comply with the requirements of all applicable regulatory agencies (e.g., WAC 332-30-148).
 - f. Helical anchors or other designs that minimize the footprint on the seabed are to be used to the greatest extent practicable.
4. Mooring buoys ~~shall~~must be located, designed, constructed, and operated so as to minimize impacts to shoreline resources and unnecessary interference with the right of adjacent property owners, as well as adjacent shoreline or water uses. To this end, applications for such facilities must demonstrate conformance with the following criteria. The proposal:
- a. Is located with regard to favorable conditions related to wind, current, bathymetrics and, for overnight moorage facilities, adequate flushing action.
 - b. Complies with all federal, state, regional, and local requirements regarding water quality including, but not limited to, Department of Health Standards and environmental policies and regulations contained in ~~Chapter 6~~AMC 19.72.410-460, *Environmental Protection General Regulations*.
 - c. Provides for adequate upland support facilities (e.g., restrooms, dumpsters, etc.).
 - d. Does not significantly interfere with navigation.
 - e. Demonstrates that the buoy system proposed is adequate to withstand the maximum expected physical stress that the environment and moored craft will place on the buoy.
 - f. Demonstrates compliance with mitigation sequencing techniques. When impacts cannot be avoided, impacts must be mitigated to assure no net loss of ecological function necessary to sustain shoreline resources.
5. Extended moorage (longer than ~~30~~5 days), regardless of method, on waters of the state except as allowed by applicable state regulations and unless a lease or permission is obtained from the state and impacts to navigation and public are mitigated is prohibited.

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19.72.655 – Shoreline Habitat and Natural Systems Enhancement Projects

A. Introduction

Shoreline habitat and natural systems enhancement and restoration projects include those activities proposed and conducted specifically for the purpose of establishing, restoring, or enhancing habitat for priority species in shorelines. Mitigation for project impacts is not necessarily included in this section.

B. Regulations

- 1. Restoration and enhancement ~~shall~~must be carried out in accordance with an approved shoreline restoration plan.
- 2. All shoreline restoration and enhancement projects ~~shall~~must protect the integrity of adjacent natural resources, including aquatic habitats and water quality.

3. Long-term maintenance and monitoring ~~shall~~must be included in restoration or enhancement proposals.
4. Shoreline restoration and enhancement may be allowed if the project proponent demonstrates that no significant change to sediment transport will result and that the enhancement will not adversely affect ecological processes, properties, or habitat.
5. Shoreline restoration and enhancement projects ~~shall~~must use be designed using scientific and technical information, and implemented using best management practices.
6. Shoreline restoration and enhancement ~~shall~~must not significantly interfere with the normal public use of the navigable waters of the state without appropriate mitigation.
7. Shoreline restoration and ecological enhancement projects may be permitted in all shoreline environments, provided the project's purpose or consequence is the restoration of the natural character and ecological functions of the shoreline.
- ~~7.8.~~ The City may grant relief from shoreline master program development standards and use regulations resulting from shoreline restoration projects within urban growth areas consistent with criteria and procedures in WAC 173-27-215.

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19.72.660 – Shoreline Stabilization Measures and Flood Protection Works

A. Introduction

Shore stabilization works include actions taken to stabilize the shoreline, addressing erosion impacts to property and improvements caused by natural processes, such as current, flood, tides, wind, or wave action. These actions include structural and nonstructural methods.

Nonstructural methods include building setbacks, relocation of the structure to be protected, ground water management, and/or planning and regulatory measures to avoid the need for structural stabilization.

Structural methods can be "hard" or "soft". Hard structural stabilization measures refer to those with solid, hard surfaces, such as concrete bulkheads. These are static structures traditionally constructed of rock, concrete, wood, metal, or other materials that deflect, rather than absorb, wave energy. Soft structural measures rely on softer materials, such as vegetation, drift logs, and gravel. They are intended to absorb wave energy, mimicking the function of a natural beach. Generally, the harder the construction measure, the greater the impact on shoreline processes, including sediment transport, geomorphology, and biological functions. Structural shoreline stabilization methods also often result in vegetation removal and damage to near-shore habitat and shoreline corridors. The following methods of shoreline stabilization are organized from "soft" to "hard". The use of "soft" methods is the preferred "best practices" choice (if non-structural methods cannot be used or are insufficient) when considering shoreline stabilization measures.

"Soft"

- Vegetation enhancement;
- Upland drainage control;
- Bioengineering/biotechnical measures;
- Beach enhancement;
- Anchor trees; dynamic revetment and

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Gravel enhancement.

"Hard"

Rock revetments;

Gabions;

Groins;

Retaining walls and bluff walls;

Bulkheads; and

Seawalls.

What constitutes normal repair and maintenance? As applied to shoreline stabilization, "normal repair" and "normal maintenance" include the patching, sealing, or refinishing of existing structures and the replenishment of sand or other material that has been washed away if part of a previous authorized activity. Normal maintenance and normal repair are limited to those actions that are typically done on a periodic basis. Construction that causes significant ecological impact is not considered normal maintenance and repair. (See [Section 2.4 AMC 19.72.915 of this SMP](#) for the definition of "normal maintenance or repair".)

What constitutes replacement? As applied to shoreline stabilization measures, "replacement" means the construction of a new structure to perform a shoreline stabilization function when an existing structure can no longer adequately serve its purpose. Additions to or increases in size of existing shoreline stabilization measures are considered new structures under this Master Program.

In addition, repairs that exceed a certain threshold are also effectively "replacement," providing a meaningful opportunity for the project applicant to consider and implement softer solutions to an existing hard structural stabilization. The following are thresholds for considering a repair to be effectively replacement: 1) when any repair is being conducted along more than 50 percent of the shoreline stabilization on the subject property, or 2) when repair is being conducted along more than 25 feet of shoreline stabilization when that repair work includes removal and replacement of the stabilization measure's foundation material. These repairs may still be processed as Shoreline [Letters of Exemptions](#) if the relevant exemption criteria are met; however, the replacement provisions of these regulations will apply.

What is required for additions to existing shoreline stabilization? Additions to or increases in size of existing shoreline stabilization measures ~~shall~~[will](#) be considered new structures.

Is there an exception for protecting a home? Pursuant to the Shoreline Management Act (RCW 90.58.100(6)), measures to protect single-family residences occupied prior to January 1, 1992, are exempt from the requirement to obtain a shoreline substantial development permit. However, a ~~statement~~[shoreline letter](#) of exemption must be obtained from the City before constructing, adding to or substantially modifying these structures. The City may issue an [shoreline letter](#) exemption upon a finding that the structure is designed to minimize harm to the shoreline natural environment and that, to the extent feasible, the structure complies with the policies, prohibitions, and development standards of this Master Program. Mitigation will be required to meet the no net loss standard.

The following policies and regulations apply to all actions and developments that modify the shoreline for the purposes of preventing shore erosion or flooding.

B. Development Regulations

1. New development, including the subdivision of land, ~~shall~~will not create lots which require future shoreline stabilization to the extent feasible. If necessary, a geotechnical report ~~shall~~will be required.
2. New development near steep slopes or bluffs ~~shall~~must be set back sufficiently to ensure that shoreline stabilization is unlikely to be necessary during the life of the structure as demonstrated by a geotechnical analysis.
3. New development that would require shoreline stabilization which causes significant impacts to adjacent or down-current properties and shoreline areas ~~shall~~will not be allowed.
4. Structural stabilization methods ~~shall~~will be permitted when necessary for reconfiguration of the shoreline for (i) mitigation or enhancement purposes, or (ii) if determined to be appropriate based on the criteria of this section. In all other cases, structural stabilization methods ~~shall~~will only be allowed when all of the following criteria are met:
 - a. Relocation of existing structures, or implementation of nonstructural measures, such as placing the development even farther from the shoreline, planting and or retaining vegetation, or installing on-site drainage improvements, are not feasible or not sufficient.
 - b. Structural stabilization has been demonstrated, through a coastal engineer or other qualified geotechnical report, to be necessary to support or protect a legally established, inhabited structure or ongoing shoreline use that is in danger of loss or substantial damage or when necessary for reconfiguration of the shoreline for mitigation or enhancement.
 - c. The erosion is not being caused by upland conditions on the subject property, such as the loss of vegetation and drainage;
 - d. The shoreline stabilization measure will mitigate adverse impacts to the extent feasible.
 - e. Except for those uses that are water-dependent or when necessary to protect a single-family residence, uses ~~shall~~will not be allowed to have hard structural stabilization unless a Conditional Use Permit is obtained. See Conditional Use Permit requirements in Section 3.1 and WAC 173-26-201(3)(d)(iii). Bioengineered or soft structural stabilization is permitted.
5. As appropriate to the individual proposal, the City ~~shall~~will require and utilize the following information during its review of shoreline stabilization proposals:
 - a. Purpose of the project;
 - b. Documentation (including photos) of existing (pre-construction) shoreline characteristics.
 - c. Description of physical, geological, and/or soil characteristics of the area including existing and proposed slope profiles and location of ordinary high water mark;
 - d. Hydraulic characteristics of the water body within one-half (0.5) mile on each side of the proposed project;
 - e. Existing shoreline stabilization and flood protection devices within one-half (0.5) mile on each side of the proposed project;
 - f. Biological characteristics of the area including vegetation, fish and wildlife resources, and suitability of site to support forage fish spawning;

- g. Construction materials including size, shape, quantity, plant types, and soil preparations;
 - h. Construction methods and timing;
 - i. Predicted impact upon area shore and hydraulic processes, ecological functions, public access, adjacent properties, and shoreline and water uses;
 - j. Evaluation to determine if alternative non-structural techniques are feasible;
 - k. Monitoring and adaptive management may be required to determine if the structure is properly functioning;
 - l. Description of measures incorporated into the design to address aesthetics and public access; and
 - m. Evaluation of the cumulative effects of “hard” stabilization methods within a drift cell ~~shall~~must be determined by a Washington State licensed civil engineer with a specialty in coastal engineering or a qualified Washington State licensed geologist with a specialty in coastal geology, and a qualified marine habitat biologist.
 - n. Geotechnical reports ~~shall~~will include estimates of the rate of erosion and urgency (damage within 3 years) and evaluate alternative solutions.
6. New development, including creation of new parcels, that would require future shoreline stabilization during the life of the structure considering sea level rise projections is prohibited except where no alternative locations are available and no net loss of ecological functions will result as demonstrated through a geotechnical analysis.
7. Shoreline stabilization works, including revetments and bulkheads, ~~shall~~must be located, designed and constructed in such a manner that will:
- a. Minimize alterations of the natural shoreline and shoreline processes including sediment transport.
 - b. Minimize damage to ecological functions including wildlife, fish and shellfish habitats.
 - c. Provide for the long term multiple use of shoreline resources and public access to public shorelines. In the design of publicly financed or subsidized works, consideration ~~shall~~will be given to providing pedestrian access to shorelines for low intensity outdoor recreation.
 - d. The shoreline defense structure ~~shall~~will mitigate adverse impacts to the extent feasible, blend with the surroundings, and not distract from the aesthetic qualities of the shoreline.
 - e. Achieve the policy of no net loss of ecological functions necessary to sustain shoreline resources.
8. Use of scrap building materials, asphalt from street work, or any discarded materials, equipment or appliances for the stabilization of shorelines ~~shall~~will be prohibited.
9. Upon project completion, all temporarily disturbed shoreline areas ~~shall~~must be restored to as near pre-project configuration as possible and replanted with appropriate vegetation, with preference given to native plantings. All losses in nearshore/riparian vegetation or fish or wildlife habitat ~~shall~~will be mitigated at a ratio that would be equivalent to the time that it would take the vegetation to reach full maturity or the level of maturity prior to disturbance.
10. Hard Stabilization Methods (e.g., revetments, bulkheads)

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- a. "Hard" stabilization methods are solid, static structures including rock revetments, gabions, concrete groins, retaining walls and bluff walls, bulkheads, and seawalls (definitions in ~~Chapter 15~~ [AMC 19.72.915](#)). The two most common hard methods applied in Puget Sound are revetments and bulkheads.
- b. A revetment is a sloped shoreline structure built to protect an existing eroding shoreline or newly placed fill against currents and wave action. Revetments are most commonly built of randomly placed boulders (riprap) but may also be built of sand cement bags, paving, or building blocks, gabions (rock filled wire baskets) or other systems and materials. The principal features of a revetment, regardless of type is a heavy armor layer, a filter layer, and toe protection.
- c. Bulkheads are solid or open-pile walls usually constructed parallel to the shore whose primary purpose is to contain and prevent the loss of soil by erosion, wave, or current action. Bulkheads are used to protect marine bluffs by retaining soil at the toe of the slope or by protecting the toe of the bank from erosion and undercutting. Bulkheads are typically constructed of poured-in-place concrete, steel or aluminum sheet piling, wood, or wood and structural steel combinations.

11. Additional Regulations for "Hard" Stabilization Structures

- a. Proposals for "hard" stabilization structures must first demonstrate that use of natural materials and processes and non-structural solutions, including relocation or reconstruction of existing structures, to bank stabilization are unworkable. Then, evaluate the cumulative effect of allowing "hard" stabilization methods along the shoreline prior to permitting new "hard" structures. If it is determined that the cumulative effect would have a net loss of shoreline ecological functions, then exemptions and permits ~~shall~~[will](#) not be granted.
- b. "Hard" stabilization structures may be allowed only when evidence is presented which conclusively demonstrates that at least one of the following conditions exist:
 - i. Erosion threatens a legally established use or existing building(s) on upland property: provided that all other alternative methods of shore protection have proven infeasible or insufficient.
 - ii. Structural stabilization is necessary to the operation and location of a new, single-family home, or a water-dependent use consistent with this Master Program; provided that all other alternative methods of shore protection have proven infeasible or insufficient through a geotechnical report.
 - iii. Structural stabilization is necessary as part of a habitat enhancement project.
- c. Bulkheads are to be permitted only where local physical conditions are suitable for such alterations. Factors to consider ~~shall~~[will](#) include, but are not limited to, foundation bearing materials and surface and subsurface drainage.

12. Siting and Design

- a. Soft shoreline stabilization measures that provide restoration of shoreline ecological functions may be permitted waterward of the ordinary high water mark.
- b. Unless found to be infeasible, bulkheads and revetments ~~shall~~[must](#) be located landward of the ordinary high water mark and follow the natural contours of the shoreline. In addition:

- i. Where no other bulkheads are adjacent, the construction of a bulkhead ~~shall~~must be as close to the eroding bank as possible and in no case ~~shall~~will it be more than three (3) feet from the toe of the bank.
- ii. A bulkhead for a permitted fill ~~shall~~must be located at the toe of the fill.
- iii. Where permitted, a bulkhead must tie in no further waterward than flush with existing bulkheads on adjoining properties, except where the adjoining bulkheads extend waterward of the ordinary high water mark. In which case, the new bulkhead must meet standard requirements.
- c. Replacement bulkheads may be permitted if there is a demonstrated need to protect principal uses or structures from erosion caused by currents, tidal action, or waves provided that:
 - i. The replacement structure is designed, located, sized, and constructed to assure no net loss of ecological functions.
 - ii. For residences, the replacement structure does not encroach waterward of the ordinary high water mark or existing structure and there are overriding safety or environmental concerns. In such cases, the replacement structure ~~shall~~will abut the existing shoreline stabilization structure. Minor encroachment may be granted for resurfacing of existing structures in conformance with Washington State Department of Fish & Wildlife regulations, replacement of existing structures protecting residences occupied prior to January 1, 1992, or for soft shoreline stabilization measures that provide restoration of ecological functions.
 - iii. The existing bulkhead structure is removed unless doing so is found to be detrimental to ecological functions or unreasonable.
 - iv. If a structure is placed waterward of the existing bulkhead or revetment, all impacts, including loss of beach habitat, must be fully mitigated.
- d. Bulkheads ~~shall~~must be sited and designed consistent with appropriate engineering principles. Professional geologic site studies or design may be required for any proposed bulkhead if the Shoreline Administrator determines sufficient uncertainties exist.
- e. Bulkheads ~~shall~~must be designed for the minimum dimensions necessary to adequately protect the development.
- f. Bulkheads and revetments ~~shall~~must be designed to permit the passage of surface or groundwater without causing ponding or saturation of retained soil/materials.
- g. Adequate toe protection ~~shall~~must be provided to ensure bulkhead stability.
- h. Materials used in bulkhead construction ~~shall~~must meet the following standards:
 - i. Bulkheads ~~shall~~must utilize stable, non-erodible, homogeneous materials such as concrete, wood, and rock that are consistent with the preservation and protection of the ecological habitat.
 - ii. Shore materials ~~shall~~will not be used for fill behind bulkheads, except clean spoil from a permitted dredge and fill operation or clean upland materials.
- i. If an armored revetment is employed the following design criteria ~~shall~~will be met:

- i. The size and quantity of the material ~~shall~~must be limited to only that necessary to withstand the estimated energy intensity of the hydraulic system;
- ii. The toe reinforcement or protection must be adequate to prevent a collapse of the system from wave action; and
- iii. Fish habitat components ~~shall~~must be considered in the design subject to Hydraulic Project Approval by the Washington Department of Fish and Wildlife.

13. Public Access Provisions

- a. When hard stabilization measures are required at a public access site, provision for safe access to the water ~~shall~~must be incorporated into bulkhead design wherever reasonable and practicable.
- b. Stairs or other permitted structures may be built into a hard stabilization structure, but ~~shall~~will not extend waterward of it.
- c. Prior to granting a permit for new shoreline stabilization (bulkheads, breakwaters, groins and jetties) the effect of such development on adjacent properties ~~shall~~will be determined and the decision of the City ~~shall~~must reflect such determination. Applications for such development must be accompanied by information showing configuration of the shoreline and consistency of bank materials for properties within 300 feet in both directions from the proposal. Mitigation of adverse effects may be required as an alternative to denial.
- d. Public access is required as part of any publicly financed shoreline erosion control measures.

Article 7. Enforcement and Penalties

19.72.710 – Enforcement

- A. The enforcement provisions of RCW 58.17 and WAC 173-27-240 through 173-27-310 ~~shall~~ applies.
- B. The Shoreline Administrator and/or a designated representative ~~shall~~must enforce all provisions of the Master Program. The Shoreline Management Act calls for a cooperative enforcement program between local and state government. It provides for both civil and criminal penalties, orders to cease and desist, orders to take corrective action and permit rescission. The choice of enforcement action and the severity of any penalty should be based on the nature of the violation and the damage or risk to the public or to public resources. The existence or degree of bad faith of the persons subject to the enforcement action, the benefits that accrue to the violator, and the cost of obtaining compliance may also be considered.

19.72.715 – Penalties

Any person found to have willfully engaged in activities on the City's shorelines in violation of the Shoreline Management Act of 1971 or in violation of the City's Shoreline Master Program, rules or regulations adopted pursuant thereto ~~shall be~~is subject to the penalty provisions of the AMC.

19.72.720 – Violations – Subsequent Development and Building Permits

No building permit or other development permit ~~shall~~will be issued for any parcel of land developed or divided in violation of this Master Program. All purchasers or transferees of property ~~shall~~must comply

with provisions of the Act and this Master Program and each purchaser or transferee may recover damages from any person, firm, corporation, or agent selling, transferring, or leasing land in violation of the Act or this Master Program including any amount reasonably spent as a result of inability to obtain any development permit and spent to conform to the requirements of the Act or this Master Program as well as costs of investigation, suit, and reasonable attorney's fees occasioned thereby. Such purchaser, transferee, or lessor, as an alternative to conforming their property to these requirements, may rescind the sale, transfer, or lease and recover costs of investigation, litigation and reasonable attorney's fees occasioned thereby from the violator.

19.72.725 – Public and Private Redress

- A. Any person subject to the regulatory program of the Master Program who violates any provision of the Master Program or the provisions of a Permit issued pursuant thereto ~~shall~~will be liable for all damages to public or private property arising from such violation, including the cost of restoring the affected area to its condition prior to such violation.
- B. The City Attorney may bring suit for damages under this section on behalf of the City. Nothing in this section precludes private persons from bringing suit for damages on their own behalf. If liability has been established for the cost of restoring an area affected by violation, the court ~~shall~~must make provisions to assure that restoration will be accomplished within a reasonable time at the expense of the violator. In addition to such relief, including monetary damages, the court, in its discretion, may award attorneys' fees and costs of the suit to the prevailing party.

19.72.730 – Fees for Permits Obtained After Development

- A. Triple fees for permits obtained after development. Permits obtained following, rather than prior to, the establishment of a development or use ~~shall~~must be three (3) times the normal amount. This provision is in addition to the enforcement measures contained in this ~~chapter~~Article and in the AMC.
- B. Delinquent permit penalties ~~shall~~must be paid in full prior to resuming the use or activity.

Article 8. Master Program – Review, Amendments and Adoption

19.72.810 – Master Program Review

This Master Program ~~shall~~must be periodically reviewed and adjustments ~~shall~~must be made as are necessary to reflect changing local circumstances, new information or improved data, and changes in State statutes and regulations. This review process ~~shall~~must be consistent with WAC 173-26 requirements and ~~shall~~must include a local citizen involvement effort and public hearing to obtain the views and comments of the public.

19.72.815 – Amendments to Master Program

- A. Any of the provisions of this Master Program may be amended as provided for in RCW 90.58.120 and .200 and Chapter 173-26 WAC. Amendments or revision to the Master Program, as provided by law, do not become effective until approved by the Washington State Department of Ecology.
- B. Proposals for shoreline environment redesignation (i.e., amendments to the shoreline maps and descriptions), must demonstrate consistency with the criteria set forth in WAC 173-22-040.

19.72.820 – Severability

If any provisions of this Master Program, or its application to any person or legal entity or parcel of land or circumstances is held invalid, the remainder of the Master Program, or the application of the provisions to other persons or legal entities or parcels of land or circumstances, ~~shall~~must not be affected.

19.72.825 – Effective Date

This Master Program ~~shall~~will take effect on ~~October 4, 2019~~[date] and ~~shall apply~~applies to new applications submitted on or after that date and to incomplete applications submitted prior to that date.

Commented [AC87]: Adoption date.

Article 9. Definitions

19.72.910 – General Information

For the purpose of this Master Program, certain terms and their derivations ~~shall~~must be construed as specified in this section. Some terms used in this Master Program may have a different definition and application under other City of Anacortes regulations. Words in the singular include the plural, and the plural, the singular. The words "~~shall~~must" and "will" are mandatory; the word "may" is permissive. Additional definitions applicable to this Master Program and adopted by reference herein, are found in RCW 90.58 and applicable sections of the Washington Administrative Code. The following definitions apply throughout this Program, unless otherwise indicated.

If a definition is not included here, the City ~~shall~~will rely on definitions found in applicable citations in the Revised Code of Washington (RCW), Washington Administrative Code (WAC), the Anacortes Municipal Code (AMC) specifically Chapters 19.12, Definitions and Interpretation, and 19.70, Critical Areas Regulations, Ordinance #3064, dated July 26, 2021, and finally a standard dictionary, in that order. In case of conflict with AMC, definitions within the RCW, WAC, and/or this Master Program ~~shall~~must prevail.

Commented [AC88]: Table 4-1 #7

19.72.915 – Definitions

A. A Definitions.

~~"Abiotic"~~ means ~~Not~~ Living.

~~Accessory Building – A subordinate building attached to or detached from the principal building and used for purposes customarily incidental to the use of the principal building. Accessory buildings include but are not limited to an automobile storage garage, playhouse, laundry room, garden shelter, hobby room and mechanical room.~~

~~Accessory Dwelling Unit – An accessory dwelling unit (ADU) is a habitable dwelling unit added to, created within, or detached from and on the same lot with a single family dwelling that provides basic requirements for living, sleeping, eating, cooking, and sanitation.~~

~~Accessory Use – A water oriented or non-water oriented use that is demonstrably subordinate and incidental to a primary use and which functionally supports its activity.~~

Commented [AC89]: Table 4-1 # 7 – Definitions removed already exist in Title 19

Commented [AC90]: Table 4-1 # 7 – Definitions removed already exist in Title 19

"Accretion" means ~~T~~The growth of a beach by the addition of material transported by wind and/or water. Included are such shoreforms as barrier beaches, points, spits, hooks and tombolos.

"Act" means the Washington State Shoreline Management Act, Chapter 90.58 RCW. ~~The Shoreline Management Act of 1971, as amended (Chapter 90.58 RCW).~~

Commented [AC91]: Table 5-1 #2

"Activity" means ~~A~~An occurrence associated with a use; the use of energy toward a specific action or pursuit. Examples of shoreline activities include but are not limited to fishing, swimming, boating, dredging, fish spawning, wildlife nesting, or discharging of materials.

Act means the Washington State Shoreline Management Act, Chapter 90.58 RCW

Commented [AC92]: Table 5-1 #2

"Adjacent Lands" means ~~L~~lands adjacent to the shorelines of the state (outside of shoreline jurisdiction). The SMA directs local governments to develop land use controls (i.e., zoning, comprehensive planning) for such lands consistent with the policies of the SMA, related rules and the local shoreline master program (see Chapter 90.58.340 RCW).

"Administrator" means ~~T~~the City Director of Planning, Community, and Economic Development or his/her designee, charged with the responsibility of administering the Anacortes Shoreline Master Program.

"Advertising" means ~~A~~any display of letters, numerals, characters, words, symbols, emblems, illustrations, objects or registered trademarks which serve to call to the attention of the public products, services, businesses, buildings, premises, events, candidates or ballot propositions. On-premise advertising is that which is actually located on the site of the business or service advertised.

"Agricultural Activities" means ~~A~~agricultural uses and practices including, but not limited to: Producing, breeding, or increasing agricultural products; rotating and changing agricultural crops; allowing land used for agricultural activities to lie fallow in which it is plowed and tilled but left unseeded; allowing land used for agricultural activities to lie dormant as a result of adverse agricultural market conditions; allowing land used for agricultural activities to lie dormant because the land is enrolled in a local, state, or federal conservation program, or the land is subject to a conservation easement; conducting agricultural operations; maintaining, repairing, and replacing agricultural equipment; maintaining, repairing, and replacing agricultural facilities, provided that the replacement facility is no closer to the shoreline than the original facility; and maintaining agricultural lands under production or cultivation.

"Agriculture" means ~~T~~the cultivation of soil, production of crops, or the raising of livestock.

~~AKART - An acronym for "all known, available, and reasonable methods of prevention, control, and treatment" (WAC 173-201A-020). AKART shall represent the most current methodology that can be reasonably required for preventing, controlling, or abating the pollutants associated with a discharge. The concept of AKART applies to both point and nonpoint sources of pollution.~~

"Alteration" means ~~A~~any human-induced action that impacts the existing conditions of the area. Alteration includes but is not limited to:

1. Grading, filling, dredging, draining, channelizing, cutting, topping;
2. Clearing, relocating or removing vegetation;

3. Paving, construction, modifying for surface water management purposes;
4. Human activity that impacts the existing topography, vegetation, hydrology, or wildlife habitat.

Alteration does not include walking, passive recreation, or similar activities.

“Amendment” means ~~A~~^a revision, update, addition, deletion, and/or reenactment to an existing shoreline master program.

“Anadromous Fish” means ~~S~~^s species, such as salmon, which are born in fresh water, spend a large part of their lives in the sea, and return to freshwater rivers and streams to procreate.

“Applicable Master Program” means ~~T~~^{the} Master Program approved or adopted by the Washington State Department of Ecology pursuant to RCW 90.58.090 or RCW 90.58.190.

“Approval” means ~~A~~^{an} official action by a local government legislative body agreeing to submit a proposed shoreline master program or amendments to the department for review and official action pursuant to these regulations; or an official action by the department to make a local government shoreline master program effective, thereby incorporating the approved shoreline master program or amendment into the state master program.

“Appurtenance” means ~~A~~^a structure or development that is necessarily connected to the function and enjoyment of a single-family residence or other use and is located landward of the ordinary high water mark and the perimeter of a wetland. On a statewide basis, normal appurtenances include a garage; deck; driveway; utilities; fences; and grading which does not exceed two hundred fifty (250) cubic yards and which does not involve placement of fill in any wetland or waterward of the ordinary high water mark.

“Aquaculture” means ~~T~~^{the} culture or farming of food fish, shellfish, or other aquatic plants or animals, including the incidental preparation of these products for human use. The term encompasses a wide variety of activities including hatching, seeding, planting, cultivating, feeding, raising, and harvesting of plants and animals, but does not encompass the wild harvest of geoduck.

Commented [AC93]: Table 2-1 2011b

“Aquatic” means ~~A~~^{all} water bodies, including marine waters, lakes, rivers, and streams and their respective water columns and underlying lands waterward of the ordinary high water mark..

“Archaeology” means ~~T~~^{the} systematic recovery by scientific methods of material evidence remaining from man’s life and culture in past ages, and the detailed study of this evidence.

“Associated Wetlands” means ~~T~~^{those} wetlands that are in proximity to and either influence, or are influenced by tidal waters or a lake or stream subject to the Shoreline Management Act (WAC 173-22-030(1)).

“Average Grade Level means” ~~T~~^{the average of the natural or existing topography of the portion of the lot, parcel, or tract of real property which will be directly under the proposed building or structure: In the case of structures to be built over water, average grade level shall be the elevation of the ordinary high water mark. Calculation of the average grade level shall be made by averaging the ground elevations at the midpoint of all exterior walls of the proposed building or structure.}

Commented [AC94]: Ecology comment, consistent with height definition under WAC 173-27-030(3)

"Auxiliary" means ~~A~~a structure or use which is supplemental or supportive to the primary structure or use.

B. B Definitions.

"Backshore" means ~~The~~the area wetted by storm tides but normally dry between the coastline and the high tide line. It may be a narrow gravel berm below a sea bluff or a broader complex of berms, marshes, meadows, or dunes landward of the high tide line.

"Bar" means ~~S~~similar to spits and hooks, though generally not attached to the mainland during periods of high water.

"Barrier Beach" means ~~A~~an accretion shore form of sand and gravel that has been deposited by longshore drift, like storm barriers, in front of bluffs, bays, marshes and estuaries.

"Bathymetry" means ~~Bathymetric~~ ~~The~~the measurement of water depth at various places in a body of water; also: the information derived from such measurements - bathymetric

"Beach" means ~~T~~the zone of unconsolidated material that is moved by waves, wind and tidal currents, extending landward to the coastline.

"Beach feeding" means ~~A~~a process by which beach material is deposited at one or several locations in the updrift portion of a driftcell. The material is then naturally transported by a wave's down drift to stabilize or restore eroding beaches or berms.

"Benthic/Benthos" means ~~O~~of or having to do with the bottom of oceans or seas. In biology, "benthos" meaning the organisms living on or in the bottom of oceans, lakes, or streams.

"Berm" means ~~a~~A linear mound of sand or gravel that is placed parallel to the shore at or above the ordinary high water mark. This may be a natural or a manmade feature.

~~Best Management Practices (BMPs) BMPs are methods of improving water quality that can have a great effect when applied by numerous individuals. BMPs encompass a variety of behavioral, procedural, and structural measures that reduce the amount of contaminants in stormwater runoff and in receiving waters. The term "best management practices" is typically applied to nonpoint source pollution controls and is considered a subset of the AKART requirement.~~

"Bioengineering" means ~~T~~the practice of using natural vegetative materials to stabilize shorelines and prevent erosion. This may include use of bundles of stems, root systems, or other living plant material, soft gabions, fabric or other soil stabilization techniques, and limited rock toe protection where appropriate. Bioengineering projects often include fisheries habitat enhancement measures in project design (e.g., anchored logs, root wads, etc.). This use of bioengineering as a shoreline stabilization technique is seen as an alternative to riprap, concrete, and other structural solutions.

"Biota" means ~~T~~the animals and plants that live in a particular location or region.

"Biologist" means - Qualifications

"Biotic" means ~~O~~of or relating to life; *especially*: caused or produced by living beings.

“Boat Launch or Ramp” means ~~G~~graded slopes, slabs, pads, planks, or rails used for launching boats by means of a trailer, hand, or mechanical device.

“Boat Lift” means ~~A~~a mechanical device that can hoist vessels out of the water for storage and place vessels into the water. These devices are usually located along a pier.

“Boating Facilities” means ~~B~~oating facilities including ~~ing~~e marinas, both backshore and foreshore, dry storage and wet-moorage types, covered moorage, boat launches, and marine travel lifts. Boating facility standards do not apply to docks serving four or fewer single-family residences.

“Boathouse” means ~~A~~a structure designed for storage of vessels located over water or in upland areas, which is designed to surround or enclose the vessel. Boathouses should not be confused with “houseboats.”

“Bog” means ~~A~~a shallow water area that may be filled by sedimentation and the decaying of vegetation.

“Breakwater” means ~~A~~a n off-shore structure generally built parallel to the shore that may or may not be connected to land. Its primary purpose is to protect a harbor, moorage, or navigational activity from wave and wind action by creating a still-water area along the shore. A secondary purpose is to protect the shoreline from wave-caused erosion.

“Buffer” means ~~T~~he zone contiguous to an ~~n~~ environmentally sensitive critical area that is required for the continued maintenance, function, and/or structural stability of the critical area. Buffer widths vary depending on the relative quality and sensitivity of the area being protected. Unlike zoning setbacks, buffer areas are intended to be left undisturbed, or may need to be enhanced to support natural processes, functions and values. The critical functions of the riparian buffer (those associated with an aquatic system) include shading, input of organic debris and coarse sediments, uptake of nutrients, stabilization of banks, interception of sediments, overflow during high water event, protection from disturbance by humans and domestic animals, maintenance of a wild habitat, and room for variation of aquatic system boundaries over time due to hydrological or climatic effects. The critical functions of terrestrial buffers include protection of slope stability, attenuation of surface water flows from stormwater runoff and precipitation, and erosion control.

(Also See “Setbacks”).

~~Building—Any structure having a roof supported by columns or walls used or intended to be used for the shelter or enclosure of any use or occupancy. (different but consistent with AMC)~~

“Building Setback Line” means ~~U~~nless otherwise indicated with this Master Program, the line which establishes the limits of all buildings, structures, and fencing along the shoreline. Setback lines are based upon land use patterns while setbacks associated with buffers are intended to protect critical areas (See “buffer”).

“Building Height” – see ~~Height~~ [Section 5.12 Shoreline Use and Modification Matrix and Development Standards.](#)

“Bulkhead” means ~~A~~a solid or open-pile wall usually constructed parallel to the shore whose primary purpose is to contain and prevent the loss of soil by erosion, wave, or current action. Bulkheads are used to protect marine bluffs by retaining soil at the toe of the slope or by

Commented [AC95]: Table 4-1 #7

protecting the toe of the bank from erosion and undercutting. Bulkheads are typically constructed of poured-in-place concrete, steel or aluminum sheet piling, wood, or wood and structural steel combinations.

Bulkheads are normally lighter than a seawall and similar to structures termed "Revetments" defined below.

"Buoy" ~~Buoys are~~ means a floating devices anchored in a waterbody for navigational purposes or moorage. See also "Mooring Buoy."

B.C. C Definitions.

"Campground" means ~~A~~an outdoor area established for overnight accommodation of recreational users.

"Channel" means ~~A~~an open conduit for water either naturally or artificially created, but does not include artificially created irrigation, return flow, or stock watering channels. See also "Stream".

~~City- The incorporated City of Anacortes, Washington.~~

"Clearing" means ~~T~~the destruction or removal of vegetation, ground cover, shrubs and trees including, but not limited to, root material removal that affects the erosive potential of the soils on the site. This includes such activities as clear-cutting or selective harvest of trees, chipping of stumps and hauling off of shrubs, slash piles, etc.

"Coastline" ~~menas~~ ~~T~~the highest landward line of long-term marine water effect upon the land.

"Covered Moorage" means ~~B~~boat moorage, with or without walls, that has a roof to protect the vessel.

"Commercial ~~Commercial~~ developments" ~~are~~ means those uses that are involved in wholesale and retail trade or business activities. Examples include but are not limited to hotels, motels, grocery stores, restaurants, shops, offices, and indoor recreation facilities.

~~Comprehensive Plan- The document, including maps, adopted by the City Council that outlines the City's goals and policies relating to management of growth, and prepared in accordance with Ch. 36.70A RCW. The term also includes adopted sub area plans prepared in accordance with Ch. 36.70A RCW.~~

"Conditional Use" means ~~A~~ a use, development, or substantial development that is classified as a conditional use or is not classified within the applicable master program. Refer to WAC 173-27-030(4).

"Conservancy" means ~~A~~an area with natural, cultural, or historical resources of exceptional value.

"County" means ~~Skagit County, Washington.~~

"Creek" means ~~A~~a small stream; often a shallow or intermittent tributary to a river. Surface water run-off flowing in a natural or modified channel that is drawn by gravity to progressively lower levels and eventually to the sea.

"Critical Areas", ~~means~~, ~~F~~for the purposes of this Master Program, ~~"critical areas" include areas~~ including aquifer recharge areas, fish and wildlife habitat conservation areas, frequently flooded areas, geologically hazardous areas, and wetlands. Under the GMA, critical areas are to be classified, designated and protected. In designating and protecting critical areas, the City ~~shall~~ will use the best available science, consistent with RCW 36.70A.172.

"Cumulative Impact" ~~means~~, ~~T~~he impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

~~C~~D. D Definitions.

"Development" ~~means~~, ~~A~~a use consisting of the construction or exterior alteration of structures; dredging; drilling; dumping; filling; removal of any sand, gravel, or minerals; bulkheading; driving of piling; placing of obstructions; or any other project of a permanent or temporary nature which interferes with the normal public use of the surface of the waters overlying lands subject to the Act at any state of water level (RCW 90.58.030(3d)). ~~"Development" does not include dismantling or removing structures if there is no other associated development or re-development.~~ See also "Substantial Development."

Commented [AC96]: Table 2-1 2017b

"Dock" ~~means~~ A dock or pier is a landing and or moorage facility for watercraft that abuts the shoreline and extends over the water. Docks are anchored to the land, substrate or the pier with pilings or anchors and float on the water. This definition does not include recreational decks, storage facilities, or other appurtenances which may be associated with the dock or pier.

"Downdrift" ~~means~~, ~~T~~he direction of movement of beach materials.

"Dredge Spoil" or "Dredge Material" ~~means~~, ~~T~~he material removed by dredging.

"Dredging" ~~means~~, ~~t~~he removal of earth, sand, gravel, silt, or debris from the bottom of a stream, river, lake, bay, or other water body and associated wetlands.

"Drift cell" ~~means~~, ~~A~~a particular reach of marine shore in which littoral drift may occur without significant interruption and which contains any natural sources of such drift and also accretion shore forms created by such drift.

"Driftway" ~~means~~, ~~T~~he foreshore area that connects a feeder bluff and its accretion from where sand or gravel is deposited by net effect of wave action and longshore drifts.

~~Dwelling - Any building or portion thereof designed or used primarily for residential occupancy, including single family dwellings, duplexes, triplexes, fourplexes, and multifamily dwellings, and condominiums, but not including hotels or motels.~~

~~Dwelling, multifamily - A building containing two or more dwelling units.~~

~~Dwelling, single family - A dwelling designed for single family occupancy~~

E. E Definitions.

Ecological Functions—"Ecological functions" or "shoreline functions" means the work performed or role played by the physical, chemical, and biological processes that contribute to the maintenance of the aquatic and terrestrial environments that constitute the shoreline's natural ecosystem. See WAC 173-26-201(2)(c).

The beneficial roles served by ecological functions include, but are not limited to, water quality protection and enhancement, fish and wildlife habitat, food chain support, flood storage, conveyance and attenuation, ground water recharge and discharge, erosion control, wave attenuation, protection from hazards, historical and archaeological and aesthetic value protection, educational opportunities, and recreation. These beneficial roles are not listed in order of priority. Functions can be used to help set targets (species composition, structure, etc.) for managed areas, including mitigation sites.

"Economic Development" means ~~A~~a development that provides a service, produces a good, retails a commodity, or engages in any other use or activity for the purpose of making financial gain.

"Ecosystem-wide processes" means ~~T~~the suite of naturally occurring physical and geologic processes of erosion, transport, and deposition; and specific chemical processes that shape landforms within a specific shoreline ecosystem and determine both the types of habitat and the associated ecological functions.

"Emergency" means ~~A~~an unanticipated and imminent threat to public health, safety, or the environment which requires immediate action within a time too short to allow full compliance with the Master Program. Emergency construction is construed narrowly as that which is necessary to protect property from the elements (RCW 90.58.030(3eiii) and WAC 173-27-040(2d)). See also "Substantial Development".

"Enhancement" means ~~A~~alteration of an existing resource to improve or increase its characteristics and processes without degrading other existing functions. Enhancements are to be distinguished from resource creation or restoration projects.

"Environmental Impacts" means ~~T~~the effects or consequences of actions on the natural and built environments. Environmental impacts include effects upon the elements of the environment listed in the State Environmental Policy Act (SEPA) (WAC 197-11-600 and WAC 197-11-444)

"Environment(s) (Shoreline Environment(s))" means ~~D~~designations given specific shoreline areas based on the existing development pattern, the biophysical capabilities and limitations, and the goals and aspirations of local citizenry, as part of a Master Program.

"Erosion" means ~~T~~the group of natural processes including weathering, dissolution, abrasion, corrosion, and transporting by which earthy or rocky material is removed from any part of the earth's surface.

"Esplanade" means ~~A~~a public walk or walkway.

"Estuary" means ~~T~~that portion of a coastal stream influenced by the tide of marine waters into where it flows and where the seawater is diluted with fresh water derived from land drainage.

"Exempt Development" means ~~C~~certain specific developments as listed in WAC 173-27-040 and Chapter 90.58 RCW are exempt from the definition of substantial development and therefore exempt from the substantial development permit process of the SMA. An activity that is

exempt from the substantial development provisions of the SMA must still be carried out in compliance with policies and standards of the Act and the local master program. Conditional use and/or variance permits may also still be required even though the activity does not need a substantial development permit (RCW 90.58.030(3e)).

"Extreme Low Tide" means ~~T~~the lowest line of the land reached by a receding tide.

F. F Definitions.

"Fair Market Value" of a development means ~~"Fair market value" of a development is~~ the open market bid price for conducting the work, using the equipment and facilities, and purchase of the goods, services and materials necessary to accomplish the development. This would normally equate to the cost of hiring a contractor to undertake the development from start to finish, including the cost of labor, materials, equipment and facility usage, transportation and contractor overhead and profit. The fair market value of the development ~~shall~~will include the fair market value of any donated, contributed or found labor, equipment, or materials.

"Feasible" means ~~Pursuant to the Shoreline Guidelines (WAC 173-26), feasible~~ means that an action, such as a development project, mitigation, or preservation requirement, meets all of the following conditions:

- (a) The action can be accomplished with technologies and methods that have been used in the past in similar circumstances, or studies or tests have demonstrated in similar circumstances that such approaches are currently available and likely to achieve the intended results;
- (b) The action provides a reasonable likelihood of achieving its intended purpose; and
- ~~-(c)~~ The action does not physically preclude achieving the project's primary intended legal use. In cases where these guidelines require certain actions unless they are proven to be infeasible, the burden of proving infeasibility is on the applicant. In determining an action's infeasibility, the reviewing agency may weigh the action's relative public costs and public benefits, considered in the short- and long-term time frames.

"Feeder Bluff" means ~~A~~a shore or sea bluff whose eroding material is transported by longshore drift and provides the building blocks and nourishment for spits, bars, hooks, and other accretion shore forms.

"Fill" means ~~T~~the addition of soil, sand, rock, gravel, sediment, earth retaining structure, or other material to an area waterward of the OHWM, in wetlands, or on shorelands in a manner that raises the elevation or creates dry land.

"First Class Tidelands" means ~~T~~the shores of navigable tidal waters belonging to the state, lying within or in front of the corporate limits of any city, or within one mile of either side and between the line of ordinary high tide and the inner harbor line; and within two miles of the corporate limits on either side and between the line of ordinary high tide and the line of extreme low tide.

"Float" means ~~A~~a floating structure, not connected to the shoreline, that is moored, anchored, or otherwise secured in the water.

"Floating Home" means ~~A~~a floating structure that is designed and built to be used, or is modified

to be used, as a stationary waterborne residential dwelling.

“Flood Control” ~~means~~ ~~a~~ Any undertaking for the conveyance, control, and dispersal of floodwaters caused by abnormally high direct precipitation or stream overflow.

“Floodplain” ~~means~~ ~~A~~ a term synonymous with the hundred-year floodplain, meaning that land area susceptible to inundation with a one percent chance of being equaled or exceeded in any given year. The limit of this area ~~shall~~ ~~must~~ ~~is~~ be based upon flood ordinance regulation maps or a reasonable method that meets the objectives of the Shoreline Management Act.

“Floodway” ~~means~~ ~~T~~ the area, as identified in a master program, that either: (i) Has been established in federal emergency management agency flood insurance rate maps or floodway maps; or (ii) consists of those portions of a river valley lying streamward from the outer limits of a watercourse upon which flood waters are carried during periods of flooding that occur with reasonable regularity, although not necessarily annually, said floodway being identified, under normal condition, by changes in surface soil conditions or changes in types or quality of vegetative ground cover condition, topography, or other indicators of flooding that occurs with reasonable regularity, although not necessarily annually. Regardless of the method used to identify the floodway, the floodway ~~shall~~ ~~will~~ ~~does~~ not include those lands that can reasonably be expected to be protected from flood waters by flood control devices maintained by or maintained under license from the federal government, the state, or a political subdivision of the state. [\[RCW 90.58.030\(2\)\(b\)\]](#)

Commented [AC97]: Gap Analysis: Table 2-1 2007a

“Forest Practices” ~~means~~ ~~A~~ any activity conducted on or directly pertaining to forest land and relating to growing, harvesting, or processing timber, including but not limited to: road and trail construction; harvesting, final and intermediate; precommercial thinning; reforestation; fertilization; prevention and suppression of diseases and insects; salvage of trees; and brush control. Forest practice ~~shall~~ ~~will~~ ~~does~~ not include preparatory work such as tree marking, surveying and road flagging, and removal or harvesting of incidental vegetation from forest lands such as berries, ferns, greenery, mistletoe, herbs, mushrooms, and other products which cannot normally be expected to result in damage to forest soils, timber, or public resources.

“Functions and Values” (see “Ecological Functions”)

~~D~~. ~~G~~. [G Definitions.](#)

“Gabions” ~~means~~ ~~S~~ structures composed of masses of rocks, rubble, or masonry held tightly together usually by wire mesh so as to form blocks or walls. Sometimes used on heavy erosion areas to retard wave action or as foundations for breakwaters or jetties.

“Geomorphology” ~~means~~ ~~T~~ the science dealing with the relief features of the earth and the processes influencing their formation.

“Geotechnical report or geotechnical analysis” ~~means~~ ~~A~~ a scientific study or evaluation conducted by a qualified expert that includes a description of the ground and surface hydrology and geology, the affected land form and its susceptibility to mass wasting, erosion, and other geologic hazards or processes, conclusions and recommendations regarding the effect of the proposed development on geologic conditions, the adequacy of the site to be developed, the impacts of the proposed development, alternative approaches to the proposed development, and measures to mitigate potential site-specific and cumulative geological and hydrological impacts of the proposed development, including the potential adverse impacts to adjacent and down-current

properties. Geotechnical reports ~~shall~~will must conform to accepted technical standards and must be prepared by qualified professional engineers or geologists who have professional expertise about the regional and local shoreline geology and processes.

~~GMA—Growth Management Act—Washington State House Bill 2929 adopted in 1990 and amendments thereto. Codified largely within Chapter 36.70A RCW.~~

~~Grading—The movement or redistribution of the soil, sand, rock, gravel, sediment, or other material on a site in a manner that alters the natural contour of the land.~~

“Grassy Swale” means ~~A~~a vegetated drainage channel that is designed to remove various pollutants from storm water runoff through biofiltration.

“Groyne” means ~~A~~a barrier-type structure extending from the backshore or stream bank into a water body. The purpose of a groyne is to interrupt sediment movement along the shore. A groyne is also referred to as a rock weir.

“Guidelines” means ~~in~~in context of the Shoreline Master Program Guidelines, ~~and those standards~~those standards adopted by the department to implement the policy of chapter 90.58 RCW for regulation of use of the shorelines of the state prior to adoption of master programs. Such standards ~~shall~~must also provide criteria for local governments and the department in developing and amending master programs.

H. H Definitions.

“Habitat” means ~~T~~the place or type of site where a plant or animal naturally or normally lives and grows.

“Harbor Area” means ~~T~~the area of navigable tidal waters as determined in Section I of Article 15 of the Washington State constitution, which ~~shall~~must be forever reserved for landings, wharves, streets, and other conveniences of navigation and commerce.

“Hearings Board” means ~~T~~the State Shorelines Hearings Board established by the Act.

Height: Is defined under SMP Section 5.12 Shoreline Use and Modification Matrix and Development Standards. ~~Height shall be measured from average grade level to the highest point of a structure not otherwise excepted from the height limits, where “average grade level” is: the average of the natural or existing topography of the portion of the lot, parcel or tract of real property which will be directly under the proposed building or structure; provided, that in the case of structures to be built over water, average grade level shall be the elevation of ordinary high water. Calculation of the average grade level shall be made by averaging the elevations at the center of all exterior walls of the proposed building or structure. Additionally, “natural or existing topography” is: The topography of the lot, parcel or tract of real property immediately prior to any site preparation, grading, excavation, or filling.~~

~~No building or structure in the Shoreline Area (200 feet from OHWM) shall exceed the height limits indicated on Table 5.2, except:~~

~~1. Cranes, gantries, mobile conveyors and similar equipment necessary for the function of marinas, marine manufacturing, permitted commercial, industrial or port activities and servicing vehicles.~~

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~~2. Flagpoles or masts, transmission towers, chimneys, smokestacks, aerials or stairwells, when part of a permitted use.~~

~~3. Belfries, monuments, spires or steeples, transmission towers, provided such structures shall be designed to minimize obstruction of views.~~

~~4. In non-residential zones, penthouses for elevator and other mechanical equipment and monitors for light and ventilation are permitted, when occupying less than 15% of the total roof area less than 5% of lot coverage and extending not more than 10 feet above roof level.~~

~~5. When considering allowance of structures to exceed the height limitations the Planning commission must consider:~~

~~a. View obstruction;~~

~~b. Alternate siting outside shoreline areas;~~

~~c. Significance of alteration of existing skyline profile.~~

~~d. The variance criteria in Chapter 15 of this SMP.~~

~~Temporary construction equipment is not used in calculating height.~~

~~For Personal Wireless Service Facilities/Emergency Communication Facilities, height means the vertical distance measured from the lowest pre-existing ground level within the footprint of the facility to the highest point on the facility, including but not limited to the antenna or antenna array.~~

~~"Historic" means -H~~having considerable importance or influence in history; historical.

~~"Historic Overwater Structure" means -T~~those overwater structures which are identified on the City's historic register.

~~"HPA -Hydraulic Project Approval (HPA)" means -T~~the permit issued by the Washington State Department of Fish and Wildlife pursuant to the State Hydraulic Code Chapter 77.55 RCW.

~~"Hydric Soil" -Hydric soil~~ means soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper soil horizon(s), thereby influencing the growth of plants.

~~"Hydrophytes" means -P~~plants capable of growing in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content.

I. Definitions.

~~"Impervious Surface" means a non-vegetated surface area that either prevents or retards the entry of water into the soil mantle as under natural conditions prior to development. A non-vegetated surface area which causes water to run off the surface in greater quantities or at an increased rate of flow from the flow present under natural conditions prior to development. Common impervious surfaces include, but are not limited to, roof tops, walkways, patios, driveways, parking lots or stormwater areas, concrete or asphalt paving, gravel roads, packed~~

earthen materials, and oiled, macadam or other surfaces which similarly impede the natural infiltration of stormwater.

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"Industry" means ~~T~~the production, processing, manufacturing, or fabrication of goods or materials. Warehousing and storage of materials or production is considered part of the industrial process.

"Inner Harbor Line" means ~~A~~a line located and established in navigable tidal waters between the line of ordinary high tide and the outer harbor line and constituting the inner boundary of the harbor area.

"In-kind Replacement" means ~~T~~o replace wetlands, biota or other organisms with substitute flora or fauna whose characteristics closely match those destroyed, displaced, or degraded by an activity.

"In-Stream Structures" means ~~S~~structures waterward of the ordinary high water mark that either cause or have the potential to cause water impoundment or the diversion, obstruction, or modification of water flow.

J. Definitions.

"Jetty" means ~~A~~a structure generally perpendicular to the shore, extending through or past the intertidal zone. Jetties are built singly or in pairs at a harbor entrance or river mouth mainly to prevent accretion from littoral drift in an entrance channel, which may or may not be dredged. Jetties also serve to protect channels from storm waves or cross currents and to stabilize inlets through barrier beaches. On the Pacific Coast, most jetties are of rip-rapped, mound construction.

K. K Definitions. None

Reserved.

L. L Definitions.

"Lake" means ~~A~~a body of standing water in a depression of land or expanded part of a river, including reservoirs, of twenty (20) acres or greater in total area. A lake is bounded by the ordinary high water mark or, where a stream enters a lake, the extension of the elevation of the lake's ordinary high water mark within the stream (WAC 173-22-030(9)).

~~Landscaping Vegetative ground cover including shrubs, trees, flower beds, grass, ivy and other similar plants and including tree bark and other materials which aid vegetative growth and maintenance.~~

~~LID, Low Impact Development Low impact development is a stormwater management and land development strategy applied at the parcel and subdivision scale that emphasizes conservation and use of on-site natural features integrated with engineered, small scale hydrologic controls to more closely mimic predevelopment hydrologic functions.~~

"Littoral Drift" means ~~T~~the mud, sand, or gravel material moved parallel to the shoreline in the nearshore zone by waves and currents.

M. M Definitions.

“Marina” means ~~A~~ a facility that provides launching, storage, supplies, moorage, and other accessory services for five or more pleasure and/or commercial water craft.

“Marine” means ~~P~~ pertaining to tidally influenced waters, including oceans, sounds, straits, marine channels, and estuaries, including the Pacific Ocean, Puget Sound, Straits of Georgia and Juan de Fuca, and the bays, estuaries and inlets associated therewith.

“Marine bluffs” means ~~S~~ slopes greater than 40 percent that exceed a vertical height of 10 feet within the marine shoreline jurisdiction.

“Master Program” means ~~T~~ the comprehensive use plan for a described area and the use regulations together with maps, diagrams, charts, or other descriptive material and text; a statement of desired goals and standards developed in accordance with the policies enunciated in RCW 90.58.020.

“May” means ~~T~~ the action is acceptable, provided it conforms to the provisions of these regulations.

“Mining” means ~~T~~ the removal of naturally occurring rock, sand, gravel, and minerals from the earth.

“Mitigation” or “Mitigation Sequencing” means ~~T~~ the process necessary to avoid, minimize or reduce, or compensate for the environmental impact(s) of a proposal (see WAC 197-11-768 and WAC 173-26-201(2.e)). Mitigation or mitigation sequencing means the following sequence of steps listed in order of priority, with (a) of this subsection being top priority:

1. Avoiding the impact altogether by not taking a certain action or parts of an action;
2. Minimizing impacts by limiting the degree or magnitude of the action and its implementation by using appropriate technology or by taking affirmative steps to avoid or reduce impacts;
3. Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
4. Reducing or eliminating the impact over time by preservation and maintenance operations;
5. Compensating for the impact by replacing, enhancing, or providing substitute resources or environments; and
6. Monitoring the impact and the compensation projects and taking appropriate corrective measures.

“Mixed-use Development” means ~~Mixed-use projects are~~ developments that combine water-dependent/water-related uses with water-enjoyment uses and/or non-water-oriented uses. Mixed-use developments can be a tool for increased water-dependent activities, civic revitalization, and public access to the shoreline. To encourage mixed-use projects that achieve a public benefit, special provisions can be included in a master program that offer a potential developer incentives or more latitude than normal master program requirements. In return, the developer’s proposal must include elements that further the objectives of the Shoreline Management Act and benefit the public. Implicit in the concept of mixed-use provisions is that additional development incentives must be justified by increased and long-term public benefit resulting from the project and that the public benefit must relate to SMA objectives. Generally in mixed-use projects the water-oriented uses and non-revenue recreation uses are

“subsidized” by the economic advantages of the other uses in the sense that the water-oriented uses could not be economically developed without support from viable non-water-oriented uses

“Mixed Use Facility” means ~~A~~ mixed-use facility is a structure or development that combines non-water-oriented uses such as transient accommodations, residential units, or retail with one or more water-oriented uses in a manner that takes advantage of a shoreline location and which, as a general characteristic of the use, provides shoreline recreational and aesthetic enjoyment for a substantial number of people. In order to meet the definition of a mixed use facility, the facility must be designed to protect views to the shoreline, must be open to the general public and must be devoted to the specific aspects of the use that foster shoreline enjoyment.

“Moorage” means ~~A~~ any device or structure used to secure a vessel for temporary anchorage, but which is not attached to the vessels (such as a docks or buoys).

“Moorage Piles” means ~~S~~ structural members that are driven into the lake bed or tide lands to serve as a stationary moorage point. They are typically used for moorage of small boats in the absence of, or instead of, a dock or pier. In some cases, moorage piles may be associated with a dock or pier.

“Mooring Buoy” means ~~A~~ a floating object anchored to the bottom of a water body that provides tie up capabilities for vessels.

“Mooring Buoy Field” means ~~T~~ the existence or establishment of 12 or more mooring buoys in a contiguous area.

“Multiple-Use” means ~~T~~ the combining of compatible uses within one development.

“Must” means ~~A~~ a mandate; the action is required.

E.N. N Definitions.

“Native Plants” or “Native Vegetation” means ~~P~~ plant species that are indigenous to Fidalgo Island.

“Natural” means ~~A~~ a shoreline possessing unique or fragile features that are totally or essentially unaltered from their natural state or are relatively intolerant of human use other than for passive historical, cultural, scientific, recreational, archaeological, or educational activity.

“Natural or Existing Topography” means ~~T~~ the topography of the lot, parcel, or tract of real property immediately prior to any site preparation or grading, including excavation or filling.

“Navigable Waters” means ~~T~~ those waters lying waterward of and below the line of navigability on lakes not subject to tidal flow, or extreme low tide mark in navigable tidal waters, or the outer harbor line where harbor area has been created.

“No Net Loss” means No net loss of ecological function shall be measured based on the data submitted with a shoreline application, and SEPA checklist if applicable.

“Nonconforming development” or “Nonconforming structure” means ~~A~~ an existing development or structure that was lawfully constructed at the time it was built but is no longer fully consistent with present regulations such as setbacks, buffers or yards; area; bulk; height or density standards due to subsequent changes to the master program.

"Nonconforming lot" means ~~A~~ a lot that met dimensional requirements of the applicable master program at the time of its establishment but now contains less than the required width, depth or area due to subsequent changes to the master program.

~~Non-conforming Use or Development~~ ~~A shoreline use or structure or portion thereof which was lawfully constructed or established prior to the effective date of the Shoreline Management Act or local shoreline master program provision, or amendments, but no longer conforms to the policies and regulations of this Master Program.~~

"Nonconforming use" means ~~A~~ an existing shoreline use that was lawfully established prior to the effective date of the act or the applicable master program, but which does not conform to present use regulations due to subsequent changes to the master program.

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"Non-water-oriented Use" means ~~A~~ a use that has little or no relationship to the shoreline and is not considered a priority use under the Shoreline Management Act. All uses which do not meet the definition of water-dependent, water-related, or water-enjoyment are classified as non-water-oriented uses.

Examples of non-water-oriented uses include professional offices, general retail or commercial uses, residential development, condominiums, and mini-storage facilities.

"Normal Maintenance" means ~~T~~ those usual acts to prevent a decline, lapse, or cessation from a lawfully established condition (WAC 173-27-040(2b)). See also "Normal Repair".

"Normal Protective Bulkhead" means ~~A~~ a bulkhead, common to single-family residences, constructed at or near the ordinary high water mark to protect an existing single-family residence, and which sole purpose is for protecting land from erosion, not for the purpose of creating new land (WAC 173-27-040(2c)).

"Normal Repair" means ~~a~~ Activities that restore the character, size or scope of a project only to the previously authorized condition within a reasonable period after decay or partial destruction, excepting that repair involving total replacement which is not common practice or causes substantial adverse effects to the shoreline resource or environment ~~shall~~ will not be construed as normal repair (WAC 173-27-040(2b)) See also "Normal Maintenance".

"Noxious Weed" means ~~A~~ any plant which is invasive, such as Himalayan blackberries, nettles, Scotch broom, Spartina, and listed on the state noxious weed list in Chapter 16-750 WAC.

~~F.O.~~ O Definitions.

"Offshore" means ~~T~~ the sloping subtidal area seaward from the low tideland.

"Offshore Moorage Device" means ~~A~~ an offshore device anchored or otherwise attached to the sea bottom used to moor water craft.

"Off-site Compensation" means ~~T~~ to compensate for lost or degraded wetlands or other shoreline environmental resources by creating or restoring these areas on lands other than the site on which the impacts were located

"On-site Compensation" means ~~T~~ to compensate for lost or degraded wetlands or other shoreline environmental resources by creating or restoring these areas at or adjacent to the site on which the

impact were located.

"Out-of-kind compensation" means ~~to~~ compensate for lost or degraded wetlands or other shoreline environmental resources by creating substitute habitat whose characteristics do not closely approximate those lost or degraded by a development activity.

"One-hundred-year Flood" means ~~the~~ the maximum flood expected to occur during a one-hundred-year period.

~~Open Space—A land area allowing view, use, or passage that is almost entirely unobstructed by buildings, paved areas, or other man-made structures.~~

"Ordinary High Water Mark (often abbreviated OHWM)" means ~~that~~ that mark on all lakes, streams, and tidal waters that will be found by examining the bed and banks and ascertaining where the presence and action of waters are so common and usual, and so long continued in all ordinary years, as to mark upon the soil a character distinct from that of the abutting upland in respect to vegetation as that condition exists on June 1, 1971 or as it may naturally change thereafter; or as it may change thereafter in accordance with permits issued by the local government or the Washington State Department of Ecology; provided that in any area where the ordinary high water mark cannot be found, the ordinary high water mark adjoining saltwater ~~shall~~ will be the line of mean higher high tide, and the ordinary high water mark adjoining fresh water ~~shall~~ will be the line of mean high water.

"Outer Harbor Line" means ~~a~~ a line located and established in navigable waters as provided in Section 1 of Article 15 of the Washington State Constitution, beyond which the state ~~shall~~ will never sell or lease any rights whatsoever.

"Over-water Structure" means ~~any~~ any device or structure projecting over the ordinary high water mark, including, but not limited to piers, docks, floats, and moorage or anchor buoys.

~~Parking Space or Parking Stall—Areas providing for the storage of motor vehicles, including vista parking facilities. Excepting however, that this definition shall not apply to vehicle holding areas necessary to support a publicly operated ferry system.~~

P. Definitions.

"Performance Standard" means ~~the~~ regulations, which include bulk and dimensional standards that are applied to the design and function of a development or use.

"Permit (or Shoreline Permit)" means ~~any~~ any substantial development, variance or conditional use permit, or revision, or any combination thereof, authorized by the Act (WAC 173-27-030(13)).

~~Person—An individual, firm, partnership, corporation, association, organization, agency, or any non-federal entity however designated.~~

"Pier" means ~~a~~ a fixed, pile-supported structure ~~that sits in~~ above the water.

"Pocket Beach" means ~~in~~ in this Master Program, ~~pocket beach refers to~~ an isolated accretion beach bordered by shoreline modifications.

"Point" means ~~a~~ a low profile beach promontory, generally of triangular shape whose apex extends

seaward.

"Pollutant" means ~~A~~ any substance that has been or may be determined to cause or tend to cause injurious, corrupt, impure, or unclean conditions when discharged to surface water, air, ground, sanitary sewer system, or storm drainage system.

"Port" means ~~a~~ center for water-borne commerce and traffic.

"Practicable Alternative" means ~~A~~ an alternative that is available and capable of being carried out after taking into consideration short-term and long-term cost, existing technology, options of project scale and phasing, and logistics in light of overall project purposes, and having less impacts to environmentally sensitive areas. It may include using an area not owned by the applicant that can reasonably be obtained, utilized, expanded, or managed in order to fulfill the basic purpose of the proposed development.

"Priority habitat" means ~~A~~ a habitat type with unique or significant value to one or more species. An area classified and mapped as priority habitat must have one or more of the following attributes:

- Comparatively high fish or wildlife density;
- Comparatively high fish or wildlife species diversity;
- Fish spawning habitat;
- Important wildlife habitat;
- Important fish or wildlife seasonal range;
- Important fish or wildlife movement corridor;
- Rearing and foraging habitat;
- Important marine mammal haul-out;
- Refuge habitat;
- Limited availability;
- High vulnerability to habitat alteration;
- Unique or dependent species; or
- Shellfish bed.

A priority habitat may be described by a unique vegetation type or by a dominant plant species that is of primary importance to fish and wildlife (such as oak woodlands or eelgrass meadows). A priority habitat may also be described by a successional stage (such as, old growth and mature forests). Alternatively, a priority habitat may consist of a specific habitat element (such as a consolidated marine/estuarine shoreline, caves, snags) of key value to fish and wildlife. A priority habitat may contain priority and/or non-priority fish and wildlife.

"Priority Species" means ~~S~~ species requiring protective measures and/or management guidelines to ensure their persistence at genetically viable population levels. Priority species are those that meet any of the criteria listed below.

~~(a)~~ Criterion 1. State-listed or state proposed species. State-listed species are those native fish and wildlife species legally designated as endangered (WAC 232-12-014), threatened (WAC 232-12-011), or sensitive (WAC 232-12-011). State proposed species are those fish and wildlife species that will be reviewed by the department of fish and wildlife (POL-M-6001) for possible listing as endangered, threatened, or sensitive according to the process and criteria defined in WAC 232-12-297.

~~(b)~~ Criterion 2. Vulnerable aggregations. Vulnerable aggregations include those species or groups of animals susceptible to significant population declines, within a specific area or statewide, by virtue of their inclination to congregate. Examples include heron colonies, seabird concentrations, and marine

mammal congregations.

~~(c)~~ Criterion 3. Species of recreational, commercial, and/or tribal importance. Native and nonnative fish, shellfish, and wildlife species of recreational or commercial importance and recognized species used for tribal ceremonial and subsistence purposes that are vulnerable to habitat loss or degradation.

~~(d)~~ Criterion 4. Species listed under the federal Endangered Species Act as either proposed, threatened, or endangered.

"Priority Use" means a shoreline use that ~~the~~ the Shoreline Management Act and this Master Program give preference to ~~shoreline uses that are~~ is water-dependent or water-related, provide public access and recreational use of the shoreline, as well as other uses which provide an opportunity for substantial numbers of people to enjoy the shoreline and to single-family residences (See RCW 90.58.020)

"Proposed, Threatened and Endangered (PTE) Species" means ~~those~~ those native species that are proposed to be listed or are listed in rule by the Washington State Department of Fish and Wildlife as threatened or endangered, or that are proposed to be listed as threatened or endangered or that are listed as threatened or endangered under the federal Endangered Species Act.

"Public Access" means ~~A~~ means of physical approach to and along the shoreline available to the general public. This may also include visual approach.

"Public Interest" means ~~the~~ the interest shared by the citizens of the state or community at large in the affairs of government, or some interest by which their rights or liabilities are affected such as an effect on public property or on health, safety, or general welfare resulting from a use or development. [WAC 173-27-030(14)]

"Public Use" ~~Public use~~ means a use to be made available daily to the general public on a first-come, first-served basis, and may not be leased to private parties on any more than a day use basis. (WAC 332-30-106(56))

R. R Definitions.

"RCW" means - Revised Code of Washington.

"Recreational Facilities" means ~~F~~ facilities such as parks, trails and pathways, campgrounds, and swim rafts that provide a means for relaxation, play, or amusement. For the purposes of this Master Program, recreational uses are divided into two categories:

1. Water-dependent (e.g., boating facilities, fishing pier, swim rafts) and
2. Non-water-dependent. Non water-dependent recreational uses are further divided into three subcategories based on their relative impact to the shoreline environment:
 - a. High Intensity recreational uses require substantial development/ land modification or large areas of fertilized lawn. Such uses may include but are not limited to camp grounds, sport courts (e.g., tennis/basketball), golf course, sport fields (e.g., ball park), aquatic center, skateboard park.
 - b. Moderate Intensity recreational uses are typified by formal parks for passive recreation (e.g., Washington and Cap Sane Parks) requiring some modification of natural conditions, limited

paving and often including accessory structures (e.g., picnic shelters, restrooms, viewing galleries, gazebos, playground equipment).

- c. Low intensity recreational uses are passive in nature (e.g., walking, photography, wildlife viewing) and require very minimal alteration of natural conditions. Such uses/modifications may include but are not limited to trails, vista points, wildlife viewing areas, picnic tables and benches.

"Recycling Facilities" means ~~R~~ recycling facility means a facility for the collection and/or sorting and storage of recyclable materials generated from domestic or small business sources, such as bottles, cans, paper, cardboard, aluminum, and plastics. This definition does not include facilities for the processing of recyclable materials, which are classified as a manufacturing use. Recycling facilities are further divided into two categories:

1. Major recycling facilities include facilities primarily dedicated to the collection, sorting, or purchase and resale of recyclable materials.
2. Minor recycling facilities include bins or other temporary or permanent facilities for the collection of small quantities of recyclable materials to be sorted and/or processed elsewhere. A minor facility may be accessory to a primary use, such as a recycling bin at a grocery store parking lot.

"Repair" (See Normal Repair)

"Residence" means ~~A~~ dwelling and those structures and developments within a contiguous ownership that are normal appurtenances. An appurtenance is necessarily connected to the use and enjoyment of a residence and is located landward of the perimeter of a wetland, and associated buffers, and landward of the ordinary high water mark. A normal appurtenance includes a garage, deck, driveway, utilities, fences, and grading that does not exceed 250 cubic yards.

"Residential Development" means ~~Residential development refers to~~ one or more buildings, structures, lots, parcels, or portions of parcels that are used or intended to be used to provide a dwelling for human beings. Residential development includes single-family residences, duplexes, other detached dwellings, multifamily residences, apartments, townhouses, mobile home parks, group housing, condominiums, subdivisions, planned unit developments, and short subdivisions. Residential development also includes accessory uses and structures such as garages, sheds, tennis courts, swimming pools, driveways, parking areas, fences, cabanas, and saunas, but not guest cottages, when allowed by the underlying zoning. Residential development does not include hotels, motels, or camping facilities.

"Restaurant" means ~~A~~ an establishment where food and drink are prepared, served and consumed primarily within the principal building. Restaurants may qualify as a water-enjoyment use when located, designed and operated to assure the public's ability to interact with the shoreline. Water-enjoyment design elements may include the incorporation of outdoor seating areas that are compatible with shoreline public access. Drive-thru restaurants are not considered water-enjoyment uses and are prohibited in the shoreline designation.

"Restore", "restoration" or "ecological restoration" means ~~T~~ the reestablishment or upgrading of impaired ecological shoreline processes or functions. This may be accomplished through measures including, but not limited to, revegetation, removal of intrusive shoreline structures and removal or treatment of toxic materials. Restoration does not imply a requirement for returning the shoreline area to aboriginal or pre-European settlement conditions (WAC 173-26-020(27)).

Restoration of ecological functions, above and beyond that which may be required as mitigation for project impacts, is considered a water-dependent use under this Master Program.

"Retrieval Lines" means ~~a~~ a system by which a float or other floating object is retrieved to a pier, dock, or shoreland.

"Revegetation" means ~~t~~ The planting of vegetation to cover any land areas that have been disturbed during construction. This vegetation ~~shall~~ must be maintained to insure its survival and ~~shall~~ will must be consistent with planting requirements of the Anacortes Landscaping Code.

"Revetment" means ~~A revetment is~~ a sloped shoreline structure built to protect an existing eroding shoreline or newly placed fill against currents and wave action. Revetments are most commonly built of randomly placed boulders (riprap) but may also be built of sand cement bags, paving, or building blocks, gabions (rock filled wire baskets) or other systems and materials. The principal features of a revetment, regardless of type is a heavy armor layer, a filter layer, and toe protection. See also "bulkheads."

"Riprap" means ~~a~~ A layer, facing, or protective mound of stone placed on shoulders, slopes, or other such places to protect them from erosion, scour, or sloughing of a structure or embankment; also, the stone so used.

"Rock Weir" means ~~A~~ a structure made of loose rock that is designed to control sediment movement, water flow, or both. A rock weir adjacent to a shoreline is typically formed by placing rock in a line outward from the shore, with the top of the rock embankment below the water level to restrict current movements parallel to the shore without completely blocking flow.

"Runoff" means ~~W~~ water that is not absorbed into the soil but rather flows along the ground surface following the topography.

S. [S Definitions.](#)

"Sediment" means ~~T~~ the fine-grained material deposited by water or wind.

"SEPA" See State Environmental Policy Act.

"SEPA Checklist" means ~~A~~ a checklist is required of some projects under SEPA to identify the probable significant adverse impacts on the quality of the environment. The checklist will also help to reduce or avoid impacts from a proposal, and help the responsible governmental agency decide whether a full environmental impact statement (EIS) is required (WAC 197-11-960).

"Scientific, Cultural and Educational Facilities" mean ~~T~~ those sites, structures, or facilities that provide unique insight into our natural and cultural heritage.

"Sea wall" means ~~A~~ a bulkhead, except its primary purpose is to artificially armor the shore from erosion by water waves and it may incidentally retain uplands or fills. Sea walls are usually more massive than bulkheads or revetments because they are designed to resist the full force of waves.

"Second Class Shoreland" means ~~L~~ land bordering on the shore of a navigable lake or river not subject to tidal flow, between the line of ordinary high water and the line of navigability and within or in front of the corporate limits of any City or within two miles thereof upon either side.

"Second Class Tideland" means ~~L~~land over which the tide ebbs and flows outside and more than two miles from the corporate limits of any City from the line of ordinary high tide to the line of extreme low tide.

"Setbacks" mean:

- A. "Setback (yard requirements)" means the distance between a building and its property lines.
- B. Shoreline Environment Setbacks – the distance between a building or use and the ordinary-high water-mark (OHWM) as established for each specific environmental designation under ~~Chapter~~ 5AMC 19.72.310-365 of this Master Program.

~~Shall – Indicates a mandate; the particular action must be done, unless a variance is secured or another appropriate exception applies.~~

"Shore Defense Works" means ~~S~~tructures or modifications for the purpose of retarding shore erosion from waves or current action, protecting channels and harbors from wave action, encouraging deposition of beach materials, preventing stream bank overflow, and retaining uplands. They may consist of bulkheads, seawall, dikes, revetments, breakwaters, jetties, groins, or gabions. Defense works are commonly constructed from quarry rock (rip-rap), treated wood, concrete, steel, and sand and gravel.

"Shoreland Areas or Shorelands" means ~~T~~hose lands extending landward for two hundred (200) feet in all directions as measured on a horizontal plane from the ordinary high water mark, including all wetlands associated with the shoreline which are subject to the provisions of this chapter; the same to be designated as to location by the Washington Department of Ecology (see also RCW 90.58.030).

"Shoreline Administrator" See Administrator.

"Shoreline areas and shoreline jurisdiction" means ~~A~~ll "shorelines of the state" and "shorelands" as defined in RCW 90.58.030.

"Shoreline Environment(s)" See "Environment"

"Shoreline Management Act of 1971" means ~~A~~a law passed by the Washington State Legislature in 1971 and ratified by the voters in 1972 (reference RCW 90.58).

"Shoreline master program or master program" means ~~T~~he comprehensive use plan for a described area, and the use regulations together with maps, diagrams, charts, or other descriptive material and text, a statement of desired goals, and standards developed in accordance with the policies enunciated in RCW 90.58.020. As provided in RCW 36.70A.480, the goals and policies of a shoreline master program for a county or city approved under chapter 90.58 RCW ~~shall~~will be considered an element of the county or city's comprehensive plan. All other portions of the shoreline master program for a county or city adopted under chapter 90.58 RCW, including use regulations, ~~shall~~will be considered a part of the county or city's development regulations.

"Shoreline Modifications" means ~~T~~hose actions that modify the physical configuration or qualities of the shoreline area, usually through the construction of a physical element such as a dike, breakwater, pier, weir, dredged basin, fill, bulkhead, or other shoreline structure. They can include other actions, such as clearing, grading, or application of chemicals.

“Shoreline Permit” ~~means~~ ~~A~~ permit to conduct a development or use as defined by RCW 90.58 and this Master Program. A shoreline permit means any form of permission required under RCW 90.58 prior to undertaking activity on shorelines of the state, including substantial development, conditional use or variance permits.

“Shoreline Setback Line” ~~—~~ ~~U~~ unless otherwise indicated within this Master Program, ~~means~~ the line which establishes the limits of all buildings, structures and fencing along the shoreline. Setback lines are based upon land use patterns while setbacks associated with buffers are intended to protect critical areas (See “buffer areas”).

Shoreline setbacks are measured horizontally in a line perpendicularly from the ordinary high water mark (OHWM) to the most waterward part of the structure.

“Shorelines” ~~means~~ ~~A~~ all the water area of Anacortes, including their associated wetlands, together with lands underlying them, except:

1. Shorelines of statewide significance.
2. Shorelines or segments of streams upstream of a point where the mean annual flow is twenty cubic feet per second or less and the wetlands associated with such upstream segments.
3. Shorelines on lakes less than twenty acres in size and wetlands associated with such small lakes.

“Shorelines Hearings Board” ~~means~~ ~~A~~ a state-level quasi-judicial body, created by the SMA, which hears appeals by any aggrieved party on the issuance of a shoreline permit, enforcement penalty and appeals by local government on DOE approval of master programs, rules, regulations, guidelines or designations under the SMA. See RCW 90.58.170; 90.58.180; and WAC 173-27-220 and 173-27-290.

“Shorelines of the State” ~~means~~ ~~T~~ the total of all shorelines and shorelines of statewide significance.

“Shorelines of Statewide Significance” ~~means~~ ~~A~~ a shoreline of the state with respect to the City of Anacortes as identified as follows: Those areas of Puget Sound and the Strait of Juan de Fuca and adjacent saltwaters north to the Canadian line and lying seaward from the line of extreme low tide. Padilla Bay, from March Point to William Point, is also identified as a specific estuarine area and is considered a Shoreline of Statewide Significance waterward from the ordinary high water mark and all associated shorelands.

“Should” ~~means~~ ~~A~~ a particular action is required unless there is a demonstrated, compelling reason, based on policy of the Shoreline Management Act and these regulations, against taking the action.

~~Sign—Any visual communication device, structure, placard or fixture that uses color, form, graphic, illumination, symbol, or writing to advertise, announce the purpose of, or identify the purpose of a person or entity, or to communicate information of any kind to the public. For the purpose of this chapter, a sign is not considered to be building or structural design, but is restricted solely to graphics, symbols or written copy that is meant to be used in the aforementioned way. However, a sign shall not include the following:~~

~~a.—Official notices authorized by a court, public body or public officer.~~

~~b.—Direction, warning, or information sign authorized by federal, state, or municipal authority.~~

~~e.—The official flag, emblem, or insignia of a government, school or religious group or agency.~~

~~d.—A memorial plaque or tablet, or cornerstones indicating the name of a building and date of construction, when cut or carved into any masonry surface or when made of bronze or other incombustible part of the building or structure. (See also “Advertising.”)~~

“Significant vegetation removal” means ~~T~~he removal or alteration of trees, shrubs, and/or ground cover by clearing, grading, cutting, burning, chemical means, or other activity that causes significant ecological impacts to functions provided by such vegetation. The removal of invasive or noxious weeds does not constitute significant vegetation removal. Tree pruning, not including tree topping, where it does not affect ecological functions, does not constitute significant vegetation removal.

Commented [AC101]: Gap Analysis: Table 5-1 #5

“Single-family dwelling” – see “Dwelling, single-family”

“SMA” See Shoreline Management Act.

“Soil Bioengineering” means ~~A~~n applied science that combines structure, biological and ecological concepts to construct living structures that stabilizes the soil to control erosion, sedimentation and flooding using live plant materials as a main structural component.

“Solid Waste” means ~~S~~olid waste includes all putrescible and nonputrescible solid and semisolid wastes, including garbage, rubbish, ashes, industrial wastes, wood wastes and sort yard wastes associated with commercial logging activities, swill, demolition and construction wastes, abandoned vehicles and parts of vehicles, household appliances and other discarded commodities. Solid waste does not include sewage, dredge material or agricultural or other commercial logging wastes not specifically listed above.

“State Environmental Policy Act, (SEPA)” ~~SEPA~~ means a state law that requires state agencies, local governments and other lead agencies to consider environmental impacts when making most types of permit decisions, especially for development proposals of a significant scale. As part of the SEPA process, EISs may be required to be prepared and public comments solicited.

“State master program” means ~~T~~he cumulative total of all shoreline master programs and amendments thereto approved or adopted by rule by the department.

“Stream” means ~~A~~a body of running water; especially such a body moving over the earth's surface in a channel or bed, as a brook, rivulet, or river.

“Structure” means ~~A~~a permanent or temporary edifice or building, or any piece of work artificially built or composed of parts joined together in some definite manner on, above, or below the surface of the ground or water, except for vessels.

“Substantial Development” means ~~A~~ny development that:

1. The total cost or fair market value exceeds the amount specified in WAC 173-27-040(2)(a); or
2. Materially interferes with the normal public use of the water or shorelines of the state.

A list of developments not considered substantial development is provided in Section 2.4 of this Master Program. [Developments not required to obtain shoreline permits or local reviews can be found under Section 2.5, \(WAC 173-27-044\).](#)

Commented [AC102]: Gap Analysis: Table 2-1 2017c

"Substantially degrade" means ~~To~~ cause significant ecological impact.

"Substructure, pier" means ~~Relating to all the pier composite elements supporting the pier decking itself, excluding the pier pile.~~

Commented [AC103]: Gap Analysis: Table 5-1 #6.

"Swamp" means ~~A~~ lowland region saturated with water.

T. T Definitions.

"Temporary building or structure" means ~~A~~ building or structure not having or requiring permanent attachment to the ground or to other structures.

"Temporary use" means ~~A~~ use established for a fixed period of time with the intent to discontinue such use upon the expiration of such time. Such uses do not involve the construction or alteration of any permanent structure.

"Top of Slope" means ~~t~~The top of slope is a distinct, topographical break in slope that separates slopes inclined at less than forty percent (40%) from slopes forty percent (40%) or steeper. When no distinct break exists, the top of slope is the upper most limits of the area where the ground surface drops ten (10) feet or more vertically within a horizontal distance of twenty-five (25) feet.

"Toe of Slope" means ~~T~~the toe of slope is a distinct topographical break in slope that separates slopes inclined at less than forty percent (40%) from slopes forty percent (40%) or steeper. When no distinct break exists, the toe of slope of a steep slope is the lowermost limit of the area where the ground surface drops ten (10) feet or more vertically within a horizontal distance of twenty-five (25) feet.

"Tombolo" means ~~A~~ causeway-like accretion spit connecting an offshore rock or island with the main shore.

"Truck Maneuvering Area" means ~~A~~an area of a site used by trucks for turning and backing or for access to loading/unloading areas.

U. U Definitions.

"Upland" means ~~T~~the area above and landward of the ordinary high water mark.

"Use or Use Activity" means ~~T~~the purpose or activity for which the land, or building thereon, is designed, arranged or intended, or for which it is occupied or maintained and ~~shall~~will includes any manner of performance or operation of such activity with respect to the provision of this title. The definition of "use" also includes the definition of "development."

"Utility" means ~~A~~ service or facility that produces, transmits, stores, processes, or disposes of electrical power, gas, water, sewage, communications, oil, and the like. Utilities have been categorized in this Master Program as primary, accessory, and personal wireless facilities:

- I. Primary utilities are services and facilities that produce, transmit, carry, store, process or dispose of power, gas, water, sewage, communications (excepting wireless facilities, see below), oil and the like. For example: sewage treatment plants and outfalls, public high-tension utility lines, power generating or transfer stations, gas distribution lines and storage facilities.

2. Accessory utilities are small-scale distribution services directly serving a permitted shoreline use. For example, power, telephone, cable, communication antennas, water, sewer lines, including stormwater systems.
3. Personal wireless facilities meaning any unstaffed facility for the transmission and/or reception of personal wireless services. This can consist of an equipment shelter or cabinet, a support structure or existing structure used to achieve the necessary elevation, and the antenna or antenna array.

V. V Definitions.

"Variance, Shoreline" means ~~A~~^a means of granting relief from specific bulk, dimensional or performance standards set forth in the applicable master program to a particular piece of property, which property, because of special circumstances is deprived of privileges commonly enjoyed by other properties in the same vicinity and environmental designation, and not a means to vary from the permitted uses of a shoreline.

Commented [AC104]: Gap Analysis: Table 4-1 #7

"Vegetation Removal" See "significant vegetation removal."

"Vegetation Stabilization" means the ~~P~~^planting of water-loving land vegetation upon shoreline banks, slopes, or berms to retain soil and retard erosion from surface run-off; planting of aquatic vegetation offshore to reduce wave action and retain bottom materials; and utilizing temporary structures or netting to enable plants to establish in unstable areas.

"Vessel" means a ~~S~~^ship, boat, barge, or any other floating craft that is designed and used for navigation and does not interfere with the normal public use of the water.

W. W Definitions.

"Waste Disposal" means ~~R~~^refuse composed of garbage, rubbish, ashes, dead animals, demolition wastes, automobile parts, and similar material.

"Water-dependent Use" means ~~a~~^A use or a portion of a use, which, as its primary characteristic, cannot exist in any other location than on the water because it is dependent on the water by the intrinsic nature of its operations.

"Water-enjoyment Use" means ~~A~~^a shoreline recreational use such as a park, pier, or other use that facilitates public access to the shoreline as a primary characteristic of the use; or, a use that provides for passive/active recreational use or aesthetic enjoyment of the shoreline for a substantial number of people as a general character of the use and which, through location, design and operation assure the public's ability to enjoy the physical and/or aesthetic qualities of the shoreline.

In order to qualify as a water-enjoyment use, the use must be open to the public and most if not all of the shoreline oriented space within the project must be devoted to the specific aspects of the use that foster shoreline enjoyment.

Water-enjoyment uses may include, but are not limited to, shoreline parks, public access piers or other improvements (e.g., walkways or boardwalks) facilitating public access to the shorelines of the state or that foster the public's awareness and understanding of the shorelines of the state (e.g., shoreline or maritime-related museums, and scientific/ecological reserves).

Other uses, including mixed-use developments, may qualify as water-enjoyment uses if they include a

mix of more than one of the general water-enjoyment uses designed to take advantage of a waterfront location, protect views of the water, enhance pedestrian traffic, and display and sell merchandise oriented to marine uses or other office and research functions contributing to marine activities. Examples may include those uses listed below:

1. Ecological and Scientific Reserves
2. Waterfront Parks
3. Beaches for Public Use
4. Aquariums Available to the Public
5. Museums - Marine Oriented or Natural History Museums
6. Restaurants providing substantial public access and/or public views to the water for non-paying customers and not necessarily limited to working hours of operation.

“Water-oriented Use” means ~~A~~ use or a portion of a use which is either a water-dependent, water-related, or water-enjoyment use, or any combination thereof. All uses which do not meet the definition of water-dependent, water-related, or water-enjoyment are classified as non-water-oriented uses.

“Water-related Use” means ~~A~~ use or portion of a use that is not intrinsically dependent on a waterfront location, but whose operation cannot occur economically without a shoreline location. Water-related uses contribute to the marine trades, maritime educational uses or maritime heritage uses or activities of a particular shoreline designation because of the following:

1. A functional requirement for a waterfront location, such as the arrival or shipment of materials by water (e.g., fish processors), or the ability to work on boats that are moored in a marina (e.g., sail lofts, riggers, boat repair) or;
2. The use provides a necessary service supportive of the water-dependent, water-related commercial activities and the proximity of the use to its customers and marine trades businesses makes its services less expensive and more convenient. Examples include marine chandleries or marine hardware stores, boat shops, marine electrical services, marine metal work or fabrication, or manufacturers of boat parts or supplies that are necessary for a viable marine trades economy; or
3. The use provides marine-related services necessary to serve in-water marinas and on-land boatyards that provide a cluster of marine-related businesses that derive an economic benefit from close proximity to one another. Examples include boat dealers and brokers, marine surveyors and marine architects, moorage offices, shower and laundromat facilities for moorage guests, and specialized professional services to support the marine trades; or
4. The use provides maritime educational or maritime heritage activities that strengthen the City’s marine trades businesses by providing a cluster of activities that support water-dependent uses, water-related uses and marine-related services. Examples include yacht or sail club facilities, diving shops with classes and/or rentals, recreational services that promote on-the-water activities (e.g., kayak rentals) and interpretive and educational facilities that provide demonstration areas or classrooms for marine trades or marine-related ecology or educational workshops, seminars or classes (e.g., vocational boat schools or maritime educational centers).

“Watershed Restoration Plan” means ~~A~~ plan, developed or sponsored by the Department of Fish and

Wildlife, the Department of Ecology, the Department of Natural Resources, the Department of Transportation, a federally recognized Indian tribe acting within and pursuant to its authority, a City, a county, or a conservation district that provides a general program and implementation measures or actions for the preservation, restoration, re-creation, or enhancement of the natural resources, character, and ecology of a stream, stream segment, drainage area, or watershed for which agency and public review has been conducted pursuant to chapter 43.21C RCW, the State Environmental Policy Act.

“Wetlands or Wetland Areas” means ~~Areas~~ areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. Wetlands do not include those artificial wetlands intentionally created from nonwetland sites, including, but not limited to, irrigation and drainage ditches, grass-lined swales, canals, detention facilities, wastewater treatment facilities, farm ponds, and landscape amenities, or those wetlands created after July 1, 1990, that were unintentionally created as a result of the construction of a road, street, or highway. Wetlands may include those artificial wetlands intentionally created from nonwetland areas to mitigate the conversion of wetlands if permitted by the City (RCW 36.70A.030(21)).

“Wireless Facilities” – See “Utility”

Shoreline Element

Introduction

Requirements of the Shoreline Management Act

In November 1972, the people of the State of Washington enacted the Shoreline Management Act (RCW 90.58). The primary purpose of the Act is to provide for the management and protection of the state's shoreline area resources by planning for reasonable and appropriate uses. The law provides a two-tier planning and regulatory program by the state and local government. By law, the City is responsible for the following:

- A. Preparation of a "Master Program" in accordance with the policies and requirements of the Act and the State Shoreline Guidelines (WAC 173-26).
- B. Development of a permit system in accordance with the requirements of the Act.

The City of Anacortes' Role in Implementing the Shoreline Management Act

In order to protect the public interest in the preservation and reasonable use of the shorelines of the state, the Shoreline Management Act establishes a planning program coordinated between the state and local jurisdictions to address the types and effects of development occurring along the state's shorelines. By law, the City is responsible for the following:

- A. Development of an inventory of the natural characteristics and land use patterns along "shorelines of the state" within the City's territorial limits. This inventory provides the foundation for development of a system that classifies the shoreline into distinct "environments". These environments provide the framework for implementing shoreline policies and regulatory measures.
- B. Preparation of a "Shoreline Master Program" to determine the future of the shorelines. This future is defined through the goals developed for the following land and water use elements: economic development, public access, circulation, recreation, shoreline use, conservation, historical/cultural protection, and floodplain management. Local government is encouraged to adopt goals for any other elements, which, because of present uses or future needs, are deemed appropriate and necessary to implement the intent of the Shoreline Management Act. In addition, policy statements are developed to provide a bridge between the goals of the master program and the use activity regulations.

developed to address different types of development along the shoreline. Master program regulations are developed and adopted, as appropriate, for various types of shoreline development, including the following: agriculture, aquaculture, forest management, commercial development, marinas, mining, outdoor advertising and signs, residential development, utilities, ports and water related industries, bulkheads, breakwaters, jetties and groins, landfills, solid waste disposal, dredging, shoreline protection, road and railroad design, piers, and recreation.

- C. Development of a permit system to further the goals and policies of both the Act and the local Master Program. (Local government has the option to adopt the administrative process as part of the SMP or as a reference document not considered part of the SMP. This allows local government to make changes without the need of a SMP amendment. See WAC 173-26-191(2)(a)(C).)

Local governments have the primary responsibility for initiating the planning program and administering the regulatory requirements. The City of Anacortes Shoreline Master Program must be consistent with the policies and requirements of the Shoreline Management Act and the State Shoreline Master Program Guidelines. The role of the Department of Ecology is to provide support and review of the Shoreline Master Program and subsequent shoreline development permits and approvals and on insuring compliance with the policies and provisions of the SMA.

The Anacortes Shoreline Master Program comprises:

- This Shoreline Element of the Anacortes Comprehensive Plan
- Anacortes Municipal Code (AMC) Chapter 19.72 Shorelines
- The Shoreline Restoration Plan

Purposes of the Shoreline Master Program

The Shoreline Management Act defines a Master Program as a “comprehensive use plan for a described area.” The shoreline planning process differs from the more traditional planning process in that the emphasis is on protecting the shoreline environment through management of uses.

The purposes of the Master Program are:

- A. To carry out the responsibilities imposed on the City of Anacortes by the Washington State Shoreline Management Act (RCW 90.58).
- B. To promote uses and development of the Anacortes shoreline consistent with the Anacortes Comprehensive Plan while protecting and restoring environmental resources.
- C. To promote the public health, safety, and general welfare by providing a guide and regulation for the future development of the shoreline resources of the City of Anacortes.

Legislative Findings

The legislative findings and policies of the Act, as set forth in RCW 90.58.020, are as

follows: the shorelines of the state are among the most valuable and fragile of its natural resources and there is great concern throughout the state relating to their utilization, protection, restoration, and preservation. In addition, it finds that ever-increasing pressures of additional uses are being placed on the shorelines, necessitating increased coordination in the management and development of the shorelines of the state.

The legislature further finds that much of the shoreline of the state and adjacent uplands are in private ownership and that unrestricted construction on the privately owned and publicly owned shorelines of the state is not in the best public interest. Therefore, coordinated planning is necessary in order to protect the public interest associated with the shoreline of the state. There is, therefore, a clear and urgent demand for a planned, rational, and concerted effort, jointly performed by federal, state, and local governments, to prevent the inherent harm in an uncoordinated and piecemeal development of the state's shorelines.

There are three basic policy areas to the Shoreline Management Act:

The SMA emphasizes accommodation of reasonable and appropriate uses, protection of shoreline environmental resources, and protection of the public's right to access and use the shorelines.

- **Shoreline Use:** It is the policy of the state to provide for the management of the shorelines of the state by planning for and fostering all reasonable and appropriate uses. This policy is designed to ensure the development of these shorelines in a manner which, while allowing for limited reduction of rights of the public in navigable water, will promote and enhance the public interest. This policy contemplates protecting against adverse effects to the public health, the land and its vegetation and wildlife, and the water of the state and its aquatic life, while generally protecting public rights of navigation and its associated activities.
- **Public Access:** In accordance with the Act, master programs must provide for public access to publicly owned areas, and a recreational element for the preservation and enlargement of recreational opportunities. "The public's opportunity to enjoy the physical and aesthetic qualities of natural shorelines of the state shall be preserved to the greatest extent feasible consistent with the overall best interest of the state and the people generally" (i.e., One must look at the overall "best interest" of the state and the people when considering public access opportunities. In some cases, public access goals may be superseded by the goals of environmental protection or promotion of appropriate uses).
- **Environmental Protection:** The Act is intended to protect shoreline natural resources, including "...the land and its vegetation and wildlife, and the waters of the state and their aquatic life..." against adverse effects. To this end, uses shall be preferred that are consistent with control of pollution and prevention of damage to the natural environment or are unique to or dependent on use of the state's shorelines. Alteration of the natural condition of the shorelines of the state, in those limited instances when authorized, shall be given priority for single family residences, ports, parks, marinas, piers, and other improvements facilitating public access to shorelines of the state, and to industrial and commercial developments that will provide an opportunity for substantial numbers of the people to enjoy the shorelines of the state.

The second section of the Act, states, in part:

“...Uses shall be preferred which are consistent with control of pollution and prevention of damage to the natural environment or are unique to or dependent on use of the state’s shoreline. Alterations of the natural conditions of the shorelines of the state, in those limited instances where authorized, shall be given priority for single family residences and their appurtenant structures, ports, shoreline recreational uses including but not limited to parks, marinas, piers, and other improvements facilitating public access to the shorelines of the state, industrial and commercial developments which are particularly dependent on their location on or use of the shorelines of the state and other development that will provide an opportunity for substantial numbers of people to enjoy the shorelines of the state.” (RCW 90.58.020).

Goals & Policies

Shoreline Master Program Elements

This Section contains goals that form the foundation of the Shoreline Master Program and apply to all areas of Anacortes shoreline jurisdiction, regardless of the designated shoreline environment. The Shoreline Management Act requires cities to adopt goals, or “elements”, to guide and support major shoreline management issues. RCW 90.58.100(2)

Shoreline Use Element

As required by RCW 90.58.100(2)(e), this section addresses the proposed general distribution, location, and extent of uses on shorelines and adjacent land areas for housing, business, industry, transportation, agriculture, natural resources, recreation, education, public buildings and grounds, and other categories of public and private uses of land.

Goal S-1.1 Shoreline Uses. Establish and implement policies and regulations for land uses that are consistent with the requirements of the Shoreline Management Act, the Shoreline Master Program Guidelines, and the Growth Management Act, and which promote a mixture of reasonable and appropriate shoreline uses that enhance the City’s character, emphasize its connection with marine trades, foster its historic and cultural identity, protect environmental resources, and achieve a net ecosystem improvement over time.

~~Policy 4.2.1~~ **Policy S-1.1.** Identify and designate those shoreline areas suited for particular long term uses, including conservancy, recreational, residential, commercial, and industrial.

~~Policy 4.2.2~~ **Policy S-1.2.** Avoid uses which would pre-empt preferred shoreline uses as contemplated by the Shoreline Management Act.

~~Policy 4.2.3.~~ **Policy S-1.3.** Maximize water-dependent and water-related uses in appropriate locations.

~~Policy 4.2.4.~~ **Policy S-1.4.** Encourage marine trades and water-oriented uses that are keeping with the historical character of the area.

~~Policy 4.2.5.~~ **Policy S-1.5.** Enhance public access and achieve no net loss of shoreline ecological functions by appropriately locating, designing, and operating all activities, development, and redevelopment.

~~Policy 4.2.6.~~ **Policy S-1.6.** Develop existing public view and access easements to facilitate public access to the water and to provide the shoreline and pursue additional public access opportunities. Private access opportunities are not limited by this policy.

Economic Development Element

As required by RCW 90.58.100(2)(a), this section addresses the location and design of industries, industrial projects of statewide significance, transportation facilities, port facilities, tourist facilities, commerce and other developments that are particularly dependent on their location on or use of the shorelines of the state. This section also provides consistent policies and plans which promote the State's constitutional reservation of harbor areas for use by commerce and navigation and are consistent with marine resource protection.

Goal S-2. Foster a balanced, diversified, and sustainable marine oriented service in the local economy that contributes to Anacortes' high quality of life, through the protection and enhancement of the community's natural, historical, and cultural amenities, and the improvement of the financial well-being of its residents.

~~Policy 4.3.1.~~ **Policy S-2.1.** Provide opportunity for development of water-dependent commercial and industrial uses, preferably at locations that are currently developed or at locations outside of critical habitat areas.

~~Policy 4.3.2.~~ **Policy S-2.2.** Plan so that deep water sites are available for uses requiring such sites.

~~Policy 4.3.3.~~ **Policy S-2.3.** Establish multiple use commercial and industrial sites for compatible, water-oriented development activities.

~~Policy 4.3.4.~~ **Policy S-2.4.** Encourage public access to the water and the shoreline in commercial areas.

~~Policy 4.3.5.~~ **Policy S-2.5.** Maintain and improve existing water quality to make waters attractive to recreational users, and where appropriate, encourage uses complementary and compatible with recreational development.

~~Policy 4.3.6.~~ **Policy S-2.6.** Detailed consideration should be given to enhancing the habitat function of Fidalgo Bay to provide greater resource protection and improved opportunities for recreation, tourism, and commercial fisheries.

~~Policy 4.3.7.~~ **Policy S-2.7.** Support and maintain maritime industries and visitor services as significant components of the area economy.

~~Policy 4.3.8.~~ [Policy S-2.8.](#) Give priority to new shoreline commercial and industrial development that is water-dependent or water-related or which provides a significant public benefit in the form of restoration of ecological functions, and enhancement of public access and for revitalization of historic resources.

~~Policy 4.3.9.~~ [Policy S-2.9.](#) Strengthen the marine trades economy while protecting the natural environment and increasing public use of shoreline areas.

- (a) Maintain and enhance Anacortes's character as a working waterfront City by allowing marine-related commerce and industry in appropriate shoreline areas.
- (b) Assist the Port of Anacortes in the development and implementation of plans for Port properties that are consistent with the Growth Management Act and the Shoreline Master Program.
- (c) Plan and design shoreline open spaces that are compatible with marine-related industrial and commercial uses of shoreline areas.
- (d) Promote the skill, motivation, and availability of Anacortes' marine trade workforce as a regional resource of major importance to the City and County's economic future.
- (e) Encourage governmental and non-profit agencies to work with local firms to identify and transfer technology that can increase marine trade's competitiveness.
- (f) Encourage the creation of marine trade jobs, including jobs dependent upon traditional skills, construction techniques, and materials, such as: sail and canvas accessory manufacture; spar and rigging construction; marine-oriented carpentry; construction of wooden boats; blacksmithing; and block-making and casting, as well as more modern skills and trades.
 - (i) Support educational and vocational training efforts aimed at enhancing marine trade skills, including mentorship and apprenticeship programs.
 - (ii) Promote marine trade enterprises on Port owned lands by working with the Port of Anacortes.

~~Policy 4.3.10.~~ [Policy S-2.10.](#) The Fidalgo Bay Navigation Channel is a critically important deep-water access to marine industries located on the City's Fidalgo Bay industrial and commercial marine zones. The current employment level in these zones exceeds 1500 and has the potential to double over the next 20 years.

The Fidalgo Navigation Channel should be maintained at its current federally authorized depth of -18 feet. The existing waterfront connections to this channel and the upland connections to the water access should be protected from encroachments (unless relocated to an adjacent location). Provided that impacts are fully mitigated, additional connections should be given the highest priority.

Circulation Element

As required by RCW 90.58.100(2)(d), this section addresses the general location and extent of existing and proposed major thoroughfares, transportation routes, terminals, and other public utilities and facilities, all correlated with the shoreline use element.

Goal S-3. Achieve safe, convenient, non-motorized-friendly, and diversified circulation systems to provide public access to the shoreline and efficient movement of people and goods with minimum disruption to the shoreline environment and minimum conflict among shoreline uses and between shoreline users and abutting upland areas.

~~Policy 4.4.1.~~ Policy S-3.1. Maintain and improve existing navigation channels to serve water-dependent uses and develop new navigation channels where appropriate. New navigation channels shall be adequately mitigated.

~~Policy 4.4.2.~~ Policy S-3.2. Motorized land transportation routes should be located as far as reasonably possible from the water's edge, except where needed to access water-dependent uses.

~~Policy 4.4.3.~~ Policy S-3.3. When possible, improve existing transportation facilities to enhance economic, recreational, and visual benefits to the public.

~~Policy 4.4.4.~~ Policy S-3.4. Assure that shore located activities provide sufficient parking in areas which avoid possible adverse impacts to water quality or shoreline view.

~~Policy 4.4.5.~~ Policy S-3.5. Require installation of native vegetation adjacent to transportation facilities.

~~Policy 4.4.6.~~ Policy S-3.5. The City should protect the former Burlington Northern right-of-way from the railroad trestle to the Port marine terminal facilities for future transportation planning and development.

Public Access Element

As required by RCW 90.58.100(2)(b), this section makes provision for public access to publicly owned areas.

Goal S-4. Provide, maintain, and enhance a safe, convenient, and balanced system of public access, both physical and visual: a system that increases the amount and diversity of opportunity for the public to enjoy the shorelines of the state, including access for people with disabilities to the extent feasible, while respecting the rights of private ownership; a system that is respectful of fragile natural features of the shorelines; and, strives to maintain the character of the community.

~~Policy 4.5.1.~~ Policy S-4.1. Provide for public access to shorelines in City parks and recreation plans.

~~Policy 4.5.2.~~ Policy S-4.2. Increase opportunities for public view sites and identify publicly owned access areas through appropriate signing.

~~Policy 4.5.3.~~ [Policy S-4.3.](#) Use street ends abutting shorelines for public access and view easements and develop lateral access along the waterfront connecting access points unless an alternative public access plan has been agreed to by the City.

~~Policy 4.5.4.~~ [Policy S-4.4.](#) Provide incentives for public shoreline access opportunities in private developments.

~~Policy 4.5.5.~~ [Policy S-4.5.](#) Encourage development of facilities (restaurants, shops, markets) which attract the public to appropriate shoreline areas.

~~Policy 4.5.6.~~ [Policy S-4.6.](#) Locate a public fishing pier along the Guemes channel with priority to co-locating with an existing facility; the location has yet to be determined.

~~Policy 4.5.7.~~ [Policy S-4.7.](#) Incorporate design standards for appropriate building design and landscaping including but not limited to height, bulk, scale, setbacks, signage, lighting, and preservation of view corridors to protect and enhance public access; encourage the use of native vegetation where landscaping is required.

~~Policy 4.5.8.~~ [Policy S-4.8.](#) Preserve and enhance shoreline access areas through acquisition, enhancement of shoreline street ends, signage of public access points, and designation and design of specific shoreline access areas for small vessels such as kayaks.

~~Policy 4.5.9.~~ [Policy S-4.9.](#) Promote a coordinated system of connected pathways, sidewalks, passageways between buildings, beach walks, and shoreline access points that increase the amount and diversity of opportunities for walking and chances for personal discoveries.

~~Policy 4.5.10.~~ [Policy S-4.10.](#) Provide access for a range of users including pedestrians, cyclists, boaters, and people with disabilities to the extent feasible.

~~Policy 4.5.11.~~ [Policy S-4.11.](#) Vary public access opportunities by providing a range from urban water walks to viewing platforms of natural areas.

~~Policy 4.5.12.~~ [Policy S-4.12.](#) Expand the amount and diversity of shoreline public access opportunities consistent with the character, functions, and values of the shoreline, private property rights, and public safety.

~~Policy 4.5.13.~~ [Policy S-4.13.](#) Encourage plans by existing industries and public agencies occupying waterfront lands, including the Port of Anacortes and Washington State Ferries, to provide as much public accessibility to the water as practicable, consistent with public safety, homeland security concerns, and the protection of shoreline ecological functions.

~~Policy 4.5.14.~~ [Policy S-4.14.](#) Develop a waterfront trail along the Guemes Channel connecting Washington Park to Downtown and the Tommy Thompson Trail, while providing protection of intact shoreline ecological functions or enhancement to shoreline functions where impaired conditions exist and where such enhancements are feasible.

Recreational Element

As required by RCW 90.58.100(2)(c), this section provides for the preservation and enlargement of recreational opportunities, including but not limited to parks, tidelands, beaches, and recreational areas.

Goal S-5. Develop and maintain appropriate public and private recreational opportunities that are compatible with adjacent uses and that minimize and mitigate for disruption of the shoreline environment, recognizing the importance of existing park, trail, and recreation areas.

~~Policy 4.6.1.~~ [Policy S-5.1.](#) Increase opportunities for water-oriented recreation in coordination with the Port of Anacortes and Skagit County.

~~Policy 4.6.2.~~ [Policy S-5.2.](#) Develop priorities for acquisition of public recreation and access sites in shoreline areas, particularly those providing lineal access, and acquire sites through purchase or easements.

~~Policy 4.6.3.~~ [Policy S-5.3.](#) Encourage development of private recreational facilities.

~~Policy 4.6.4.~~ [Policy S-5.4.](#) Provide a balance of active recreational and passive open spaces.

~~Policy 4.6.5.~~ [Policy S-5.5.](#) Do not allow public recreation sites to exceed their capacity to sustain the recreation experience sought by visitors.

~~Policy 4.6.6.~~ [Policy S-5.6.](#) Do not allow conflicting recreational uses to decrease a site's primary recreational value.

~~Policy 4.6.7.~~ [Policy S-5.7.](#) All uses abutting the Fidalgo Bay waterfront should provide a walkway that will constitute a segment of a continuous, publicly accessible esplanade (the walkway should be at least ten feet wide) unless an alternative public access plan has been agreed to by the City.

~~Policy 4.6.8.~~ [Policy S-5.8.](#) Prohibit recreational facilities and activities that even after mitigation are reasonably projected to significantly degrade fragile shoreline ecosystems and ecological functions.

~~Policy 4.6.9.~~ [Policy S-5.9.](#) Public recreation facilities should be planned and designed to augment and enhance private recreation facilities and vice versa.

~~Policy 4.6.10.~~ [Policy S-5.10.](#) Unique shoreline recreational areas and vistas should be preserved for future generations.

~~Policy 4.6.11.~~ [Policy S-5.11.](#) Recreational planning and development should recognize the wide variety of needs generated by the diverse local and regional population.

~~Policy 4.6.12.~~ [Policy S-5.12.](#) Commercial recreational developments should conform to relevant regulations contained in the Shoreline Master Program.

~~Policy 4.6.13.~~ [Policy S-5.13.](#) Recreational developments, public and private, should be located, constructed, and operated so as not to be a hazard to public health and safety nor should they materially interfere with normal public use of the water and shorelines.

Conservation Element

As required by RCW 58.100(2)(f), this section addresses the preservation of natural resources, including but not limited to scenic vistas, aesthetics, and fish and wildlife habitat.

Goal S-6. Preserve, protect, enhance and restore shoreline natural resources including scenic vistas, aesthetics, estuaries, beaches, shorelines, fragile ecological areas, fish

and wildlife habitats, native vegetation and landforms, water and air.

~~Policy 4.7.1.~~ [Policy S-6.1.](#) Preserve, protect, enhance, and restore critical areas and shoreline ecological processes and functions through regulatory and non-regulatory means that may include required vegetated shoreline setbacks, acquisition of key properties, regulation of development, and incentives to encourage ecologically sound design and maintenance.

~~Policy 4.7.2.~~ [Policy S-6.2.](#) Locate, design, construct, and operate development so as not to degrade water quality as measured by state water quality standards.

~~Policy 4.7.3.~~ [Policy S-6.3.](#) Achieve no net loss of shoreline ecological functions. This shall be accomplished by the use of Mitigation Sequencing, as defined in this master program, and as provided by WAC 173-26-201(2)(e).

~~Policy 4.7.4.~~ [Policy S-6.4.](#) Identify unique and sensitive shoreline areas for permanent protection.

~~Policy 4.7.5.~~ [Policy S-6.5.](#) Develop and apply appropriate conservation practices in public shoreline areas.

~~Policy 4.7.6.~~ [Policy S-6.6.](#) Establish a "significant areas" acquisition fund designed to provide for acquisition and public land banking of privately held priority properties as a "development mitigation" strategy.

~~Policy 4.7.7.~~ [Policy S-6.7.](#) Develop and design performance standards which will minimize detrimental impacts of development upon the shoreline.

~~Policy 4.7.8.~~ [Policy S-6.8.](#) Encourage study and monitoring of waters and shoreline habitats; maintain awareness of existing conditions and future alterations.

~~Policy 4.7.9.~~ [Policy S-6.9.](#) In conjunction with State regulatory and resource agencies, affected tribes, and the County, establish clear requirements for mitigating development-related impacts to resources. These could include a pre-approved set of mitigation projects, activities and strategies upon which permit applicants could focus their mitigation plans.

~~Policy 4.7.10.~~ [Policy S-6.10.](#) Support research and demonstration efforts designed to create new eelgrass beds which, if successfully developed, could serve as an eelgrass mitigation bank.

~~Policy 4.7.11.~~ [Policy S-6.11.](#) All soils disturbed by use activities, and which are potentially erodible or unstable should be stabilized through seeding, mulching, terracing or other effective means.

~~Policy 4.7.12.~~ [Policy S-6.12.](#) Development on unique or fragile shoreline areas should be avoided unless it can be shown in the proposal that development will not degrade the shoreline, or that the development will enhance public use of shoreline resources while fully mitigating for impacts to fragile areas.

~~Policy 4.7.13.~~ [Policy S-6.13.](#) Shorelines are to be kept free of discarded waste materials.

~~Policy 4.7.14.~~ [Policy S-6.14.](#) Existing street rights-of-way or utility easements which offer physical or visual access to the shorelines or water body should be maintained in public ownership for resource conservation and as a recreational and public view resource.

~~Policy 4.7.15~~–[Policy S-6.15](#). The City shall ensure that permit approval from U.S. Department of the Army, Corps of Engineers, is secured for all construction and work performed in navigable waters of the United States; permit approval of this agency is also required for the discharge of dredged or fill material on wetlands adjacent and contiguous to navigable waters of the United States.

~~Policy 4.7.16~~–[Policy S-6.16](#). Mitigation for all proposed shoreline development should comply with Mitigation Framework requirements (Revised Final Integrated Fidalgo Bay-Wide Plan & EIS, 2000 & EIS, Chapter VIII).

~~Policy 4.7.17~~–[Policy S-6.17](#). Protect existing shoreline trees and other shade vegetation, especially in areas where surf smelt and/or sand lance spawning has been documented.

~~Policy 4.7.18~~–[Policy S-6.18](#). The maximum width for either the wetland buffer or the shoreline setback must be applied for the portion of the wetland that lies within the shoreline setback.

Restoration & Adaptive Management Element

Consistent with the Shoreline Management Act’s policy on protection and restoration of environmental resources of the shoreline, this section addresses the requirement to achieve no net loss of ecological functions necessary to sustain shoreline natural resources and to provide for the restoration of impaired ecological functions.

Goal S-7. Achieve no net loss of ecological functions and strive to improve impaired shoreline ecological functions with the goal of achieving improvement over time, when compared to the status at the time of adoption of the Master Program.

~~Policy 4.8.1~~–[Policy S-7.1](#). Implement the Restoration Plan included in Appendix B of this Master Program.

~~Policy 4.8.2~~–[Policy S-7.2](#). Encourage projects that restore/rehabilitate/enhance shoreline resources. Strategies may include but are not limited to a simplified permit process, reduced or waiver of permit fees, public outreach, encouraging landowners to replant with native vegetation, tax relief, transfer of development rights, and City participation.

~~Policy 4.8.3~~–[Policy S-7.3](#). Provide incentives for restoration by implementing tools which may include, but are not limited to: modifying the shoreline setback area that would apply to the restored areas or allowing a greater range of uses or flexible development standards (e.g., setbacks, height limits, lot coverage) on properties providing restoration.

~~Policy 4.8.4~~–[Policy S-7.4](#). Craft a preferential tax incentive in coordination with the County through the Public Benefit Rating System administered by the County under the Open Space Taxation Act (RCW 84.34) to encourage private land owners to preserve natural shoreline features for “open space” tax relief.

~~Policy 4.8.5~~–[Policy S-7.5](#). Employ Adaptive Management: Monitor and analyze the cumulative impacts of development permitted in shoreline areas, including development exempt from a Shoreline Substantial Development Permit. Where impacts are occurring beyond that anticipated, the City should

revise the Master Program to address the cumulative impacts, and/or revise the conditions of approval of developments to address the new information.

~~Policy 4.8.6.~~ Policy 5-7.6. Mitigation for new development projects should use enhancement of degraded conditions to offset the impacts of new development near shoreline resources.

~~Policy 4.8.7.~~ Policy 5-7.7. During the project review process, mitigation for impacts of the development should emphasize restoration of ecological functions.

~~Policy 4.8.8.~~ Policy 5-7.8. The City acknowledges sea level rise is a direct effect stemming from climate change factors and should be considered in future planning. The City should:

- a. Consider establishing sea level rise projections based on best available science.
- b. Revisit sea level rise projections every eight years consistent with the SMP periodic update cycle and revise if necessary.
- c. Recognize and monitor the potential effects of climate change as additional scientific information becomes available.
- d. Encourage shoreline development and redevelopment to consider addressing sea level rise in the following preferential order: avoid, retreat, protect, and accommodate.
- e. Continue to evaluate sea level rise impacts and climate change factors, consistent with best available science, in future policy and regulatory amendments.
- f. Consider sea level rise impacts when planning for new development for the life cycle of the improvements.

Historic, Cultural, Scientific, and Educational Element

As required by RCW 90.58.100(2)(g), this section provides for the protection and restoration of buildings, sites, and areas having historic, cultural, scientific, or educational values.

Goal S-8. Ensure recognition, preservation, protection, and restoration of shoreline areas that have historical, cultural, educational, or scientific value and create a unique "sense of place" in shoreline jurisdiction.

~~Policy 4.9.1.~~ Policy 5-8.1. Foster greater appreciation for the importance of shoreline management, environmental conservation, and maritime history and activities by encouraging educational projects and programs.

~~Policy 4.9.2.~~ Policy 5-8.2. Ensure that new development is compatible with existing historic structures and cultural areas, and that it promotes the creation of or own legacy for the future.

~~Policy 4.9.3.~~ Policy 5-8.3. Encourage the rehabilitation, renovation, and adaptive reuse of upper floors of historic buildings (e.g., for artist studios, permanent housing, and office space).

~~Policy 4.9.4.~~ Policy 5-8.4. Encourage public and private groups to research and study areas of historical tribal or cultural significance.

~~Policy 4.9.5.~~ [Policy 5-8.5.](#) Areas of historical or cultural significance should be considered in park and recreation planning.

~~Policy 4.9.6.~~ [Policy 5-8.6.](#) Develop guidelines to direct private and public development with regard to historic structures and areas.

Shoreline Environment Designations

Shorelines of Statewide Significance.

~~Policy 5.5.1.~~ [Policy 5-9.1.](#) Recognize the order of use preferences established by the Shoreline Management Act in formulating and implementing the Master Program and any amendments affecting shorelines of statewide significance. This Master Program gives preferences to uses, in the following order of preference, that:

- ~~a.g.~~ [a.g.](#) *Recognize and protect the statewide interest over local interest.* The City will consult with applicable state agencies, affected Indian tribes, and statewide interest groups on proposed actions affecting shorelines of statewide significance.
- ~~b.h.~~ [b.h.](#) *Preserve the natural character of the shoreline.* Shoreline environment designations and use regulations should direct higher intensity uses away from functionally intact shorelines.
- ~~c.i.~~ [c.i.](#) *Result in long-term over short-term benefit.* The benefits of new development should be evaluated in light of the long-term impacts on shoreline resources and aesthetics.
- ~~d.j.~~ [d.j.](#) *Protect the resources and ecology of the shoreline.*
- ~~e.k.~~ [e.k.](#) *Increase public access to publicly owned areas of the shoreline.* Given that all of Anacortes' shorelines of statewide significance lie seaward of the line of extreme low tide, public access for shorelines of statewide significance pertains to aesthetics and access for recreational uses such as boating and scuba diving.
- ~~f.l.~~ [f.l.](#) *Increase recreational opportunities for the public on the shoreline.*
- ~~g.m.~~ [g.m.](#) *Provide for any other element as defined in RCW 90.58.100.*

~~Policy 5.5.2.~~ [Policy 5-9.2.](#) In addition to the provisions of this section, all proposed developments and activities within Shoreline of Statewide Significance should comply with [Section 5.6 Aquatic shoreline environment designation policies](#) and all other appropriate provisions ~~the~~ this Master Program.

Aquatic

~~Policy 5.6.1.~~ [Policy 5-10.1.](#) Limit uses and activities within the Aquatic environment to water-dependent uses, ecological restoration and public access/recreational improvements designed to provide access to the shoreline for a substantial number of people, with few exceptions.

~~Policy 5.6.2.~~ [Policy 5-10.2.](#) In aquatic areas adjacent to Urban or Urban Maritime designated shorelines, permit water-enjoyment uses in *existing* over-water structures along the Anacortes waterfront built prior to March 1, 2010 or in new structures in the limited instances where they are auxiliary to and necessary in support of water-dependent uses. (For purposes of over-water

structures the mere presence of pilings would not meet the definition of an “existing” structure.)

New Over-Water Structures

~~Policy 5.6.3.~~ [Policy S-10.3.](#) Allow new over-water structures only for water-dependent and accessory uses, restoration projects, public access, or minor, accessory non-water-dependent Port facilities in conjunction with a water-dependent use. New over-water structures, other than single-family and community piers, must show significant public benefits and approval shall only be granted after consideration has been given to the environment impacts to public resources.

~~Policy 5.6.4.~~ [Policy S-10.4.](#) Limit the size of new over-water structures to the minimum necessary to support the structures’ intended use and encourage multiple-use as a means of reducing impacts of shoreline development and increasing effective use of water resources.

Reuse of Historic Over-Water Structures

~~Policy 5.6.5.~~ [Policy S-10.5.](#) Permit minor expansions or rebuilding of historic over-water structures when necessary to provide public access, to facilitate environmental restoration, to facilitate preservation and reuse of historic structures, or to meet building safety codes when in support of a water-dependent use, PROVIDED the structures are rebuilt or expanded using environmentally-friendly designs and that construction activities implement BMPs. The newly-expanded or rebuilt structure shall provide better habitat function and values to fish and wildlife than the existing structure. Minor is defined as less than a 10% increase in overwater square footage.

~~Policy 5.6.6.~~ [Policy S-10.6.](#) Refurbish or rebuild existing piers and wharves to maintain a modern-day link with the community’s maritime history. The refurbishment or redevelopment of existing pier and wharf structures may include water-enjoyment uses PROVIDED the structures are rebuilt or expanded using environmentally-friendly designs and that construction activities implement BMPs. The newly-expanded or rebuilt structure should provide better habitat function and values to fish and wildlife than the existing structure. Non-water-dependent commercial uses should not be allowed over water except in existing or replacement structures or in new structures in the limited instances where they are auxiliary to and necessary in support of water-dependent uses.

~~Policy 5.6.7.~~ [Policy S-10.7.](#) Develop, in coordination with the Port, a moorage float and dock facility for passenger ferries and other seasonal commercial tour vessels.

Design Elements

~~Policy 5.6.8.~~ [Policy S-10.8.](#) All developments and uses should be located and designed to minimize interference with surface navigation, to be compatible with adjacent aquatic and upland uses, and with wildlife resources, and to consider impacts to public view.

Environmental Protection

~~Policy 5.6.9.~~ [Policy S-10.9.](#) Shoreline uses and modifications within the Aquatic environment should be designed and managed consistent with the Environmental Protection policies and regulations of Chapter 6 including, but

not limited to, preservation of water quality, habitat (such as eelgrass, kelp, forage fish spawning beaches, etc.), natural hydrographic conditions, and safe, unobstructed passage of fish and wildlife, particularly those species dependent on migration.

~~Policy 5.6.10~~ [Policy S-10.10](#). Remove abandoned over-water structures when they no longer serve their permitted use and provide no environmental benefit.

~~Policy 5.6.11~~ [Policy S-10.11](#). Multiple use of over-water facilities is encouraged.

~~Policy 5.6.12~~ [Policy S-10.12](#). Private, non-commercial docks for individual residential or community use are allowed. The project should result in no net loss of ecological functions and should pursue alternative alignments or locations to avoid or minimize potential impacts.

~~Policy 5.6.13~~ [Policy S-10.13](#). All over water and near-shore developments require habitat assessment of site and adjacent beach sections.

Natural

~~Policy 5.7.1~~ [Policy S-11.1](#). Allow uses that are in keeping with the primary goal of environmental protection. To the extent feasible, new uses and activities should be limited to restoration projects and public access or recreational/educational uses.

~~Policy 5.7.2~~ [Policy S-11.2](#). Preserve and enhance ecological functions of the area by appropriately designing permitted uses.

Conservancy

Uses. ~~Policy 5.8.1~~ [Policy S-12.1](#). Protect shoreline functions and resources by limiting, to the extent feasible, new uses and activities in the Conservancy designation to recreational, cultural and historic uses located and designed to avoid shoreline impacts.

~~Policy 5.8.1~~ [Policy S-12.2](#). Ensure the preservation of scenic and non-renewable natural resources and the conservation of renewable resources for the benefit of existing and future generations, by limiting permitted uses and assuring that they are located and designed appropriately.

~~Policy 5.8.2~~ [Policy S-12.3](#). Encourage the following uses:

- a. Uses that preserve the natural character of the area or promote preservation of open space, culturally or historically significant sites, or sensitive lands, either directly or over the long term.
- b. Uses that result in restoration of ecological functions if the use is otherwise compatible with the character of the area.

~~Policy 5.8.3~~ [Policy S-12.4](#). Give priority to water-oriented uses over non-water-oriented uses. For shoreline areas adjacent to commercially navigable waters, water-dependent uses that cannot be reasonably located in other environments should be given highest priority.

~~Policy 5.8.4~~ [Policy S-12.5](#). Establish best management standards for shoreline stabilization measures, vegetation conservation, water quality, and shoreline modifications within the Conservancy designation to ensure that new

development does not result in a net loss of shoreline ecological functions or further degrade other shoreline values.

~~Policy 5.9.5.~~ Policy S-12.6. Public access and public recreation objectives should be implemented in the Conservancy environment whenever feasible.

Shoreline Residential

Uses

~~Policy 5.9.1.~~ [Policy S-13.1.](#) Allow residential uses as the primary allowed uses in the Shoreline Residential designation.

~~Policy 5.9.2.~~ [Policy S-13.2.](#) Allow limited non-residential uses such as community clubhouse, day cares, home occupation businesses, churches, and bed and breakfasts provided they are consistent with the residential character of the neighborhood.

[Policy S-13.3.](#) Other accessory uses subordinate and incidental to water-oriented uses may be considered only when adjacent to existing overwater structures between H Avenue and B Avenue.

~~Policy 5.9.3.~~ [Policy S-13.4.](#) Implement public access, public education (e.g., interpretive signs), and public recreation objectives whenever feasible while ensuring that significant ecological impacts can be mitigated and private property rights reserved.

~~Policy 5.9.4.~~ [Policy S-13.5.](#) Encourage protection/restoration of ecological functions through proactive public education, reduced setback incentives and stewardship programs.

Design Elements

~~Policy 5.9.5.~~ [Policy S-13.6.](#) Allow development only in those areas where impacts and hazards to or caused by the proposed development can be effectively mitigated and where the environment is capable of supporting the proposed use in a manner that protects ecological functions.

~~Policy 5.9.6.~~ [Policy S-13.7.](#) Minimize impacts to bluffs by requiring shoreline development to implement low impact development (LID) stormwater techniques as described in Low Impact Development, Technical Guidance Manual for Puget Sound (PSAT, January 2005).

~~Policy 5.9.7.~~ [Policy S-13.8.](#) Protect public vista points and views enjoyed by a substantial number of occupied residences by ensuring that new development is sensitively located and designed. Private views of the shoreline, although considered during the review process, are not expressly protected. Property owners concerned with the protection of views from private property are encouraged to obtain view easements, purchase intervening property and/or seek other similar private means of minimizing view obstruction.

~~Policy 5.9.8.~~ [Policy S-13.9.](#) Provide for public access and joint-use of recreational facilities when permitting multi-lot developments (i.e., more than four), multi-family residential, cottage developments and recreational facilities.

~~Policy 5.9.9.~~ [Policy S-13.10.](#) Provide adequate access, utilities, and public services to serve existing needs and/or planned future development.

~~Policy 5.9.10.~~ [Policy S-13.11.](#) While shoreline setbacks based on science are preferred to protect ecological functions, using them may not be feasible where previous development has significantly altered the natural shoreline environment, such as along some parts of Burrows Bay. In such areas, an alternative strategy is established for new and re-development using smaller shoreline setbacks that are based on the existing development pattern, in combination with mitigation requirements that provide enhancement of existing degraded conditions and offsets impacts of the development on shoreline ecological functions.

Urban

Uses

~~Policy 5.10.1.~~ [Policy S-14.1.](#) Give priority to water-oriented uses over non-water-oriented uses. First priority should be given to water-dependent uses. Second priority should be given to water-related uses and third priority to water-enjoyment uses. Non-water-oriented uses shall only be allowed if they are part of mixed used developments where the primary use is (1) water-dependent or (2) water-related, or (3) in conjunction with a water-enjoyment use on sites where there is no access to water.

~~Policy 5.10.2.~~ [Policy S-14.2.](#) Encourage uses that enhance ecological functions and/or enhance opportunities for the public use and enjoyment of the shoreline; new development shall not cause a net loss of shoreline ecological functions.

Design Elements

~~Policy 5.10.3.~~ [Policy S-14.3.](#) Ensure that, where applicable, improvements within this district are reviewed for compatibility and consistency with the Design Standards codified in the zoning code.

~~Policy 5.10.4.~~ [Policy S-14.4.](#) Encourage designs that incorporate conservation and restoration elements, such as restoration of intertidal habitat, shoreline vegetation, and enhancement of public access.

~~Policy 5.10.5.~~ [Policy S-14.5.](#) Require, where applicable, new development and/or redevelopment to include environmental cleanup (e.g., removal of contaminated soils) and restoration of the shoreline in accordance with state and federal requirements.

Public Access

~~Policy 5.10.6.~~ [Policy S-14.6.](#) Plan for a public pedestrian walkway system along the Urban waterfront utilizing a combination of natural beaches, pathways, piers, wharves, street-ends, sidewalks, stairways, or other improvements. Although it may not be feasible for the walkway system to be continuous throughout the entire area, it should promote quality pedestrian access to and along major portions of the waterfront. Street-ends should, at a minimum, become developed access points to the shoreline. Linkage between these street-ends should be determined by the physical characteristics of the shorelines, existing development patterns, potential for structural improvements, and other factors relevant to developing a continuous pedestrian system. *Port of Anacortes' Integrated Approach to Marine Public Access, Final Report (October, 2003)*, is incorporated by reference into this SMP.

~~Policy 5-10.7.~~ [Policy S-14.7.](#) Encourage designs that enhance pedestrian traffic without impeding vehicular traffic through the use of paving textures, fencing, landscaping, and signage that make a greater distinction between automobile traffic and pedestrian circulation systems.

Urban Maritime

Uses

~~Policy 5-11.1.~~ [Policy S-15.1.](#) Give preference to water-dependent transportation, shipping, Port, and manufacturing uses due to their proximity to deep shipping berths and channels and to navigable waters.

~~Policy 5-11.2.~~ [Policy S-15.2.](#) Encourage expansion of water-dependent and water-related uses.

~~Policy 5-11.3.~~ [Policy S-15.3.](#) Non-water-oriented uses should not be allowed unless they are a supportive use to a water-oriented use or are established along with the water-oriented use.

~~Policy 5-11.4.~~ [Policy S-15.4.](#) Primary non-water-oriented uses should not be permitted.

~~Policy 5-11.5.~~ [Policy S-15.5.](#) Existing non-water-oriented industrial and commercial uses should be encouraged to relocate to non-waterfront property.

~~Policy 5-11.6.~~ [Policy S-15.6.](#) Industrial and commercial development along Urban Maritime shorelines should provide protection of existing ecological functions where practicable and mitigated. It should also provide public access opportunities only where appropriate and where public safety would not be compromised and alternative off-site provision has been made.

Public Access

~~Policy 5-11.7.~~ [Policy S-15.7.](#) Where desirable and practicable, industrial and commercial facilities should be designed to facilitate pedestrian waterfront activities. *The Port of Anacortes' Integrated Approach to Marine Public Access, October 2003* is incorporated by reference, and substitutes for uniform public access requirements on individual port actions.

Environmental Protection

Impacts, Mitigation, and Bonding

~~Policy 6-3.1.~~ [Policy S-16.1.](#) Protect the environment through implementation of this Master Program including the use of the AMRRCM mitigation sequence (Avoid, Minimize, Rectify, Reduce, Compensate, Monitor) (WAC 173-26-201(2)(e)(i)).

~~Policy 6-3.2.~~ [Policy S-16.2.](#) Minimize the adverse impacts of shoreline developments and activities on the shoreline environment during all phases of development (e.g., design, construction, operation, and management).

~~Policy 6-3.3.~~ [Policy S-16.3.](#) Assure, at a minimum, that development and use within shoreline jurisdiction results in no net loss of ecological functions necessary to sustain shoreline natural resources. Development activities must protect existing ecological functions and ecosystem-wide processes.

~~Policy 6.3.4.~~ [Policy S-16.4.](#) Encourage shoreline developments or activities that serve to enhance ecological functions and/or values and those that protect and/or contribute to the long-term restoration of properly functioning conditions for proposed, threatened, and endangered species consistent with the fundamental goals of this Master Program. Use of creosote and pentachlorophenol treated woods is prohibited. ~~Use of other treated woods (e.g. CZA, ACZA) should be minimized as much as practicable.~~

~~Policy 6.3.5.~~ [Policy S-16.5.](#) Ensure, through appropriate monitoring and enforcement measures, that all required conditions are met, improvements installed, and properly maintained.

~~Policy 6.3.6.~~ [Policy S-16.6.](#) Shoreline-specific critical area provisions promote human uses and values, such as public access and aesthetic values, provided they do not significantly adversely impact ecological functions.

Environmental Elements

Policy 6.4.1. [Policy S-17.1.](#) Protect against adverse impacts to the public health, to the land and its vegetation and wildlife, and to waters of the state and their aquatic life. In-stream structures that protect and preserve ecosystem-wide processes, ecological functions, and cultural resources, including, fish and fish passage, wildlife and water resources, shoreline critical areas, hydrogeological processes, and natural scenic vistas are of particular importance. This section provides policies and regulations to address environmental impacts to the elements of the environment listed in the State Environmental Policy Act (SEPA) (WAC 197-11-444). It is not intended to limit the application of SEPA.

Vegetation Conservation

~~Policy 6.5.1.~~ [Policy S-18.1.](#) Prohibit speculative clearing, grading, or vegetation removal. Allow alteration of the natural landscape only in association with existing legal uses or a new permitted shoreline use or development.

~~Policy 6.5.2.~~ [Policy S-18.2.](#) Limit alteration of the natural landscape to the minimum necessary to accommodate the shoreline development or a landscape plan developed in conjunction with the shoreline development, or to remove invasive vegetation.

~~Policy 6.5.3.~~ [Policy S-18.3.](#) Restrict clearing and grading within shoreline jurisdiction in order to maintain the functions and values of the shoreline environment, including protection of habitat and shoreline bluffs.

~~Policy 6.5.4.~~ [Policy S-18.4.](#) Tree removal is to be minimized on City shorelines. Place priority on retention of snags and live trees that provide nesting or perching for eagles, other raptors, or priority species.

~~Policy 6.5.5.~~ [Policy S-18.5.](#) Use best management practices (BMPs) during clearing and grading to control erosion.

Critical Areas – General

~~Policy 6.6.1.~~ [Policy S-19.1.](#) Protect unique, rare, and fragile environments, including wetlands and fish and wildlife habitat conservation areas, from impacts associated with development.

~~Policy 6.6.2.~~ [Policy S-19.2.](#) Locate and design development to minimize risks to people, property and other critical areas associated with geologically hazardous areas, frequently flooded areas, and tsunamis.

~~Policy 6.6.3.~~ [Policy S-19.3.](#) Provide a level of protection to shoreline-specific critical areas that is equal to or greater than the level of protection provided by the adopted Anacortes critical areas regulations. Recognizing this, the City has ~~incorporated~~ [adopted](#) appropriate portions of its critical areas regulations into this Master Program ~~as Appendix A~~ [by ordinance](#).

Fish and Wildlife Habitat Conservation Areas

~~Policy 6.7.1.~~ [Policy S-20.1.](#) Encourage the protection of critical saltwater habitats in recognition of their importance to the marine ecosystem of the City of Anacortes and the State of Washington. These habitats provide critical reproduction, rearing and migratory nursery areas for valuable recreational and commercial species. They provide habitat for many marine plants, fish, and animals.

An analysis of alternatives using SEPA will be required for any project proposed within FWHCA's. The analysis should include, in part, shoreline bathymetry, shoreline features at the site, and substrate composition.

~~Policy 6.7.2.~~ [Policy S-20.2.](#) Water-dependent uses, including recreational facilities, marinas, transportation facilities and some utility crossings, may be permitted in critical saltwater habitats provided that on-site and/or off-site mitigation is provided that will result in no net loss of ecological functions resulting from the proposed facility or utility.

~~Policy 6.7.3.~~ [Policy S-20.3.](#) Protect the composition of the beach and bottom substrate. Developments within or adjacent to the shoreline jurisdiction where critical saltwater habitats exist, should avoid to the extent practicable directly or indirectly changing the composition of the beach and bottom substrate except for restoration or for driving of pilings for uses permitted under this Master Program.

~~Policy 6.7.4.~~ [Policy S-20.4.](#) Avoid impacts on critical saltwater habitats by appropriately locating and designing developments beyond the standard setback where necessary to protect the critical habitat.

Frequently Flooded Areas and Tsunami Inundation Areas

~~Policy 6.8.1.~~ [Policy S-21.1.](#) Ensure that new development in areas prone to periodic flooding comply with the Frequently Flooded Areas standards [in the \(Section A-1 of the City's - Critical Areas Regulations as referenced within Section 6.6, Critical Areas - General, AMC 19.70.61000 63025, and Floodplain Management Regulations in AMC Chapter 19.74 found in Appendix A\)](#) to minimize health hazards and property damage due to flooding.

~~Policy 6.8.2.~~ [Policy S-21.2.](#) Develop, enhance, and implement education programs aimed at mitigating natural hazards, and reducing the risk to citizens, public agencies, private property owners, businesses and schools.

~~Policy 6.8.3.~~ [Policy S-21.3.](#) Encourage development of acquisition and management strategies to preserve open space for flood mitigation, fish habitat, and water quality in frequently flooded areas.

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~~Policy 6.8.4.~~ [Policy S-21.4.](#) Coordinate and support the development of improved tsunami warning systems.

Geologically Hazardous Areas

~~Policy 6.9.1.~~ [Policy S-22.1.](#) Ensure that new development or the creation of new lots does not cause any foreseeable risk from geological conditions to people or improvements during the life of the development.

~~Policy 6.9.2.~~ [Policy S-22.2.](#) Permit development in such a manner and only in locations where no slope protection (e.g. bulkheads, rip-rap, retaining walls, etc.) is necessary or where nonstructural protection (e.g., shoreline setbacks) is sufficient for the life of the project (75 years).

~~Policy 6.9.3.~~ [Policy S-22.3.](#) Ensure that proposals are designed and constructed in a manner that does not increase or result in slope instability or sloughing.

~~Policy 6.9.4.~~ [Policy S-22.4.](#) Allow shoreline modifications or other measures to protect existing primary structures only when they are demonstrated to be necessary, when no alternatives including relocation or reconstruction of existing primary structures are found to be feasible, and when the modifications are found to comply with the policies and regulations of this Master Program for modifications ([See Chapter 9](#)) as well as the requirements of WAC 173-26-231 (Shoreline Modification requirements). Preference should be given to those types of shoreline modifications that have a lesser impact on ecological functions. Assure that modifications individually and cumulatively will result in no-net-loss of ecological functions.

~~Policy 6.9.5.~~ [Policy S-22.5.](#) New development should be discouraged in geologically hazardous areas by promoting and encouraging property development transfers, or encouraging expanded buffers and setbacks through property tax incentives.

Wetlands

~~Policy 6.10.1.~~ [Policy S-23.1.](#) Preserve and protect wetland ecosystems, and mitigate impacts, so that there is no net loss of wetland acreage and functions. Where feasible, improve wetland quality. Maintaining or restoring vegetated buffers is the preferred method for protecting/improving wetland functions.

~~Policy 6.10.2.~~ [Policy S-23.2.](#) Prevent adverse impacts to wetland functions by controlling all activities that could potentially affect wetland ecosystems whether the activity is located within or adjacent to shorelines jurisdictional wetlands or their buffers.

~~Policy 6.10.3.~~ [Policy S-23.3.](#) Encourage in-kind replacement of functional wetland values as the preferred mitigation. Where in-kind replacement is not feasible or practical due to the characteristics of the existing wetland, provide ecological resources of equal or greater value, preferably within the same hydrologic sub-basin, and located based on limiting factors or critical needs identified in watershed or comprehensive resource management plans, including the Shoreline Restoration Plan.

~~Policy 6.10.4.~~ [Policy S-23.4.](#) Coordinate proposals for mitigation, creation, or enhancement with appropriate resource agencies to ensure adequate design and consistency with local, state and federal regulatory requirements.

~~Policy 6.10.5.~~ [Policy S-23.5.](#) Develop wetland education programs to increase awareness of the importance of wetlands and to inform the citizenry of protective wetland regulations. The City of Anacortes should distribute wetland education materials to the public, including schools, landowners, and developers in the Anacortes area.

~~Policy 6.10.6.~~ [Policy S-23.6.](#) Seek regional solutions to wetland mitigation through coordinated planning with state and federal agencies, Skagit County, port authorities and the public.

Shoreline Public Access

GENERAL POLICIES

~~Policy 7.3.1.~~ [Policy S-24.1.](#) Seek to maintain and enhance public access, both physical and visual, throughout the City's shoreline. Access should be provided for a range of users including pedestrians, bicyclists, boaters and, to the extent feasible, people with disabilities. Access opportunities should be varied, ranging from urban water walks to viewing platforms of natural areas. Encourage the use of public access facilities to actively educate and inform the public on the importance of environmental protection of the shoreline jurisdiction. Work in partnership with local entities (e.g., Skagit Marine Resources Committee, and others) to implement this policy.

~~Policy 7.3.2.~~ [Policy S-24.2.](#) Locate and design public access in a manner that does not result in a net loss of ecological functions or wildlife habitat.

~~Policy 7.3.3.~~ [Policy S-24.3.](#) Link recreational and public access opportunities together via trails, beach walks and water routes whenever appropriate. Where practical, access points link to non-motorized transportation routes, such as bicycle and hiking paths, and kayak/canoe routes.

~~Policy 7.3.4.~~ [Policy S-16.38.](#) Seek a public pedestrian walkway system along the waterfront utilizing a combination of natural beaches, pathways, piers, wharves, street-ends, sidewalks, stairways, or other improvements. Although it may not be feasible for the walkway system to be continuous along the water's edge throughout the entire area, it should promote quality pedestrian access to and along major portions of the waterfront. The public's ability to physically walk along the beach is a priority and thus extending boardwalks over the beach should be limited. Where development of a waterfront trail is to occur, the development should protect shoreline ecological functions and enhance areas of impaired functions when feasible.

~~Policy 7.3.5.~~ [Policy S-24.4.](#) Require new development that impacts public access to mitigate through the provision of on-site visual and physical public access, unless such access is shown to be incompatible due to reasons of safety, security, or impact to the shoreline. In lieu of on-site improvements, the Shoreline Administrator may allow for off-site improvements if said improvements would provide a greater public benefit.

~~Policy 7.3.6.~~ [Policy S-24.5.](#) Foster public access through a variety of approaches including purchase of key segments, encouraging public and private partnerships, and working with developers to explain the benefits of incorporating public access and recreation.

~~Policy 7.3.7.~~ [Policy S-24.6.](#) Incorporate public access provisions into the review and approval of all public and private development projects including

land divisions into five or more parcels. Exceptions may be considered for the following:

- a. Single-family dwelling units not part of a development planned for five or more parcels;
- b. Where deemed inappropriate due to health, safety, security, incompatible uses, constitutional or other legal limitations and environmental concerns. In these cases alternate methods of providing public access ~~shall~~ must be considered such as off-site improvements, viewing platforms, separation of uses through site planning and design, and restricting hours of public access; and
- c. Where a more effective integrated public access plan exists.

BEACHWALKS

~~Policy 7.3.8.~~ Policy S-24.7. Preserve beachwalks as unimproved public access. Beachwalks are unmarked sections of intertidal land upon which the public has rights of passage in accordance with the Public Trust Doctrine. Beachwalks by definition are usually not passable on a 24-hour basis due to tidal action.

STREET ENDS

~~Policy 7.3.9.~~ Policy S-24.8. Encourage the use of street ends and other publicly owned or controlled lands to increase public access to shoreline areas.

~~Policy 7.3.10.~~ Policy S-24.9. Develop street end access and viewpoints. Improvements to and linkages between these street-ends should be determined by the physical characteristics of the shorelines, existing development patterns, potential for structural improvements, and other factors relevant to developing a continuous pedestrian system.

~~Policy 7.3.11.~~ Policy S-24.10. Ensure that use of street ends for parking does not physically block public access to the shoreline or degrade the scenic qualities of the City. (~~See Parking Facilities, Section 8.9, Chapter 8~~)

~~Policy 7.3.12.~~ Policy S-24.11. Identify and bring into compliance uses that unlawfully encroach on public access areas, unless a street use agreement has previously been made between the City of Anacortes and the proponent of the use.

~~Policy 7.3.13.~~ Policy S-24.12. Develop a prioritized list of improvements to street ends. Cost effectiveness should be a key element in prioritizing the proposed improvements.

DESIGN

~~Policy 7.3.14.~~ Policy S-24.13. Public access improvements should be designed and constructed to:

- a. Look and “feel” welcoming to the public and be usable by the greatest number and diversity of people including, to the extent possible, the physically handicapped.
- b. Connect to public areas, street-ends and other pedestrian or public thoroughfares.
- c. Be as close as possible to the water's edge while preserving the natural character of the shoreline and protecting ecological functions and processes of shorelines and/or their associated wetlands.

- d. Be compatible with the surrounding character and appropriate for the anticipated intensity of use. In general, the higher the intensity of development and use, the more formal and durable the improvements should be.
- e. Enhance the character of Anacortes, including the historic and economic activity of downtown, marine business and industry, Port activity, and natural areas.
- f. Avoid conflicts with water-dependent uses.
- g. Provide for public safety and minimize potential impacts to private property and individual privacy and security.
- h. Require low maintenance design.
- i. Ensure that construction (i.e., structures, trails and access pathways) incorporates environmentally sensitive design and materials (e.g., use non-toxic, natural materials).

Specific Use Policies

Advertising and Signs

~~Policy 8.2.1.~~ [Policy S-25.1.](#) Ensure that signage within the shoreline jurisdiction complies with the City's Sign regulations codified in ~~Chapter Title 17-19~~ of the Anacortes Municipal Code.

~~Policy 8.2.2.~~ [Policy S-25.2.](#) Ensure that signs are compatible with the shoreline environment and adjacent land and water uses through appropriate design and placement.

~~Policy 8.2.3.~~ [Policy S-25.3.](#) Minimize degradation of vistas and viewpoints and ensure visual access to the water from such vistas by appropriately locating signs.

~~Policy 8.2.4.~~ [Policy S-25.4.](#) Signs should not be placed where they will detract from or block shoreline views, nor should they be of a design and size which would degrade the shoreline character as defined in the Area Designations.

Agriculture

~~Policy 8.3.1.~~ [Policy S-26.1.](#) Agricultural activities ~~shall~~ [must](#) be prohibited in all environments except for home gardens associated with a single-family residence.

Aquaculture

~~Policy 8.4.1.~~ [Policy S-27.1.](#) Non-commercial aquaculture for recovery of a native population is preferred.

~~Policy 8.4.2.~~ [Policy S-27.2.](#) Limit all other aquaculture uses to the Urban ~~and~~ [Urban Maritime environments and adjacent Aquatic environments](#) as a Conditional Use.

~~Policy 8.4.3.~~ [Policy S-27.3.](#) Ensure that, when permitted, aquaculture developments are located, designed and operated in a manner that is

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compatible with existing uses and in keeping with the natural shoreline environment and the environmental protection and restoration policies of this Master Program.

~~Policy 8.4.4.~~ [Policy S-27.4.](#) Aquaculture should not be permitted where it would result in a net loss of shoreline ecological functions; adversely affect the quality or extent of habitat for native species including eelgrass, kelp, and other macroalgae; adversely impact other habitat conservation areas; or interfere with navigation or other water-dependent uses.

~~Policy 8.4.5.~~ [Policy S-27.5.](#) The City should actively seek substantive comment on any shoreline permit application for aquaculture from all appropriate Federal, State and local agencies; affected tribes; and the general public regarding potential adverse impacts. Comments of nearby residents or property owners directly affected by a proposal should be considered and evaluated, especially in regard to use compatibility and aesthetics.

Commercial Development

~~Policy 8.5.1.~~ [Policy S-28.1.](#) Give priority to those commercial developments that are dependent on shoreline locations or that allow a substantial number of people to actively or passively enjoy the shoreline; preference should first be given to water-dependent uses, then to water-related and water-enjoyment uses.

~~Policy 8.5.2.~~ [Policy S-28.2.](#) Except for marinas, commercial docking facilities, and related facilities, prohibit new over-water commercial structures.

~~Policy 8.5.3.~~ [Policy S-28.3.](#) Design commercial uses in a manner that provides reasonable physical and visual access to the water.

~~Policy 8.5.4.~~ [Policy S-28.4.](#) Design commercial uses adjacent to the ordinary high water mark in a manner that provides shoreline setback enhancement and environmental restoration at the water's edge consistent with constitutional and other limitations on the regulation of private property.

~~Policy 8.5.5.~~ [Policy S-28.5.](#) New non-water-oriented commercial uses are prohibited unless there is no direct access to navigable waterways or unless they are part of a mixed-use project that includes water-dependent uses as the primary uses or navigation is severely limited at the proposed site and the use provides a significant public benefit with respect to SMA objectives for public access and ecological benefit.

Industrial and Port Facilities

~~Policy 8.6.1.~~ [Policy S-29.1.](#) Reserve shorelines that are particularly suitable for water-dependent and water-related industrial and port development for these uses.

~~Policy 8.6.2.~~ [Policy S-29.2.](#) Prohibit non-water-dependent industrial and port developments over water.

~~Policy 8.6.3.~~ [Policy S-29.3.](#) Require new industrial and port development to provide physical and visual access to shorelines whenever possible, consistent with constitutional and statutory limitations, and provided such access does not interfere with industrial operations or endanger public health and safety.

~~Policy 8.6.4.~~ [Policy S-29.4.](#) Encourage cooperative use of docks, cargo handling, storage, parking, and other accessory facilities among private or public entities in shoreline industrial and port areas.

~~Policy 8.6.5.~~ [Policy S-29.5.](#) Ensure that land transportation and utility corridors serving ports and water-related industry follow the guidelines provided under the sections dealing with utilities and transportation. Where feasible, transportation and utility corridors should be located upland to reduce conflicts with industrial operations.

~~Policy 8.6.6.~~ [Policy S-29.6.](#) Only water-dependent industrial and port uses ~~shall~~[will](#) be permitted on shorelands with direct frontage on and practical access to navigable waterways.

~~Policy 8.6.7.~~ [Policy S-29.7.](#) Opportunities for public access to the water are required at port and industrial sites, unless such access would interfere with operations or endanger public health and safety, or the proponent otherwise provides for equivalent access elsewhere in the City.

~~Policy 8.6.8.~~ [Policy S-29.8.](#) Cooperative and complementary port and industrial activities are encouraged to locate in common areas.

~~Policy 8.6.9.~~ [Policy S-29.9.](#) Industrial uses and redevelopment are encouraged to locate where environmental cleanup and restoration can be accomplished.

~~Policy 8.6.10.~~ [Policy S-29.10.](#) New non-water-oriented industrial uses are prohibited unless they are part of a mixed-use project, navigation is severely limited, and the use provides a significant public benefit with respect to SMA objectives.

Marinas

~~Policy 8.7.1.~~ [Policy S-30.1.](#) Ensure that proposed marinas and the expansion of existing marinas are located, designed, constructed and operated in a manner that will minimize damage to shoreline processes and functions. When impacts cannot be avoided, impacts must be mitigated to assure no-net-loss of ecological function necessary to sustain shoreline resources.

~~Policy 8.7.2.~~ [Policy S-30.2.](#) Ensure that marinas are located, designed, and operated so as to be compatible with adjacent uses and protect the aesthetic qualities of the shoreline environment.

~~Policy 8.7.3.~~ [Policy S-30.3.](#) Consult the standards and guidelines of applicable federal, state and local agencies in planning for marina expansion and new mooring facilities.

~~Policy 8.7.4.~~ [Policy S-30.4.](#) Marinas are to be designed to minimize adverse impacts to water quality, through avoidance and/or mitigation, and to be aesthetically compatible with the shoreline area.

~~Policy 8.7.5.~~ [Policy S-30.5.](#) Viewpoints and public access to marina areas should be included in marina plan and design.

~~Policy 8.7.6.~~ [Policy S-30.6.](#) Marinas must be designed to comply with regulations prepared by the State Department of Fish and Wildlife and other agencies having jurisdiction over such development.

~~Policy 8.7.7.~~ [Policy S-30.7.](#) New marinas and marina expansions are to be located and designed so that they will minimize damage to fish and shellfish resources after all mitigation requirements are met.

~~Policy 8.7.8.~~ [Policy S-30.8.](#) Marinas are to be designed to minimize, as far as practicable, adverse impacts to natural shoreline processes.

~~Policy 8.7.9.~~ [Policy S-30.9.](#) Special attention should be given to the design and development of operational procedures for fuel handling and storage in order to minimize accidental spillage and provide satisfactory means for handling those spills that do occur.

~~Policy 8.7.10.~~ [Policy S-30.10.](#) All applicable State and local health and safety standards ~~shall~~ [must](#) be complied with in the development of marinas.

~~Policy 8.7.11.~~ [Policy S-30.11.](#) Upland dry storage marinas are preferred for non-transient storage of boats less than 30 feet in length, provided adequate boat launching/retrieval facilities and in-water staging floats are provided.

~~Policy 8.7.12.~~ [Policy S-30.12.](#) Preference should first be given to water-dependent uses, then to water-related and water-enjoyment uses.

Mining

~~Policy 8.8.1.~~ [Policy S-31.1.](#) Ensure that all mining activities occur in appropriately designated areas outside of the Anacortes shoreline jurisdiction.

Parking Facilities

~~Policy 8.9.1.~~ [Policy S-32.1.](#) Encourage offsite parking with shuttle parking service.

~~Policy 8.9.2.~~ [Policy S-32.2.](#) Design and place parking facilities as far as practicable from the water's edge.

~~Policy 8.9.3.~~ [Policy S-32.3.](#) Ensure that parking facilities are adequate to serve the level of demand anticipated by the associated use.

~~Policy 8.9.4.~~ [Policy S-32.4.](#) Minimize impacts from parking facilities in shoreline areas including those related to stormwater runoff, water quality, visual qualities, public access, and vegetation and habitat maintenance, through appropriate location and design.

Recreational Facilities

~~Policy 8.10.1.~~ [Policy S-33.1.](#) Encourage the coordination of local, state, and federal recreation planning so as to mutually address recreational needs. Shoreline recreational developments should be consistent with all adopted park, recreation, and open space plans.

~~Policy 8.10.2.~~ [Policy S-33.2.](#) Encourage the linkage of shoreline parks, recreation areas, and public access points in a linear system, such as hiking paths, bicycle paths, and scenic drives.

~~Policy 8.10.3.~~ [Policy S-33.3.](#) Locate and design recreational developments in a manner that preserves, enhances, or creates scenic views and vistas.

~~Policy 8.10.4.~~ [Policy S-33.4.](#) Locate and design recreational facilities to minimize adverse impacts including those related to stormwater runoff, water quality, visual qualities, public access, and vegetation and habitat maintenance.

~~Policy 8.10.5.~~ [Policy S-33.5.](#) Encourage physical and visual access to shorelines and surface waters.

~~Policy 8.10.6.~~ [Policy S-33.6.](#) Prevent concentration of clutter and leave the beaches and tidelands in their natural state by locating camping and overnight recreation sites in upland areas. Park design and operation should deal with the impact such activities have not only within park boundaries but on adjacent properties and communities as well.

~~Policy 8.10.7.~~ [Policy S-33.7.](#) Prohibit use of recreational off-road vehicles within the shoreline area, except by public agencies for maintenance, operations and emergency services.

~~Policy 8.10.8.~~ [Policy S-33.8.](#) Location, design and operation of recreational facilities ~~shall~~ [must](#) be consistent with the purpose of environment designations in which they are allowed.

~~Policy 8.10.9.~~ [Policy S-33.9.](#) Recreational development ~~shall~~ [must](#) achieve no net loss of ecological processes and functions.

Residential Development

~~Policy 8.11.1.~~ [Policy S-34.1.](#) Single-family residences are identified as a priority use only when developed in a manner consistent with control of pollution and prevention of damage to the natural environment.

~~Policy 8.11.2.~~ [Policy S-34.2.](#) No net loss of ecological functions must be assured with specific standards for setback of structures sufficient to avoid problems with future soil stabilization, planted areas, density, shoreline stabilization, and on-site sewage disposal.

~~Policy 8.11.3.~~ [Policy S-34.3.](#) Prohibit residential structures, floating homes (except that floating shelters for boats may be allowed in a marina for community and/or youth boating programs operated by nonprofit organization or public agencies), and accessory structures except for permitted docks in areas waterward of the ordinary high water mark, or within wetlands, habitat conservation areas, flood hazard areas, landslide hazard areas or their respective buffers.

~~Policy 8.11.4.~~ [Policy S-34.4.](#) Ensure that all residential development is designed:

- a. At a level of density of site coverage and occupancy compatible with the physical capabilities of the shoreline area, and consistent with the density provisions of the Anacortes Comprehensive Plan Ordinance No. ~~2757~~ [2982, dated July 18, 2016](#) and ~~Zoning Unified Development~~ Code Ordinance No. ~~2702~~ [3040, dated July 22, 2019](#), as amended.
- b. To preserve and enhance existing shoreline vegetation, control erosion and protect water quality, ecological resources and shoreline aesthetics of the shoreline both during and after construction.
- c. To protect public views and provide public access to the shoreline. In accordance with the Public Access [policies and requirements in Chapter 7](#) ~~AMC Ch. 19.72 Shorelines~~, residential developments of more than four (4) dwelling units should provide dedicated and improved public access to the shoreline.
- d. To preserve natural drainage courses, aquifer recharge areas, and similar ecologically sensitive areas.

Commented [AC3]: Table 5-1 #9

- e. Private views of the shoreline, although considered during the review process, are not expressly protected. Property owners concerned with the protection of views from private property are encouraged to obtain view easements, purchase intervening property and/or seek other similar private means of minimizing view obstruction. Residential structures greater than thirty-five feet above average grade level are prohibited, except for a multi-use project containing multi-family residential.
- f. To blend into the site as much as possible.

~~Policy 8-11.5.~~ Policy S-34.5. Consider additional design features for new subdivision and short subdivisions that:

- a. Cluster dwelling units in order to preserve natural features, minimize physical impacts, and provide for public access to the shoreline.
- b. Maintain usable waterfront areas for the common use of all property owners within the development.
- c. Are serviced by sanitary sewer and public water facilities in accordance with appropriate state and local health regulations. Storm drainage facilities ~~shall~~ must be separate, not combined with sewage disposal systems.
- d. Assures that the lots created will not require shoreline stabilization other than soft armoring in order for reasonable use to occur.

~~Policy 8-11.6.~~ Policy S-34.6. Encourage joint use of shoreline facilities including access stairs, trams, piers, and docks.

~~Policy 8-11.7.~~ Policy S-34.7. Planned unit residential developments which provide for additional open space and public shoreline access are encouraged.

~~Policy 8-11.8.~~ Policy S-34.8. Subdivisions and high density residential developments are to be planned and designed to avoid problems of storm and sanitary sewage disposal, and minimize impervious surfaces.

Scientific, Cultural and Educational Facilities

~~Policy 8-12.1.~~ Policy S-35.1. Consider permanently preserving sites, where practicable, consistent with constitutional and statutory limitations, for scientific study and public observation.

~~Policy 8-12.2.~~ Policy S-35.2. Provide for site inspections and an evaluation by a professional archaeologist in coordination with affected Indian tribes. Ensure that archaeological data is properly salvaged by attaching special conditions to development activities in areas known to contain archaeological data.

~~Policy 8-12.3.~~ Policy S-35.3. Prevent public or private developments from destroying or destructively altering potential or recognizable sites having historic, cultural, scientific, or educational value protected by state law wherever feasible, consistent with constitutional and statutory limitations.

~~Policy 8-12.4.~~ Policy S-35.4. Ensure that excavation activities are conducted in compliance with the applicable policies and standards of this Master Program.

~~Policy 8-12.5.~~ Policy S-35.5. An inventory of historical and archeological sites should be prepared and referred to when reviewing plans for development in shoreline areas.

~~Policy 8-12.6.~~ [Policy S-35.6.](#) If, in the course of construction on shorelines, items of possible archeological significance are uncovered, the contractor ~~shall~~ [must](#) notify the City of the find, and stop work which could damage such items, or protect the items from damage, until appropriate evaluations and actions can be carried out.

Transportation Facilities

~~Policy 8-13.1.~~ [Policy S-36.1.](#) Proposed transportation and parking facilities are required to plan, locate, and be designed where routes will have the least possible adverse effect on unique or fragile shoreline features, and will not result in a net loss of shoreline ecological functions or adversely impact existing or planned water-dependent uses.

~~Policy 8-13.2.~~ [Policy S-36.2.](#) Circulation system plans must include systems for pedestrian, bicycle, and public transportation where appropriate.

~~Policy 8-13.3.~~ [Policy S-36.3.](#) Parking ~~shall~~ [must](#) be allowed only as necessary to support an authorized shoreline use and where it minimizes environmental and visual impacts of the parking facilities.

~~Policy 8-13.4.~~ [Policy S-36.4.](#) Discourage the location of new roads in the shoreline jurisdiction.

~~Policy 8-13.5.~~ [Policy S-36.5.](#) Reserve new roads for local access traffic or to connect to and serve new or existing transportation facilities.

~~Policy 8-13.6.~~ [Policy S-36.6.](#) Avoid unnecessary duplication of roads by making use of existing roads where practicable. New wetland crossings by roads or trails should be avoided.

~~Policy 8-13.7.~~ [Policy S-36.7.](#) Plan road locations to fit the topography so alterations of natural conditions will be minimized.

~~Policy 8-13.8.~~ [Policy S-36.8.](#) Make provisions for scenic corridors and safe pedestrian and other non-motorized travel when designing new public roadways. Also, provisions should be made for viewpoints, rest areas, scenic corridors, and picnic areas in public shorelines.

~~Policy 8-13.9.~~ [Policy S-36.9.](#) Coordinate plans for transportation facilities with land use. Plans for transportation facilities should be consistent with the Anacortes Comprehensive Plan.

~~Policy 8-13.10.~~ [Policy S-36.10.](#) Road and railway development should be located as far inland from the land/water interface as feasible and should not interfere with other appropriate shoreline uses, or degrade shoreline areas.

~~Policy 8-13.11.~~ [Policy S-36.11.](#) Design of roadways on shoreline areas should take advantage of scenic vistas and provide for viewpoints and rest and picnic sites in public areas.

~~Policy 8-13.12.~~ [Policy S-36.12.](#) Design of new roadways or redesigned roadways ~~shall~~ [must](#) use Low Impact Development provisions when practicable.

Utilities

~~Policy 8-14.1.~~ [Policy S-37.1.](#) Design, location and maintenance of utilities is required to assure no net loss of ecological functions.

~~Policy 8.14.2.~~ [Policy S-37.2.](#) Utilities are required to be located in existing rights-of-ways whenever possible.

~~Policy 8.14.3.~~ [Policy S-37.3.](#) Utility production and processing facilities and transmission facilities are required to be located outside of shoreline jurisdiction, unless no other feasible option exists.

~~Policy 8.14.4.~~ [Policy S-37.4.](#) Incorporate, to the extent feasible, major utility corridors on shorelines areas into the City's programs and plans for public access to and along water bodies.

~~Policy 8.14.5.~~ [Policy S-37.5.](#) Prohibit solid waste disposal activities and facilities, other than minor recycling facilities as defined by the AMC, in shoreline areas.

~~Policy 8.14.6.~~ [Policy S-37.6.](#) Prohibit utilities in wetlands and other critical areas unless no other practicable alternative exists.

~~Policy 8.14.7.~~ [Policy S-37.7.](#) Ensure that whenever utilities must be placed in a shoreline area, the location is chosen to:

- a. Meet the needs of future populations in areas planned to accommodate this growth.
- b. Utilize existing transportation and utility sites, rights-of-way and corridors, whenever possible. Joint use of rights-of-way and corridors should be encouraged.
- c. Preserve scenic views and aesthetic qualities of the shoreline area.
- d. Be located such that shoreline defense works will not be required for the life of the project.
- e. Non-water-oriented parts of wastewater treatment, water reclamation, desalinization, and power plant facilities ~~shall~~ [must](#) be located outside shoreline jurisdiction unless it can be demonstrated that no other feasible option is available.

~~Policy 8.14.8.~~ [Policy S-37.8.](#) Restore the land/substrate to its pre-project configuration upon completion of installation/maintenance of utilities in shorelines. Disturbed areas should be replanted with native species, and be provided with irrigation and maintenance care until the newly planted vegetation is established.

~~Policy 8.14.9.~~ [Policy S-37.9.](#) Placement of utilities in shoreline areas should be planned and designed to avoid degradation of the shorelines and shoreline views during and after installation.

Specific Shoreline Modification Policies

General Policies and Regulations

POLICIES APPLICABLE TO ALL SHORELINE MODIFICATIONS

~~Policy 9.2.1.~~ [Policy S-38.1.](#) Locate and design all new development in a manner that prevents or minimizes the need for shoreline modifications.

~~Policy 9.2.2.~~ [Policy S-38.2.](#) Regulate shoreline modifications to assure that the modifications individually and cumulatively do not result in a net loss of

ecological functions. Mitigation may be required to meet the no net loss standard.

~~Policy 9.2.3.~~ [Policy S-38.3.](#) Give preference to those types of shoreline modifications that have a lesser impact on ecological functions and require mitigation of identified impacts resulting from shoreline modifications.

~~Policy 9.2.4.~~ [Policy S-38.4.](#) Plan for the enhancement of impaired ecological functions where feasible and appropriate while accommodating permitted uses. Incorporate all feasible measures to protect ecological shoreline functions and values and ecosystem-wide processes and values in the placement and design of shoreline modifications. To avoid and reduce ecological impacts, the mitigation sequence in WAC 173-26-201(2)(e) should be followed.

~~Policy 9.2.5.~~ [Policy S-38.5.](#) Non-structural shoreline modifications are preferred over structural modifications.

~~Policy 9.2.6.~~ [Policy S-38.6.](#) Where applicable, base provisions on scientific and technical information and a comprehensive analysis of drift cells for marine waters.

Boat Launches

~~Policy 9.3.1.~~ [Policy S-39.1.](#) Maintain, improve, and expand existing boat launch capacity for future Port, commercial, and recreational uses.

~~Policy 9.3.2.~~ [Policy S-39.2.](#) Install, maintain and rebuild boat launches in such a manner as to minimize adverse affects on natural and physical shoreline resources.

Breakwaters

~~Policy 9.4.1.~~ [Policy S-40.1.](#) Breakwaters should be allowed only where necessary to support water-dependent uses, public access, shoreline stabilization, or other specific public purpose.

~~Policy 9.4.2.~~ [Policy S-40.2.](#) The availability for public use of the shoreline and water surface should be a strong consideration in allowing future breakwater construction.

~~Policy 9.4.3.~~ [Policy S-40.3.](#) Before a permit for breakwater construction can be issued, the construction and subsequent maintenance phases must be identified.

~~Policy 9.4.4.~~ [Policy S-40.4.](#) Multiple use concepts are to be strongly encouraged in the construction of both private and public breakwaters.

~~Policy 9.4.5.~~ [Policy S-40.5.](#) The design and construction of breakwaters ~~shall~~[must](#) address impacts to, and protect, ecological functions and critical areas. Mitigation sequencing and appropriate mitigation ~~shall will be~~[is](#) required.

~~Policy 9.4.6.~~ [Policy S-40.6.](#) Breakwater design and construction should be such that disruption to the movement of sand, circulation of water, and biological communities are minimized and mitigated.

~~Policy 9.4.7.~~ [Policy S-40.7.](#) Floating breakwaters are preferred over traditional breakwater designs.

Docks, Piers and Floats

~~Policy 9.5.1.~~ [Policy S-41.1.](#) Limit docks, piers and floats to those required as part of a permitted water-dependent use; those operated by the City, the Port of Anacortes, Washington State Ferries, or those otherwise provided for public use. As used here, a dock associated with a single-family residence is a water-dependent use provided that it is designed and intended as a facility for access to watercraft and otherwise complies with the provisions of this section.

~~Policy 9.5.2.~~ [Policy S-41.2.](#) Limit docks, piers and floats associated with single-family residential use to the single-family residences within Flounder Bay and Cap Sante. Prohibit all other docks, piers and floats associated with single-family residences.

~~Policy 9.5.3.~~ [Policy S-41.3.](#) Prohibit docks, piers and floats located outside of a permitted marina to be used for permanent moorage of occupied boats (i.e., liveaboards).

~~Policy 9.5.4.~~ [Policy S-41.4.](#) Prohibit over water boathouses except that floating shelters for boats may be allowed in a marina for community and/or youth boating programs operated by nonprofit organization or public agencies.

Policy 9.5.5. Policy S-41.5. Ensure that docks, piers, and floats are:

- a. Considered together with shoreline characteristics, tidal action, aesthetics and adjacent land and water uses.
- b. Discouraged at locations where critical physical limitations exist, such as shallow, sloping bottoms; areas of frequent high wind, wave, or current exposure; high littoral drift areas; or slide prone and/or feeder bluffs.
- c. Designed and maintained to mitigate adverse impacts to the environment such as eelgrass beds and fish habitats shoreline aesthetics and minimize interference with the public use of the water.
- d. Designed, constructed, and maintained to provide a reasonable level of safety to users.

~~Policy 9.5.6.~~ [Policy S-41.6.](#) Encourage consideration of mooring buoys in place of piers, docks, and floats.

~~Policy 9.5.7.~~ [Policy S-41.7.](#) Use of floating docks or open pile piers is preferred over solid structures in order to minimize obstruction to currents and circulation of marine life.

~~Policy 9.5.8.~~ [Policy S-41.8.](#) The cooperative use of piers and docks should be encouraged. New residential development of two or more single-family dwellings should provide joint use or community dock facilities.

~~Policy 9.5.9.~~ [Policy S-41.9.](#) Piers and docks should not be constructed so as to obstruct navigable waters or to significantly reduce public use of the water surface.

~~Policy 9.5.10.~~ [Policy S-41.10.](#) Wood products treated with creosote or pentachlorophenol are prohibited on all new structures or repair projects. Use of other treated wood containing toxic compounds should only be used where non-toxic materials are deemed impracticable.

~~Policy 9.5.11.~~Policy S-41.11. Pier and dock construction should be restricted to the minimum size necessary to meet the needs of the proposed water-dependent use.

Dredging and Dredge Soil Disposal

~~Policy 9.6.1.~~Policy S-42.1. Dredging of navigable channels and berths and marina areas should be permitted provided that it avoids or, if that is not practicable, minimizes adverse effects on marine or freshwater habitat and ecological function. Impacts that cannot be avoided should be mitigated in a manner that assures no net loss of shoreline ecological functions.

~~Policy 9.6.2.~~Policy S-42.2. Dredging of navigable channels, berths, marina areas, and effective reuse of dredged materials should be consistent with this Master Program and other City plans and regulations.

~~Policy 9.6.3.~~Policy S-42.3. Disposal or deposition of dredged material in water areas should be allowed when it is for the improvement of habitat or restoration of ecological functions, or where the alternative of depositing material on land is more detrimental to the shoreline resource than depositing it in the water, or as approved by state agencies at an approved deep-water disposal site.

~~Policy 9.6.4.~~Policy S-42.4. Beneficial use of dredge material for environmental remediation projects, ecological enhancement, and restoration should be encouraged.

~~Policy 9.6.5.~~Policy S-42.5. New development should be sited and designed to avoid or, if that is not possible, to minimize the need for new and maintenance dredging.

~~Policy 9.6.6.~~Policy S-42.6. Dredging for the purpose of establishing, expanding, or relocating or reconfiguring navigation channels and basins should be allowed where necessary for assuring safe and efficient accommodation of existing or proposed navigational uses and then only when significant ecological impacts are minimized and when mitigation is provided.

~~Policy 9.6.7.~~Policy S-42.7. Maintenance dredging of established navigation channels and basins should be restricted to maintaining previously dredged and/or existing authorized location, depth, and width.

Fill

~~Policy 9.7.1.~~Policy S-48.1. Fill should be located, designed, and constructed to protect shoreline ecological processes and functions.

~~Policy 9.7.2.~~Policy S-48.2. Fill landward of the ordinary high water mark should be permitted when necessary to support permitted uses, and when significant impacts can be avoided or mitigated.

~~Policy 9.7.3.~~Policy S-48.3. Fill waterward of the ordinary high water mark should be permitted only by Shoreline Conditional Use Permit when necessary to accommodate water-dependent uses; public access; expansion or alteration of transportation facilities of statewide significance currently located on the shoreline and then only upon a demonstration that alternatives to fill are not feasible; a transportation facility, utility, or navigational structure with no feasible alternative; cleanup and disposal of contaminated sediments as part of an interagency environmental clean-up plan; disposal of dredged material

considered suitable under and conducted in accordance with the Dredged Material Management Program of the Department of Natural Resources, Department of Ecology and U.S. Army Corps of Engineers; and public access.

~~Policy 9-7.4.~~ [Policy S-48.4.](#) Shoreline areas should not be considered for location of sanitary (municipal solid waste) landfills or the disposal of material which will cause significant water quality impacts.

~~Policy 9-7.5.~~ [Policy S-48.5.](#) Perimeters of fill should be protected by shoreline stabilization or other design measures, unless it can be demonstrated that there will be environmental or public benefit for not employing any of these methods.

~~Policy 9-7.6.~~ [Policy S-48.6.](#) Placement of material for maintenance, restoration, or enhancement of beaches or mitigation should be permitted.

~~Policy 9-7.7.~~ [Policy S-48.7.](#) Fill should not adversely impact navigation.

Jetties and Groins

~~Policy 9-8.1.~~ [Policy S-49.1.](#) Jetties and groins located waterward of the OHWM ~~shall~~[will](#) be allowed only where necessary to support water-dependent uses, public access, shoreline stabilization, or other specific public purpose.

~~Policy 9-8.2.~~ [Policy S-49.2.](#) Jetties and groins should be permitted only for water-dependent uses when the benefits to the region outweigh short-term resource losses from such works, and only where mitigated to provide no net loss of shoreline ecological functions and processes.

~~Policy 9-8.3.~~ [Policy S-49.3.](#) Alternative structures, including several smaller discontinuous structures, should be considered where physical conditions make such alternatives with less impact feasible.

~~Policy 9-8.4.~~ [Policy S-49.4.](#) Jetties and groins ~~shall~~[must](#) be designed to protect critical areas and ~~shall~~[will](#) apply mitigation sequencing.

Mooring Buoys

~~Policy 9-9.1.~~ [Policy S-50.1.](#) Allow mooring buoys for transient boaters as a means to encourage economic development and recreation. Designated mooring buoys provide boaters with an alternative to anchoring in critical eelgrass beds.

~~Policy 9-9.2.~~ [Policy S-50.2.](#) Work with the Port of Anacortes, Washington State Parks, other public or non-profit agencies and the Department of Natural Resources to identify a "carrying capacity" of mooring buoys.

~~Policy 9-9.3.~~ [Policy S-50.3.](#) Prohibit mooring buoys where such installations will significantly interfere with navigation.

~~Policy 9-9.4.~~ [Policy S-50.4.](#) Discourage the placement of mooring buoys where sufficient dock facilities exist.

~~Policy 9-9.5.~~ [Policy S-50.5.](#) Ensure that mooring buoys are located, designed, constructed and operated in a manner that will minimize damage to sensitive ecological areas such as eelgrass beds, or aquaculture resources or facilities, except where the impacts of the mooring buoys will replace existing and ongoing practices that cause greater ecological degradation. (For example, the lesser impact of mooring buoys may be a suitable alternative to the current impacts of boat anchors.)

~~Policy 9.9.6.~~ Policy S-50.6. Ensure that mooring buoy fields are located, designed and operated so as to be compatible with adjacent uses and protect the aesthetic qualities of the shoreline environment.

~~Policy 9.9.7.~~ Policy S-50.7. Ensure that mooring buoys and the swing path of attached vessels do not encroach on navigation channels, privately owned tidelands, or the swing path of a legally established or “grandfathered” moored boat and buoy.

~~Policy 9.9.8.~~ Policy S-50.8. Extended moorage on waters of the state without a lease or permission ~~shall~~must be actively discouraged and mitigation of impacts to navigation and access is required.

Shoreline Habitat and Natural Systems Enhancement Projects

~~Policy 9.10.1.~~ Policy S-51.1. Restoration and enhancement of shorelines should be designed using principles of landscape and conservation ecology and should restore or enhance chemical, physical, and biological watershed processes that create and sustain shoreline habitat structures and functions.

~~Policy 9.10.2.~~ Policy S-51.2. Restoration and enhancement actions should improve shoreline ecological functions and processes and should target meeting the needs of sensitive and/or locally important plant, fish and wildlife species.

~~Policy 9.10.3.~~ Policy S-51.3. The City should seek funding from State, Federal, private and other sources to implement restoration, enhancement, and acquisition projects, particularly those that are identified in the Restoration Plan of this SMP (Appendix B) or any local watershed or area plans.

~~Policy 9.10.4.~~ Policy S-51.4. The City should develop processing guidelines that will streamline the review of restoration-only projects.

~~Policy 9.10.5.~~ Policy S-51.5. Allow for the use of tax incentive programs, mitigation banking, grants, land swaps, or other programs, as they are developed, to encourage restoration and enhancement of shoreline ecological functions and to protect habitat for fish, wildlife and plants.

Shoreline Stabilization Measures & Flood Protection Works

~~Policy 9.11.1.~~ Policy S-52.1. Strive to reduce or eliminate the need for structural shoreline modifications activities through application of appropriate land use designations, development standards, and public education.

~~Policy 9.11.2.~~ Policy S-52.2. Discourage new development requiring structural shoreline stabilization. Any such work will require mandatory geotechnical analysis. New development on steep slopes and bluffs ~~shall~~must be set back to prevent the need for future shoreline stabilization during the life of the project.

~~Policy 9.11.3.~~ Policy S-52.3. Relocating existing structures out of harm’s way is preferable to construction of structural shoreline stabilization.

~~Policy 9.11.4.~~ Policy S-52.4. Allow structural stabilization methods only:

- a. After a determination is made by a qualified professional with experience and proven success installing non-structural bio-engineered shoreline stabilization techniques that soft armoring

will not succeed or is not suitable due to specific site considerations.

- b. Where it has been demonstrated to be necessary to support or protect a legally established, inhabited structure or ongoing shoreline use that is in danger of loss or substantial damage, or when necessary for reconfiguration of the shoreline for mitigation or enhancement purposes, or where necessary to the operation and location of a new, single-family or multifamily structure, or a water-dependent, water-related, or water-enjoyment use consistent with this Master Program. They will not be permitted for the indirect purpose of creating land by filling.

~~Policy 9-11-5.~~ [Policy S-52.5.](#) Encourage soft stabilization and protection works, such as protective berms or vegetative stabilization over “hard” structural means such as concrete bulkheads or extensive revetments. Furthermore, designs that do not interrupt net drift or migration of anadromous fish are preferred (for example, open piling construction is preferable to solid walls, and floating breakwaters are preferable to solid landfills).

~~Policy 9-11-6.~~ [Policy S-52.6.](#) Potential impacts that proposed shoreline stabilization measures have on ecosystem-wide processes (e.g., sand movement) and functions (e.g., habitat) must be evaluated. Make provisions to minimize impacts where feasible. Mitigation must be provided to achieve no net loss of ecological functions.

~~Policy 9-11-7.~~ [Policy S-52.7.](#) Give special attention to the effect these structures will have on aesthetic qualities of the shoreline, public access and use of the water.

~~Policy 9-11-8.~~ [Policy S-52.8.](#) Construction of shoreline stabilization measures should not be allowed until effects on adjacent shores have been evaluated by the Shoreline Administrator against Shoreline Goals, Policies and Regulations. A coastal engineering report that considers alternative protection measures should be required for all proposals for new shoreline stabilization structures.

~~Policy 9-11-9.~~ [Policy S-52.9.](#) Shoreline stabilization measures should be designed to have a minimal degradation on water views, and avoid adverse effects on fisheries resources.

~~Policy 9-11-10.~~ [Policy S-52.10.](#) Shoreline stabilization measures which would decrease publicly owned lands should not be allowed.

~~Policy 9-11-11.~~ [Policy S-52.11.](#) Shoreline stabilization structures should be allowed only where demonstrated to be necessary to support or protect permitted shoreline uses or where an existing structure is in imminent danger from shoreline erosion.

~~Policy 9-11-12.~~ [Policy S-52.12.](#) One foot of bank hardening ~~shall~~ [must](#) be removed or other equivalent mitigation for every foot of hardening installed. Such removal may be on non-contiguous sites, and may be on public property with agreement of the entity owning the site.

~~Policy 9-11-13.~~ [Policy S-52.13.](#) New development, including creation of new parcels, that would require shoreline stabilization is prohibited, unless needed to protect allowed uses where no alternative locations are available and no net loss of ecological functions will result.

ADDITIONAL POLICIES FOR HARD STABILIZATION METHODS

~~Policy 9-11-14~~, [Policy S-52.14](#). Evaluate the cumulative effect of allowing “hard” stabilization methods along the shoreline prior to permitting new “hard” structures. If it is determined that the cumulative effect would have a net loss of ecological functions on the shoreline, then exemptions and permits should not be granted.

~~Policy 9-11-15~~, [Policy S-52.15](#). Do not permit “hard” structures as a solution to geo-physical problems such as mass slope failure, sloughing, or landslides. Hard structures should only be approved for the purposes of preventing bank erosion.

By Email

May 31, 2022

Libby Grage, Planning Manager
City of Anacortes
libbyb@cityofanacortes.org

Re: Shoreline Master Program Update supplemental comments

Dear Ms. Grage:

Thank you for shepherding the City of Anacortes' Shoreline Master Program update ("Update") toward a conclusion. As you and the City Council work to finalize the document, I offer the following supplemental comments on behalf of Evergreen Islands. We provide these comments with a goal of ensuring that the SMP addresses sea level rise and conserves essential terrestrial and submerged aquatic vegetation consistent with the most current, accurate, and complete scientific and technical information available. We have proposed specific revisions to draft Update language for docks, mooring buoys, shoreline stabilization, and the definition of no net loss -- additions are underlined and removals are marked with ~~strike-through~~. On sea level rise, we have attached comments that a consortium recently submitted to Skagit County for their SMP update. And to address vegetation conservation, we provide a suggested approach without specifying language due to the complexity of the current draft.

A. Critical Areas Ordinance Integration.

As you integrate the Critical Areas Ordinance into the Update, we encourage you to establish marine buffers at one site potential tree height, consistent with Washington Department of Fish and Wildlife ("WDFW") recommendations and the Growth Management Hearings Board's recent determination that 50-foot riparian buffers conflict with the Best Available Science. This issue is addressed in more detail under the vegetation conservation discussion below.

B. Sea Level Rise.

We appreciate that the City acknowledges the reality of sea level rise and note from a recent staff report that the City intends to recognize sea level rise in the Update. We request that the City also take clear steps to ensure that future development and redevelopment along City shorelines is constructed to avoid impacts from sea level rise. Toward that end, I have attached as Attachment A a comment letter that we recently submitted with other signatories to Skagit County as part of its SMP update process. Please note that the signatories to that letter did not prepare it with the intent that it apply to Anacortes' SMP. However, Evergreen Islands believes that many of the recommendations translate well to the Update.

C. Vegetation Conservation (Section 6.5).

The SMP must be revised to conserve vegetation consistent with the Shoreline Master Program Guidelines (“Guidelines”) requirement to protect adequate shoreline vegetation. The Guidelines note that shoreline vegetation performs functions that include the following:

- providing shade necessary to maintain the cool temperatures required by salmonids, spawning forage fish, and other aquatic biota;
- providing organic inputs critical for aquatic life;
- providing food in the form of various insects and other benthic macroinvertebrates;
- stabilizing banks, minimizing erosion, and reducing the occurrence of landslides;
- reducing fine sediment input into the aquatic environment;
- filtering and vegetative uptake of nutrients and pollutants;
- providing a source of large woody debris;
- regulating microclimate; and
- providing critical wildlife habitat.¹

Consequently, to protect property, human safety, visual qualities of the shoreline, and plant and animal species and their habitat, the SMP must conserve and restore the ecological functions and ecosystem-wide processes performed by vegetation along shorelines.²

The most current science, WDFW’s Riparian Ecosystems Management Recommendations, recommends the establishment of riparian management zones along marine shorelines that extend one site potential tree height from the water.³ WDFW further recommends avoiding the following in an RMZ: (1) clearing, grading, and filling; (2) new development that would require bank hardening; (3) on-site sewage systems without habitat monitoring plans; or (4) removal of hazard trees without proper evaluation and avoidance and minimization of impacts.⁴ These recommendations apply to RMZs in urban areas as well as non-urban areas.⁵ To simplify the RMZ designation and implementation process, WDFW created a statewide interactive map of 200-year site-potential tree height, which indicates that RMZs of approximately 91 feet to 193 feet would apply in Anacortes.⁶

The Update conflicts with the Guidelines and this current science by allowing clearing and

¹ WAC 173-26-221(5)(b).

² WAC 173-26-221(5)(b).

³ A. Windrope, *et al.*, Riparian Ecosystems, Vol. 2: Mgmt. Recommendations, A Priority Habitats and Species Doc. of the Wash. Dep’t of Fish and Wildlife, 6-8 (2020) (hereafter “Riparian Recommendations”) (attached hereto as Attachment B).

⁴ Riparian Recommendations, at 25-27.

⁵ Riparian Recommendations, at 29-30 (discussing streams).

⁶ WDFW Online SPTH Map Tool, *available at*

<https://wdfw.maps.arcgis.com/apps/MapJournal/index.html?appid=35b39e40a2af447b9556ef1314a5622d> (last visited May 31, 2022).

grading of shorelines up to 15 feet from the Ordinary High Water Mark (“OHWM”) and trimming within that 15 feet. DR-6.5.8, DR-6.5.9. While uncertainty regarding the Critical Areas Ordinance shoreline buffer widths leaves some uncertainty about long-term protections for Anacortes’ shoreline vegetation, the SMP’s current Vegetation Conservation section authorizes a substantial amount of vegetation removal that conflicts with the Guidelines. For example, a proposal for development activity must include a landscaping plan to protect existing native vegetation within only 15 feet of the OHWM. DR-6.5.8. Further, water-dependent uses and public access trails are exempt from even those inadequate protections, though they require a landscaping/mitigation plan aimed at providing equal or greater functions. *Id.* Photos of the damage that resulted from the construction of Phase VII of the Guemes Channel Trail reveal the difficulty associated with attempting to replace cleared shoreline vegetation and its functions.⁷ Within the 15-foot distance, landowners can obtain a clearing and grading permit without a landscaping plan to remove 25% of a tree’s crown, and 25% of its limbs every five years, eventually allowing the removal of all of its branches. DR-6.5.9.b, .9.d.

Starting 15 feet from OHWM, the entire parcel may be cleared and graded subject to a landscaping plan. For example, any “alteration of the natural landscape” may occur in conjunction with “[l]andscaping or maintenance associated with an existing legal use or new permitted shoreline use or development.” DR-6.5.2.a. In addition, modification of vegetation can occur in association with a legal, nonconforming use in association with the no net loss criteria, which allows for vegetation removal subject to attempts to compensate for lost function. DR-6.5.2.c. The only limitation on the extent of clearing and grading of shoreline vegetation is the extent of the “intended development,” which could be the entire parcel. DR-6.5.3. And while a developer must obtain approval of a detailed landscape plan for revegetation (DR-6.5.7), with the exception of the first 15 feet from the OHWM, the plan can propose to replace the cleared vegetation with lawn and other nonnative plants. DR-6.5.6 (“discouraging” lawns and “preferring” native plants, but requiring neither); DR 6.5.8 (within 15 feet, native vegetation that has been destroyed must be replaced with native vegetation). While the SMP includes requirements for the size and coverage of shrubs and trees when planted, it does not actually require the planting of shrubs and trees outside of the first 15 feet from the OHWM. DR-6.5.7.f, .7.g. Last, there is no limitation on the frequency at which a property may be cleared and “landscaped,” so long as the landowner provides a landscaping plan each time.

Further, the landscaping plan need not require replacement of the amount of vegetation removed. For new development, replanting need not extend beyond 50% of the shoreline. DR-6.5.8.a. For redevelopment, planting need only extend along 25% of the shoreline. *Id.* And planting areas can occur in small, 100-square-foot islands that measure 10 feet by 10 feet. *Id.*

Due to the complexity of the current proposed SMP language, we do not have specific edits to

⁷ See Attachment C (note that the “recent” photographs were taken at project completion a few years ago).

propose to the vegetation conservation section. However, we recommend establishing a scientifically-supported shoreline riparian management zone equal to one site potential tree height and strictly limiting vegetation impacts within that buffer consistent with the most current scientific recommendations from WDFW. The most current science does not support the draft Update.

D. Dock and Buoy Shading of Critical Areas Like Seagrass and Kelp (Section 9.5).

When constructed over submerged aquatic vegetation, overwater structures cause impacts to their viability by shading out sunlight, even when grated.⁸ For this reason, WDFW requires new overwater structures to be constructed at least 25 horizontal feet from the edge of seagrass or kelp.⁹ For consistency with that state rules and the most current science, we recommend that the Update be revised to add the following:

Docks

Policy 9.5.5.e. Designed and constructed to avoid shading submerged underwater vegetation like seagrass and kelp.

DR 9.5.5.e. avoid shading of seagrass and kelp by being located at least twenty-five feet (measured horizontally from the nearest edge of the structure) and four vertical feet away from seagrass and kelp beds (measured at extreme low water).

Mooring buoys

DR-9.9.3.g. Buoys must be located at least twenty-five feet (measured horizontally from the nearest edge of the structure) and four vertical feet away from seagrass and kelp beds (measured at extreme low water).

E. Shoreline Stabilization (Section 9.11).

Shoreline armoring causes substantial impacts by altering existing shoreline conditions and functions. A comprehensive study of armoring effects conducted in 2016 found that armoring “was consistently associated with reductions in beach width, riparian vegetation, numbers of accumulated logs, and amounts and types of beach wrack and associated invertebrates.”¹⁰ WDFW’s Marine Shoreline Design Guidelines provide additional information about impacts, as well

⁸ See K. Fresh, et al., *Using light-permeable grating to mitigate impacts of residential floats on eelgrass Zostera marina L. in Puget Sound, Washington*, Ecol. Eng. (2006), doi:10.1016/j.ecoleng.2006.04.012 (concluding that grating up to 50% of a float deck either did not affect dock shading impacts on seagrass or that such effect could not be detected), attached hereto as Attachment D; W. Gladstone and G. Courtenay, *Impacts of docks on seagrass and effects of management practices to ameliorate these impacts*, Estuarine, Coastal and Shelf Science 136, 53-60 (2014) (concluding that grating reduced, but did not eliminate, the loss of seagrass biomass under docks), attached hereto as Attachment E.

⁹ WAC 220-660-380(3)(b)(iii)(A).

¹⁰ M. Dethier, et al., *Multiscale impacts of armoring on Salish Sea shorelines: Evidence for cumulative and threshold effects*, 175 Estuarine, Coastal and Shelf Science 106, 106 (2016), attached hereto as Attachment F.

as an in-depth discussion of less harmful alternatives.¹¹

While the Update includes potential alternatives to hard armoring, including “soft” structures and non-structural solutions, the most current science dictates that the Update be revised to strictly limit the construction of structural modifications and their associated vegetation removal and geological impacts. The current draft broadly allows new hard and soft armoring, even where it would cover and therefore eliminate irreplaceable forage fish spawning habitat. To remedy that situation, we propose the following redline edits to the proposed policies and regulations:

Policy 9.11.2. ~~Discourage~~**Prevent** new development requiring structural shoreline stabilization.

Policy 9.11.4. Allow structural stabilization methods only:

- a. After a determination is made by a qualified professional that nonstructural methods like building setbacks, relocation of the structure to be protected, and groundwater management, will not prevent significant damage to existing inhabited structures ~~with experience and proven success installing non-structural bio-engineered shoreline stabilization techniques that soft armoring will not succeed or is not suitable due to specific site considerations.~~
- b. Where it has been demonstrated to be necessary to support or protect a legally established, inhabited structure ~~or ongoing shoreline use~~ that is in danger of loss or substantial damage, or when necessary for reconfiguration of the shoreline for mitigation or enhancement purposes, ~~or where necessary to the operation and location of a new, single-family or multifamily structure, or a water-dependent, water-related, or water-enjoyment use consistent with this Master Program.~~ They will not be permitted for the indirect purpose of creating land by filling.

Policy 9.11.11. Shoreline stabilization measures should be allowed only where demonstrated to be necessary to ~~support or protect~~ prevent the elimination of existing permitted shoreline uses or where an existing structure is in imminent danger from shoreline erosion.

Policy 9.11.13. New development, including creation of new parcels, that would require shoreline stabilization is prohibited, ~~unless needed to protect allowed uses where no alternative locations are available and no net loss of ecological functions will result.~~

DR-9.11.1 New development, including the subdivision of land, must not create lots which require future shoreline stabilization ~~to the extent feasible. If necessary,~~

¹¹ Available at <https://wdfw.wa.gov/publications/01583>.

~~a geotechnical report must be required.~~

DR-9.11.4. d. The shoreline stabilization measure will mitigate adverse impacts ~~to the extent feasible.~~

f. The shoreline stabilization measure will not significantly disrupt feeder bluff contributions of beach material or sediment transport.

g. The shoreline stabilization measure will not adversely impact forage fish spawning habitat, such as surf smelt or Pacific sand lance spawning beaches.

F. Permit Tracking.

We are pleased to see in the City staff responses to comments the indication that the City has obtained a grant from the Department of Ecology for a shoreline permit tracking system that can be used to evaluate how the SMP performs against the no net loss standard. We encourage the City to include in the ordinance that adopts the SMP update a statement that the tracking system will be established by the date that the SMP update becomes effective.

G. No Net Loss.

On a final point, we recommend that you revise the proposed definition for no net loss so that it reflects the substance of that term rather than the permit process. Right now, the proposal defines it as “must be measured based on the date submitted with a shoreline application, and SEPA checklist if applicable.” Section 12.2. But this definition does not describe the term no net loss itself or provide guidance to residents striving to meet that standard.

Ecology’s SMP Handbook describes no net loss as follows:

Over time, the existing conditions of shoreline ecological functions should remain the same as the SMP is implemented. Simply stated, the no net loss standard is designed to halt the introduction of new impacts to shoreline ecological functions resulting from new development. Both protection and restoration are needed to achieve no net loss.¹²

Based on this description, we propose the following definition for no net loss:

No net loss means that new development does not result in new impacts to shoreline ecological functions and that the existing condition of shoreline ecological functions therefore remains the same at the site-specific and landscape scale.

¹² Washington Department of Ecology, Publication No. 11-06-010, SMP Handbook, Chapter 4, at 1 (June 2017).

Thank you for your efforts to significantly update the City's SMP. Please do not hesitate to contact me at 360-622-8060 or kyle@loringadvising.com if you have any questions about these comments.

Sincerely,



Kyle A. Loring

Attchmts

Cc: Matt Miller, Mayor
City Council
Don Measamer, Director of Planning, Community, & Economic Development
Darcy Swetnam, City Attorney
Marlene Finley, President, Evergreen Islands

ATTACHMENT A



By Email

March 31, 2022

Skagit County Board of County Commissioners
1800 Continental Place
Mount Vernon, WA 98273
pdscomments@co.skagit.wa.us

Re: Incorporating Sea Level Rise into Skagit County's Comprehensive SMP Update

Dear Commissioners Browning, Janicki and Wesen:

Thank you for extending the comment period and for taking the time to carefully consider these comments on the comprehensive update to Skagit County's Shoreline Management Program (SMP). With this letter, the undersigned local conservation organizations, representing thousands of Skagit Valley residents, emphasize that:

- Skagit County has an urgent need to address the existing and impending risks that climate change, and particularly sea level rise, pose to our community's infrastructure, safety, and the environment;
- the County should join other jurisdictions that are already taking these steps—deferring this needed planning until the next update will only exacerbate the challenge;
- well-settled scientific information can be used to guide the County's planning;
- the Shoreline Management Act requires SMPs to address flooding issues and to use the most current scientific and technical information in doing so; and
- we have proposed a sampling of redlined text from the SMP update that would incorporate sea level rise considerations into development decisions.

This letter addresses each of the points above. The proposed revisions to the SMP language begin at page 7. You will also find a summary of each of the signatories to this letter in the Appendix.

A. It Is Imperative to Address Sea Level Rise Today.

Now is the time for Skagit County to begin addressing the adverse effects of climate change — particularly Sea Level Rise (SLR). The County is highly vulnerable to the effects of rising sea levels. If left unmanaged, future flooding and coastal erosion will pose considerable risks to life, safety, jobs, critical infrastructure, coastal ecosystems, homes and businesses, agriculture, the County's natural and recreational assets, and the economy. Some of Skagit's coastal roads are already failing due to erosion or flooding regularly and will not hold up under SLR, particularly with more frequent storm events. Without planning, low elevation and marine areas of the County - which the vast majority of Skagitonians transit through daily, live in or make their livelihood in - will increasingly be cut off or damaged as the impacts of climate change and SLR are felt. Not only are these low lying areas, including extensive farmland, at risk, but emergency responses are expensive and are often extremely damaging to the environment. Crisis often means a temporary solution, rather than encouraging innovation and the best use of resources. We cannot afford to lose our coastal ecosystems, infrastructure, or farmland or place people in harm's way. Skagit County needs to plan and to act now.

Across the globe, the case for planned approaches to climate change adaptation is clear. Sea level rise is one of the primary and most devastating impacts from climate change, and it, along with river and coastal flooding, is of particular importance in Skagit County. Skagit Climate Science Consortium notes:

Increases in coastal flooding and erosion are the result of more frequent extreme high tides, higher storm surge, and the greater chance of a high tide coinciding with a flooding river. Sea level and storm surge can cause floodwaters to "back up" into the lower Skagit River potentially increasing river flooding. Already seawater backs up from the bay to about Mt. Vernon during high tides. Rising sea levels can cause storm waves to become larger and more likely to overtop dikes and erode coastal bluffs and bulkheads.¹

As the Department of Ecology writes, "[s]ea level rise and storm surge[s] will increase the frequency and severity of flooding, erosion, and seawater intrusion—thus increasing risks to vulnerable communities, infrastructure, and coastal ecosystems."² Not only will our marine shorelines be impacted, but as Ecology continues "[m]ore frequent extreme storms are likely to cause river and coastal flooding, leading to increased injuries and loss of life." The 2022 NOAA

¹ Skagit Climate Science Consortium, Sea Level Rise, Brief Overview. Education Resources, www.skagitclimatescience.org

² Washington Department of Ecology, *Preparing for a Changing Climate; Washington State's Integrated Climate Response Strategy*, Publication No 12-01-004, 90 (April 2012), available at <https://fortress.wa.gov/ecy/publications/publications/1201004.pdf>.

Sea Level Rise Technical Report³ warns that “SLR will create a profound shift in coastal flooding over the next 30 years by causing tide and storm surge heights to increase and reach further inland.” “Moderate floods will be 10 times as common as they are today. Major flooding will happen five times as often.”

We also note the broad community support for addressing sea level rise because it will flood homes, farms, businesses, and wildlands equally. It will not discriminate. All in its path will be harmed. So this Commission owes it to the entire County to properly plan for SLR in the SMP.

We value the Skagit and all that it has to offer, which is why Skagit County needs a program along with policies and regulations to help prepare for the challenge of sea level rise and flooding. We want county planning focused on building stronger and better prepared communities and resources, encouraging and protecting resilient coastal ecosystems, and ensuring a healthy future for generations to come.

While we appreciate the good work of Skagit County and the Watershed Company in making significant improvements from the current code, we wish to draw your attention to the glaring gap remaining – the urgent need to address sea level rise as a result of a changing climate in the Shoreline Management Plan.

B. Climate Change and Sea Level Rise Are Well-Settled Scientific Principles and Their Effects Can Be Projected with Reliable Certainty.

The science on climate change and sea level rise for our region is not new. In 1991, Ecology stated that “[a]ccelerated sea level rise is an acknowledged secondary effect of the greenhouse effect. Only the rate of acceleration is debated.”⁴ At that time, the US Environmental Protection Agency projected sea level rise through 2100 ranging between 1.8 and 11.3 feet.⁵ More recently, a 2022 report by the National Oceanic and Atmospheric Administration, titled “Global and Regional Sea Level Rise Scenarios for the United States,” refined projected rates of sea level rise and found that flooding events would increase significantly by 2050.⁶ The report projects several scenarios for sea level rise in the northwestern US, with the intermediate scenario resulting in 0.6 feet of sea level rise by 2050 and 2.6 feet of sea level rise by 2100.⁷

³ NOAA, NASA, US EPA, USGS, FEMA, US Army Corps, US Dept of Defense, *et al.*, *Global Sea Level Rise Scenarios for the United States: Updated Mean Projections and Extreme Water Level Probabilities Along U.S. Coastlines*, NOAA Technical Report NOS 01 (2022), available at: <https://oceanservice.noaa.gov/hazards/sealevelrise/noaa-nostechrpt01-global-regional-SLR-scenarios-US.pdf> (hereafter “NOAA Report”) (attached hereto).

⁴ Washington State Department of Ecology, *Sea Level Rise in Washington State: State-of-the-knowledge, Impacts, and Potential Policy Issues*, Pub. No. 93-537 Version 2.1, 4 (Dec. 199), available at: <https://apps.ecology.wa.gov/publications/documents/93537.pdf>.

⁵ *Id.*

⁶ NOAA Report.

⁷ *Id.* at 23.

Minor/disruptive flooding events are projected to increase in frequency in the northwest from about 4 events/year in 2020 to more than 10 events/year by 2050.⁸ Additional scientific information about the anticipated effects of climate change on Washington's coasts, as well as considerations like clean water, endangered species, and human health, can be found at the University of Washington's Climate Impacts Group website⁹ and Ecology's Climate Change web pages.¹⁰

A 2011 reported titled Skagit River Basin Climate Science Report described the local shoreline impacts from climate change, stating that:

Increased flood risks from the combination of sea level rise and projected increases in river flooding has the potential to cause major damage to low-lying farms and urban development in the floodplain, impacting homes, businesses, water treatment plants, and transportation infrastructure such as bridges and roads. ...Sea level rise may also impact the ability to drain low-lying farmland using traditional tide gates. Warmer water temperatures, more severe and prolonged low summer flows, and potential habitat loss associated with projected sea level rise are projected to negatively impact coldwater fish species such as salmon, steelhead, and trout.¹¹

Thus, the science shows that it's time to act. As the NOAA report states, "[s]ea level rise driven by global climate changes is a clear and present risk to the United States today and for the coming decades and centuries."¹²

C. Additional Delays Will Lead to Greater Costs Down the Road—Skagit County Should Complete the Work it Started in 2011 to Address Climate Change and Sea Level Rise.

Although it may seem urgent to finalize the SMP since it has taken so long to get to this stage, it will be far more burdensome to the community, the environment, natural resource lands and the County to delay planning for SLR until the next update in 2028. The economic impact of allowing homes or infrastructure to be built in areas that will experience SLR impacts in upcoming years is enormous. Skagit County is well known for its agriculture, with approximately 1000 farms covering 97,700 acres.¹³ The dollar value of these crops exceeded \$314,447,000 in 2020.¹⁴ Without a plan, Skagit agriculture is increasingly at risk. The answer is not as simple as

⁸ *Id.* at 41.

⁹ <https://cig.uw.edu/>.

¹⁰ <https://ecology.wa.gov/Air-Climate/Climate-change>.

¹¹ Se-Yeun Lee & Alan F. Hamlet, *Skagit River Basin Climate Science Report*, 15 (Sept. 2011), available at: <https://www.skagitcounty.net/EnvisionSkagit/Documents/ClimateChange/Complete.pdf>.

¹² NOAA Report, at 1.

¹³ USDA 2017 Census of Agriculture, County Profiles.

¹⁴ Draft Skagit County WSU Extension 2020 Skagit County Agricultural Statistics.

building higher levees and more sea walls. The effective use of these structures will have a place in a plan, but these structures often accelerate erosion of adjacent, unprotected coastal areas, and damage coastal habitats by starving them of sediments and natural shorelines. Thus, risk reduction measures must be part of any plan. Additionally, natural shorelines should be used as a defense. Natural shorelines not only host numerous ecological environments for fish and wildlife, and are beloved for recreation locally, but also can provide long term, cost-effective buffers to our coastal communities, livelihoods, and infrastructure. In the challenging, uncertain world of climate change and Sea Level Rise, planning is the first thing to do.

Further, Skagit County has been working on the issue since 2011, when the Skagit County SMP Stakeholders task group identified climate change and sea level rise as critical issues that needed to be addressed and proposed several recommendations. In her April 15, 2016 staff report on the SMP Update, Betsy Stevenson similarly recommended that the update incorporate sea level rise into planning for residential development, shoreline erosion rates, and newly subdivided lots.¹⁵

Some local governments are already following Ecology's direction to address flood hazards and to reduce damage caused by floods by addressing sea level rise in their SMPs. Ecology's *Shoreline Master Program Handbook Appendix A: Addressing Sea Level Rise in Shoreline Master Programs* presents background information on projected sea level rise in Washington State and impacts and offers guidance for addressing sea level rise in SMP updates. In addition, Ecology has partnered with Washington Sea Grant to develop the Puget Sound Coastal Resilience Project that incorporates data on future sea level, high tides, and storm surges to map projected inundation in the Nooksack, Skagit, Stillaguamish, Snohomish, Nisqually, and Skokomish River deltas. Thus, information exists to support planning for SLR, and jurisdictions from the Swinomish Indian Tribal Community to the City of Anacortes are formally assessing and addressing the risks of SLR.

D. Shoreline Management Act Mandates to Use Science and Address Flooding Require the County to Address Climate Change and Sea Level Rise.

While the Shoreline Management Act ("SMA") and Shoreline Master Program Guidelines ("Guidelines") do not expressly use the term "sea level rise," it is not possible in 2022 to satisfy the SMA's requirements to use current science and address flooding without acknowledging and addressing sea level rise. The SMA instructs shoreline master programs to include "[a]n

¹⁵ Supplemental Staff Report #1, from Betsy Stevenson to Planning Commission, regarding Shoreline Master Program Update – Comprehensive Plan Policies, Development Regulations and Shoreline Environment Designation Maps, 4-5 (April 15, 2016), *available at*: <https://www.skagitcounty.net/PlanningAndPermit/Documents/SMP/Supplemental%20Staff%20Report%204-15-2016.pdf>.

element that gives consideration to the statewide interest in the prevention and minimization of flood damages....”¹⁶ The Guidelines note that the most effective means for reducing flood hazards is to prevent or remove development in flood-prone areas.¹⁷ And in updating SMPs, the Guidelines declare that “[e]ffective shoreline management requires the evaluation of changing conditions and the modification of policies and regulations to address identified trends and new information.”¹⁸ Sea level rise certainly qualifies as an identified trend, and while scientific evidence of its existence along our shorelines could no longer be characterized in 2022 as “new,” recent scientific studies have refined projections with increased specificity.

In addition, the SMA and Guidelines direct the County to incorporate scientific information and thus require the use of readily-available sea level rise information. The SMA directs the County to “[c]onsider all plans, studies, surveys...being made by federal...agencies...dealing with pertinent shorelines of the state,” and, more specifically for sea level rise, to “[u]tilize all available information regarding hydrology, geography, topography, ecology, economics, and other pertinent data.”¹⁹ To implement the SMA directive to protect shoreline natural resources and the ecological functions necessary to sustain those natural resources, counties must use scientific and technical information.²⁰ First, counties must “identify and assemble the most current, accurate, and complete scientific and technical information available that is applicable to the issues of concern.”²¹ Second, once a county has amassed this information, it must “base master program provisions on an analysis incorporating” this information.²² Nowhere do the Guidelines suggest that a county can ignore current and accurate scientific information, much less ignore it without justification. Consequently, just as the SMP acknowledges the reality of physical processes like tides and feeder bluffs, it must acknowledge the scientifically-undisputed rising sea levels that are threatening its shorelines.

Even if the Guidelines did not require the SMP Update to incorporate common sense measures to protect your community from unnecessary damage and danger due to sea level rise, residents reasonably expect this from you. Like most challenges that elected representatives face, sea level rise won’t disappear by ignoring it. Instead, the risks and the expense of responding to them will merely increase as historic development patterns and practices continue. Our community cannot twiddle our thumbs any longer on the issue of sea level rise. The longer we procrastinate, the costlier it will become to undo the damages to our infrastructure, our agricultural sector, our properties, and our communities from sea level rise.

¹⁶ RCW 90.58.100(2)(h).

¹⁷ WAC 173-26-221(3)(b).

¹⁸ WAC 173-26-201(2)(b).

¹⁹ RCW 90.58.100(1)(c), (e).

²⁰ WAC 173-26-201(2)(c), (2)(a).

²¹ WAC 173-26-201(2)(a).

²² WAC 173-26-201(2)(a).

E. Several Revisions to the SMP Update Could Address Sea Level Rise.

Fortunately, a few simple revisions to the Update can start to address shoreline development in areas that are already being, and likely in the near future to be, affected by sea level rise.

Toward that end, we propose specific language below. Note that additions are marked with underline, and deletions marked with ~~strike through~~. Please also note that we propose planning and permitting decisions based on the anticipated life for the specified type of development based on the planning horizon concept contemplated by Ecology.²³

Policies:

Shoreline Uses and Modifications

- 6C-6.5: Essential public facilities should not be constructed in flood plains and areas of marine shorelines that are likely to be inundated by sea level rise during the anticipated life span of those facilities.
- 6C-15.3: Residential development should be located:
 - c. to avoid the need for hard shoreline stabilization and flood hazard management facilities during the anticipated life span of that development.
- 6C-15.12: New shoreline residential development should be designed, located, and constructed to ensure that it will not need to be relocated or reconstructed due to sea level rise during the anticipated life span of that development.
- 6C-16.1 ~~Limit use of hard structural stabilization measures to reduce shoreline damage.~~ Use of hard structural stabilization measures will be prohibited except where there is no reasonable alternative to protect a primary structure existing as of 2022.

Critical Areas

- 6G-2.3: Protect and manage shoreline-associated wetlands, including maintenance of sufficient volumes of surface and subsurface drainage into wetlands, as well as the landward migration of wetlands as a result of sea level rise, to sustain existing vegetation and wildlife habitat.
- 6G-2.8: Limit new development in floodplains and areas of marine shorelines likely to be inundated by sea level rise during the anticipated life span of that new development.
- 6G-2.9: Regulate development within the 100-year floodplain and areas of marine shorelines likely to be inundated by sea level rise to avoid adverse impacts to shoreline

²³ *Sea Level Rise in Washington State*, Pub. No. 93-537 Version 2.1, at 20 (acknowledging, however, that “[p]lanning and analysis horizons for land use decisions or commitments might as well be perpetual for all practical purposes. Once a site has been ‘committed’ to a use, that use becomes established by tradition or legal fact.”)

ecological functions and to avoid risk and damage to property and loss of life.

Flood Hazard Reduction policies:

- 6I-1.5: Skagit County shall monitor the impacts of climate change on shorelands, the shoreline master program's ability to adapt to sea level rise and other aspects of climate change at least every periodic update, and revise the shoreline master program as needed. Skagit County shall periodically assess the best available sea level rise projections and other science related to climate change within shoreline jurisdiction and incorporate them into future program updates, as relevant.
- 6I-1.6: Plans, regulations, and programs related to tidal flooding and storm surge will be coordinated and integrated with the Comprehensive Plan, marine flood hazard plans, National Flood Insurance, and regulations for critical areas and the SMP.
- 6I-1.7: Non-structural flooding and storm surge hazard reduction measures are preferred over structural measures. When evaluating alternative measures, the removal or relocation of structures in the tidal flood and storm surge-prone areas should be considered.
- 6I-1.8: Tidal flood and storm surge hazard protection measures will result in No Net Loss of ecological functions and ecosystem-wide processes associated with marine and estuarine shorelines.
- 6I-1.9: Marine and estuarine ecological systems should be returned to and maintained in the future in a more natural state where feasible including by removal of structures and hard armoring blocking the upward shoreline migration due to sea level rise.
- 6I-1.10: New lots and new expanded development should be located so they will not interfere with the landward expansion and movement of wetlands and aquatic vegetation as sea level rises.

Development Regulations:

- 14.26.305(1) No Net Loss of Ecological Functions. Uses and developments on Skagit County shorelines must be designed, located, sized, constructed, and maintained to achieve no net loss of shoreline ecological functions necessary to sustain shoreline natural resources, considering sea level rise estimates.
- **14.26.310-1 Dimensional Standards.** 10% Hard Surface Limits for all uses in Rural Conservancy.
- **14.26.320 General Provisions Applicable Upland of the OHWM**
 - (1)(a) New development must be located and designed to avoid the need for future shoreline stabilization to the maximum extent feasible during the life span

of the structure and based on sea level rise projections for that time period.

- o (1)(b) Land divisions must be designed to ensure that future development of the created lots will not require shoreline stabilization for reasonable development to occur or cause foreseeable risk from geological or hydrological conditions, including any change in conditions projected by 2100 due to sea level rise.

- **14.26.350 Flood Hazard Reduction**

- o (1)(c) Actions under this section must be designed to accommodate the amount of sea level rise estimated during the anticipated life span of proposed development.
- o (2)(b) That the potential adverse impacts on ecological functions and priority species, including those associated with or exacerbated by sea level rise, can be successfully mitigated;

- **14.26.380 Vegetation Conservation**

- o (2) Application requirements
 - (g) areas projected to be inundated by sea level rise during the anticipated life span of the proposed development.

- **14.26.460 Recreational Development**

- o (4)(c) Recreational developments must be located, designed and operated in a manner consistent with the purpose of the environment designation in which they are located and so that no net loss of shoreline ecological functions or ecosystem-wide processes results, considering projected sea level rise.

- **14.26.470 Residential Development**

- o (4)(a) Plats and subdivisions must be designed, configured and developed in a manner that ensures that no net loss of ecological functions results from the plat or subdivision at full build-out of all lots. New lots shall be designed and located so that the buildable area is outside the area likely to be inundated by sea level rise in 2100 and outside the area in which wetlands and aquatic vegetation likely will migrate during that time.
- o (4)(b) Residential development must be located and designed to avoid the need for flood hazard reduction measures and for tidal flooding and storm surge protection measures, including shoreline stabilization, based on sea level rise projections during the anticipated life span of the development.
- o (4)(g) Where lots are large enough, new structures shall be located so that they are outside of the area likely to be inundated by sea level rise during the

anticipated life span of those structures and outside of the area in which wetlands and aquatic vegetation will likely migrate during that time.

- o (4)(h) New and substantially improved structures shall be elevated above the elevation likely to be gained by sea level rise during the anticipated life span of those structures.

- **14.26.475 Shoreline Habitat and Natural Systems Enhancement Projects**

- o (3) Application Requirements:
 - (a)(i) Plan and cross-section views of the existing and proposed shoreline configuration, showing accurate existing and proposed topography and OHWMs as estimated for 2100 based on sea level rise projections.

- **14.26.480 Structural Shoreline Stabilization**

- o (2)(a) New hard shoreline stabilization structures are prohibited, except when analysis confirms that there is a significant possibility that a primary structure built before 2022 will be damaged within three years as a result of shoreline erosion in the absence of such hard shoreline stabilization structures, or where waiting until the need is immediate results in the loss of opportunity to use measures that would avoid impacts on ecological functions.
- o (2)(c)(i) To protect ~~an existing~~ primary structure built before 2022, including a residence, when conclusive evidence, documented by a geotechnical analysis, is provided that the structure is in danger from shoreline erosion caused by currents or waves....
- o (3)(a)(ii)(A) Plan and cross-section views of the existing and proposed shoreline configuration, showing accurate existing and proposed topography and OHWMs as estimated based on sea level rise provisions over the anticipated life span of the development.
- o (3)(b)(iv) An assessment that concludes the replacement structure is designed, located, sized, and constructed to assure no net loss of ecological functions consistent with mitigation sequencing requirements in SCC 14.26.305 and incorporating sea level rise projections for the anticipated life span of the structure.

- **14.26.485 Transportation Facilities**

- o (3) Application requirements
 - (a)(iii) potential for enlargement of inundated areas, including the potential and the area projected to be inundated by sea level rise over

the anticipated life span of the facility.

o (4) Development Standards.

- (a) Transportation facilities must be planned, located, and designed to achieve all of the following at current tidal levels and at tidal levels projected over the anticipated life span of the facilities due to sea level rise:
- (i) Bridge abutments and necessary approach fills must be located, if feasible, landward of associated wetlands or OHWM for water bodies without associated wetlands, as they are projected to migrate during the anticipated life span of those abutments due to sea level rise, provided mid-river bridge piers are permitted.
- (j) Roads and railroads must not measurably increase flood levels or profiles and must not restrict or otherwise reduce floodplain and floodway capacities at current tidal levels and at tidal levels projected during the anticipated life span of that development due to sea level rise

● **14.26.490 Utilities**

o (4) Development Standards

- (a)(ii) Locate and design the project to avoid the need for new structural shoreline stabilization or flood hazard reduction facilities over the anticipated life span of the utilities based on projected sea level rise.
- (c)(i) Underwater utility lines must enter and emerge inland from fresh and salt water banks, dikes, beaches, or shorelands in their projected location as it migrates over the anticipated life span of the utility lines due to sea level rise.
- (d)(ii) Permitted water crossings requiring structural abutments or approach fills must set back such facilities landward of the OHWM in the location projected for those water crossings due to sea level rise projections at the end of the anticipated life span of those crossings.

● **14.26.515 Standard Critical Areas Review and Site Assessment Procedures**

o (4)(c) The site assessment shall include:

- (x) the projected location of the critical area over the anticipated life span of the new development based on sea level rise projections.

● **14.26.534 Wetland Performance-based Buffer Alternatives and Mitigation Standards**

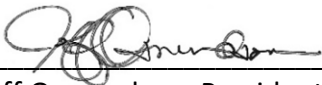
- o (2) Buffer Width Averaging.
 - (e) Averaging is prohibited for wetland buffers unless the applicant demonstrates that the buffer will not be adversely affected by projected sea level rise over the anticipated life span of the development.
- **14.26.540 Aquifer recharge areas intent**
 - o (1)(d) limit adverse impacts to drinking water from saltwater intrusion to the maximum extent possible as sea level rises.
- **14.26.542 Aquifer recharge areas prohibited activities**
 - o (7) Drilling new wells within 100 feet of an existing well that has experienced saltwater intrusion to the extent that chloride levels exceed Washington State maximum contaminant levels.
- **14.26.562 Geologically hazardous areas site assessment requirements**
 - o (2)(h) A description of the likely effect that sea level rise projected over the anticipated life span of the development will have on the geologically hazardous area.
- **14.26.563 Geologically hazardous area mitigation standards.**
 - o (2)(b) A site assessment is submitted and certifies that:
 - (ii) A quantitative slope stability analysis indicates no significant risk to the development proposal and adjacent properties; or the geologically hazardous area can be modified; or the development proposal can be designed so that the hazard is eliminated, all taking into consideration the sea level rise projected over the anticipated life span of the development.
- **14.26.572 Fish and wildlife habitat conservation area site assessment requirements.**
 - o (4) A description of the likely effect that sea level rise projected over the anticipated life span of the development will have on the fish and wildlife habitat conservation area.
- **14.26.574 Fish and wildlife habitat conservation area performance-based buffer alternatives and mitigation standards.**
 - o (2) Buffer Width Averaging.
 - (f) Averaging is prohibited for buffers unless the applicant demonstrates that the buffer will not be adversely affected by projected sea level rise over the anticipated life span of the development.

Conclusion

Don't let Skagit County get left behind. The risk of not planning for sea level rise is far too great. With both high probability of sea level rise and the high-cost consequences, Skagit County must act now to reduce the risk to lives, to protect the economic vitality of the community and the region, and to preserve our rich ecological heritage.

Sincerely,

/s/ Marlene Finley
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A handwritten signature in black ink, appearing to read "Hal Rooks", is positioned above a horizontal line.

Hal Rooks, President
Guemes Island Planning Advisory Committee

A handwritten signature in black ink, appearing to read "Ander Russell", is positioned above a horizontal line.

Ander Russell, Program Director
RE Sources
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Bellingham, WA 98225

cc: Joe Burcar, Department of Ecology

Attachment

APPENDIX

The organizations signing the letter above represent thousands of Skagit County residents who care about the natural and built environments. We value this area and all that it has to offer, and strongly encourage Skagit County to adopt SMP policies and regulations to help prepare our community for the challenge of sea level rise and flooding. We want county planning focused on building stronger and better prepared communities, encouraging and protecting resilient coastal ecosystems and ensuring a healthy future for generations to come.

Evergreen Islands dedicates itself to promoting, protecting, and defending Skagit County's unique saltwater island ecosystems, and to ensuring that Skagit County manage the expansion of its built environment to protect local ecological treasures.

Washington Environmental Council is a 501(c)(3) organization founded in 1967. Our mission is to protect, restore, and sustain Washington's environment for all, and we are committed to clean water protections for Puget Sound and for all Washington State waters.

RE Sources is a local organization in northwest Washington. Founded in 1982, RE Sources works to build sustainable communities and protect the health of northwest Washington's people and ecosystems through the application of science, education, advocacy, and action. RE Sources has over 20,000 supporters in Whatcom, Skagit, and San Juan counties.

Sierra Club, founded in 1892, is the largest and oldest grassroots conservation organization in the United States, with more than 3,000,000 members nationwide, and more than 100,000 members and supporters in Washington. The Mt. Baker Group (MBG) of Sierra Club's Washington State Chapter encompasses Whatcom, Skagit and San Juan Counties, collectively home to more than 10,000 members and supporters. More than 3,000 members and supporters reside in Skagit County, where MBG takes a keen interest in the efforts of elected officials to protect their constituents from the increasingly dangerous impacts of climate change.

Skagit Audubon Society is the National Audubon chapter focused on Skagit County. The society's 450 members share a mission of conserving and restoring natural ecosystems, focusing on birds, other wildlife, and their habitats for the benefit of humanity and the earth's biological diversity.

Guemes Island Planning Advisory Committee's mission is to sustain the island's rural character and natural environment.

ATTACHMENT B

RIPARIAN ECOSYSTEMS, VOLUME 2: MANAGEMENT RECOMMENDATIONS

*A PRIORITY HABITATS AND SPECIES DOCUMENT OF THE
WASHINGTON DEPARTMENT OF FISH AND WILDLIFE*

December 2020



This document should be cited as follows:

Riparian Ecosystems, Volume 2: Management Recommendations. 2020. Amy Windrope, Terra Rentz, Keith Folkerts, and Jeff Azerrad. A Priority Habitats and Species Document of the Washington Department of Fish and Wildlife, Olympia, Washington.

ACKNOWLEDGMENTS

Land Acknowledgement: We acknowledge the traditional, ancestral, territory of Washington state on which we are learning, working, and organizing today. We recognize the longstanding history that has brought us to reside on this land and seek to understand those who first lived here.

Many people were involved with creation of both Volumes 1 and 2 for Priority Habitats and Species (PHS) Riparian Ecosystems. WDFW extends our sincere appreciation to the following individuals and organizations that played important roles during development and/or review of both volumes.

The Washington Department of Ecology (Ecology) and U.S. Environmental Protection Agency (EPA) provided funds that made this document possible (Contract C1300107).

The Washington State Academy of Sciences, with coordination by Dr. Robert Bates, provided an independent peer review that improved the scientific rigor of Volume 1.

Federal (EPA and NOAA Fisheries) and tribal entities (individual tribes, the Northwest Indian Fisheries Commission, Columbia River Inter-Tribal Fish Commission, and Upper Columbia United Tribes) as well as numerous state agencies (Washington State departments of Ecology, Natural Resources, and Commerce; Recreation and Conservation Office; Washington State Conservation Commission; and Puget Sound Partnership) reviewed draft versions of this document. During the summer 2018 public comment period, local governments and members of the public provided valuable feedback that led to a more concise and user-friendly final version of Volume 2.

Within WDFW, Keith Folkerts led coordination, contract planning and budgeting for this work. Tim Quinn and George Wilhere were integral in ensuring a strong relationship with information in Volume 1 and provided additional valuable feedback on multiple drafts. Terry Johnson developed the Site-Potential Tree Height mapping tool and wrote the associated user guide information in the Appendix to this Volume 2. Alison Hart produced final graphics and ensured consistent formatting and stylistic usage throughout. Mary Huff provided editorial support, improved the document's organization, and (in late 2020) took it across the finish line.

WDFW recognizes and appreciates the significant role that tribes, local governments, conservation organizations, and others play in accomplishing our agency's mission. Indeed, we are certain that without these concerted efforts to designate and protect the riparian ecosystems that are essential for most of the state's fish and wildlife species, WDFW would be unable to fulfill its mandate on behalf of all of Washington's residents.

While we acknowledge and have deep appreciation for all the review and comments provided, WDFW bears sole responsibility for this document and any errors contained herein.

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ACRONYMS FOR VOLUME 2

CAO	Critical Areas Ordinance
CMZ	Channel Migration Zone
CREP	Conservation Reserve Enhancement Program
DFC	Desired Future Condition
DNR	Department of Natural Resources (Washington State)
EBM	Ecosystem Based Management
EPA	Environmental Protection Agency (U.S.)
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FEMAT	Forest Ecosystem Management Assessment Team
FPA	Forest Practices Act
FWHCA	Fish and Wildlife Habitat Conservation Area
GIS	Geographic Information System
GMA	Growth Management Act
HMP	Habitat Management Plan
HRCD	High Resolution Change Detection
LID	Low Impact Development
NHD	National Hydrography Dataset
NOAA	National Oceanographic and Atmospheric Administration
NRCS	Natural Resources Conservation Service
OHWM	Ordinary High-Water Mark
OSS	On-site Sewage Systems
PHS	Priority Habitats and Species
RCO	Recreation and Conservation Office (Washington State)
RCW	Revised Code of Washington
RMZ	Riparian Management Zone
RZ	Riparian Zone
SMA	Shoreline Management Act
SMP	Shoreline Master Program
SPTH	Site-Potential Tree Height
SPTH ₂₀₀	Site-Potential Tree Height (at age 200 years)
USFS	United States Forest Service

USFWS	United States Fish and Wildlife Service
UWCIG	University of Washington Climate Impacts Group
VSP	Voluntary Stewardship Program
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife
WFPB	Washington Forest Practices Board
WRIA	Water Resource Inventory Area
WSCC	Washington State Conservation Commission
WWRP	Washington Wildlife and Recreation Program

CHAPTER 1. OVERVIEW

1.1 OUR ROLE AS WASHINGTON’S CONSERVATION AGENCY

The mission of the Washington Department of Fish and Wildlife (WDFW) is to preserve, protect, and perpetuate the state’s fish, wildlife, and ecosystems while providing sustainable fish and wildlife recreational and commercial opportunities.

We offer the following science-based guidance to further that mission through the preservation, protection, and—where possible—restoration of healthy, intact, and fully functioning riparian ecosystems statewide. As described throughout this volume, we believe that protection *and* restoration¹ of Washington’s riparian ecosystems is a foundational conservation action; considering a growing population and changing climate, it is also an urgent one.

Within the State of Washington’s land use decision-making framework, WDFW’s role is that of advisor. We provide information relative to our mission about the habitat needs of fish and wildlife, and the likely implications of various land use decisions on those resources over time. Through the Priority Habitats and Species (PHS) Program, we work cooperatively with land use decision makers and landowners to facilitate solutions that accommodate their needs *and* the needs of fish and wildlife. We provide this PHS document, *Riparian Ecosystems Volume 2: Management Recommendations* in support of that effort.

Priority Habitats are places that warrant special consideration for protection when land use decisions are made and should also be prioritized for restoration or enhancement wherever possible. To qualify as a “Priority Habitat” in WDFW’s PHS program, an ecosystem or habitat component must provide unique or significant value to many species. Specifically, it must have one or more of the following attributes (WDFW 2008):

- Comparatively high fish and wildlife density
- Comparatively high fish and wildlife species diversity
- Important fish or wildlife breeding habitat

WDFW’S MISSION

To preserve, protect, and perpetuate Washington’s fish, wildlife, and ecosystems while providing sustainable fish and wildlife recreational and commercial opportunities.

WDFW’S RIPARIAN VALUES

We value the protection and restoration of healthy, intact, and fully functioning riparian ecosystems statewide.

WDFW’S RECOMMENDATION

Within the context of wise watershed management, preserve, protect, and—where possible—restore the full extent of riparian ecosystems.

¹ Restoration of riparian ecosystems is critically important because legacy of environmental impacts resulting from the ways land use has affected riparian areas over the past 200 years. In other words, what remains available for protection is not enough to provide the full functions and values Washington’s fish and wildlife need.

- Important fish or wildlife seasonal ranges
- Important fish or wildlife movement corridors
- Limited availability
- High vulnerability to habitat alteration
- Unique or dependent species

Riparian areas (comprised of riparian ecosystems, active floodplains, and riverine wetlands) meet all these criteria, and were among the first Priority Habitats described by WDFW. Riparian areas provide important ecological functions that help create and maintain aquatic habitats in addition to supporting terrestrial wildlife. Riparian areas alongside rivers and streams are the focus of this document, however much of the science reviewed in Volume 1 and the recommendations in this Volume 2 are relevant for lakes, ponds, and marine shorelines as well.

As previously mentioned, one role of WDFW in land use decision making is that of advisor. In that role, recommendations like those contained in this document and in complementary PHS documents (available at <https://wdfw.wa.gov/species-habitats/at-risk/phs/recommendations>) provide critical information for the protection (and where necessary, recovery) of Washington's fish and wildlife. We recognize landowners and land managers most often face situations where various human needs must also be met; and thus, considerations other than fish and wildlife will be incorporated into land use decision making.

The information presented in this management recommendation document is not, in and of itself, science. Rather, it consists of policy recommendations which are informed by the best available science summarized in Volume 1² and which reflect WDFW's mission and legislative mandate. To that end, these recommendations represent WDFW's guidance for the protection and restoration of healthy, intact, and fully functioning riparian ecosystems and

Ecosystem Based Management & WDFW's Conservation Principles

In 2013, WDFW adopted ecosystem-based management principles into policy (WDFW Policy 5004). Ecosystem-based management is an integrated, science-based approach to natural resource management that aims to sustain the ability of ecosystems to provide goods and services upon which humans and other species depend. Importantly, ecosystem-based management recognizes the magnitude of humans as change agents in the ecosystem, and the role of social, economic, and ecological factors in managing complex and dynamic systems.

We believe that conservation is best achieved through employing the following ecosystem-based management principles:

1. We practice conservation by managing, protecting, and restoring ecosystems for the long-term benefit of people, and for fish wildlife and their habitats.
 2. We work across disciplines to solve problems because of their connections among organisms, species and habitats.
 3. We integrate ecological, social, economic, and institutional perspectives into our decision-making.
 4. We embrace new knowledge and apply best science to address changing conditions through adaptive management.
 5. We collaborate with our co-managers and conservation and community partners to help us achieve our shared goals.
-

² The original manuscript of *Riparian Ecosystems, Volume 1: Science Synthesis and Management Implications* was publicly released in May 2018. In 2020, the format of the document was professionally designed, which included making limited updates to content focused on copyediting and improving usability. In accordance with standard citation practice, Volume 1 is now cited as having a 2020 publication date, but substantively, the current document is equivalent to the original 2018 version.

for how land managers and land use regulators can utilize best available science to protect these ecosystems within the scope of their authority and/or ability.

For example, local governments are encouraged to use information provided through PHS to guide critical area ordinance (CAO) updates and other land use policies, plans, or regulations. More specifically, WDFW advises using the information in this PHS Riparian Volume 2 for designating riparian areas as Fish and Wildlife Habitat Conservation Areas (FWHCAs) and protecting them for their inherent value, rather than just as buffers for rivers and streams. This is because riparian areas are so important for helping sustain endangered, threatened, and sensitive species; providing habitat connectivity for both aquatic and terrestrial wildlife; and for their critical role in protecting salmonid habitat (WAC 365-190-130).

In short, Volumes 1 and 2 focus on the science and management, respectively, of riparian ecosystems to support fish and aquatic wildlife species. Volume 1 characterizes riparian ecosystem functions and essential processes, while Volume 2 provides management guidance for riparian ecosystems in the context of watershed processes. To be clear, these two volumes do *not* provide a summary of science or recommendations regarding the contribution of riparian ecosystems for the protection of terrestrial wildlife species. However, our first generation PHS Riparian-specific document, *Management Recommendations for Washington's Priority Habitats: Riparian* (Knutson and Naef 1997) does provide terrestrial species information related to riparian areas. Further, PHS has separate, species-specific management recommendations that address the needs of many terrestrial Priority Species.

This document provides recommendations applicable across the State of Washington but does not address unusual, site-scale environmental conditions or issues specific to particular ecological communities. We strongly encourage addressing such matters at a local level with the assistance of WDFW regional habitat biologists, and other technical experts and stakeholders such as tribal biologists and conservation organizations.

1.2 PURPOSE AND APPLICABILITY OF VOLUME 2

The purpose of this document is to provide guidance to protect and—where possible—restore healthy, intact, and fully functioning riparian ecosystems, which are fundamental for clean water, healthy salmon populations, and climate resilient watersheds.

Volume 2 provides information to:

- Protect existing and restore degraded riparian ecosystem functions in support of aquatic and terrestrial species recovery;
- Assist local governments with their responsibilities to protect priority fish and wildlife and their habitats;
- Assist landowners and local groups in implementing voluntary restoration actions on and off working lands; and
- Incorporate monitoring and adaptive management to understand how well regulatory and non-regulatory efforts are protecting riparian functions and values.

This guidance is applicable to riparian ecosystems statewide. We offer a specific focus on lands within the purview of the Growth Management Act (GMA) and Shoreline Management Act (SMA), although a broader application by local governments and other users is also appropriate.

While many other federal, state, and tribal government programs and policies pertain to riparian ecosystems, they are not specifically addressed in this document. For instance, we do not discuss holistic protection of floodplains, nor do we discuss specific Endangered Species Act (ESA) requirements relative to listed salmonids and other species. Also, we do not address commercial forestlands that fall under the jurisdiction of the Forest Practices Act (FPA), or the Department of Ecology's clean water regulations. These other programs and policies were developed with specific goals and objectives that may be different from the goals of this document, and as such may differ with guidance provided herein.

1.3 SCIENCE SYNTHESIS AND MANAGEMENT IMPLICATIONS (VOLUME 1) SUMMARY

As stated above, Volume 1 (Quinn et al. 2020; see footnote 2) provides important information integral to the development of these management recommendations. It includes both overarching as well as specific considerations important to all efforts, large and small, to protect rivers and streams for the benefit of the aquatic species associated with them. Volume 1 focuses on the science of riparian ecosystems—specifically, how riparian areas interact with large-scale drivers (e.g., topography, geology, climate, and land use) and watershed processes to create and maintain riparian and aquatic habitat in support of fish and wildlife. Thus, we provide here an explicit definition of riparian ecosystems from Volume 1 that combines a variety of conceptual riparian descriptions from the scientific literature:

Riparian ecosystems are transitional between terrestrial and aquatic ecosystems, distinguished by gradients in biophysical conditions, ecological processes, and biota. They are areas through which surface and subsurface hydrology connect waterbodies with adjacent uplands. They include those portions of terrestrial ecosystems (i.e., *a zone of influence*) that significantly influence exchanges of energy and matter with aquatic ecosystems and the portion of the ecosystem characterized by moist soils and plants adapted to periodically saturated soils – the *riparian zone* (RZ). The width of the riparian ecosystem is typically defined by the outer edge of the zone of influence, which, in forested regions, is based on site-potential tree height (SPTH) measured from the edge of the active channel. While our definition of riparian ecosystem does not include the water in river or streams, it does include riverine wetlands and recognizes the riparian zone as a distinctive area within riparian ecosystems.

To assist managers in understanding important implications of the science synthesized in Volume 1, we reiterate the ten overarching findings of that document below. These findings are also discussed in more detail in later chapters.

1. Protection and restoration of riparian ecosystems continues to be critically important because: (a) they are disproportionately important, relative to area, for aquatic species (e.g., salmon) and terrestrial wildlife; (b) they provide ecosystem services such as water purification and fisheries (Naiman and Bilby 2001, NRC 2002, Richardson et al. 2005); and (c) by interacting with watershed-scale processes, they contribute to the creation and maintenance of aquatic habitats.
2. Stream riparian ecosystems encompass the riparian zone; the active floodplain, including riverine wetlands and the terraces; and adjacent uplands that contribute matter and energy

to the active channel or active floodplain (Gregory et al. 1991, Naiman and Bilby 1998). Such terraces and adjacent uplands are called the zone of influence.

3. The width of the riparian ecosystem is estimated by one 200-year SPTH measured from the edge of the active channel or active floodplain. Protecting functions within at least one 200-year SPTH is a scientifically supported approach if the goal is to protect and maintain full function of the riparian ecosystem.
4. Where the riparian zone is narrow (<100 ft [30 m]) and the zone of influence lacks tall trees (<100 ft), (e.g., in parts of the Columbia Plateau Ecoregion), the pollution removal function may determine the width of the zone of influence.
5. The riparian ecosystem begins at the edge of the active channel or active floodplain, whichever is wider. As the active channel moves back and forth across the channel migration zone (CMZ), the riparian ecosystem moves with it. Consequently, there are times when the riparian ecosystem lies adjacent to or overlaps the CMZ (see Figure 2.3). Hence, to maintain riparian ecosystem functions, management must anticipate and protect future locations of the riparian ecosystem.
6. A near consensus of scientific opinion holds that the most effective and reliable means of maintaining viable self-sustaining fish, especially salmon, and wildlife populations is to maintain/restore ecosystems to conditions that resemble or emulate their historical range of natural variability (Swanson et al. 1994, Reeves et al. 1995, Bisson et al. 2009). This opinion is based in part on the complexity of processes that affect the expression of habitats over time and space.
7. The protection and restoration of watershed-scale processes, especially related to hydrology, water quality, connectivity, and inputs of wood, shade, and sediment are important for aquatic system function, and help maximize the ecological benefits of riparian ecosystem protections.
8. Riparian areas and surrounding watersheds are complex and dynamic systems comprised of many interacting components. Natural disturbances (flood, fire, and landslides) across the watershed and through time create the mosaic of conditions necessary for self-sustaining populations of fish, especially salmon, and other aquatic organisms.
9. Impending changes to aquatic systems as a result of climate change increase risk to species already threatened by human activities. The effects of climate change on rivers and streams threaten to reduce fish distribution and viability throughout the Pacific Northwest (Beechie et al. 2013).
10. The use of the precautionary principle and adaptive management are particularly appropriate when dealing with complex and dynamic systems, and when we have uncertainty related to exactly how management activities affect functioning of watersheds and riparian ecosystems.

1.4 KEY FINDINGS AND RECOMMENDATIONS

WDFW recognizes that there is a significant amount of work currently being done throughout the state to protect and restore riparian areas. This focus is longstanding and has ranged from regulatory protections that guide Washington's growing population to voluntary conservation on our working lands. Below, we highlight what we believe—based on best available science and our agency's mission—are the most important recommendations to ensure healthy, intact, and fully functioning riparian ecosystems that provide for the preservation, protection and perpetuation of Washington's fish and wildlife:

1. **Designate riparian ecosystems as critical areas:** WDFW recognizes riparian ecosystems as a Priority Habitat for fish and wildlife and recommends that local jurisdictions designate those ecosystems as Fish and Wildlife Habitat Conservation Areas (FWHCAs), a type of critical area. We define the bounds of the riparian ecosystem as the riparian management zone (RMZ), and this RMZ should be designated as the location where protection and restoration of riparian ecosystem functions and values are addressed. RMZs provide a framework for delineating, evaluating, planning, and managing functions and values. In this volume, we provide a process for RMZ delineation (Chapter 2).
2. **Include watershed-scale management considerations:** Watershed-scale management is critical to realizing the full benefits of riparian ecosystem protection and restoration. Certain types of anthropogenic changes at the watershed scale can dramatically reduce the effectiveness of riparian ecosystems to protect aquatic habitat. For example, unmitigated delivery of stormwater from impervious surfaces like roads, parking lots, and rooftops to streams, for example, dramatically increases peak stream flows, alters channel form, and short-circuits the capacity of riparian areas to remove pollutants from runoff. Similarly, road-crossing culverts that are impassible to fish can reduce stream-network connectivity and dramatically reduce amounts of otherwise suitable habitat.
3. **Use reference points to locate the inner edge of the RMZ:**
 - For streams without Channel Migration Zones (CMZs), the inner edge of the RMZ should be delineated starting at the outer edge of active floodplain, if this has or can be determined; otherwise, from the active channel, as delineated by the Ordinary High-Water Mark (OHWM)³.
 - For streams with CMZs, the unpredictable nature of channel migration should be accommodated through delineation of an RMZ that encompasses both the entire CMZ and future locations of the riparian ecosystem. In these instances, the inner edge of the RMZ should be located at the outer edge of the CMZ.

Whether or not a stream has a CMZ, the distance from the inner edge of the RMZ to the outer edge of the RMZ should be one SPTH₂₀₀.

³ Active floodplain delineations are rarely available, and we currently lack a repeatable, well-vetted, and widely accepted method for the delineation of active floodplains. Therefore, until such a process is developed, we recommend delineating the RMZ's inner edge using the OHWM for streams without CMZs.

4. **Include CMZs in delineation of the RMZ:** CMZs are important to protect for maintaining riparian functions and values, and so are included in the delineation of RMZs. Over time, a riparian ecosystem will occupy different parts of the CMZ and uplands outside the CMZ. Lateral channel migration and related streambank erosion processes can pose risks to homes and communities located near rivers; however, when channels are constrained from moving, aquatic and riparian ecosystems may degrade over time. To maintain riparian ecosystem functions, land managers must anticipate and protect future locations of the riparian ecosystem and thus delineate the RMZ accordingly.
5. **Establish RMZ widths based on site-specific conditions:** From the perspective of those riparian ecosystem functions affecting aquatic systems, the width of the riparian ecosystem varies with ecological conditions. The most efficient way to protect riparian functions is to adopt protections that recognize these differences, rather than uniform-width (i.e., one-size-fits-all) RMZs, as these may result in over-protection in some places and under-protection in others.
 - a. **In forested ecoregions, start with SPTH₂₀₀:** At most riparian areas in forested ecoregions, SPTH₂₀₀ is 100 feet or greater, and so the RMZ is delineated using one SPTH₂₀₀. If SPTH₂₀₀ is less than 100 feet, the RMZ is delineated by the pollution removal function (see below). In highly altered areas where soil data are not available, it may be necessary to estimate SPTH₂₀₀ values based on nearby soils.
 - b. **In dryland ecoregions, start with SPTH₂₀₀ (if available), or the width of the riparian vegetation community:** If site conditions do not support tree species or SPTH₂₀₀ is less than 100 feet, then RMZ width is determined by the full extent of all riparian vegetation (the riparian zone) or by the pollution removal function—see below.
 - c. **For both forested and dryland ecoregions, use the pollution removal function when appropriate:** Where the SPTH₂₀₀ and/or the width of the riparian vegetative community is less than 100 feet, we recommend that RMZ width be delineated at a minimum of 100 feet, as this provides the width necessary for 95% pollution removal target for most pollutants (approximately 85% for surface nitrogen.)⁴

To aid with site-specific RMZ delineation, WDFW created an internet-based mapping tool that reports recommended widths for RMZs (Appendix 1) statewide based on SPTH₂₀₀. The tool also notes instances where a 100-foot RMZ should be applied to support the pollution removal function.

6. **Apply the recommended RMZ delineation steps to all streams, whether or not they are fish-bearing:** In 1997, WDFW recommended a lower level of protection for non-fish bearing streams than fish-bearing streams. In reviewing the current science literature for Volume 1, we found no evidence that full riparian ecosystem functions along non-fish-bearing streams are less important to aquatic ecosystems than full riparian ecosystem

⁴ See Chapter 2, Section 2.3.5 for more information about surface nitrogen removal and other site-specific characteristics that may require RMZ distances greater than 100 feet in order to ensure an adequate pollution removal function.

functions along fish-bearing streams. This recommendation is based on four additional considerations. Non-fish-bearing streams:

- Support a unique community of aquatic and riparian-obligate wildlife;
- Provide movement corridors for wildlife, particularly in the face of changing climate conditions;
- Provision fish-bearing streams with matter and energy; and
- Provide cool water to downstream reaches. Washington State has already experienced increased stream temperatures due to climate change and expect further increases, which have direct implications for the persistence of fish.

7. **Establish monitoring and adaptive management frameworks:** We believe it is critical to understand if riparian ecosystems protections are working as intended, and if not, to adjust them accordingly. We recommend the establishment of monitoring and adaptive management designed to improve (where necessary) local permit implementation and compliance, and to increase effectiveness of actions intended to protect aquatic species.

8. **Consider needs of relevant terrestrial species:** As stated earlier, a review of new literature related to the needs of terrestrial Priority Species was not a focus of Volume 1.

Nonetheless, riparian areas provide important functions for threatened, endangered, and sensitive terrestrial wildlife that require consideration by landowners and land managers. WDFW regional habitat biologists, tribal biologists and/or other local habitat experts can assist in identification of site-specific terrestrial species needs. Because riparian protections

WAC 365-190-130

FISH AND WILDLIFE HABITAT CONSERVATION AREAS

(1) "Fish and wildlife habitat conservation" means land managed for maintaining populations of species in suitable habitats within their natural geographic distribution, so that the habitat is sufficient to support viable populations over the long term and isolated subpopulations are not created. This does not mean maintaining all individuals of all species at all times, but it does mean not degrading or reducing populations or habitats so that they are no longer viable over the long term. Counties and cities should engage in cooperative planning and coordination to help assure population viability.

Fish and wildlife habitat conservation areas contribute to the state's biodiversity and occur on both publicly- and privately-owned lands. Designating these areas is an important part of land use planning for appropriate development densities, urban growth area boundaries, open space corridors, and incentive-based land conservation and stewardship programs."



WAC 173-26-186

GOVERNING PRINCIPLES OF THE [SMP] GUIDELINES

(8) "Through numerous references to and emphasis on the maintenance, protection, restoration, and preservation of "fragile" shoreline "natural resources," "public health," "the land and its vegetation and wildlife," "the waters and their aquatic life," "ecology," and "environment," the act makes protection of the shoreline environment an essential statewide policy goal consistent with other policy goals of the act. It is recognized that shoreline ecological functions may be imparted not only by shoreline development subject to the substantial development permit requirements of the act but also by past actions, unregulated activities, and development that is exempt from the act's permit requirements. The principle regarding protecting shoreline ecological systems is accomplished by these guidelines in several ways, and in the context of related principles."

benefit both aquatic and many terrestrial wildlife species, concentrating protections around riparian areas may also be an efficient use of resources.

1.5 RELATIONSHIP WITH WASHINGTON’S DEVELOPMENT LAWS AND REGULATIONS

1.5.1 *Relationship with the Growth Management Act (GMA)*

The GMA requires local jurisdictions to designate and protect critical areas, and in so doing, use best available science and give special consideration to anadromous species⁵. The GMA also encourages state agencies to provide technical assistance to counties and cities in the review of their critical areas ordinances (CAOs), comprehensive plans, and development regulations [RCW [36.70A.130\(6\)\(g\)](#)]. While the Washington State Department of Commerce (Commerce) administers the GMA, WDFW is the lead state agency for advising local governments on matters related to one type of critical area: Fish and Wildlife Habitat Conservation Areas (FWHCAs), and we produce PHS Management Recommendations like this Volume 2 in support of that role.

This document provides guidance that is consistent with the GMA, under which local governments exercise their land use responsibilities: specifically, protection of the functions and values of critical areas. It also reflects the legal and policy framework within which WDFW and the PHS program operate, which includes among other things providing a source of best available science necessary to support local governments in distinguishing and delineating those critical areas (e.g., FWHCAs).

WDFW understands that local jurisdictions have existing critical area regulations that have been approved by elected officials and in many cases have been found to be compliant with GMA through the Growth Management Hearings Board and courts. We acknowledge that revising a critical area regulation can be a lengthy, expensive, and contentious process, and so jurisdictions frequently do not make updates to their CAOs more frequently than required by law or rule. In this volume, we aim to be more precise about where recent science has improved our certainty around the need for riparian protections, as well as for specific practices; and how to incorporate best available science and WDFW’s management recommendations.

WDFW also recommends local jurisdictions continue considering PHS best available science (e.g., Volume 1; PHS maps), incorporating PHS Management Recommendations, and seeking technical assistance from WDFW’s regional habitat biologists not just when updating and implementing critical area policies and regulations, but in all land use planning efforts.

1.5.2 *Relationship with the Shoreline Management Act (SMA)*

As with GMA, WDFW plays a role of technical advisor under SMA, working directly through locally led development processes, with the goal of addressing needs for fish and wildlife. Under SMA, the Department of Ecology (Ecology) has a role approving Shoreline Master Program (SMP) updates when they are deemed consistent with all statutory and regulatory requirements. Ecology also has

⁵ RCW 36.70A.172(1): “In designating and protecting critical areas under this chapter, counties and cities shall include the best available science in developing policies and development regulations to protect the functions and values of critical areas. In addition, counties and cities shall give special consideration to conservation or protection measures necessary to preserve or enhance anadromous fisheries.”

a direct role in implementation of SMPs, including issuing the final decision to approve, deny, or put conditions on locally issued conditional use permits and variances. [Under GMA, Commerce does not approve comprehensive plan updates or CAOs.]

The goal of SMA is “to prevent the inherent harm in an uncoordinated and piecemeal development of the state’s shorelines” (RCW [90.58.020](#)). To achieve that end, WDFW recommends local jurisdictions designate riparian areas and provide the same levels of protection for them within the SMA jurisdiction areas as they do under GMA. While the SMA does not apply to streams with 20 cubic feet per second (cfs) or less mean annual flow, we recommend the application of the guidelines in this Volume 2 to all rivers and streams, regardless of size.

1.6 ORGANIZATION OF VOLUME 2

Chapter 1 aims to establish Volume 2’s purpose and intent; articulate WDFW’s values; and provide policy context regarding protection and designation of riparian ecosystems.

In Chapter 2, we define the RMZ based on SPTH₂₀₀ with special considerations for urban and dryland landscapes; and provide a stepwise process for identifying and delineating the RMZ both for requiring riparian protections and for classifying RMZs as a FWHCA under GMA.

Chapter 3 articulates policies, plans, and practices that protect riparian ecosystems. WDFW recognizes that counties and cities have a long history of providing such protections, and the responsibility to include best available science when updating CAOs. The protection recommendations described in this chapter are intended to help counties and cities moving forward with reviewing and updating their CAOs and other relevant policies and plans.

Chapter 4 explains the importance of restoration in riparian management, which is necessary for recovery of the degraded riparian functions present in many locations and is critical to recover salmon stocks and preserve Washington’s riparian-dependent Priority Species. To that end, we outline voluntary approaches to improve riparian functions. Although Volume 2 is not a restoration guide, it is applicable to restoration practitioners in that it describes management actions that enhance riparian functions and values. We do not address restoration project design or standards but provide links within this chapter to resources that do.

Chapter 5 will assist with developing monitoring programs in support of adaptive management, designed to ensure transparent programs that consistently deliver sufficient protection of riparian functions. Careful monitoring and adaptive management are particularly important when a land use may harm a critical area and scientific information about the likely severity of harm is lacking. Although specific to local governments, this chapter provides valuable resources for any land manager interested in engaging in adaptive management.

Finally, this volume includes an appendix that contains a “how-to” process for utilizing WDFW’s SPTH mapping tool to help determine recommended minimum RMZ widths around the state. The tool itself is available at wdfw.maps.arcgis.com/apps/MapSeries/index.html?appid=919ea98204eb4f5fa70eca99cd5b0de1.

CHAPTER 2. RIPARIAN MANAGEMENT ZONE DELINEATION

2.1 INTRODUCTION

We define the extent of the riparian ecosystem as the area that provides full ecological function for bank stability, shade, pollution removal, contributions of detrital nutrients, and recruitment of large woody debris. For the purposes of management or regulatory protection, the riparian management zone (RMZ) encompasses the riparian ecosystem, and—when present—the channel migration zone (CMZ) to account for lateral movement of the riparian ecosystem over time. RMZs can also provide habitat for many terrestrial wildlife species including movement corridors. WDFW categorizes the riparian ecosystem as a Priority Habitat, and thus recommends local jurisdictions designate all riparian areas as critical areas: specifically, Fish and Wildlife Habitat Conservation Areas (FWHCAs), as mentioned in Chapter 1.

The RMZ provide an initial framework for delineating, assessing, planning, and managing riparian ecosystems. The RMZ as defined here is not necessarily the same as setbacks or buffers. Setbacks are areas meant to protect an important feature (e.g., a stream or wetland) from certain types of adjacent activities, e.g., the area separating a building from the bank of a river. Setbacks are not typically designed to provide ecological function. On the other hand, buffers, which also protect important features, are commonly undeveloped, naturally vegetated areas that can contribute habitat and in the case of a stream, to riparian functions. In this document, we reserve the use of the term RMZ to mean the area capable of providing full function and managed to that end.

2.2 FOUNDATIONAL CONCEPTS IN RMZ DETERMINATIONS

2.2.1 *Desired Future Condition*

A major goal in fulfilling WDFW's mission to preserve, protect, and perpetuate Washington's fish, wildlife, and ecosystems is the protection and restoration of healthy, intact, and fully functioning riparian areas. More specifically, the goal will be achieved through management strategies that result in ecosystem composition and structure that provides the five key ecological functions associated with riparian ecosystems. A useful benchmark for this goal is desired future condition (DFC) for riparian areas. DFC describes what land managers are attempting to achieve, often in terms of composition and structure (e.g., vegetation or land-use), over a period of time in a given geographic area. The DFC we recommend results in fully functioning riparian ecosystems as measured by the five key ecological functions (bank stability, shade, pollution removal, contributions of detrital nutrients, and recruitment of large woody debris) in western Washington. The DFC for composition and structure is old, structurally complex conifer-dominant forest. Such forests exhibit large diameter trees, contain numerous large snags and logs, and have multi-layered canopies and canopy gaps, which promote understory plant diversity.

Throughout the Columbia Plateau, differences in hydrology and geomorphology manifest substantial site-level differences in composition and structure of riparian vegetation, and hence, the DFC for composition and structure is more site-dependent in the Columbia Plateau than in western Washington. Nonetheless, the DFC in the Columbia Plateau is based on the same concepts of ecosystem composition and structure that support the same five key ecological functions in forested regions; specifically, biologically diverse vegetation communities consisting of native trees,

shrubs, grasses and forbs. In addition, the DFC for the upland portion of the riparian ecosystem which serves as the zone of influence and contributes to the pollution removal function in the Columbia Plateau is often intact native shrub-steppe or prairie vegetation.

2.2.2 Site-Potential Tree Height (SPTH) Background

A fundamental component of our recommendation is the use of site-potential tree height (SPTH). In this section, we provide background information on its origin, applicability, and usefulness (see also Volume 1, Chapter 9).

In 1993, a group of experts (Forest Ecosystem Management Assessment Team [FEMAT]) was convened to develop a conceptual model to determine how to protect riparian areas in forested landscapes. This model has come to be known as the FEMAT curves (FEMAT 1993). Though this model is over 25 years old, it continues to be one of the most useful conceptual models informing riparian management.

The FEMAT curves provide a conceptual model of important riparian functions and how those functions change with increased distance from the stream channel (Figure 2.1). The model conveys two important points: (1) four of the five riparian ecosystem functions or processes occur within one 200-year SPTH; and (2) the marginal return for each function or process decreases as distance from the stream channel increases. Thus, designating a riparian area based on at least one SPTH₂₀₀ is a scientifically supported approach if the goal is to protect and maintain full function of the riparian ecosystem for aquatic habitat and species, including salmon.

The FEMAT curves and SPTH have been used to describe the lateral extent of riparian ecosystems, and accordingly, the width of the RMZ needed to provide full riparian ecosystem function.

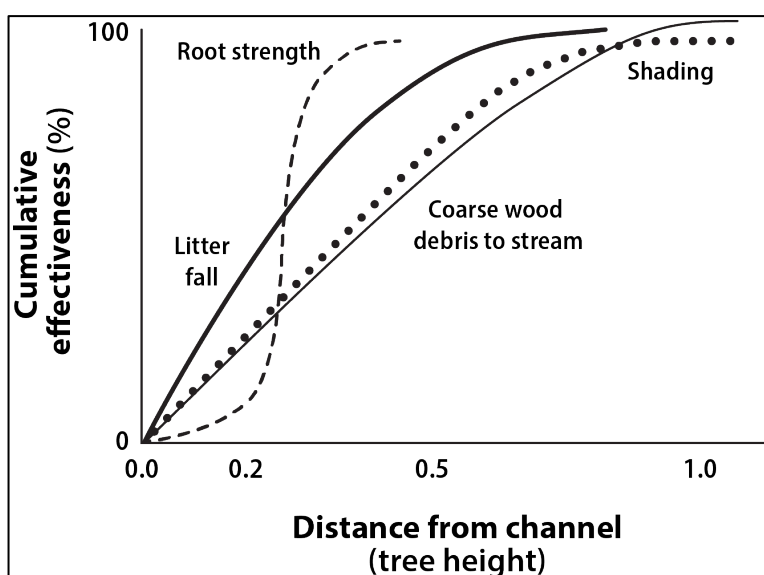


Figure 2.1. The “FEMAT Curves” (FEMAT 1993): a generalized conceptual model describing contributions of key riparian ecosystem functions to aquatic ecosystems as the distance from a stream channel increases. “Tree height” refers to average height of the tallest dominant tree (200 years old or greater); referred to as site-potential tree height (SPTH).

FEMAT (1993, p. V-34) defined SPTH as “the average maximum height of the tallest dominant trees (200 years or more) for a given site class.” The key phrase in this definition is “200 years or more” which refers to the approximate minimum age of old-growth forests. This reflects FEMAT’s underlying assumption that old-growth forest conditions are needed for full riparian ecosystem functions. WDFW uses SPTH at 200 years (abbreviated SPTH₂₀₀) in our recommendations in this Volume 2.

Given its utility, the height of site-potential trees has been described for a variety of tree species and can be readily found in silvicultural literature. Mean heights of dominant trees in riparian old-growth forest of Washington range from 100 to 240 feet (Fox 2003). The wide range of heights reflects differences in site productivity, i.e., local differences in soil nutrients and moisture, light and temperature regimes, and topography. Site productivity is described quantitatively through a site index, which is the average height that dominant trees of a species are expected to obtain at a specified tree age at a given location.

FEMAT defined Site potential tree height (SPTH) as “the average maximum height of the tallest dominant trees (200 years or more) for a given site class.”

“200 years or more” is the approximate minimum age of old-growth forests which are thought to be necessary for full riparian ecosystem functions.

2.2.3 *The Importance of Channel Migration Zones (CMZs)*

Not all streams have CMZs, but where CMZs are present, it is necessary to map the CMZ in order to establish an RMZ. The Washington Forest Practices Board Manual (DNR 2004) provides a useful definition of the CMZ as “the area where the active channel of a stream is prone to move and this results in a potential near-term loss of riparian function and associated habitat adjacent to the stream, except as modified by a permanent levee or dike” (DNR 2004, Section M2).

Protecting the CMZ from incompatible land uses (e.g., development) is important for providing riparian ecosystem functions. Human alterations to river channels that limit channel migration and bank erosion can degrade aquatic and riparian habitats. For these reasons, geomorphologists have developed protocols for delineating CMZs. Further, RMZ delineation along streams with CMZs ensures that riparian functions do not degrade as a channel moves. Proper delineation also helps landowners avoid siting homes and infrastructure in CMZs that coincide with geologically hazardous critical areas and floodplains ([WAC 365-190-120\[6f\]](#)).

2.2.4 *Relationship of CMZs and Floodplains*

This document does not include guidance on the integration of floodplains into RMZ delineation (see footnote 4 for a brief explanation about the active floodplain). However, a general understanding of floodplains and their relationship to CMZs is valuable, as the two often overlap.

Both federal and state regulations establish floodplain protections. Floodplain data and [maps](#) (typically 100-year floodplains) are readily available through the Federal Emergency Management Agency’s National Flood Insurance Management Program. Ecology is the state’s authority as lead on floodplain management and we support their recommendations for management of [Frequently Flooded Areas](#) (another type of critical area specified in GMA) and the use of the [Floodplains by Design](#) grant program to reduce hazards and restore natural functions. Proper floodplain delineation and protection helps landowners and land managers avoid placing homes and infrastructure in areas at high-risk of flooding.

The Bureau of Land Management provides common clues to help determine the presence of an active floodplain (BLM 2015) such as visual evidence of frequent inundation, which may include but is not limited to:

- Fresh deposits of fine sediment;
- Floodplain vegetation matted down or lying flat on floodplain from overbank flow or by deposition or overbank sediment;
- Debris piled on the upstream side of tree trunks; or
- High water marks seen on rocks, trees, or other stationary objects; and ice-rafted deposits on the floodplain.

However, BLM advises caution when relying on these visual clues. Furthermore, looking for signs that an active floodplain is present is only the first step toward delineating the outer edge of an active floodplain. We recommend reviewing BLM's technical reference titled *Proper Functioning Condition Assessment for Lotic Areas* (BLM 2015) and to consult Ecology for assistance regarding floodplain delineation and protections.

Good floodplain management is not only beneficial for human communities, it is also good for fish and wildlife. Although we do not describe use of the 100-year floodplain to measure the RMZ in Volume 2, we recommend that landowners and land use decision makers treat floodplains similarly to RMZs due to their importance to instream health, as habitat, and for their ecological services.

2.3 PROCEDURES FOR RMZ DELINEATION

To conserve riparian habitat, one must first establish the lateral extent (i.e., width) of the RMZ. In Chapter 1, we noted that an RMZ encompasses the riparian zone and zone of influence (Figure 2.2, page 16), and, where present, considers the CMZ (Figure 2.3, page 18). In this section, we outline general steps for collecting site-specific information essential to map an RMZ. These steps will help you identify a site's proximity to streams as well as essential site characteristics. With this information, we then explain how to delineate an RMZ.

In the rest of this section, we explain how to:

- Identify the ecoregion in which the riparian ecosystem is located (e.g., forested or dryland);
- Verify the presence of a stream;
- Identify the inner edge of the RMZ; and finally
- Determine the RMZ width.

2.3.1 *Determining Ecosystem Location*

We have identified two distinct types of ecoregions statewide, each with a slightly different RMZ delineation procedure: (1) Forested, and (2) Dryland. In general, forested ecoregions dominate western Washington, northeastern Washington, and portions of southeast, north central, and eastern Cascades. Dryland ecosystems are more readily contained in the Columbia Plateau Ecoregion east of the Cascade Range.

Landowners and land use planners should utilize the SPTH mapping tool, described in Appendix 1, to determine the ecoregion where the river or stream lies. Appendix 1 also provides instructions for using this tool to determine the 200-year site-potential tree height (SPTH₂₀₀) at a given location.

2.3.2 *Verifying the Presence of a Stream*

Once you have identified which ecoregion you are in (e.g., Columbia Plateau), a qualified professional⁶ should visit the site to verify the stream's location on or near the project area. It is very important not to rely solely on "stream maps" (e.g., DNR stream layer, National Hydrography Dataset) in place of a site visit (which is also important for mapping RMZs) because existing mapped stream layers often have errors, including streams whose locations are mapped inaccurately on the landscape, and streams actually present on the landscape that are missing from maps. Instead, use the site visit to validate existing stream maps.

2.3.3 *Identifying the Inner Edge of the RMZ*

Once you have verified a stream's location, proceed to locate the inner edge of the RMZ. Accurate RMZ delineation is dependent on using the correct starting point. In this section, we describe how to determine the location of the RMZ's inner edge using either the Channel Migration Zone (CMZ), if one is present; or the Ordinary High-Water Mark (OHWM). Ecology, as the state's water quality lead, provides extensive guidance and resources associated with OHWM or CMZ, and those resources are referenced here forward.

2.3.3 (A) Identifying Ordinary High-Water Mark (OHWM)

Delineate the RMZ's inner edge by identifying the OHWM along both sides of the stream following the procedure in Chapter 3 of Ecology's [OHWM delineation manual](#) (Anderson et al. 2016).

⁶ Qualified professionals can be entities and individuals identified by the jurisdiction, WDFW regional habitat biologists, tribal biologists, Ecology staff, and/or other individuals familiar with stream verification and who have local expertise (e.g., Conservation District staff, Stream Teams, etc.).

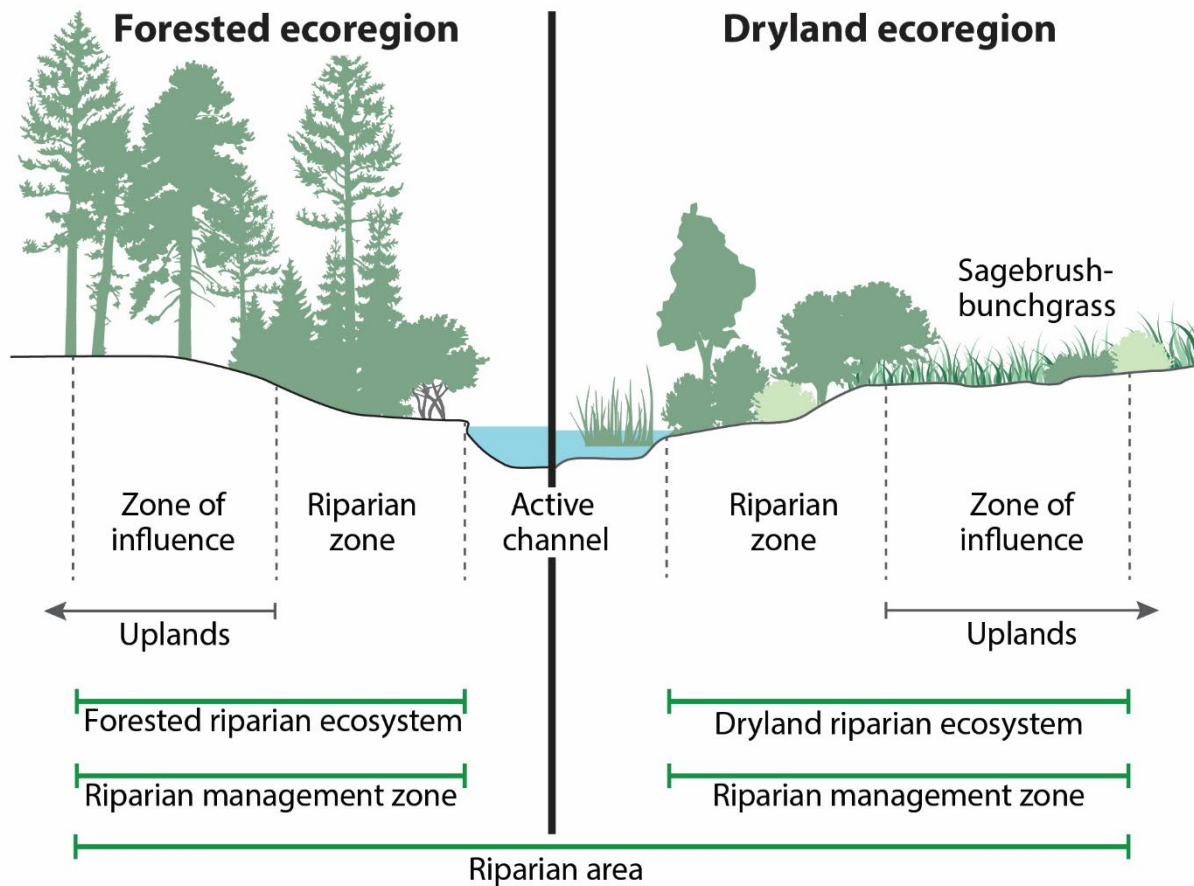


Figure 2.2. The diagram depicts the *riparian management zone* (RMZ) for both forested (left) and dryland (right) ecoregions. The RMZ is coincident with the *riparian ecosystem*, which consists of the *riparian zone* (riparian vegetative community) and the *zone of influence*. The *riparian zone* extends from the edge of the active channel towards the uplands and it includes areas where vegetation is influenced at least periodically by flowing waters. The *zone of influence* includes areas where ecological processes significantly influence the stream, at least periodically.

2.3.3 (B) Identifying the Channel Migration Zone

Delineate the RMZ's inner edge by identifying the edge of the CMZ. Information about CMZs is available for certain streams in the state. For example:

- **SMA-Covered Shorelines** – During Shoreline Master Program comprehensive updates, many jurisdictions map the general location of CMZs associated with shorelines that fall under the jurisdiction of SMA (RCW [36.70A.480](#)). Note that even smaller streams not subject to SMA jurisdiction can have CMZs. In these cases, we recommend jurisdictions still identify and analyze CMZs to protect riparian ecosystems and public health and safety.
- **Puget Sound Streams** – The federal Endangered Species Act may require CMZ delineation in Puget Sound basin streams under the FEMA National Flood Insurance Program Biological Opinion for Puget Sound.

- **Other Local Examples** – Check with your jurisdiction to see if they have more detailed CMZ maps.

Ecology provides the following resources which can help landowners and land managers assess the presence and extent of CMZs where maps and data on CMZs do not currently exist:

- [CMZ Home Page](#) provides a high-level look at CMZ identification, and references useful documents;
- [Channel Migration Processes and Patterns in Western Washington](#) (Legg and Olson 2014) describes the general channel migration processes that occur in western Washington;
- [A Methodology for Delineating Planning-Level Channel Migration Zones](#) (Olson et al. 2014) provides a process for delineating “planning-level” CMZs and gives a few good examples in the appendices;
- [A Framework for Delineating Channel Migration Zones](#) (Rapp and Abbe 2003) is a more in-depth guide on how to develop “detailed” CMZs; and
- [Screening Tools for Identifying Migrating Stream Channels in Western Washington](#) (Legg and Olson 2015) outlines the “CHAMP” (channel migration potential) GIS layer with guidance on using it to identify high-risk CMZs.

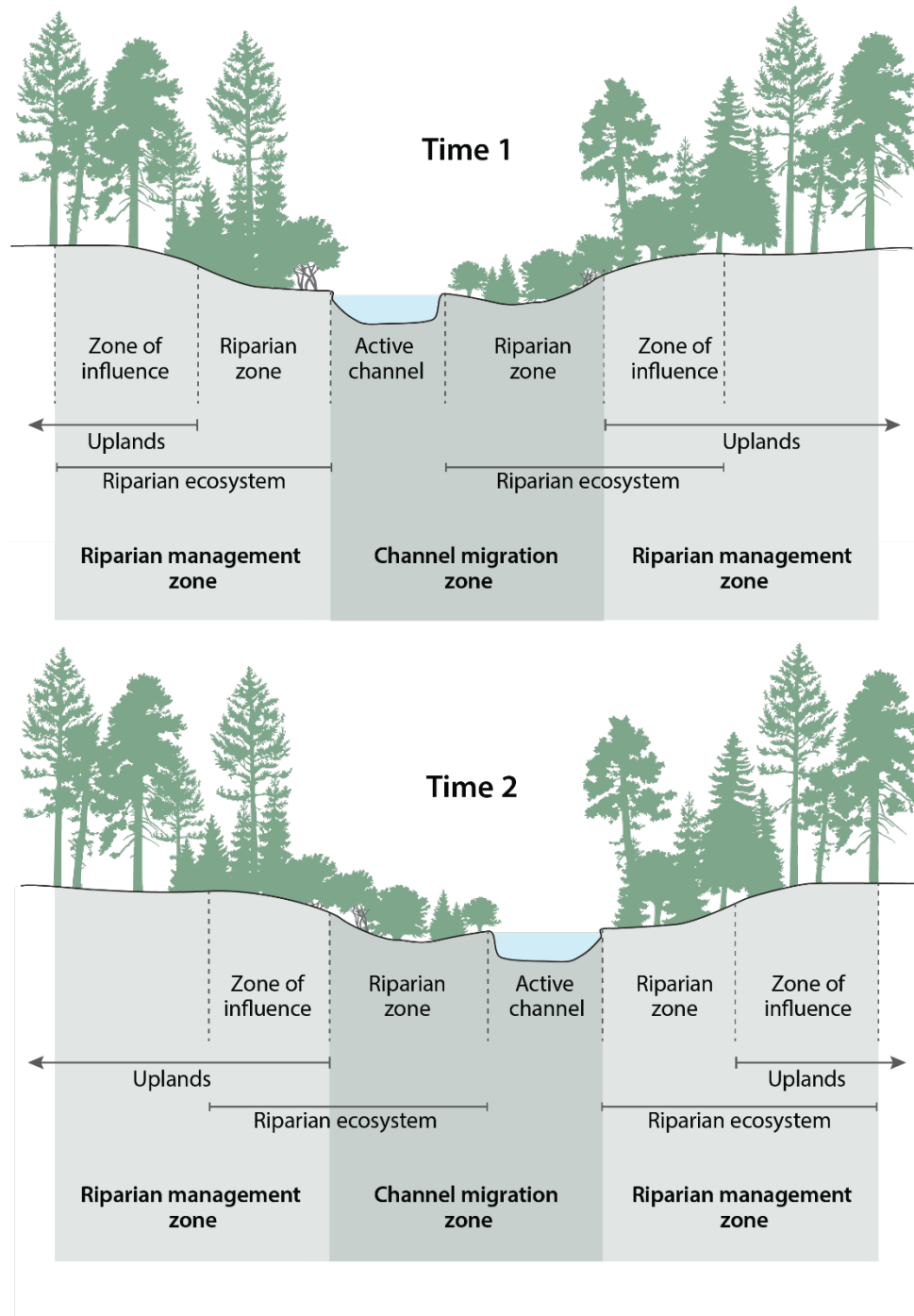


Figure 2.3. This diagram depicts the spatial relationship between the riparian management zone (RMZ) and channel migration zone (CMZ) over time. As the active channel moves laterally within the CMZ, the riparian ecosystem moves with it. As a result, when considering the establishment of an RMZ, delineation should occur at the edge of the CMZ to account for the full extent of both the present day and future riparian ecosystems. Time 1 and Time 2 could be separated by days or centuries. This depiction of a forested system is one representation of a CMZ, which are also present in dryland systems: both should be managed for accordingly.

2.3.4 Determining RMZ Width

Once you have determined the location of the RMZ's inner edge, you then establish the width of the RMZ. The following stepwise process aims to establish recommended minimum delineation distances based on $SPTH_{200}$, vegetation composition, and pollution removal function (Figure 2.4). We say “recommended minimum” because upland adjacent land uses may require further adjustment of the RMZ to provide adequate pollution removal functions. Landowners and land use regulators should also consider additional actions to support wildlife connectivity and/or to protect riparian adjacent Priority Habitats.

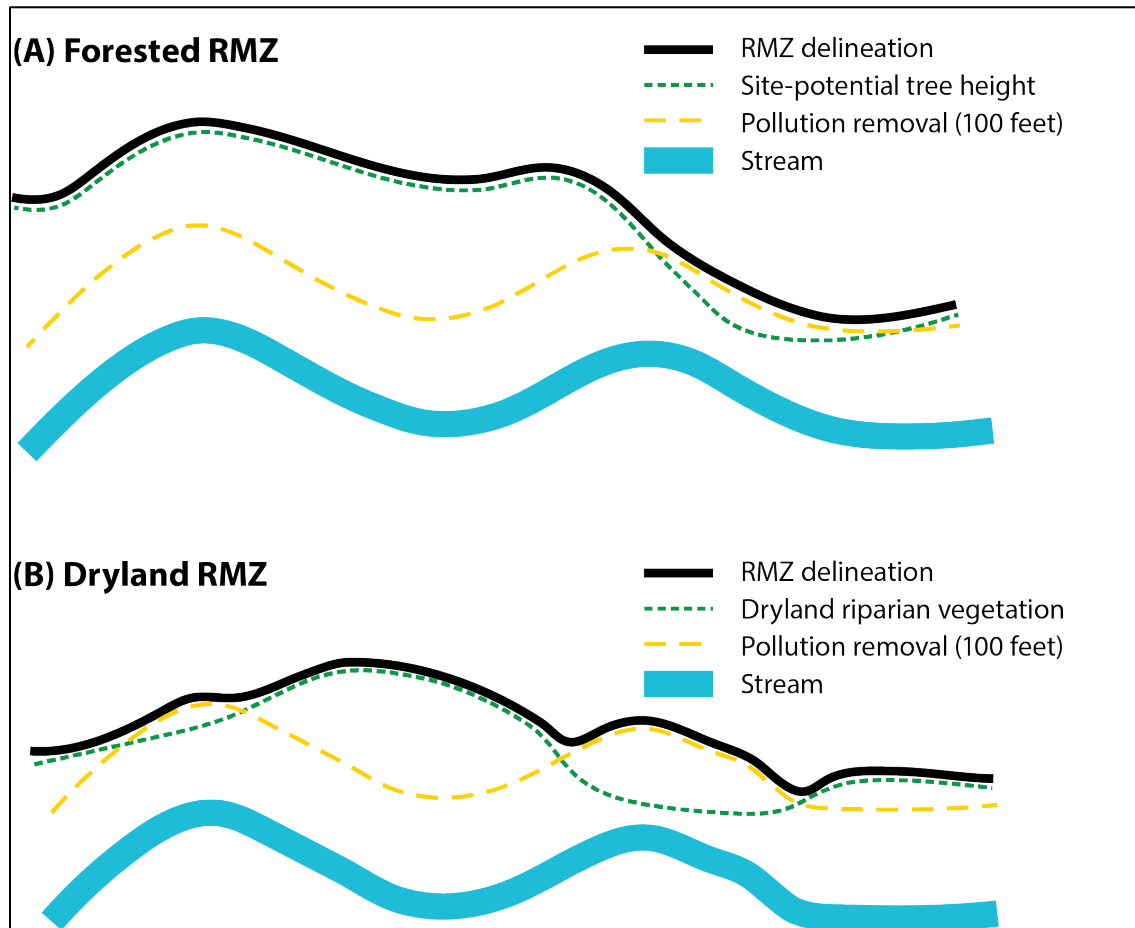


Figure 2.4. Aerial view of variable width RMZ delineation process for forested (A) and dryland (B) systems.

- Step 1: Identify the SPTH or full extent of the riparian vegetative community (green);
- Step 2: Overlay a 100-foot pollution removal distance (yellow);
- Step 3: Delineate the RMZ (black) as the greater of the two distances.

We tailor the following guidance based on two types of ecoregion: (1) Forested and (2) Dryland.

2.3.4 (A) Forested Ecoregions

Forested ecoregions are well-suited for using $SPTH_{200}$ consistently to establish RMZ widths, and so for these areas, landowners and land managers can rely on the $SPTH_{200}$ information provided in the SPTH mapping tool (see Appendix 1). The tool provides the derived average height attained by the dominant tree species at age 200 years ($SPTH_{200}$) using the U.S. Natural Resource Conservation

Service (NRCS) forest productivity site index values, which we recommend for delineation of RMZs (see Sec 9.3 in [Volume 1](#) for background on the origin and use of SPTH₂₀₀). In forested ecoregions, contributions of large wood as a riparian ecosystem function often define the farthest lateral extent of the RMZ.

Occasionally, the SPTH₂₀₀ may be less than 100 feet, in which case the pollution removal function (described in more detail in Section 2.3.5 below) defines the lateral extent of the RMZ.

In Washington, SPTH₂₀₀ can be as large as 260 feet: therefore, be sure to evaluate each soil polygon within 260 feet of the stream channel to ensure that RMZ delineation is in fact being driven by the largest dominant tree species.

2.3.4 (B) Dryland Ecoregion

Riparian ecosystems in arid and semi-arid regions of North America (also referred to as the dryland ecoregion) make up less than 1 to 3 percent of the landscape (Patten 1998). Dryland riparian ecosystems are hydrologically linked to and influenced by adjacent surface waters; as a result, surface waters sustain riparian vegetation that is clearly distinct from upland vegetation.

Riparian ecosystems in dryland environments are highly variable due to various site-level conditions. While these ecosystems may support large trees in low gradient floodplains, tree presence in riparian ecosystems throughout the dryland ecoregion is much more varied than in forested ecoregions, and so in many cases, the contribution of large wood no longer serves as the outermost ecological function for RMZ delineation. Further, riparian vegetation may be minimal or even non-existent, particularly along degraded, incised streams. In dryland ecoregions, the outermost of three factors drives delineation of the RMZ: (1) SPTH₂₀₀ (if trees are present); (2) riparian vegetative community; or (3) pollution removal function.

2.3.4 (C) Considerations in Highly Modified and Urban Systems

In some locations, riparian systems have been substantially modified, and current site-specific conditions may not provide adequate indication of where riparian vegetation would naturally occur. On the whole, this is particularly true of riparian systems in dryland ecoregions. In these instances, we recommend considering nearby sites with unaltered vegetation or selecting a representative site with similar bank height and gradient conditions to identify adequate riparian vegetation delineation for both protection and restoration.

Protecting Columbia Plateau's Priority Habitats Supports Riparian Health

Native shrub-steppe vegetation and other drought-tolerant plant communities dominate Washington's dryland environments. Approximately 450 plant community associations occur in this region, with over 20% of these associations considered vulnerable (WDFW 2005, p. 523). Among the most imperiled ecosystems in North America, historical shrub-steppe has been greatly reduced due to conversion to other land uses (Vander Haegen 2007).

Riparian areas are critical to most animal species using shrub-steppe. Biodiversity in these vegetative communities increases dramatically where surface water occurs, and riparian areas directly support numerous species found only in or near water (Rogers et al. 1988, Johnson and O'Neil 2001). Linking and protecting upland adjacent Priority Habitat(s) not only aims to support Washington's wildlife and their associated habitat conservation goals, but also works to protect and maintain riparian ecosystem integrity.

Similarly, four major urban areas (Seattle, Spokane, Tacoma, and Bellingham) in forested ecoregions lack NRCS soils data. For these areas, WDFW identified nearby NRCS soils polygons and calculated weighted averages as estimates reflective of the surrounding environment (“imputed SPTH₂₀₀”). Much like in forested areas where SPTH₂₀₀ data are available, we recommend using the imputed SPTH₂₀₀ values specified for each of these urban areas to delineate RMZs within them.

2.3.5 Width delineation steps

Step 1: Use SPTH₂₀₀ if it is at least 100 feet.

In **forested ecoregions**, WDFW recommends full protection within one SPTH₂₀₀, identified with the use of our SPTH mapping tool (<https://arccg.is/1ueq0a>). The mean SPTH₂₀₀ in western Washington ranges from 100 to 240 feet (Fox 2003). Some soil polygons have SPTH₂₀₀ information for multiple tree species; therefore, each soil polygon within one SPTH₂₀₀ should be evaluated to ensure RMZ delineation is driven by the largest dominant tree species. Occasionally the SPTH₂₀₀ in forested ecoregions is less than 100 feet; for example, red alder is a fairly common riparian tree species, yet the SPTH₂₀₀ for this species does not always exceed 100 feet. If red alder is the only species for which SPTH₂₀₀ information is available for a certain location, and it is less than 100 feet, then skip to Step 3.

In **dryland ecoregions**, it is less common, but still possible to find riparian vegetation which includes—and may even be dominated by—large trees. Examples of large tree species in these areas are black cottonwood (*Populus trichocarpa*) and ponderosa pine (*Pinus ponderosa*). If SPTH₂₀₀ in dryland ecoregions exceeds 100 feet, then it should be used for the RMZ width.

Step 2: In dryland ecoregions, if SPTH₂₀₀ is less than 100 feet or if no large trees are present, identify the extent of the riparian vegetative community.

In **dryland ecoregions**, the riparian vegetative community is often comprised of shrubs, sedges, grasses, and forbs that are distinct from upland communities. For example, in the Columbia Plateau, vegetation within riparian ecosystems often exhibits an abrupt demarcation between the riparian zone and zone of influence. Phreatophytic⁷ trees and shrubs and hydrophytic⁸ herbaceous plants are confined to moist streamside areas, but the upland zone of influence may consist of sagebrush or bunchgrass communities [for more information, see Volume 1, Chapter 7 (Section 7.1.1)]. Where trees are not present or consist only of small species (less than 100 feet tall), WDFW recommends full protection of the entire riparian vegetative community. In some places the community may only be a few feet wide but in others it may extend up to several hundred feet, particularly when associated with a wetland or floodplain (Bermingham et al. 2013). Where the riparian vegetative community is less than 100 feet wide, go to step 3.

⁷ A phreatophytic plant is a species that obtains water from the subsurface zone of saturation either directly or through the capillary fringe (Thomas 2014).

⁸ Hydrophytic plants are those that are adapted to growing conditions associated with periodically saturated soils. They include obligate wetland plants that almost always occur in wetlands under natural conditions, facultative wetland plants that usually occur in wetlands but are occasionally found in non-wetlands, and facultative plants that are equally likely to occur in wetlands or non-wetlands (Lichvar et al. 2012).

Step 3: Overlay 100-foot pollution removal delineation

The following applies to both **forested and dryland ecoregions**.

Our recommendation to protect full riparian function recognizes the importance of the pollution removal function of riparian ecosystems. Because pollution removal depends on multiple factors, including slope, soils, plant community composition, and upland uses, establishing a standard RMZ width for 100% pollution removal even at the site scale was impractical.

Where neither SPTH₂₀₀ nor the extent of the riparian vegetative community is at least 100 feet, we recommend RMZ delineation of a *minimum* distance of 100 feet, because this distance will achieve 95% or more removal efficacy of phosphorous, sediment, and most pesticides. To be clear, we value a similar removal efficacy for nitrogen, and at a 100-foot width, an RMZ would achieve only 80% removal efficacy for surface runoff containing excess nitrogen. However, the literature reflects that both the actual risk posed by excess nitrogen, as well as the efficacy of its removal, are very site-specific. In recognition of this, we strongly recommend that, where upland uses contribute nitrogen, the 100-foot minimum pollution removal distance be extended accordingly when determining the appropriate RMZ width.

Further, if RMZ widths are being based on a minimum pollution removal function at locations with steep slopes or poorly drained soils, distances greater than 100 feet should also be considered: this applies for all pollutants. Additionally, WDFW recommends cities and counties identify high intensity land uses that may be located adjacent to riparian areas within their jurisdiction and establish wider RMZs to enhance the pollution removal function in these locations as well, following guidance from Ecology.

When dealing with variables such as those outlined above, it may be necessary to seek expert assistance in determining the appropriate adjustments to RMZ widths based on the pollution removal function.

CHAPTER 3. RIPARIAN REGULATORY PROTECTIONS

3.1 INTRODUCTION

This chapter gives guidance to help local governments review, develop, and implement regulatory tools to protect riparian ecosystems as critical areas, i.e., Fish and Wildlife Habitat Conservation Areas (FWHCAs). We describe key steps toward creating effective programs to protect riparian ecosystems consistent with the goals of the Growth Management Act (GMA), Shoreline Management Act (SMA), and Voluntary Stewardship Program (VSP). More specifically, this chapter describes recommendations for carrying out common land use activities and provides steps for developing Habitat Management Plans (HMPs). The riparian management zone (RMZ) should serve as the focal area to apply our recommendations.

Parcel-scale regulations are foundational to Washington's traditional land use regulatory approaches for protecting rivers and streams and their adjacent riparian ecosystem. However, sole reliance upon a regulatory approach at this site scale may result in loss of aquatic system function over the long term (see Volume 1). Thus, we believe that site-scale regulations must work in coordination with watershed-scale planning (Chapter 4) and that both should be monitored and adaptively managed (Chapter 5). In this chapter, we present considerations and recommendations for managing and protecting riparian ecosystems at both site- and watershed-scales.

3.2 RECOMMENDATIONS TO LOCAL JURISDICTIONS

Protection of watersheds commonly falls under the purview of agencies other than WDFW. Nonetheless, we encourage local jurisdictions (and their long-range planners in particular) to consider how land use patterns at all scales collectively affect fish and wildlife and other important ecosystem services.

The scientific literature review (see [Volume 1](#)) informs WDFW's position that protecting the area within one SPTH₂₀₀ from the edge of a stream channel maintains full riparian ecosystem functions for all aquatic species, including salmon, and promotes healthy, intact riparian ecosystems. This recommendation provides the greatest level of certainty that land use activities do not impair functions and values of riparian ecosystems. We recommend the use of monitoring and adaptive management (see Chapter 5) to inform regulations and evaluate the complement of both regulatory and voluntary conservation measures in achieving outcomes.

Land use decision makers should ensure all programs that can affect riparian habitat (e.g., CAOs; SMPs; and ordinances for clearing and grading, fire hazard reduction, and tree protection) are coordinated to optimize the ability of local policies, rules, and management activities to protect those habitats. Further, jurisdictions should look for gaps such as inconsistencies, exemptions and loopholes, or inefficient practices (e.g., inspection and monitoring protocols) that could impede protection of or cause harm to riparian ecosystems.

To that end, we provide important questions to consider when reviewing CAOs, Comprehensive Plans, or other plans that can affect riparian ecosystems:

1. Conservation Strategies:

- What external strategies exist (salmon recovery plans, reach-scale assessments, and incentive-based plans) to maintain, protect and restore riparian areas?
- Which of these strategies (if any) currently inform your regulatory, planning, and/or voluntary processes or programs?
- If these strategies are not in your current programs, could they be incorporated to provide additional benefits to riparian ecosystems? Are there other strategies that could also (or instead) benefit riparian ecosystems?
- Which of these strategies may help your jurisdiction satisfy mitigation obligations?
- How are riparian restoration and/or enhancement programs informed by these strategies?

2. Regulatory Buffers:

- Does your jurisdiction rely on $SPTH_{200}$ for delineating regulatory riparian buffers?
- If your jurisdiction does not rely on $SPTH_{200}$ for delineating those buffers, does your jurisdiction currently have regulatory buffers for riparian areas that are equal to or greater than the distance equal to $SPTH_{200}$?
- Are there buffer exemptions? If so, how do those affect riparian function across your jurisdiction?
- Do your buffers consider the CMZ?
- Do your buffers consider adjacent wetlands and appropriate wetland delineation methodology as prescribed by Ecology?
- If your jurisdiction's CAO or SMP buffers are less than $SPTH_{200}$, can you use the RMZ to identify areas to do mitigation or areas impacted that will require mitigation?

3. Restoration and Adaptive Management (see also Chapter 5):

- Can your jurisdiction use the RMZ to identify areas for incentive-based restoration?
- Do you have a monitoring and adaptive management program for improving permit implementation?
- Is your jurisdiction collecting information on effectiveness of protecting riparian areas?
- If you collect effectiveness information, what programs (e.g., incentives, regulations) could you improve to increase riparian conservation?

4. Other Programs and Regulations

- What other regulations separate from CAOs, may inadvertently affect riparian areas? (e.g., clearing and grading ordinance that lack safeguards for riparian protection.)
- Are there opportunities to connect riparian areas with other protected areas (e.g., frequently flooded areas, geologically hazardous areas, green belts, parks, wetlands, and aquifer recharge areas)?

3.2.1 Recommendations for Common Activities in the RMZ

Local governments should regulate all land use activities that are likely to impact functions of a riparian ecosystem found within the RMZ to ensure, at a minimum, that the existing functions and values are protected from development actions. For the purposes of meeting requirements under GMA, SMA, and VSP, we describe the RMZ as the area in which functions and values are contributed

to the riparian ecosystem: providing a delineated space not just for protection, but also for mitigation and management. We also recommend prioritizing the RMZ as the space for restoration⁹. We provide specific information and recommendations for the following ten common activities: (Note that neither the list of activities nor the recommendations themselves are exhaustive; for more information, contact your WDFW regional habitat biologist.)

1. On-site Sewage Systems (OSS)
 2. Bank hardening
 3. Clearing, grading, and placement of fill
 4. Removal of noxious weeds
 5. Forest practices and conversions
 6. Firewise and wildfire hazard reduction
 7. Removal of hazard trees
 8. Non-compensatory restoration and enhancement
 9. Emergency activities
 10. Educational or Recreational Areas
1. *On-site Sewage Systems (OSS)* – Historically, developers sited OSS at lower elevations bordering streams, lakes and wetlands in order to use passive gravity flow. The disadvantage of these systems is that when drain fields are located near water features, they can more easily contaminate water with high loads of nutrients and toxic pollutants, causing significant impacts to flora, fauna and water quality. The State Department of Health adopted rules establishing public health standards for location, design, installation, operation, maintenance, and monitoring of OSS, including requiring setbacks from waterbodies ([WAC 246-272A](#)) which modern OSS systems, using pump systems, can support. Some OSS may meet public health standards even if located within RMZs; nevertheless, jurisdictions should exercise authority to require HMPs to ensure project proponents protect habitat functions of riparian critical areas.
 2. *Bank Hardening* – We recommend jurisdictions avoid allowing new development that requires bank protection now or is likely to in the future (consider channel migration, wind and wave action, and climate change), unless it addresses an imminent threat as an emergency activity (see Emergency Activities in this section below). Always look to alternative places to site a project so that no bank protection measures are needed. If measures cannot be avoided, require that a project proponent evaluate the effectiveness of bioengineering alternatives (also known as soft armoring) prior to proposing hard armoring. Follow bank protection recommendations in the [Washington State Integrated Streambank Protection Guidelines](#) (Cramer et al. 2002) when bank protection is unavoidable.
 3. *Clearing, Grading, and Filling* – We recommend jurisdictions acknowledge impacts of clearing, grading, and filling on riparian areas in their CAOs by limiting these activities to areas outside the RMZ (unless directly related to restoration) as they can negatively affect riparian areas. If a clearing, grading, or filling project must encroach in an RMZ, limit disturbance and minimize

⁹ As explained previously, many riparian areas had already experienced a substantial degree of degradation before laws like GMA, SMA, and VSP were passed, so while protecting what level of riparian functions and values remain is essential, protection alone will not be sufficient for meeting the needs of the state's fish and wildlife species.

effects to the greatest extent possible. Require that a qualified professional prepare an HMP describing how the project proponent will follow the mitigation sequence.

Jurisdictions that exempt small areas from filling or grading ordinances in riparian ecosystems should calculate cumulative impacts from these exemptions. They should also mitigate impacts and subsequently establish monitoring to ensure that mitigation measures are effectively negating potential losses to habitat function.

4. *Invasive and/or Noxious Plant Removal* – Many CAOs do not require a permit for control and removal of invasive and/or noxious weeds within riparian ecosystem. We support this when weed control efforts (1) employ hand weeding with light equipment; (2) use only Ecology-approved aquatic herbicides and adjuvants (a substance added to herbicides to improve application); avoid use of hazardous substances; and (3) do not result in soil compaction. Local governments should retain some oversight authority for more extensive invasive and/or noxious plant control projects to ensure adequate protections of riparian functions, especially water quality. Most communities issue an exemption letter or permit, which should include conditions to ensure impacts to fish, wildlife, and habitat are minimal.

It is important to note that even plants native to the region can, in certain circumstances, be detrimental to riparian areas. An example is in Puget Sound Prairies, where in the absence of periodic fire events (typically prescribed fire), common western Washington conifer species like Douglas fir outcompete native deciduous species (primarily Oregon white oak). In these circumstances, conifer removal and re-establishment of historical riparian conditions (oak and prairie vegetation) should occur under an approved HMP. WDFW regional [habitat biologists](#) can assist in preparing, reviewing, and implementing such a plan.

5. *Forest Practices and Conversions* – The state’s Forest Practices Act ([RCW 76.09](#) and [WAC 222](#)) regulates forest practice activities on forestland: We recommend that the proponent always contact DNR prior to conducting forest practice activities and seek technical assistance from a WDFW regional habitat biologist to ensure protections for Priority Habitats and Species. When conducting commercial forest practice activities, the forest practice rules—not the CAO—apply for protection of resources on site. Lands converted from forestry to another use require a special forest practice permit, and when converting land, local CAOs are applied. If conversion occurs, WDFW recommends timber harvests not be allowed within SPTH₂₀₀.
6. *Wildfire Hazard Reduction* – Wildfire is a concern in Washington, though the threat varies across the state. Local regulations to reduce wildfire hazards should be coordinated with a Firewise program in order to require landowners to consult with a Firewise professional (<http://www.dnr.wa.gov/firewise>) before removing trees or manipulating vegetation in an RMZ. Understanding the composition of historical forest stands and shrub-steppe can help ensure retention of riparian functions when carrying out wildfire hazard reduction activities. When fuel (vegetation) reduction efforts involve the removal of merchantable trees, the proponent should check with the local jurisdiction and DNR, which may require a permit for tree removal.
7. *Removing Hazard Trees* – Tree trimming or removal in RMZs is sometimes necessary to address public safety concerns but should be balanced with the potential impacts to riparian ecosystem function. Jurisdictions should define a “hazard tree” (sometimes referred to as a “danger tree”) as a threat to life, property or public safety, and require that the method of tree removal not

adversely affect riparian ecosystem functions if possible. Specifically, we recommend that any removal of hazard trees involve an avoidance and minimization of damage to remaining trees and vegetation within the RMZ. We further recommend that local governments require a qualified arborist to evaluate requests for hazard tree removal. The qualified arborist should be able to establish when a tree presents an imminent threat to life, property or public safety.

It is important to note that snags (dead trees) are a Priority Habitat feature for wildlife, and so should be preserved if not hazardous.

Some local governments use Forest Practice Rules ([WAC 222-21-010\[4\]](#)), which define a hazard tree as “any qualifying timber reasonably perceived to pose an imminent danger to life or improved property.” This applies to any tree within 1.5 tree-lengths of the structure. A DNR forester can verify during a site visit that a tree is a hazard based on this definition, and thus removing the hazard would not be subject to the Forest Practice jurisdiction or require a Forest Practice Application.

8. *Restoration and Enhancement* – We encourage local governments to include in their CAOs allowances for restoration and/or enhancement of the riparian ecosystem, including in-channel or streamside work, especially on lands set aside for conservation. To the extent possible, jurisdictions should promote incentives and set up a streamlined review process for restoration or enhancement projects to help facilitate project proponents not just meeting the minimum requirements of the local CAO, but instead going “above and beyond”. Significant resources are available to jurisdictions that address limiting factors in riparian areas or undertake high priority restoration activities that benefit salmon or other listed species (*see* Chapter 4 for information on restoration).
9. *Emergency Activities* – Local codes typically have provisions for emergency activities (e.g., bank stabilization to address imminent threats to homes) that provide relief from time delays related to procedural code requirements. Local regulations should distinguish the immediate need to permit an emergency activity from the need to compensate for its impacts after-the-fact.
10. *Educational or Recreational Areas* – Public access to shorelines is a priority use under the SMA and providing educational and/or recreational developments such as trails, viewing platforms, or similar facilities may also enhance the public’s understanding and appreciation of riparian areas, streams, and habitats. Thus, some focused use of the RMZ for educational and recreational activities may be desirable, if it does not create significant disturbances. Most CAOs include allowances for unpaved access to a stream for aesthetic or recreational enjoyment with defined limits on clearing to avoid impacts and minimizing soil, vegetation, and habitat disturbances: this is an allowance we support. That said, construction of trails could allow greater access for pets and other high intensity recreation, which may increase predation on, and/or disturbance of fish and wildlife species. Regulations should minimize impacts from recreational trails and interpretive facilities to the extent practicable, informed by PHS data and associated management recommendations.

3.2.2 *Project-specific Riparian Habitat Management Plans*

When reviewing proposed projects near streams, local governments typically require applicants to provide detailed site-specific HMPs (often called a Critical Area Report). Here we describe six aspects of Riparian HMPs that we recommend be addressed in CAOs:

1. When HMPs are required;
 2. Which additional critical areas must be delineated, and how;
 3. Which specific land use actions must be identified, and how;
 4. Mitigation requirements;
 5. Monitoring and Adaptive Management requirements; and
 6. Articulate who must prepare and review the HMP.
1. *When required* – We recommend jurisdictions require an HMP whenever someone proposes a land use activity in an RMZ (regardless of the jurisdiction’s regulatory RMZ delineation) or when a proposal likely could affect riparian or aquatic functions. In cases where there is less confidence in the spatial accuracy of the RMZ, consider requiring a Riparian HMP when impacts occur adjacent to the RMZ’s zone of influence.

Maps, [DNR’s stream layers](#), the [National Hydrography Dataset](#) (NHD), and other (e.g., local) stream layers are important for triggering HMPs. An HMP should be required whenever a stream is present near proposed development activities, including but not limited to subdivisions (plats, short plats, and large lot subdivisions), land/vegetation disturbing activities (e.g., clearing and grading, septic drain field siting), and stormwater routing.
 2. *Critical Area Delineation* – HMPs should have the extent of critical areas within and adjacent to a proposed project site identified, along with ecosystem functions that need protection. Follow the RMZ delineation procedure outlined in Chapter 2, along with locations of other critical areas on or near the site (e.g., wetlands, geologic hazards, frequently flooded, critical aquifer recharge areas; informed by Ecology). Also, identify salmon and other priority aquatic species that use the stream network in the immediate vicinity as well as up- and downstream. Likewise, HMPs should identify Priority Species that may use the riparian corridor and any other Priority Habitats to which the corridor is connected. Attach the delineation map (1) to the property’s title to inform future property owners of the site’s critical areas, and (2) use it to update the jurisdiction’s critical areas maps.
 3. *Land Use Action Identification* – A complete HMP should describe relevant management recommendations for Priority Habitats and Species found on or near the site. Include a map in the HMP showing the location of proposed land use actions. It should identify and quantify current and proposed disturbances to the RMZ and other FWHCAs.
 4. *Mitigation* – The HMP should have a description of the project proponent’s mitigation sequencing. It should describe in detail measures to avoid impacts and minimize unavoidable impacts (e.g., clustering, conservation easements, and seasonal construction restrictions). If mitigation or compensation is necessary, the HMP should identify ways to improve riparian ecosystem function by enhancing riparian corridor connectivity (e.g., removal of stream barriers) or by improving the quality of the riparian area (e.g., replacing invasive vegetation with appropriate native vegetation).
 5. *Monitoring and Adaptive Management* – The HMP should describe requirements for monitoring and adaptive management. In addition, it should identify measurable standards and expectations to monitor compliance (e.g., areal extent of vegetative cover, composition of riparian tree species, maximum invasive plant cover). The HMP should identify frequency of visits to monitor the site (e.g., at year 1, 2, 3, 5, 8, and 10) as well as measurable triggers for requiring more actions (e.g., maximum percent area coverage of invasive plants). The HMP

should specify who is responsible for preparing, reviewing, and submitting reports. Finally, if deemed necessary by the jurisdiction, the report should include a cost estimate for monitoring, and the project proponent should post a bond for this amount or more to allow for overages.

6. *Preparer and Reviewer* – A qualified professional biologist, botanist, or ecologist should prepare the HMP; additional expertise related to CMZs, unstable slopes, and wetlands may also be necessary. Additionally, an independent professional with similar qualifications should review the HMP. WDFW's regional habitat biologists can often serve in this role, especially for larger projects. USFWS or NOAA Fisheries should also review the HMP if the project might affect a federally listed fish or wildlife species.

3.3 RIPARIAN MANAGEMENT IN URBAN AREAS

Some people have raised questions about the applicability of RMZs to urban and urbanizing areas. These concerns generally fall into two categories: (1) the science on RMZs comes largely from agricultural and forestry settings, and so is perceived to be irrelevant to urban areas; and (2) there is a belief that the need to maximize density of development in urban areas is in direct conflict with the protection of riparian areas.

Concerns over the relevancy of literature on riparian functions to urban areas is largely unfounded. While most riparian ecosystem studies are from non-urban settings, the principles are the same. Functions of shade, bank stability, large wood recruitment, nutrient inputs, and pollutant removal operate similarly in urban areas as they do in other settings. However, within urban areas, these riparian ecosystem functions are often greatly diminished or even absent altogether.

The role that urban RMZs play in delivering habitat functions for aquatic and many terrestrial species is also like that in non-urban areas. Factors that may be different in urban areas are that urban riparian ecosystems may perform some functions at reduced levels due to their position in developed watersheds, which are often heavily degraded. However, intact RMZs in urban areas function as wildlife corridors that link habitat patches, which is critical for many species. In fact, sometimes RMZs in urban areas may be more important from a habitat standpoint, because within urban areas, adjacent uplands are often even more degraded than the RMZs, which then are often the only remaining areas where habitat functions are provided. Thus, a key element to maintain in urban RMZs is connectivity, both in and along streams.

Many Puget Sound salmon move through channelized streams, traversing heavily urbanized areas prior to reaching spawning grounds and as juveniles on a reciprocal journey to marine waters. Salmon must pass through a wide spectrum of development. For example, adults returning to spawn often start in urban cores (e.g., downtown Seattle), where streams are often channelized; then pass through areas with small lots and high urban density and into suburban creeks where larger lots allow for more riparian protection; and finally, to rural lots with less development and better ecosystem health. When juveniles make their journeys in reverse, they generally spending more time in each of these areas than their parents did, and yet because of their small size, they are also at much greater risk of not surviving any of them. While the decades-long decline of many of our native salmon stocks illustrate just how challenging this is, their persistence—especially the subspecies which are showing signs of improvement—shows us what is possible. Therefore, it is critical that the urban environment maintain and enhance the ability of different species and ages of salmon to not just survive, but thrive, while in these disturbed areas.

Many of the actions we recommend urban communities focus on are the same or similar to those appropriate in less densely developed areas. For example, it is critical to maintain connectivity through properly sized culverts such that all fish can pass through at all relevant life stages. Additional riparian function can be achieved through revegetation efforts using native plants and by improving connectivity between habitat patches. A landscape analysis can help identify existing connections to protect, as well as areas where restoring connectivity is a priority. On the other hand, some actions are particularly well-suited to urban jurisdictions, like standards for Low Impact Development (LID) and state-of-the-art stormwater management. Further, when changes are made to urban infrastructure, this may create opportunities to improve riparian functions while contributing to new or improved public open spaces.

Recommendations for urban riparian ecosystems:

1. Delineate urban RMZs to protect what areas remain and to highlight lost or degraded areas to target for restoration.
2. Quantify current conditions, with a goal of maintaining and improving functions through regulatory and voluntary means.
3. Identify and prioritize restoration opportunities and projects within the RMZ:
 - a. Protect riparian functions that remain, especially in places that are relatively high functioning; implement actions that enhance degraded functions (*see* Chapter 4).
 - b. Prioritize opportunities to maintain and restore in-stream and riparian connectivity.
 - c. Adopt a stormwater design manual equivalent to Ecology's most current manual for western and eastern Washington.
 - d. Manage stormwater by adopting Ecology's latest manual regarding LID for new development, redevelopment and retrofit projects.
4. When replacing or removing existing infrastructure within an RMZ:
 - a. Map RMZ to pinpoint the best sites to restore – consider connectivity and adjacency to other Priority Habitats;
 - b. Improve aquatic connectivity by replacing culverts and removing barriers to movement;
 - c. Revegetate with native plants and consider improvements for wildlife by integrating structures necessary for nesting, breeding, and foraging;
 - d. As infrastructure is remodeled or replaced, incorporate additional setbacks from streams;
 - e. Control access to RMZ to limit soil compaction;
 - f. Avoid operating equipment near the stream to reduce sedimentation and soil compaction; and
 - g. Avoid using chemicals in the RMZ which are not approved for use there by Ecology.

3.4 MANAGING WATERSHEDS

As described in Chapter 8 of Volume 1, land use activities in a watershed can affect the stream network, even when the riparian ecosystem itself is relatively undisturbed. "Watershed management" is a land management approach that seeks to minimize negative effects of upland land uses on aquatic systems, which include riparian areas. The remainder of this chapter focuses on key watershed elements important to managing and protecting functional aquatic systems. Many of the approaches we outline here are non-regulatory and can complement regulatory efforts;

as previously stated, we recommend cities and counties inventory current conditions of critical areas and, based on that inventory, develop watershed scale management plans accordingly.

Fully functional riparian ecosystems, in combination with targeted watershed protections, provide significant benefits to humans. These benefits, often described as ecosystem goods and services, include clean water; decreased flooding; increased nutrient cycling, sediment and pollutant filtering; reduced erosion; carbon sequestration; and cultural services such as recreational, spiritual, and other nonmaterial benefits. These services provide real but often unquantified economic benefits to individuals and society that largely go unnoticed until they are lacking.

3.4.1 *Watershed-Scale Recommendations to Protect Aquatic Systems*

To achieve desired ecosystem goods and services watershed managers should focus on influencing watershed processes that act upon water, wood, sediment, nutrients, vegetation, and pollutants at both the site- and watershed-scale. This section focuses on watershed-scale management.

Restore and Protect Watershed Processes – Efforts to improve watershed conditions should first focus on protecting and restoring watershed *processes* (e.g., natural disturbances) that create and retain habitat for fish and wildlife. Maintain the frequencies, magnitudes, and durations of natural disturbances (flood and fire being the most common) to the greatest extent that surrounding land uses can tolerate.

Manage Land for Stormwater – Stormwater runoff can change the timing, quality, and quantity of water provided to streams. Land uses should avoid/minimize changes to surface water flows. Protection and restoration efforts should focus on attenuating peak flows and reducing pollutants. Primary tools available to local governments include land use designations/zoning code, and stormwater regulations. See [City of Redmond Watershed Management Plan](#) (City of Redmond 2013).

Manage Land for Stream Temperatures – Reduced riparian vegetation cover, decreased streamflow, and simplified stream channels (e.g., increased width-to-depth ratio and reduced groundwater exchange) can lead to increased water temperature (Volume 1, Chapter 4). Modifications like these are often the result of land use activities such as riparian vegetation removal; water diversions; unmanaged livestock grazing; and stream channelization associated with roads, levees, and other forms of development. Identify and restore thermally sensitive stream reaches at the watershed scale to maintain optimal stream temperatures for sensitive aquatic species such as salmonids.

Restore and Protect Connectivity – Manage watersheds to avoid creating longitudinal (e.g., dams, road crossings), lateral (e.g., levees and roads/buildings that cutoff riparian areas and floodplains from their stream), and vertical (water withdrawals, reductions of floodplains) barriers to fish and wildlife movement and fragmentation of their habitat. This is especially important for highly mobile species that require a variety of habitat components across large areas. For example, where CMZs interact with floodplains, dikes and levees restrict the movement of the river or stream and also serve as a barrier for fish and many forms of wildlife.

Restoration to correct existing barriers to movement of water, wood, sediment, and species (e.g., removing blocking culverts) is a high priority with proven benefits for salmon. Connectivity to achieve nearly or completely contiguous RMZs is important to water quality and to achieve

connectivity among patches. Ensuring connectivity both for terrestrial and aquatic wildlife works towards a more interconnected and healthy riparian system.

Plan for Climate Change – Impending changes to aquatic systems caused by climate change increases risk to species already threatened, and riparian ecosystem protection is one of the most useful responses to ameliorate those risks. For example, because more intense rainfall events will lead to wider streams, larger culverts will be necessary to support fish passage. WDFW, in collaboration with the University of Washington’s Climate Impacts Group, created an [online tool](#) (UWCIG 2017) that estimates how much a stream’s channel width will increase with climate change in the years 2040 and 2080. Connectivity within the RMZ allows voluntary migration for species and helps minimize temperature change and increase off-channel storage of water to reduce low flows.

Conduct Monitoring and Adaptive Management – Monitoring and adaptive management are important elements to both site-scale and watershed-scale; this is addressed further in Chapter 5.

3.4.2 *Tools and Key References for Assessing Current Watershed Conditions*

Washington’s State agencies, including WDFW, have developed multiple tools to assist local government in assessing watershed conditions. Jurisdictions can utilize these resources—many available at no cost—to quantify changes in land cover, tailor planning for specific species, coordinate monitoring activities, inform restoration, and assess watershed health.

WDFW’s High Resolution Change Detection (HRCd) is a spatial dataset that characterizes changes in land cover. This tool allows jurisdictions to evaluate in specific ways how watersheds are changing at a sub-parcel scale over 2- to 3-year intervals. This dataset is currently available throughout the entire Puget Sound basin and in some Eastern Washington watersheds. HRCd data is available at www.pshrcd.com.

WDFW’s [Priority Habitats and Species](#) program has several resources of interest to watershed planners. In addition to this two-volume document on riparian ecosystems, readers will find useful ideas in [Land Use Planning for Salmon, Steelhead and Trout: A land use planner’s guide to salmonid habitat protection and recovery](#) (Knight 2009) and [Landscape Planning for Washington’s Wildlife: Managing for Biodiversity in Developing Areas](#) (Azerrad et al. 2009).

Since 2004, the [Pacific Northwest Aquatic Monitoring Partnership](#) has collaborated with West Coast federal, state, and tribal agencies to coordinate monitoring activities and develop common approaches. This partnership provides best practices, mapping tools, and protocols, and serves as a voluntary clearinghouse for a wide variety of monitoring projects.

Since 2009, Ecology’s [Watershed Health Monitoring Project](#) has been monitoring sites throughout the state to assess watershed health. This project’s protocols can be adapted by jurisdictions and scaled to watersheds of various sizes. Data is stored in the [Environmental Information Management database](#). This sophisticated database allows users to input and retrieve data via the web, reliably store it, and make it available for analysis. Quality assurance/quality control measures ensure data put into the database are of high quality.

Ecology’s [Puget Sound Watershed Characterization](#) is a Puget Sound-wide tool that compares areas based on their suitability and value for restoration and protection. This tool informs two fundamental questions: (1) where to focus protection and restoration on the landscape first, and

(2) what types of activities and actions (i.e., restoration, protection, conservation, or development) are most appropriate to that place. With insights gained by this tool, decision-makers can incorporate information regarding watershed processes to improve plans (e.g., comprehensive plans, subarea plans, CAOs, stormwater plans) and conservation efforts (e.g., in-lieu fee programs, open space tax credits, open space land acquisitions).

In 2016, the Washington Department of Commerce (Commerce) published [Building Cities in the Rain](#) (Ballash 2016) to help communities improve watersheds while redeveloping and revitalizing urban areas. The guidance describes an optional three-step process for prioritizing watersheds for stormwater retrofits in urban areas. Commerce's [Puget Sound Mapping Project](#) uses an interactive map to help users develop insights about how current and expected development patterns might affect the region's environmental health. The tool is designed to help decision makers consider information from the Puget Sound Watershed Characterization (described above) when making decisions regarding development projects, urban growth boundaries, and compensatory mitigation.

Finally, the University of Washington's [Climate Impacts Group](#) has developed a suite of tools, many in concert with WDFW, which may be useful for landowners and land use decision makers including climate trends, culvert design projections, and habitat connectivity.

CHAPTER 4. RESTORING RIPARIAN ECOSYSTEMS

4.1 INTRODUCTION

This chapter provides high-level guidance to landowners, land use decision makers, and conservation partners to promote restoration of riparian areas. Despite recent efforts to protect existing riparian systems, imperiled salmon stocks and other riparian dependent endangered species are not recovering as hoped (Table 4.1). Since non-indigenous settlement of Washington began in the 1800s, between 50 percent and 90 percent of riparian ecosystems have been lost or extensively modified (RCO 2019). While two subspecies (Hood Canal summer chum and Snake River fall Chinook) are moving towards recovery, most listed salmon in Washington are below recovery goals (Table 4.1).

The lack of recovery is also evidenced in the ongoing decline of salmon fishing, which affects the long-term health of Washington's tribes, Washington's economy, and our shared cultural heritage. The lack of salmon is one of the primary reasons Southern Resident Killer Whales are at risk of extinction, in addition to other impacts such as vessel disturbance and pollutants. (Lacy et al. 2017, Murray et al. 2019)

Given the extent of historical loss, WDFW recognizes that protection alone of remaining riparian ecosystems, will not recover salmon or the Southern Resident Killer Whale population. Therefore, WDFW recommends restoring and enhancing riparian ecosystems to achieve healthy, intact, and fully functioning riparian systems statewide. Continued investments in restoration will be required at all levels of government and in concert with Washington tribes.

Table 4.1. Non-statistical evaluation of natural origin (wild) fish that returned to spawn with consideration for threats and factors affecting health including habitat, harvest, and hydropower. (Adapted from RCO 2019; Data sources: WDFW, Indian tribes, NOAA).

Below Goal (Endangered Species Act-Listed Salmon in Washington)			Near Goal
Getting Worse	Not Making Progress	Showing Signs of Progress	Approaching Goal
Upper Columbia River Spring Chinook	Upper Columbia River Steelhead	Mid-Columbia River Steelhead	Hood Canal Summer Chum
Puget Sound Chinook	Lower Columbia River Chum	Lake Ozette Sockeye	Snake River Fall Chinook
	Lower Columbia River Coho	Lower Columbia River Steelhead	
	Lower Columbia River Fall Chinook	Snake River Steelhead	
	Lower Columbia River Spring Chinook	Puget Sound Steelhead	
	Snake River Spring Chinook		
	Snake River Summer Chinook		

4.2 RESTORATION ACTIONS

Although this section focuses on restoring riparian areas for the benefit of salmon, emulating historical conditions benefits many other aquatic and terrestrial species as well. WDFW is available to provide technical assistance and species-specific guidance for terrestrial species-focused restoration and recovery efforts. To recover salmon, we must protect all remaining existing riparian and watershed functions, while seeking opportunities to restore functions that have been lost over time. We provide the following information to assist the restoration community¹⁰ in understanding what is important to restore.

4.2.1 *Developing a Restoration Strategy*

Aquatic restoration strategies typically start with a clear set of goals and objectives. The selection of appropriate restoration strategies is informed by the political, social, and ecological context of the watershed, and bounded by the extent of opportunities and constraints. It is important in ecosystem restoration to consider the habitat attributes and scale necessary for a desired suite of species, be they aquatic or terrestrial. At a watershed scale, restoration efforts should focus first on projects that offer the greatest potential for success. The [Stream Habitat Restoration Guidelines](#) (Cramer 2012) suggest the following prioritization of stream habitat restoration strategies that are specific to instream related activities most often geared at anadromous fish:

1. *Protect existing habitat.* Protect areas that provide healthy, high-quality habitat functions (strongholds, refugia, and key sub-watersheds) to prevent further degradation. Secure, expand, and link protected areas.
2. *Connect habitat.* Connect and provide access to isolated habitat, including instream, off-channel, and estuarine habitat made inaccessible by culverts, levees, fragmentation, or other man-made obstructions.
3. *Restore habitat-forming processes.* Employ land use recovery and watershed restoration techniques to restore processes that create, maintain, and connect habitats (including restoring sediment dynamics, large wood dynamics, and flow regimes; avoiding/removing manmade disturbances within the riparian ecosystem; and maintaining water quality, floodplain connectivity, and channel evolutionary processes). Employ a combination of active or passive restoration techniques, as necessary. Active restoration involves accelerating processes or attempting to change the trajectory of succession; passive restoration simply involves ceasing environmental stressors such as agriculture, grazing, or timber harvest, and then allowing nature to take its course.
4. *Create new or enhance existing habitat.* Improve existing or create new habitat for specific species by installing instream structures such as large woody debris; reconfiguring channel shape, cross-section, or profile to reduce incision or restore flow; or constructing one or more new side channels.

In conjunction with other state agencies and partners, WDFW provides multiple technical guidance documents to help design and implement riparian restoration projects that have proven successful

¹⁰ Many watersheds in Washington have salmon recovery restoration goals that can be obtained from regional Salmon Recovery Boards or Lead Entities for Salmon Recovery. Lead Entities and Salmon Recovery Boards are in every region of the state, including those areas without salmon or other anadromous fish (https://www.rco.wa.gov/salmon_recovery/regions/regional_orgs.shtml).

in different types of landscapes, including on marine shorelines, and on river- and streambanks. These are part of a suite of Aquatic Habitat Guidelines found at <https://wdfw.wa.gov/licenses/environmental/hpa/application/assistance>. They include:

- [Water Crossing Design Guidelines](#) (Barnard et al. 2013)
- [Stream Habitat Restoration Guidelines](#) (Cramer 2012)
- [Integrated Streambank Protection Guidelines](#) (Cramer et al. 2012)
- [Land Use Planning for Salmon, Steelhead and Trout: A land use planner's guide to salmonid habitat protection and recovery](#) (Knight 2009)
- [Draft Fishway Guidelines for Washington State](#) (Bates 2000)
- [Draft Fish Protection Screen Guidelines for Washington State](#) (Nordlund and Bates 2000)
- [Marine Shoreline Design Guidelines](#) (Johannessen et al. 2014)
- [Your Marine Waterfront](#) (WDFW 2016)
- [Protecting Nearshore Habitat and Functions in Puget Sound](#) (AHGP 2010)

4.3 IMPLEMENTING RIPARIAN STRATEGIES THROUGH INCENTIVES

There are several types of conservation incentives available to individuals and local governments:

- *Financial assistance*: grant programs that provide funding for conservation activities
- *Tax adjustment*: tax reductions for landowners undertaking conservation activities
- *Technical assistance*: advice and/or hands-on help for landowners on tools or techniques
- *Recognition*: promotion of landowners who undertake conservation actions

Each of these will be described (and examples provided) in more detail, below.

4.3.1 *Financial Assistance*

State and federal grant funds are available for riparian ecosystem conservation and restoration projects on public and private lands through the Recreation and Conservation Office (RCO) and Salmon Recovery Funding Board. To access these funds and to learn more, go to <https://www.rco.wa.gov/grants/index.shtml>. Grant programs include:

- [Aquatic Lands Enhancement Account](#)
- [Washington Wildlife and Recreation Program](#) (WWRP; Riparian Protection, Critical Habitat, Natural Areas, and Urban Wildlife Habitat Categories)
- [Salmon Recovery Funding Board](#)
- [Estuary and Salmon Restoration Program](#)—a program of WDFW
- [Land and Water Conservation Fund](#)
- [Puget Sound Acquisition and Restoration](#)

Land trusts also help land owners conserve habitat for key aquatic and terrestrial species, often leveraging funds from foundations and other non-governmental sources; see www.walandtrusts.org for a county-specific list of land trusts.

For agricultural property owners, local conservation districts and the Washington State Conservation Commission (WSCC) can provide technical assistance to find an approach that works for the farmer and improves riparian ecosystem function. Technical assistance is also available

from the federal Natural Resources Conservation Service (NRCS), Washington State University Extension, and WDFW. Additionally, a host of state and federal financial incentives to expand and maintain riparian functions within the riparian management zone (RMZ) are available, some of which are listed below. For example, the Conservation Reserve Enhancement Program (CREP) provides funding to landowners for riparian preservation and is the most successful riparian buffer program in Washington. Since CREP's 1999 inception in our state, more than 900 miles of stream buffers have been planted, and as of October 2020, producers had over 13,500 acres actively enrolled in CREP. Contact your local conservation district or the RCO to learn more.

- [Conservation Reserve Enhancement Program](#) (NRCS)
- [Environmental Quality Incentives Program](#) (NRCS)
- [Conservation Stewardship Program](#) (NRCS)
- [Conservation Reserve Program](#) (NRCS)
- [Regional Conservation Partnership Program](#) (NRCS)
- [Agricultural Conservation Easement Program](#) (NRCS)
- [Agricultural Land Easements](#) (NRCS)
- WWRP [Farmland Preservation Grants](#) (RCO)

Timber landowners have access to a variety of forestry-oriented conservation incentive programs (see list, below) and can also receive technical assistance from DNR's Forest Stewardship Program (foreststewardship@dnr.wa.gov / 360-902-1428):

- [Forestry Riparian Easement](#) (DNR)
- [Rivers and Habitat Open Space Program](#) (DNR)
- [Healthy Forests Reserve Program](#) (NRCS)
- [Family Forest Fish Passage Program](#) (DNR)
- [Forest Legacy](#) (USFS)
- WWRP [Forestland Preservation Grant Program](#) (RCO)

4.3.2 *Tax Reduction Incentives*

Landowners can receive a substantial tax reduction by converting land into "open space" status because of the Open Space Taxation Act ([WAC 458-30](#)), enacted in 1970. Lands with riparian areas often qualify for this incentive; see your county assessor and local planning department for details.

4.3.3 *Technical Assistance*

Local governments and individual landowners who want to improve riparian habitat for a suite of species can request land use advice from a variety of sources, including:

- WDFW regional habitat and district wildlife biologists. Go to <http://arcg.is/1SgsHqk> to find the names and direct contact information for your local biologists, or call the regional office in your area:
 - Region 1 – Eastern: 509-892-1001
 - Region 2 – North Central: 509-754-4624
 - Region 3 – South Central: 509-575-2740
 - Region 4 – North Puget Sound: 425-775-1311
 - Region 5 – Southwest: 360-696-6211

- Region 6 – Coastal: 360-249-4628
- Salmon Recovery Lead Entities or Regional Fisheries Enhancement Groups
- Tribal natural resource departments
- Local [Conservation Districts](#)

4.4 SUGGESTED RESTORATION PRACTICES

The following section provides a series of suggested restoration practices promoted by WDFW, other state and federal agencies, and conservation partners. We encourage consideration of these activities and others within and adjacent to the RMZ, as delineated in accordance with our recommendations in Chapter 2. Further, it is not unusual to find other types of Priority Habitats (e.g., wetlands, shrub-steppe) adjacent to riparian areas. In such cases, restoration practices should not degrade or disturb the adjacent habitat, but rather—if feasible—improve it in addition to improving the riparian habitat. The same approach should be used where riparian-adjacent Priority Species areas are present.

Like most restoration practices, the ones recommended below can range in complexity, both biologically and technically, so landowners are strongly encouraged to seek technical assistance from WDFW and other experts before taking any action: This will help save money, time, and greatly increase the likelihood of success for any restoration activity. Landowners should also be aware that many of these activities may require permits^{11, 12} issued by one or more agencies such as WDFW for the [Hydraulic Code rules](#), and DNR for the [Forest Practices rules](#); as well as permits from the local jurisdiction.

1. Improve quality of vegetation for both aquatic and terrestrial wildlife by removing invasive species wherever present. Further, to avoid the likely return of invasive species, cleared areas should be replaced with native riparian vegetation: specifically, native vegetation that provides needed ecosystem functions as described in Volume 1 and throughout this document (e.g., shade, large wood, pollution removal).
2. Where riparian areas already possess some native vegetation, enhance them with a greater mixture of native plants that provide necessary habitat components (forage, cover, breeding, roosting, etc.) for a diversity of species and multiple riparian functions (e.g., streambank stability, wood recruitment, organic litter input, and pollutant removal). The specific mix of vegetation will vary by ecoregion and local needs, but likely includes conifers, grasses, and herbaceous plants.
3. Increase off-channel habitat and improve natural flow regimes by removing dikes or levees and restoring access to and within the floodplain.

¹¹ The Governor's ORIA Office provides additional assistance for general permitting questions (https://www.oria.wa.gov/site/alias_oria/347/Permitting.aspx)

¹² Larger projects may also trigger permit requirements with federal agencies, such as the U.S. Army Corps of Engineers (USACE).

4. In areas of incised channels, reintroduce beaver or construct beaver dam surrogates to store sediments, raise streambed elevation, raise water table elevation, and restore riparian vegetation.
5. Remove reed canary grass, which can greatly inhibit channel morphology and aquatic species movement. (Management techniques for reed canary grass vary and are often site-specific: contact your local WDFW regional habitat biologist for technical assistance.)
6. Through proper consultation with WDFW and tribal biologists, increase the presence of large wood in streams and rivers to improve habitat for salmon, resident fish species, and aquatic amphibians.
7. Increase connectivity through removal of non-fish passing culverts. If replacement culverts are needed, ensure they are adequately sized and climate-change-resilient; see WDFW's online resource on [Incorporating Climate Change into the Design of Water Crossing Structures](#) (Wilhere et al. 2016).
8. Reduce soil erosion by increasing vegetation complexity and density, excluding (or substantially minimizing) soil compacting activities, and implementing upland soil management techniques where applicable.
9. For agricultural operators: add and/or improve fencing structures to increase the amount of riparian area acreage from which livestock are excluded to reduce compaction, erosion, and overgrazing.

CHAPTER 5. IMPROVING PROTECTION THROUGH ADAPTIVE MANAGEMENT

5.1 INTRODUCTION

Adaptive management is widely recognized as an essential component of effective natural resource management because it provides a systematic process for continually improving policies and management through outcome-based learning. The adaptive management process is a continual cycle of planning, acting, monitoring, evaluating, and adjusting (Figure 5.1). This feedback loop provides information for making adjustments that focus on improving decisions in all phases of resource management. The utility of adaptive management programs should be considered by conservation practitioners, landowners, and land use planners to ensure that conservation actions achieve desired outcomes: in the case of this document, that means preserving, protecting, and restoring healthy, intact, and fully functioning riparian areas. In addition to improving ecosystem outcomes, adaptive management should improve clarity of regulations—resulting in increased transparency to all stakeholders.

All cities and counties are currently protecting critical areas, including riparian ecosystems, through a variety of regulatory and non-regulatory mechanisms. One regulatory challenge is understanding how well these mechanisms meet their intent of protecting ecosystem functions and values and how to make improvements where they are falling short. This chapter was written in collaboration with the Washington Department of Commerce (Commerce) and relies heavily on the Commerce’s 2018 update of the [Critical Areas Ordinance Handbook](#) (Bonlender 2018), with one exception, as noted.

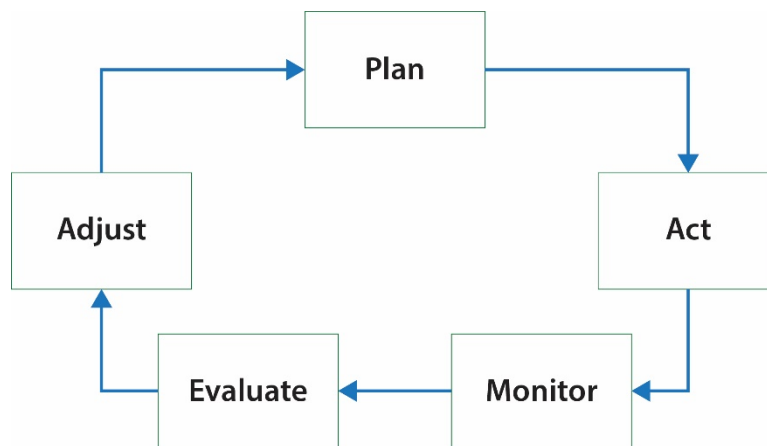


Figure 5.1. A simple depiction of the adaptive management cycle (modified from Bormann et al. 1994).

The process for monitoring we describe here supports both local and larger-scale actions that improve our collective efforts to protect riparian ecosystems throughout the state. For example, the Puget Sound Partnership (Partnership) uses “[Vital Signs](#)” of ecosystem health and recovery, such as riparian forest cover, to understand ecosystem condition, articulate shared goals and progress, and inspire action towards meeting those goals.

Adopting an adaptive management program can allow local governments to respond more quickly and meaningfully as new information become available. A willingness to address issues identified through this process is critical to the idea of adaptive management.

5.2 COMMON QUESTIONS ADDRESSED BY ADAPTIVE MANAGEMENT

Adaptive management does not have to be expensive or complicated to be useful. We believe local jurisdictions can maximize their investment in adaptive management by focusing on two types of monitoring related to their own regulatory process (explained in more detail in the next section).

We begin by discussing three basic types of monitoring because we have found it instructive to understand how different monitoring types can be hierarchically or sequentially staged, based on the types of questions they seek to answer: implementation monitoring, effectiveness monitoring¹³, and validation monitoring.

5.2.1 *Implementation Monitoring*

Implementation monitoring typically helps the permit issuer (permittor) answer the following questions about its permitting system, by looking at the outcomes of individual permits:

- Are permits consistent with regulations?
- Do permits contain all necessary conditions or provisions for a project?
- Does the permittor issue consistent permits (same requirements) for all permittees?

Implementation monitoring can also include:

- Permit *compliance monitoring*, which asks if the permittee followed or complied with each permit condition or provision and refrained from conducting unpermitted activities. Compliance monitoring usually takes place very soon after completion of permitted work.
- Keeping track of unpermitted activities; that is, finding changes in land use or management that require a permit but where no permit of any kind was issued.

Monitoring does not have to be complicated. Even if a city or county chooses to do only permit implementation monitoring, this will provide key information that can improve the permit process, and an individual landowner can check whether choices like enhancing native plantings produce the desired results.

5.2.2 *Effectiveness Monitoring*

In Commerce's 2018 Critical Areas Handbook, *effectiveness monitoring* is a form of long-term implementation monitoring. In other words, effectiveness monitoring looks at permit compliance as a while to determine whether permit conditions/provisions (e.g., buffer widths) are followed over time.

For the purposes of this document, we describe effectiveness monitoring a bit differently: Specifically, effectiveness monitoring is a way to determine whether permit conditions/provisions

¹³ As explained further in Section 5.2.2, we describe and use the term effectiveness monitoring somewhat differently than how it is described in Commerce's 2018 Critical Areas Handbook.

are working relative to intended environmental outcomes. For example, “Are permit conditions/provisions leading to the riparian function(s) (e.g., shade, bank stability) that they were intended to provide?” Effectiveness monitoring typically involves some on-the-ground measurement of environmental variables affected by land use activities.

5.2.3 Validation Monitoring

Research within the adaptive management framework is often referred to as *validation monitoring*. In the context of land use regulations, the questions relate to how management of critical areas (e.g., riparian) affects the specific environmental resource it was intended to protect (e.g., water quality, salmon). Validation monitoring may be beyond the fiscal means of most local governments. Moreover, it often involves questions that must be addressed over large spatial extents (e.g., at watershed or multi-watershed scale). In comparison, implementation and effectiveness monitoring are often tied to local jurisdiction’s regulatory processes at the site scale: For these reasons, the next two sections focus more on these two types of monitoring

5.3 RECOMMENDED IMPLEMENTATION MONITORING EFFORTS

We advise local governments to focus first on using implementation monitoring to evaluate their regulatory processes that affect riparian ecosystems. Implementation monitoring tracks execution of the permitting system from the perspective of both the permit issuer (permittor) and permit holder (permittee) (Figure 5.2). This effort can result in regular status reports that help demonstrate how well local governments and permittees are working together to meet resource objectives in a fair and consistent manner.

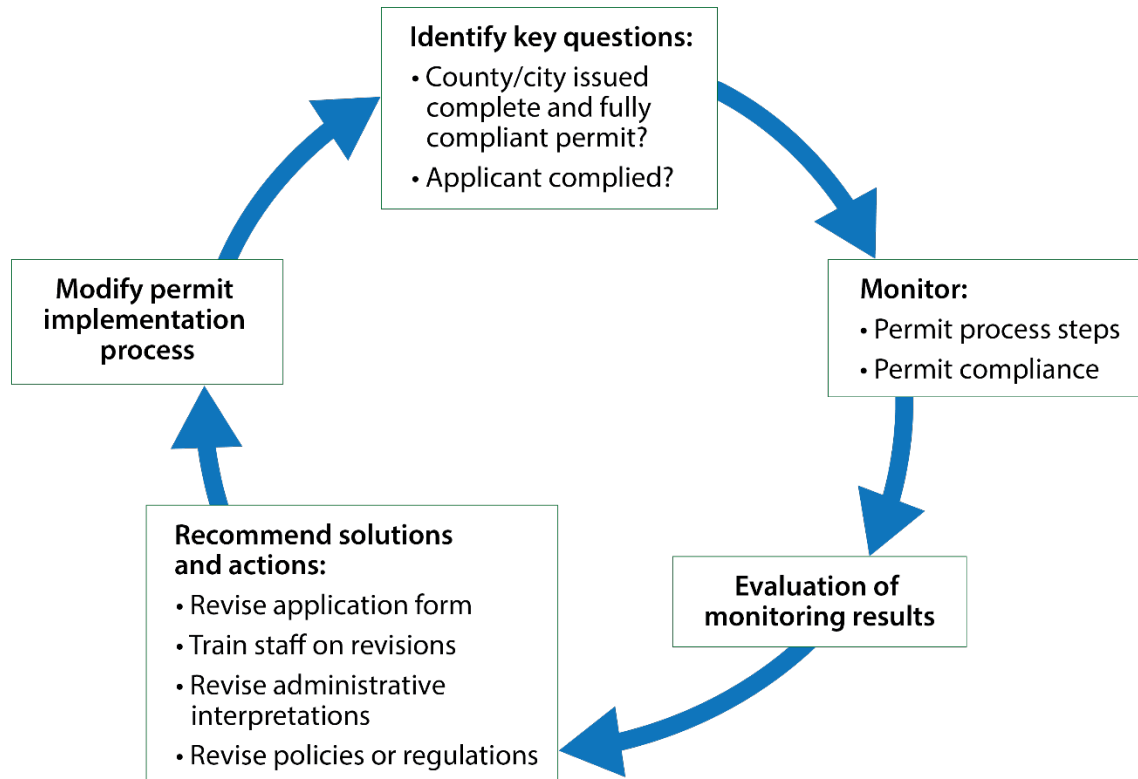


Figure 5.2. Depiction of the adaptive management cycle specific to permit compliance.

Implementation monitoring provides key information for permitting process improvement (**Error! Reference source not found.**2; Table 5.1). Even in situations where local governments cannot monitor all steps in their permitting process, monitoring any step—regulations to permit conditions/provisions, permit provisions to construction, construction to inspections, or inspections to enforcement—can provide valuable feedback about the quality of regulatory processes.

Table 5.1. Key questions for implementation monitoring during the Critical Areas permit review process.

Process Steps	Key study questions to evaluate permit implementation	Proposed metrics
Application	Was adequate information gathered from the permit applicant? Did the local government provide timely and necessary technical assistance to the permit applicant?	Number and percent of complete applications. i.e., include all information necessary to issue a permit. Number and percent by type of permit applications missing information
Permit	Do permit provisions follow the local government code?	Number and percent of permit provisions by type consistent with code.
Permit	Do permit provision identify intent of protection and how it can be accomplished? (e.g., area of tree retention, distance of structure from stream, clearing, grading, or storm water provisions, replanting requirements, extent of impervious surface.)	Number and percent of (complete) permits (i.e., include all provisions that enable a permittee to be fully compliant with the permit.) Number, percent, and type of missing provision/information
Permit (variance)	If a variance was granted, is the reason for the variance clearly stated?	Percent of variances by type justified by code or policy Percent of permits with variances by type.
Permit (mitigation)	If compensatory mitigation was required, were the unavoidable impacts clearly identified/quantified? Was the rationale clearly stated?	Number and percent of permits by type with unavoidable impacts Percent of permits by type with quantified mitigation requirements
Compliance	Post-Construction Visit: Did the permittee comply with the permit? (Requires field measurements of some or all the provisions in the permit. For riparian ecosystems, key provisions to inspect include RMZ width, retention of trees, replanting, structure distances from stream, area of impervious surface, and implementation of storm water provisions.)	Number and percent by type of provision that were out of compliance.
Enforcement	Are enforcement actions necessary to meet permit provisions and/or the regulations?	Number and percent by type of permit enforcement actions.

Because little or no fieldwork is required, the easiest and least expensive step to monitor is the link between regulations and permit provisions: that is, whether local land use regulations have been translated into permit provisions that can be understood easily by permittees. We recommend that some implementation monitoring become part of all local regulatory programs, even if it only on a relatively small subset of permits selected at random. A database for storing information on each

step (i.e., a permit tracking system—see Table 5.1, Figure 5.3) is a critical tool for creating a complete system of accountability.

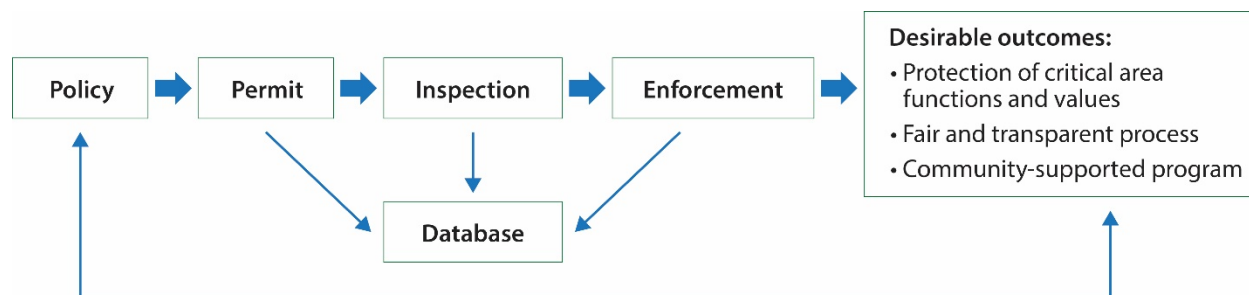


Figure 5.3. One system of permit accountability that includes implementation monitoring of internal permit processes, inspection for permit compliance, a database from which to judge outcomes, and a feedback loop connecting outcomes with policy intent.

Long-term implementation monitoring can help answer additional questions, such as: “Are rules/regulations intended to provide long-term protection of critical areas (e.g., RMZs) actually followed or maintained over time?” One way to answer this is by looking at changes in land cover, which describes the type and amount of vegetation, roads, and buildings occurring on the landscape. By comparing high quality aerial photographs taken of the same locations over time, change can be quantified and attributed to specific activities, both from natural disturbances (e.g., wildfires, river channel migration) and human activities (e.g., timber harvesting, residential subdivision construction, highway widening). In Section 5.5, we describe one such process WDFW developed and for which information for many parts of the state are already available.

5.4 EFFECTIVENESS OF REGULATORY PROTECTIONS OF CRITICAL AREAS

Where implementation monitoring has been successful, that is, either documenting a highly functional permitting process or improving poorly performing permitting process, we encourage additional effort on effectiveness monitoring. As described above, our primary goal for effectiveness monitoring would focus on understanding how well the permit conditions/provisions lead to measurable outcomes on the ground (e.g., protection/restoration of one or more riparian functions or values) over an extended period.

5.5 USING LAND COVER CHANGE TO UNDERSTAND LONG-TERM REGULATORY PROTECTION

High Resolution Change Detection ([HRCD](#)) is a tool that is useful for detecting changes in two specific types of land cover (tree canopy and impervious surfaces) over set time periods. Land cover change analysis like HRCD can show jurisdictions the degree to which critical area regulations are maintaining RMZs as intended. This information can then help shape if, where, why, and how adjustments to permitting processes should occur. By combining land cover change analysis with targeted questions about permitting processes, jurisdictions can begin to adaptively manage changes to their overall regulatory system.

Adaptive Management Framework in the Voluntary Stewardship Program

The Voluntary Stewardship Program (VSP) was authorized by the Legislature in 2011 through RCW 36.70A.705. The goals of VSP are to protect and enhance critical areas where agricultural activities are conducted, maintain and improve the long-term viability of agriculture in the State of Washington, and reduce conversion of farmland to other uses. The program provides counties with an alternative approach from traditional development regulations that require protection (and encourage enhancement) of critical areas at the individual parcel scale. Instead, VSP relies upon voluntary practices and incentive programs to protect (and enhance) at a watershed scale. Counties “opted-in” to VSP, and as of 2019, 27 of the state’s 39 counties are participating.

Under VSP, local workgroups created work plans that include benchmarks for protection and enhancement of critical areas designed to be achieved through voluntary and incentive-based actions. VSP requires monitoring and adaptive management to maintain and enhance critical areas, including riparian ecosystems, and directs workgroups to monitor at the watershed or sub-watershed scale. Key requirements for county-level programs include:

1. Establishing a durable system to track and report goals, benchmarks, and performance metrics.
2. Developing implementation and effectiveness monitoring programs and conducting monitoring on a pre-determined schedule.
3. Establishing an adaptive management program with (a) “triggers”; (b) subsequent actions to take; and (c) a process to review/update both the triggers and actions over time.
4. Reporting on the achievement of protection and enhancement goals and benchmarks at specified intervals.

Numerous counties have utilized WDFW’s recommended VSP Adaptive Management Matrix in approved VSP Work Plans. Examples include:

- Chelan County, Appendix I (Approved April 2017)
- Grant County, Tables 5-7 through 5-10 (Approved June 2017)
- Asotin County, Tables 5-3 through 5-5 (Approved May 2018)
- Okanogan County, Chapter 6 (Approved September 2018)
- Spokane County, Section 4 (Approved November 2018)

Jurisdictions can adapt matrices as templates for connecting goals, benchmarks, performance metrics, monitoring, and adaptive management for other uses beyond VSP. These matrices can be modified as frameworks to identify specific elements of any adaptive management plan.

The example in the following section is adapted from Commerce’s Critical Areas Handbook (Bonlender 2018). Chapter 7 of that document provides a number of similar monitoring program examples, nearly all of which were developed by cities or counties.

5.5.1 *Example: WDFW/Thurston County Shoreline Master Program*

In 2015, Thurston County and WDFW utilized a National Estuary Program grant to quantify shoreline vegetation, land cover change, and evaluate land use permit compliance. Specifically, Thurston County used WDFW’s HRCD data to monitor compliance within the County’s Shoreline Master Program (SMP) jurisdiction. This project developed a [protocol manual](#) for using HRCD for this purpose, available to all jurisdictions within the Puget Sound region.

One goal of the pilot project was to answer several related sets of questions:

For Thurston County:

- What land cover change is happening within designated SMP areas? What change is happening throughout the Deschutes River watershed (WRIA 13)?
- How does change known by permit records compare with detected changes by HRCD?
- What changes, if any, can be made to the land use permits or permitting process that could increase the relevancy or efficacy in utilizing the HRCD in compliance monitoring?

For WDFW:

- How well can HRCD detect changes relative to land use permit records?
- Using Thurston County's SMP area as an example test area, what land cover changes are happening which HRCD is not capturing?
- With the development of a HRCD user manual, can HRCD be successfully utilized by other entities in the absence of direct assistance by WDFW?

The pilot quantified increases in impervious surfaces and decrease in tree canopy within marine areas of the SMP jurisdiction and checked for relevant permits issued. It consisted of five phases:

Phase 1: Initial SMP Change Analysis: Staff from WDFW's Habitat Program and the County's Long-Range Planning Department intersected the HRCD dataset with the County's SMP area and tax parcel data within ArcGIS for three time periods of HRCD availability (2006 to 2009, 2009 to 2011, and 2011 to 2013). Staff compared known areas of change to those locations with the county's land use permit records to find locations of observed change via HRCD without any permit record. During this phase, land cover change statistics were also produced, including total area of change and discrete occurrences of land cover change events.

Phase 2: Learning What the HRCD Misses: Using the SMP area in the County, WDFW staff manually looked for land cover changes not captured by the HRCD analysis, to understand how accurate HRCD was in capturing all land cover change situations (rates of omission error).

Phase 3: Developing a Standardized Method for Utilizing the HRCD: A major goal of this project was to develop support materials for others to be able to utilize HRCD to answer land use management questions independent of WDFW staff assistance. Using lessons learned in Phases 1 and 2, WDFW and the County agreed upon a recommended method for applying HRCD to a specific management question, and collaboratively developed a "how-to" manual. In this phase, WDFW staff also developed a web-based service (<https://hrcd-wdfw.hub.arcgis.com>) where users can download the HRCD dataset, detail the methodology of HRCD construction, find WDFW contact information, and more.

Phase 4: Testing the Manual through Remaining SMP Analysis in WRIA 13: Using only the HRCD dataset and the manual produced in Phase 3, County staff examined land cover change within the remaining SMP areas within WRIA 13 successfully for the same three time periods that HRCD data was available and utilized in the earlier phase.

Phase 5: Training and Outreach: With the lessons learned and products derived from Phases 1 through 4 of the project, staff worked in conjunction with the [Coastal Training Program](#), managed by Ecology, to develop and deliver a workshop for planning staff within other state agencies, local

governments, and some non-governmental organizations. WDFW also used this opportunity to train internal staff on the benefits, limitations, and uses of HRCD.

The evaluators analyzed land cover change within Thurston County's SMP area between 2006 and 2013, pulling permit records from timeframes that corresponded with the available HRCD datasets. The project's findings were very helpful, not only because of the information collected, but also in providing proof of concept for several of the steps/tools.

For example: The utility of HRCD in analyzing patterns of land cover change in a specific geographic area of concern were well demonstrated. The HRCD analysis found that, from 2006 to 2013, less than half of one percent (0.39%) of the riparian area contained within the SMP had land cover change – approximately two-thirds of this was due to canopy loss, with one-third due to new impervious surfaces. The HRCD analysis did not find any permitted developments that were out of compliance, though it did find unpermitted events (e.g., tree removal) in each time period studied.

Furthermore, the HRCD dataset proved to be relatively simple to use. With the development of standard application methods, Thurston County was able to complete an analysis of their remaining SMP area without any further assistance from WDFW.

On the flip side, Thurston County found that comparing actual permit compliance with HRCD data was “tedious and difficult” because of limitations with the county's permit tracking database ([AMANDA](#)). For example, in many cases, land use permits did not include enough information to determine conclusively that a parcel with observed change via HRCD was out of compliance or determine that the parcel had a permit record during the study's timeframe in question.

Local governments can use HRCD analysis at the start to find land cover changes that are otherwise unknown; as they begin to understand patterns, HRCD analysis provides indications to identify locations that warrant closer investigation through other methods.

5.6 CONCLUSION

Implementation and effectiveness monitoring are important parts of adaptive management and can be undertaken relatively easily by local governments. Many of our riparian ecosystems are already degraded and stressed, so it is worth our while to investigate whether the actions put in place to protect them are being carried out as required and leading to the specific environmental responses that were intended. This is now more important than ever, because in spite of advances in science and efforts to improve regulatory processes, climate change and population pressures are increasingly confronting many parts of the state. Using monitoring and adaptive management to track successes and failures and then learning from both will make our challenges easier to overcome.

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GLOSSARY OF TERMS

Active channel: The active channel is defined by the lower limit of continuous riparian vegetation (Naiman et al. 1998) and may be delineated by absence of both moss on rocks and rooted vegetation (USFS 2008). The upper most elevation of the active channel is sometimes equated with the ordinary high-water mark.

Active floodplain: Located between the active channel and adjacent terrace or hillslopes (Fetherston et al. 1995; Harris 1987). Depending on the watershed, the flood return interval of the active floodplain varies between 1 and 10 years (Wolman and Leopold 1957; Ward and Stanford 1995; Lichvar et al. 2006; Williams et al. 2009; BLM 2015).

Adaptive management: The systematic acquisition and application of reliable information to improve management over time. It often includes treating management decisions as experiments in order to address critical uncertainties and learn more quickly from experience. It involves setting objectives, monitoring conditions, and adjusting management based on results. Hallmarks of a sound adaptive management program include: (1) adequate funding for monitoring and research, (2) a willingness to change course when pre-established triggers are reached, and (3) a commitment to gather data and evaluate conditions at appropriate spatial extents and time scales. *See Ecosystem-based management and WAC 365-195-920(2).*

Anadromous fisheries: The commercial, recreational or subsistence harvest of fish that are born in freshwater, rear at sea, and return to freshwater to spawn. Anadromous fisheries of Washington include salmon (Chinook, coho, chum, sockeye, and pink), steelhead, bull trout, coastal cutthroat trout, green sturgeon, white sturgeon, eulachon, longfin smelt, and Pacific lamprey.

Aquatic species: Wildlife species that live in marine or freshwater including fish, shellfish (e.g., clams, snails, mussels), amphibians (e.g., frogs, salamanders), reptiles (e.g., turtles), crustaceans (e.g., crayfish), insects (e.g., larval mayflies, stoneflies, caddisflies, dragonflies) and various other invertebrates.

Best Available Science: Information produced through a valid scientific process that WDFW or another local, state or federal agency has determined represents the best available science consistent with criteria set out in WAC 365-195-900 through 365-195-925. (Volume 1 of this document is an example of Best Available Science regarding riparian ecosystems.)

Biota: The animal and plant life of a region, habitat, or geological period.

Buffer: The area around a critical area that separates the critical area from incompatible uses. For example, a 200m buffer may be established around a heron-nesting colony (the critical area) to keep suburban land uses from disrupting the colony. *See WAC 365-190-130(3)(a).* Riparian ecosystems are both buffers (for instream habitat) and critical areas on their own merit.

Channel Migration Zone: The area within which a river channel is likely to migrate and occupy over a specified time period (e.g., 100 years).

Channel slope or gradient: The average steepness of a stream segment measured as its change in elevation divided by its length. Typically, a segment's gradient is considered low if less than 2%, moderate between 2% and 4%, and high if greater than 4%.

Classification (critical area): Defining categories to which critical areas are assigned. The Priority Habitats and Species (PHS) program provides WDFW's recommended classification scheme for Fish and Wildlife Habitat Conservation Areas. Classification precedes designation in counties' and cities' effort to protect critical areas. *See* WAC 365-190-040(4).

Complexity: The complicated state seen in dynamic environments that contain multiple components and processes that interact with one another in a web of interactions whose outcomes are often unpredictable. Complexity can be described with conceptual models; outcomes of well-understood complex phenomena can be partially predicted using computer models.

Connectivity: Landscape connectivity is the physical relationship between landscape elements. Functional connectivity describes the degree to which landscapes facilitate or impede the movement of organisms between areas of habitat.

Critical Aquifer Recharge Area: Areas with an essential recharging effect on aquifers used for potable water. One of five types of Critical Areas identified in the Growth Management Act.

Critical Area(s): Places that the Growth Management Act requires all counties and cities to designate and protect, specifically, (1) Wetlands; (2) Critical Aquifer Recharge Areas; (3) Fish and Wildlife Habitat Conservation Areas (e.g., Riparian Management Zones); (4) Frequently Flooded Areas; and (5) Geologically Hazardous Areas. In developing policies and regulations to protect the functions and values of critical areas, counties and cities are required to include best available science and give special consideration to conservation or protection measures necessary to preserve or enhance anadromous fisheries. *See* RCW 36.70A.172(1). The presence of a critical area may limit some land development options. *See* WAC 365-190-040(6).

Delineation (critical area): The act of applying definitions or performance standards in the field to identify the boundary of a critical area.

Designation (critical area): Assigning critical areas into established categories and specifying their general distribution, location, and extent. Designation can be made by maps (which are useful for public awareness and for identifying if a proposal may affect a critical area) and by performance standards or definitions (which allow for specific identification and site-scale delineation during permit review). WDFW's Priority Habitats and Species (PHS) program provides the agency's recommended designation maps and performance standards/definitions for Fish and Wildlife Habitat Conservation Areas. Designation occurs after classification in counties' and cities' efforts to protect critical areas. *See* WAC 365-190-040(5).

Disturbance regime: The frequency, magnitude, and duration of disturbance events.

Disturbance: A pronounced, temporary change in environmental conditions within an ecosystem. Disturbances often act quickly and can alter ecosystem composition, structure, and function.

Ecological (biological) integrity: Ability of an ecological system to support and maintain a community of organism that has species composition, diversity, and functional organization comparable to those of natural habitats within a region. An ecological system has integrity when its dominant ecological characteristics (composition, structure, function, and processes) occur within their historical ranges of natural variability. *See* Historical condition and Range of natural variability.

Ecosystem(s): A spatially explicit unit of the Earth that includes all the organisms, along with all components of the abiotic (chemical and physical) environment. Ecosystems have composition, structure, and functions.

Ecosystem composition (or ecological composition): All living (biotic) and nonliving parts of an ecosystem.

Ecosystem function(ing) (or ecological function): (1) The process or cause and effect relationship underlying two or more interacting components, e.g., terrestrial plant material as food/substrate for aquatic invertebrates. (2) The sum of processes that sustain the system. (3) The capacity of natural processes and components to provide goods and services that satisfy human needs, either directly or indirectly. Ecosystem functions can be conceived as a subset of ecological processes (*See* Ecosystem process).

Ecosystem process (or ecological process): Interactions among components of an ecosystem, biotic (living organisms) and abiotic (chemical and physical) components. Many processes involve transfer, conversion, or storage of matter or energy (*See* Ecosystem function).

Ecosystem structure (or ecological structure): The arrangement of and relations among the parts or elements (components) of an ecosystem.

Ecosystem-based management (EBM): Management driven by explicit goals; executed by policies, protocols, and practices; and made adaptable by monitoring and research; based on our best understanding of the ecological interactions and processes necessary to sustain ecosystem composition, structure, and function. EBM acknowledges that humans are an important ecosystem component and focuses on managing human activities within ecosystems. EBM often involves balancing ecological, economic, and social objectives within the context of existing laws and policies.

Enhance: To improve a critical area's existing ecosystem processes, structure, and/or functions so that its ecological integrity is more like its historical condition.

Erosion: The loosening and transport of soil particles and other sediment by water. Terrestrial erosion includes raindrop splash erosion, overland flow sheet erosion, surface flow rill (shallow) and gully (deeper) erosion. Channel erosion includes streambank erosion and channel incision (gouging). Rill and gully erosion diminish the ability of the riparian area to trap sediment and pollutants and can often be avoided with intact riparian vegetation.

Fish and Wildlife Habitat Conservation Areas (FWHCA): A type of Critical Area specified in the Growth Management Act. The intent of FWHCAs are to maintain populations of species in suitable habitats within their natural geographic distribution so that (1) the habitat available is sufficient to support viable populations over the long term, and (2) isolated subpopulations are not created. FWHCAs come in a variety of types including waters of the state, places with which listed species have a primary association, habitats and species of local importance, and riparian ecosystems. *See* WAC 365-190-130.

Flow regime (stream): The distribution of stream flow through space and time. Flow regimes can be described by their magnitude (e.g., mean annual, hourly maximum), timing, frequency or return periodicity, duration, spatial distribution, and rate of change. The pathways that water takes to reach a stream (e.g., surface runoff) and within a stream exert a strong influence on the flow regime.

Function: Physical, chemical, or biological processes that occur within an ecosystem. WAC 365-196-830 says, “Functions are the conditions and processes that support the ecosystem. Conditions and processes operate on varying geographic scales ranging from site-specific to watershed and even regional scales.” See also Ecosystem function(ing) and Ecosystem process.

Habitat: The resources and conditions presented in an area that support the functional needs of a species (e.g., hiding, migration, resting, feeding, breeding, and rearing), and which are necessary for its survival and reproduction. Habitat is species-specific, scale dependent, and more than vegetation composition or structure.

Hazard Tree: A tree that a jurisdiction’s building official or other recognized professional (e.g., certified arborist, registered landscape architect, or certified forester) has determined poses a near-term hazard to public safety or to an existing permanent structure or public utility.

Herbaceous: Non-woody plants such as grasses and ferns.

Historical condition: See Ecological integrity and Range of natural variability.

Hydrology: Description of the properties, distribution, movement, and storage of water on and below the Earth’s surface.

Impervious surface: Ground surfaces that resist or prevent water infiltration, e.g., roofs of houses, roadways.

Imputed: estimated; a value assigned to missing data by inference from the values of data within the same dataset.

Infiltration: The rate or process by which water on the ground enters the soil.

Instream: Within flowing freshwater; also, the area waterward of the Ordinary High-Water Mark.

Large Woody Debris: Large dead woody material (such as fallen trees and branches) in various stages of decomposition that provide nutrient capital to forest and aquatic resources and serve as habitat in forest and riparian ecosystems. Large wood is usually defined as having diameter greater than 4 in (10 cm) and length greater than 6 ft (≈ 2 m).

Low Impact Development (LID): A storm water and land-use management strategy that tries to mimic natural hydrologic conditions by emphasizing pre-disturbance hydrologic processes of infiltration, filtration, storage, evaporation, and transpiration.

Mitigation: General category of measures that a proponent may take to avoid, minimize, and compensate for impacts.

Mitigation sequence: The stepwise process of protecting a critical area through, first (1) avoiding harm to the critical area to the maximum extent practicable, then (2) minimizing unavoidable harm to the maximum extent practicable, and finally (3) providing compensation for all unavoidable harm by restoring, creating, enhancing, or preserving the critical area’s ecological functions and values to replace those impacted or lost through permitted activities.

Monitoring: The process of observing and checking the progress or quality environmental conditions for the purposes of adaptive management. Often described as having three types – implementation, effectiveness, and validation.

Morphology (stream channel, aka fluvial geomorphology): A stream channel's shape and how it changes over time. Channel morphology is influenced by the abundance and variation in sediment sources, the ability of water to transport sediment downstream, and interactions of sediment with riparian vegetation and woody debris.

Off-Channel Habitat: Overflow channels, sloughs, alcoves, wetlands, and small streams found within the floodplains of larger river channels. Off-channel habitat consists of waters connected to and draining into rivers and streams by inundation during peak flow events (Smith 2005; WAC 222-16-031). Off-channel habitat provides habitat for salmonids and other aquatic species which often afford (1) spawning habitat that does not experience scouring high flows; and (2) summer rearing habitat that does not experience loss of stream flow.

Ordinary High Water Mark (OHWM): (1) That mark that will be found by examining the bed and banks and ascertaining where the presence and action of waters are so common and usual, and so long continued in all ordinary years, as to mark upon the soil a character distinct from that of the abutting upland (Washington Department of Ecology 2016). (2) That line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas (U.S. Army Corps of Engineers, 2014).

Organic litter: Plant, leaf, tree, or soil litter, and duff are dead plant materials that have fallen to the ground. In this document, organic litter is referenced as available for contributions to the stream system.

Passive Restoration: Allowing natural succession to occur in an ecosystem after removing a source of disturbance.

Population viability (local): The likelihood that a population of a species will persist for some length of time.

Precautionary principle: Erring on the side of not harming resources when faced with uncertainty, especially for potential harm that is essentially irreversible. Utilizing a precautionary approach in land use planning involves: (1) taking preventive action (avoiding impacts); (2) shifting the burden of proof to the project proponents; (3) exploring a wide range of potential alternatives; and/or (4) including multiple stakeholders and disciplines in decision making.

Priority Area: The area within a Priority Species' natural geographic distribution within which protective measures and/or management actions are needed to (1) support viable populations over the long term and (2) avoid creating isolated subpopulations.

Priority Habitat: A State of Washington habitat type with unique or significant value to many species; an area with one or more of the following attributes: (1) comparatively high fish and wildlife density; (2) comparatively high species diversity; (3) important breeding habitat; (4) important seasonal ranges; (5) important movement corridors; (6) limited availability; (7) high vulnerability to habitat alteration; or (8) unique or dependent species. Examples of Priority Habitats include but are not limited to instream, riparian, shrub steppe, Oregon white oak woodlands, freshwater wetlands, and marine nearshore.

Priority Habitats & Species (PHS): WDFW's primary means of transferring fish and wildlife information from resource experts to local governments, landowners, and others for the protection of fish, wildlife, and habitat. Includes endangered, threatened, sensitive, candidate, and vulnerable species and habitats deemed priorities of WDFW and reflective of best available science. *See* WAC 365-190-130.

Priority Species: A State of Washington fish or wildlife species requiring protective measures and/or management actions to ensure its survival. A Priority Species fits one or more of the following criteria: (1) is a state-listed endangered, threatened, sensitive, or candidate species, (2) has vulnerable aggregations, or (3) is of recreational, commercial, and/or tribal importance. Examples of Priority Species include but are not limited to steelhead/rainbow trout, bull trout/Dolly Varden, great blue heron, cavity-nesting ducks, sage grouse, fisher, orca, and elk.

Process: *See* Ecosystem process.

Protect: To prevent the degradation of existing ecosystem functions and values.

Range of natural variability (or Historical range of natural variability): Refers to the range of ecological conditions (components, structures and functions) in a time period before widespread anthropogenic changes.

Recruitment (wood): The process of wood moving from a riparian area to the stream channel. Sources of recruitment include bank erosion, windthrow, landslides, debris flows, snow avalanches, and tree mortality due to, for example, fire, ice storms, beavers, insects, or disease. Dominant factors include, but are not limited to, channel width, slope steepness, slope stability, forest composition and structure, and local wind patterns.

Refugia (singular Refugium): sites to which biota retreat, persist in and potentially expand from under changing environmental conditions (Keppel et al. 2012).

Riparian: An adjective meaning alongside a waterbody: stream, river, lake, pond, bay, sea, and ocean. Riparian areas are sometimes referred to by different names: riparian ecosystems, riparian habitats, riparian corridors, or riparian zones. Depending on the contexts, these terms may have somewhat different meanings.

Riparian area: A defined area encompassing both sides of a water body, composed of aquatic ecosystems (i.e., the river or stream), riparian ecosystem, and riverine wetlands. Riparian areas are three dimensional: longitudinal up and down streams, lateral to the width of the riparian ecosystem, and vertical from below the water table to above the canopy of mature site-potential trees (NRC 2002).

Riparian buffer: Buffer refers to its purpose, which is to reduce or prevent adverse impacts to water quality, fisheries, and aquatic biodiversity from human activities occurring upslope of the buffer. Riparian buffers managed specifically for pollutant removal may also be called a vegetated filter strip.

Riparian ecosystem: Riparian areas are transitional between terrestrial and aquatic ecosystems and distinguished by gradients in biophysical conditions, ecological processes, and biota. They are areas through which surface and subsurface hydrology connect waterbodies with their adjacent uplands. They include those portions of the ecosystem distinguished by gradients (i.e., riparian

zones) and portions of terrestrial ecosystems that significantly influence exchanges of energy and matter with aquatic ecosystems (i.e., the Zone of Influence). Our definition of riparian ecosystem does not include adjacent waters (i.e., rivers or streams, but does include riverine wetlands) and recognizes the riparian zone as a distinctive area within riparian ecosystems.

Riparian Management Zone: A delineable area defined in a land use regulation; often synonymous with riparian buffer. For the purposes of this document, we define the RMZ as the area that has the potential to provide full riparian functions. In many forested regions of the state this area occurs within one 200-year site-potential tree height measured from the edge of the stream channel. In situations where a CMZ is present, this occurs within one site-potential tree height measured from the edges of the CMZ. In non-forest zones the RMZ is defined by the greater of the outermost point of the riparian vegetative community or the pollution removal function, at 100-feet.

Riparian values: The benefits that riparian ecosystems provide to society, including but not limited to flood damage reduction, water quality improvement, provision of harvestable populations of salmon, and provision of recreational opportunities. Riparian values have direct economic consequences to local communities through fishing opportunities, and flood and water quality protection, among others.

Riparian zone: A distinctive area within riparian ecosystems. The riparian zone contains wet or moist soils and plants adapted to growing conditions associated with periodically saturated soils. *See* Riparian ecosystem.

Risk: A situation involving exposure to danger, harm, or loss. Risk reflects the magnitude of the adverse impact and its probability of occurring. Risk is appropriately managed by applying the precautionary principle (especially for irreversible losses) and through adaptive management.

Salmonid: A family of fish comprised of salmon, trout and whitefish. Native salmonid species in Washington State include: Chinook Salmon (*Oncorhynchus tshawytscha*), Chum Salmon (*O. keta*), Coho Salmon (*O. kisutch*), Pink Salmon (*O. gorbuscha*), Sockeye Salmon/Kokanee (*O. nerka*), Steelhead/Rainbow Trout (*O. mykiss*), Cutthroat Trout (*O. clarki*), Bull Trout (*Salvelinus confluentus*), Dolly Varden (*S. malma*), Pygmy Whitefish (*Prosopium coulteri*), and Mountain Whitefish (*P. williamsoni*). This list does not include names of subspecies. (*See* anadromous fisheries).

Site class: The classification of a site based on the productivity of its dominant tree species. Site classes vary based on local differences in soil nutrients and moisture, light and temperature regimes, and topography. Site classes are typically described as most productive (I) through least productive (V).

Site-Potential Tree Height: The average maximum height of the tallest dominant trees for a given age and site class.

Stronghold: Habitat strongholds are refugia watersheds that contain high quality habitat with depressed or weak populations. The habitat in these areas has a high to very high potential to support these species. The population level in these areas is not considered to be a function of habitat, but other factors (USFS2001).

Structure: *See* Ecosystem structure.

Succession: Ecological succession is the process by which the biological community composition recovers over time following a disturbance event.

Uncertainty (scientific): The absence of information about the state of something or a relevant variable. Sources of uncertainty include, but are not limited to natural variation (i.e., because outcomes vary in difficult-to-predict ways through time and space), model uncertainty (i.e., we do not understand how things interact with each other), systematic error (e.g., poorly designed experiments or calibrated instruments), or measurement error. *See Risk.*

Values: The level of benefits that the space, water, minerals, biota, and all other factors that make up a natural ecosystem provide to support native life forms, including humans (Cordell et al. 2005).

Vegetative filter strips: A riparian buffer designed to capture nutrients, contaminant compounds, and sediment transported by run-off. Filter strips are sometimes synonymous with riparian buffers.

Water quality: Physical, chemical, and biological characteristics of water that describe its suitability to meet human needs or habitat requirements for fish and wildlife.

Watershed processes: The fluxes of energy (e.g., sunlight, wildfire) and materials (particularly water and sediment) that interact with biota (e.g., vegetative cover, salmon, beavers, soil microbes) to form a watershed's physical features and characteristics, which give rise to its instream physical and ecological conditions. These processes occur within a context that reflects the watershed's climate, geology, topography, and existing human land use. *See Ecosystem process.*

Watershed: A land area that drains to a common waterbody.

Wetland: Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support—and that under normal circumstances do support—a prevalence of vegetation typically adapted for life in saturated soil conditions. Examples include but are not limited to swamps, marshes, and bogs.

Zone of Influence: The portions of terrestrial ecosystems that significantly influence exchanges of energy (e.g., sunlight) and matter (e.g., large wood, sediment, nutrients) with aquatic ecosystems.

APPENDIX. SITE-POTENTIAL TREE HEIGHT MAPPING TOOL

The Site-Potential Tree Height (SPTH) Mapping Tool helps users find information they need to conserve, protect, and restore riparian ecosystems within a project site. The SPTH mapping tool works on personal computers (PCs) and mobile devices (tablets and smartphones).

SITE-POTENTIAL TREE HEIGHT MAP DATA

The SPTH mapping tool contains several GIS data layers, explained below:

1. Site-potential Tree Height at 200 Years (SPTH₂₀₀),
2. Imputed¹⁴ SPTH₂₀₀ Values for Urban areas,
3. Dryland Ecosystems – No SPTH Values, and
4. Other Lands – No SPTH Values.

Site-potential Tree Height at 200 Years (SPTH₂₀₀)

WDFW derived the SPTH₂₀₀ values from forest productivity site index information using Natural Resource Conservation Service (NRCS) soil polygons and its Soil Data Viewer tool for ArcGIS. The NRCS-provided forest productivity site index values, in feet, were for ages 50 years in Western Washington and typically 100 years in Eastern Washington. WDFW determined SPTH₂₀₀ values using tree site index equations. Each soil polygon has one or more tree species records with associated SPTH₂₀₀. When multiple tree species records with associated SPTH₂₀₀ are available, WDFW recommends using the largest SPTH₂₀₀ value of the tree species historically present at the site (such trees may currently be found on the site, but also may not). For example, if a project site contains mostly red alder but Douglas-fir is present (or was present prior to modern human alterations), use the Douglas-fir SPTH₂₀₀ for that soil polygon.

Imputed SPTH₂₀₀ Values

Four large urban areas (Seattle, Spokane, Tacoma, and Bellingham) lacked NRCS soil polygons; therefore, forest productivity information could not be mapped for most locations within those areas. Similarly, numerous soil polygons labelled as “Urban Land” lacked forest productivity information. For each of these four urban areas, WDFW calculated an imputed SPTH₂₀₀ by using an area-weighted average for 200-year site index values within a two-mile buffer around the perimeter. WDFW recommends the use of this imputed SPTH₂₀₀ as a guide for delineating RMZs in these urban areas. At the time of publication, WDFW had calculated imputed SPTH₂₀₀ information for those large urban areas. WDFW expects to continue to update the map.

Dryland Ecosystems and Other Lands

Not all soil polygons are forested, or have forest productivity information from NRCS; therefore, not all of them have associated SPTH₂₀₀ values. In addition, Benton, Franklin, Grant, and Adams counties had no forest productivity information in their NRCS soil polygons. These areas without SPTH₂₀₀ values were classified in one of two ways: as “dryland ecosystems”, or “other lands.”

¹⁴ Imputed: estimated; a value assigned to something by inference from the value of the products or processes to which it contributes.

- WDFW approximated the area contained within “dryland ecosystems” using the Arid Lands Initiative study area boundary (Arid Lands Initiative, 2014) and have developed associated process steps that we recommend be used to derive RMZ widths (Volume 2, Section 2.2.3).
- The “other lands” comprise the remaining soil polygons and are small and dispersed across the landscape. These polygons include the NRCS soil map unit name, if applicable, and often represent soils that do not support tree growth, such as beaches and wetlands, as well as certain types of heavily modified sites like gravel pits. Please consult with a WDFW regional habitat biologist on deriving RMZs for “other lands” and consider following a similar process for delineation in dryland ecosystems.

USING THE MAPPING TOOL

The mapping tool can be accessed from several locations:

- WDFW web site (<https://wdfw.wa.gov/species-habitats/at-risk/phs/recommendations>),
- Washington Geospatial Open Data Portal (<http://geo.wa.gov/>), and
- ArcGIS Online (AGOL) (<https://wdfw.maps.arcgis.com/apps/MapSeries/index.html?appid=919ea98204eb4f5fa70eca99cd5b0de1>).

The mapping tool consists of the statewide map with the four riparian datasets described above; user tools; and a sidebar explaining map contents, how to use the map, and links to supporting documents.

The four riparian datasets have unique colors indicating where the information occurs.

- Green: Area where SPTH₂₀₀ has been calculated.
- Orange: Areas where SPTH₂₀₀ values have been imputed.
- Pale brown: Dryland ecosystems where there is no tree height information.
- Beige: Places for which no SPTH site index information is available.

Tribal and publicly owned/managed lands federal and tribal lands are typically subject to different riparian regulations. Tribal, federal, and state lands are displayed in shades of grey. County-owned lands are shown in lavender, and city-owned lands are light blue.

The mapping tool contains the following tools (Figure A1):

1. **Zoom Slider:** zoom in or out on the center of the map.
2. **Home icon:** resets map to statewide extent.
3. **Target icon:** allows the user to zoom directly to their current location.
4. **Address Search:** zooms to a street address, place name, or latitude and longitude.
5. **Measurement:** use this to measure the distance between objects (e.g. edge of stream to another point), or to measure an area (square feet of an area surrounding a project site).
6. **Basemap Selector:** change the basemap to show a different view of the landscape: aerial imagery (default), topographic map, open street map, terrain with labels, and USGS national map.

7. **Legend:** displays the map layers currently visible. For example, map layers displayed at a site-specific scale will not appear in the legend when zoomed out to the statewide extent.
8. **Scale bar:** shows the scale that the map is zoomed to. At a statewide extent, the scale bar will show 0 to 60 miles. When zoomed to a scale where you can view the project area, the scale bar will show 0 to 100 feet or 200 feet.
9. **Coordinates:** latitude and longitude (decimal degrees) are shown where the cursor is located on the map.
10. **Panning:** move the map by placing the cursor over a desired location and dragging it to the center of the map display.

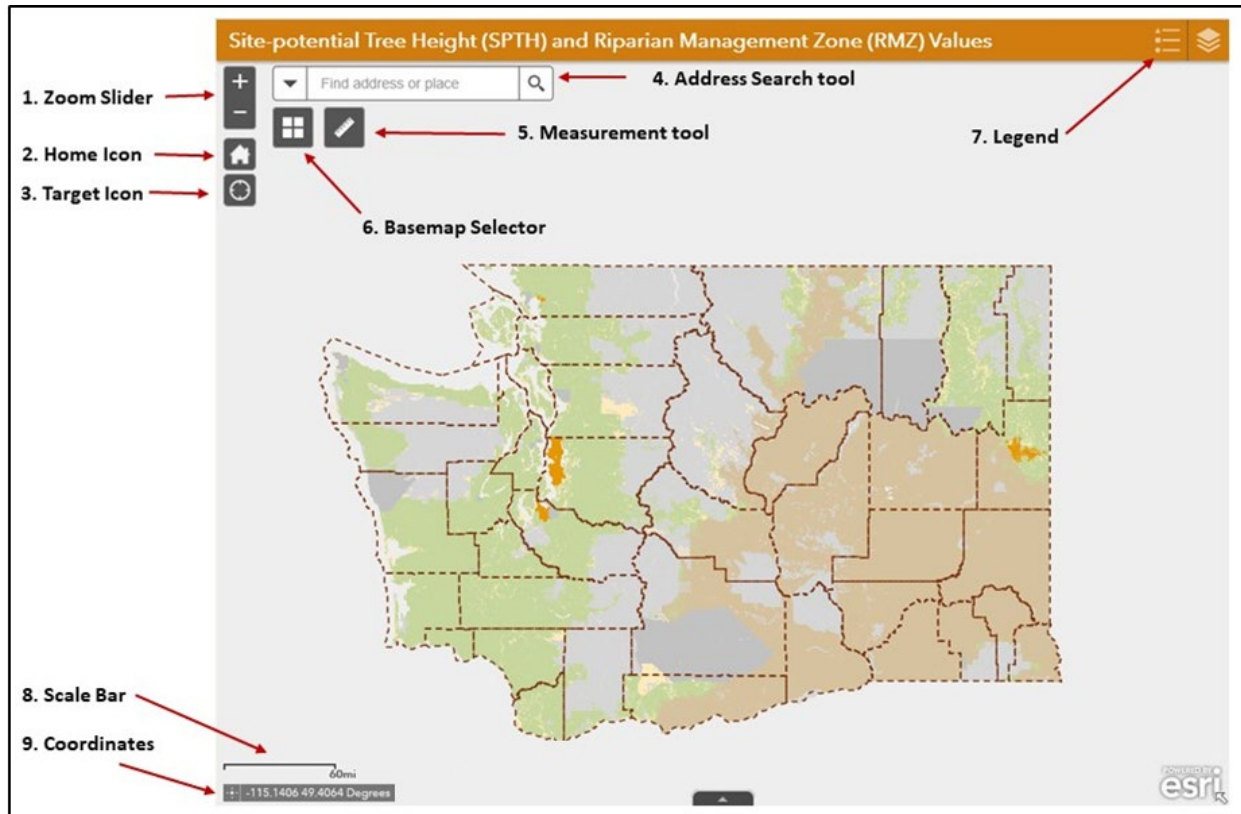


Figure A1. Tools available on the SPTH₂₀₀ and RMZ Online Map.

To zoom to a site location, use the Address Search tool or use a combination of the Zoom Slider and panning. (If using the Address Search tool, select the “ArcGIS World Geocoding Service” from the dropdown menu to the left of the search field for faster results.) Once the site is located, a click (on PCs) or tap (on mobile devices) of the cursor will open a popup window with information about that location. Be sure to review each window if multiple records are selected.

The NRCS soil polygons form a complex mosaic across the landscape, so you must zoom in close enough to clearly see your project site. Clicking (or tapping, on mobile devices) on the map when it is zoomed out will result in erroneous returns of the SPTH₂₀₀ values. Below is an example of using these tools to obtain riparian information at a project site.

MAPPING TOOL EXAMPLE #1

1. Start up the Online Map.
2. Type the project location into the Address Search tool (Figure A2). If the address is unknown, use a nearby place name or latitude and longitude.

This example uses 16018 Mill Creek Boulevard, Mill Creek, Washington.

3. Select the correct address from the drop-down menu or continue to enter manually. Click (on a **PC**) or tap (on a **mobile device**) the search button. The map will zoom to that location, shown as a small blue box and a popup titled "Search result" (Figure A3).

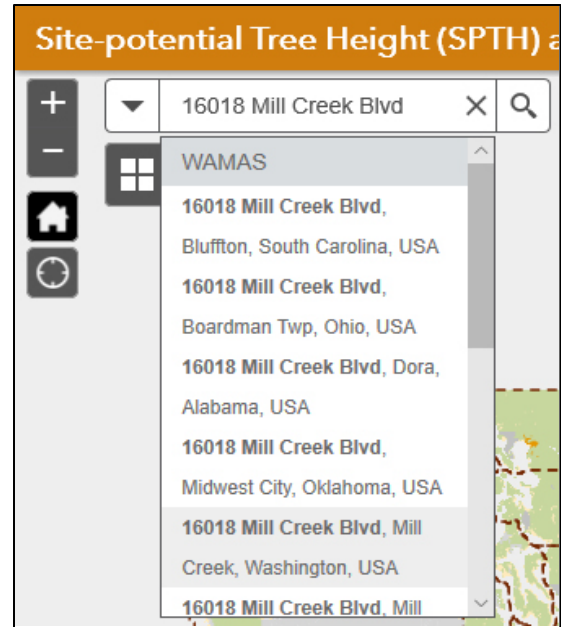


Figure A2. Using the Address Search tool.



Figure A3. Zoomed in aerial image of the site address.

4. Click (or tap) on the “X” in the Address Search tool to close the popup. Zoom and pan until you can clearly see where the project site is on the landscape (Figure A4).

In this example, the project site lies in a wooded area to the west of the address selected in the previous screen. We panned west to center the map display over the project site. In this screen, you can see the outlines of the soil polygons.



Figure A4. Adjusting the map display over the project site.

5. Click (or tap) near a stream on the project site. The outline of the soil polygon selected will turn blue, and a popup window will provide information about the SPTH₂₀₀ (Figure A5). On a PC, the popup should automatically show (1) the SPTH₂₀₀ in feet, (2) the species of tree it is based on, and (3) the reference study used to derive the height value. On a mobile device, tap the arrow on the right side of the popup to display this information.

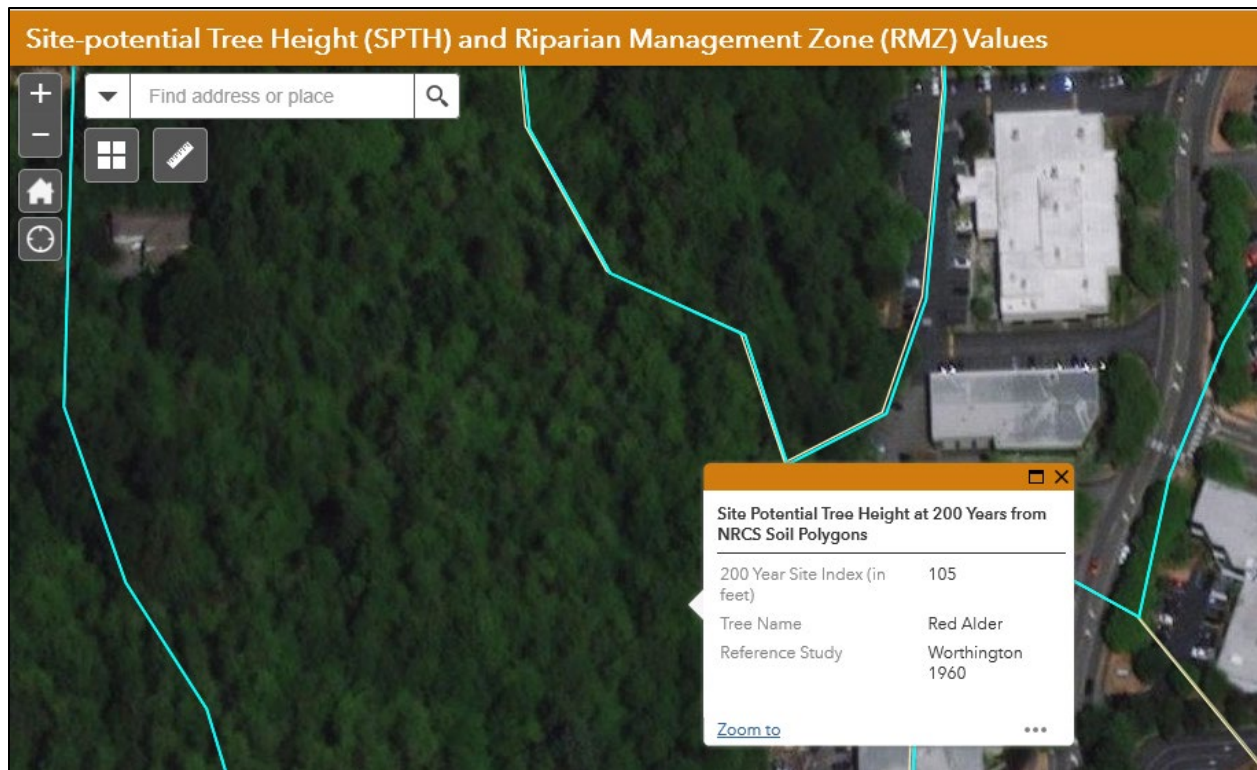


Figure A5. Bringing up the SPTH₂₀₀ information at the project site.

In Example #1, the soil polygon for the project site only showed one tree species: Red Alder. Sometimes soil polygons will list more than one tree species, as shown in Example #2.

MAPPING TOOL EXAMPLE #2

Example #2, the project site was at a different location. Steps 1-3 in Example #1 were repeated to zoom to the project site. For this site, the popup window for the selected soil polygon looked different:

- The upper left corner of the popup window says “(1 of 2)”; and
- There is a small arrow near the upper right corner of the popup window.

This means that this soil polygon has two different associated tree species. The first is Douglas-fir (see Figure A6a).

To view the information for the second tree species, click on the small arrow. The second tree species is western hemlock (see Figure A6b).

For project locations with multiple tree species, WDFW recommends using the largest SPTH₂₀₀ value, even if the largest tree species is not the most numerous (or even currently present) onsite.

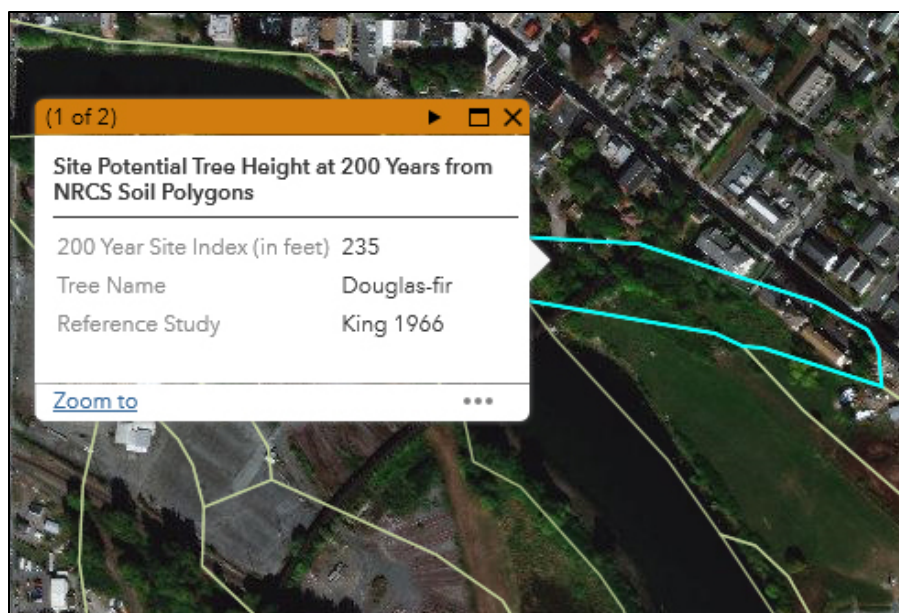


Figure A6a. SPTH information for the first of multiple tree species at a given site.

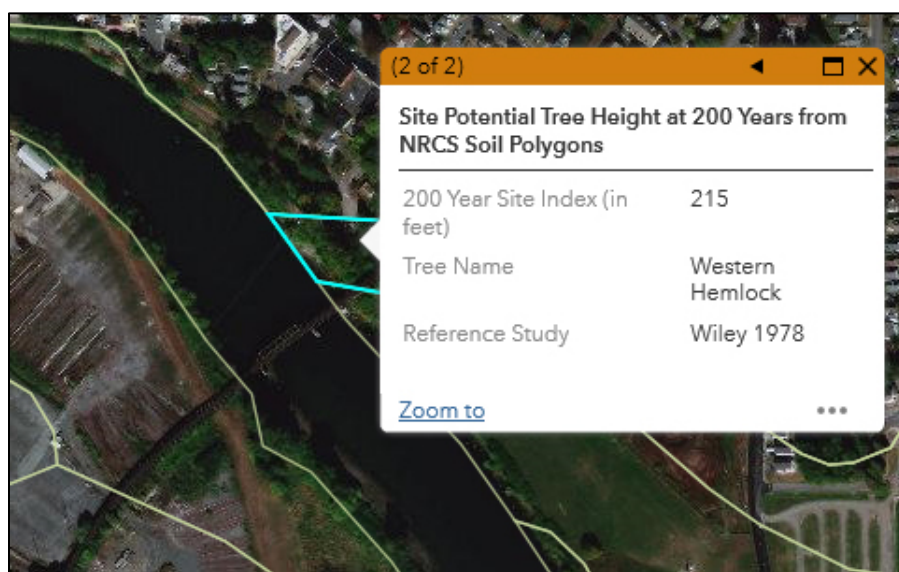


Figure A6b. SPTH₂₀₀ information for the second of multiple tree species at a given site.

APPENDIX REFERENCES: TREE SITE INDEX CURVES

The following twenty studies were used to determine $SPTH_{200}$ throughout the state:

- Alexander, R.R. 1966. Site indexes for lodgepole pine, with corrections for stand density: instructions for field use. Research Paper RM-24. U.S., Forest Service, Rocky Mountain Forest and Range Experiment Station, Fort Collins, Colorado.
- Alexander, R.R. 1967. Site indexes for Engelmann spruce. Research Paper RM-32. U.S., Forest Service, Rocky Mountain Forest and Range Experiment Station, Fort Collins, Colorado.
- Baker, F.S. 1925. Aspen in the Central Rocky Mountain Region. Bulletin 1291. United States Department of Agriculture, Washington, D.C.
- Barnes, G.H. 1962. Yield of even-aged stands of western hemlock. Technical Bulletin 1273. U.S. Forest Service, Pacific Northwest Forest and Range Experiment Station, Portland, Oregon.
- British Columbia Forest Service (BCFS). 1977. Site index curves for cottonwood (as adapted by W.J. Sauerwein). pp. 852-853 in *Pocket Woodland Handbook*. U.S. Department of Agriculture, Soil Conservation Service, Portland, Oregon.
- Cochran, P.H. 1979a. Gross yields for even-aged stands of white or Douglas-fir and white or grand fir east of the Cascades in Oregon and Washington. Research Paper PNW-263. U.S. Forest Service, Pacific Northwest Forest and Range Experiment Station, Portland, Oregon.
- Cochran, P.H. 1979b. Site index and height growth curves for managed, even-aged stands of Douglas-fir east of the Cascades in Oregon and Washington. Research Paper PNW-251. U.S. Forest Service, Pacific Northwest Forest and Range Experiment Station, Portland, Oregon.
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- Kurucz, J.F. 1978. Preliminary, polymorphic site index curves for western red cedar (*Thuja plicata* Donn) in coastal British Columbia. Forest Research Note No. 3. MacMillan Bloedel, Nanaimo, British Columbia.
- Meyer, W.H. 1961. Yield of even-aged stands of ponderosa pine. Technical Bulletin 630 (revised 1961). United States Department of Agriculture, Washington, D.C.

- Meyer, W.H. 1937. Yield of even-aged stands of Sitka spruce and western hemlock. Technical Bulletin 544. United States Department of Agriculture, Washington, D.C.
- Monserud, R.A. 1985. Applying height growth and site index curves for inland Douglas-fir. Research Paper INT-347. U.S. Forest Service. Intermountain Research Station, Ogden, Utah.
- Schmidt, W.C., R.C. Shearer, and A.L. Roe. 1976. Ecology and silviculture of western larch forests. Technical Bulletin 1520. U.S. Forest Service, Washington, D.C.
- Wiley, K.N. 1978. Site index tables for western hemlock in the Pacific Northwest. Forestry Paper No. 17. Weyerhaeuser Company, Western Forestry Research Center, Centralia, Washington.
- Worthington, N.P., F.A. Johnson, G.R. Staebler, and W.J. Lloyd. 1960. Research Paper No. 36. Normal yield tables for red alder. U.S. Forest Service, Pacific Northwest Forest and Range Experiment Station, Portland, Oregon.

ATTACHMENT C

BEFORE and DURING CONSTRUCTION - looking east towards Lovric's Marina



NOW, RECENTLY, looking east towards Lovric's Marina



BEFORE and DURING CONSTRUCTION looking west towards the WA State Ferry Terminal



NOW, recently, looking towards the WA State Ferry Terminal



BEFORE and DURING CONSTRUCTION, near the middle of Phase VII of the trail



NOW, recently, looking towards the middle of Phase VII of the trail.



ATTACHMENT D

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Using light-permeable grating to mitigate impacts of residential floats on eelgrass *Zostera marina* L. in Puget Sound, Washington

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ABSTRACT

This study evaluated whether light-permeable deck grating could mitigate impacts of residential mooring floats constructed over eelgrass (*Zostera marina* L.) in Puget Sound, Washington. Eelgrass shoot densities in undisturbed control areas and underneath and adjacent to 11 residential floats (16–50% of each float was grated) were monitored prior to float installation and annually for 3 years following installation. Using linear regression analysis, a decline in eelgrass shoot densities relative to controls was detected underneath three floats (eelgrass was eliminated under only one float) and adjacent to two floats. When control data were used to represent 100% grated, there was a weak relationship between eelgrass bed quality and percent of the deck grated ($r=0.46$, $p=0.032$), but no relationship when the range of grating was 16–50% ($p=0.90$). The percent of a float deck grated did not contribute significantly to a multiple regression model examining change in eelgrass density that included five other dependent variables associated with the design of the floats. We conclude that either there was no effect of grating up to 50% of a float deck or we could not detect an effect. We hypothesize that the large number of site and landscape scale variables associated with a float influenced the effect (and our ability to detect it) of any one variable (such as grating). Consequently, we recommend that managers manipulate as many attributes of a float as possible (including grating) in order to reduce risks to eelgrass.

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Seagrasses are common in shallow-water marine and estuarine areas of both hemispheres (Den Hartog, 1970; Phillips and Menez, 1988; Green and Short, 2003) and are widely recognized as one of the most productive and important habitats in these areas (Hemminga and Duarte, 2001). These plants provide significant economic benefits because of the many resource functions they support (Costanza et al., 1997). Because

seagrasses occur in shallow, coastal areas, they are especially vulnerable to human-induced disturbances (Short and Wyllie-Echeverria, 1996). One such impact is the placement of overwater structures over seagrass beds. The cumulative impact of small residential piers, docks, and floats is a particular concern because large numbers of such structures are typically aggregated in areas with seagrass (Loflin, 1995;

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Burdick and Short, 1999; MacFarlane et al., 2000). The primary effect of overwater structures is considered to be a reduction in light levels which can potentially reduce plant density, plant vigor, and leaf size (both length and width), and in the worst case, eliminate the seagrass (Fresh et al., 1995; Loflin, 1995; Sweeney, 1996; Burdick and Short, 1999; Shafer, 1999; Beal and Schmit, 2000). Impacts to fauna can occur as a result of loss and fragmentation of the seagrass habitat (Simenstad et al., 1999; Bell et al., 2001; Haas, 2002; Hovel and Lipcius, 2001, 2002).

The proliferation of residential overwater structures is a threat to the seagrass *Zostera marina* (eelgrass), in Puget Sound, Washington, USA. Previous research indicates there is often a significant decline in eelgrass density when overwater structures are placed over eelgrass beds, with a total loss often occurring (Fresh et al., 1995; Burdick and Short, 1999). This conflicts with the goal of regulatory agencies in Washington State to achieve “no net loss” in state managed waters (Fresh, 1994). A “no net loss” approach to eelgrass management in Puget Sound has been increasingly adopted because the ecological services provided by these plants sustain many economically valuable resources (e.g., Phillips, 1984; Costanza et al., 1997). For example, eelgrass functions as habitat for several species of Pacific salmon *Oncorhynchus* spp. (Simenstad et al., 1988; Simenstad, 1994) that are currently listed as threatened under the Endangered Species Act of the United States (e.g., Department of Commerce, 1999).

The primary option available to manage impacts from residential overwater structures on eelgrass in Puget Sound (and elsewhere) is to manipulate their design and placement because compensatory mitigation actions are impractical due to high costs. Avoiding eelgrass, the only certain method of protecting eelgrass (Kenworthy et al., 2006) and achieving the regulatory standard of “no net loss” is also impractical in many areas of Puget Sound where access to private property is only possible by boat or float plane and thus requires a mooring structure.

Research from other areas suggests that the impacts of an overwater structure built over seagrass can be reduced by increasing the height of a structure over the water, managing the structure's orientation, and minimizing width (Loflin, 1995; Burdick and Short, 1999; Shafer, 1999; Beal and Schmit, 2000). The ability to manipulate these design features in the construction of overwater structures in Puget Sound is limited for several reasons. First, from a practical perspective, there are often limits to the amount of change possible in a float's orientation, width, and height due to site-specific circumstances associated with each property including moorage requirements (e.g., vessel size) and the different physical demands placed on the structure by local weather, tides, and currents. For example, because of site-specific topography, an east-west oriented structure (the worst case) cannot usually be changed to one oriented north-south (the best case).

Second, impacts on eelgrass from recreational boat moorage in Puget Sound often involve floats and not piers or docks. Floats are distinguished from docks in that they move vertically with the tide (with only minimal horizontal movement) so the height of the float deck over the bottom varies with the tide (Fig. 1). Docks are fixed in place by pilings so the height of the decking over the bottom does not vary. Floats are



Fig. 1 – A typical pier, ramp, and float arrangement used for residential boat moorage in Puget Sound, Washington.

an essential component of residential moorage structures in Puget Sound because tidal exchange can exceed 4.0 m, which makes mooring vessels to fixed height structures impractical. The ability to manage the height of a structure over the bottom, which was the primary attribute affecting eelgrass in Burdick and Short's (1999) study, is not available for floats since the float sits on the surface of the water. Burdick and Short (1999) noted that the impacts of floats on eelgrass were generally more severe than docks and often resulted in complete elimination of the eelgrass under the structure. Fresh et al. (1995) reported that eelgrass density was substantially lower (relative to areas adjacent to the floats) under four of five floats studied and absent under two of them.

Third, previous studies of interactions between overwater structures and seagrass have focused on intertidal seagrass (Loflin, 1995; Burdick and Short, 1999; Shafer, 1999; Beal and Schmit, 2000). In Puget Sound, subtidal eelgrass, which can grow to depths of 8.8 m Mean Lower Low Water (MLLW), is often the type of seagrass impacted by floats. Compared to intertidal eelgrass, subtidal eelgrass typically grows at lower densities and occurs in fringing beds with plants that are usually longer and wider than intertidal eelgrass (Phillips, 1984; Thom et al., 1998; Hayashida, 2000; Berry et al., 2003). Thus, overwater structures may have different types of impacts on subtidal eelgrass than on intertidal eelgrass, and the design features developed for intertidal populations may not achieve the same results for subtidal populations (Burdick and Short, 1999; Shafer, 1999).

The objective of this study was to determine if grating the surface of a float in Puget Sound could help reduce impacts of these structures on density of subtidal eelgrass. We hypothesized that the primary effect of a float on eelgrass was to reduce submarine light levels underneath and adjacent to a float (Backman and Barilotti, 1976; Bulthuis, 1983; Dennison, 1987; Zimmerman et al., 1991; Batiuk et al., 1992; Shafer, 1999). We reasoned that increasing light penetration under and around the floats by reducing the “footprint” or impervious surface area of the float by grating should help reduce risks to eelgrass. Although reducing the surface area could be accomplished by changing the size of a structure, we tested the effects of grating because it represented a practical, low-cost, structurally sound means of accomplishing this goal.

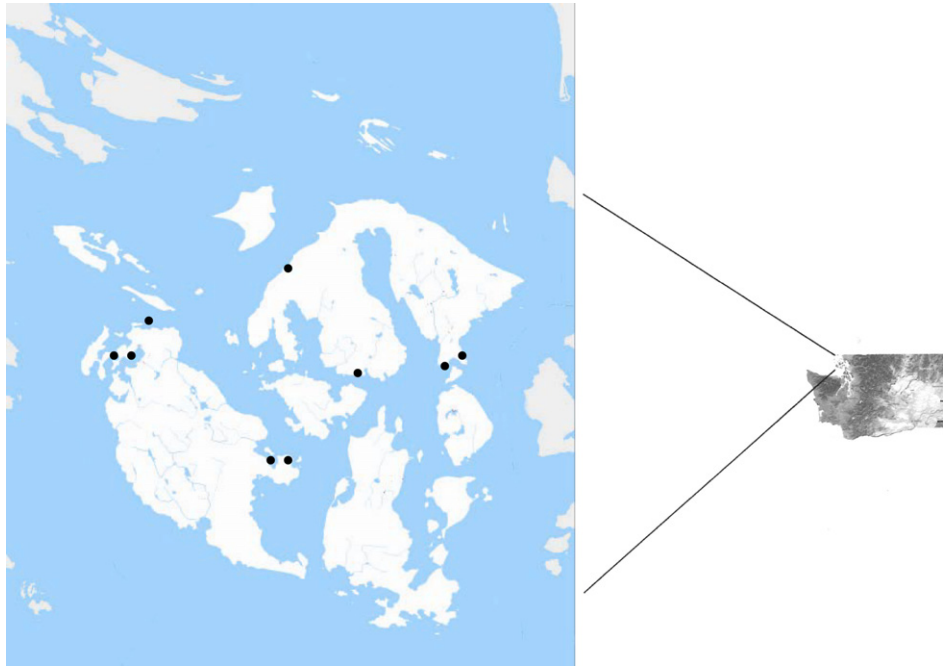


Fig. 2 – Location of the floats studied in Puget Sound, Washington, USA (one float, which was located a considerable distance from the sites shown on this map, was not included).

1. Methods

1.1. Field methods

The study was conducted in San Juan and Whatcom counties of northern Puget Sound, Washington (Fig. 2). The shoreline in this area is irregular with numerous protected bays, inlets, and coves. Eelgrass occurs primarily in these less exposed areas (Berry et al., 2003), which is also where most residential floats are found. Eelgrass is distributed from approximately the mid-intertidal (+0.4 m, MLLW) to a depth of 8.8 m, MLLW (Berry et al., 2003). We estimated that there were >300 floats in San Juan County in 2000 at the time this study ended. San Juan County possesses approximately 660 km of shoreline, much of which consists of steep cliffs and bluffs that is not suitable for floats (or docks). In comparison, Puget Sound as a whole has 4310 km of shoreline with an estimated 3000 residential docks or floats (PSWQA, 2002). From 1995 to 1999, >50 permits were received to construct new floats in San Juan County (Sweeney, 1996; Brian Williams, Washington Department of Fish and Wildlife, La Conner, WA, USA, unpublished data).

We measured eelgrass density before a float was constructed and then monitored eelgrass density annually under the float, on both sides of the float and at a nearby undisturbed control site, for 3 years following construction. Between 1991 and 2000, we studied 11 floats at 10 sites (Table 1); two connected floats at one site were evaluated separately (7a and 7b). Floats were typical of those built throughout Puget Sound. There are currently no statewide regulations or guidelines for how overwater structures should be constructed. Managers work with property owners to permit structures, which requires the consideration of many factors simultane-

ously. These factors include the moorage requirements at the site (i.e., number and sizes of vessels that would be moored), specific engineering considerations of the float, topography, local regulations, local weather, tides, and currents. For example, the length of a float and depth over which the float was located were typically a function of vessel(s) size, engineering issues, land topography, and legal issues (e.g., location of harbor lines) (Table 1). As a result, the percent of a float that was grated (defined as the percentage of the dock surface area that was “open”) and the grating ratio (how much of the float surface possessed grating material) could not be “controlled” (Fig. 3).

The same set of survey protocols was used at all sites, although minor adjustments were made to account for site-specific conditions. At each float, eelgrass density was measured by SCUBA divers along four permanently established transects. One transect (under-float) was located directly under the centerline of the float. Two transects (near-float) were located parallel to the long axis of the float, along each side of the float; these transects were located approximately one float width from the edge of the float. A fourth transect (control) was located within a nearby eelgrass bed at a similar depth that was not directly disturbed by floats or other anthropogenic factors.

Density counts were made at points along each transect 1 year before construction and annually for 3 years after the float was installed. For an individual float, the pre- and post-construction monitoring were usually conducted at approximately the same time each year. However, all floats were not monitored during the same time period. Eelgrass density was measured at a minimum of four randomly selected stations along each transect. Shoot counts were made within three randomly selected, 0.25 m² quadrates at each station. Quadrates

Table 1 – Characteristics of the floats studied in Puget Sound, Washington

Float number	Float type ^a	Location ^b	Years studied	Float width ^c	Float length ^d	Compass orientation in degrees	Percent grated	Water depth under-float ^e	Bed quality under-float ^f	Precon. control density, shoots/m ²
2	I, P	SJI	1994–1997	2.4	13.7	90	50	3.1	3.70	6.3
3	L, P	Main	1993–1996	2.4	15.2	270	36	1.2	5.24	43.8
5	I, P	Orcas	1993–1996	2.4	13.7	360	50	4.6	7.20	2.5
6	I, S	SJI	1993–1996	2.8	15.2	180	29	1.2	12.40	4.4
7a	I, P	SJI	1991–1994	2.4	13.7	270	38	6.8	5.60	5.9
7b	I, P	SJI	1991–1994	2.4	10.7	360	38	4.6	1.00	5.9
8	I, P	SJI	1991–1994	3.1	24.4	270	16	3.1	8.10	2.1
9	I, P	SJI	1993–1996	3.1	51.2	90	20	3.1	0.48	1.3
10	L, S	Orcas	1996–1999	3.0	13.7	90	50	2.5	12.20	11.3
11	I, P	SJI	1996–1999	2.6	12.5	360	45	1.5	0.47	6.2
12	I, P	SJI	1996–2000	3.0	15.2	210	50	3.7	0.00	2.3

^a I: linear design, L: L design, P: permanent float, S: seasonal.

^b SJI: San Juan Island, Main: mainland, Orcas: Orcas Island.

^c Float width in meters.

^d Float length in meters.

^e Depth is defined as mean depth integrated under the float structure.

^f Calculated by dividing mean shoot densities found at stations underneath floats 3 years after floats were installed by mean shoot densities measured from the same stations before the float was installed. This value was then multiplied by 10.

were placed so they did not overlap and one corner was on the center point of the selected station.

1.2. Data analysis

Linear regression analysis was used to test for changes in eelgrass density underneath floats, adjacent to floats, and at the control site for each float. Under-float stations and near-

float stations were compared separately to controls. The two sides of each float were also analyzed separately because of potential differences in vessel mooring patterns. A float was considered to have an effect on eelgrass density if one of two conditions was met:

1. There was a statistically significant decline in density underneath or adjacent to the float but no change or a

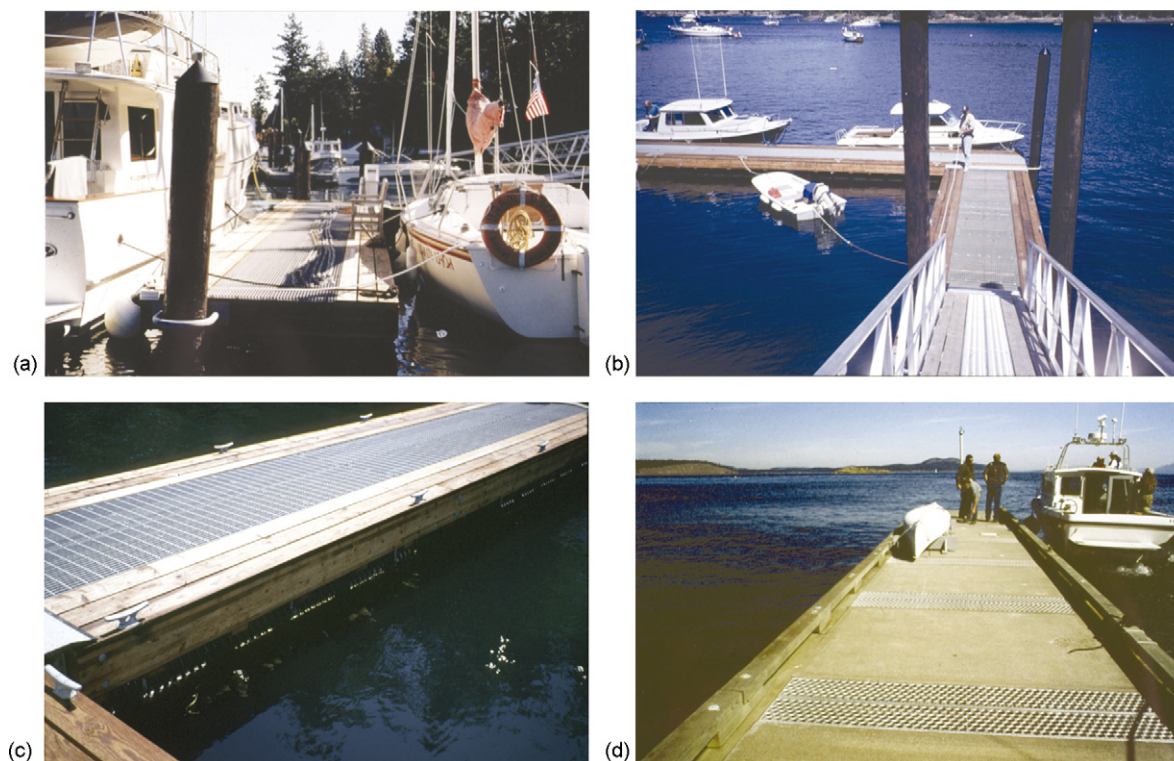


Fig. 3 – Examples of float deck grating and some other attributes associated with floats in Puget Sound.

Table 2 – Results of regression analysis testing the change in eelgrass density underneath floats and in control areas in Puget Sound, Washington

Float	Underneath floats				Control floats				Float effect
	R ²	Alpha	f	Change ^a	R ²	Alpha	f	Change ^a	
2	0.37	0.001	15.49	–	0.05	0.467	0.57	0	Yes
3	0.07	0.393	0.80	0	0.01	0.700	0.16	0	No
5	0.04	0.301	1.16	0	0	0.962	0.01	0	No
6	0	0.937	0.01	0	0.07	0.250	1.46	0	No
7a	0.31	0.002	11.94	–	0	0.804	0.06	0	Yes
7b	0.13	0.078	3.43	0					No
8	0.12	0.430	0.64	0	0.06	0.113	2.62	0	No
9	0.59	0.001	19.90	–	0.2	0.051	4.41	–	No
10	0.51	0.002	6.80	–	0.24	0.017	6.80	+	Yes
11	0.28	0.002	11.61	–	0.12	0.039	4.62	–	No
12	0.85	0.002	56.73	–	0.35	0.003	11.69	–	No

A float was considered to have an effect on eelgrass density if there was a significant decline in density underneath the float but no change or a significant increase in density at the control site OR there was no change in density underneath or adjacent to the float but a significant increase in density at the control site.

^a Change: (+) increase, (–) decrease, and (0) no change.

statistically significant increase in density at the control site.

- There was no change in density underneath or adjacent to the float but a statistically significant increase in density at the control site.

To test the hypothesis that an increase in the amount of light-permeable float surface would mitigate impacts on eelgrass density, we tested the relationship between eelgrass bed quality (after Burdick and Short, 1999) and the percent a deck was grated. Eelgrass bed quality was calculated by dividing mean shoot densities found at stations underneath floats 3 years after floats were installed by mean shoot densities before the float was installed. A value of 0 represented the complete elimination of eelgrass. Proportional eelgrass change values were standardized and transformed before use in regressions.

A multiple regression model was developed to evaluate deck surface grating within the context of other features commonly managed in the construction of overwater structures such as float width and length. Six variables were considered: (1) depth (an integrated average under the float), (2) width of the float, (3) compass orientation, (4) length, (5) grate ratio (the relative amount of openness of the material used, and (6) percent of the deck grated. Although there are other float attributes that could potentially cause declines in eelgrass density (e.g., vessel moorage patterns and debris accumulation under the float), we could not reliably measure them as part of this study. The dependent variable tested in the multiple regression was:

$$Y = \left(\frac{\text{mean under-float shoot density 3 years post-construction} - \text{mean shoot density 3 years post-construction at the control location}}{\text{mean shoot density 3 years post-construction at the control location}} \right)$$

This independent variable was transformed using the arcsin transformation (Sokal and Rohlf, 1995). We used this particular independent variable because it eliminates interannual variation from the results and because control and float eelgrass densities were comparable before construction.

2. Results

Shoot densities prior to construction along the under-float transect were low, averaging <10 shoots/m² at 9 of the 11 sites studied (Table 1). There was a statistically significant decline in shoot density underneath 6 of the 11 floats (floats 2, 7a, 9, 10, 11, and 12; $p < 0.05$) (Table 2) and total loss of eelgrass occurred under one float (float 12; Table 2). When compared to the change in eelgrass density at control sites, there was evidence of a float effect at three floats (floats 2, 7a, 10; Table 2). We found a significant decline in eelgrass densities adjacent to three of the floats (7b, 9, 12; $p < 0.05$; Table 3) but when compared to controls, there was evidence of a treatment effect at two floats (floats 7b and 10) (Table 3). Shoot densities were significantly reduced under both sides of 7b. Float 10 was the only site where a treatment (i.e., float) effect was indicated both adjacent to and underneath the float.

The relative change in average shoot density at under-float stations before construction of floats compared to 3 years post-construction ((density pre-construction – density 3 years post-construction)/density pre-construction) was significantly related to the percent of the float deck grated ($r = 0.47$, $p = 0.028$). Grating, however, only explained 21.9% of the variation in the relative amount of change in shoot density. In addition, when controls were used as a surrogate for 100% grating there was a relationship between eelgrass bed quality and percent of the deck grated ($r = 0.46$, $p = 0.032$) with grating

explaining 21.0% of the variation in the relative amount of change in eelgrass bed quality (Fig. 4). To test if the “outlier” at 100% grating ($y = 2.5$) affected the significance of this regression, we reran the analyses eliminating this point and found

Table 3 – Results of regression analysis evaluating change in eelgrass density adjacent to floats in Puget Sound, Washington

Float number	Control			Side of float	Side 1				Side of float	Side 2			
	Alpha	f	Diff ^a		Alpha	f	Diff ^a	Float effect		Alpha	f	Diff ^a	Float effect
2	0.467	0.57	0	N	0.070	3.50	0	No	S	0.130	2.61	0	No
3	0.700	0.16	0	E	0.130	2.78	0	No	W	0.080	3.90	0	No
5	0.962	0.01	0	E	0.420	0.68	0	No	W	0.700	0.15	0	No
6	0.250	1.46	0	E	0.880	0.02	0	No	W	0.150	2.29	0	No
7a	0.804	0.06	0	E	0.220	1.57	0	No	W	0.800	0.07	0	No
7b				N	0.001	10.6	–	Yes	S	0.050	4.45	–	Yes
8	0.113	2.62	0	N	0.001	14.7	+	No	S	0.940	0.006	0	No
9	0.051	4.41	–	N	0.010	7.88	–	No	S	0.060	4.19	–	No
10	0.017	6.80	+	N	0.190	2.01	0	Yes	S	0.060	4.48	+	No
11	0.039	4.62	–	E	0.140	2.64	0	No	W	0.100	3.18	0	No
12	0.003	11.7	–	E	0.001	16.1	–	No	W	0.005	11.22	–	No

A float was considered to have an effect on eelgrass density if there was a significant decline in density adjacent to the float but no change or a significant increase in density at the control site OR there was no change in density adjacent to the float but a significant increase in density at the control site. The same control was used for both parts of float 7 (there were also vessels moored along the west side of float 2 but no difference was indicated at this float).

^a Difference significance: (+) increase, (–) decrease, and (0) difference.

the regression was still significant ($p < 0.05$). When the analyses was restricted to the range of grating actually used on the floats (i.e., 16–50% grated), there was no relationship between bed quality and percent of the deck grated ($p = 0.90$).

There were highly significant relationships between mean shoot densities underneath floats and in control areas both before construction ($F = 173.7$, $p < 0.0001$) and 3 years post-construction ($F = 36.5$, $p < 0.00015$) (Fig. 5). The slopes of these regressions lines were not significantly different ($t = 1.42$, d.f. = 18). The six variables tested in the multiple regression were able to explain 60.5% of the variation in the independent variable $Y = ((\text{under-float shoot density in year 3} - \text{control shoot density in year 3}) / \text{control shoot density in year 3})$. However, the overall multiple regression was not significant

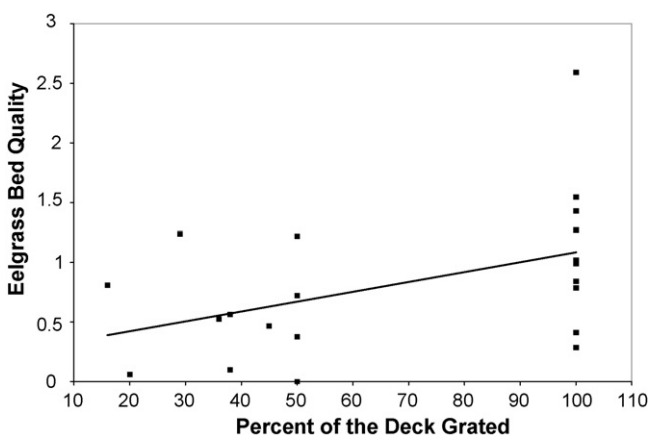


Fig. 4 – The relationship between eelgrass bed quality and percent of the float grated in Puget Sound, Washington. Eelgrass bed quality was calculated as eelgrass density under the float in year 3 divided by eelgrass density under the float prior to construction. The control bed quality was calculated similarly and used to represent 100% grating of a float.

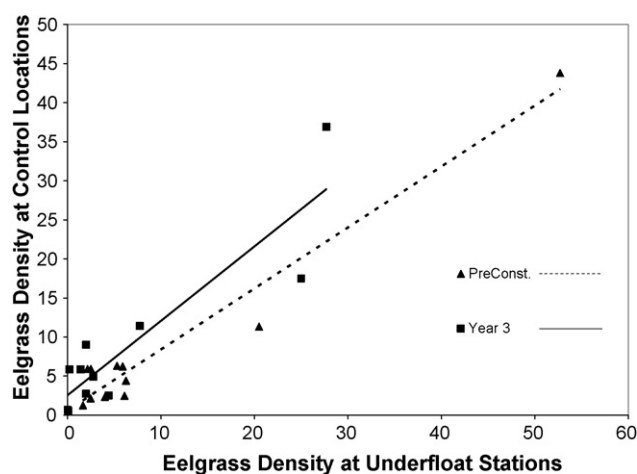


Fig. 5 – The relationship between eelgrass density underneath floats and at control sites (each point is one float) prior to construction and 3 years post-construction in Puget Sound, Washington.

($F = 1.02$, $p = 0.52$). The highest correlation of any independent variable with Y was the grate ratio which only explained 9.1% of the variation in Y .

3. Discussion

Our results suggest that incorporating deck grating (up to 50% of the deck surface grated) into the construction of a float in Puget Sound cannot be used to consistently achieve a regulatory standard of “no net loss” of eelgrass. There will still be a risk of negatively impacting eelgrass density when grating is used and floats are built within the range of float parameters we tested. Our hypothesis was that adding grating to structures as they were built would allow enough light to reach

the eelgrass to achieve a “no net loss” standard. To accomplish this, there would have to be no decline in eelgrass shoot densities detectable either underneath or adjacent to any of the floats. Even though we concluded there was no change in eelgrass shoot density underneath 8 of 11 floats, there was a decline in eelgrass shoot density underneath three of the floats (eelgrass was eliminated underneath one of these floats) and adjacent to two floats. This indicates floats were still having an effect on eelgrass density at some locations despite the use of the grating.

Although our results indicate that using grating does not make it possible to avoid impacts to eelgrass with certainty, there may have been some beneficial effect of the grating. The grating could have helped reduce losses of eelgrass underneath and around floats in Puget Sound (i.e., not avoid impacts but reduce losses). This could have occurred in one of two ways. First, if there was a threshold effect, grating up to a certain amount would have had no effect but losses would have been reduced above this threshold value. Second, there could be a functional relationship (e.g., linear) between the amount of grating used and the change in eelgrass density. Within the range of grating that we tested, we did not find an indication of a relationship between the percentage a float deck was grated and the change in eelgrass density (either operating as a threshold or a functional relationship). In fact, there was a large amount of change in eelgrass shoot density associated with any one level of grating. For example, the change in eelgrass bed quality with 50% grating ranged from a complete loss (float 12) to nearly a 25% increase. These results are consistent with the multiple regression model where grating in the 16–50% range was not a primary factor explaining variability in eelgrass shoot densities. There was a weak relationship between the amount of grating and eelgrass change when we used control data as a surrogate for 100% grating. This suggests that a threshold of at least 50% of the float grated may need to be achieved before an effect is detectable.

We hypothesized that grating would provide an inexpensive and “simple” solution to the protection of eelgrass populations around floats such that its use on the types of floats typically built in Puget Sound would provide adequate protection for the associated eelgrass populations. However, this did not appear to be the case. While it is possible that grating within the range we tested was ineffectual, it is also possible that it was effective but that we could not detect its effect because of the confounding effect of other float attributes. Although our work and other studies have focused on a limited suite of float attributes (Loflin, 1995; Burdick and Short, 1999; Shafer, 1999; Beal and Schmit, 2000; this study), the effect of a float (or any overwater structure) on eelgrass or other seagrasses is potentially a function of the cumulative effects of these and other attributes associated with the float and its surrounding environment. The effect of any one factor (such as grating) and the ability to detect an effect may depend on numerous other characteristics of the structure and surrounding environment. Some attributes may have an effect at one site but not at another site depending on the specific characteristics of the float and its associated environment. Further, effects of some attributes may be transitory events and hard to detect without frequent site visits.

In Puget Sound, for example, we identified >20 variables that could potentially affect submarine light levels and hence eelgrass density at a float site. These attributes include those that operate at a site or location scale and those that are landscape scale (i.e., their effect is not a localized effect on one structure). Examples of site-scale attributes include those that have been the primary focus of researchers studying float and dock effects, including length and width of the structure, height over the water, orientation, and grating (Loflin, 1995; Burdick and Short, 1999; Shafer, 1999; Beal and Schmit, 2000; this study). Other site-scale attributes that have not been evaluated include effects of vessels moored at the float (vessel size, how long vessels are moored, depth under the vessel, and moorage position along the float), debris accumulation under the float, and shading by macroalgae (e.g., *Laminaria* spp.) attached to the float.

Landscape-scale features that could influence impacts of a float on seagrass include water circulation patterns, storms, changes in turbidity levels, freshwater runoff, pollution, and nutrient discharge (e.g., Moore et al., 1997; Tamaki et al., 2002; Campbell and McKenzie, 2004). For example, point and non-point discharges from residential development could increase nitrogen levels, result in eutrophication, and cause eelgrass shoot densities in the area to decline as a result (e.g., Koch, 2001; Wigand et al., 2003). In addition, wind-driven currents or large, repeated vessel wakes could negatively affect seagrass population densities. Results of our study suggest landscape-scale attributes may have been affecting the eelgrass associated with our floats. The lack of a difference in slopes for the relationships between control and under-float density both before and 3 years after construction, suggests both control and float sites were responding to larger-scale conditions independent of the float structures (see Fig. 5). Further evidence of this type of large-scale effect is indicated by the fact that eelgrass shoot density declined at a number of the control sites as well as under the floats.

While many attributes associated with a float operate by affecting the amount of light reaching the plants (Burdick and Short, 1999; Shafer, 1999), there may be other types of impacts on seagrasses. For example, grazer, microalgae, and nutrient interactions and alteration of the sediment matrix can also reduce seagrass cover (Ruiz and Romero, 2003). Scouring of eelgrass may occur when a vessel docks or leaves (Simenstad et al., 1999; Haas, 2002). Interannual variation in shoot density can also occur from climate variations resulting in warmer or cooler temperatures or changes in the amount of nearby freshwater run-off (e.g., Nelson, 1998).

Clearly, the large number of potential variables associated with a float that can affect eelgrass shoot density indicates that isolating the effects of any individual factor or factors is a challenge. Ideally, some sort of experimental approach could be informative, such as monitoring the same float with and without grating or installing two identical floats adjacent to each other with only a change in one attribute (e.g., float width). Another approach would be to find a nearby float constructed without grating that was similar enough to use as a “control”. These approaches were not possible to implement in the regulatory environment in Puget Sound. As a result, we chose to evaluate effects of grating by comparing eelgrass shoot densities underneath and adjacent to floats

constructed with grating to eelgrass densities in control areas. We adopted this approach in part because these constraints represent authentic circumstances for natural resource managers who must work with property owners to permit (or not permit) a structure. This situation requires the consideration of many factors simultaneously, some of which cannot be controlled.

We conclude that reducing risks to eelgrass habitats in Puget Sound associated with placement of floats in shoreline areas can best be achieved by managing as many attributes associated with a structure as possible. Because of the high level of uncertainty associated with the effectiveness of changes in any one attribute, managers should take all possible steps to maximize the amount of submarine light to reduce risks to eelgrass. We encourage the initiation of tests to evaluate how much of a float's surface can be safely grated above the 50% level and if these levels have positive effect on the seagrass. While we were not able to fully evaluate the effect of other attributes associated with residential floats such as vessel moorage patterns and debris accumulation, we also strongly recommend that future studies be designed to evaluate effects of a wider set of variables than have been evaluated to date. Other indicators of float effects should be considered, such as eelgrass leaf size and changes in other faunal components such as epifaunal invertebrates (Haas, 2002). We also recommend that evaluations of the effects of small overwater structures are needed outside the United States. Although the impact of residential overwater structures on tropical and temperate seagrass systems is well established in the United States (Burdick and Short, 1999; Shafer, 1999; this study), the impact of these structures has not been evaluated globally. Instead, most studies in coastal areas have focused on impacts associated with coastal construction, such as marinas (Larkum and West, 1990; Ruiz and Romero, 2003). Changes in the species of seagrass, habitat the seagrass occupies, and so on may have significant influences on how overwater structures affect seagrass in coastal ecosystems throughout the world.

Acknowledgements

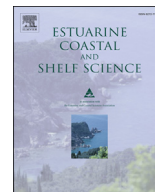
We would like to thank the individual property owners who participated in this study. The help of T. Turner and statistical insights of S. Hurlbert and J. Norris are greatly appreciated. The hard work and enthusiasm of C. Betcher and V. T., and R. Wyllie-Echeverria contributed a great deal to the implementation of this study.

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ATTACHMENT E



Impacts of docks on seagrass and effects of management practices to ameliorate these impacts



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ABSTRACT

Seagrasses have high conservation and human-use values, but around the world they are being damaged by human activities. Compared to the larger spatial scale at which some human activities affect estuaries and their seagrasses (e.g. catchment disturbance, dredging, pollution, trawling), recreational boating and infrastructure of moorings and docks act at smaller scales. However, the cumulative effects contribute to stresses acting on seagrass beds. This study assessed the effects of docks on the native seagrass *Zostera muelleri* subsp. *capricorni* in an estuary in south-east Australia and of current management practices designed to reduce dock impacts on this seagrass. A field survey found that seagrass biomass was significantly reduced below docks, and the effects were not influenced by dock orientation. Management practices requiring the use of a mesh decking to provide greater light penetration reduced, but did not eliminate, the reduction in seagrass biomass caused by docks. A modified beyond BACI experiment provided evidence for a causal link between the installation of wooden or mesh docks and reductions in biomass of seagrass. The reduction in biomass was apparent 6 mo after dock installation, and by 26 mo seagrass biomass had declined by at least 90%. Faced with increasing coastal populations, increases in recreational use, and continued pressures from other human activities, alternative management practices that further minimize the effects of docks are needed.

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1. Introduction

Seagrass beds are productive, shallow-water ecosystems that provide a habitat for a rich and unique faunal biodiversity including the juveniles of many species important for commercial and recreational fishing activities (Waycott et al., 2009; Unsworth and Cullen, 2010). Seagrass beds stabilize sediments and are likely to play an important role in the prevention of coastal erosion. Seagrasses are an important component of estuarine ecological processes due to their high primary productivity, roles in detrital pathways and nutrient cycles, and their export of nutrients and energy to other associated ecosystems (Poiner and Peterken, 1995; Gillanders, 2007). The faunal biodiversity of estuarine seagrass beds is greater than, and different from, nearby unvegetated habitats and seagrass beds therefore represent a substantial component of the overall habitat and species diversity of estuaries (Jenkins and Wheatley, 1998; Rotherham and West, 2002).

Australia has the greatest richness of seagrass species and the largest area of temperate seagrass beds in the world (Gillanders, 2007). Seagrasses within New South Wales (NSW), Australia, have declined in extent and condition as a result of increased turbidity, siltation, erosion from dredging, eutrophication, sea urchin grazing, and trawling (Brodie, 1995; Poiner and Peterken, 1995; Macdonald, 1996; NSW EPA, 2000; ASEC, 2001). The outcome of these pressures on seagrass within NSW was an average 50% loss of seagrass area in estuaries in the period of 1960s–early 1990s (Poiner and Peterken, 1995). Similar, and sometimes greater, losses of seagrass have occurred in other Australian states (Neverauskas, 1987; Preen et al., 1995; Kendrick et al., 2002; Campbell and McKenzie, 2004) and other countries (Delgado et al., 1999; Baden et al., 2003; Hauxwell et al., 2003; Waycott et al. 2009).

Although less dramatic than the losses due to human industry and ecosystem alteration, seagrasses are damaged by recreational activities such as boating (Dunton and Schonberg, 2002; Milazzo et al., 2004), bait collecting (Skilleter et al., 2006), food harvesting (Boese, 2002; Cabaço et al., 2005), trampling (Eckrich and Holmquist, 2000), and the infrastructure installed for recreation such as moorings (Hastings et al., 1995) and docks (Fyfe and Davis, 2007). Seagrasses in NSW estuaries are located in the shallow, nearshore environment and, extending out from the shore for

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distances of 10s to 100s of metres in shallow waters, they are potentially exposed to the impacts of dock construction and use. Current understanding of the impacts of docks on seagrass comes from a small number of studies. Seagrass shoot density was significantly reduced immediately below a dock in Jervis Bay (NSW, Australia), but no impact was detected 5 m away from the dock (Fyfe and Davis, 2007). Two-thirds of docks in Nantucket Harbor and Waquoit Bay (Massachusetts, USA) had no seagrass (*Zostera marina*) below them (Burdick and Short, 1999). Seagrass (*Halodule wrightii*) biomass below docks in Perdido Bay (Alabama, USA) was 67–70% of the values recorded in areas without docks (Shafer, 1999).

Loss of seagrass below docks occurs as a direct result of shading and the indirect impacts of associated boating activities. *Halodule wrightii* were not present under docks where light levels were less than 14% surface irradiance (Shafer, 1999). The effect of shading was greatest between 1000 h and 1500 h, and seagrasses subject to additional shading during the morning and late afternoon due to dock height and orientation were particularly vulnerable to effects of shading (Shafer, 1999). Seagrass and sediment in the vicinity of docks are affected through boat propeller scarring (Shafer, 1999; Burdick and Short, 1999). A cumulative assessment of dock impacts in Waquoit Bay (Massachusetts, USA) found that docks shaded less than 1% of total seagrass area in the Bay. However, seagrass beds in the vicinity of docks were also affected by anchor damage and propeller scarring, and so the areal extent of impact was substantially greater than the area of seagrass directly shaded by docks (Burdick and Short, 1999).

There are large numbers of docks in some estuaries in NSW, including Lake Macquarie (760), Tuggerah Lakes (32), Brisbane Water (≈ 750), and Pittwater (≈ 675). Some of these estuaries have lengthy shorelines (e.g. 174 km in Lake Macquarie). However, docks are often concentrated in some areas, reaching densities of 60 docks per km, which is likely to lead to a localization of effects. The effects of docks on seagrass are covered by the NSW by the Fisheries Management Act and its associated Policy and Guidelines for Fish Habitat Conservation and Management (Fairfull, 2013), and implemented by local municipalities. The Policy and Guidelines exclude docks from beds of *Posidonia australis* seagrass (existing as endangered populations in several estuaries), provide guidelines on dock designs, and require a permit for construction of docks over other seagrasses. Construction permits are issued jointly by the NSW Department of Primary Industries (DPI), the Department of Lands, and the local municipality. Guidelines on dock designs include restrictions on the maximum length, minimum water depth, orientation (a north–south orientation is preferred but not mandated), height, and decking materials (e.g. the use of aluminium mesh or translucent PVC to allow greater light penetration). There is, however, no published information on the effects of docks on seagrasses in NSW to inform conservation planning (with the exception of Fyfe and Davis, 2007) or the effects of design options (such as alternative decking materials and orientation) in modifying the impacts of docks on seagrass.

The aims of this study were to quantify the effects of docks on seagrass and evaluate the effects of management options for minimizing their effects, including dock orientation and decking materials. The approaches taken included a series of spatially and temporally replicated mensurative experiments that compared seagrass biomass below wooden or mesh docks with control sites (no docks), and tested the effects of dock orientation on seagrass loss. In order to definitively identify docks as the cause of seagrass loss, a modified beyond BACI (Before–After–Control–Impact) experiment was done to quantify the changes in seagrass following the installation of wooden or mesh docks.

2. Materials and methods

2.1. Study area

This study was undertaken in Lake Macquarie (Fig. 1) between 2006 and 2008. Lake Macquarie is a natural estuarine lagoon with an average depth of 5.7 m, covering an area of about 100 km² and surrounded by extensive residential and industrial development. Although seagrass cover has increased in some parts of the lake, the total extent of seagrass has declined since the 1960s (King and Hodgson, 1986). Seagrasses occurring in the shallow (max. depth 1 m) nearshore waters are *Zostera muelleri* subsp. *capricorni*, *Halophila* spp., and *Ruppia megacarpa* (King and Holland, 1986). This study was restricted to an examination of the effects of docks on *Z. muelleri* subsp. *capricorni*. We use the term dock to mean small single wharves installed perpendicular to the shoreline on private property, and distinguish them from public wharves (that may be used mostly for public transport, shipping, commercial fishing operations) and marinas. This study focused on domestic docks (i.e. adjoining privately owned land), which have design constraints imposed by the current policy and guidelines and the local municipality (Lake Macquarie City Council, LMCC). At the time of this study LMCC Development Control Plan 1 Section 3.1.1 (Development Adjoining the Lake and Waterways Zone) required the width of domestic docks to be 900–1200 mm, the height to be 600–750 mm above mean high water mark, and the deck to be constructed from 150 mm $\times$ 35 mm hardwood or aluminium mesh (dimensions not specified). Although the gaps between hardwood deck planks, and the dimensions of the openings in the aluminium mesh are not specified, the Plan requires the deck to provide natural light penetration when the dock is situated over seagrass. The locations of all domestic docks were obtained from the LMCC and confirmed by personal visits as part of site selections. Docks were pre-selected to minimize inter-dock variation in dimensions, so their width varied from 900 to 1100 mm and their height above the water varied from 600 to 700 mm. Spring tide range in Lake Macquarie at the study sites is ~ 120 mm (Nielsen and Gordon, 2008).

2.2. Effects of wooden docks and dock orientation

The null hypotheses that seagrass biomass below wooden docks would not differ from beds without docks, and that dock orientation (i.e. north–south vs east–west) would not affect seagrass biomass, were tested. Samples of *Zostera muelleri* subsp. *capricorni* plants were collected by inserting a 10 cm diameter PVC corer into the sediment to a depth of 10 cm. The corer was withdrawn and the sample washed through a 1 mm sieve to remove adhering sediment. Seagrass samples were returned to the lab and oven-dried at 70 °C until a constant weight was achieved (this usually required 48–72 h). The final dry weight of the seagrass sample was used as an estimate of seagrass biomass (whole plant). The values for seagrass biomass reported hereafter represent dry weight biomass 0.008 m⁻². Five replicate cores were collected following the results of an earlier pilot study (authors' unpublished data) that found that this amount of replication provided mean values with an acceptable sampling precision (standard error/mean) of 0.15 (Andrew and Mapstone, 1987).

Sampling was done by laying a tape measure (hereafter called the 'transect') immediately below and along the centreline of a dock and inserting the PVC corer at randomly selected distances (based on a table of random numbers) along the tape measure. Sampling began at least 3 m from the low tide mark on the shore and replicate samples were separated by at least 1.5 m to prevent disturbance during collection of adjacent samples. In seagrass beds

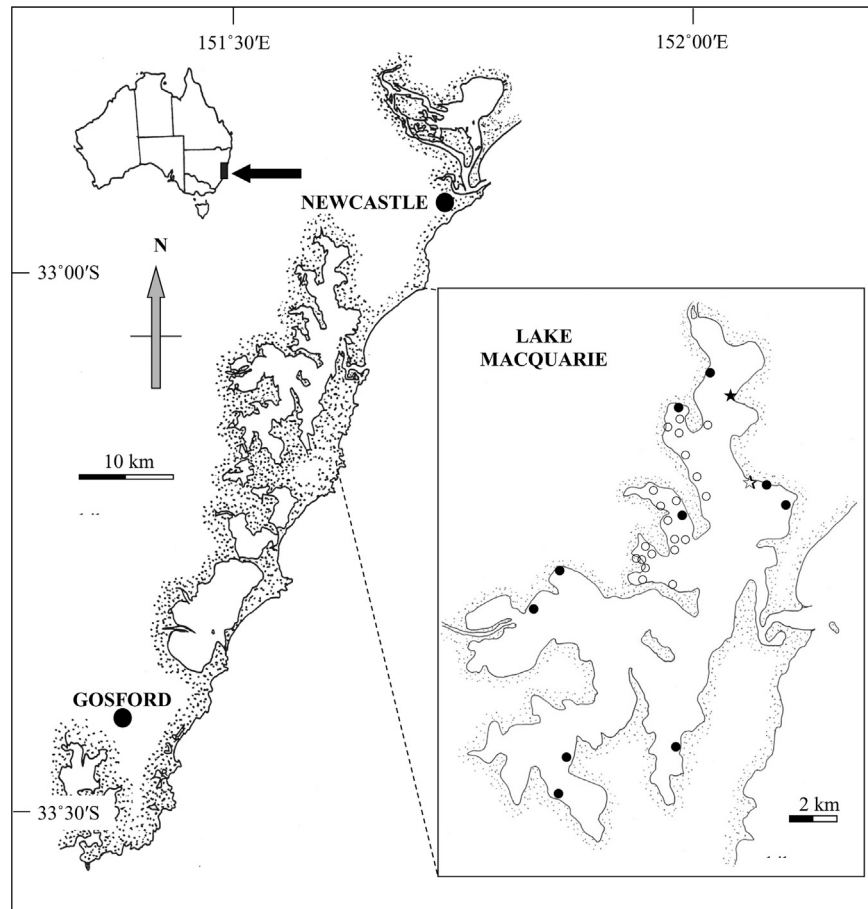


Fig. 1. Locations of study sites in Lake Macquarie used to assess *Zostera muelleri* subsp. *capricorni* for ● effects of dock orientation (each symbol represents 3 docks or 3 seagrass beds without docks), ○ comparison of wooden vs mesh dock study (each symbol represents a single dock or single transect in a seagrass bed without transects), and for BACI study on effects of installation of wooden dock (☆) and mesh dock (★).

without jetties the transects were laid and samples collected using an identical protocol.

A four-factor design was used to test the hypotheses, based on the following model: Treatment (2 levels (dock, no dock), fixed, orthogonal); Orientation (2 levels (north–south, east–west), fixed, orthogonal); Site (3 levels, random, nested in Treatment $\times$ Orientation); and Transect (3 levels, random, nested in Site (Treatment $\times$ Orientation)). There were $n = 5$ replicate samples per Transect. Three sites of each combination of Treatment and Orientation were randomly selected from amongst the available docks. Replicate sites were at least 1 km apart. Within each site 3 docks or non-dock areas were selected. The orientation of all docks was determined during site visits. The large number of docks in Lake Macquarie meant that it was possible to select docks that were within $\pm 10^\circ$ of north–south or east–west. Sampling occurred in January–February 2006.

2.3. Effects of wooden and mesh docks

The null hypotheses that seagrass biomass below wooden and mesh docks would not differ, and that seagrass biomass below both types of docks would not differ from seagrass beds without docks, were tested. Preliminary site visits in May 2006 revealed there were insufficient mesh docks to include site as a potential source of variation. Seven mesh docks and 7 wooden docks of the same orientation, length and height on the western side of Lake Macquarie were selected for the comparison. All docks were within the range of allowable width and height specified by LMCC. Gaps

between wooden decking planks were 10–12 mm. The decking of all mesh docks was identical and consisted of aluminium expanded mesh, with diamond-shaped openings of length 95 mm, maximum width 32 mm, and mesh thickness 7 mm. Reference transects were positioned in seagrass beds in the same orientation as the dock transects and at least 500 m from the nearest dock. Sampling occurred in June 2006, September 2006, and December 2006. Transects were placed in the same position on each sampling occasion, the positions of samples recorded, and subsequent positions selected to ensure that samples were at least 1.5 m from previous samples.

A three-factor design was used to test the null hypotheses, based on the following model: Time (3 levels (June 2006, September 2006, December 2006), random, orthogonal); Treatment (3 levels (mesh dock, wooden dock, controls i.e. no dock), fixed orthogonal); and Transect (7 levels, random, nested in each level of Treatment). There were $n = 5$ replicate samples per Transect.

2.4. Effects of installation of wooden and mesh docks: BACI test

Although the aforementioned mensurative field experiments provided evidence for an association between docks and seagrass loss (see Results), they do not demonstrate conclusively that docks caused the loss of seagrass. Therefore, a modified beyond BACI field experiment (Underwood, 1992; Glasby, 1997) was used to test whether installation of wooden and mesh docks led to loss of seagrass. The design is ‘modified’ because only a single example of each dock type was available for testing, and each was compared

with multiple controls. The mesh and wooden docks were installed in May and June 2006 respectively. Sampling associated with the new mesh dock was done 1 week before installation (hereafter called the 'before' sample) and at 6 mo ('after 1') and 26 mo ('after 2') following installation. Sampling associated with the new wooden dock was done 3 mo before installation ('before') and again at 7 mo ('after 1') and 26 mo ('after 2') following installation. The different time periods of the 'before' sample for the two dock types occurred because the installation of the new mesh dock became known to the authors only 1 wk prior to its installation. The effects of dock installation were quantified by comparing the biomass of *Zostera muelleri* subsp. *capricorni* along transects below each new dock with the biomass of *Z. muelleri* subsp. *capricorni* along 6 control transects in each of 3 control sites. Control sites were located from 250 m to 5 km away from the new docks. The selection of multiple control sites, and multiple transects within each control site, addresses the need for impacts to be assessed by accounting for the range in natural variation in seagrass growth that is likely to be occurring (Underwood, 1992). The control transects were the same length and depth as the transects under the new docks.

The null hypothesis that seagrass biomass would not decline after installation of wooden and mesh docks was tested. The model consisted of the following factors: Before vs After (fixed); Dock vs Control (fixed); Sites random and nested in (Dock vs Control) with $n = 1$ site in Dock and $n = 3$ sites in Control; and Transects random and nested in Site (Dock vs Control) with $n = 1$ transect in the Impact site and $n = 6$ transects in the Control sites. There were $n = 5$ replicate samples per transect. As only a single before sample was obtained, separate analyses were done for each dock type for the comparison of before with after 1, and before with after 2. In this asymmetrical design, an effect of dock installation is demonstrated by a significant Before vs After $\times$ Dock vs Control interaction and post-hoc pairwise tests that demonstrate significant loss of seagrass below docks, but not control transects, from Before to After.

All hypotheses were tested with permutational multivariate analysis of variance (PERMANOVA) (Anderson, 2001). Univariate asymmetrical PERMANOVAs (Terlizzi et al., 2005; Anderson et al., 2008) were used to compare changes in seagrass biomass from before to after dock installation in transects below new docks and in control transects. Prior to PERMANOVA the raw data were checked for homogeneity of variances and, where necessary, transformed to eliminate heterogeneity. The resemblance measure was Euclidean distance and the analyses were done with PERMANOVA+ for PRIMER software (PRIMER-E Ltd).

3. Results

3.1. Effects of wooden docks and dock orientation

The biomass of seagrass below docks was significantly less than the biomass of seagrass in beds without docks, regardless of their orientation (Table 1, Fig. 2). The average seagrass biomass below docks (3.3 ± 0.85 g) was 25.8% of the average biomass in beds without docks (12.8 ± 1.45 g). The absence of a significant result for Site (Table 1) shows that this difference was spatially consistent throughout Lake Macquarie. The significant result for Transects (Site (Treatment $\times$ Orientation)) occurred because there was significant variation in average seagrass biomass among some, but not all, transects in most sites.

3.2. Comparison of wooden and mesh docks

The $T_i \times T_r$ interaction occurred because seagrass biomass below mesh docks and in the control sites changed through time but it did not change below wooden docks. The three treatments

Table 1

Summary of results of four-factor PERMANOVA testing for differences in biomass of *Zostera muelleri* subsp. *capricorni* between seagrass beds with and without wooden docks (Treatment) of north–south and east–west orientations (Orientation) in different sites (Sites), and at multiple docks or transects in each site (untransformed data, variances homogeneous, Cochran's $C = 0.12$, $P > 0.05$) ($n = 9999$ permutations of residuals under a reduced model).

Source of variation	df	MS	Pseudo-F	P (perm)
Treatment: T	1	3912	29.81	0.002
Orientation: O	1	379.90	2.90	0.13
T $\times$ O	1	1.55	0.01	0.90
Site (T $\times$ O): Si (T $\times$ O)	8	131.21	1.48	0.19
Transect (Si (T $\times$ O))	24	88.96	5.81	0.0001
Res	144	15.31		

differed significantly in their seagrass biomass at each sampling time (Table 2, Fig. 3). The average seagrass biomass below wooden docks was 5.2%, 16.9% and 20.9% of the average seagrass biomass in control transects at the three times. The average seagrass biomass below mesh docks was 41.5%, 49.7% and 46.7% of the average seagrass biomass in control transects at the three times. Therefore the null hypothesis that seagrass biomass below wooden and mesh docks would not differ is rejected, and the null hypothesis that seagrass biomass below both types of docks would not differ from seagrass beds without docks is rejected.

The significant Time $\times$ Transect (Treatment) interaction occurred because there was inconsistent temporal variation among transects in the three treatments. Average seagrass biomass varied significantly among some transects (not shown in graph) below wooden docks at all sampling times. Seagrass biomass did not vary significantly among mesh docks at any time, whereas it varied among some control transects at some (but not all) times.

3.3. Effects of dock installation

Seagrass biomass below the wooden dock was not significantly reduced 6 mo after installation, relative to the changes that occurred at transects in the control sites, as shown by the absence of a significant (Before vs After) $\times$ (Dock vs Controls) interaction (Table 3a, Fig. 4a). Average seagrass biomass declined significantly in the transect below the new wooden dock but also to varying degrees in many of the transects in each of the control sites, as shown by the significant (Before vs After) $\times$ Transect (Site (Dock vs Control)) interaction. It is worth noting that the greatest decline in biomass from Before to After 1 occurred at the dock transect (even

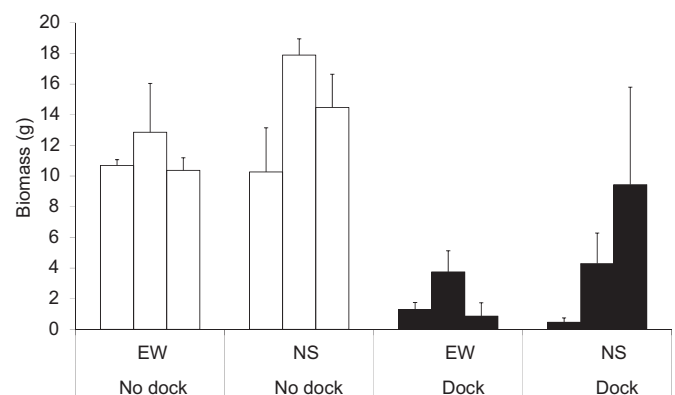


Fig. 2. Biomass of *Zostera muelleri* subsp. *capricorni* in Lake Macquarie in each of 3 sites with no docks (east–west (EW) and north–south (NS) orientations) and 3 sites with wooden docks (EW and NS orientations). Values shown are mean $\pm$ standard error of 3 transects in each site ($n = 5$ replicate samples per transect).

Table 2

Summary of results of three-factor PERMANOVA testing for differences in biomass of *Zostera muelleri* subsp. *capricorni* at three times (Time) between wooden docks, mesh docks and control seagrass beds without docks (Treatment) and among multiple examples of each Treatment level (Transects). Analyses done on $\ln(X + 1.5)$ transformed data (Cochran's $C = 0.07$, $P > 0.05$) and $n = 9999$ permutations of residuals under a reduced model.

Source of variation	df	MS	Pseudo-F	P (perm)
Time: Ti	2	1.58	22.86	0.0001
Treatment: Tr	2	9.67	12.06	0.0001
Transects (Tr)	18	0.08	1.13	0.38
Ti $\times$ Tr	4	0.73	10.54	0.0001
Ti $\times$ Transect (Tr)	36	0.07	2.33	0.0002
Res	252	0.03		

though the difference was not significant). Seagrass biomass also varied significantly among the control sites, in a consistent manner among times.

Twenty-six months after installation, the biomass of seagrass below the wooden dock was significantly less than controls, and this temporal decline was greater than the reduction that occurred in the control transects (as shown by the significant (Before vs After) $\times$ (Dock vs Control) interaction) (Table 3b). Seagrass biomass below the wooden dock declined significantly from before to after 2 ($t = 7.29$, $P = 0.009$) and seagrass biomass in the controls was not significantly different in the after 2 sample ($t = 15.20$, $P = 0.10$) (Fig. 4a). Seagrass biomass declined by 96% under the new wooden dock between the before and after 2 samples. There was also significant variation in seagrass biomass among transects in the control sites, and significant variation among the control sites, although this variation was less than the temporal changes below the dock.

Between the before and after 1 sampling associated with the new mesh dock there were significant, but inconsistent, changes in seagrass biomass that were unrelated to the dock installation (Table 4a, Fig. 4b). The significant (Before vs After) $\times$ Transect (Site(Dock vs Control)) interaction occurred because seagrass biomass changed in the transect below the new mesh dock, in some transects in two control sites, and in all transects in one control site. Average seagrass biomass also varied significantly among the three control sites.

The (Before vs After) $\times$ (Dock vs Control) interaction term for the test of before and after 2 samples was marginally significant

Table 3

Summary of asymmetrical PERMANOVA results testing for a change in biomass of *Zostera muelleri* subsp. *capricorni* from (a) before to 7 mo after, and (b) from before to 26 mo after installation of a wooden dock. The change occurring below the newly installed dock was compared with changes among $n = 6$ transects in each of $n = 3$ control sites ($n = 9999$ permutations of residuals under a reduced model).

Source of variation	df	MS	Pseudo-F	P (perm)
(a) Before to 7 mo after installation ($\ln(X + 0.1)$ transformed data, Cochran's $C = 0.11$, $P > 0.05$)				
Before vs After: B vs A	1	12.36	38.62	0.002
Dock vs Control: D vs C	1	0.50	0.44	0.54
Site (D vs C): Si (D vs C)	2	3.92	10.29	0.002
(B vs A) $\times$ (D vs C)	1	1.12	3.50	0.07
Transect (Site (D vs C)): Tr (Si (D vs C))	15	0.38	1.96	0.02
(B vs A) $\times$ Si (D vs C)	2	0.07	0.18	0.83
(B vs A) $\times$ Tr (Si (D vs C))	15	0.39	1.99	0.02
Res	152	0.19		
(b) Before to 26 mo after installation ($\ln(X + 0.1)$ transformed data, Cochran's $C = 0.07$, $P > 0.05$)				
Before vs After: B vs A	1	35.17	141.08	0.001
Dock vs Control: D vs C	1	2.34	1.64	0.18
Site (D vs C): Si (D vs C)	2	4.97	10.31	0.002
(B vs A) $\times$ (D vs C)	1	3.53	14.15	0.007
Transect (Site (D vs C)): Tr (Si (D vs C))	15	0.48	3.22	0.0002
(B vs A) $\times$ Si (D vs C)	2	0.34	1.49	0.26
(B vs A) $\times$ Tr (Si (D vs C))	15	0.23	1.51	0.11
Res	152	0.15		

($P = 0.05$) (Table 4b, Fig. 4b). Pairwise tests showed that seagrass biomass changed significantly below the mesh dock between the before and after 2 samples ($t = 4.12$, $P = 0.008$) and did not change in the controls over the same time period ($t = 12.05$, $P = 0.10$). Seagrass biomass below the new mesh dock declined by 90% between the before and after 2 samples, compared to 72% decline in the controls. Seagrass biomass varied significantly among transects in two of the three control sites, and among the control sites (Table 4b).

4. Discussion

4.1. Effects of existing wooden docks

Seagrass was present below all wooden docks examined, however, the average seagrass biomass below docks was 25.8% of the average biomass in beds without docks. This loss of seagrass biomass is considerably larger than values reported in Perdido Bay (Alabama USA) (67–70% of the values recorded in areas without docks; Shafer, 1999). However, Burdick and Short (1999) reported that seagrass was absent below two-thirds of the docks examined in two estuaries in Massachusetts (USA).

The distribution, abundance and growth of seagrasses are influenced by a range of physical environmental influences and biological processes. Biological processes influencing the survival of seagrass beds include the distribution of other seagrass plants, productivity of epiphytic algae, grazing and burrowing activity of invertebrates (Edgar, 2001), and algal blooms (Beal and Schmit, 2000). Physical factors influencing seagrass include sediment composition, salinity, nutrients, water depth, turbidity, wave exposure and light (Hillman et al., 1995; Abal and Dennison, 1996; Vermaat et al., 1996; Longstaff and Dennison, 1999; Moore and Wetzel, 2000). Control areas used in this study were selected to be as similar as possible to areas with docks to minimize the potential for other factors to contribute to differences in seagrass biomass. Seagrass below docks in Lake Macquarie was compared with control areas of similar depth and exposure and there is no evidence that the study areas differed in water quality or sediment composition (WBM, 1997).

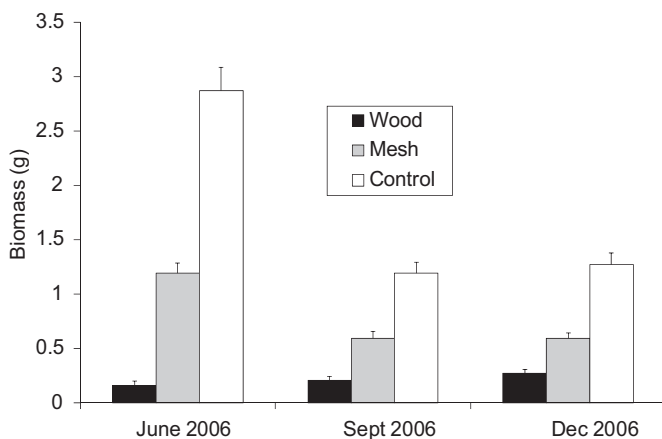


Fig. 3. Biomass of *Zostera muelleri* subsp. *capricorni* seagrass below wooden docks, below mesh docks and in seagrass beds with no docks (i.e. controls). Values shown are mean $\pm$ standard error from 7 transects in each treatment at each time ($n = 5$ replicate samples per transect).

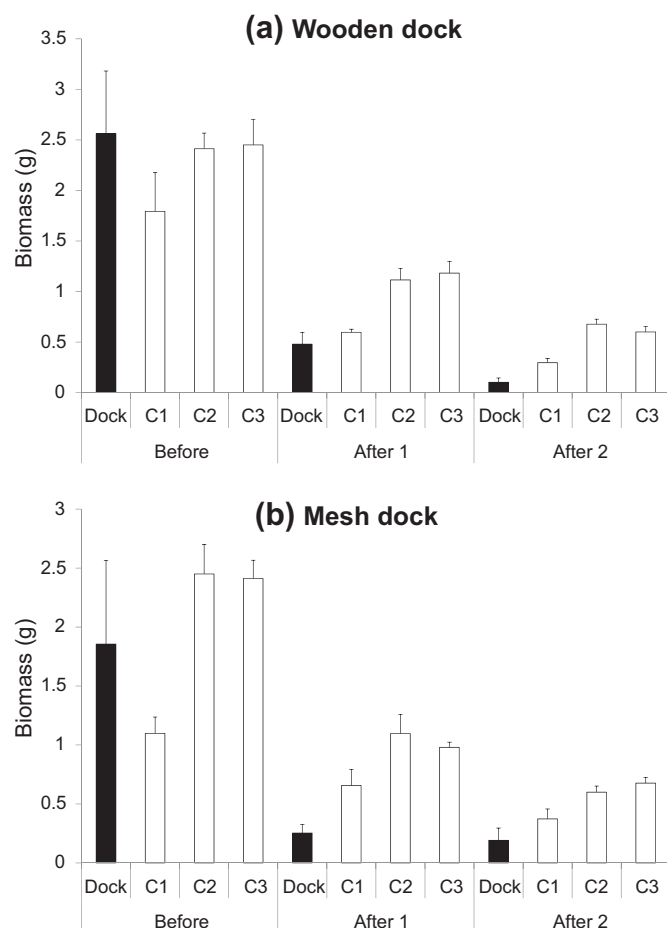


Fig. 4. Changes in biomass of *Zostera muelleri* subsp. *capricorni* seagrass from before to after installation of (a) wooden dock and (b) mesh dock in transects below each dock and in control site (C1–C3). Values shown are mean + SE based on 1 transect below each dock ($n = 5$) and the mean of six transect-level means in each site at each time.

Table 4

Summary of asymmetrical PERMANOVA results testing for a change in biomass of *Zostera muelleri* subsp. *capricorni* from (a) before to 6 mo after, and (b) from before to 26 mo after installation of a mesh dock. The change occurring below the newly installed dock was compared with changes among $n = 6$ transects in each of $n = 3$ control sites ($n = 9999$ permutations of residuals under a reduced model).

Source of variation	df	MS	Pseudo-F	P(perm)
(a) Before to 6 mo after installation (Ln(X + 0.1) transformed data, Cochran's C = 0.10, $P > 0.05$)				
Before vs After: B vs A	1	12.25	22.14	0.002
Dock vs Control: D vs C	1	3.42	1.81	0.15
Site (D vs C): Si (D vs C)	2	7.91	27.06	0.0001
(B vs A) × (D vs C)	1	1.82	3.29	0.09
Transect (Site (D vs C)):	15	0.29	2.01	0.02
Tr (Si (D vs C))				
(B vs A) × Si (D vs C)	2	0.48	0.83	0.46
(B vs A) × Tr (Si (D vs C))	15	0.57	3.94	0.0001
Res	152	0.15		
(b) Before to 26 mo after installation (Ln(X + 0.1) transformed data, Cochran's C = 0.08, $P > 0.05$)				
Before vs After: B vs A	1	21.90	77.16	0.002
Dock vs Control: D vs C	1	2.61	1.15	0.24
Site (D vs C): Si (D vs C)	2	8.54	14.10	0.0004
(B vs A) × (D vs C)	1	1.24	4.38	0.05
Transect (Site (D vs C)):	15	0.61	3.45	0.0001
Tr (Si (D vs C))				
(B vs A) × Si (D vs C)	2	0.42	1.67	0.22
(B vs A) × Tr (Si (D vs C))	15	0.25	1.42	0.15
Res	152	0.18		

An examination of the impacts of dock shading on the seagrass *Halodule wrightii* in Alabama (USA) quantified the amount of light reduction due to dock shading (Shafer, 1999). The amount of light *H. wrightii* received was critical to seagrass survival: seagrass was not present under docks where light levels were less than 14% surface irradiance. The effect of shading was greatest between 1000 h and 1500 h, and seagrasses subject to additional shading during the morning and late afternoon due to dock height and orientation were particularly vulnerable to effects of shading (Shafer, 1999). The minimum light level below docks needed to support seagrass (i.e. allow for 50% of normal production) has been estimated to be 30% of available light (Burdick and Short, 1999).

Shading seagrass species by experimentally manipulating light levels or exposure to high water turbidity leads to reduced production or death of seagrass plants and seedlings. These impacts are reflected at the habitat scale as reduced density, shoot length, biomass and leaf cover (Gordon et al., 1994; Fitzpatrick and Kirkman, 1995; Grice et al., 1996; Longstaff and Dennison, 1999; Wood and Lavery, 2000; Bintz and Nixon, 2001). Therefore, shading caused by docks is the most likely explanation for the declines in seagrass biomass observed below docks. There is, however, a need for studies to quantify the declines in light levels below wooden and mesh docks (and other potentially suitable decking materials) and to correlate this with seagrass abundance below docks and with features of individual docks (e.g. height, width, water depth). Such studies would be a first step towards determining the threshold for significant shading effects on seagrass and the interactive effects of dock design on this threshold.

Seagrass biomass varied among transects in sites with docks of both orientations and in sites without docks. Variation among transects in sites with docks may have occurred because of variation in the age of docks and therefore the duration of shading of seagrass beds. The observed variation in seagrass biomass among transects and among replicates within transects in seagrass beds without docks is not unusual. Spatial variation (at similar scales used in this study) in seagrass features (biomass, leaf length, shoot density) has been reported in other estuaries in south-east Australia (Bell and Westoby, 1986; Edgar et al., 1994; Fyfe and Davis, 2007).

4.2. Effects of dock orientation

There was no effect of the orientation of docks on seagrass biomass: seagrass was consistently reduced below wooden docks with north–south or east–west orientations. This result contrasts with the only other study of dock orientation (Burdick and Short, 1999) that reported significantly less seagrass below east–west docks than north–south docks. The authors explained that the difference between dock orientations reflected the daily movement of the sun from east to west causing the centres of east–west docks to be shaded for most of the day whereas the centres of north–south docks were shaded only in the middle of the day (Burdick and Short, 1999). The authors therefore recommended that, to minimize impacts on seagrass, docks should be oriented within 10° of the north–south axis. The difference in results between the present study and the study of Burdick and Short (1999) may be attributed to differences in dock widths. The docks studied in Lake Macquarie were 900–1100 mm wide. Docks studied by Burdick and Short (1999) were 0.7–6.9 m wide and 12 of the 21 docks exceeded 1.5 m width. The absence of an effect of dock orientation in Lake Macquarie may reflect the generally narrower width and the change in the angle of the sun throughout the year. At a latitude of 32°S (the approximate position of the study area) in June the sun's altitude will be approximately 33° above the northern horizon and in December its altitude will be approximately 80° (source: <http://>

www.phys.murdoch.edu.au/rise/reslab/resfiles/sun/text.html, accessed June 14, 2007). Therefore there would not be many months per year that the area immediately below docks may be shaded for a large part of the day. Additional studies comparing the effects of a range of dock widths and orientations on light availability and seagrass growth may provide more information on the acceptable limits of dock dimensions.

4.3. Comparison of wooden and mesh docks

The use of an aluminium mesh decking reduced the effects of docks on seagrass. Biomass of seagrass below mesh docks was always greater than below wooden docks, although biomass below both dock types was always less than undisturbed seagrass. Although light was not measured in this study, it is likely that the mechanism responsible for the reduced effects of aluminium mesh docks is greater light penetration through the deck compared to wooden docks. The effects of wooden and mesh docks were not compared in another study (Fyfe and Davis, 2007); however, it found a significant effect of a single mesh dock on seagrass (73% decline in shoot density). Other studies evaluating the effectiveness of alternative materials to increase light penetration through docks, such as glass prisms (Steinmetz et al., 2004) and grating (Fresh et al., 2006), also found no measurable benefits.

The comparison of wooden and mesh docks and the assessment of the impacts of dock installation revealed changes in seagrass biomass through time. Although we used a destructive method of sampling seagrass, we attempted to eliminate potentially negative effects of sampling at one time on the plants collected subsequently by ensuring the latter were not collected within the vicinity of previous collections (i.e. within 1.5 m). The inconsistency among treatments in the direction (i.e. increase or decrease) and magnitude of temporal variation in seagrass biomass suggests this risk was minimised by our sampling approach. Temporal variation in seagrass biomass occurred under existing mesh docks as well in seagrass beds with no docks. The major feature of this temporal variation was an autumn–winter decline in seagrass biomass, which was apparent as a decline after March–June 2006. Similar winter die-back of *Zostera muelleri* subsp. *capricorni* has been reported in Port Hacking (Kirkman et al., 1982) and Botany Bay (Larkum et al., 1984) and for *Z. muelleri* subsp. *muelleri* in Port Phillip Bay, Victoria (Kerr and Strother, 1990) and for *Heterozostera tasmanica* in Westernport Bay, Victoria (Bulthuis and Woelkerling, 1983; Edgar et al., 1994). Shoot growth rates of *Z. muelleri* subsp. *capricorni* are also lowest in winter (King and Holland, 1986). The temporal variation in *Z. muelleri* subsp. *capricorni* reported for Lake Macquarie in this study therefore appears to represent a natural phenomenon typical of this species and other related species.

The lack of temporal variation in *Zostera muelleri* subsp. *capricorni* biomass below wooden docks is intriguing. Seasonal declines in *Z. muelleri* subsp. *muelleri* biomass are associated with changes in solar radiation and day length (Kerr and Strother, 1989). The majority of the seasonal change in total plant biomass in *Z. muelleri* subsp. *capricorni* and *Z. muelleri* subsp. *muelleri* is accounted for by changes in leaf biomass (Kirkman et al., 1982; Larkum et al., 1984; Kerr and Strother, 1990). The lack of seasonal variation in seagrass biomass below wooden docks could be due to the absence of a strong seasonal variation in light levels, or the amount of light penetrating below docks may not be sufficient for a significant increase in growth. This explanation is supported by other studies (Shafer, 1999) that have found a greater relative reduction in shoot density than total plant biomass under docks.

A modified beyond BACI experiment confirmed the results of the field surveys and provided evidence that the installation of docks caused a significant decline in seagrass biomass. Although only single

examples of each dock type were available for study, the comparison of both dock types with multiple control sites provided a meaningful test of the effects of dock construction. Simultaneous testing of multiple examples of dock construction will improve the generality of this finding. Seagrass biomass below the wooden and mesh docks declined by similar amounts, 96% and 90% respectively, 26 months after dock installation. The experimental design employed in this study cannot distinguish between potential impacts of the installation process (e.g. seagrass destruction resulting from the insertion of pilings into the sediment as the support for the decking) and the combined effects of the installation process and shading from the dock decking. It was not possible to include a control for the installation process (i.e. pilings without decking) therefore the results of this study refer to the combined effects of installation and shading.

The declines in biomass below the new docks were detectable over and above a general decline in seagrass biomass that occurred in all the control sites over the same time period (Fig. 4). Similar dramatic declines in seagrass under new docks and in control sites were also reported in the only other study to assess the impacts of dock construction (Beal and Schmit, 2000). The declines were due to natural processes (i.e. algal bloom) that affected control and treatment sites equally. However, by 33 weeks after construction the cover of seagrass was less under the new docks than control sites.

5. Conclusion

Infrastructure, such as docks, associated with recreational usage of estuaries in south-east Australia is an issue for the long-term conservation of seagrasses. Although the total 'footprint' of ecological effects of docks in estuaries is small relative to other disturbances, they contribute to the total impact of human uses of estuaries. The effects of docks on seagrass were not influenced by the orientation of the docks used in this study, and their effects were reduced when aluminium mesh decking was used in place of wooden decking. Field observations of the effects of docks on seagrass were supported by a modified BACI field experiment involving the installation of wooden-deck and aluminium mesh-deck docks. Alternative controls, such as limits to the total numbers of docks and the use of other construction materials, may have additional conservation benefits.

Acknowledgements

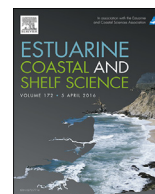
This study was funded by a Lake Macquarie City Council Research Grant. Thanks to R Economos for assistance at various stages of this project. Thanks to the numerous dock owners for allowing access for sampling for this study and to T Stansfield for facilitating our study on the impacts of dock installation. T Glasby and two anonymous reviewers provided very useful comments on earlier versions of the manuscript. J Morton generously provided the map that was used for Fig. 1. The collection of seagrass for this study was authorized under a permit from NSW Department of Primary Industries.

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ATTACHMENT F



Multiscale impacts of armoring on Salish Sea shorelines: Evidence for cumulative and threshold effects

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ABSTRACT

Shoreline armoring is widespread in many parts of the protected inland waters of the Pacific Northwest, U.S.A, but impacts on physical and biological features of local nearshore ecosystems have only recently begun to be documented. Armoring marine shorelines can alter natural processes at multiple spatial and temporal scales; some, such as starving the beach of sediments by blocking input from upland bluffs may take decades to become visible, while others such as placement loss of armoring construction are immediate. We quantified a range of geomorphic and biological parameters at paired, nearby armored and unarmored beaches throughout the inland waters of Washington State to test what conditions and parameters are associated with armoring. We gathered identical datasets at a total of 65 pairs of beaches: 6 in South Puget Sound, 23 in Central Puget Sound, and 36 pairs North of Puget Sound proper. At this broad scale, demonstrating differences attributable to armoring is challenging given the high natural variability in measured parameters among beaches and regions. However, we found that armoring was consistently associated with reductions in beach width, riparian vegetation, numbers of accumulated logs, and amounts and types of beach wrack and associated invertebrates. Armoring-related patterns at lower beach elevations (further vertically from armoring) were progressively harder to detect. For some parameters, such as accumulated logs, there was a distinct threshold in armoring elevation that was associated with increased impacts. This large dataset for the first time allowed us to identify cumulative impacts that appear when increasing proportions of shorelines are armored. At large spatial and temporal scales, armoring much of a sediment drift cell may result in reduction of the finer grain-size fractions on beaches, including those used by spawning forage fish. Overall we have shown that local impacts of shoreline armoring can scale-up to have cumulative and threshold effects – these should be considered when managing impacts to public resources along the coast.

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1. Introduction

Anthropogenic alteration of shorelines is a worldwide phenomenon as a significant proportion of population growth is in coastal communities. Types of shoreline development are diverse, ranging from simply building houses overlooking the water to completely altering the shore by covering it with fill or structures. The Salish Sea, which includes all the inland marine waters of

British Columbia (Canada) and of Washington State (USA), has shorelines that range from virtually pristine beaches to concrete-covered commercial ports. In the face of increasing coastal urban growth and sea level rise, effective management of our shorelines requires understanding both functions of natural beaches and the scales at which we are impacting them (Arkema et al., 2013; Harris et al., 2015).

One of the most prevalent forms of coastal development in the Salish Sea and worldwide is shoreline armoring, comprising various artificial means of stabilizing banks and bluffs that might otherwise erode and endanger infrastructure. A recent conservative

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estimate of armored shoreline in the continental US is 14% (Gittman et al., 2015). Local, mostly biological, effects of shoreline armoring are well known for some types of embayments and marshes (e.g., Bozek and Burdick, 2005; Chapman and Underwood, 2011) and open-coast sandy beaches (e.g., Dugan et al., 2008; review by Nordstrom, 2014), and recently for the gravel-sand beaches of Puget Sound (Sobocinski et al., 2010; Heerhartz et al., 2014). Armoring locally reduces retention of logs and wrack (algae, sea-grass, leaf litter, and other organic and inorganic debris left by ebbing tides) and the invertebrate communities that inhabit this detritus. It can also have indirect effects on seabird and shorebird use (Dugan et al., 2008) as well as abundance and diversity of large mobile invertebrates (Chapman, 2003). Potential spawning locations for beach-spawning forage fish, such as surf smelt (*Hypomesus pretiosus*), are reduced when armoring covers the high shore, and egg mortality increases when beach temperatures are raised by shoreline modifications (Rice, 2006). These trophically important fish may also be negatively impacted in cases where armoring coarsens the sediment due to local winnowing of finer grain sizes (Penttilä, 2007; Quinn et al., 2012; Fox et al., 2015; Greene et al., 2015). By changing the nearshore habitats encountered by juvenile migrating salmon, armoring affects their diets (Munsch et al., 2015) and possibly residence time (Heerhartz and Toft, 2015).

Considerable study of physical impacts of armoring on beaches has been conducted, although the results are contradictory. In some circumstances, interactions of sediment impoundment, wave reflection, and alterations to nearshore water currents may alter beach scour, mobilization of sediment, and recovery from storms. In theory, these processes may result in narrower, steeper, and coarser-grained beaches (Pilkey and Wright, 1988; Bozek and Burdick, 2005; Nordstrom, 2014). One clear effect is that passive erosion (e.g., caused by relative sea level rise) causes narrowing of armored shorelines because the upper beach is prevented from migrating inland. In contrast, whether active erosion is induced by seawalls is still argued (reviews by Kraus and McDougal, 1996; Ruggiero, 2010); few long-term studies have been attempted but generally do not show a definitive armoring effect (e.g., Griggs et al., 1994; Griggs, 2010). Modeling work (e.g., Ruggiero, 2010) suggests that contradictions seen in the literature may stem from variation among study systems in key physical parameters, in particular the relative elevation of the seawall and the morphology of the beach and nearshore, including their slopes.

Even for the more consistent biological impacts of armoring, translating local effects to a landscape scale is challenging because of the myriad other natural and anthropogenic factors that affect shoreline processes. The signal to noise problem is particularly large in inland waters such as the Salish Sea because of the complexities of underlying geology, shoreline shape, freshwater input, wave fetch, orientation to prevailing winds, nearshore bathymetry, and sources of sediments, vegetation, and organisms. In most of the world, beach sediments derive predominantly from rivers. On sandy shorelines, these sediments are jealously retained with groins, and millions of dollars are spent annually to replenish beaches where natural sources have been locked up by dams (Berry et al., 2013). Although numerous rivers empty into the Salish Sea and a few of them create large deltas, much of the riverine sediment is deposited in deep fjord-like basins rather than building beaches. Instead, most beach-building sediment comes from erosion of bluffs (Keuler, 1988). It follows that “locking up” these sediments by armoring shorelines should have large-scale and long-term impacts, including cumulative effects if few sediment sources are left unaltered (reviewed by Berry et al., 2013; Nordstrom, 2014). However, demonstrating cumulative effects, e.g. changes that continue to worsen with additional armoring, is notoriously difficult – especially if changes appear gradually, as is

likely with many geomorphic processes. In Europe, extensive coastal armoring is thought to have contributed to broad-scale steepening of the shoreline (Taylor et al., 2004), but many other processes could be important.

In the southern part of the Salish Sea (in Washington State), which includes Puget Sound, extensive shoreline armoring has accompanied the last 100 years of development along the greater Everett-Seattle-Tacoma urban corridor, and is thought to significantly impair nearshore ecosystem processes (Simenstad et al., 2011). While local effects have recently been documented (e.g., Sobocinski et al., 2010; Heerhartz et al., 2014), broader or cumulative impacts have not. This uncertainty stymies managers and regulators who lack compelling data that would provide the “best available science” to inform guidelines. Pressures to relax armoring regulations stem from the need to protect valuable infrastructure from erosion, especially with risk exacerbated by sea level rise. Sociological studies show that decisions by a few homeowners to armor their shoreline often triggers neighbors to do the same, leading to cascading local impacts (Scyphers et al., 2015). In addition to such possible cumulative effects, regulators are particularly interested in which types or locations of armoring have greater impacts than others, and whether there are thresholds that trigger these impacts. Samhouri et al. (2010) define an ecological threshold as a point at which small changes in environmental conditions produce large (non-linear) responses in ecosystem state. For example, ecological thresholds have been associated with habitat fragmentation (e.g., Andrén, 1994) and edge effects (Toms and Lesperance, 2003). One possible threshold that may apply to shoreline armoring is the extent that structures encroach on the beach. In addition, slow and delayed “latent impacts” (Coverdale et al., 2013) may exist but are very difficult to detect, especially given signal-to-noise problems.

Previous studies by our research team have focused on local impacts of shoreline armoring in central and southern Puget Sound (Heerhartz et al., 2014, 2015). We dealt with among-site ‘noise’ by use of a paired sampling design, focusing our surveys on nearby, physically-paired, armored and unarmored beaches. Here we broaden our geographic scale to test whether the documented biological effects of armoring exist on beaches in the Salish Sea north of Puget Sound. We also test whether any physical impacts are detectable, because our previous work in central and southern Puget Sound found few differences in quantified physical parameters that were correlated with armoring. The northern region has more bedrock shorelines and different oceanographic characteristics, so we anticipated that there would be some regional differences in beach parameters. Based on our own localized studies and on literature from other systems (e.g., open-coast beaches), we hypothesized that: 1) Armoring-associated reduction of logs, wrack, and invertebrates would be consistent across regions in paired-beach analyses; 2) These associations would be increasingly clear when armoring is lower on the beach face; 3) By examining a large range of sites, the predicted pattern of armoring altering beach slope and sediment coarseness might be detectable; and 4) Such geomorphic signals would be most distinct where extensive stretches of armoring have “locked up” more sediment sources in an area. To address these questions, we discuss regional patterns but ignore the huge beach-to-beach variation in geomorphic conditions, to be discussed elsewhere (A.N. McBride, pers. comm.).

2. Methods

2.1. Sites

Our analyses include data from 65 pairs of armored and unarmored beaches in the inside marine waters of Washington State,

from the southern extent of Puget Sound to the Canadian border (Fig. 1). The data thus encompass three oceanographic regions: South (6 site pairs), landward of a sill at the Tacoma Narrows; Central (23 site pairs), inside Puget Sound proper, south of a sill at Admiralty Inlet; and North (36 site pairs), outside of the Sound but within the Salish Sea. The south sites and to a lesser extent the central ones are influenced by constrained water exchange caused by the sills, and by freshwater input from several rivers. The north sites have greater oceanic flushing but have substantial seasonal freshwater input from several large rivers, especially the Fraser in Canada and the Skagit in Washington. The primary sediment composition on our study beaches was a mix of sand and gravel predominantly derived from glacial and interglacial deposits, delivered to beaches via episodic bluff erosion, and distributed by longshore transport (Shipman, 2010). Wave energy regime and local geology are then the primary drivers of beach sediment character and gradient in the Salish Sea. Pairs of beaches were within the same drift cell (independent zone of littoral sediment transport from source to deposition area) and same component of that drift cell (erosional or depositional). The 65 pairs were within 49 different drift cells (out of over 600 in the Washington state portion of the Salish Sea). These 49 cells ranged from 1.8 to 60.4 km long, and varied from 0 to 99% armored.

Sites had armoring at different elevations and of different types (e.g., concrete seawalls, stone riprap, retaining walls of wood pilings). Paired beaches were matched as closely as possible in terms of geomorphic setting and geology of the bluff, aspect to prevailing winds and sun, wave exposure, and nearshore bathymetry. Beaches in a pair were always nearby; mean distance between members of a pair was 383 m, maximum distance was 1 km. All field data reported here were collected in summer (June to Aug.); central and south sites were surveyed in 2010–2012, north sites in 2012–2013.

2.2. Biological surveys

Data collection followed procedures described in Heerhartz et al. (2014). Briefly, at all sites we placed a 50 m shore-parallel transect high on the shore near the wrack zone; this line was used for both biological and sediment sampling. We define beach wrack as organic matter consisting of detached and stranded algae, seagrass, and terrestrial debris. We surveyed the most recent line of beach wrack and avoided older and usually more desiccated wrack. Armored beaches lacking wrack and logs were surveyed at the highest elevation where natural beach sediments were present (i.e., at the toe of armoring). At 10 randomly selected points we estimated the percent cover of each type of wrack (i.e., seagrass, algae, or terrestrial-source), and noted the most abundant types of algae. At 5 of these points we collected samples of wrack and the top 2.5 cm of sediment using a 15-cm diameter benthic corer, and quantified the number of logs (less or greater than 2 m length). We also measured the width of the log line perpendicular to shore. In the lab, wrack samples were sorted into types, dried, and weighed. All invertebrates were extracted (using 106 μ m sieves) from the wrack, and identified and counted using a dissecting microscope; talitrid “beach-hopper” amphipods and other crustaceans were identified to genus, and other invertebrates to family (except oligochaetes, which were not identified beyond class). Invertebrate-dense samples were split with a Folsom Plankton Splitter and abundances were back-calculated. For analyses, all parameters were averaged (percent covers) or summed (biomasses, invertebrate counts) across the transect ($n = 5$ for wrack core and log samples, $n = 10$ for wrack percent covers).

2.3. Geomorphic survey methods

We characterized sediment grain sizes from the wrackline from three to five of the core samples by sieving dried sediments smaller than 16 mm through progressively finer sieves (1/2 phi intervals) using a RoTap shaker, and weighing the amount retained in each sieve. Coarser sediments (cobbles) were individually measured. Elevations of wracklines were measured; because these differed within and among pairs, sediments were not all collected from the same elevation on the beach. In addition, we assessed grain sizes, with lower precision, along a transect at Mean Low Water (MLW: ca. +1 m above MLLW). At three randomly selected points we used a 50 $\times$ 50 cm quadrat to estimate percent cover of cobbles (>6 cm), pebbles (4 mm – 6 cm), granules (2–4 mm), sand (<2 mm), and mud (smooth) at the surface and at 5 cm subsurface. The two sets of estimates were averaged for per-quadrat proportions.

Beach profiles were obtained on low tides using a laser level and stadia rod or RTK-GPS, measuring from the top of the berm or toe of the eroding bluff (on unarmored beaches) to elevations approaching mean lower low water (MLLW), depending on the tide. On armored beaches the profiles were measured from the lowest elevation on the armoring structure to MLLW. Beach slope was calculated for the upper portion of each beach from the wrack line to ~0.6 vertical meters above local MLW. This section was consistently in the active sediment transport zone of the foreshore (an area of similar energy) of our beach transects. See Supplementary Material for additional methods and data sources.

Due to the fjord-like shape and complex bathymetry of the Salish Sea, the magnitude of the vertical tidal range varied greatly from our northern to southern sites. Mean tidal range varied from 1.39 to 3.19 m, and the elevation of the mean higher high water (MHHW) datum varied from 2.39 (in the north) to 4.32 m (far inside Puget Sound) above MLLW. To standardize our elevation measurements in relation to tidal range and enable us to meaningfully assess impacts of armoring emplaced at various elevations, we calculated a “relative encroachment” (RE) metric by subtracting the elevation of armoring or toe of bluff from the MHHW datum for each beach. Datum information for nearby sites was obtained from: <http://tidesandcurrents.noaa.gov/>; in some cases it was necessary to interpolate between distant stations. Positive RE values indicated that the toe (of armoring or bluff) was lower than MHHW, and negative values were higher. RE at our study sites are reported in vertical feet, and ranged from –5.1 ft (–1.55 m) to +7.0 ft (=2.14 m), with a mean of –0.33 ft $\pm$ 0.16 SEM (standard error of the mean) (–0.10 m $\pm$ 0.05 SEM).

We tested whether the proportion of the drift cell that was armored (hereafter referred to as DCA: data from various sources) would generate cumulative armoring impacts, for example by blocking increasing proportions of sediment sources. Variables that could be affected by large-scale and long-term impacts of armoring might show these effects, including some parameters where local and short-term impacts were not seen. Of particular interest was testing our hypotheses of a correlation between sediment grain size or beach slope and DCA.

2.4. Statistical analyses

We assessed local impacts of armoring using paired t-tests, taking advantage of our sampling design to compare the differences between mean values of each measured response parameter at each pair of beaches. Parameters tested are listed in Table 1.

We tested larger-scale effects of RE and DCA on response variables of interest using a mixed effects model. For all analyses “Site” was defined as a random effect and RE or DCA as a fixed effect. Each “Site” had two sampled beaches, the armored beach and its

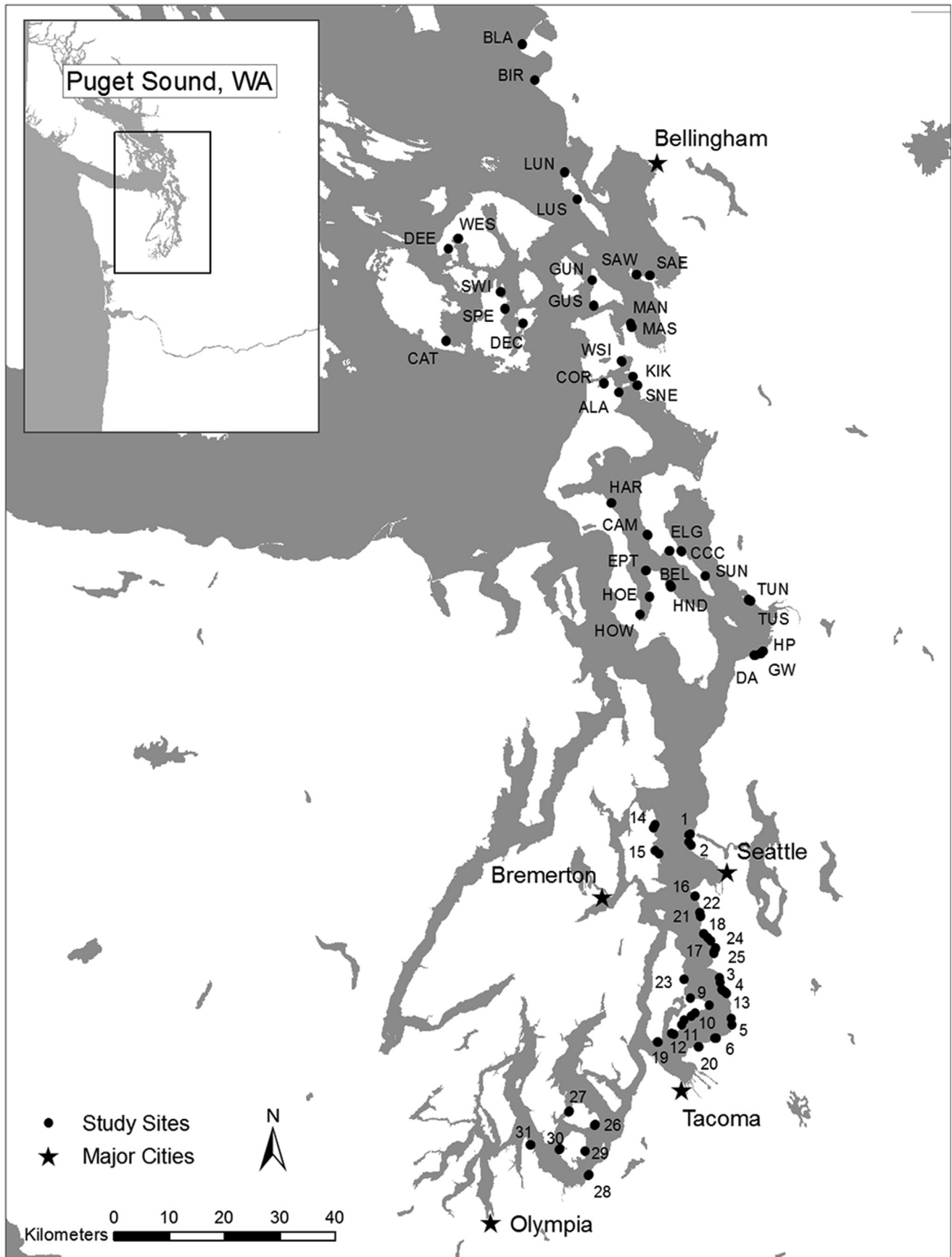


Fig. 1. Map of the Washington State portion of the Salish Sea, showing study site locations and major cities. Each pair of beaches (armored and unarmored) is represented by a dot. North sites are represented by letters, Central by #1–25, and South by #26–31. Basemap data courtesy of Washington Dept. of Ecology (WA State Basemap, Place Names) <http://www.ecy.wa.gov/services/gis/data.htm> and Washington State Dept. of Transportation (Shoreline) <http://www.wsdot.wa.gov/mapsdata/geodatacatalog/>.

Table 1
Summary of statistical tests.

Paired t-tests			RE			DCA		
Description	p value	Direction	p value	Direction	Test type	p value	Direction	Test type
Beach Width	0.0104	U > A						
Beach Slope	ns		0.0453	neg	C	0.0028	pos	C
Shade on upper shore	<0.0001	U > A						
Number of logs	<0.0001	U > A						
Width of log line	<0.0001	U > A						
Wrack Terrestrial Percent Cover	<0.0001	U > A	<0.0001	neg	B	ns		B
Wrack Algae Percent Cover	0.0012	U > A	0.0002	neg	B	ns		B
Wrack Total Percent Cover	<0.0001	U > A	<0.0001	neg	B	ns		B
Wrack Total Mass	<0.0001	U > A	<0.0001	neg	A	0.0074	neg	A
Wrack Algae Mass	0.00773	U > A	<0.0001	neg	A	0.0247	neg	A
Wrack Terrestrial Mass	0.00013	U > A	<0.0001	neg	A	ns		A
Wrack Total Invertebrates	ns		0.0001	neg	A	0.0051	neg	A
Wrack Total Amphipods	ns		0.003	neg	A	ns		A
Wrack Total Insects	ns		<0.0001	neg	A	ns		A
Wrack Total Collembola	0.00759	U > A	0.0001	neg	A	0.0293	neg	A
Wrack Oligochaeta + Nematoda	ns							
Wrack Megalorchestia	0.0002	U > A						
Very Coarse Gravel	ns		ns		B	0.0001	pos	B
Coarse Gravel	ns		ns		B	ns		B
Medium Gravel	ns		ns		B	ns		B
Fine Gravel	ns		ns		B	ns		B
Very Fine Gravel	ns		ns		B	ns		B
Very Coarse Sand	ns		ns		B	ns		B
Coarse Sand	ns		ns		B	ns		B
Medium Sand	ns		ns		B	0.0042	neg	B
Fine Sand	ns		ns		B	0.0008	neg	B
Fines	ns		ns		B	ns		B

Notes: Type of test: A = Mixed-effect ANOVA on quasi-Poisson data; B = Mixed-effects on arcsin sqrt transformed data; C = normal linear mixed effect model. 'ns' = non-significant. 'neg' and 'pos' refer to the direction of effect of the parameter on the response variable, e.g. large RE is associated with low wrack cover.

unarmored pair. In this setting the model is allowed to vary the intercept for each “Site,” therefore accounting for both within site and among site variation, i.e. acknowledging that sites are representative of Salish Sea beaches and were randomly selected. For models testing counts of wrack invertebrates (either summed, or separately for particular taxa) or components of wrack mass we used a generalized mixed effects model with a quasi-Poisson distribution using the glmmPQL function in the MASS package in R (Venables and Ripley, 2002; R Development Core Team, 2014). A quasi-Poisson distribution was chosen over a Poisson distribution to account for overdispersion and to adequately fit biological count data. For all model fits, residual plots and fitted values were examined, and all appeared reasonable considering the inherent variability of the dataset. For models testing the effect of RE or DCA on percent cover or proportion data (including wrack cover and sediment grain sizes) we used a normal linear mixed effects model with “Site” as the random effect on arcsine-square root transformation of the response variable, as is common with such data to improve normality. The mixed effects models testing the effect of DCA all showed high correlation between the fixed effect and the random effect of Site (Supplemental Table 1). This was expected since each member of a Site existed in the same drift cell by design. Because of the difficulty of deciding what constitutes an independent test, and lack of agreement in the literature on adjusting alpha levels for multiple testing (e.g., Hurlbert and Lombardi, 2003, 2012), we present *p* values as reported by individual tests, and interpret our results conservatively.

Some regression analyses showed non-linear changes in the response variable, suggesting a threshold or breakpoint. For these we applied segmented (piecewise) regression to search for statistically significant two-segment relationships; these can be common in ecological systems and are characterized by an abrupt change in a response variable at some point (“threshold”) in an independent variable (Toms and Lesperance, 2003; Samhouri et al.,

2010). Our analyses used an approach based on Crawley (2007) (see Supplementary Material). All univariate analyses were run in R (R Development Core Team, 2014).

We used permutational multivariate analysis of variance (PRIMER v6 with PERMANOVA+; Clarke and Gorley, 2006; Anderson et al., 2008) to test for differences in sediment grain sizes between armored and unarmored beaches (type as fixed factor) with sites as replicates (pair as random factor). Multivariate relationships between environmental predictor variables and wrack sample invertebrate assemblages were investigated using distance-based linear modeling (DISTLM) conducted using the step-wise selection procedure to minimize the Akaike information criterion (AIC). These analyses partition the multivariate variability of the invertebrate assemblages along best-fit axes and then test the environmental variables that are most closely related to these axes.

3. Results

3.1. Regional differences

Although we were interested in testing for armoring effects on beach parameters that might exist despite regional variation, the physical backdrop for testing such local impacts includes regional differences in bluff geology and shoreline geomorphology. There are fundamental geologic differences among regions that result in variation in bluff material (Fig. 2). The north region experienced advance and retreat of glaciers so that surface morphology reflects the zone of ice grinding on bedrock; the exposed sediment in the central region transitions to a glacial outwash zone; and the sediment deposits in the south are dominated by outwash that was at the front edge of the ice. These influences are also seen in sediment grain sizes at the wrackline of the study beaches (Fig. 2). Grain size distributions were quite consistent between armored and

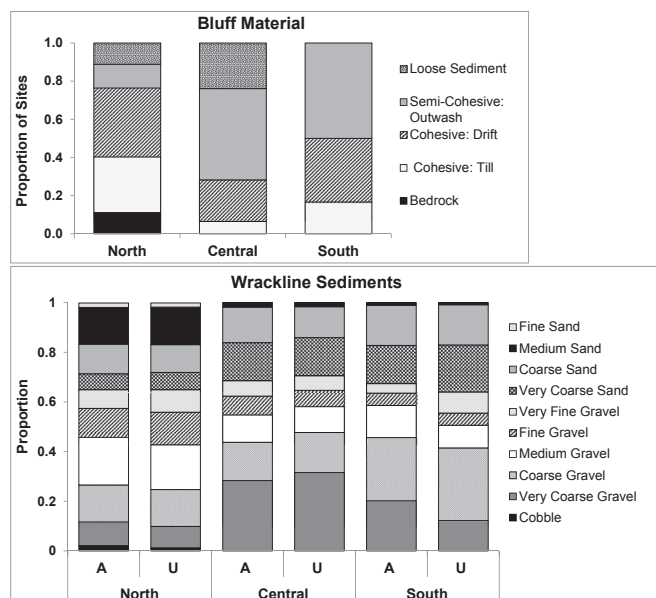


Fig. 2. Upper panel: Regional differences in geological materials comprising bluffs at the study sites. Lower panel: averaged sediment grain-size distributions (proportions) in samples from the wrack line (samples sieved in the lab). Sample sizes: North = 36 pairs of beaches, Central = 23 pairs, South = 6 pairs.

unarmored beaches within a region, but some differed among regions; in particular, very coarse gravel and very coarse sand were more abundant at the central sites (in the outwash zone), medium sand was particularly abundant at the north sites, and coarse gravel in the south. Sediments at MLW also showed no obvious armoring effect in the paired analysis but had some regional differences, with pebbles and granules more abundant in the south (Suppl. Fig. 1).

Characteristics of the chosen sites varied among regions for some physical parameters but not others. The large-scale parameter of wave fetch impacting each beach did not vary with treatment but was lower in the south (Fig. 3). Drift cell lengths were greatest in the north and shortest in the south, but with substantial variance within all regions (Suppl. Fig. 2). The DCA (proportion of the drift cell armored: Suppl. Fig. 2) of the drift cells containing our study sites were very different among regions, highest in the urbanized and heavily-armored central region (mean $69\% \pm 5\%$ SE armored) and much lower in the north ($24 \pm 3\%$) and south ($25 \pm 15\%$). Beach width was reduced consistently by armoring but showed no regional pattern (Fig. 3). Elevation of the toe of the bluff/armoring showed both a treatment effect, with armoring moving the toe to a lower elevation, but also a regional effect because of the much greater tidal range in the south region. The toes of unarmored bluffs are much higher above MLLW in the south than the north (Fig. 3) because of this factor. Our calculated relative encroachment metric (RE) accounted for this background difference (see Methods). In all regions armored beaches 'encroached' upon Mean Higher High Water relative to unarmored beaches (Fig. 3); this difference was least in the north, showing that armoring is generally not emplaced as low on the shore in that region, and greatest in the south. RE values for unarmored beaches were similar among regions.

Some of the abiotic and biotic parameters that respond locally to armoring (see below) also varied among regions (Figs. 3 and 4). Numbers of logs stranded on the beach were much higher at unarmored beaches but were most abundant in the central region and least in the south; the same pattern was seen in width of the log line (data not shown). Shade from overhanging vegetation likewise

was always higher at unarmored beaches but was most abundant (and most different with armoring) at the south sites (Fig. 3). Algal and seagrass wrack biomasses were much greater at the north sites, and there was some variation in the types of wrack found there; seagrass was much more common (Fig. 4), reflecting the local abundance of large seagrass meadows in the region. Algal types were not weighed separately in the wrack samples, but we did record the most common component in each; in all regions, ulvoid algae were the most common (in 80–85% of samples in all regions), but *Fucus* spp. was more common in the north samples (most common alga in 13% of the samples, versus only 1% in the central and south). The north part of the Salish Sea contains a high proportion of bedrock, the preferred substrate of *Fucus*, whereas there is little such habitat in the central and south regions (Fig. 2).

Invertebrates in the wrackline samples showed surprising and largely unexplained differences among regions. This was seen especially in the abundances of talitrid amphipods, oligochaetes, and nematodes, all of which were very patchy at the north sites but often 2–10 times more abundant than at the central or south sites (Fig. 4). For the amphipods, these differences stemmed largely from very abundant juveniles (unidentified talitrids) and adults in the genus *Traskorchestia*, with lower numbers of adults in the genus *Megalorchestia* (Fig. 4). Factors affecting amphipod assemblages (all three groups) were examined with multivariate analyses, testing how well a wide range of 'independent' variables (grain sizes, amounts and types of wrack, RE, shade, etc.) can predict the types and abundances of amphipods. The best DISTLM analysis produced an r^2 of only 0.32, with 11 predictor variables included. More amphipods of all types were found with more wrack mass and fewer with high RE and high DCA, but all correlations between individual amphipod taxa and individual factors were very weak (r^2 values <0.05). Total wrack mass was correlated with total amphipods over all beaches, but not strongly ($r^2 = 0.19$). When the wrack was mostly terrestrial there were almost no amphipods, but when the wrack was mostly marine the numbers ranged from zero to over 10,000 among five core samples.

Of the other wrackline arthropods, Collembola varied highly within and among regions; in particular some of the south sites had very large numbers, but these showed no correlations with amounts of any type of wrack. Insects (primarily Diptera larvae and adults) tended to be more abundant in the north (Fig. 4). Insect numbers showed no correlations with algal mass but a positive correlation with terrestrial wrack mass ($r^2 = 0.16$ for all beaches), especially for armored beaches ($r^2 = 0.25$).

3.2. Sound-wide patterns in paired analyses

As was found in the central-south regions (Heerhartz et al., 2014, 2015), when data from the north sites were included in a 65-pair sound-wide analysis, armoring had clear sound-wide impacts on a number of parameters on the upper shore (Figs. 3 and 4, Table 1). Unarmored beaches within a pair were wider (overall means and SE Armored 27.3 ± 1.8 m, Unarmored 33.7 ± 1.9 m), and extended higher up the shore (Armored 3.03 ± 0.07 m above MLLW, Unarmored 3.77 ± 0.08 m), but we found no paired differences in slope of the upper shore (Armored 0.115 ± 0.0002 , Unarmored 0.110 ± 0.0001). This slope metric is not sensitive to small-scale armor-induced scour. Unarmored beaches had far more shade from overhanging vegetation (Armored $12.5 \pm 3.2\%$, Unarmored $41.7 \pm 4.8\%$), more stranded drift logs (Armored 0.7 ± 0.2 , Unarmored 6.7 ± 0.5), and a wider log line (Armored 0.6 ± 0.1 m, Unarmored 5.2 ± 0.4 m). More wrack also accumulated on unarmored beaches, with this pattern holding true for all the measured components of algae, seagrass, and terrestrial plant material (visible by region in Fig. 4). All these differences except slope were significant

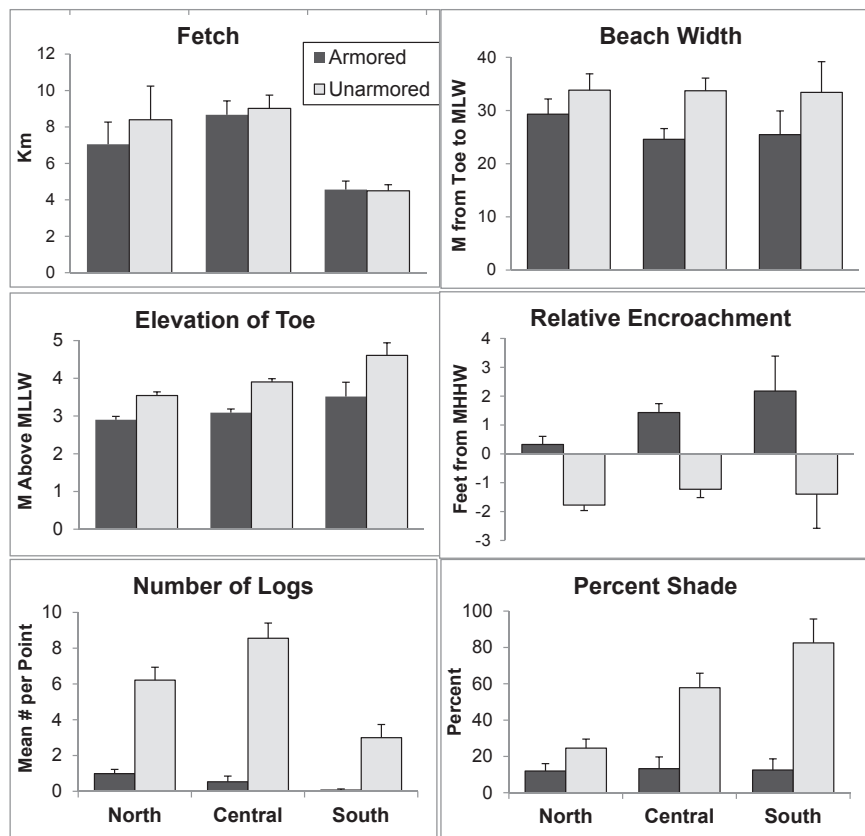


Fig. 3. Physical parameters measured at all beaches. Bars are means and one SE. Sample sizes as in Fig. 2.

in paired t-tests (p values < 0.01 , Table 1).

However, for the invertebrates found in the wrack, some of these patterns were not consistent with the more localized study of Heerhartz et al. (2015). Armored beaches had reduced numbers of amphipods and insects only in the central and south regions (Heerhartz et al., 2015); when the north beaches were included, neither of these paired t-tests was significant (Fig. 4, Table 1). The exceptions were numbers of Collembola, which varied highly among regions but overall were more common at unarmored beaches, and the relatively uncommon talitrid amphipod genus *Megalorchestia*, also more abundant at unarmored beaches (Fig. 4). Worms involved in decomposition of the wrack (oligochaetes and nematodes) showed no overall armoring effect (Fig. 4, Table 1).

Grain size distributions of sediment at the wrack line were generally consistent between pairs of sites (visible by region in Fig. 2), even though the “wrackline” sediments were usually sampled from lower elevations at armored beaches (with wrack stranded at the toe of the armoring). We found no differences in any sediment grain sizes in paired t-tests (p values > 0.15 , Table 1). In the mid shore (MLW), where sediments were collected at the identical elevation on armored and unarmored beaches, there was again no effect of armoring on grain sizes (Table 1, Suppl. Fig. 1).

3.3. Thresholds and cumulative impacts

We tested for the relative roles of armoring emplaced lower on the shore and of increasing amounts of armoring within drift cells by regressing RE and DCA against the suite of dependent variables (amounts of wrack of different kinds, counts of invertebrates in the wrackline, numbers of logs, etc.). These regressions generally had the form expected from the pairwise analyses, for example declines

in logs, wrack, and invertebrates occurred with larger encroachment of armoring on the beach, but few had r^2 values > 0.10 (data not shown). Often the scatterplots were ‘wedge-shaped’ (e.g., Fig. 5, Suppl. Fig. 3). For example, Fig. 5 shows that low-shore-armored beaches always had few logs or little wrack, whereas unarmored or high-shore-armored beaches had highly variable amounts. These plots thus were indicative of the large number of interdependent parameters causing variation in the measured shoreline variables, e.g., wrack abundance at the time of measurement was affected by many factors other than encroachment.

Based on the appearance of some scatterplots, we used segmented regression to test for thresholds in the number of logs on a beach in relation to relative encroachment (Fig. 5). Our analysis found that there was a breakpoint in the relationship at a relative encroachment of 1.44 feet (SE ± 1.37 ft), where the regression changed from a non-significant slope of -0.31 (± 0.70) to a significant slope of -1.34 (± 0.27) ($p < 0.0001$) (Fig. 5). In other words, beaches with armoring low on the shore had far fewer logs than expected based on the relationship between number of logs and RE for beaches where the armoring was farther up the shore. Thus RE = 1.44 ft constitutes a threshold of relative encroachment below which logs are virtually excluded from a beach. This model was compared to a simple linear regression of total logs against RE using AIC and r -squared values; these were almost identical, with segmented AIC at 723.6 ($r^2 = 0.26$) and simple regression at 722.2 ($r^2 = 0.25$). These comparisons suggest that both models are similar in their ability to describe the data, but in terms of data useful to managers, it is helpful to present the segmented model and threshold. Other scatterplots and segmented regressions suggested similar relationships for the amount of wrack (Suppl. Fig. 3) but were not significant.

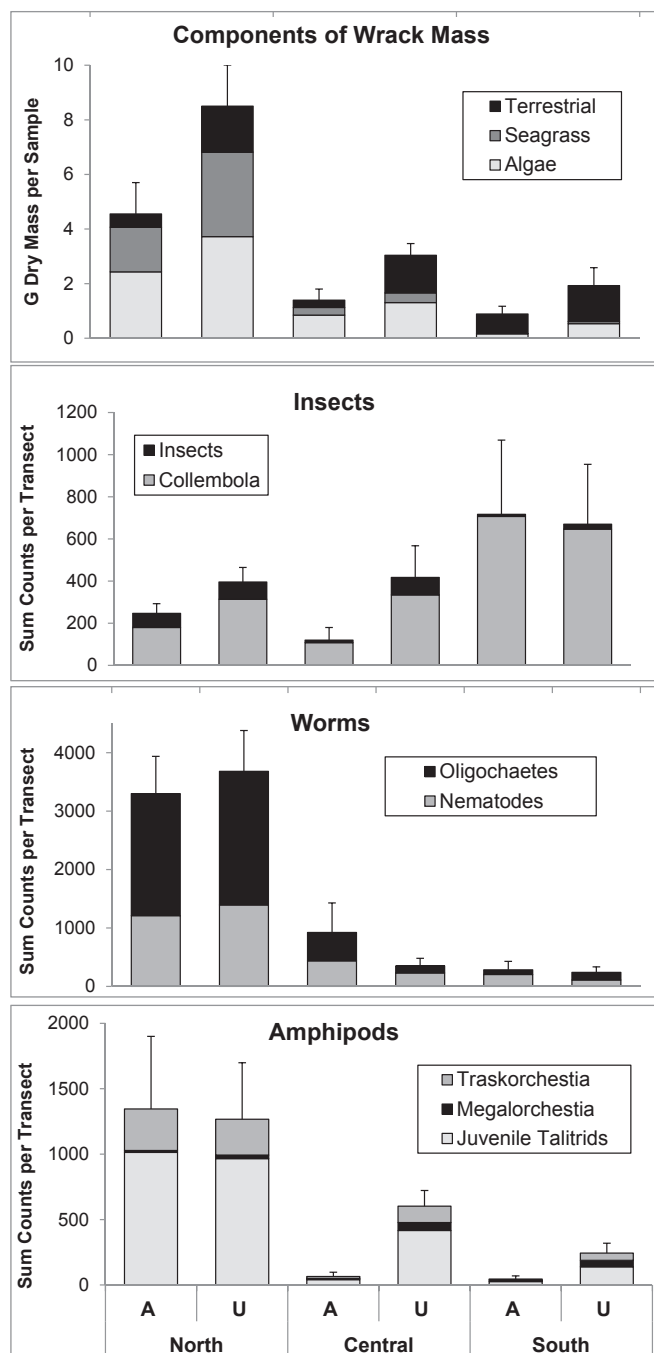


Fig. 4. Abundances of types of wrack and organisms in wrack cores by region and treatment (armored vs unarmored). Bars are means and one SE of the summed elements. North = 36 pairs of beaches, Central = 23 pairs, South = 6 pairs.

Our 65 pairs of sites varied greatly in the degree of armoring present (DCA) in the drift cells where they were located (Suppl. Fig. 2). Of particular interest at this larger spatial scale was testing our prediction that there would be an effect of alongshore extent of armoring on sediment grain sizes or beach slope, which showed no armoring signal at the local, paired *t*-test scale. Our mixed-effects regressions showed clear effects of DCA on a number of grain sizes (Table 1). Fig. 6 illustrates these patterns with DCA-extent binned (4 categories) so that the whole grain size spectrum can be shown at once. Regardless of their local armoring status, beaches in the more-extensively armored drift cells (“High”

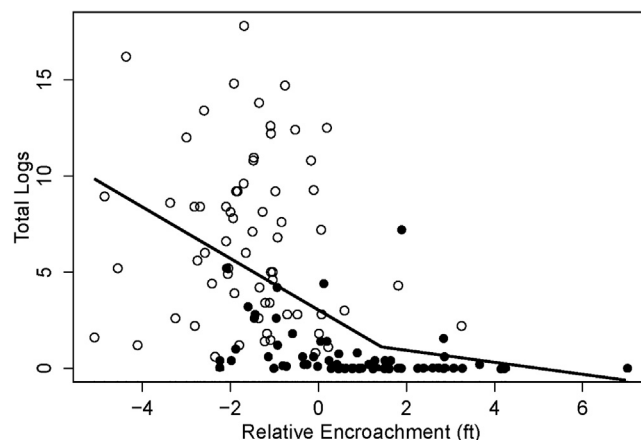


Fig. 5. A segmented regression of the number of logs per transect relative to encroachment of bluff or armoring below MHHW. Regression lines incorporate both unarmored beaches (open circles), and armored beaches (filled circles).

in Fig. 6) had significantly higher proportions of coarse sediments, especially very coarse gravel (32–64 mm), and significantly lower proportions of fine sand (125–250 μm) and medium sand (250–500 μm) (Table 1). Multivariate analyses testing the suite of all grain sizes together showed a highly significant relationship with DCA (1-way PERMANOVA, $p = 0.0001$). To be certain that these grain-size differences were not biased by the generally lower elevation of “wrackline” samples at armored beaches, we ran a simple linear model (without the Site term and thus not mixed-effects) on DCA versus grain sizes (arcsin sqrt transformed) using data from just the unarmored beaches (visible in Fig. 6). Even with the smaller sample sizes (half the *N* beaches), there was still a significant association of higher DCA with an increased fraction of very coarse gravel ($p = 0.0002$), and decreased medium sand ($p = 0.006$). Other grain sizes were not statistically related to armoring.

We also analyzed sediments from the mid-shore (MLW) at all beaches, although for this elevation we had less precise data on grain sizes (from estimates using quadrats in the field) (Fig. 6). Mixed-effects regressions showed no significant effects of DCA on any grain sizes at this lower elevation.

Because DCA varied with region (Suppl. Fig. 2), as did the proportions of different sediment sizes on the beaches (Fig. 2), we were concerned that the relationship between DCA and grain size might be biased, i.e. driven by some other independent variable that differed among regions. To address this, we examined the underlying geological material (categories in Fig. 2) of the bank or bluff in each drift cell and found that not surprisingly, DCA varied with bluff material – the most armoring occurred in drift cells dominated by loose sediment (that would presumably require more stabilizing), and the least armoring in bedrock areas. A 2-factor ANOVA on the proportion of very coarse gravel (the fraction with the strongest relationship to degree of armoring) with factors of underlying material (6 types) and DCA (4 levels, binned as in Fig. 6) showed that gravel was significantly associated with DCA ($p < 0.0001$), but not with underlying bluff material ($p = 0.21$), with no significant interaction ($p = 0.08$). Thus one interpretation of this analysis is that although underlying geological material in the bluff must ultimately affect the amount of gravel on the beach, the regional pattern is more closely related to the degree of armoring in the drift cell.

The slope of the upper beach also varied with DCA. This test was run with only 54 pairs of beaches (see Suppl. Methods). Beaches on more-armored drift cells (regardless of local armoring) had slightly

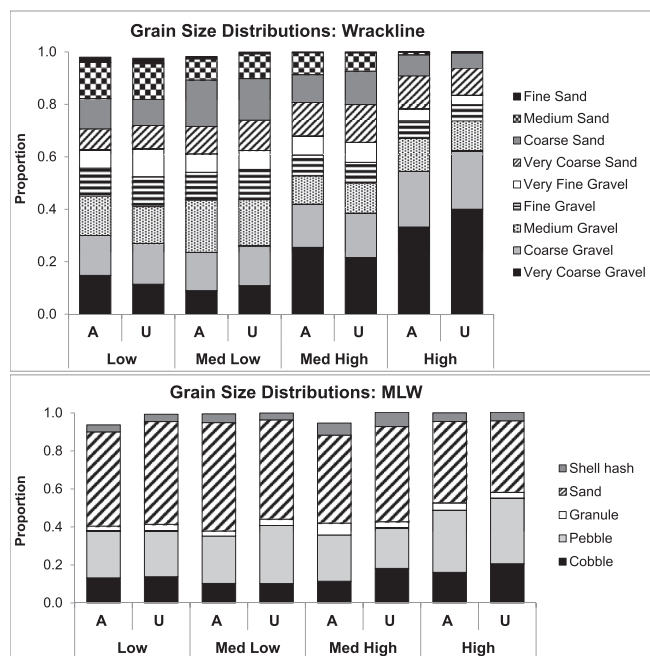


Fig. 6. Proportions of sediment grain sizes at the Wrack line (upper panel) and at Mean Low Water (lower panel) in drift cells with different degrees of armoring (Low DCA = 0–0.2 proportion armored, Medium Low = 0.2–0.5, Medium High = 0.5–0.8, and High = 0.8–1.0). We split these proportions somewhat unevenly to allow for similar site replication within each bin, and also to highlight the impacts of particularly low and particularly high amounts of armoring in the drift cell. Sediments from the Wrack line were dry-sieved in the lab; sediments at MLW were estimated in quadrats on the beach. Some of the MLW bars do not sum to 1.0 because of small amounts of hardpan or mud present. For each of the bars (A and U) in each DCA category, the N beaches = Low 20, Med Low 24, Med High 12, High 9.

but significantly steeper slopes than those in less-armored drift cells (Table 1, $p = 0.0028$, data not illustrated); mean slope was 10% at low-DCA beaches and 15% at high-DCA areas. Unexpectedly, relative encroachment had a small but significant ($p = 0.045$) effect in the opposite direction; beaches with greater encroachment of armoring were slightly flatter than those with less encroachment. This may relate to heavily-encroached beaches having scour in front of armoring, which would lead to a reduced near-armor slope (A.N. McBride pers. comm.).

The proportion of the drift cell armored was also directly or indirectly associated with several biological parameters. Mixed-effects regressions showed that DCA had a significant negative effect on some wrack mass parameters, and also on total numbers of wrack invertebrates and *Collembola* (Table 1).

4. Discussion

4.1. Local and regional effects

As was found in our previous sampling over a smaller geographic region (Sobocinski et al., 2010; Heerhartz et al., 2014, 2015), a variety of response variables, especially those associated with the upper shore, differed between paired armored and unarmored beaches across the southern part of the Salish Sea. Parameters locally reduced by armoring included width and shadiness of the beach, and log and wrack accumulation on the upper shore. Many of the invertebrate taxa that inhabit the wrack or live under logs were also less abundant with armoring. Most of these patterns were visible throughout our large study area even though there were substantial underlying regional differences. Northern beaches had more algal and seagrass wrack; the abundance of bedrock in

the north that supports large algal populations likely contributed to the available algal wrack mass, as did seagrass from very large seagrass beds in Padilla Bay and on large river deltas. The lesser encroachment of armoring in the north also presumably allowed more wrack to accumulate. Northern shorelines have been settled and altered more recently than the central region, and regulation of armoring elevation has become stricter with time. The northern sites also had lower overall proportions of their drift cells armored (DCA); this could be due to the greater awareness of shoreline impacts in this later-developed region, and/or to the larger proportion of bedrock in the drift cells reducing the need for shoreline stabilization.

For some biotic parameters there was an association with armoring either on local or broader spatial scales, while for others the regional, geomorphic, or other sources of variation obscured such potential patterns. The larger masses of wrack (especially algal) in the north were occupied by higher densities of amphipods, nematodes, and oligochaetes, while more insects were associated with larger amounts of terrestrial wrack. Somewhat surprisingly, numbers of insects showed no relationship with the amount of overhanging vegetation (percent shade). *Collembolans* showed a regional pattern driven by high densities in a few southern sites, but did not correlate with any type of wrack.

The very large regional variation in talitrid amphipod abundances and their inconsistent response to armoring likely relate to unexplored behavioral responses of these important wrack inhabitants. *Megalorchestia* was the only amphipod taxon to show a consistent sensitivity to armoring across regions (seen also by Dugan et al., 2003), and to respond significantly to relative encroachment of armoring on the beach. This genus tends to burrow in sand high on the shore (Pelletier et al., 2011; Dugan et al., 2013) and to be sensitive to sediment textures (Viola et al., 2013). *Traskorchestia*, in contrast (likely including most of the “juvenile talitrids” counted) burrows less and is more likely to move around the beach, shelter in wrack, and survive submersion for extended periods (Koch, 1989). They may concentrate in lower wrack when the tide is out but (in the absence of armoring) move to higher elevations to avoid being submerged at high tide. Our wrack samples were taken at variable times relative to the tidal level and under many different weather conditions, and we did not track age or field-moisture content of the wrack; such static sampling may have affected our ability to accurately measure these highly mobile organisms.

Our tests of armoring-associated effects lower on the shore were inconclusive. Sediment analyses at Mean Low Water showed no differences between paired beaches. We also tested for a biotic response to hypothesized changes in sediment texture in the abundance or species richness of juvenile clams, but found no patterns (Dethier, unpubl.). Our mid-shore samples were physically removed from armoring by an average of ~30 m across the beach face, meaning that direct armor effects such as from wave reflection were unlikely. Long-term indirect effects such as gradual loss of finer sediments from the beach face could impact the mid shore but were not detected in our data.

4.2. Broader-scale patterns

For some parameters that we hypothesized would be affected by armoring, the local, paired-beach scale was mismatched to the larger-scale processes that likely control these parameters. This was particularly true for geomorphological parameters such as beach profiles (e.g., slope). One likely explanation is that armoring impacts “smear” among members of a sampled pair; for example, if an unarmored beach has sediment naturally eroding onto the shore, some of the sediment is likely to get carried to the nearby armored beach even if that beach is, on average, “updrift”. Conversely,

changes to wave energies and sand supply caused by a large stretch of armoring could impact sediment processes on a nearby unarmored beach. Important contextual parameters such as age of the armoring often could not be ascertained due to poor historical record keeping. Even with our large sample sizes we had insufficient replication to test hypotheses related to different types of armoring, for example vertical concrete versus sloped riprap.

Our ability to test for relationships between armoring and various response parameters was also compromised by the interactions between space and time, and geomorphology and biology. Testing hypotheses about armoring effects on sediment grain sizes and beach slopes, for example, was not possible until we had data encompassing drift cells with a large range of armoring – and for those conditions to have been present for long enough that finer sediments had time to gradually winnow out of armored beaches. In addition, there are potential geomorphic factors not considered in our analysis, and a definitive cause and effect relationship is yet to be determined. Differences in upper-shore sediment grain sizes were not detected at the paired beach scale but were significant when examined at a large geographic scale. We interpret this regional-scale analysis to suggest that there is a reduction of sediment input resulting from armoring large proportions of drift cells. In turn, this appears to have long-term, cumulative geomorphological effects, such that proportions of fine sediments are reduced, leaving behind coarser ones. Even at this scale, cumulative armoring effects were relatively subtle, and statistically significant only for the grain sizes at the ends of the size spectrum. As in sandy beach ecosystems (Berry et al., 2014), this cumulative effect may reduce the ecological resilience of Puget Sound beaches, where sediment supply is already episodic. Grain sizes then affect numerous biological parameters such as suitability for spawning surf smelt (Penttilä, 2007), and the numbers and types of invertebrates in the wrack zone and elsewhere on the beach (e.g., Viola et al., 2013; Heerhartz et al., 2015). The predominance of wedge-shaped plots in our analyses (e.g., Fig. 5, Suppl. Fig. 3) attests to the large numbers of factors affecting all of our measured parameters; abundances of wrack invertebrates, for example, are likely influenced not only by the amount and type of wrack itself, but the elevation of the wrack on the shore, the porosity of the sediment, and the region.

Lower elevations of shoreline armoring, calculated as relative encroachment over the beach, showed a clear negative association with most beach parameters at both local and larger spatial scales. For some of these parameters, such as number of accumulated logs, segmented regressions demonstrated that there was a distinct threshold elevation below which armoring seemed to have dramatic impacts; a similar pattern was seen in total wrack mass. In each case, the threshold was ca. 1–2 vertical feet below MHHW. Armoring below this elevation, which is no longer permitted for new construction in Washington State, was associated with substantially greater differences in measured parameters than armoring higher on the beach. This elevation thus may constitute a “utility threshold” (Samhouri et al., 2010) to be targeted by management actions or restoration to obtain the most significant beneficial changes in ecosystem functions.

Our study has documented both obvious and more subtle effects of armoring on Salish Sea shorelines, including those detectable at diverse spatial and temporal scales as summarized in Fig. 7. Some differences, such as reduced wrack accumulation on armored beaches, could be seen at local spatial scales (paired beaches) and probably would be observable within days of armor installation. Wrack is delivered to beaches on almost every high tide, and stranding of this material is clearly reduced in front of armoring, especially when the structure is relatively low on the shore. At the other end of the spatial and temporal spectrum, the hypothesized

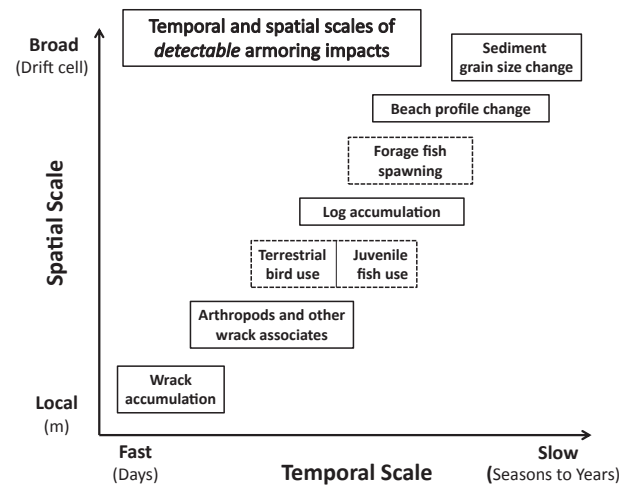


Fig. 7. Temporal and spatial scales at which different types of impacts of armoring can be detected. Impacts in dashed boxes are hypothesized but not thoroughly demonstrated. Speed of responses following restoration (armor removal) may follow the same temporal and spatial patterns.

geomorphic responses such as slope and grain size distributions were not visible at the paired-beach scale, where they are obscured by the numerous processes that impact local beaches on both short and long-term time scales. These responses likely require both a large extent of armoring and substantial time of sediment reworking to create a signal that is detectable over the natural geomorphic variability.

The positions of responses related to armoring on the space and time axes in Fig. 7 are only approximate, and some are context-dependent or only weakly supported. Forage fish spawning, placed at intermediate scales of space and time (Fig. 7), could actually be affected rapidly and locally if armoring covers spawning beaches, or slowly and only at very broad scales in the case of gradual population decline due to large-scale loss of appropriate sand grains for egg attachment. Our previous studies have suggested that shoreline armoring has some effect on abundance and behavior of terrestrial birds (Heerhartz, 2013) and juvenile salmon (Toft et al., 2013; Heerhartz and Toft, 2015), but since these organisms are highly mobile and use large stretches of shoreline, distinguishing population responses to armoring is very difficult. Mobile organisms in general present similar problems with regard to conservation (Runge et al., 2014; Rolet et al., 2015). Juvenile salmon migrating alongshore on their way to the ocean encounter the entire spectrum of armored and natural beaches, so attributing effects on diet, fitness, and survival to one factor such as armoring requires manipulative studies such as holding fish in a small area to measure local feeding rates (Toft et al., 2007, 2013). Armoring located in juvenile fish habitats likely changes the character of the wrack and invertebrates therein, as well as overhanging vegetation and insects, all of which may alter behavior or feeding of the fish (Duffy et al., 2010).

While our study did not directly address restoration efforts, our observations combined with site-specific data from armor-removal projects within the Salish Sea (e.g., Toft et al., 2014) suggest that many of the armoring impacts we observed may be reversible. In some cases, beach functions may be at least partially restored by modification of shore structures and may not require complete removal (Berry et al., 2013; Nordstrom, 2014). Our data suggest that moving armoring higher on the shore may restore some ecological functions while still protecting infrastructure. Recovery of beach characteristics and functions may follow the same temporal patterns illustrated in Fig. 7. Wrack can return quickly when armoring

has been removed and there is physical space on the upper shore for it to accumulate; colonization by arthropods and other decomposers is likely to follow quickly if there are local sources of colonists. Terrestrial birds will probably visit restored spaces quickly, once invertebrate food becomes available, and rapid juvenile salmonid use of a restored beach has already been demonstrated at a site in Puget Sound (Toft et al., 2013). If sediments are appropriate for spawning forage fish, or if armoring removal is accompanied by beach nourishment with appropriate sediment, then egg-laying may occur during the next spawning season; but even spawning on appropriate sediment is unpredictable in space and time (e.g., surf smelt: Penttilä, 2007). These biotic changes may happen on relatively short temporal scales, for example seasonally, rather than taking years over which some armoring impacts may develop. Recovery of geomorphic parameters such as beach shape and pre-armoring sediment grain sizes will depend on sediment sources, whether from updrift, upslope, or artificial delivery.

Multiscale spatial and temporal impacts of armoring are also likely to be seen on open-coast sandy beaches or other systems such as armored estuarine marshes. On sandy beaches, the effects of armoring on wrack accumulation and on other trophic levels have been well studied (e.g., Dugan et al., 2008). A relatively unique feature of Pacific Northwest beaches is extensive windrows of beach logs, but these may have some parallel in marsh vegetation that can only develop when armoring is absent or very high on the shoreline (Bozek and Burdick, 2005). As in the Salish Sea, on both sandy beaches and marshes the direction of drift (e.g., longshore currents, estuarine outflow) should affect the location and spatial scale of armoring impacts because the accumulation of both sediments and organic matter are important in those ecosystems. Geomorphic effects of armoring on open beaches or marshes are similarly likely to be slow or highly episodic, depending on types of sediment sources and their proximity, as well as variations in wave energy. The degree to which sediment sources are locked up, either by extensive alongshore armoring or by dams on riverine sources, may have cumulative effects; investigating possible thresholds in the interactions between sediment budgets and marsh health or beach geomorphology would be useful but temporally challenging.

In conclusion, our broad study covering a wide range of beaches and drift cells with different types, elevations, and degrees of armoring has allowed us to quantify hitherto elusive patterns of impacts of armoring on beach processes. Armoring alters beach conditions from the local to the sound-wide scale, with its effects likely emerging on time scales that range from immediate to years or decades. In the Salish Sea, there is great variation among beaches and regions in upper-shore parameters such as logs, wrack, and invertebrates, but in many cases an armoring signal overrides these complex processes, and broad associations are visible. The changes in the geomorphic character of beaches towards steeper and coarser conditions appear to be slow and subtle, but ultimately can ramify to impact beach functions, including supporting forage fish use and altering the infauna. The elevation of armoring on the shore clearly does make a difference to numerous functional characteristics, and at least in the case of log accumulation, there is a threshold for this effect. Our data also suggest that adding more armoring within drift cells may lead to cumulative impacts on several geomorphic and biological parameters. The mechanisms that might cause these cumulative effects, for example starving the beaches of sediment supply or altering local hydrodynamics, require further investigation.

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Appendix A. Supplementary data

Supplementary data related to this article can be found at <http://dx.doi.org/10.1016/j.ecss.2016.03.033>.

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Public Comment Summary: City of Anacortes SMP Periodic Update

2nd Draft Public Comment – City Council Review – June 2022

WRITTEN COMMENTS RECEIVED

Comment Number	Comment Topic and Section Number (Citation)	Commenter	Comment	Local Government Response and Rationale
1	Sea Level Rise	Loring Advising	We request that the City take clear steps to ensure that future development and redevelopment along City shorelines is constructed to avoid impacts from sea level rise.	The City has added policies and one development regulation recognizing the impacts sea level rise has towards future development, added after these comments were received. A summary of these changes can be found in the response to comments, June 2022 revision.
2	Vegetation Conservation (Section 6.5)	Loring Advising	The SMP must be revised to conserve vegetation consistent with the Shoreline Master Program guidelines to protect adequate shoreline vegetation.	<u>Change not recommended:</u> The proposed vegetation conservation standards work in-tandem with existing shoreline buffer and setback guidelines within the SMP, outlined within Sections 5.7 – 5.11 (AMC 19.72-340-.360) and Table 5.2 Shoreline Development Standards Matrix (AMC Table 19.72.365(B)). Proposed changes to the vegetation conservation standards prescribed under SMP 6.5 (AMC 19.72.445) add increased protection for trees along the shoreline and are consistent with the principles and standards provided within WAC 173-26-221(5), for protection of shoreline vegetation and no-net loss of shoreline ecological function.
3	Critical Areas Ordinance Integration	Loring Advising	In integrating the Critical Areas Ordinance Update, the Growth Management Hearings Board’s recent determination that 50-foot riparian buffers conflict with Best Available Science.	<u>Change not recommended:</u> The City acknowledges that the Washington Department of Fish and Wildlife (WDFW) has issued new management recommendations for riparian

Comment Number	Comment Topic and Section Number (Citation)	Commenter	Comment	Local Government Response and Rationale
			WDFW created a statewide interactive map of 200-year site-potential tree height, which indicates that RMZs of approximately 91 feet to 193 feet would apply in Anacortes. We recommend establishing a scientifically-supported shoreline riparian management zone equal to one site potential tree height and strictly limiting vegetation impacts within that buffer consistent with the most current scientific recommendations from WDFW. The most current science does not support the draft Update.	management zones. Although the City is not proposing to use site potential tree height as a determining factor for shoreline buffers, the City has evaluated ecological functions and existing/proposed land uses as part of the City's comprehensive SMP update. The City used this information to designate shoreline environments and develop shoreline buffers and setbacks consistent with science and the SMP guidelines.
4	Vegetation Conservation (Section 6.5)	Loring Advising	The Updated SMP conflicts with the WDFW guidelines and best available science—specifically related to allowing clearing/grading of shorelines as close as 15 ft. from the OHWM (DR-6.5.8, DR-6.5.9). For example, a proposal for development activity must include a landscaping plan to protect existing native vegetation within only 15 feet of the OHWM. DR-6.5.8. Further, water-dependent uses and public access trails are exempt from even those inadequate protections, though they require a landscaping/mitigation plan aimed at providing equal or greater functions. Starting 15 feet from OHWM, the entire parcel may be cleared and graded subject to a landscaping plan. For example, any “alteration of the natural landscape” may occur in	<u>Change not recommended:</u> Shoreline setbacks prescribed within Table 5.2 (AMC 19.72.365(B)) range from 25-feet for Urban, Urban Maritime, and the Shoreline Residential within Burrow's Bay to 100-feet for Conservancy and Natural Shoreline Environment Designations for non-water dependent development. As a result, areas reserved for native vegetation where development is otherwise prohibited extends to at least these the extent of these setbacks. Further, within shoreline jurisdiction (200-feet from OHWM) all clearing and grading activities must be limited to the minimum necessary for intended development (DR-6.5.3) (AMC 19.72.445(B)(3)). The Shoreline Management Act allows in limited circumstances water dependent uses and public access when in conflict with natural conditions of Shorelines of the State, per WAC 173-26-176. Only

Comment Number	Comment Topic and Section Number (Citation)	Commenter	Comment	Local Government Response and Rationale
			conjunction with “[l]andscaping or maintenance associated with an existing legal use or new permitted shoreline use or development.” DR-6.5.2.a. While a developer must obtain approval of a detailed landscape plan for revegetation (DR-6.5.7), with the exception of the first 15 feet from the OHWM, the plan can propose to replace the cleared vegetation with lawn and other nonnative plants. DR-6.5.6 (“discouraging” lawns and “preferring” native plants, but requiring neither); DR 6.5.8 While the SMP includes requirements for the size and coverage of shrubs and trees when planted, it does not actually require the planting of shrubs and trees outside of the first 15 feet from the OHWM. DR-6.5.7.f, .7.g.	when supported through the public access or economic development elements of the SMP can such developments be considered for authorization, consistent with remaining SMP provisions. Public Access Policy 4.5.14 (Policy S-4.13), for example, documents the intent to develop a waterfront trail connecting Washington Park to Downtown and the Tommy Thompson Trail. Further, Policy 4.3.8 (Policy S-2.8) prioritizes water dependent and water related development so long as it includes restoration of ecological functions. Both public access and water dependent development actions are further supported by WAC 173-26-176(3)(a): <i>"Alterations of the natural condition of the shorelines of the state, in those limited instances when authorized, shall be given priority for single-family residences and their appurtenant structures, ports, shoreline recreational uses including but not limited to parks, marinas, piers, and other improvements facilitating public access to shorelines of the state, industrial and commercial developments which are particularly dependent on their location on or use of the shorelines of the state and other development that will provide an opportunity for substantial numbers of the people to enjoy the shorelines of the state."</i> Regarding the reference and protection of the first 15-feet of shoreline, as prescribed by DR 6.5.8 (AMC 19.72.445(B)(8)), the net benefit and ecological lift is greatest when enhancing the shoreline closest to the water’s edge. Planting at the water’s edge

Comment Number	Comment Topic and Section Number (Citation)	Commenter	Comment	Local Government Response and Rationale
				encourages overwater hanging vegetation, a critical component to provide suitable habitat for fish by providing overwater shade, cover, and allochthonous input of detritus and insects to improve food sources. An applicant must demonstrate that both the first 15-feet from the OHWM and the shoreline buffer and setback are avoided as a first preference. Regarding re-vegetation in instances where native species aren't used, a compelling case for utilizing lawn would be within a few feet of a proposed structure for maintenance of that structure. It wouldn't be feasible to have dense, native vegetation up to the building's edge in this scenario. Regarding native vegetation replacement/enhancement, the square footage is determined by amount of impact proposed and its location, not relegated to only within 15-feet of the shoreline. Further, if no native vegetation exists along the shoreline or the site is degraded for development in the Shoreline Residential Shoreline Environment Designation, 15% of the total site must be replanted with native vegetation, per DR 5.9.12 (AMC 19.72.350(D)(4)(b)).
5	Vegetation Conservation (Section 6.5)	Loring Advising	Within the 15-foot distance, landowners can obtain a clearing and grading permit without a landscaping plan to remove 25% of a tree's crown, and 25% of its limbs every five years, eventually allowing the removal of all of its branches.	<u>Change not recommended:</u> Every time a clearing and grading permit is submitted to conduct tree trimming within shoreline jurisdiction, the applicant must demonstrate 75% of a tree's original crown remains after the activity is concluded,

Comment Number	Comment Topic and Section Number (Citation)	Commenter	Comment	Local Government Response and Rationale
				per DR-6.5.9(b) (AMC 19.72.445(B)(9)(b)). Further, the applicant will need to demonstrate the trimming activity is for view preservation, not creation, DR-6.5.9(b) (AMC 19.75.445(B)(9)(d)).
6	Vegetation Conservation (Section 6.5)	Loring Advising	In addition, modification of vegetation can occur in association with a legal, nonconforming use in association with the no net loss criteria, which allows for vegetation removal subject to attempts to compensate for lost function. DR-6.5.2.c.	<u>Change not recommended:</u> Further modification of a legal nonconforming use would not be able to expand or re-locate over existing conditions without conforming to the SMP, per SMP 3.9 – Nonconforming Uses (AMC 19.72.250).
7	Vegetation Conservation (Section 6.5)	Loring Advising	The only limitation on the extent of clearing and grading of shoreline vegetation is the extent of the “intended development,” which could be the entire parcel. DR-6.5.3.	<u>Change not recommended:</u> Area made available to development are also constrained by shoreline setbacks and buffers, impervious surface maximums for residential development within Conservancy and Shoreline Residential Shoreline Environment Designations (DR-5.8.6 and DR-5.9.10, respectively) and demonstration by the applicant that clearing and grading be the minimum necessary for development.
8	Vegetation Conservation (Section 6.5)	Loring Advising	Last, there is no limitation on the frequency at which a property may be cleared and “landscaped,” so long as the landowner provides a landscaping plan each time.	<u>Change not recommended:</u> Restrictions and conditions to an approved landscape plan must be recorded on a revised Notice on Title, per DR-6.5.8 (AMC 19.72.445(B)(7)). These areas are then protected from further development or modification, thereby reducing the area for future development expansion.
9	Vegetation Conservation (Section 6.5)	Loring Advising	Further, the landscaping plan need not require replacement of the amount of vegetation removed. For new development, replanting need not extend beyond 50% of the shoreline.	<u>Change not recommended:</u> DR-6.5.8 (AMC 19.72.445(B)(8)) specifies that planting areas must provide equal to or greater environmental

Comment Number	Comment Topic and Section Number (Citation)	Commenter	Comment	Local Government Response and Rationale
			DR- 6.5.8.a. For redevelopment, planting need only extend along 25% of the shoreline. Id. And planting areas can occur in small, 100-square-foot islands that measure 10 feet by 10 feet. Id.	function than already exists. An example of this would be development in shoreline jurisdiction, yet outside the shoreline buffer or setback where the planting requirement within the first 15-feet of shoreline would exceed the impact proposed if mitigated at a 1:1 ratio. Independent of development, if shoreline vegetation within 15-feet of the OHWM is destroyed or significantly degraded, it shall be replaced per DR-6.5.8 (AMC 19.72.445(B)(8)). This finding is consistent with the SMP Inventory and Characterization Report, per SMP Comprehensive Update adoption date (October 4, 2010).
10	D. Dock and Buoy Shading of Critical Areas Like Seagrass and Kelp (Section 9.5)	Loring Advising	The SMP verbiage in this section is not consistent with WDFW requirements or BAS for spacing between submerged aquatic vegetation. Recommended revisions: Docks: <u>Policy 9.5.5.e. Designed and constructed to avoid shading submerged underwater vegetation like seagrass and kelp.</u> <u>DR 9.5.5.e. avoid shading of seagrass and kelp by being located at least 25 feet (measured horizontally from the nearest edge of the structure) and four vertical feet away from seagrass and kelp beds (measured at extreme low water).</u> Mooring Buoys:	<u>Change not recommended:</u> Standards for critical saltwater habitats, including submerged aquatic vegetation, is addressed within SMP Section 6.7 – Fish and Wildlife Habitat Conservation Areas (AMC 19.72.435(B)), specifically DR-6.7.1 (AMC 19.72.435(B)(2)(a)) and DR-6.7.6 (AMC 19.72.435(B)(2)(f)). Submerged aquatic vegetation includes kelp beds and eelgrass beds. These development regulations include both avoidance and development buffer criteria for in-water development such as docks and mooring buoys. DR-6.7.1, for example speaks to restrictions on impacting critical saltwater habitats, shown below. <u>DR-6.7.1 (AMC 19.72.435(B)(2)(a) Water-dependent development and uses, including marinas, docks, piers, mooring areas, underwater parks, utility crossings, and shoreline modifications, must not intrude into or be built over critical saltwater habitat</u>

Comment Number	Comment Topic and Section Number (Citation)	Commenter	Comment	Local Government Response and Rationale
			<u>DR-9.9.3.g. Buoys must be located at least 25 feet (measured horizontally from the nearest edge of the structure) and four vertical feet away from seagrass and kelp beds (measured at extreme low water).</u>	unless the applicant can show that all of the following criteria can be met: a. The use preference listing in RCW 90.58.020 for uses in Shoreline of Statewide Significance must be adhered to. b. The public's need for such a structure is clearly demonstrated and an alternative alignment or location on the applicant's property that would avoid impacts to critical saltwater habitats is not feasible or would result in unreasonable and disproportionate cost to accomplish the same general purpose. An alternatives analysis will be required for any non-exempt project proposed within FWHCAs. The analysis should include in part, shoreline bathymetry, shoreline features at the site, and substrate composition. c. The project is consistent with the state's interest in resource protection and species recovery. d. Impacts to critical saltwater habitat functions are mitigated to result in equal or better ecological function. DR-6.7.6 (AMC 19.72.435(B)(2)(f) further puts the burden of proof on the applicant and their licensed professional in determining buffer requirements for Fish and Wildlife Habitat Conservation Areas via a habitat management plan, where eelgrass and kelp fall are a subsection of.

Comment Number	Comment Topic and Section Number (Citation)	Commenter	Comment	Local Government Response and Rationale
11	Shoreline Stabilization (Section 9.11)	Loring Advising	The best available science dictates that the SMP Update be revised to strictly limit the construction of structural modifications and their associated vegetation removal and geological impacts. Recommended changes to Policy 9.11.2, 9.11.4, 9.11.11, DR-9.11.1, and DR-9.11.4. Policy 9.11.2: Discourage <u>Prevent</u> new development requiring structural shoreline stabilization. Policy 9.11.4. Allow structure stabilization methods only: a. After a determination is made by a qualified professional that nonstructural methods like building setbacks, relocation of the structure to be protected, and groundwater management, will not prevent significant damage to existing inhabited structures with experience and proven success installing non-structural bioengineered shoreline stabilization techniques that soft armoring will not succeed or is not suitable due to specific site considerations. b. Where it has been demonstrated to be necessary to support or protect a legally established, inhabited structure or ongoing shoreline use that is in danger of loss or substantial damage, or when necessary for reconfiguration of the shoreline for mitigation or enhancement purposes, or where necessary to the operation and location of a new, single-	<u>Change not recommended:</u> The City has introduced a number of policies and one regulation regarding shoreline structural modifications in response to Skagit Land Trust comments during in the SMP 2nd Draft Public Comment Period from February 16th – March 9th, 2022. Here, the applicant must take into account sea level rise for the life of the proposed structure when proposing a structural modification/stabilization, such as the edit reflected under DR-9.11.6 (AMC 19.72.660(B)(6)): <i>New development, including creation of new parcels, that would require future shoreline stabilization during the life of the structure <u>considering sea level rise projections</u> is prohibited except where no alternative locations are available, and no net loss of ecological functions will result as demonstrated through a geotechnical analysis.</i> Further, proposed language for Policy 4.8.8(d) (Policy S-7.8(d)) provides a framework for addressing shoreline development and redevelopment in-sequence: d. <u>Encourage shoreline development and redevelopment to consider addressing sea level rise in the following preferential order: avoid, retreat, protect, and accommodate.</u> Regarding the request to prevent structural shoreline stabilization altogether for property protection, Per RCW 36.70A.370 of the Growth Management Act – Protection of private property, no regulations shall completely prevent development of private property.

Comment Number	Comment Topic and Section Number (Citation)	Commenter	Comment	Local Government Response and Rationale
			family or multifamily structure, or a water-dependent, water-related, or water-enjoyment use consistent with this Master Program. they will not be permitted for the indirect purpose of creating land by filling. Policy 9.11.11 Shoreline stabilization measures should be allowed only where demonstrated to be necessary to support or protect <u>prevent the elimination of existing</u> permitted shoreline uses or where an existing structure is in imminent danger. Policy 9.11.13. New development, including creation of new parcels, that would require shoreline stabilization is prohibited, unless needed to protect allowed uses where no alternative locations are available and no net loss of ecological functions will result. DR-9.11.1. New development, including the subdivision of land, must not create lots which require future shoreline stabilization to the extent feasible. If necessary, a geotechnical report must be required. DR-9.11.4. d. The shoreline stabilization measure will mitigate adverse impacts to the extent feasible. ...	The Washington State Constitution further supports that, 'Private property shall not be taken for public use without just compensation having been made...'. As such, no change will be made to Policies 9.11.2, 9.11.4, 9.11.11, 9.11.13, DR-9.11.1 and DR-9.11.4. (Policies S-52.2, S-52.4, S-52.11, S-52.13 and AMC Regarding proposed additions to Section 9.11 of Shoreline Stabilization (AMC 19.72.660(B)), any development proposal must first demonstrate bioengineering or other soft structural stabilization technique isn't feasible, as well as the proposal's potential impacts to feeder bluffs and forage fish spawning habitat as part of a required development proposal, per DR-9.11.5 (AMC 19.72.660(B)(5). Further, shoreline stabilization must be located, designed and constructed to minimize impacts and achieve a no-net loss of shoreline function, per DR-9.11.7 (AMC 19.72.660(B)(9): <i>Minimize alterations of the natural shoreline and shoreline processes including sediment transport.</i> <i>Minimize damage to ecological functions including wildlife, fish and shellfish habitats.</i> <i>Provide for the long term multiple use of shoreline resources and public access to public shorelines. In the design of publicly financed or subsidized works, consideration must be given to providing pedestrian access to shorelines for low</i>

Comment Number	Comment Topic and Section Number (Citation)	Commenter	Comment	Local Government Response and Rationale
			f. <u>The shoreline stabilization measure will not significantly disrupt feeder bluff contributions of beach material or sediment transport.</u> g. <u>The shoreline stabilization measure will not adversely impact forage fish spawning habitat such as surf smelt or Pacific sand lance spawning beaches.</u>	<i>intensity outdoor recreation.</i> d. <i>The shoreline defense structure must mitigate adverse impacts to the extent feasible, blend with the surroundings, and not distract from the aesthetic qualities of the shoreline.</i> e. <i>Achieve the policy of no net loss of ecological functions necessary to sustain shoreline resources.</i>
12	Permit Tracking	Loring Advising	We encourage the City to include in the ordinance that adopts the SMP update a statement that the tracking system will be established by the date that the SMP update becomes effective.	<u>Change not recommended:</u> Monitoring of no net loss of ecological functions is not required at this time as part of the comprehensive and periodic updates of the City's SMP. The City does anticipate that future comprehensive updates to the SMP will include an evaluation of no net loss compared to the baseline condition established during the 2010 update. While the City has not created an established tracking mechanism, the City monitors and records permit activity and will continue to do so following adoption of the SMP. Additionally, the City will track performance monitoring of mitigation projects through receipt of annual monitoring reports from the applicant.
13	No Net Loss	Loring Advising	Revise the proposed definition for "no net loss" so that is a true definition of the substance material versus the permit process. Based on the Ecology SMP handbook we propose the following definition: "No net loss means that new development does not result in new	The City will consider amending the no-net loss definition to the following: <i>No Net Loss of ecological functions is the maintenance of existing shoreline ecological processes and functions at the level that existed at the time of approval of the</i>

Comment Number	Comment Topic and Section Number (Citation)	Commenter	Comment	Local Government Response and Rationale
			impacts to shoreline ecological functions and that the existing condition of shoreline ecological functions therefore remains the same at the site-specific and landscape scale.”	<i>major update to the shoreline master program, adopted October 4, 2010 and reflected in the shoreline inventory and characterization report dated October 2009, or for a development project, the conditions that existed prior to initiation of use or alterations of the shoreline that result in adverse impacts on ecological processes and functions.</i>



City of Anacortes Shoreline Master Program Periodic Update

City Council
Draft 3 Discussion | September 12,



SMP Review History thus far

- SMP Open Houses – October 30th, 2019, March 2020
- August 26th, October 14th 2020 – Planning Commission Study sessions
- Joint Ecology/City public hearing & comment period –Nov. 18 – Dec. 18, 2020
 - *December 9th, joint public hearing*
- Submittal to Ecology for Initial Determination – April 2021
 - *Includes response to comments*
- Received Ecology's Initial Determination of Concurrence October 2021
- 2nd Draft Public Comment Period – Feb 16 – March 9, 2022
- Planning Commission Recommendation – April 13, 2022
- City Council Introduction – May 16, 2022
- City Council Follow up meeting – May 23, 2022

Tonight's topics

- AMC 19.72 – Shoreline Regulations – City Council Discussion Draft (8/9/22)
- Shoreline Element – Comprehensive Plan – City Council Discussion Draft (8/31/22)
- Evergreen Islands (Loring Advising) Comments Response Matrix (June 2022)
- Shoreline Concept



Response To SMP Public Comments (June 2022)

#1 – Loring Advising (Sea Level Rise)

We request that the City take clear steps to ensure that future development and redevelopment along City shorelines is constructed to avoid impacts from sea level rise.	The City has added policies and one development regulation recognizing the impacts sea level rise has towards future development, added after these comments were received. A summary of these changes can be found in the response to comments, June 2022 revision.
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- Sea level rise addressed added via regulation (AMC 19.72.660 B)(6) and the Restoration & Adaptive Management Element of the Comprehensive Plan (Policy S-7.8).

Response To SMP Public Comments (June 2022)

#1 – Loring Advising (Sea Level Rise) – AMC 19.72.660(B)(6):

6. New development, including creation of new parcels, that would require future shoreline stabilization during the life of the structure considering sea level rise projections is prohibited except where no alternative locations are available and no net loss of ecological functions will result as demonstrated through a geotechnical analysis.

- Also indirectly addresses Loring Advising – Comment #11 (pdf page 8).
- Shoreline stabilization must also incorporate sea level rise into the life of the structure.
 - *Increases burden of proof for applicant in protecting new parcels/structures.*

Response To SMP Public Comments (June 2022)

- Restoration and Adaptive Management Element recommended addition in Comprehensive Plan – Shoreline Element.
- Policy S-7.8(d) also addresses Comment #11 (pdf page 8)

~~Policy 4.8.8~~ Policy S-7.8. The City acknowledges sea level rise is a direct effect stemming from climate change factors and should be considered in future planning. The City should:

- Consider establishing sea level rise projections based on best available science.
- Revisit sea level rise projections every eight years consistent with the SMP periodic update cycle and revise if necessary.
- Recognize and monitor the potential effects of climate change as additional scientific information becomes available.
- Encourage shoreline development and redevelopment to consider addressing sea level rise in the following preferential order: avoid, retreat, protect, and accommodate.
- Continue to evaluate sea level rise impacts and climate change factors, consistent with best available science, in future policy and regulatory amendments.
- Consider sea level rise impacts when planning for new development for the life cycle of the improvements.

Response To SMP Public Comments (June 2022)

- #2 – Loring Advising (Vegetation Conservation)

The SMP must be revised to conserve vegetation consistent with the Shoreline Master Program guidelines to protect adequate shoreline vegetation.	<u>Change not recommended:</u> The proposed vegetation conservation standards work in-tandem with existing shoreline buffer and setback guidelines within the SMP, outlined within Sections 5.7 – 5.11 (AMC 19.72-340-.360) and Table 5.2 Shoreline Development Standards Matrix (Table 19.72.365(B)). Proposed changes to the vegetation conservation standards prescribed under SMP 6.5 (19.72.445) add increased protection for trees along the shoreline and are consistent with the principles and standards provided within WAC 173-26-221(5), for protection of shoreline vegetation and no-net loss of shoreline ecological function.
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- Shoreline Environment Designations strictly regulate new structures (100-foot setback for SED Conservancy designation – for example)

Response To SMP Public Comments (June 2022)

- #2 – Loring Advising (Vegetation Conservation)

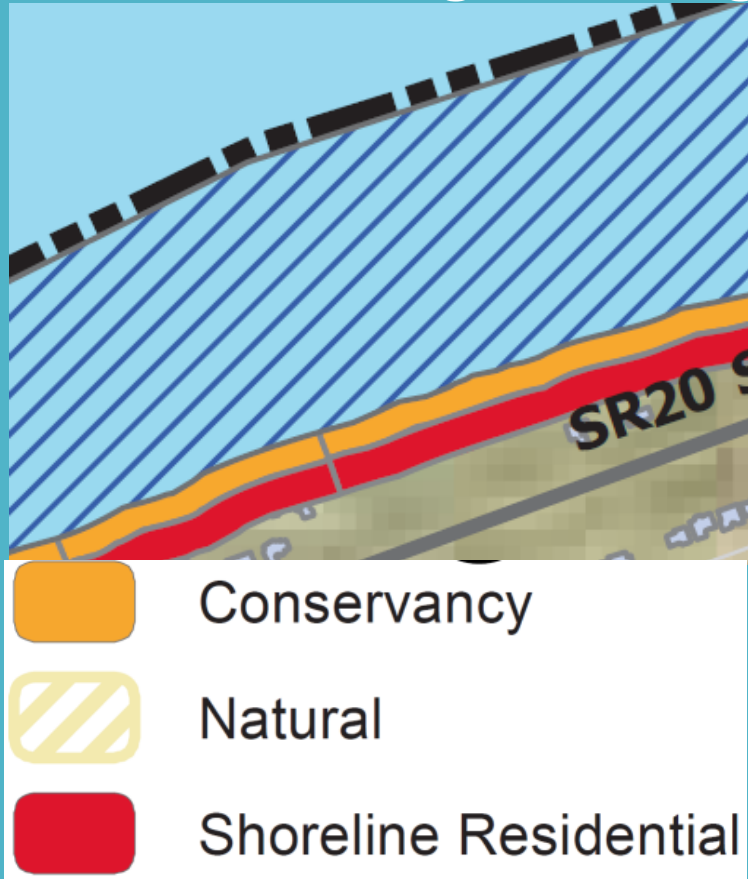


Figure 13-1: This stretch of the Anacortes shoreline along Guemes Channel has parallel shoreline designations – Conservancy adjacent to the ordinary high water mark, and Shoreline Residential in the upland area. (Washington Coastal Atlas photo.)

Source: Department of Ecology

- Shoreline Environment Designations strictly regulate new structures (100-foot setback for SED Conservancy designation – for example)

Response To SMP Public Comments (June 2022)

#3 – Loring Advising (Critical Areas Ordinance Integration)

- WDFW Riparian Management Zone (RMZ) guidance is intended for intact forested areas – not mandated for this update.

In integrating the Critical Areas Ordinance Update, the Growth Management Hearings Board’s recent determination that 50-foot riparian buffers conflict with Best Available Science.	<u>Change not recommended:</u> The City acknowledges that the Washington Department of Fish and Wildlife (WDFW) has issued new management recommendations for riparian management zones. Although the City is not proposing
WDFW created a statewide interactive map of 200-year site-potential tree height, which indicates that RMZs of approximately 91 feet to 193 feet would apply in Anacortes. We recommend establishing a scientifically-supported shoreline riparian management zone equal to one site potential tree height and strictly limiting vegetation impacts within that buffer consistent with the most current scientific recommendations from WDFW. The most current science does not support the draft Update.	to use site potential tree height as a determining factor for shoreline buffers, the City has evaluated ecological functions and existing/proposed land uses as part of the City’s comprehensive SMP update. The City used this information to designate shoreline environments and develop shoreline buffers and setbacks consistent with science and the SMP guidelines.

Response To SMP Public Comments (June 2022)

#4 – Loring Advising (Vegetation Conservation – AMC 19.72.445)

- Clearing must be minimum necessary to accommodate development.
- Native vegetation must stay intact.

The Updated SMP conflicts with the WDFW guidelines and best available science—specifically related to allowing clearing/grading of shorelines as close as 15 ft. from the OHWM (DR-6.5.8, DR-6.5.9). For example, a proposal for development activity must include a landscaping plan to protect existing native vegetation within only 15 feet of the OHWM. DR-6.5.8. Further, water-dependent uses and public access trails are exempt from even those inadequate protections, though they require a landscaping/mitigation plan aimed at providing equal or greater functions. Starting 15 feet from OHWM, the entire parcel may be cleared and graded subject to a landscaping plan. For example, any “alteration of the natural landscape” may occur in	<u>Change not recommended:</u> Shoreline setbacks prescribed within Table 5.2 (AMC 19.72.365(B)) range from 25-feet for Urban, Urban Maritime, and the Shoreline Residential within Burrow’s Bay to 100-feet for Conservancy and Natural Shoreline Environment Designations for non-water dependent development. As a result, areas reserved for native vegetation where development is otherwise prohibited extends to at least these the extent of these setbacks. Further, within shoreline jurisdiction (200-feet from OHWM) all clearing and grading activities must be limited to the minimum necessary for intended development (DR-6.5.3) (AMC 19.72.445(B)(3)). The Shoreline Management Act allows in limited circumstances water dependent uses and public access when in conflict with natural conditions of Shorelines of the State, per WAC 173-26-176. Only
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Response To SMP Public Comments (June 2022)

#4 – Continued/pdf sheet 3 Loring Advising (Vegetation Conservation - AMC 19.72.445)

- Shoreline Element Policies S-4.13 and S-2.8 (existing) support opportunity for public access (water-oriented use).

conjunction with “[l]andscaping or maintenance associated with an existing legal use or new permitted shoreline use or development.” DR-6.5.2.a. While a developer must obtain approval of a detailed landscape plan for revegetation (DR-6.5.7), with the exception of the first 15 feet from the OHWM, the plan can propose to replace the cleared vegetation with lawn and other nonnative plants. DR-6.5.6 (“discouraging” lawns and “preferring” native plants, but requiring neither); DR 6.5.8 While the SMP includes requirements for the size and coverage of shrubs and trees when planted, it does not actually require the planting of shrubs and trees outside of the first 15 feet from the OHWM. DR-6.5.7.f, .7.g.	when supported through the public access or economic development elements of the SMP can such developments be considered for authorization, consistent with remaining SMP provisions. Public Access Policy 4.5.14 (Policy S-4.13), for example, documents the intent to develop a waterfront trail connecting Washington Park to Downtown and the Tommy Thompson Trail. Further, Policy 4.3.8 (Policy S-2.8) prioritizes water dependent and water related development so long as it includes restoration of ecological functions. Both public access and water dependent development actions are further supported by WAC 173-26-176(3)(a): <i>“Alterations of the natural condition of the shorelines of the state, in those limited instances when authorized, shall be given priority for single-family residences and their appurtenant structures, ports, shoreline recreational uses including but not limited to parks, marinas, piers, and other improvements facilitating public access to shorelines of the state, industrial and commercial developments which are particularly dependent on their location on or use of the shorelines of the state and other development that will provide an opportunity for substantial numbers of the people to enjoy the shorelines of the state.”</i> Regarding the reference and protection of the first 15-feet of shoreline, as prescribed by DR 6.5.8 (AMC 19.72.445(B)(8)), the net benefit and ecological lift is greatest when enhancing the shoreline closest to the water’s edge. Planting at the water’s edge
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Response To SMP Public Comments (June 2022)

#4 – Continued/pdf sheet 4 Loring Advising (Vegetation Conservation - AMC 19.72.445)

Local Government Response and Rationale	
encourages overwater hanging vegetation, a critical component to provide suitable habitat for fish by providing overwater shade, cover, and allochthonous input of detritus and insects to improve food sources. An applicant must demonstrate that both the first 15-feet from the OHWM and the shoreline buffer and setback are avoided as a first preference. Regarding re-vegetation in instances where native species aren't used, a compelling case for utilizing lawn would be within a few feet of a proposed structure for maintenance of that structure. It wouldn't be feasible to have dense, native vegetation up to the building's edge in this scenario.	• Mitigation must be focused along water's edge. • If site is degraded 15% of the total site must be replanted with native vegetation Regarding native vegetation replacement/enhancement, the square footage is determined by amount of impact proposed and its location, not relegated to only within 15-feet of the shoreline. Further, if no native vegetation exists along the shoreline or the site is degraded for development in the Shoreline Residential Shoreline Environment Designation, 15% of the total site must be replanted with native vegetation, per DR 5.9.12 (AMC 19.72.350(D)(4)(b)).

Response To SMP Public Comments (June 2022)

#5-7 –Loring Advising (Vegetation Conservation - AMC 19.72.445)

- 5. Stringent timing, standards for tree trimming
- 6. A non-conforming site couldn't expand use or development.
 - *Replacements may need to further enhance shoreline.*
- 7. Impervious surface maximums, SED structure setbacks also minimize development

Within the 15-foot distance, landowners can obtain a clearing and grading permit without a landscaping plan to remove 25% of a tree's crown, and 25% of its limbs every five years, eventually allowing the removal of all of its branches.	<u>Change not recommended:</u> Every time a clearing and grading permit is submitted to conduct tree trimming within shoreline jurisdiction, the applicant must demonstrate 75% of a tree's original crown remains after the activity is concluded, per DR-6.5.9(b) (AMC 19.72.445(B)(9)(b)). Further, the applicant will need to demonstrate the trimming activity is for view preservation, not creation, DR-6.5.9(b) (AMC 19.75.445(B)(9)(d)).
In addition, modification of vegetation can occur in association with a legal, nonconforming use in association with the no net loss criteria, which allows for vegetation removal subject to attempts to compensate for lost function. DR-6.5.2.c.	<u>Change not recommended:</u> Further modification of a legal nonconforming use would not be able to expand or re-locate over existing conditions without conforming to the SMP, per SMP 3.9 – Nonconforming Uses (AMC 19.72.250).
The only limitation on the extent of clearing and grading of shoreline vegetation is the extent of the "intended development," which could be the entire parcel. DR-6.5.3.	<u>Change not recommended:</u> Area made available to development are also constrained by shoreline setbacks and buffers, impervious surface maximums for residential development within Conservancy and Shoreline Residential Shoreline Environment Designations (DR-5.8.6 and DR-5.9.10, respectively) and demonstration by the applicant that clearing and grading be the minimum necessary for development.

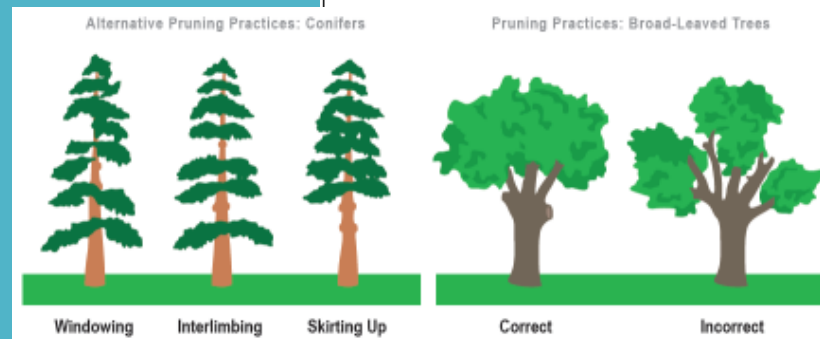


Figure 19.72.445(B)(9)(b)

Tree trimming best practices.

Response To SMP Public Comments (June 2022)

#8-9 Loring Advising (Vegetation Conservation - AMC 19.72.445)

- 8. Notice of Title protects areas from future development
- 9. Existing view corridors may be protected.
- Requires enhancement if existing conditions are degraded.

Last, there is no limitation on the frequency at which a property may be cleared and “landscaped,” so long as the landowner provides a landscaping plan each time.	<u>Change not recommended:</u> Restrictions and conditions to an approved landscape plan must be recorded on a revised Notice on Title, per DR-6.5.8 (AMC 19.72.445(B)(7)). These areas are then protected from further development or modification, thereby reducing the area for future development expansion.
Further, the landscaping plan need not require replacement of the amount of vegetation removed. For new development, replanting need not extend beyond 50% of the shoreline.	<u>Change not recommended:</u> DR-6.5.8 (AMC 19.72.445(B)(8)) specifies that planting areas must provide equal to or greater environmental
DR- 6.5.8.a. For redevelopment, planting need only extend along 25% of the shoreline. Id. And planting areas can occur in small, 100-square-foot islands that measure 10 feet by 10 feet. Id.	function than already exists. An example of this would be development in shoreline jurisdiction, yet outside the shoreline buffer or setback where the planting requirement within the first 15-feet of shoreline would exceed the impact proposed if mitigated at a 1:1 ratio. Independent of development, if shoreline vegetation within 15-feet of the OHWM is destroyed or significantly degraded, it shall be replaced per DR-6.5.8 (AMC 19.72.445(B)(8)). This finding is consistent with the SMP Inventory and Characterization Report, per SMP Comprehensive Update adoption date (October 4, 2010).

Response To SMP Public Comments (June 2022)

#10 – Loring Advising (Dock and Buoy shading – AMC 19.72.435(B))

- Critical Saltwater habitat (AMC 19.72.43) includes seagrass and kelp features, preventing intrusion.

The SMP verbiage in this section is not consistent with WDFW requirements or BAS for spacing between submerged aquatic vegetation. Recommended revisions: Docks: <u>Policy 9.5.5.e. Designed and constructed to avoid shading submerged underwater vegetation like seagrass and kelp.</u> <u>DR 9.5.5.e. avoid shading of seagrass and kelp by being located at least 25 feet (measured horizontally from the nearest edge of the structure) and four vertical feet away from seagrass and kelp beds (measured at extreme low water).</u> Mooring Buoys:	<u>Change not recommended:</u> Standards for critical saltwater habitats, including submerged aquatic vegetation, is addressed within SMP Section 6.7 – Fish and Wildlife Habitat Conservation Areas (AMC 19.72.435(B)), specifically DR-6.7.1 (AMC 19.72.435(B)(2)(a)) and DR-6.7.6 (AMC 19.72.435(B)(2)(f)). Submerged aquatic vegetation includes kelp beds and eelgrass beds. These development regulations include both avoidance and development buffer criteria for in-water development such as docks and mooring buoys. DR-6.7.1, for example speaks to restrictions on impacting critical saltwater habitats, shown below. <i>DR-6.7.1 (AMC 19.72.435(B)(2)(a) Water-dependent development and uses, including marinas, docks, piers, mooring areas, underwater parks, utility crossings, and shoreline modifications, must not intrude into or be built over critical saltwater habitat</i>
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Response To SMP Public Comments (June 2022)

#10 – Loring Advising (Dock and Buoy shading continued/pdf page 7– AMC 19.72.435(B))

- Mitigation must result in equal or better resource protection.

<u>DR-9.9.3.g. Buoys must be located at least 25 feet (measured horizontally from the nearest edge of the structure) and four vertical feet away from seagrass and kelp beds (measured at extreme low water).</u>	unless the applicant can show that all of the following criteria can be met: a. The use preference listing in RCW 90.58.020 for uses in Shoreline of Statewide Significance must be adhered to. b. The public’s need for such a structure is clearly demonstrated and an alternative alignment or location on the applicant’s property that would avoid impacts to critical saltwater habitats is not feasible or would result in unreasonable and disproportionate cost to accomplish the same general purpose. An alternatives analysis will be required for any non-exempt project proposed within FWHCAs. The analysis should include in part, shoreline bathymetry, shoreline features at the site, and substrate composition. c. The project is consistent with the state’s interest in resource protection and species recovery. d. Impacts to critical saltwater habitat functions are mitigated to result in equal or better ecological function. DR-6.7.6 (AMC 19.72.435(B)(2)(f) further puts the burden of proof on the applicant and their licensed professional in determining buffer requirements for Fish and Wildlife Habitat Conservation Areas via a habitat management plan, where eelgrass and kelp fall are a subsection of.
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Response To SMP Public Comments (June 2022)

#11 – Loring Advising (Shoreline Stabilization 7– AMC 19.72.660(B)(6))

- Protection of private property rights under the GMA must be considered.

The best available science dictates that the SMP Update be revised to strictly limit the construction of structural modifications and their associated vegetation removal and geological impacts. Recommended changes to Policy 9.11.2, 9.11.4, 9.11.11, DR-9.11.1, and DR-9.11.4. Policy 9.11.2: Discourage <u>Prevent</u> new development requiring structural shoreline stabilization. Policy 9.11.4. Allow structure stabilization methods only: a. After a determination is made by a qualified professional that nonstructural methods like building setbacks, relocation of the structure to be protected, and groundwater management, will not prevent significant damage to existing inhabited structures with experience and proven success installing non-structural bioengineered shoreline stabilization techniques that soft armoring will not succeed or is not suitable due to specific site considerations. b. Where it has been demonstrated to be necessary to support or protect a legally established, inhabited structure or ongoing shoreline use that is in danger of loss or substantial damage, or when necessary for reconfiguration of the shoreline for mitigation or enhancement purposes, or where necessary to the operation and location of a new, single-	<u>Change not recommended:</u> The City has introduced a number of policies and one regulation regarding shoreline structural modifications in response to Skagit Land Trust comments during in the SMP 2nd Draft Public Comment Period from February 16th – March 9th, 2022. Here, the applicant must take into account sea level rise for the life of the proposed structure when proposing a structural modification/stabilization, such as the edit reflected under DR-9.11.6 (AMC 19.72.660(B)(6)): <i>New development, including creation of new parcels, that would require future shoreline stabilization during the life of the structure <u>considering sea level rise projections</u> is prohibited except where no alternative locations are available, and no net loss of ecological functions will result as demonstrated through a geotechnical analysis.</i> Further, proposed language for Policy 4.8.8(d) (Policy S-7.8(d)) provides a framework for addressing shoreline development and redevelopment in-sequence: d. <u>Encourage shoreline development and redevelopment to consider addressing sea level rise in the following preferential order: avoid, retreat, protect, and accommodate.</u> Regarding the request to prevent structural shoreline stabilization altogether for property protection, Per RCW 36.70A.370 of the Growth Management Act – Protection of private property, no regulations shall completely prevent development of private property.
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Response To SMP Public Comments (June 2022)

#11 – Loring Advising (Shoreline Stabilization continued/pdf page 9-10 – AMC 19.72.660(B)(6))

- Applicant must first demonstrate bioengineering/soft structural techniques are infeasible.
- *Also no impact to feeder bluffs and forage fish spawning habitat*
- *No net loss of shoreline function*



Soft shoreline project in Anacortes, Washington, uses logs and beach nourishment instead of rock and concrete. Photo credit: Hugh Shipman.

family or multifamily structure, or a water-dependent, water related, or water enjoyment use consistent with this Master Program, they will not be permitted for the indirect purpose of creating land by filling. Policy 9.11.11 Shoreline stabilization measures should be allowed only where demonstrated to be necessary to <u>support or protect prevent the elimination of existing permitted shoreline uses</u> or where an existing structure is in imminent danger. Policy 9.11.13. New development, including creation of new parcels, that would require shoreline stabilization is prohibited, <u>unless needed to protect allowed uses where no alternative locations are available and no net loss of ecological functions will result.</u> DR-9.11.1. New development, including the subdivision of land, must not create lots which require future shoreline stabilization <u>to the extent feasible.</u> If necessary, a geotechnical report must be required. DR-9.11.4. d. The shoreline stabilization measure will mitigate adverse impacts <u>to the extent feasible.</u> ... <u>f. The shoreline stabilization measure will not significantly disrupt feeder bluff contributions of beach material or sediment transport.</u> <u>g. The shoreline stabilization measure will not adversely impact forage fish spawning habitat such as surf smelt or Pacific sand lance spawning beaches.</u>	The Washington State Constitution further supports that, 'Private property shall not be taken for public use without just compensation having been made...'. As such, no change will be made to Policies 9.11.2, 9.11.4, 9.11.11, 9.11.13, DR-9.11.1 and DR-9.11.4. (Policies S-52.2, S-52.4, S-52.11, S-52.13 and AMC Regarding proposed additions to Section 9.11 of Shoreline Stabilization (AMC 19.72.660(B)), any development proposal must first demonstrate bioengineering or other soft structural stabilization technique isn't feasible, as well as the proposal's potential impacts to feeder bluffs and forage fish spawning habitat as part of a required development proposal, per DR-9.11.5 (AMC 19.72.660(B)(5). Further, shoreline stabilization must be located, designed and constructed to minimize impacts and achieve a no-net loss of shoreline function, per DR-9.11.7 (AMC 19.72.660(B)(9): a. <i>Minimize alterations of the natural shoreline and shoreline processes including sediment transport.</i> b. <i>Minimize damage to ecological functions including wildlife, fish and shellfish habitats.</i> c. <i>Provide for the long term multiple use of shoreline resources and public access to public shorelines. In the design of publicly financed or subsidized works, consideration must be given to providing pedestrian access to shorelines for low intensity outdoor recreation.</i> d. <i>The shoreline defense structure must mitigate adverse impacts to the extent feasible, blend with the surroundings, and not distract from the aesthetic qualities of the shoreline.</i> e. <i>Achieve the policy of no net loss of ecological functions necessary to sustain shoreline resources.</i>
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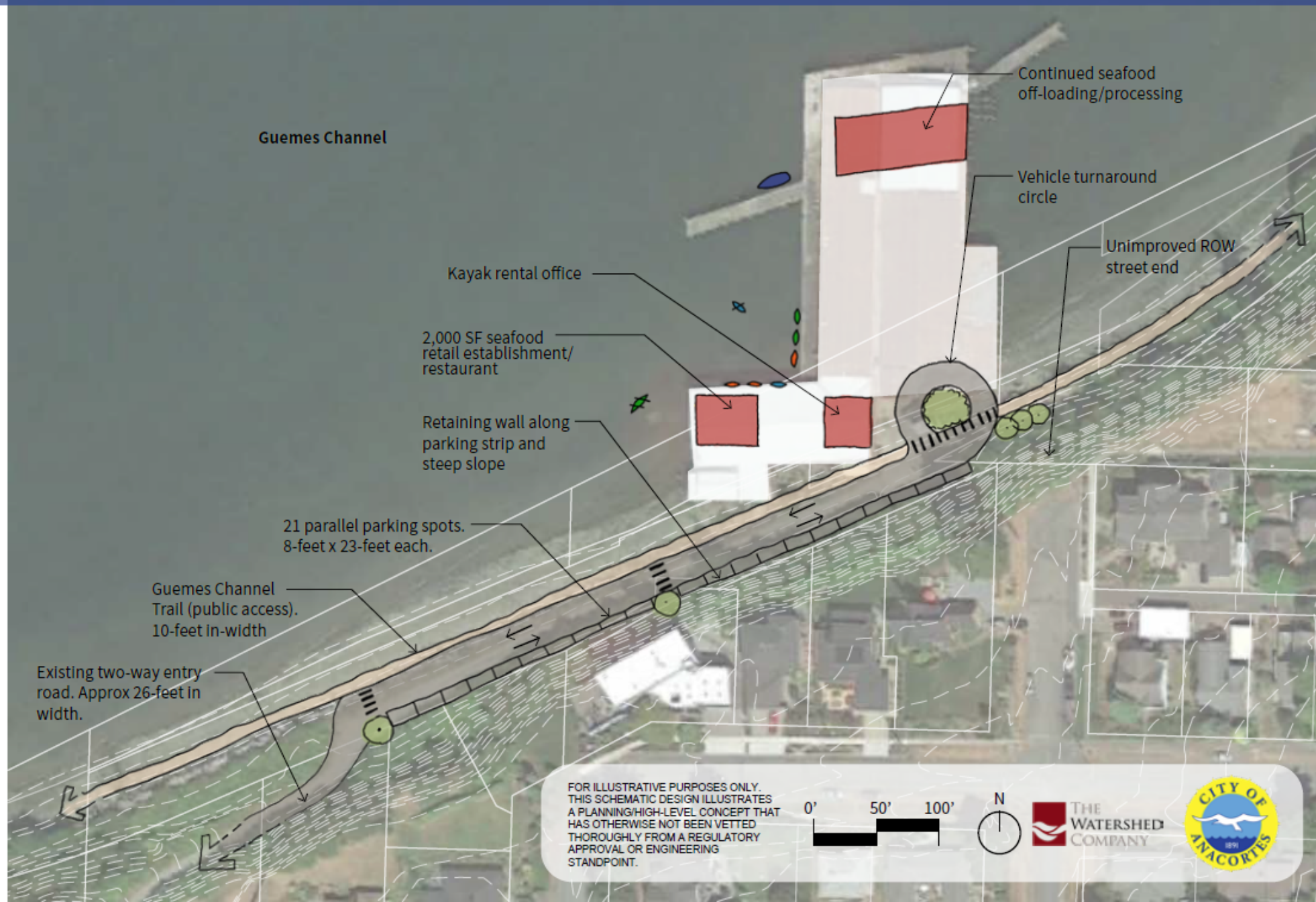
Response To SMP Public Comments (June 2022)

#12-13 – Loring Advising (Permit Tracking, no net loss)

- 12. No net loss monitoring is not required as part of this update by Ecology.
 - *City anticipates improving tracking of mitigation through a recently-awarded Ecology grant.*
- 13. No net loss definition may be amended, consistent with SMP adoption date.

We encourage the City to include in the ordinance that adopts the SMP update a statement that the tracking system will be established by the date that the SMP update becomes effective.	<u>Change not recommended:</u> Monitoring of no net loss of ecological functions is not required at this time as part of the comprehensive and periodic updates of the City's SMP. The City does anticipate that future comprehensive updates to the SMP will include an evaluation of no net loss compared to the baseline condition established during the 2010 update. While the City has not created an established tracking mechanism, the City monitors and records permit activity and will continue to do so following adoption of the SMP. Additionally, the City will track performance monitoring of mitigation projects through receipt of annual monitoring reports from the applicant.
Revise the proposed definition for "no net loss" so that is a true definition of the substance material versus the permit process. Based on the Ecology SMP handbook we propose the following definition: "No net loss means that new development does not result in new	The City will consider amending the no-net loss definition to the following: <i>No Net Loss of ecological functions is the maintenance of existing shoreline ecological processes and functions at the level that existed at the time of approval of the</i>
impacts to shoreline ecological functions and that the existing condition of shoreline ecological functions therefore remains the same at the site-specific and landscape scale."	<i>major update to the shoreline master program, adopted October 4, 2010 and reflected in the shoreline inventory and characterization report dated October 2009, or for a development project, the conditions that existed prior to initiation of use or alterations of the shoreline that result in adverse impacts on ecological processes and functions.</i>

CITY OF ANACORTES | SHORELINE MASTER PROGRAM PERIODIC UPDATE | CANNERY CASE STUDY



Next Steps

- May 16, 2022: City Council SMP Amendments – Introduction
- May 23, 2022: City Council SMP direct changes for public hearing
- **September 12, 2022: City Council Meeting to discuss 3rd draft**
- Fall 2022: Public Comment Period
- TBD: City Council Public Hearing
- TBD: Anticipated SMP Adoption

Additional information

- Project website:
 - <https://www.anacorteswa.gov/1095>
 - Staff contact is Libby Grage, Planning Manager
 - (360) 299-1986
 - libbyb@cityofanacortes.org

Thanks for
listening—questions





City Council Agenda Bill

Meeting Date: September 12,
2022

Agenda Item: 7.b.

Agenda Item Title: R Avenue Long Term Improvements Project National Highways Freight Program Grant Acceptance

Staff Contact(s): Henry Hash

Approved for Submittal to Council by **Action Type**

GREG FRANCIOCH

Motion

Henry Hash

Item Summary: The City has been awarded \$3,484,000 in transportation grant funds from the National Highways Freight Program (NHFP) through the Washington State Department Of Transportation (WSDOT). The funding for this program utilizes federal funds. The match for the grant is 13.5% for a total of \$550,000. This project is contained in the City's Comprehensive Plan as a traffic capacity improvement and therefore the match is eligible for use of transportation impact fees.

The project includes construction of a roundabout at the intersection of 30th and R Avenue and extension of the center median at 28th Street and 34th Street. The left turn from R Avenue to westbound 32nd Street will remain following the project.

Construction of a roundabout at 30th Street and R Avenue will improve traffic flow at three intersections (28th, 30th and 34th) along the corridor that are calculated to fail due to projected growth identified in the Comprehensive Plan. The project will also provide connections for all modes of transportation across R Avenue between the high-density residential and the underutilized commercial/industrial areas on either side of R Avenue. The project also provides a connection from the Tommy Thompson Trail to ACFL via the 29th Street and H Avenue [bike routes](#) defined in the [Anacortes Bike and Walks Plan](#).

Budget Impact:

\$3,484,000 in Grant Funding

\$550,000 in Impact Fees for City Match

\$4,034,000 Project Total

Previous Action: Approval of [2016 Comprehensive Plan](#).
Approval of [2022-2027 Capital Facilities Plan](#)

Recommended Motion: I move to authorize the Mayor to sign agreements with WSDOT accepting the NHFP grant for the R Avenue Long Term Improvement Project.

Alternative Actions: Notify WSDOT that the City has declined the grant funds.

Attachments (listed in order presented):

1. WSDOT Grant Award Letter - NHFP 2022
2. 30th Street Roundabout

June 10, 2022

Mr. Tim Hohmann
Engineering Services Manager
City of Anacortes
PO Box 547
Anacortes, Washington 98221-0547

**City of Anacortes
'R' Avenue Long-Term Improvements Project
FFY 2023 National Highway Freight Program (NHFP)
Federal Funding – Revised**

Dear Mr. Hohmann:

WSDOT is pleased to advise you that the above-mentioned project was selected to receive funding through the National Highway Freight Program (NHFP). NHFP funds are only eligible for work on the National Highway Freight Network (NHFN). The federal funding is limited as shown below:

'R' Avenue Long-Term Improvements Project **\$3,484,000**
FFY 2023 Available NHFP Funding: \$1,730,000

Scope: Project is to construct the improvements in Phase 3 and Phase 5 of the overall project, which include a non-traversable median, transit pull-outs, adding/improving sidewalks/walkways, bicycle wayfinding, signal or roundabout, traffic calming measures, additional street lighting, bicycle lanes, and a physical buffer between pedestrian and walkway.

Note: *Projects require 13.5% local match for all eligible federal expenditures. Federal funds cannot be used as match.*

In order to meet federal and state requirements, the following are required:

- Project expenditures incurred before receiving notice from Local Programs of federal fund authorization are not eligible for reimbursement.
- Please refer to the Local Programs webpage for detailed authorization information including: (<https://wsdot.wa.gov/business-wsdot/support-local-programs>)
 - ✓ Local Agency Guidelines (LAG) manual for detailed requirements.
 - ✓ Transportation Improvement Program (TIP) and Statewide Transportation Improvement Program (STIP) amendments, as applicable.
 - ✓ Funding and billing forms.
 - ✓ Local Project Report is required to be completed by the end June and December each year. To access the database, you will need an account name and password. Your account name is **Anacortes** and your password is **Anaco527**. The password is case sensitive.

Tim Hohmann
City of Anacortes
'R' Avenue Long-Term Improvements Project
FFY 2023 National Highway Freight Program (NHFP)
June 10, 2022

- *FFY 2023 funds are provided for construction, and are available October 1, 2022, and must be obligated by September 20, 2023.*

As a reminder, Local Programs encourages all agencies to submit monthly progress billings to ensure timely reimbursement of eligible expenditures.

For assistance, please contact Mehrdad Moini, your Region Local Programs Engineer at 206.440.4734.

Sincerely,

A handwritten signature in blue ink, appearing to read "Jay Drye", with a long horizontal flourish extending to the right.

Jay Drye, PE
Director
Local Programs

JD:st:ml

cc: Kevin Murphy, Executive Director, SCOG
Mehrdad Moini, Northwest Region Local Programs Engineer, MS NB82-121
Ron Pate, Rail, Freight & Ports Division Director, MS 47407



30th Street Roundabout



St	Before project LOS	After project LOS
28th St	E	B
30th St	E	A
34th St	D	B

Legend

- New Roundabout
- Median