CLALLAM MRC MEETING AGENDA

May 19th, 2025
5:30 p.m. – 7:00 p.m.
Hybrid Meeting

Zoom meeting link: https://us06web.zoom.us/j/83769639254?pwd=FmcMflhkxw6df902xa2tsxu6UAHGVB.1
Meeting ID: 837 6963 9254
Passcode: 12345
For more information about the MRC, please contact Cathy Lear at (360) 417-2361

Welcome by Chair LaTrisha Suggs / Call to Order / Roll Call

- Determination of quorum

Public Comment on agenda items, *limited to 3 minutes per participant at the discretion of the Chair*

Approval of Minutes – April

Election of Chair, Vice Chair, and NWSC Representative

- Nominations
  - Chairperson
  - Vice-Chairperson
  - NWSC Rep

Announcements

- Open MRC seats: member representing community At-Large, member & alternate for Makah Tribe (appointed directly by Tribe), alternates for District 1 and Development Community
  - Chris Rumple (Development Community) has stepped down as of 5/1/2025. He is interested in the MRC and wants to remain on the emailing list.
- Interview by Pepper Fisher with Pacific Radio, 5/6/25, regarding three Crabs Letter. LaTrisha and Ann participated.
- Senator Murray may participate with MRC projects with late May visit – Ediz Hook suggested
- Clallam County Environmental Health seeking shellfish sampling volunteers
- NWSC: meeting in Clallam County May 30th, likely at 10am
  - Location, time and agenda will be shared prior to the meeting
  - Project presentation, 20 minutes - Pinto abalone or Ediz Hook revegetation

Committee and Project Reports

- Education/Outreach opportunities: 2 future events
  - Forever Stream Fest (4th Annual; sponsored by PA Garden Club) - September 20th, 2025, 10am to 3pm at Pebble Beach Park, PA
  - Dungeness River Festival – September 26th, 2025
- Northwest Straits Commission update – Alan Clark
- Policy Subcommittee - Ann Soule, Alan Clark, Ed Bowlby

2025 Meetings

January 16 (Thu)	April 21	July 21	October 20
February 20 (Thu)	May 19	August 18	November 17
March 17	June 16	September 15	December 15

- Additional leads report if an update is needed

New or special business items

- Projects for the next biennium (10/2025 - 9/2027)
  - See attached draft proposals and budgets
  - Need to identify co-lead for Derelict Gear Removal and Ediz Hook Debris Removal
- Northwest Straits Foundation (Jason Morgan) seeking MRC letter of support for planned derelict gear removal in PA Harbor & Sequim Bay
- Staff transitions – thank you and enjoy your retirement, Cathy! Rebecca resuming as MRC Coordinator.

Discussion of next meeting date and agenda

- Next regular meeting Monday, June 16
  - Presentation from Amy Olsen, Seattle Aquarium Research Scientist, on WA sea otters and their recent return to Clallam Bay
- Call for new agenda items

Public Comment *Limited to 3 minutes per participant at the discretion of the Chair*

Good of the Order

Adjourn

Clallam County DCD is inviting you to a scheduled Zoom meeting.
Join Zoom Meeting – NEW link as of April and onward
https://us06web.zoom.us/j/83769639254?pwd=FmcMflhkxw6df902xa2tsxu6UAHGVB.1

Meeting ID: 837 6963 9254
Passcode: 12345

One tap mobile
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2025 Meetings

January 16 (Thu)	April 21	July 21	October 20
February 20 (Thu)	May 19	August 18	November 17
March 17	June 16	September 15	December 15

April 25, 2025 – Commission Meeting Highlights

Key highlights

- Alan Clark was elected Chair and Jamie Stephens was elected the vice-Chair of the NW Straits Commission. Many thanks to Tim Ellis, outgoing chair, for his service the last two years.
- Senator Murray and Representative Larsen have reintroduced the NW Straits Initiative reauthorization bill. Senator Cantwell and Representative Randall are cosponsors. To learn more see the press release.
- The May 30 NW Straits Commission meeting will be held at the Dungeness River Nature Center in Clallam County. Additional details and the agenda will be available the week of the meeting on our Events page. If you have questions contact, Caitlyn Blair (blair@nwstraits.org).
- The 2024 Impact Report is currently the second most visited page on the NW Straits Commission website! If you are interested in sharing the report or reading it yourself, click here or contact Jessica Owens (owens@nwstraits.org).
- Skagit MRC has released a Native Olympia Oyster Restoration StoryMap, available on their website!
- Snohomish MRC's 2024 Annual Report is available on their website!
- There will be two Kayak Kickoffs for 2025 MRC kelp monitoring volunteers, the first will be at Padilla Bay from 10:00 – 2:00 PM on May 2, and the second one will be at the WSU Jefferson County Extension Office in Port Hadlock from 1:00 – 4:00 PM on May 14. There will be multiple kayak safety trainings for MRC kelp monitoring volunteers at Bowman Bay, Fidalgo Island on May 31 and June 1, and at North Beach, Port Townsend on June 7 (two classes per day). Registration has closed for all events but if you have any questions or would like to attend the kickoff or safety training, please contact Jeff Whitty (whitty@nwstraits.org) asap.

YEAR ONE			Task 1	Task 2	Task 3	Task 4	Task 5	Task 6	Task 7	Task 8	Task 9	Task 10	
			Project Admin/ Mgt	Elwha River Stewardship	Pigeon Guillemot	Olympia Oyster Monitoring	Kelp Monitoring	Forage Fish Monitoring	Pinto Abalone Monitoring	Hazwoper	Education & Outreach	Derelict gear removal	
Salaries			85,000.00										
Benefits			25,500.00										
Indirect			27,327.50										
Contractual				1,980.00	800.00	1,500.00			30,000.00	6,000.00		18,000.00	
Supplies				140.00			1,000.00			500.00	1,000.00	500.00	
Travel			1,000.00				1,500.00	500.00	500.00	500.00	1,000.00	500.00	
Other†													
TOTAL			138,827.50	2,120.00	800.00	1,500.00	2,500.00	500.00	30,500.00	7,000.00	2,000.00	19,000.00	
											Year 1 total =	**$ 204,747.50**	
YEAR TWO			Task 1	Task 2	Task 3	Task 4	Task 5	Task 6	Task 7	Task 8	Task 9	Task 10	Task 11
			Project Admin/ Mgt	Elwha Stewardship	Pigeon Guillemot	Olympia Oyster Monitoring	Kelp Monitoring	Forage Fish Monitoring	Pinto Abalone Monitoring	Hazwoper	Education & Outreach	Derelict gear removal	Ediz Hook Debris Removal
Salaries			85,000.00										
Benefits			25,500.00										
Indirect			27,327.50										
Contractual				3,000.00	800.00	1,500.00			30,000.00	6,000.00		7,000.00	9,000.00
Supplies				140.00			1,000.00			500.00	1,000.00	500.00	1,500.00
Travel			1,000.00				1,500.00	500.00	500.00	500.00	1,000.00	500.00	500.00
Other†													
TOTAL			138,827.50	3,140.00	800.00	1,500.00	2,500.00	500.00	30,500.00	7,000.00	2,000.00	8,000.00	11,000.00
												Year 2 total =	**$ 205,767.50**

SEANWS-2025 – MRC Project Information Form

1. **Project Title: Crab Pot Removal**

2. **Project lead:** co-lead: Ioana Bociu

3. **Project description:**

Locate and remove derelict gear around Port Angeles City Pier and other PA crabbing locations.

Train Port Angeles MRC and local community on impacts of derelict gear and effective derelict crab pot removal techniques.

Vision/Goals:

Ultimately we would love to see this project sunset because no more derelict gear remains to be removed! However, we are not yet at that point.

Through a community event that highlights the efforts to locate and retrieve derelict gear, we will talk about the effects of derelict gear on our local resources and show what is required to locate and retrieve the gear.

4. **Roles of Participants and Partners**:

MRC members, MRC staff - coordinate with partners and contractors

Northwest Straits Foundation – provide expertise to identify locations of derelict gear

Consultants – provide equipment to retrieve identified derelict gear

5. **Activities and Timeline:**

Investigate permitting needs;

Determine Pot Locations;

Remove Crab Pots;

Design and host community event to highlight impacts of derelict gear; show what is involved in locating and retrieving gear;

Report & Continuation Plan

6. **Outputs:**

Proofed means for low-cost crab pot removal;

Greater community awareness of derelict gear's impact on local resources;

7. **Outcomes:**

Reduced harm on environment by derelict crab pots; community members understand impacts of derelict gear, importance of retaining their gear, and importance of removing derelict gear.

8. **Deliverables:** Please list any deliverables that you anticipate and associated due dates.

#	Description	Proposed due date
	Year 1	
	Sidescan maps of crab pots at local areas	9-30-2026
	Map of where crab pots were removed (GPS locations)	12-31-2026
	Maps of crab pots not removed, entanglement hazard/ embedded, etc.	12-31-2026
	Project Report with Data, Results, and Future Recommendations	12-31-2026
	Year 2	
	Sidescan maps of crab pots at local areas	8-30-2027
	Map of where crab pots were removed (GPS locations)	9-30-2027
	Maps of embedded crab pots (not removed), entanglement hazard	9-30-2027
	Project Report with Data, Results, and Future Recommendations	9-30-2027

9. **Additional project information:**

Project type	Focused Questions	Response
9a. Education and Outreach	• Who is your target audience? • What are your key messages? • What do you want your target audience to do as a result of this project? • What tactics or tools will you use to reach your audience? • How will you know if your actions were successful?	Target audience: Community members Key message: importance of maintaining fishing gear; techniques used to identify and retrieve derelict gear Success: people know more about keeping their gear and what is required to retrieve it. We can do this with a simple questionnaire.

9b. Monitoring	• What protocols will be used? • Will the monitoring data affect a decision about marine resources? • Where will the monitoring data go? • Are the data contributing to a larger baseline data set? • If ongoing monitoring, what will you consider the end of your monitoring program?	
9c. Restoration	• Are any permits required for this project and if so, what is the status of the permits? • Who has ownership of the project site? • Has a cultural assessment of the site been completed (if applicable)? • Is there ongoing maintenance associated with the project? • How do you plan to evaluate the effectiveness of conservation actions?	

SEANWS-2025 – MRC Project Information Form

1. **Project Title: Education and Outreach**

2. **Project lead:** Nancy Stephanz

3. **Project description:**

The Clallam MRC engages in community outreach and education, promotes marine stewardship, and shares information about the MRC itself. The MRC will distribute educational materials, attend local events and festivals, train the community for oil spill response, and support projects conducted in the community by partners and others.

Vision/Goals:

Successful engagement of the public, students, and citizen scientists about issues including species restoration, climate change, toxins including marine debris, beach stewardship, fossil fuel transportation, effects of oils spills, and shoreline development within Clallam County and along the Strait of Juan de Fuca.

4. **Roles of Participants and Partners**:

MRC members engage with community members to highlight and educate on topics of interest, such as toxins, climate change, and shoreline development.

Partners are:

Dungeness Nature Center – host of Dungeness River Festival;

Port Angeles Garden Club – host of Streamfest;

Local businesses that distribute outreach cards.

Projects conducted by other entities:

- Shellfish biotoxin sampling at Pillar Point (Dept of Health)
- Mussel Biotoxin Project in Port Angeles Harbor (WDFW)
- Sound Toxins harmful algal bloom monitoring (WA Sea Grant, Feiro Marine Life Center)
- "Catch More Crab" derelict crab pot prevention campaign (Northwest Straits Foundation)
- European Green Crab surveys and trapping (WA Sea Grant)
- Surfrider – outreach and sani kan at Elwha Beach

5. **Activities and Timeline**

Participate in 2 local festivals annually

Explore the opportunities to offer presentations to area groups such as sailors at local yacht clubs; college students and community through Studium Generale; local programs such as the Tuesday lecture series through North Olympic Library System.

Create and distribute outreach cards

Host oil spill response training

6. **Outputs:**

Participants at two local festivals

Participants in oil spill response training

3 presentations given to local area groups

Outreach cards distributed

7. **Outcomes:**

Community members will have an increased understanding of local and regional marine issues and the role the MRC and Initiative partners play in protecting and restoring marine resources.

8. **Deliverables:** Please list any deliverables that you anticipate and associated due dates.

#	Description	Proposed due date
	Year 1	
	Document tabling at 2 local festivals	12-31-2026
	Document oil spill response training	12-31-2026
	Document creation and distribution of outreach cards	12-31-2026
	Year 2	
	Document tabling at 2 local festivals	12-31-2027
	Document oil spill response training	12-31-2027
	Document creation and distribution of outreach cards	12-31-2027

9. **Additional project information:**

Project type	Focused Questions	Response
9a. Education and Outreach	• Who is your target audience? • What are your key messages?	Community members Role of MRC and importance of marine environment

	• What do you want your target audience to do as a result of this project? • What tactics or tools will you use to reach your audience? • How will you know if your actions were successful?	Have a greater awareness of the MRC and of the marine and nearshore environments Various tools depending upon the circumstance (festivals, training, outreach cards) Number of visitors to festival booth, to training events, to web site via QR code
9b. Monitoring	• What protocols will be used? • Will the monitoring data affect a decision about marine resources? • Where will the monitoring data go? • Are the data contributing to a larger baseline data set? • If ongoing monitoring, what will you consider the end of your monitoring program?	
9c. Restoration	• Are any permits required for this project and if so, what is the status of the permits? • Who has ownership of the project site? • Has a cultural assessment of the site been completed (if applicable)? • Is there ongoing maintenance associated with the project? • How do you plan to evaluate the effectiveness of conservation actions?	

SEANWS-2025 – MRC Project Information Form

1. **Project Title: Forage Fish Monitoring**

2. **Project lead:** Chelsea Korbulic

3. **Project description**:

As part of the NWSC and WDFW's region-wide effort, trained MRC members and volunteers sample monthly for forage fish eggs across four locations: Ediz Hook, Cline Spit, and Elwha Beaches east and west. Forage fish data are both processed by and shared with WDFW as part of a regional long-term dataset.

4. **Vision/Goals:**

Provide a better understanding of the forage fish populations within the Salish Sea by performing citizen science monitoring and raising awareness about the ecological importance of forage fish.

5. **Roles of Participants and Partners**:

WDFW: provides training and some supplies; identifies forage fish eggs; hosts database

6. **Activities and Timeline:**

Perform monthly forage fish sampling following established WDFW protocol. Upload data to WDFW. Transport samples to WDFW laboratory in Port Townsend.

7. **Outputs:**

Samples from identified sampling sites

Outcomes:

Increased understanding of forage fish spawning locations

8. **Deliverables:**

#	Description	Proposed due date
	Year 1	
	Amended QAPP	10-31-2026
	Final report	12-31-2026
	Year 2	
	Amended QAPP	10-31-2027
	Final report	12-31-2027

9. **Additional project information:**

Project type	Focused Questions	Response
9a. Education and Outreach	• Who is your target audience? • What are your key messages? • What do you want your target audience to do as a result of this project? • What tactics or tools will you use to reach your audience? • How will you know if your actions were successful?	
9b. Monitoring	• What protocols will be used? • Will the monitoring data affect a decision about marine resources? • Where will the monitoring data go? • Are the data contributing to a larger baseline data set? • If ongoing monitoring, what will you consider the end of your monitoring program?	WDFW protocols will be used The data will help to identify locations of spawning forage fish The data is uploaded to WDFW site The end of the program will be considered in consultation with NWSC and WDFW
9c. Restoration	• Are any permits required for this project and if so, what is the status of the permits? • Who has ownership of the project site? • Has a cultural assessment of the site been completed (if applicable)? • Is there ongoing maintenance associated with the project? • How do you plan to evaluate the effectiveness of conservation actions?	

SEANWS-2025 – MRC Project Information Form

1. **Project Title: Kelp Monitoring**

2. **Project lead:** Alan Clark and Chelsea Korbulic

3. **Project description:**

MRC members and volunteers will continue to conduct kelp surveys at Freshwater Bay and Clallam Bay in August and September each year. The surveys will use the most recent NWSC kelp kayak survey protocol to track the size and extent of the kelp beds in the Strait of Juan de Fuca. Survey results contribute to a georeferenced database of kelp distribution, bed sizes, and kelp speciation that can be incorporated into NWSC SoundIQ database and potentially the DNR database.

The project supports a larger Commission-sponsored kelp monitoring program that provides a better understanding of kelp distribution, bed sizes, and kelp speciation within the Salish Sea. The Clallam MRC will continue to monitor two kelp beds in Freshwater Bay and one kelp bed in Clallam Bay between July-September 2026 and 2027.

4. **Vision/Goals:**

This project documents the size, in acres, of two kelp beds at Freshwater Bay and one bed at Clallam Bay using a hand-held GPS device deployed from a kayak. Species composition, overall bed condition, and water depth and temperature measurements are documented at specific locations within each bed. This information is uploaded to a geographic information system operated by the Northwest Straits Commission that enable users to track trends over time.

Given the importance of kelp beds as nursery areas and habitat for a variety of ecologically, economically and culturally important fish and invertebrates such as forage fish, juvenile salmonids and shellfish species, these studies provide valuable information to state and federal resource agencies on kelp bed extent, condition, and persistence through time.

In addition, the Freshwater Bay nearshore areas in proximity to the Elwha River mouth are continuing to recover from historic disturbances related to hydroelectric dams, their removal in 2011-2014. Monitoring kelp in this dynamic region is important to understanding the long-term recovery of these ecosystems and can inform future restoration efforts locally and regionally.

5. **Roles of Participants and Partners**:

We work closely with Washington State Department of Natural Resources (WDNR), the Northwest Straits Commission (NWSC), the Northwest Straits Foundation (NWSF), and local citizen scientists, as needed.

6. **Activities and Timeline:**

Safety training

Surveys in Freshwater Bay and Clallam Bay

Complete monitoring worksheet

Submit completed worksheet at season's end

Upload and share data

Report to MRC and NWSC

7. **Outputs:**

Outputs will include GIS maps of kelp beds showing acreage, water depth and temperature date and specific locations, and photographs showing kelp bed characteristics. Observations on the condition of the canopy kelp (both Bull Kelp and Giant Kelp) and notes on other species seen will be noted on data sheets. In addition, area photographs showing kelp bed characteristics will be provided. These data will be electronically provided to the Northwest Straits Commission and SoundIQ.

8. **Outcomes:**

This project increases the knowledge of kelp status and trends along the Strait of Juan de Fuca and augment and complements the synoptic survey work conducted by WDNR.

9. **Deliverables:**

#	Description	Proposed due date
	Year 1	
	QAPP amendment (through NWSC)	April 30, 2026
	Training for volunteers – safety, survey protocol	June 30, 2026
	Data upload to NWSC and Sound IQ	September 30, 2026
	Final report	September 30, 2026
	Year 2	
	QAPP amendment (through NWSC)	April 30, 2027
	Training for volunteers – safety, survey protocol	June 30, 2027
	Data upload to NWSC and Sound IQ	October 30, 2027
	Final report	September 30,2027

10. **Additional project information:**

Project type	Focused Questions	Response
9a. Education and Outreach	• Who is your target audience? • What are your key messages? • What do you want your target audience to do as a result of this project? • What tactics or tools will you use to reach your audience? • How will you know if your actions were successful?	
9b. Monitoring	• What protocols will be used? • Will the monitoring data affect a decision about marine resources? • Where will the monitoring data go? • Are the data contributing to a larger baseline data set? • If ongoing monitoring, what will you consider the end of your monitoring program?	Protocols have been approved by NWSC. The data will be used to understand the well-being of kelp forests in the Strait of Juan de Fuca. The data is uploaded to Sound IQ. Project's end will be determined in consultation with NWSC and other partners.
9c. Restoration	• Are any permits required for this project and if so, what is the status of the permits? • Who has ownership of the project site? • Has a cultural assessment of the site been completed (if applicable)? • Is there ongoing maintenance associated with the project? • How do you plan to evaluate the effectiveness of conservation actions?	

SEANWS-2025 – MRC Project Information Form

1. **Project Title: Olympia Oyster Monitoring**

2. **Project lead:** Lyn Muench, Chris Burns

3. **Project description:**

The Clallam MRC is part of a regional effort to restore the native Olympia oyster. One and a half (1.5) acres of tidelands has been established in Sequim Bay as a restoration site, where the MRC has been focusing its efforts since 2018. In partnership with the Jamestown S'Klallam Tribe, the MRC conducted population surveys in 2024 that showed good recruitment and population growth versus prior years.

In March 2024, the MRC also spread 47 tons of clean Pacific oyster shell as substrate for Olympia oysters. The MRC will continue to focus going forward on monitoring this restored habitat through annual population surveys. Jamestown S'Klallam Tribe will work with the Clallam County Marine Resources Committee's Olympia Oyster Restoration Lead and Clallam MRC Coordinator to plan, coordinate and implement the Olympia Oyster Population Surveys.

4. **Vision/Goals:**

Contribute to the Puget Sound wide effort to restore sustainable Olympia oyster populations in Puget Sound. Continue to monitor restoration of Olympia oyster populations through planning, coordinating and implementing the Olympia Oyster Population Surveys.

5. **Roles of Participants and Partners**:

Jamestown S'Klallam Tribe staff – provide technical input for surveys; write report

6. **Activities and Timeline:**

Monitor growth and survival of Olympia Oyster restoration efforts in Sequim Bay by performing population surveys.

7. **Outputs:**

Agreements with partners; Monitoring event; growth and survival on previously restored Olympia Oyster beds in Sequim Bay; report on growth and survival.

8. **Outcomes:**

Approximately 1.5 acres of Olympia oysters are monitored; native species populations restored.

9. **Deliverables:**

#	Description	Proposed due date
	Year 1	
	Agreement with Jamestown S'Klallam Tribe	4/30/2026
	QAPP	4/30/2026
	Monitoring report	9/30/2026
	Year 2	
	Agreement with Jamestown S'Klallam Tribe	4/30/2027
	QAPP	4/30/2027
	Monitoring report	9/30/2027

10. **Additional project information:**

Project type	Focused Questions	Response
9a. Education and Outreach	• Who is your target audience? • What are your key messages? • What do you want your target audience to do as a result of this project? • What tactics or tools will you use to reach your audience? • How will you know if your actions were successful?	
9b. Monitoring	• What protocols will be used? • Will the monitoring data affect a decision about marine resources? • Where will the monitoring data go? • Are the data contributing to a larger baseline data set? • If ongoing monitoring, what will you consider the end of your monitoring program?	Established monitoring protocols will be used.
9c. Restoration	• Are any permits required for this project and if so, what is the status of the permits? • Who has ownership of the project site? • Has a cultural assessment of the site been completed (if applicable)? • Is there ongoing maintenance associated with the project?	No permits required

	• How do you plan to evaluate the effectiveness of conservation actions?	

SEANWS-2025 – MRC Project Information Form

1. **Project Title: Pigeon Guillemot Monitoring**

2. **Project lead:** Ed Bowlby, Mary Sue Brancato

3. **Project description**:

The pigeon guillemot is considered an indicator species of nearshore health, since it feeds primarily on forage fish such as gunnels and sculpins, and other small marine creatures which it catches by diving beneath the surface. Clallam MRC initiated pigeon guillemot breeding surveys in the county in 2016, in collaboration with Island MRC and Olympic Peninsula Audubon Society.

Pigeon guillemots lay eggs in the early summer, and the burrows are monitored from June to approximately September as the adults forage for food and the chicks mature. Monitoring begins in June and continues at each site until nesting season concludes in in late August or September. All data are provided to the regional Salish Sea Guillemot Network/ WDFW Survey 123 data management system, and the project is a collaboration with the Olympic Peninsula Audubon Society.

4. **Vision/Goals:** Document pigeon guillemot breeding colonies on Clallam County beaches using established protocols, involving citizen scientist volunteers to expand the monitoring area in the Salish Sea for this indicator species.

5. **Roles of Participants and Partners**:

Olympic Peninsula Audubon Society – partner – trains volunteers

Island County – partner – hosts intern who enters data into regional Salish Sea Guillemot Network/ WDFW Survey 123 data management system

Salish Sea Guillemot Network/ WDFW Survey 123 data management system – partner – hosts database

6. **Activities and Timeline:**

Train volunteers to monitor pigeon guillemot nesting activities
Monitor during nesting season
Upload data

7. **Outputs:**

Trained Volunteers

Monitoring schedule

Data

8. **Outcomes:** Pigeon guillemot nesting and feeding habits will be documented and the information entered into the regional database. As an indicator species of nearshore health, the monitoring results will help draw the picture of conditions in the nearshore.

9. **Deliverables:**

#	Description	Proposed due date
	Year 1	
	Amend existing QAPP	6-30-2026
	List of volunteers	9-30-2026
	Upload data	12-31-2026
	Final report	12-31-2026
	Year 2	
	Amend existing QAPP	6-30-2027
	List of volunteers	9-30-2027
	Upload data	12-31-2027
	Final report	12-31-2027

10. **Additional project information:**

Project type	Focused Questions	Response
9a. Education and Outreach	• Who is your target audience? • What are your key messages? • What do you want your target audience to do as a result of this project? • What tactics or tools will you use to reach your audience? • How will you know if your actions were successful?	
9b. Monitoring	• What protocols will be used? • Will the monitoring data affect a decision about marine resources? • Where will the monitoring data go? • Are the data contributing to a larger baseline data set? • If ongoing monitoring, what will you consider the end of your monitoring program?	Protocols established by Salish Sea Guillemot Network As an indicator of nearshore health, the data can be used to inform decisions regarding the nearshore. Monitoring data is entered into Salish Sea Guillemot Network/ WDFW Survey 123 data management system. Data are contributing to a larger baseline

		data set. End of the program will be determined in consultation with project partners.
9c. Restoration	• Are any permits required for this project and if so, what is the status of the permits? • Who has ownership of the project site? • Has a cultural assessment of the site been completed (if applicable)? • Is there ongoing maintenance associated with the project? • How do you plan to evaluate the effectiveness of conservation actions?	

SEANWS-2025 – MRC Project Information Form

1. **Project Title:** Pinto Abalone Restoration/Monitoring

2. **Project lead:** Jeff Ward, Alan Clark

3. **Project description:** The pinto abalone is the only abalone species found in Washington waters. This native species has cultural and ecological significance, grazing rock surfaces and maintaining the health of rocky reef habitat and kelp beds. Population declines have been precipitous; the Washington Department of Fish & Wildlife (WDFW) documented a ~98% decline from 1992 to 2017, leading WDFW to formally list pinto abalone as a State endangered species in 2019 and publish the Pinto Abalone Recovery Plan (Sowul et al., 2022).

   Restoration efforts for pinto abalone in Washington State have been underway for several years in the San Juan Islands and adjacent waters. There, the highly collaborative team with representatives from non-profit organizations, government agencies, universities and tribes, led by Puget Sound Restoration Fund (PSRF) and WDFW, has used conservation aquaculture as the main strategy for rebuilding pinto abalone populations. Since 2009, nearly 50,000 juveniles produced primarily at the Kenneth K. Chew Center for Shellfish Research and Restoration – the conservation hatchery that PSRF operates at NOAA's Manchester Research Station - have been released to rocky reef habitat in the San Juan Islands and surroundings.

   These animals, representing well over 200 genetically distinct families, were deployed to better understand outplant methods and to rebuild populations at 29 different sites across a wide geographic range. The key, however, to restoring the species throughout its range in Washington waters is to fill a critical spatial knowledge gap; presently, there is a dearth of information regarding pinto abalone distribution and abundance in the Strait of Juan de Fuca (Strait). Further, efforts by WDFW and PSRF to locate these populations has been opportunistic, not deliberate, due to funding and capacity constraints.

   For this proposed project, the Clallam County Marine Resources Committee (CCMRC) will partner with PSRF to continue existing pinto abalone monitoring work in the Strait, by conducting presence/absence surveys, that will be foundational to custom-fitting a conservation, restoration, and research strategy for pinto abalone in the Strait of Juan de Fuca.

4. **Vision/Goals:**

The ultimate vision of the work is to rebuild iconic and important pinto abalone populations throughout their home range, thereby facilitating development of healthy kelp beds that support myriad uses and functions in the marine environment. By documenting and eventually enhancing pinto abalone populations along the Strait, the team aims to reverse

the devastation from decades of unsustainable harvest. Further, the project is a tangible way in which the CCMRC and PSRF can strengthen their connection and the broader communities they each represent; both groups are both deeply invested in marine conservation and restoration, and bring complementary skill sets to the partnership.

5. **Roles of Participants and Partners**:

In addition to PSRF, we will work closely with the Northwest Straits Commission (NWSC), WDFW, Washington State Department of Natural Resources (WDNR), and our three treaty tribe MRC members: Makah, Lower Elwha Klallam, and Jamestown S'Klallam. We will also share information and progress with the Abalone Restoration Partners group sponsored by WDFW, as we did in 2024. Further, we hope to eventually recruit local recreational and commercial divers and will also partner with local vessel operators to increase capacity for increased monitoring and restoration efforts as the project evolves in the future.

6. **Activities and Timeline:**

The team's primary activity will be to conduct dive surveys each year to identify existing populations and aggregations of pinto abalone in the Strait. It is expected that dive surveys in 2026-27 will focus primarily on the Port Angeles and Pillar Point subregions shown in Figure 1, with survey locations in each year informed by the previous year's efforts, including the pending work in the fall of 2025. Year 2 survey locations will be guided by the results of the 2025 survey. For each year of the grant, we will schedule eight surveys days.

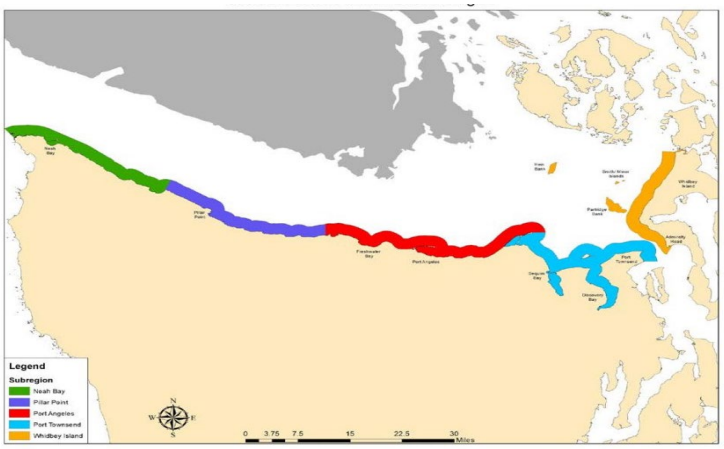


Figure 1 (from Sowul et al. 2022). Strait of Juan de Fuca Abalone Region. Five subregions within the Strait of Juan de Fuca Region. Subregion boundaries are based on the location of potential abalone habitat and information about past distribution of wild abalone. Subregions include large areas of unsuitable habitat (e.g., deep water, soft sediment) so as to be contiguous.

The dive surveys will follow methods already in use by WDFW and PSRF. The team will work with WDFW, using existing habitat maps and knowledge of suitable abalone habitat, to identify starting locations for surveys. As noted above, a total of eight survey days will occur in each year, with a team of two divers surveying at least two transects per day. Each 60-minute dive will consist of a timed swim with the divers swimming generally side by side along a transect and going off transect periodically to search for abalone in areas with good habitat.

When abalone are found, the divers will record depth, dive time, shell length of each animal. To document location, divers will signal to the survey boat by using a reel line to surface buoy, and then the boat team will travel to the buoy and mark the location with GPS.

Upon completion of the yearly surveys, the PSRF team will generate a report documenting the survey activities, presence/absence maps of abalone, and summaries of size and abundance data. The report will be reviewed by MRC leads prior to delivery to NWSC. As pinto abalone are a protected species, these data will be shared with NWSC, WDFW, PSRF, and the CCMRC, but not with the public.

The existing Quality Assurance Project Plan (QAPP) will be updated, as needed, during the two year grant.

7. **Outputs:**

The outputs will include potential improvements to the PSRF abalone survey protocols based on its use in the Strait, creation of a report detailing the survey activities and maps showing the locations of remnant abalone populations (with limited distribution disclaimer), and development of public outreach materials and presentations describing the project, as described below.

8. **Outcomes:**

Successful completion of this project may result in significant restoration of pinto abalone to areas along the Strait where they were extirpated by recreational harvesters. At a minimum, results from these surveys will provide valuable population data on this state-listed endangered species along the Strait of Juan de Fuca, and the location of promising areas for juvenile out-planting that may occur in the future if additional funding is available.

9. **Deliverables:**

#	Description	Proposed due date
1	Updated QAPP	Two month prior to field opearations

2	Final Yearly Report	One month prior to end of yearly funding period

Commented [JW1]: Cathy and Rebecca- please change this if necessary

10. **Additional project information:** Please provide additional information based on the type of project proposed. If the project contains more than one type (for example, monitoring and outreach), please answer all relevant focused questions based on each project type.

Project type	Focused Questions	Response
9a. Education and Outreach	• Who is your target audience? • What are your key messages? • What do you want your target audience to do as a result of this project? • What tactics or tools will you use to reach your audience? • How will you know if your actions were successful?	Outreach to the citizens of Clallam County and Clallam County Board of Commissioners (BOCC) will occur periodically during the project to highlight the environmental and cultural importance of Pinto Abalone and describe the work of the MRC and its partners to restore viable abalone populations to the Strait of Juan de Fuca. Our outreach activities will include progress reports to the BOCC, public presentations, and the development of posters and handouts that can be used at local events where the MRC is present. Outreach success will be gauged by attendance at public presentations, the number of handouts provided at public events, and the number of news articles developed by local media outlets.

9b. Monitoring	• What protocols will be used? • Will the monitoring data affect a decision about marine resources? • Where will the monitoring data go? • Are the data contributing to a larger baseline data set? • If ongoing monitoring, what will you consider the end of your monitoring program?	• Protocols that are currently used by PSRF and WDFW will be followed (see Section 6). • Monitoring data will be directly used to implement the Pinto Abalone Recovery Plan (Sowul et al. 2022) – identified aggregations will be included in assessments of population stability, and individuals considered for use as broodstock. Data will be housed with PSRF and WDFW as part of a pinto abalone database for all Washington waters (i.e., a a larger baseline dataset).
9c. Restoration	• Are any permits required for this project and if so, what is the status of the permits? • Who has ownership of the project site? • Has a cultural assessment of the site been completed (if applicable)? • Is there ongoing maintenance associated with the project? • How do you plan to evaluate the effectiveness of conservation actions?	• No permits required at this time • Subtidal areas along the Strait are under the jurisdiction of WDNR, WDFW, and treaty tribes. All are partners on this project. • No cultural issues are anticipated. • No ongoing maintenance required • Effectiveness of the conservation action will be determined by the geographican and temporal extent of monitoring and whether future outplanting of abalone is feasible in the Strait based on information

		developed during the project.

SEANWS-2025 – MRC Project Information Form

1. **Project Title: Elwha Beach Stewardship**

2. **Project lead: Helle Andersen, Dann May**

3. **Project description**

The West Elwha Beach Stewardship project started in 2016-18, where usage surveys conducted as an intern project observed excessive dog and human waste entering the nearshore at this popular local beach. This waste carries a risk for fecal coliform bacteria and nutrient overload – much more so than waste from wildlife, because of the supplemented diet of domestic dogs. Due to these water quality concerns, the Clallam MRC (CCMRC) now sponsors a sani kan, dog waste bag dispenser and dog waste trash container, along with documenting the usage of these facilities and the beach. A small sign on the sani kan notes that the sani kan is sponsored by the CMRC.

The goal of the effort is to protect and improve water quality, contribute to nearshore habitat and species protection, and encourage community stewardship. The CCMRC has conducted surveys on foot as well as implementing a QR code survey option this year. Going forward, we intend to continue to maintain the Sanikan on the dike, continue the QR code surveys, and maintain the pet waste station by refilling pet waste bags twice a month, and determine a streamlined method to estimate number of visitors.

Vision/Goals:

To protect and improve water quality, contribute to nearshore habitat and species protection, and encourage community stewardship.

4. **Roles of Participants and Partners:**

MRC members, MRC staff. 2-3 hours per month or 24-36 hours per year for project leads to maintain the dog waste station based on driving distance from Port Angeles. 20 hours to write the annual project report. Total 44-56 hours per year.

5. **Activities and Timeline:**

The activities occur year-round. The beach is used by visitors all year, with use peaking in the summer.

2-3 hours per month or 24-36 hours per year to maintain the dog waste station based on driving distance from Port Angeles. 20 hours to write the annual project report. Total 44-56 hours per year.

6. **Outputs:**

Contract with the sani kan company;
Purchase and distribute more than 5,200 dogi bags per year;
Weekly maintenance of a well-used Sanikan
Number of pet waste bags used

7. **Outcomes:**

An outcome would be to have a decrease in dog and human waste on the landscape, increase in QR surveys and to educate beach goers of the hazards of excrement in the nearshore.

Deliverables: Please list any deliverables that you anticipate and associated due dates.

#	Description	Proposed due date
	Year 1	
	Contract with Bill's Plumbing	12-31-2026
	Survey results	12-31-2026
	Year 2	
	Contract with Bill's Plumbing	12-31-2027
	Survey results	12-31-2027

8. **Additional project information:**

Project type	Focused Questions	Response
9a. Education and Outreach	• Who is your target audience? • What are your key messages? • What do you want your target audience to do as a result of this project? • What tactics or tools will you use to reach your audience? • How will you know if your actions were successful?	
9b. Monitoring	• What protocols will be used? • Will the monitoring data affect a decision about marine resources? • Where will the monitoring data go? • Are the data contributing to a larger baseline data set? • If ongoing monitoring, what will you consider the end of your monitoring program?	

9c. Restoration	• Are any permits required for this project and if so, what is the status of the permits? • Who has ownership of the project site? • Has a cultural assessment of the site been completed (if applicable)? • Is there ongoing maintenance associated with the project? • How do you plan to evaluate the effectiveness of conservation actions?	

SEANWS-2025 – MRC Project Information Form

Copy the Project Information Form and complete one for each project the MRC plans to do. Several projects may be merged in the grant agreement, but in the Project Information Form please separate each project (e.g. all monitoring tasks cannot be bundled under one application).

Look through the Additional Resources section at the end of this packet for Communications Project Guidance, RFP definitions, the Project Wheel, and an optional Logic Model table to help work through goals, activities, outputs, and outcomes.

1. **Project Title: Ediz Hook Debris Removal**

2. **Project lead:** Allyce Miller

3. **Project description** (short project summary including the identified need that prompted the project)
   Clallam MRC has partnered with Lower Elwha Klallam Tribe to plant native vegetation on Ediz Hook following restoration projects that removes infrastructure inhibiting nearshore processes and replenishes the sand and substrate and natural erosion control that comprises Ediz Hook. The nearshore in other locations along Ediz Hook would benefit from removal of concrete, asphalt, metal, and trash pieces that are littering the shoreline (please see attached picture). These pieces are falling out of the shoreline as it erodes, and many pieces are already exposed. Clallam MRC will partner with the Lower Elwha Klallam Tribe and City of Port Angeles to remove and dispose of the debris. The City will supply heavy equipment and operators to remove the big pieces. CMRC will pay for haul and disposal and for replanting the area.

4. **Vision/Goals:** What is the ***vision/ultimate goal*** of the work? What is your goal for this project period as a step towards that bigger goal? (How are you hoping the ecosystem and/or the community will change because of this project and other efforts? 1,500 characters)

   A healthy Ediz Hook nearshore/backshore that supports the marine and bird life that depend on the habitat of the spit is the vision/goal that this debris removal project will support. This project removes derelict debris that affects healthy nearshore/backshore processes. There are foreign materials littering the Ediz Hook shoreline and tidelands such as derelict concrete, rock, metal, and rubble. These foreign materials that litter the tidelands and shoreline negatively interact with naturally occurring nearshore/backshore ecosystem processes such as forage fish spawning. Some of the derelict debris contains hazardous chemicals like creosote and lead paint that harms fish and wildlife as well as impairs water quality. Once these harmful foreign objects are removed from the Ediz Hook shoreline, there will be native coastal vegetation planted in the heavy equipment access scars that will

improve the habitat and backshore ecosystem processes that support fish and wildlife.

5. **Roles of Participants and Partners**: Please list participants and partners directly involved with the work. Describe expected roles and responsibilities of each partner and MRC (1,500 characters):

   This project will entail support from Clallam County Marine Resources Committee, The City of Port Angeles, and the Lower Elwha Klallam Tribe.

   -The City of Port Angeles will provide: the heavy equipment to remove the derelict litter, the operating staff for the heavy equipment, the dump truck to haul off the debris, and secure the necessary permits needed to perform this removal effort. The permits needed for this project are a Hydraulic Project Approval from WDFW (LEKT already has one for the same scope of this project, but it will be extended and the City of Port Angeles will be added as a co-permittee), and possibly a DNR tidelands Right of Entry, an Army Corps of Engineers Nationwide Permit, and a City Critical Areas Permit.

   -The Clallam Marine Resources Committee will provide: volunteers to help remove small debris, funding for debris removal cost, and funding for revegetating the backshore coastal vegetation community that is disturbed by the heavy equipment access.

   -The Lower Elwha Klallam Tribe (LEKT) will provide: a staff member, Allyce Miller (who is on the Marine Resources Committee) as the project lead and logistics coordinator. LEKT will also provide guidance and assistance to The City of Port Angeles on permit acquisition as necessary.

6. **Activities and Timeline:** Briefly describe the ***main activities*** of your project along with an anticipated timeline of the activities. (The tasks and actions - science, monitoring, training, presentations, etc. accomplished by the project participants; 1,500 characters).
   - October 2025-September 2026: The City of Port Angeles and Lower Elwha Klallam Tribe work to secure all necessary permits for debris removal project.
   - September 2026: The City of Port Angeles deploys its heavy equipment, machine operator, and dump truck to Ediz Hook for 1-2 days of debris removal.
   - March 2027: Lower Elwha Klallam tribe's staff Allyce Miller and volunteers plant and seed heavy equipment access scars with native coastal vegetation. It is estimated that 1 pound of seed and ~700 plants will be needed for this revegetation effort.

- March-April 2027: Volunteers spend 1-2 days removing small debris (mainly small asphalt chunks) by hand on a low tide. One day will likely suffice, but two days may be necessary, tbd.

7. **Outputs:** What are the ***expected outputs*** of this project? (Anything tangible you can count, including people/participants in events, reports, presentations, or other tangibles; 1,000 characters)

   It is preliminarily anticipated that there will be:

   - ~20 cubic yards of debris hauled and disposed
     ~700 native coastal plants and 1 pound of native coastal seed planted
   - ~10-30 volunteers participating in planting and small debris removal effort

8. **Outcomes:** What are the ***expected outcomes*** of this project? How will the activities and outputs measurably further the goal(s) of the project. (Short-term changes you envision happening as a consequence of this work or things you might start to see within the timeline of the project. 1,500 characters)

We expect to see the area free of debris and replanted with native vegetation.

9. **Deliverables:** Please list any deliverables that you anticipate and associated due dates.

#	Description	Proposed due date
1	Debris removal along Ediz Hook's shoreline/tidelands	May 2027
2	Revegetation of native coastal plants along Ediz Hook backshore disturbed areas	May 2027
3	Educational outreach to community about coastal shoreline health and ecosystem wellness through volunteer events and Marine Resources Committee reporting	May 2027

Deliverable Examples:

Education/outreach/engagement: Outreach/education plan; social marketing strategy; evaluation plan; copy of materials; annual summary report (using Commission-provided template*)

Monitoring/research: Quality Assurance Project Plan (due before monitoring begins); annual project report (using Commission-provided template*); copy of data collected

Restoration/protection: Feasibility report; Cultural Resources Review; stewardship and evaluation plan; copies of any relevant permits; annual project report (using Commission-provided template*)

*If any project components will be completed by a consultant or contractor, please be sure they have a copy of the annual report template as well. Specific sections will need MRC perspective and contribution when working with contractors/consultations.

10. **Additional project information:** Please provide additional information based on the type of project proposed. If the project contains more than one type (for example, monitoring and outreach), please answer all relevant focused questions based on each project type.

Project type	Focused Questions	Response
9a. Education and Outreach	· Who is your target audience? · What are your key messages? · What do you want your target audience to do as a result of this project? · What tactics or tools will you use to reach your audience? · How will you know if your actions were successful?	Our target audience will be the ecosystem of Ediz Hook. We will also engage the local Port Angeles community in replanting and small debris removal efforts which will give educational outreach about marine ecosystem wellness and about what Clallam Marine Resources Committee does. We will recruit for volunteers through the Clallam Conservation District. We will know we are successful is debris is minimized and native backshore plant communities rebound.
9b. Monitoring	· What protocols will be used? · Will the monitoring data affect a decision about marine resources? · Where will the monitoring data go?	The Lower Elwha Klallam Tribe will monitor the effectiveness of the debris removal as well as the replanting effort. The tribe will

	· Are the data contributing to a larger baseline data set? · If ongoing monitoring, what will you consider the end of your monitoring program?	make sure that at least 70% of the plants survive and that debris on the shoreline is reduced by 70%.
9c. Restoration	· Are any permits required for this project and if so, what is the status of the permits? · Who has ownership of the project site? · Has a cultural assessment of the site been completed (if applicable)? · Is there ongoing maintenance associated with the project? · How do you plan to evaluate the effectiveness of conservation actions?	Yes, there are several permits that will likely be needed. The one known necessary permit is a Hydraulic Project Approval from WDFW (already obtained but needs to be extended/modified). There will possibly b a DNR tidelands Right of Entry, an Army Corps of Engineers Nationwide Permit, and a City Critical Areas Permit needed additionally depending on what level of disturbance will be deemed necessary. We will have one year to secure all permits. There has already been a Cultural Assessment done of the site. The City of Port Angeles as well as the Lower Elwha Klallam Tribe are the property owners. After this project is completed, Lower Elwha Klallam Tribe will monitor to make sure vegetation replanted is surviving and that most of the exposed debris has been removed. As time proceeds and more erosion occurs, there will possibly be more debris exposed and it will then be evaluated if further debris removal is necessary. That would be a separate project endeavor if more removal is needed.

May 2025 Final Meeting Minutes

Date: Monday, May 19, 2025
Time: 5:30 – 7:00pm
Location: Hybrid meeting, Zoom and Clallam County Board of Commissioners' Meeting Room
Minutes prepared by Amelia Kalagher

Member Roll

	Member	Present?	Alternate	Present?
Academic Community	Ed Bowlby	X	Ioana Bociu	
At Large	Alan Clark (*NWSC Rep.*)	X	Mary Sue Brancato	
At Large	*[vacant seat]*	---	Ray Kirk	X
Conservation & Environmental Interests	*[vacant seat]*	---	Nancy Stephanz	X
Development Community	*[vacant seat]*	---	*[vacant seat]*	---
District I	Jeff Ward	X	*[vacant seat]*	---
District II	Ann Soule (*Vice Chair*)	X	Lyn Muench	excused
District III	Mike Doherty	X	Dann May	X
Jamestown S'Klallam Tribe	Christopher Burns	X	Robert Knapp	X
Lower Elwha Klallam Tribe	Allyce Miller	X	Chelsea Korbulic	
Makah Tribe	*[vacant seat]*	---	*[vacant seat]*	---
Marine Related Recreation & Tourism	Alicia Amerson		Helle Andersen	X
Port Angeles City Council	LaTrisha Suggs (*Chair*)	X	Navarra Carr	
Port of Port Angeles Commission	Jesse Waknitz		Katharine Frazier	X
Sequim City Council	Meggan Uecker		Kelly Burger	X

Staff and Others Present
Cathy Lear (CCMRC Coordinator, Clallam County Habitat Biologist), Rebecca Mahan (CC Habitat Biologist), Amelia Kalagher (CCMRC Administrative Support), Angela Glore (Strait ERN Coordinator), Bruce Emery (CC Director of Community Development), Jonathan Strivens (Clallam County Environmental Health, Water Quality Specialist), Brandon Sampson (Wet Dog Boats), John Worthington (Sequim resident)

Welcome / Call to Order / Roll Call

Chair LaTrisha Suggs called the meeting to order at 5:30. Roll was called, and others introduced themselves. A quorum was present at the beginning of the meeting.

Public Comment
None at this time.

Approval of Minutes

- ***Nancy Stephanz moved to approve March minutes; Ann Soule seconded. The motion passed unanimously and the minutes were approved.***

Election of Chair, Vice Chair, and NWSC Representative

- Nominations
    - Chair: LaTrisha Suggs nominated herself for another term as Chair.
    - Vice Chair: Alan Clark nominated himself as Vice Chair.
    - NWSC Representative: Alan Clark nominated himself for another term as NWSC Representative. Alan mentioned that he will be NWSC Chair this year.
- Elections
    - Chair: ***Dann May moved for LaTrisha to remain as Chair, Nancy Stephanz seconded. There was no opposition, and LaTrisha will serve as Chair.***
    - Vice Chair: ***There was no opposition to Alan's nomination as Vice Chair; Alan will serve as Vice Chair.***
    - NWSC Representative: ***There was no opposition to Alan's nomination as NWSC Representative; and Alan will serve as NWSC Representative.***

Announcements

- *Open MRC seats:* Several seats are open. Nancy Stephanz suggested to invite Phil Parisi to be a member.
- *Interview by Pepper Fisher:* LaTrisha and Ann recently participated in a now-published interview regarding sea level rise and the 3 Crabs Rd area.
- *Clallam County Environmental Health seeking shellfish sampling volunteers:* Please contact Cathy or reach out to Jonathan Strivens of Environmental Health if you are interested in volunteering.
- *Olympia oyster surveys: May 15th, 16th, 28th:* MRC members and alternates reach out to Cathy if you plan to join.
- *NWSC meeting in Clallam County May 30th*
    - The meeting will be held at the Dungeness River Nature Center, beginning at or shortly after 10am.
    - Presentation: The MRC discussed content and presenters for this upcoming meeting. Alan Clark shared that Jefferson and Island Counties are interested in hearing about Clallam MRC's advisory work and recent letter. Bruce Emery thought that would be within the appropriate purview of the Committee. An open discussion format was suggested, with no or minimal supporting slides. Ann suggested the addition of a handout briefly describing CCMRC's projects. Cathy invited Bruce to participate in the discussion on that day as someone who received the letter, and Alan mentioned that Commissioner Randy Johnson may still be present during this discussion as well.

LaTrisha, Alan, and staff will collaborate to produce this presentation on the MRC's advisory work.
    - Caitlyn Blair is the appropriate contact at NWSC for any questions.
- Those who would like to share well wishes for Bob, Tim or Chris R were asked to email them to Amelia by Wednesday to be added to cards.
- Port Angeles Maritime Career Festival: June 7th, with associated "Flounder Pounder" fishing tournament. Bring extra coasters to Barhop, they will be serving pizza and beer during the event.

Committee and Project Reports

- *Education & Outreach opportunities:* Forever Streamfest (Sept 20) and Dungeness River Festival (Sept 26) are currently planned as the MRC's two tabling events for this year. Nancy Stephanz asked that six volunteers be present for each events (2 per shift). Helle, Nancy, Dann, and Ann volunteered. Amelia will provide signup sheets now so we know if we have coverage. Pinto abalone dives are scheduled for Sept 24-26.
- *Northwest Straits Commission update:* Alan Clark shared that the reauthorization bill was introduced by Senator Murray. The Impact Report has been published. The NWSC is looking into contingency options for funding in the uncertain funding environment.
- *Policy Subcommittee / Advisory – Ann Soule:* Public outreach for Clallam County's comprehensive plan will be conducted June-August. Bruce Emery suggested giving comments on the earlier end, to give time for meaningful consideration.

New or special business items

- *Project selection for the next biennium:* The MRC discussed the list of projects to be proposed for 2025-27. Mike Doherty has volunteered as co-lead for Ediz Hook, Ann Soule volunteered for outreach, Ed Bowlby volunteered for Olympia oysters, and Alan Clark was clarified as co-lead for forage fish. The derelict gear removal project was set to the side given funding and capacity concerns.
    - Derelict Gear Removal (ROV)
    - Elwha Stewardship
    - Pigeon Guillemot Monitoring
    - Olympia Oyster Monitoring
    - Kelp Monitoring
    - Forage Fish Monitoring
    - Pinto Abalone Monitoring
    - HAZWOPER / oiled wildlife response
    - Education & Outreach
    - Ediz Hook Debris Removal (pending City of PA's project plans)
- *Staff transitions:* Rebecca will be returning as MRC Coordinator at the beginning of June, following Cathy's retirement.

Discussion of next meeting date and agenda

- *Next meeting:* The meeting will take place on Monday, June 16th.
- *Call for new agenda items:* None at this time.

Public Comment

- John Worthington of Sequim made a comment inquiring about the relationship between Strait ERN and the MRC. He also suggested that a comparison to Jimmy-Come-Lately Creek be added to the MRC's upcoming presentation regarding sea level rise, stating he doesn't think rivers are managed fairly. He also asked about any plans to test contaminant levels near boat havens due to silicone sealant use.
- Jonathan Strivens commented that Environmental Health is still seeking volunteers for shellfish biotoxins sampling, particularly Cline Spit.

Good of the Order

None at this time.

Adjourn

Dann May moved to close the meeting; Alan Clark seconded. Chair LaTrisha Suggs adjourned the meeting at 7:00.

Action Items

- LaTrisha, Alan, Ann and staff: collaborate to produce a presentation for the May 30th NWSC meeting.
- Those who would like to share well wishes for Bob, Tim or Chris R: email them to Amelia by Wednesday to be added to cards.
- Amelia: provide signup sheets now for Streamfest and Riverfest.

CLALLAM MRC MEETING AGENDA

June 16th, 2025
5:30 p.m. – 7:00 p.m.
Hybrid Meeting

Zoom meeting link: https://us06web.zoom.us/j/83769639254?pwd=FmcMflhkxw6df902xa2tsxu6UAHGVB.1
Meeting ID: 837 6963 9254
Passcode: 12345
For more information about the MRC, please contact Cathy Lear at (360) 417-2361

Welcome by Chair LaTrisha Suggs / Call to Order / Roll Call

- Determination of quorum

Public Comment on agenda items, *limited to 3 minutes per participant at the discretion of the Chair*

Presentation

- Amy Olsen MMA, Seattle Aquarium Research Scientist: Northern Sea Otter Foraging Analysis in Washington State

Approval of Minutes – May

Announcements

- Recap: NWSC meeting in Clallam County May 30, 2025 - Alan Clark and LaTrisha Suggs
  - Link to presentation "Identify, Investigate, Integrate, Inform: MRCs as Advisory Bodies"
- 2025-2027 grant proposals submitted to Northwest Straits Commission
  - NODC RFP for SaniKan and dog waste bags at Place Rd trail - Rebecca/Amelia
- Forever Streamfest and Dungeness River Festival tabling sign ups
- Letter of Support: Northwest Straits Foundation proposal for PA Harbor and Sequim Bay Derelict Crab Pot Removal Project. FYI: letter provided, copy attached
- Update on recruitment

Committee and Project Reports

- Project Leads report only if an update is needed
- Advisory Sub-Committee
  - City of Port Angeles Comp Plan Update
    - June 12th, City presented first draft of Comp plan at open house.
    - June through September pop up events to engage and educate community members
  - BOCC Priorities Memo follow-up
  - Nearshore Actions
    - Rayonier Pier cleanup – plan potentially coming forth in June
    - Port of Port Angeles, Cofferdam Facility Seawall

2025 Meetings

January 16 (Thu)	April 21	July 21	October 20
February 20 (Thu)	May 19	August 18	November 17
March 17	June 16	September 15	December 15

- Barge facility, upland asphalt paving and stormwater treatment to their intermodal handling & transfer facility. Improvements include protecting existing sheet pile barge berth with a fiberglass sheet pile encasement, the asphalt of 12 acres of upland and the installation of a three stage biofiltration facility to treat stormwater from the facility.
- Permits: NPDES, 401 WQC, Clean Air Act (CAA), Shoreline Substantial Development Permit; DOE Coastal Zone Management, USACE NWS-2025-170

Discussion of next meeting date and agenda

- Next regular meeting Monday, July 21st
- Call for new agenda items
  - Budget discussions as needed

Public Comment *Limited to 3 minutes per participant at the discretion of the Chair*

Good of the Order

Adjourn

Clallam County DCD is inviting you to a scheduled Zoom meeting.
Join Zoom Meeting – NEW link as of April and onward
https://us06web.zoom.us/j/83769639254?pwd=FmcMflhkxw6df902xa2tsxu6UAHGVB.1

Meeting ID: 837 6963 9254
Passcode: 12345

One tap mobile
+12532050468,,83769639254#,,,,*12345# US
+12532158782,,83769639254#,,,,*12345# US (Tacoma)

Dial by your location
• +1 253 215 8782 US (Tacoma)

2025 Meetings

January 16 (Thu)	April 21	July 21	October 20
February 20 (Thu)	May 19	August 18	November 17
March 17	June 16	September 15	December 15

SEATTLE AQUARIUM

CLALLAM COUNTY MARINE RESOUCES COMMITTEE

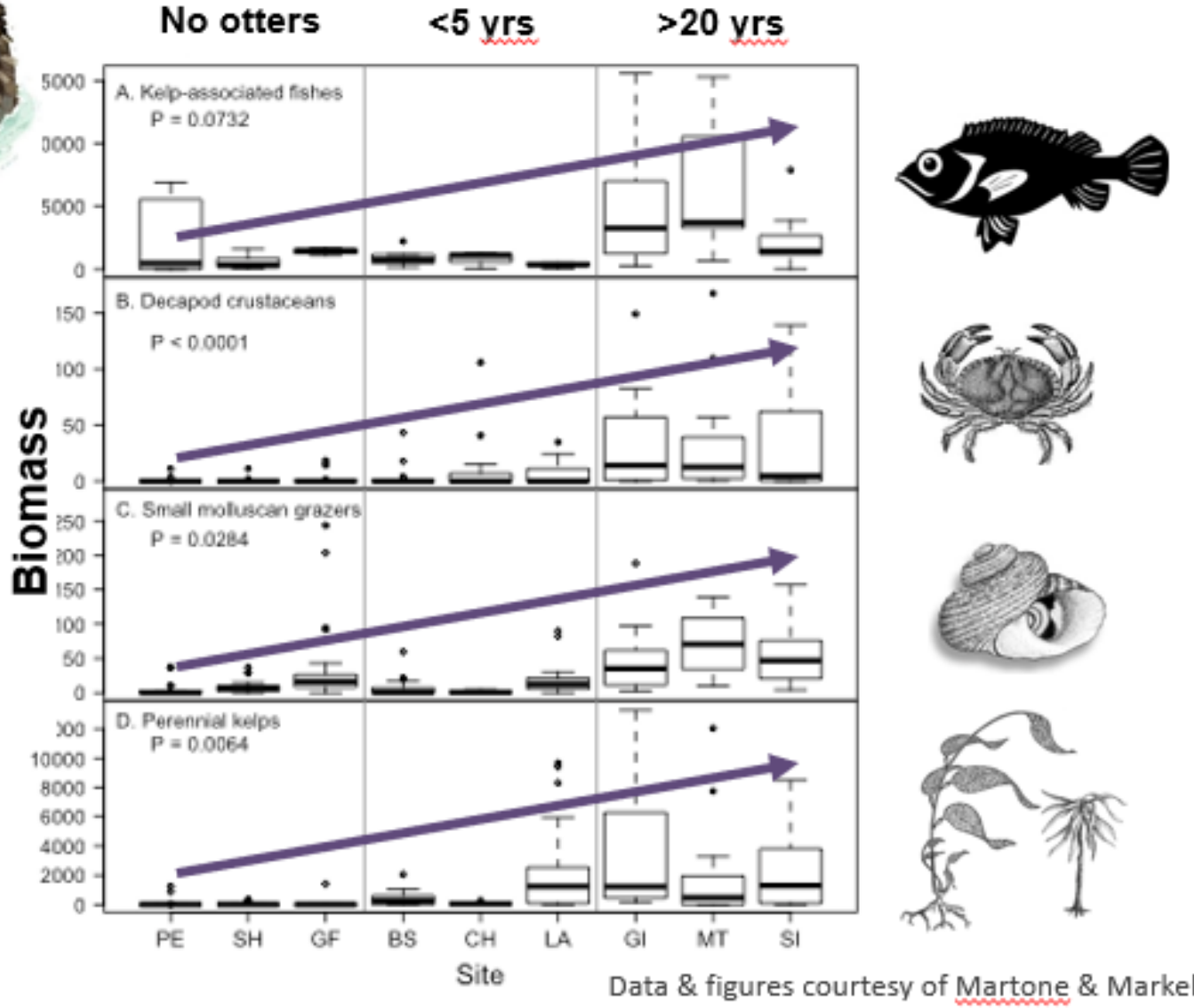
Northern Sea Otter (*Enhydra lutris kenyoni*) Foraging Analysis in Washington State

Amy Olsen MMA, Research Scientist

June, 2025

Sea Otters

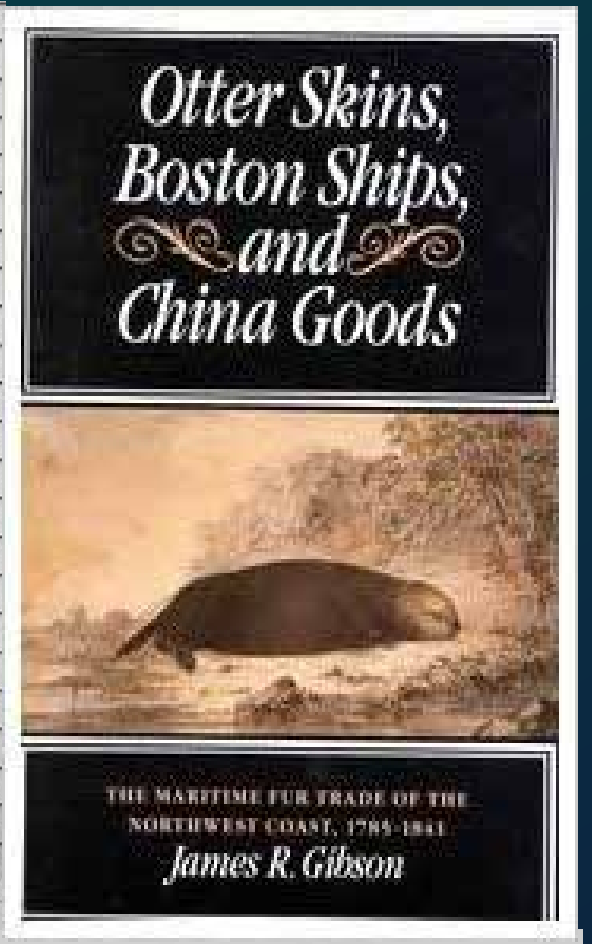
Increase in amount of kelp forest fishes, small crabs, small grazers & perennial kelps



Data & figures courtesy of Martone & Markel, unpublished data from West Coast Vancouver Island

History

- Washington's last native sea otter was hunted in 1910 near Willapa Bay.
- Almost 60 years later, sea otters were reintroduced from Amchitka, AK
  - 29 near Point Grenville (1969)
  - 30 near La Push (1970)
- An estimated 10 animals survived and founded the population today




Russia
Alaska
Prince William Sound
Yakutat
Canada
Bering Sea
Gulf of Alaska
Commander Islands
Pribilof Islands
Kamchatka Peninsula
Southeast Alaska
Aleutian Islands
Alaska Peninsula
British Columbia
Unimak Island
Attu Island
Vancouver Island
Sakhalin
Amchitka Island
Kuril Islands
Washington
Hokkaido
United States
Japan
California
P A C I F I C
San Nicolas Island
O C E A N
Mexico
Current sea otter range
Translocated sea otter population
Shaded ranges are not to scale

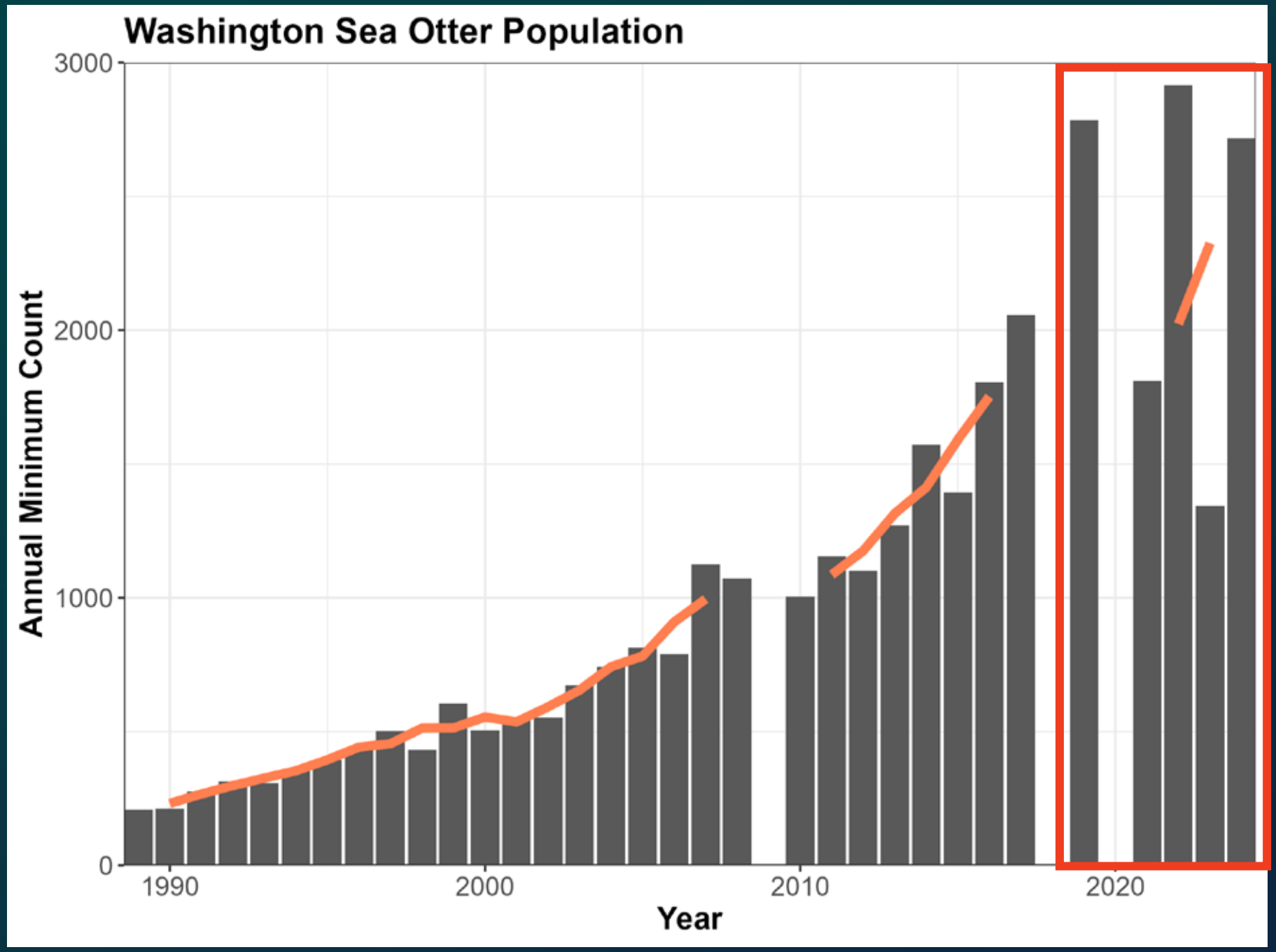
Annual Population Survey

- Multi-day annual count.
- Organized by USFWS and WDFW.
- The Seattle Aquarium has been participating every year since 2000.



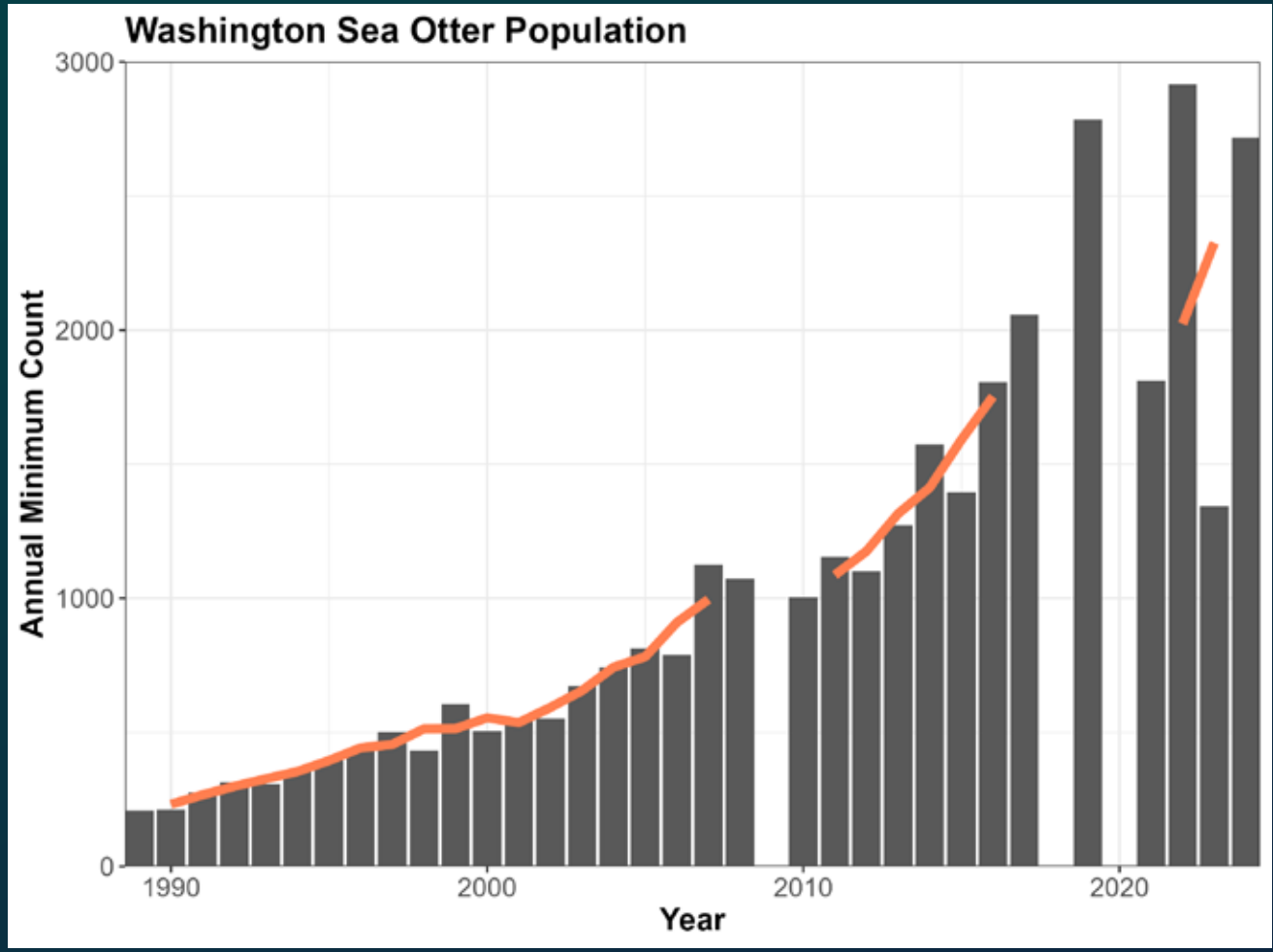

Methods

- Aerial survey via photography from small plane
- Ground observers conduct shore-based visual surveys


Washington Sea Otter Population
Annual Minimum Count
3000
2000
1000
0
1990
2000
2010
2020
Year

Challenges

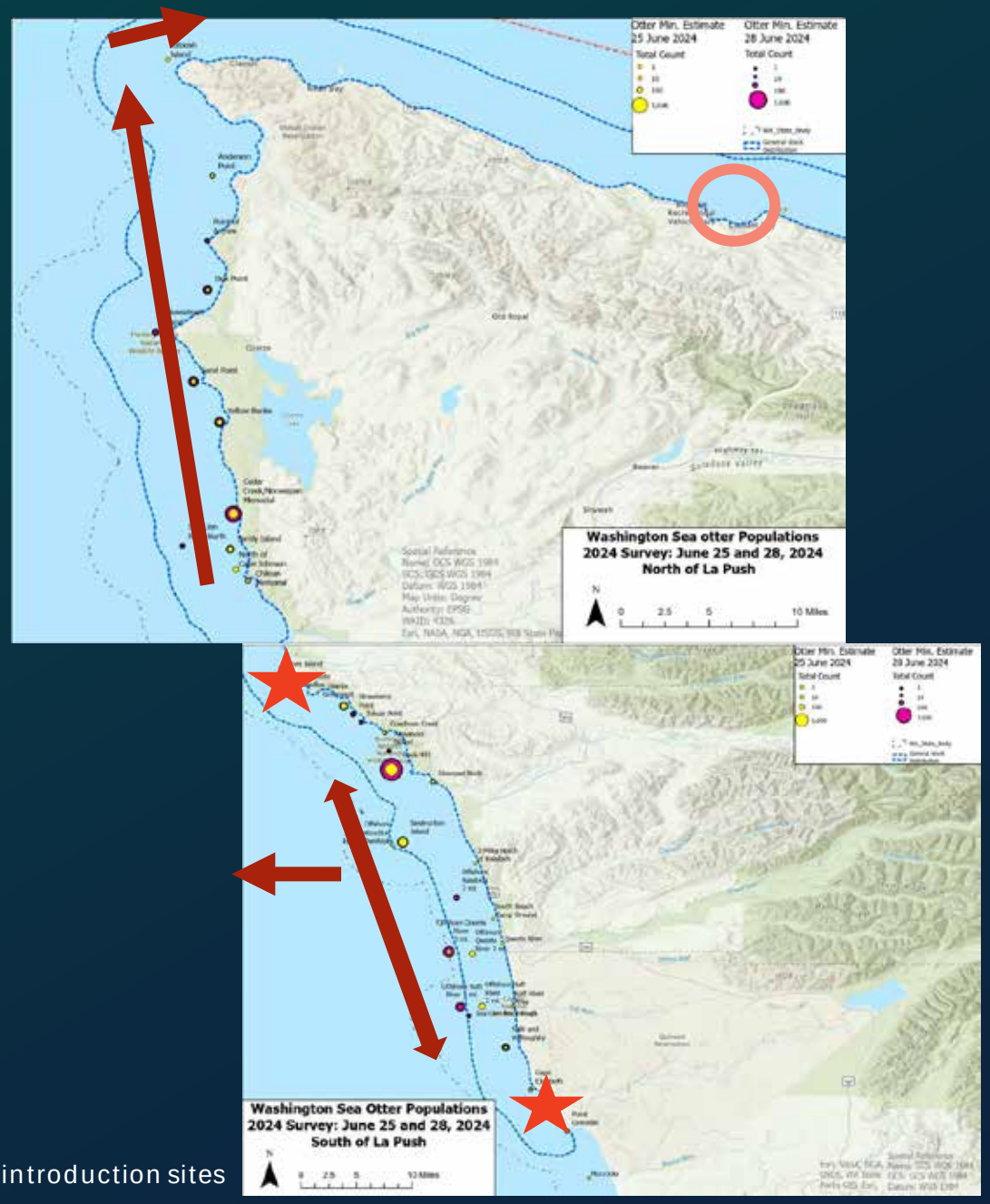
- **2021:** dense fog during survey week, only one survey was completed.
- **2022:** ran 2 offshore transects for first time and counted substantial otter numbers 2-4 miles offshore.
- **2023:** thick fog during survey week, flew again one month later and finished one complete survey. No offshore transects.



Challenges

Range Expansion

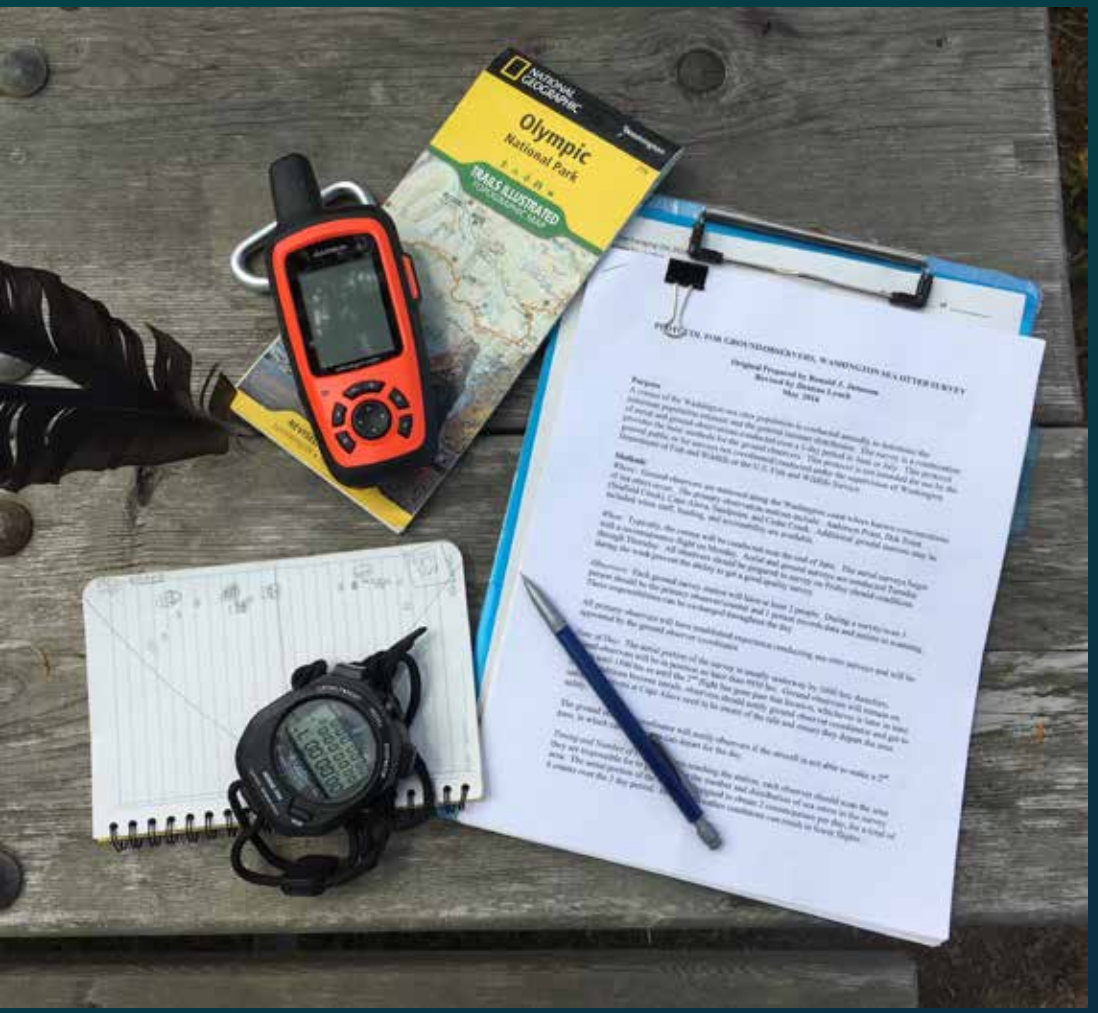
- The sea otter population reached equilibrium levels in the central area in the mid-1990s
- Expanded north and east, after 2000, sighting frequency decreased in the Strait of Juan de Fuca
- In mid-2000s, expanded range southward
- In 2022, found otters are moving offshore
- In 2024, group of otters in Clallam Bay!



WA Foraging Project

- Quantify foraging success and intensity
- The goal is to create a large database similar to CA and AK populations
- Provide information on status of population and relative abundance of prey

Method



Sea Otter Foraging Obs 2017 (ver 24May2016) Page _____ of _____

Observer/recorder: _____

Sampling Date: _____ Date data entered / initials: _____

Study: GWA KEFJ NRPP	Region: PWS KEP AKP		Obs Lat
Area: WPWS KEFJ KATM	Site:		Obs Lon

Bout#	Start	End
Age	Ott Lat	
Sex: F M TerrM U	Ott Lon	
Pup	Where	Obs Cond

Bout#	Start	End
Age	Ott Lat	
Sex: F M TerrM U	Ott Lon	
Pup	Where	Obs Cond

Bout#	Start	End
Age	Ott Lat	
Sex: F M TerrM U	Ott Lon	
Pup	Where	Obs Cond

Bout #	Dive #	DT	ST	Succ/ HT	Prey Item	Prey #	Prey Sz	Prop Not Eat	Why? / Notes / Tool Use

Where: ER = emergent rocks; IN = intertidal; KC = kelp canopy; OW = Open water; UN = unknown.
Obs condition (otter dist, visibility, glare, chop, etc): Excellent, very good, good, fair, poor, Unknown
Pup: VS = very small, S = small, M = Medium, L = Large, Y = Yes, N = No pup, U = unknown
Why prey not eaten: dropped, gave to pup, stolen by other than pup, unknown

Observations in Clallam Bay

Date	# otters
5/21/24	20
6/24/24	13
8/13/24	20
8/15/24	7
1/21/25	13
3/25/25	2
3/26/25	0
4/16/25	5
5/13/25	0
5/14/25	5

Clallam Bay


www.emeralddiving.com

Diet Composition
30
0
Bout
prey_name
Embedded cucumbers
fat gaper clam
gumboot chiton
kelp crabs
purple urchin
red urchin
unidentified Cancer crab
unidentified clam
unidentified crab
unidentified cucumber
unidentified prey
unidentified worm
NA

Data Analysis

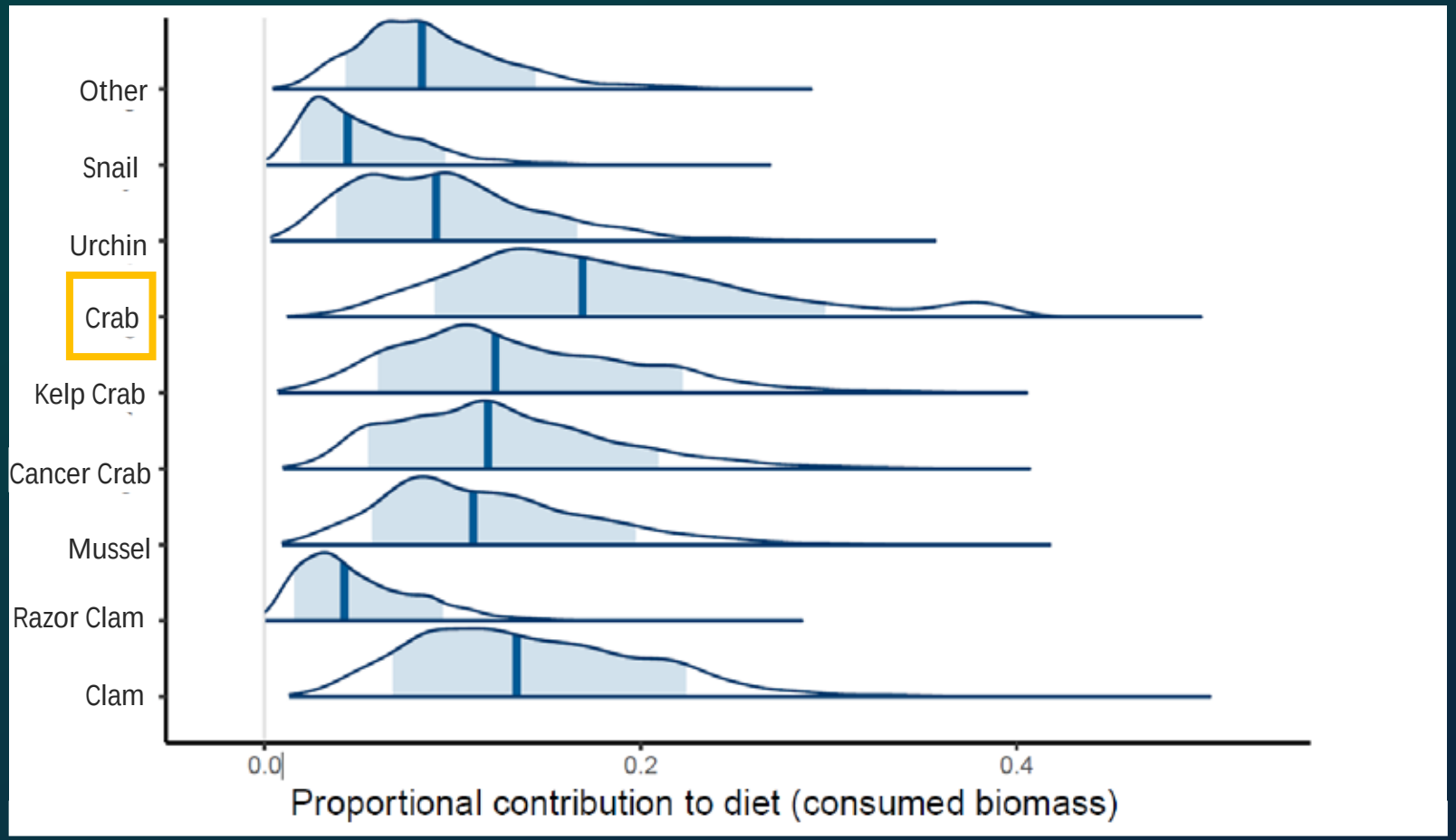
- **Sea Otter Foraging Analysis (SOFA 3.2) Model**
  - Bayesian methods are used to fit a process model to observational data
  - Questions
    - How sea otters allocate effort (energy)
    - How much of each prey type contributes to diet
    - Overall net rate of biomass consumption and energy intake
  - Makes educated guesses for unknown prey items

SEATTLE AQUARIUM

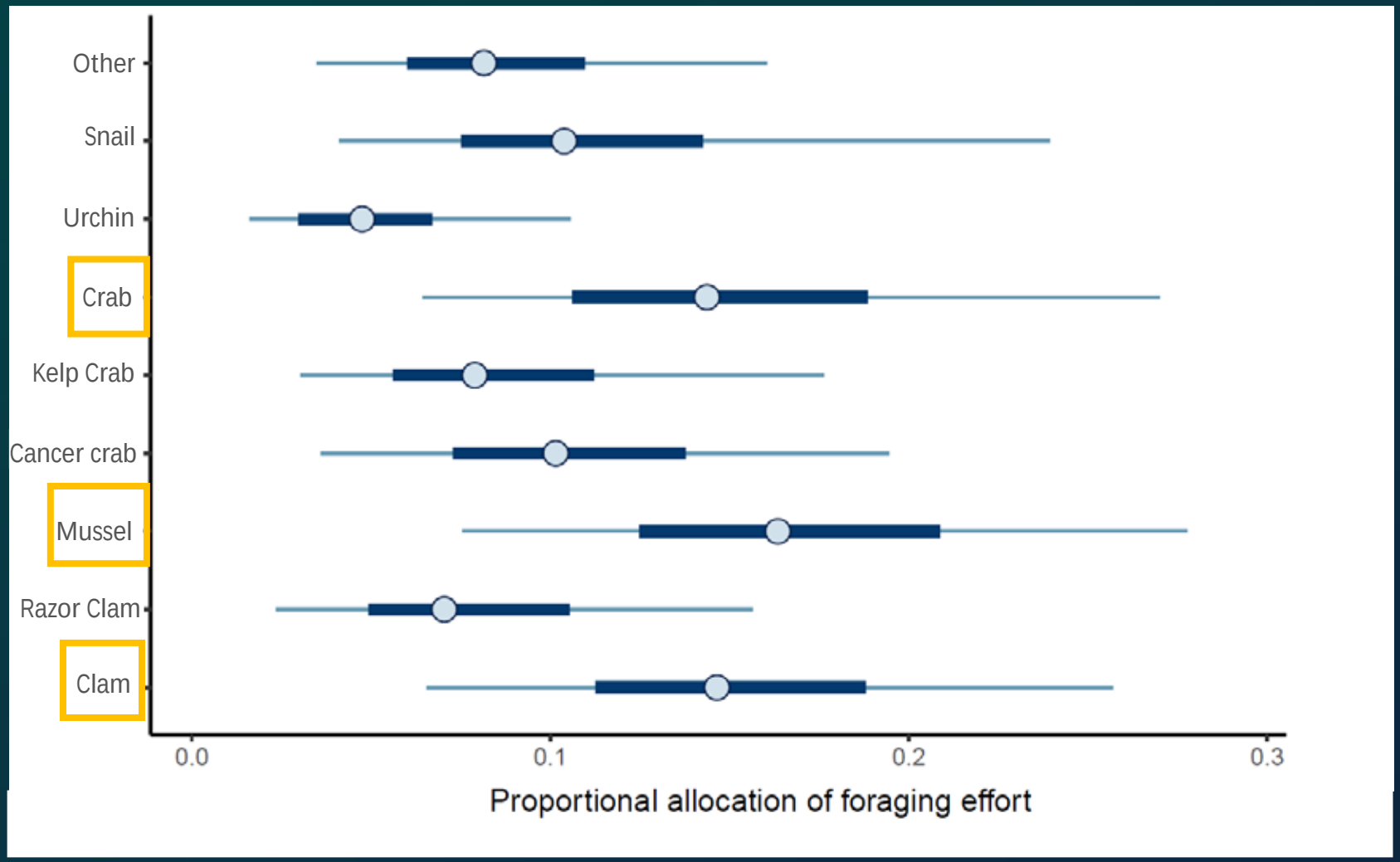
Hydra

USGS science for a changing world

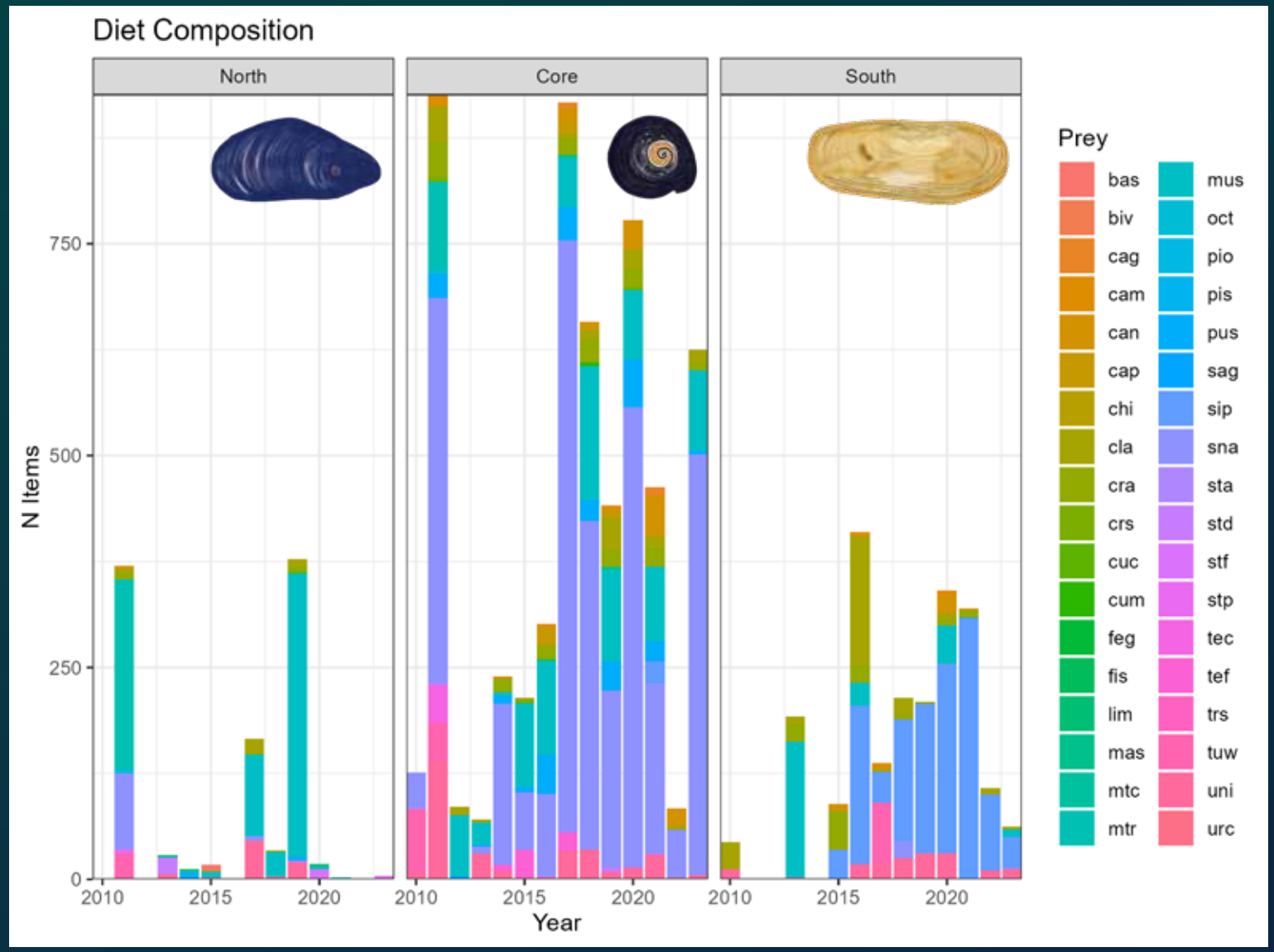
SOFA 3.2 – Entire Range



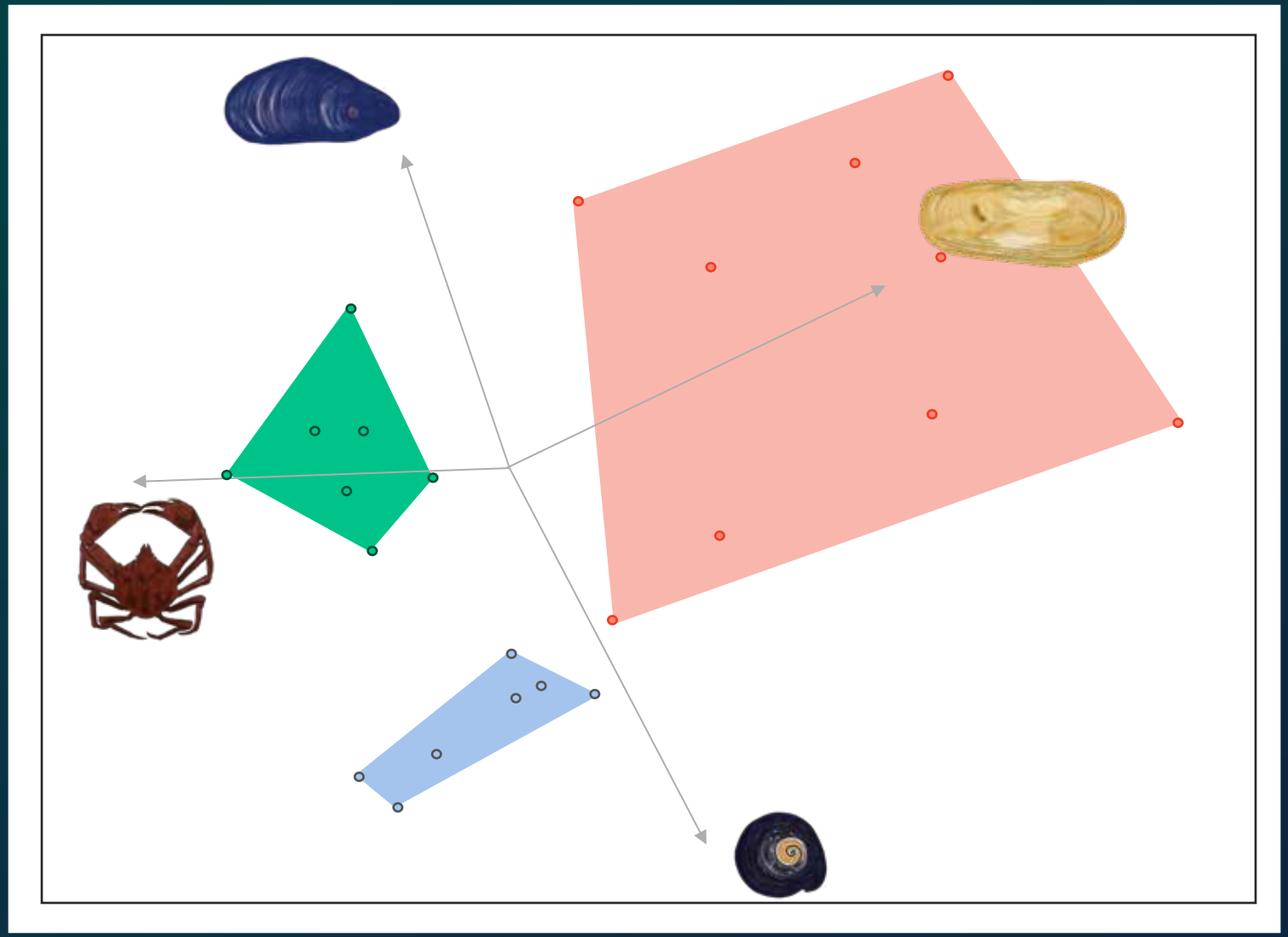
SOFA 3.2 – Entire Range



Diet Composition

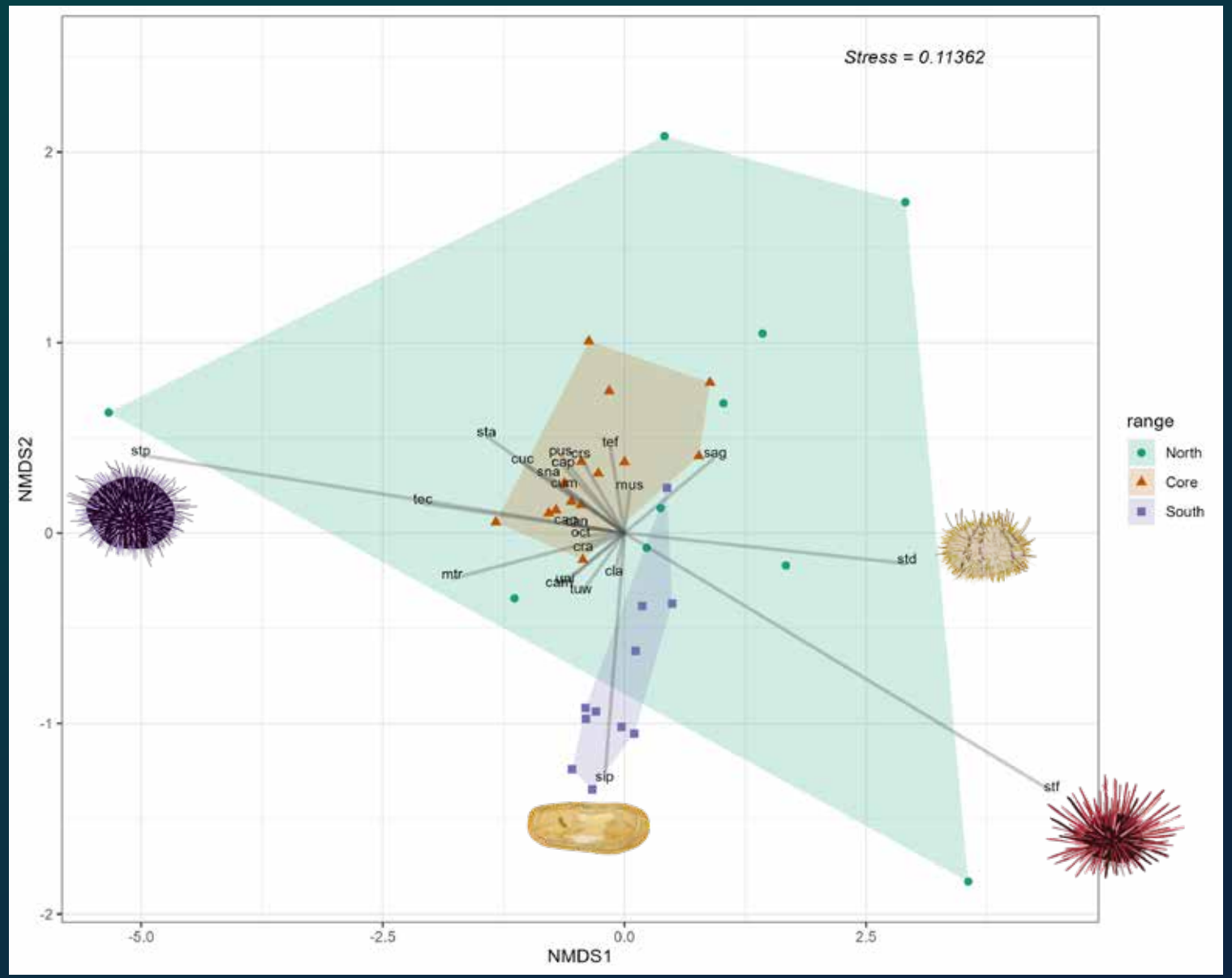


NMDS EXAMPLE



NMDS

- Removed 12 rare species (<5 occurrences)
- PERMANOVA
  - Significant difference in community structure between Range
  - Range explains **15%** of the variance (pseudo-$F_{2,123}$ = 15.64, p = 0.001)
  - Pairwise comparisons
    - **Core** and **South** significantly different (pseudo-$F_{1,106}$ = 28.51, p = 0.004)



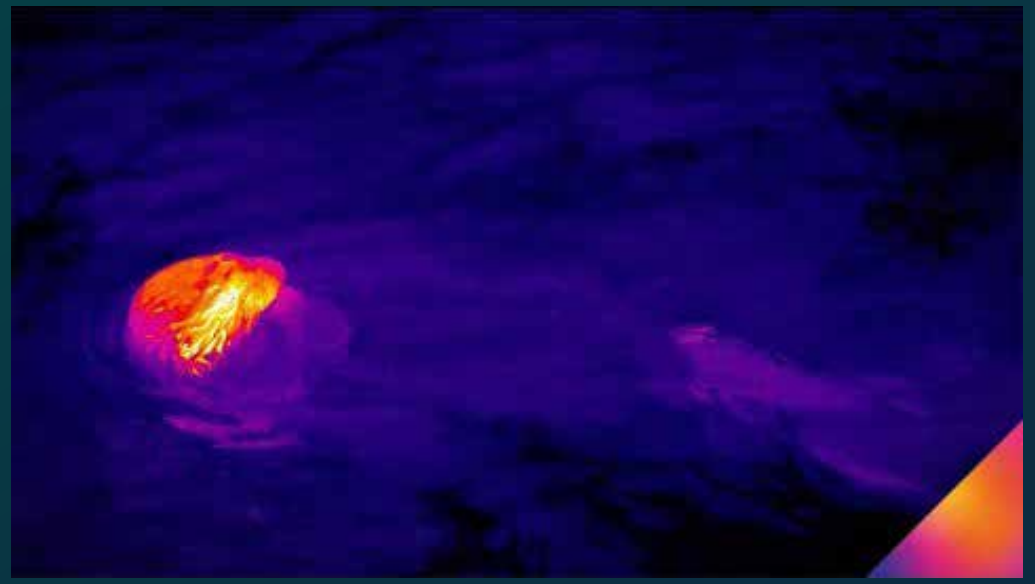
Summary

- In Clallam Bay, the otter's diet is diverse as they are coming back into a "new" area. Observing mostly young males which may be inexperienced.

- Prey items in the North and Core are more similar than the South range.

- This is important to note as the sea otters continue to expand their range north/northeast and south.

Next steps...



Thank you

a.olsen@seattleaquarium.org

C/o Clallam County Department of Community Development May 20, 2025

223 East 4th Street, Suite 5
Port Angeles, WA 98362-3015

Virginia Institute of Marine Science
Nationwide Fishing, Trap, Removal, Assessment, and Prevention Program
1375 Greate Road
Gloucester Point, Virginia 23062

Re: Northwest Straits Foundation proposal for Port Angeles Harbor and Sequim Bay Derelict Crab Pot Removal Project

To Whom it May Concern:

On behalf of the Clallam County Marine Resources Committee (MRC), please accept this letter of support for the Northwest Straits Foundation's proposal to locate and remove derelict crab pots in the marine waters of Clallam County, WA within Port Angeles Harbor and Sequim Bay.

As one of 7 counties comprising the Northwest Straits Initiative, the Clallam MRC advises the Board of County Commissioners regarding issues related to the marine resources of the Strait of Juan de Fuca and its bays, estuaries, and inlets within the borders of Clallam County. A part of the Clallam MRC's mission is to address local issues. The MRC's Strategic Plan for 2025-2029 states that the Clallam MRC may participate in regional efforts to prevent and /or remove derelict fishing and boating gear, especially derelict vessels and crabbing gear, to reduce the threat posed to marine ecosystems by this debris.

The Clallam County MRC recognizes that the loss of thousands of crab pots each season poses a threat to the resource and sustainability of our Dungness crab fishery. These lost crab pots continue to trap and kill many Dungeness crab every year and the Foundation's work focuses on reducing this non-target mortality.

Survey and removal of derelict crab pots in high priority areas and targeted outreach to users to prevent crab pots from becoming lost are key actions for reducing harm from derelict fishing gear in Washington's marine waters. Removal operations eliminate the current and future threat of derelict crab pots; outreach to user groups prevents re-accumulation of lost fishing gear. These efforts are necessary to prevent re-accumulation and protect marine species and habitats in the Salish Sea.

The Northwest Straits Foundation is a leader in addressing the problem of derelict fishing gear in Washington's Salish Sea since 2002. The Foundation's no-fault approach to removing derelict gear helps them work effectively with partners in the region and gain the trust of the state and tribes, commercial and recreational fishermen, industry, and environmental interests.

The Clallam County Marine Resources Committee strongly supports the work of the Foundation and supports providing funding for the Port Angeles Harbor and Sequim Bay Derelict Crab Pot Removal Project.

Sincerely,

LaTrisha Suggs, Chair
Clallam Marine Resources Committee

June 2025 Final Meeting Minutes

Date: Monday, June 16, 2025
Time: 5:30 – 6:43pm
Location: Hybrid meeting, Zoom and Clallam County Board of Commissioners' Meeting Room
Minutes prepared by Amelia Kalagher

Member Roll

	Member	Present?	Alternate	Present?
Academic Community	Ed Bowlby	X	Ioana Bociu	
At Large	Alan Clark (*NWSC Rep, Vice Chair*)	excused	Mary Sue Brancato	
At Large	*[vacant seat]*	---	Ray Kirk	
Conservation & Environmental Interests	*[vacant seat]*	---	Nancy Stephanz	X
Development Community	*[vacant seat]*	---	*[vacant seat]*	---
District I	Jeff Ward	X	*[vacant seat]*	---
District II	Ann Soule	excused	Lyn Muench	X
District III	Mike Doherty	X	Dann May	X
Jamestown S'Klallam Tribe	Christopher Burns	X	Robert Knapp	X
Lower Elwha Klallam Tribe	Allyce Miller		Chelsea Korbulic	X
Makah Tribe	*[vacant seat]*	---	*[vacant seat]*	---
Marine Related Recreation & Tourism	Alicia Amerson		Helle Andersen	
Port Angeles City Council	LaTrisha Suggs (*Chair*)	X	Navarra Carr	
Port of Port Angeles Commission	Jesse Waknitz		Katharine Frazier	X
Sequim City Council	Meggan Uecker		Kelly Burger	

Staff and Others Present
Amelia Kalagher (CCMRC Administrative Support), Bruce Emery (CC Director of Community Development), Sasha Horst (Northwest Straits Commission Staff), Amy Olsen (Seattle Aquarium Research Scientist, presenter), Brandon Sampson (Wet Dog Boats), John Worthington (Sequim resident), Jonathan Strivens (CC Environmental Health staff), Cathy Lear (retired CC Habitat Biologist)

Welcome / Call to Order / Roll Call

Chair LaTrisha Suggs called the meeting to order at 5:30. Roll was called, and others introduced themselves. A quorum was present at the beginning of the meeting.

Public Comment

- John Worthington of Sequim made a comment related to the presentation "Identify, Investigate, Integrate, Inform" listed on the agenda. He mentioned that SERN and NODC are local organizations that focus on integration and have existing plans, and would have liked to see groups like the MRC interface with the public to provide input prior to the development of these plans.

Presentation

- Amy Olsen, Seattle Aquarium Research Scientist, presented "Northern Sea Otter Foraging Analysis in Washington State". The presentation shared details of the Seattle Aquarium's long term monitoring study of sea otter foraging in Washington State, especially recent sightings in the CCMRC's local area. She briefly introduced sea otter diet, social behavior, function as a keystone species, range, history of being hunted by humans, and reintroduction to Washington waters. Studies dating back to approximately 1990 have shown an overall increase in population, and recent years have included additional sightings of otters during surveys 2-4 miles offshore. The range has expanded both southward along the Olympic coast and north/northeast into the Strait of Juan de Fuca. Otters have been sighted in Clallam Bay since 2024, with group sizes up to 20 in that year. Otter prey choices in Clallam Bay are quite varied because that area has been without otter predation for many years. She explained a model used to analyze foraging data, which showed there is a significant difference between the south, core and north ranges of the otters with the north and core ranges being more similar to each other than to the south. Potential next steps include conducting surveys with an aerial drone.
- Several MRC members asked questions regarding otters and Seattle Aquarium's work.

Approval of Minutes - May

- ***Nancy Stephanz moved to approve May minutes; Mike Doherty seconded. The motion passed unanimously and the minutes were approved.***

Announcements

- *Recap, NWSC meeting in Clallam County May 30th:* LaTrisha Suggs gave a presentation at that meeting summarizing the MRC's development as an advisory group, which seemed to be well received. Nancy Stephanz added that there was a presentation about the "Blue Model", an initiative to educate K-12 students in the marine trades.
- *2025-2027 grant proposals submitted to Northwest Straits Commission:* proposals for this cycle have been submitted to the Northwest Straits Commission. NODC funding which was under consideration for the Elwha Beach stewardship project must be spent by September rather than during the MRC's next grant cycle. MRC leadership, staff and project lead Helle Andersen recently met to develop the protocol for the Elwha Stewardship project. The MRC will continue to interface with the Commission throughout the summer to refine proposals.

- *Letter of Support for Northwest Straits Foundation proposal for PA Harbor and Sequim Bay Derelict Crab Pot Removal Project:* a letter was submitted, available as the last page of the agenda packet.
- *Update on recruitment:* The MRC is still attempting to recruit for available member and alternate positions. Also, efforts continue to encourage existing members to attend and engage with meetings. *Members were asked to continue recruitment efforts in their communities.
- *Forever Streamfest and Dungeness River Festival tabling signups:* Enough people have signed up to fill each timeslot (2 per slot), but if any others would like to participate they can still add themselves to the signup. Festival supplies are ready in the MRC storage unit. Chelsea Korbulic added that she will likely be able to bring forage fish egg voucher collections with a dissecting microscope to add a hands-on activity. *Amelia will look into adding a small wagon to assist in transporting festival items.

Committee and Project Reports

- *Olympia Oysters:* Oyster populations are doing great, with lots of natural recruitment.
- *Sound Toxins (community project):* Today's sampling showed relatively few harmful phytoplankton for this time of year, but another monitoring site in Camano Island has experienced a major bloom of poison-producing *Pseudo-nitzchia*.
- *Pigeon Guillemot Monitoring:* The pigeon guillemot project is in its third week of monitoring, but still needs volunteers to fill in as substitutes when other monitors are unavailable. The recruitment blurb for this project is currently posted on the MRC homepage.
- *Kelp Monitoring:* The kelp monitoring team will be paddling at Freshwater Bay tomorrow 6/18 to check out the area and practice their process prior to the first official survey.
- *Advisory Subcommittee:* The subcommittee has not yet met formally, but several current topics were recommended for MRC members to check out on their own:
    - City of Port Angeles Comp Plan Update
    - Rayonier Mill cleanup – plan potentially coming forth in June
    - Port of Port Angeles, Cofferdam Facility Seawall
    - Barge facility, upland asphalt paving and stormwater treatment to their intermodal handling & transfer facility. Improvements include protecting existing sheet pile barge berth with a fiberglass sheet pile encasement, the asphalt of 12 acres of upland and the installation of a three stage biofiltration facility to treat stormwater from the facility.
    - Permits: NPDES, 401 WQC, Clean Air Act (CAA), Shoreline Substantial Development Permit; DOE Coastal Zone Management, USACE NWS-2025-170
    - Subcommittee plans to bring back the priorities list being developed for the County Commissioners.
    - Mike Doherty added: comment period for the tug escort rulemaking has opened, and perhaps the MRC could collaborate with the Northwest Straits Commission or other MRCs to concur with comments they could be submitting. *Amelia will put this on the next agenda and inquire about others' existing comments.

Discussion of next meeting date and agenda

- *Next meeting:* The meeting will take place on Monday, July 21st.

- *Call for new agenda items:* Budget will be discussed as needed. The tug escort rule was suggested as an advisory item.

Public Comment
No additional public comment at this time.

Good of the Order
None at this time.

Adjourn
Chair LaTrisha Suggs adjourned the meeting at 6:43.

Action Items
- *Members were asked to continue recruitment efforts in their communities.
- *Amelia will look into adding a small wagon to assist in transporting festival items.
- *Amelia will put the tug escort rule on the next agenda and inquire about others' existing comments.

CLALLAM MRC MEETING AGENDA

July 21st, 2025
5:30 p.m. – 7:00 p.m.
Hybrid Meeting

Zoom meeting link: https://us06web.zoom.us/j/83769639254?pwd=FmcMflhkxw6df902xa2tsxu6UAHGVB.1
Meeting ID: 837 6963 9254
Passcode: 12345
For more information about the MRC, please contact Rebecca Mahan at 360-417-2322

Welcome by Chair LaTrisha Suggs / Call to Order / Roll Call

- Determination of quorum

Public Comment on agenda items, *limited to 3 minutes per participant at the discretion of the Chair*

Approval of Minutes – June

Announcements

- 2025-2027 grant proposals with Northwest Straits Commission
  - NWSC budget updates
  - Ediz Hook debris removal project removed from consideration
  - Elwha Beach: NODC grant for SaniKan and dog waste bags
- General NWSC update (funding efforts, strategic plan) – Alan Clark
- Habitat Biologist II position applications received (to become MRC Coordinator)
- Nancy Stephanz to be appointed Conservation & Environmental Interests rep 7/22
- PSEMP and NOAA film project to include info about MRC projects - Chelsea Korbulic
- Information:
  - Rayonier Pier cleanup: City of Port Angeles community forum July 22 (flyer attached)
  - McKinley Paper Mill – SEPA Checklist with shoreline permitting exemption to demolish & dispose of & existing crane tower and fixed pier. Disposal of existing 38' x 100' creosote pier, including about 58 creosote treated wood piling, pile caps, stringers, and decking
    - Site Plan
    - JARPA
- Paddle to Elwha; Landing at Elwha Beach July 31st, Protocol & Celebration August 1-5, 2025
  - Landing July 30th at Jamestown Beach

Committee and Project Reports

- Project leads report only if an update is needed
- Advisory Sub-Committee
  - Tug escort rulemaking: comments due August 1
  - Rayonier Pier cleanup: comments due August 12, public meeting was held July 8, community forum July 22
  - Port of Port Angeles, Cofferdam Facility Seawall

2025 Meetings

January 16 (Thu)	April 21	July 21	October 20
February 20 (Thu)	May 19	August 18	November 17
March 17	June 16	September 15	December 15

- BOCC Priorities Memo follow-up

New or special business

- Suggested draft letter to Board of Pilotage Commissioners regarding tug escort rulemaking – Mike Doherty

Discussion of next meeting date and agenda

- Next regular meeting Monday, August 18
- Call for new agenda items

Public Comment *Limited to 3 minutes per participant at the discretion of the Chair*

Good of the Order

Adjourn

Clallam County DCD is inviting you to a scheduled Zoom meeting.

Join Zoom Meeting
https://us06web.zoom.us/j/83769639254?pwd=FmcMflhkxw6df902xa2tsxu6UAHGVB.1

Meeting ID: 837 6963 9254
Passcode: 12345

One tap mobile
+12532050468,,83769639254#,,,,*12345# US
+12532158782,,83769639254#,,,,*12345# US (Tacoma)

Dial by your location
• +1 253 215 8782 US (Tacoma)

2025 Meetings

January 16 (Thu)	April 21	July 21	October 20
February 20 (Thu)	May 19	August 18	November 17
March 17	June 16	September 15	December 15

Hosted by the
City of Port Angeles

City Council Special Meeting

RAYONIER MILL CLEANUP COMMUNITY FORUM

Learn more about the Site Cleanup

Hear from Subject Matter Experts

Participate in Community Q&A

Tuesday, July 22	5:00 - 7:30 PM	City Hall, 321 E 5th St

Scan Me

Join us to learn more about the Rayonier Mill Site, efforts to remove contamination from the area, and why it's important for Port Angeles and neighboring communities.

Visit the City of Port Angeles website for full details: www.cityofpa.us

Date: July 13, 2025

Clallam County
MARINE RESOURCES
COMMITTEE

To: The Washington State Board of Pilotage Commissioners

c/o Jaimie Bever, BPC administrator

RE: Amendments to the Pilotage Rules, Chapt.363-116-WAC.

For many residents of the North Olympic Peninsula, oil spill risks are taken seriously. In December 1985, the Tank Vessel Arco Anchorage, carrying 814,000 barrels of Alaskan North Slope crude oil, entered Port Angeles harbor, ran aground and tore open two cargo holds, spilling 5690 barrels, or 239,000 gallons, into the Port Angeles harbor. Oil drifted as far west as Neah Bay, and east to Dungeness Spit. The 24/7 cleanup lasted over four months.

In December 1988, a spill occurred from the 300 foot tank barge, Nestucca, loaded with nearly 300,000 gallons of bunker oil from Cherry Point, when a tow line broke. An "insurance wire" that should have been available to deploy in such circumstances was not available. In maneuvers to reconnect the tow, the barge was ruptured by the tug's rudder (a six foot by 18" gash). The "fingerprint" of the oil was found from the Oregon Coast to Vancouver Island. 230,000 gallons spilled. A federal judge found that the "responsible party" had caused the spill.

In 1991, the fish processing vessel Tenya Maru, loaded with 450,000 gallons of fuel oil, rammed a Chinese freighter, 22 miles northwest of Cape Flattery, in Canadian waters. The vessel sank to the ocean floor near the mouth of the Strait of Juan de Fuca. Nearly 75% of the diesel oil and bunker fuel remains unaccounted for. The ship remains 500 feet under water.

We appreciate the several improvements made in recent decades to the oil transshipment system, but much more must be done. We agree with other parties that low probability events can have the potential for very high consequences, at least partially because of the record. The record of spilled oil in Washington's waters in the 1980's and 1990's justifies our concern. Communities, local governments and tribal governments have regularly supported efforts to strengthen Washington State oil spill prevention, preparedness, response, monitoring and damage assessment capabilities. U. S. and Canadian tribal

governments have express legal rights related to treaties and certain governmental forums. We encourage tribal consultations throughout this process.

We also appreciate the actions of the State Legislature, the Governor, the Department of Ecology Spills Program, the Board of Pilotage Commissioners, and numerous organizations and citizens urging additional safeguards.

The Northern Salish Sea and the Strait of Juan ed Fuca are experiencing increasing congestion in shipping lanes. The expansion of the transshipment of tar sands oil and products will raise additional risks. We support the expansion of tug escort regulations required of offshore oil tankers, to smaller oil tankers and articulated tug barges (ATBs) as well as tow barges between 5,000-40-000 dwt (other than those engaged in bunkering operations).

Thank you for the detailed rule-making process and for the opportunity to comment.

Sincerely,

Clallam County Marine Resources Committee

c: Governor Ferguson

State Senator Mike Chapman,

State Representative Steve Tharinger

State Representative Adam Bernbaum

Clallam County Board of Commissioners

Clallam County Marine Resources Committee

July 2025 Final Meeting Minutes

Date: Monday, July 21, 2025
Time: 5:30 – 7:10pm
Location: Hybrid meeting, Zoom and Clallam County Board of Commissioners' Meeting Room
Minutes prepared by Amelia Kalagher

Member Roll

	Member	Present?	Alternate	Present?
Academic Community	Ed Bowlby		Ioana Bociu	
At Large	Alan Clark (*NWSC Rep, Vice Chair*)	X	Mary Sue Brancato	
At Large	*[vacant seat]*	---	Ray Kirk	
Conservation & Environmental Interests	*[vacant seat]*	---	Nancy Stephanz	X
Development Community	*[vacant seat]*	---	*[vacant seat]*	---
District I	Jeff Ward		*[vacant seat]*	---
District II	Ann Soule	X	Lyn Muench	excused
District III	Mike Doherty	X	Dann May	
Jamestown S'Klallam Tribe	Christopher Burns	X	Robert Knapp	X
Lower Elwha Klallam Tribe	Allyce Miller		Chelsea Korbulic	excused
Makah Tribe	*[vacant seat]*	---	*[vacant seat]*	---
Marine Related Recreation & Tourism	Alicia Amerson		Helle Andersen	
Port Angeles City Council	LaTrisha Suggs (*Chair*)	excused	Navarra Carr	
Port of Port Angeles Commission	Jesse Waknitz		Katharine Frazier	X
Sequim City Council	Meggan Uecker		Kelly Burger	

Staff and Others Present
Rebecca Mahan (Clallam County Habitat Biologist Manager; CCMRC Coordinator), Amelia Kalagher (CCMRC Administrative Support), Sasha Horst (Northwest Straits Commission staff), Angela Glore (Strait ERN Coordinator), Jonathan Strivens (Clallam County Environmental Health)

Welcome / Call to Order / Roll Call

Vice Chair Alan Clark called the meeting to order at 5:30. Roll was called, and others introduced themselves.

Public Comment

- None at this time.

Approval of Minutes - June

- ***A quorum was not present. June minutes will be subject to approval at the August 18th meeting.***

Announcements

- *2025-2027 grant proposals with Northwest Straits Commission:* Alan gave an update from the Northwest Straits Commission, in which the final 2025-2027 budget is still being determined. MRCs are asked to begin planning and prioritizing for a potential budget reduction. Rebecca Mahan gave an update on the current grant proposals, which she and Amelia are revising with the Northwest Straits Commission in July. The Ediz Hook debris removal project has some concerns regarding meeting the grant criteria. The MRC is still waiting to hear about potential Strait ERN funding for the Elwha Stewardship project. Members briefly discussed prioritization and the Ediz Hook debris removal project. *Rebecca will reach out to Lower Elwha Klallam Tribe to discuss the status of the Ediz Hook debris removal project. *Amelia will issue a poll to help the MRC determine its priority projects.
- *Habitat Biologist II position applications received:* Rebecca gave an update on hiring for this position, which will serve as the MRC Project Coordinator once hired. Applications are currently being reviewed.
- *Nancy Stephanz to be appointed Conservation & Environmental Interests rep 7/22.* Nancy also gave a brief update on her Sound Toxins plankton monitoring work with Feiro Marine Life Center.
- *PSEMP and NOAA film project to include info about MRC projects:* Alan Clark gave an update on this topic. He and Chelsea Korbulic recently joined the film crew to take video kayaking at Freshwater Bay.
- *Informational items*
    - *Rayonier Pier cleanup:* Members discussed the recent community meeting with a presentation from the Department of Ecology. A community forum will be held 7/22 by the City of Port Angeles.
    - *McKinley Paper Mill:* Members briefly discussed, with no concerns about the project shared at this time.
- *Paddle to Elwha:* The canoe families' Paddle to Elwha will include a landing at Jamestown on 7/30, landing at Lower Elwha 7/31, and protocol and celebration August 1-5.
- *Clallam Conservation District:* Ann Soule added this announcement. The CCD's funding cannot continue as-is, so there is a proposal for $5 per parcel per year to replace the funding. This will be presented to the Clallam County Board of Commissioners. There is a public hearing Friday, July 25th.

Committee and Project Reports

- *Kelp:* Alan gave an update on new volunteers as part of the survey crew.

- *Pinto abalone:* Rebecca gave an update on survey dives scheduled for September.
- *Forage fish:* Chelsea, Helle and a community volunteer have been sampling routinely.
- *Advisory Subcommittee:*
    - *Rayonier Pier cleanup:* There was a public meeting July 8, and a community forum coming up through the City of Port Angeles on July 22.
    - *Cofferdam Facility seawall:* Katharine Frazier gave a brief update on this project for the Port of Port Angeles.

New and special business

- *Tug escort rulemaking:* A draft letter of support for the tug escort rulemaking was presented for consideration by Mike Doherty, but the MRC could not sign due to the lack of a quorum. It was suggested that any MRC members who support the letter may adapt it to make comment as an individual.

Good of the Order

- *Studium Generale:* Nancy Stephanz contacted Peninsula College about potential Studium Generale dates for this winter. Nancy can present. January 22 was scheduled.
- The group discussed impacts and response related to the recent Indian Creek fuel tanker spill.
- The Department of Ecology is doing a 5-year update on the best achievable science for oil spill policy.

Discussion of next meeting date and agenda

- *Next meeting:* The meeting will take place on Monday, August 18.
- *Call for new agenda items:* None at this time.

Public Comment

- Jonathan Strivens (Clallam County Environmental Health) made a comment regarding the Elwha River and Indian Creek fuel tanker spill. He received a call informing him of a plume of sediment coming down the river from the current construction zone. The group briefly discussed the construction work as it relates to the spill.

Adjourn

Vice Chair Alan Clark adjourned the meeting at 7:10.

Action Items

- *Amelia will issue a poll to help the MRC determine its priority projects.
- *Rebecca will reach out to Lower Elwha Klallam Tribe to discuss the status of the Ediz Hook debris removal project.

CLALLAM MRC MEETING AGENDA

August 18th, 2025
5:30 p.m. – 7:00 p.m.
Hybrid Meeting

Zoom meeting link: https://us06web.zoom.us/j/83769639254?pwd=FmcMflhkxw6df902xa2tsxu6UAHGVB.1
Meeting ID: 837 6963 9254
Passcode: 12345
For more information about the MRC, please contact Rebecca Mahan at 360-417-2322

Welcome by Chair LaTrisha Suggs / Call to Order / Roll Call

- Determination of quorum

Public Comment on agenda items, *limited to 3 minutes per participant at the discretion of the Chair*

Approval of Minutes

- June minutes (since quorum wasn't present in July)
- July minutes

Announcements

- Northwest Straits Initiative 2025 conference – Caitlyn Blair
- General NWSC update – Alan Clark
- 2025-2027 grant proposals with Northwest Straits Commission
  - Ediz Hook debris project removed due to NWSC and SAC feedback
  - Elwha Stewardship project funded 2025-2027 through Strait ERN / NODC
  - Project prioritization discussion (poll results attached)
- Habitat Biologist II position applications received (to become MRC Project Coordinator)
- End-of-year project reports due September 30th – project leads to work with staff

Committee and Project Reports

- Project leads report only if an update is needed
- Advisory Sub-Committee
  - Rayonier Pier cleanup: comment period ended August 12
    - Clallam, City of PA and Lower Elwha Klallam Tribe sent letters supporting L5 alternative (full removal)
    - City of Port Angeles held special meeting July 22 – recording here
  - BOCC Priorities Memo follow-up

Discussion of next meeting date and agenda

- Next regular meeting Monday, September 15
- Call for new agenda items

2025 Meetings

January 16 (Thu)	April 21	July 21	October 20
February 20 (Thu)	May 19	August 18	November 17
March 17	June 16	September 15	December 15

Public Comment *Limited to 3 minutes per participant at the discretion of the Chair*

Good of the Order

- Indian Creek fuel spill update

Adjourn

Clallam County DCD is inviting you to a scheduled Zoom meeting.

Join Zoom Meeting
https://us06web.zoom.us/j/83769639254?pwd=FmcMflhkxw6df902xa2tsxu6UAHGVB.1

Meeting ID: 837 6963 9254
Passcode: 12345

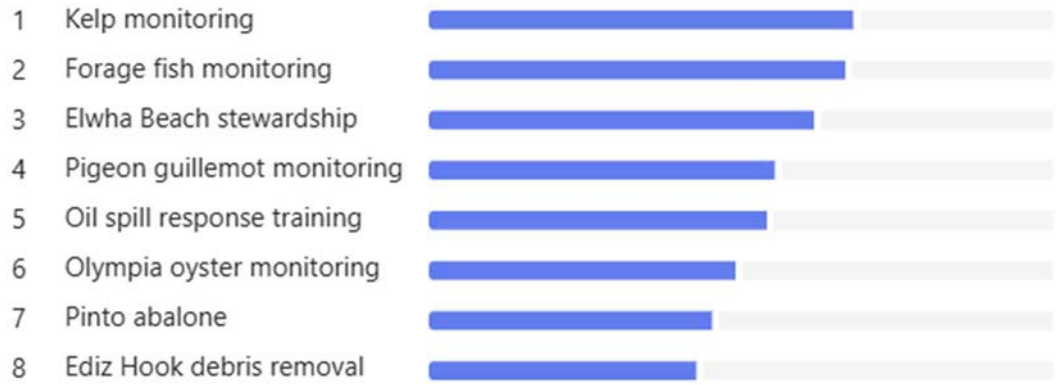
One tap mobile
+12532050468,,83769639254#,,,,*12345# US
+12532158782,,83769639254#,,,,*12345# US (Tacoma)

Dial by your location
- **+1 253 215 8782 US (Tacoma)**

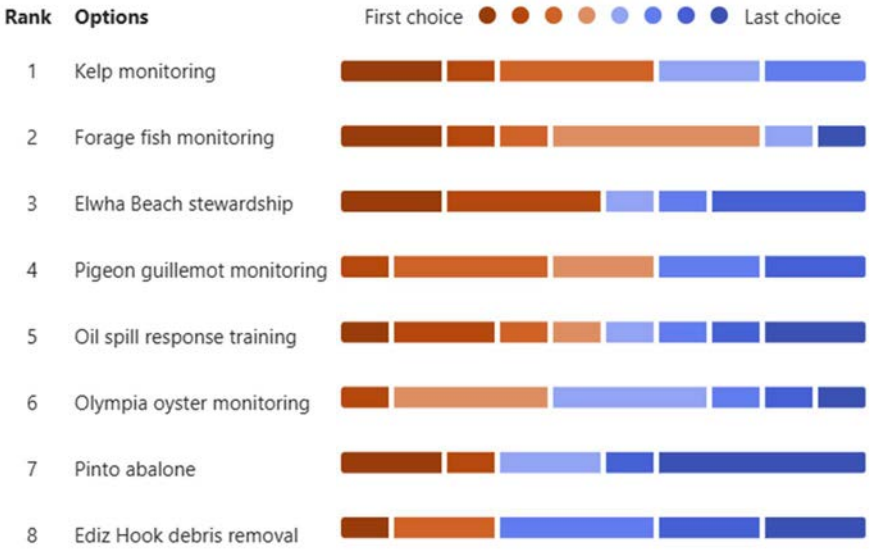
2025 Meetings

January 16 (Thu)	April 21	July 21	October 20
February 20 (Thu)	May 19	August 18	November 17
March 17	June 16	September 15	December 15

Project Prioritization Survey Results



10 Responses



Survey Comments (anonymous)

- Since it sounds like we won't be involved in the Ediz Hook debris removal, I have put it last. Oil spill response training is important. I left it next to last hoping the Ecology Department would see the need, after our recent spill here, to do that training.
- This is super hard to rank as I am so new and don't know as much about all of the projects and their value to the community … I feel like some of my answers reflect considering if the MRC isn't leading the projects then are there other groups who would take them on? And I think if I ranked again tomorrow my answer would be different. I'm not sure if prioritizing is the best way to think about them relative to budget constraints? But I also recognize I missed discussion about this during the July meeting. I'll put some more thought into it but leave it as this for now.
- Abalone represents an opportunity to engage in a region-wide restoration effort, but is expensive and may need to be scaled back. Monitoring programs are essential to assess status and trends and to support oil spill response planning. All projects should be assessed to determine how much staff time is required.
- We are asked to rank MRC projects, but I note that some of the most expensive projects, in terms of staff time are not on the list. Certainly outreach/education and our advisory role to the BOCC require time that may exceed our staffing capacity at present I would suggest that project priority be guided by the ideas of what is possible given funding and the ability of MRC staff to manage the projects with the time they have. Monitoring projects are relatively inexpensive and don't demand a lot of time. Oil response training has been disappointing in regard to participation by the community. Elwha Beach steward ship has been funded. Ediz Hook debris removal, while a good idea, doesn't seem to meet the criteria set by the NWSC for MRC projects.
- All projects should have MRC member hands-on involvement
- I hope this is helpful to staff. They should make final decision if it comes to it.

August 2025 Final Meeting Minutes

Date: Monday, August 18, 2025
Time: 5:36 – 7:05pm
Location: Hybrid meeting, Zoom and Clallam County Board of Commissioners' Meeting Room
Minutes prepared by Amelia Kalagher

Member Roll

	Member	Present?	Alternate	Present?
Academic Community	Ed Bowlby	X	Ioana Bociu	
At Large	Alan Clark (*NWSC Rep, Vice Chair*)	X	Mary Sue Brancato	
At Large	*[vacant seat]*	---	Ray Kirk	
Conservation & Environmental Interests	Nancy Stephanz	X	*[vacant seat]*	---
Development Community	*[vacant seat]*	---	*[vacant seat]*	---
District I	Jeff Ward	X	*[vacant seat]*	---
District II	Ann Soule	X	Lyn Muench	
District III	Mike Doherty	X	Dann May	
Jamestown S'Klallam Tribe	Christopher Burns	X	Robert Knapp	X
Lower Elwha Klallam Tribe	Allyce Miller	X	Chelsea Korbulic	X
Makah Tribe	*[vacant seat]*	---	*[vacant seat]*	---
Marine Related Recreation & Tourism	Alicia Amerson		Helle Andersen	
Port Angeles City Council	LaTrisha Suggs (*Chair*)		Navarra Carr	
Port of Port Angeles Commission	Jesse Waknitz		Katharine Frazier	
Sequim City Council	Meggan Uecker		Kelly Burger	

Staff and Others Present
Rebecca Mahan (Clallam County Habitat Biologist Manager; CCMRC Coordinator), Amelia Kalagher (CCMRC Administrative Support), Bruce Emery (CC Director of Community Development), Caitlyn Blair (Northwest Straits Commission), Jonathan Strivens (CC Environmental Health), Pamela Wood, Patricia

Welcome / Call to Order / Roll Call

Vice Chair Alan Clark called the meeting to order at 5:36. Roll was called, and others introduced themselves.

Public Comment

- Rebecca Mahan shared that Chair LaTrisha Suggs would not be able to attend due to an emergency.

Approval of Minutes

- ***Mike Doherty moved to approve the June and July 2025 minutes, Nancy Stephanz seconded. The motion passed unanimously and minutes were approved.***

Announcements

- *Northwest Straits Initiative 2025 conference:* Caitlyn Blair (NWSC) described conference registration and accommodations. Conference website and details have been emailed to MRC members. The registration deadline is October 7th.
- *General NWSC update:* Alan Clark described the most recent meeting, including a visit to Whatcom MRC's eelgrass preservation project at Wildcat Cove and several other topics. The MRC discussed the Blue Schools initiative and some ideas for collaboration.
- *2025-2027 grant proposals with Northwest Straits Commission:* Rebecca Mahan gave an update on the 2025-2027 grant cycle, including receiving the NODC grant for the Elwha Stewardship project, the latest budget for 2025-2027, and oil spill response training. The MRC discussed project prioritization, particularly regarding pinto abalone and oil spill response training.
    - Ann Soule suggested a motion for staff to make prioritization decisions using the discussion and survey results as guidance. The MRC discussed and the suggestion was kept informal.
- *Habitat Biologist II position:* Rebecca shared an update; 48 applications were received and the hiring process is in progress.
- *End of year project reports:* Rebecca and Amelia reviewed the needs for project leads to draft annual project reports by mid-September. Project leads should complete drafts and share raw data by September 19th, focusing on sections 6-8 of the report.

Committee and Project Reports

- *Kelp monitoring:* Alan and Chelsea gave an update. The kelp team is well prepared and has two surveys scheduled in the next week.
- *Pinto abalone:* Jeff gave an update. There was a meeting with Puget Sound Restoration Fund earlier today to confirm details for September abalone survey dives.
- *Sound Toxins:* Nancy gave an update. Sampling continues weekly, with stable and relatively low levels of toxin-producing plankton recently observed.
- *Forage fish:* Chelsea gave an update. Sampling was paused for the Elwha sites due to the fuel spill, but can now be safely resumed.
- *Advisory:*
    - *Rayonier Pier:* Alan gave an update. A City of Port Angeles special meeting on the topic is recorded, and some MRC members submitted personal comments.

- *BOCC priorities memo:* Ann Soule commented on accelerating this effort because comprehensive plan development is underway.

Discussion of next meeting date and agenda

- *Next meeting:* The meeting will take place on Monday, September 15.
- *Call for new agenda items:*
  - Nancy requested a reminder of signups for Streamfest and Riverfest.

Public Comment

- Jonathan Strivens tried to make a comment regarding education and outreach opportunities, but could not be understood via Zoom. Rebecca asked that he discuss with her tomorrow.

Good of the Order

- *Indian Creek fuel spill update:* Rebecca gave a brief update on follow-up meetings she has attended. Chelsea suggested visiting Ecology's webpage for more information.
- *Cline Spit beach parking:* Alan said that he witnessed people parking on the beach on Cline Spit, which could be a concern, particularly for forage fish habitat. The MRC discussed potential interventions for this site.
- *Escort rescue tug & Canadian oil projects:* Mike Doherty recommended that the MRC and NWSC should stay updated about the prospective rulemaking for an escort rescue tug and a number of planned Canadian projects that would affect tanker traffic in the Strait of Juan de Fuca.

Adjourn

Vice Chair Alan Clark adjourned the meeting at 7:05.

CLALLAM MRC MEETING AGENDA

September 15th, 2025
5:30 p.m. – 7:00 p.m.
Hybrid Meeting

Zoom meeting link: https://us06web.zoom.us/j/83769639254?pwd=FmcMflhkxw6df902xa2tsxu6UAHGVB.1
Meeting ID: 837 6963 9254
Passcode: 12345
For more information about the MRC, please contact Rebecca Mahan at 360-417-2322

Welcome by Chair LaTrisha Suggs / Call to Order / Roll Call

- Determination of quorum

Public Comment on agenda items, *limited to 3 minutes per participant at the discretion of the Chair*

Approval of Minutes

- August minutes

Announcements

- Northwest Straits Initiative 2025 conference – Caitlyn Blair
  - Networking lightning session: highlight one project
- Streamfest Sept 20th, Dungeness River Festival Sept 26th
- End-of-year project reports due September 30th – project leads to work with staff
  - Pigeon Guillemot
  - Kelp
  - Elwha Beach Stewardship
  - Olympia Oyster
  - Forage Fish
- General NWSC update – Alan Clark
- 2025-2027 grant proposals with Northwest Straits Commission
- Habitat Biologist II hired to become MRC Project Coordinator: Chase O'Neil
- Helle Andersen and Alicia Amerson resigned from MRC; Tim Cochnauer and Stephen Crafton-Tempel in application process

Committee and Project Reports

- Project leads report only if an update is needed
- Advisory Sub-Committee
  - BOCC Priorities Memo follow-up

Discussion of next meeting date and agenda

- Next regular meeting Monday, October 20
- Call for new agenda items

2025 Meetings

January 16 (Thu)	April 21	July 21	October 20
February 20 (Thu)	May 19	August 18	November 17
March 17	June 16	September 15	December 15

Public Comment *Limited to 3 minutes per participant at the discretion of the Chair*

Good of the Order

- Indian Creek fuel spill update
  - Thank you, Jamestown S'Klallam Tribe, for arriving on scene with booms to deploy
  - Thank you, Lower Elwha Klallam Tribe, for natural resource staff arriving on scene advocating for salmon/wildlife

Adjourn

Clallam County DCD is inviting you to a scheduled Zoom meeting.

Join Zoom Meeting
https://us06web.zoom.us/j/83769639254?pwd=FmcMflhkxw6df902xa2tsxu6UAHGVB.1

Meeting ID: 837 6963 9254
Passcode: 12345

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2025 Meetings

January 16 (Thu)	April 21	July 21	October 20
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Streamfest

Forever Streamfest 2025 - Pebble Beach Park, Port Angeles (North of Field Arts & Events Hall)
Saturday, September 20th

Setup begins 9am
Open to public 10am
Close to public 3:30pm
Breakdown aim to finish by 4:15pm

9am-11:30am: Jeff Ward & Alan Clark
11:30am-2pm: Lyn Muench & Chelsea Korbulic
2pm-4:30pm: Dann May & Nancy Stephanz

Riverfest

Dungeness River Festival 2025 - Dungeness River Nature Center, Sequim
Friday, September 26th

Setup begins 8am
Open to public 9am
Closed to public 2:30pm
Breakdown aim to finish by 3:15pm

8am-10:30am: Alan Clark & Lyn Muench
10:30am-1pm: Lyn Muench & Helle Andersen
1pm-3:30pm: Ann Soule & Nancy Stephanz

2025 Meetings

January 16 (Thu)	April 21	July 21	October 20
February 20 (Thu)	May 19	August 18	November 17
March 17	June 16	September 15	December 15

September 2025 Final Meeting Minutes

Date: Monday, September 15, 2025
Time: 5:36 – 7:04pm
Location: Hybrid meeting, Zoom and Clallam County Board of Commissioners' Meeting Room
Minutes prepared by Amelia Kalagher

Member Roll

	Member	Present?	Alternate	Present?
Academic Community	Ed Bowlby	excused	Ioana Bociu	
At Large	Alan Clark (*NWSC Rep, Vice Chair*)	X	Mary Sue Brancato	excused
At Large	*[vacant seat]*	---	Ray Kirk	
Conservation & Environmental Interests	Nancy Stephanz	X	*[vacant seat]*	---
Development Community	*[vacant seat]*	---	*[vacant seat]*	---
District I	Jeff Ward	X	*[vacant seat]*	---
District II	Ann Soule	excused	Lyn Muench	X
District III	Mike Doherty	X	Dann May	
Jamestown S'Klallam Tribe	Christopher Burns	excused	Robert Knapp	X
Lower Elwha Klallam Tribe	Allyce Miller	X	Chelsea Korbulic	X
Makah Tribe	*[vacant seat]*	---	*[vacant seat]*	---
Marine Related Recreation & Tourism	*[vacant seat]*	---	*[vacant seat]*	---
Port Angeles City Council	LaTrisha Suggs (*Chair*)	X	Navarra Carr	
Port of Port Angeles Commission	Jesse Waknitz		Katharine Frazier	
Sequim City Council	Meggan Uecker		Kelly Burger	

Staff and Others Present
Rebecca Mahan (Clallam County Habitat Biologist Manager; CCMRC Coordinator), Amelia Kalagher (CCMRC Administrative Support), Caitlyn Blair (Northwest Straits Commission), Jonathan Strivens (CC Environmental Health)

Welcome / Call to Order / Roll Call

Chair LaTrisha Suggs called the meeting to order at 5:36. Roll was called, and others introduced themselves. A quorum was not yet present at the beginning of the meeting, but was present shortly after.

Public Comment

- None at this time.

Approval of Minutes

- A quorum was now present. ***Nancy Stephanz moved to approve the August 2025 minutes, Mike Doherty seconded. The motion passed unanimously and minutes were approved.***

Announcements

- *Northwest Straits Initiative 2025 conference:* Caitlyn Blair reminded members of the October 7th deadline to register for the conference. Caitlyn also shared information about the digital art show to happen at the conference, with submissions also due October 7th.
    - *Networking lightning session:* Rebecca described the Northwest Straits Commission's request for a lightning presentation and project information for the November conference networking session. The group determined that Jeff Ward and Alan Clark can present the pinto abalone project. *Amelia will email Jeff and Alan with the needed materials.
- *Streamfest September 20th, Dungeness River Festival September 26th:* LaTrisha Suggs reminded the group of these upcoming festivals. Signups for timeslots were reviewed and adjusted as needed. *Amelia will email Bob Vreeland to check if he's interested in joining to table.
- *End-of-year project reports due September 30th:* LaTrisha Suggs and Rebecca Mahan reminded project leads of the requirements for draft reports and the upcoming deadline.
- *Oil spills & outreach:* Alan Clark began a discussion on presentations to community groups and oil spill prevention & response outreach. The MRC considered the idea that oil spills could become an intentional part of its outreach and education, perhaps through community presentations. LaTrisha asked for specific ideas to be proposed at the November meeting.
- *2025-2027 grant proposals with Northwest Straits Commission:* The grant for 2025-2027 is fully funded and going through the County's legal process to be signed.
- *Habitat Biologist II hired:* Chase O'Neil has started as Habitat Biologist II, and the new MRC Project Coordinator.
- *Membership changes:* Helle Andersen and Alicia Amerson resigned from MRC; Tim Cochnauer and Stephen Crafton-Tempel in application process.

Committee and Project Reports

- *Pinto abalone:* Jeff Ward gave an update. The first week of surveys in September was a success, with 5 abalone found while surveying east and west of Port Angeles. A potential outplant site was also identified. Jeff shared some additional details from the fieldwork and showed some GoPro footage. More surveys are scheduled for next week.
- *Kelp monitoring:* Chelsea Korbulic gave an update. The final kelp surveys in September went well. The Freshwater Bay kelp bed is very healthy. She shared a Clallam Bay otter observation with Amy Olson of the Seattle Aquarium, who is interested in hearing future observations as well.

Cynthia Harbison (DNR), working on the statewide kelp & eelgrass health plan, would like to see kelp & eelgrass protections in the 2030 Clallam County SMP update.

- *Advisory sub-committee:* The subcommittee met on September 4th. They intend to complete the list of priorities for the Board of County Commissioners, and they would like to prioritize dialogue with the Commissioners. The subcommittee's next meeting is October 10th.

Discussion of next meeting date and agenda

- *Next meeting:* The meeting will take place on Monday, October 20th.
- *Call for new agenda items:* none at this time.

Public Comment

- None at this time.

Good of the Order

- *Indian Creek fuel spill update:* Thank you to the Jamestown S'Klallam Tribe and Lower Elwha Klallam Tribe for the quick response during this fuel spill.
- *MRC member positions:* LaTrisha Suggs suggested the idea that MRC member positions could be general seats rather than specific roles representing various groups. There was some discussion, and LaTrisha suggested this topic could be discussed again next meeting.
- *Posters:* Mike Doherty shared some posters distributed by the Olympic Coast National Marine Sanctuary.

Adjourn

Chair LaTrisha Suggs adjourned the meeting at 7:04.

CLALLAM MRC MEETING AGENDA

October 20th, 2025
5:30 p.m. – 7:00 p.m.
Hybrid Meeting

Zoom meeting link: https://us06web.zoom.us/j/83769639254?pwd=FmcMflhkxw6df902xa2tsxu6UAHGVB.1
Meeting ID: 837 6963 9254
Passcode: 12345
For more information about the MRC, please contact Chase O'Neil at 360-417-2361

Welcome by Chair LaTrisha Suggs / Call to Order / Roll Call

- Determination of quorum

Public Comment on agenda items, *limited to 3 minutes per participant at the discretion of the Chair*

Approval of Minutes

- September minutes

Announcements

- Habitat Biologist II hired as new MRC Project Coordinator: Chase O'Neil
- Northwest Straits Initiative 2025 conference – Nov 7 & 8
- General NWSC update – Alan Clark
- Clallam County boards and committees applications open through Wed, Oct 22
- Volunteer hours reporting – see email from Amelia

Committee and Project Reports

- Project leads report only if an update is needed
- Elwha Beach: need MRC volunteer to fill dog bag dispenser twice per month
- Advisory Sub-Committee
    - BOCC Priorities Memo follow-up

New or special business

- NOAA Marine Debris newsletter open for 130-word submissions – see attached details
- Discussion of MRC member positions (at-large vs specific seats for community groups)

Discussion of next meeting date and agenda

- Next regular meeting Monday, November 17
- Call for new agenda items
    - Proposal for education/outreach items for oil spill prevention & response at Nov 17 meeting
    - Clallam County DCD staff presentation/update on Draft County Comp Plan Changes
    - Education Displays/Posters Kid Friendly – Discussions/Ideas

Public Comment *limited to 3 minutes per participant at the discretion of the Chair*

2025 Meetings

January 16 (Thu)	April 21	July 21	October 20
February 20 (Thu)	May 19	August 18	November 17
March 17	June 16	September 15	December 15

Good of the Order

Adjourn

Clallam County DCD is inviting you to a scheduled Zoom meeting.
Join Zoom Meeting
https://us06web.zoom.us/j/83769639254?pwd=FmcMflhkxw6df902xa2tsxu6UAHGVB.1

Meeting ID: 837 6963 9254
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Dial by your location
• +1 253 215 8782 US (Tacoma)

2025 Meetings

January 16 (Thu)	April 21	July 21	October 20
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Hi everyone,

We're working on the fall edition of the quarterly Washington Marine Debris Action Plan newsletter, and we want to highlight your work addressing the issue of marine debris in Washington! Newsletter submissions can be anything from sharing your recent beach cleanup successes and challenges, highlights from education and outreach events you've hosted, upcoming events, and all the many other marine debris prevention, removal, and research efforts in between. We'd love to share what you've been working on since the summer edition.

If you have an update to share, please read the following submission guidelines and reply to this email with your newsletter submission by Friday, October 31.

Newsletter submission requirements:

- Submission draft (130 words or less)
- A short title for your submission
- A link to more information or your website
- An accompanying photo with a short caption and photo credit
  - Please also include a signed *NOAA Copyright Form* (attached to this email) to allow us to use the photo in the newsletter
  - If anyone in the photo is identifiable, please also submit a signed *NOAA Profile and Likeness Form* (attached to this email). We are unable to use media that features clearly identifiable people unless we have permission. *Photos where a person's entire face is not showing do not require signed forms (i.e., wearing a face mask or diving mask)

Please feel free to reach out if you have any questions!

Best,

Staci McMahon
Pacific Region Marine Debris Specialist
NOAA Marine Debris Program | Lynker
Office of Response and Restoration
staci.mcmahon@noaa.gov

2025 Meetings

January 16 (Thu)	April 21	July 21	October 20
February 20 (Thu)	May 19	August 18	November 17
March 17	June 16	September 15	December 15

Clallam County MARINE RESOURCES COMMITTEE

October 2025 Final Meeting Minutes

Date: Monday, October 20, 2025
Time: 5:30 – 6:36pm
Location: Hybrid meeting, Zoom and Clallam County Board of Commissioners' Meeting Room
Minutes prepared by Amelia Kalagher

Member Roll

	Member	Present?	Alternate	Present?
Academic Community	Ed Bowlby	X	Ioana Bociu	
At Large	Alan Clark (*NWSC Rep, Vice Chair*)	X	Mary Sue Brancato	
At Large	*[vacant seat]*	---	Ray Kirk	
Conservation & Environmental Interests	Nancy Stephanz	X	*[vacant seat]*	---
Development Community	*[vacant seat]*	---	*[vacant seat]*	---
District I	Jeff Ward	X	*[vacant seat]*	---
District II	Ann Soule	X	Lyn Muench	X
District III	Mike Doherty		Dann May	X
Jamestown S'Klallam Tribe	Christopher Burns	X	Robert Knapp	excused
Lower Elwha Klallam Tribe	Allyce Miller	X	Chelsea Korbulic	X
Makah Tribe	*[vacant seat]*	---	*[vacant seat]*	---
Marine Related Recreation & Tourism	*[vacant seat]*	---	*[vacant seat]*	---
Port Angeles City Council	LaTrisha Suggs (*Chair*)	X	Navarra Carr	
Port of Port Angeles Commission	Jesse Waknitz		Katharine Frazier	X
Sequim City Council	Meggan Uecker		Kelly Burger	

Staff and Others Present
Bruce Emery (Clallam County Director of Community Development), Chase O'Neil (CC Habitat Biologist, CCMRC Project Coordinator), Rebecca Mahan (CC Habitat Biologist Manager; CCMRC Coordinator), Amelia Kalagher (CCMRC Administrative Support), Jonathan Strivens (CC Environmental Health), Edward (member of the public)

Welcome / Call to Order / Roll Call

Chair LaTrisha Suggs called the meeting to order at 5:30. Roll was called, and others introduced themselves. A quorum was present at the beginning of the meeting.

Public Comment

- None at this time.

Approval of Minutes

- ***Nancy Stephanz moved to approve the September 2025 minutes, Lyn Muench seconded. The motion passed unanimously and minutes were approved.***

Announcements

- *Habitat Biologist II hired as new MRC Project Coordinator, Chase O'Neil:* Chase introduced herself and her background, including a year in Kenya studying hyena behavior.
- *Northwest Straits Initiative 2025 conference:* The conference will be Nov 7 & 8. Members and staff briefly discussed carpooling.
- *General NWSC update:* Alan described the most recent NWSC meeting in the San Juan Islands, including a visit to the restoration site at Jackson Beach. The Northwest Straits Commission's strategic plan is published, and a fundraising guidance document for MRCs.
- *Volunteer hours reporting:* Members and alternates should refer to an email from Amelia for details on reporting their volunteer hours. Hours for this quarter (October-December) must be reported by January 7.
- *Clallam County boards and committees applications:* Applications are due this Wednesday, October 22. Two applications have been received to date.

Committee and Project Reports

- *Pinto abalone:* There are two more dive survey days planned this week. Many abalone have already been observed so far this season, and quality habitat has been identified.
- *Sound Toxins:* The Sound Toxins team at Feiro Marine Life Center saw very high counts of multiple poison-producing phytoplankton three weeks ago. Levels have returned to normal, lower levels in the last two weeks. Chris Burns shared that toxin levels in mussels and geoduck were high approximately one week ago as well.
- *Elwha Beach stewardship:* Dann May volunteered to fill the dog waste bag dispenser twice per month. *Dann will get materials from Chase/Amelia for the dog bag dispenser.
- *Advisory sub-committee:* Ann Soule shared an update. The advisory subcommittee has divvied up sections of the prior draft priorities memo to the BOCC to work on them further. The subcommittee has another meeting scheduled in early December.

New or Special Business

- *NOAA Marine Debris newsletter:* The MRC briefly discussed the possibility of contributing to NOAA's Marine Debris newsletter. LaTrisha suggested sharing the opportunity with other organizations that are doing beach cleanups – Clallam Conservation District, CoastSavers. *Staff will share the newsletter opportunity as appropriate with those groups.

- *MRC member positions discussion:* The MRC discussed the possibility of making more positions "at large" or otherwise open to a broader group. This will be discussed further next month, intending to make a decision then.
    - *Further research is needed to clarify what positions are required (per bylaws, County resolutions, 1999 Northwest Straits Initiative creation, etc).
    - Katharine can do some outreach in the Port community for representation from the development community / marine trades.
    - *Staff will share recruitment materials/brochure with Katharine and others.
    - Member of the public Edward made a comment at LaTrisha's invitation. He described his experiences and concerns related to the marine environment, particularly pollution.

Discussion of next meeting date and agenda

- *Next meeting:* The meeting will take place on Monday, November 17th.
- *Call for new agenda items:*
    - *Clallam County DCD staff presentation on draft County Comp Plan changes:* Bruce Emery gave a brief summary. He plans to present at the MRC meeting next month.
    - *Proposal for education/outreach items for oil spill prevention & response:* Alan and Mike have not developed anything further on this topic. Nancy reminded the MRC of the upcoming Studium Generale presentation in January; she could present on this topic if slides are developed. *Alan and Mike will discuss, and this topic will be mentioned again at the next meeting.
    - *Education displays/posters, kid friendly ideas discussion:* The MRC discussed some ideas for activities that could actively engage kids at outreach festivals, particularly Dungeness River Festival.
- *Chelsea's additions for marine debris and kayaking:* Chelsea added to earlier discussion that she is able to do a small writeup on the recent beach cleanups she helped facilitate for the Marine Debris publication. *Chelsea may draft a writeup and share with Chase and Amelia. Chelsea also may have recruited an additional kayaking volunteer.
- *Rebecca's additions for public outreach:* Rebecca shared that the Commissioners recently commented on a need for greater outreach/awareness of the MRC itself. The MRC briefly discussed some ideas. Jonathan Strivens of Clallam County Environmental Health offered to share MRC updates on Environmental Health's social media. LaTrisha suggested following up with the Commissioners for clarification on the requests.

Good of the Order

- **Good of the order will be moved before public comment in future meetings.*
- Dann May was interviewed by KSQM and KONP for the Great Shake-Out, and the video is available online.

Public Comment

- None at this time. One public comment was made during the earlier discussion on MRC member positions.

Adjourn

Dann May moved to adjourn the meeting, Lyn Muench seconded. Chair LaTrisha Suggs adjourned the meeting at 6:36.

CLALLAM MRC MEETING AGENDA

November 17th, 2025
5:30 p.m. – 7:00 p.m.
Hybrid Meeting

Zoom meeting link: https://us06web.zoom.us/j/83769639254?pwd=FmcMflhkxw6df902xa2tsxu6UAHGVB.1
Meeting ID: 837 6963 9254
Passcode: 12345
For more information about the MRC, please contact Chase O'Neil at 360-417-2361.

Welcome by Chair LaTrisha Suggs / Call to Order / Roll Call

- Determination of quorum

Public Comment on agenda items, *limited to 3 minutes per participant at the discretion of the Chair*

Approval of Minutes

- October minutes

Presentation

- Bruce Emery, Clallam County Director of Community Development: Clallam County Comprehensive Plan update

Announcements

- Northwest Straits Initiative 2025 conference – brief recap and comments
- Northwest Straits Commission update – Alan Clark
- Draft 2026 workplan available for comments

Committee and Project Reports

- Project leads report only if an update is needed
- Advisory sub-committee
    - BOCC Priorities Memo follow-up

New or special business

- Derelict sailboat at Place Rd – Allyce Miller
- Discussion of MRC member positions (at-large vs specific seats for community groups)
- Education and outreach discussion
    - New/updated festival displays and kid friendly ideas
    - Radio interviews (Todd Ortloff show) or other presentations
    - Potential education & outreach sub-committee

Discussion of next meeting date and agenda

- Next regular meeting Monday, December 15
- January & February meetings moved for holidays: now January 26th, February 23rd

2025 Meetings

January 16 (Thu)	April 21	July 21	October 20
February 20 (Thu)	May 19	August 18	November 17
March 17	June 16	September 15	December 15

- Call for new agenda items
    - Education/outreach for oil spill prevention & response

Good of the Order

Public Comment *limited to 3 minutes per participant at the discretion of the Chair*

Adjourn

Clallam County DCD is inviting you to a scheduled Zoom meeting.
Join Zoom Meeting
https://us06web.zoom.us/j/83769639254?pwd=FmcMflhkxw6df902xa2tsxu6UAHGVB.1

Meeting ID: 837 6963 9254
Passcode: 12345

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2025 Meetings

January 16 (Thu)	April 21	July 21	October 20
February 20 (Thu)	May 19	August 18	November 17
March 17	June 16	September 15	December 15

Comprehensive Plan Update

Draft Changes to Critical Areas and Environmental Policies, November 2025

Clallam County Department of Community Development

Mandatory Elements

The Comprehensive plan must include the following mandatory elements, as outlined in RCW 36.70A.070:

- Land Use
- Housing
- Capital Facilities
- Utilities
- Rural
- Transportation
- Economic Development
- Climate & Resiliency

New Climate Element

HB 1181

- Requires integration of a new Climate Change Element and Resiliency sub-element
- Following elements must be updated to include or build on climate change topics:
  - Land Use
  - Capital facilities
  - Public Facilities and Utilities
  - Transportation

Relationship of CAO and SMP

- Critical areas are designated and regulated under RCW 36.70A.172.
- Critical areas occurring within 200-feet of shorelines are adopted per RCW 90.58.
- Once adopted within the SMP, critical areas are regulated exclusively by the SMP.
- Policy concerning shoreline and land use within the shoreline jurisdiction (w/in 200-feet) is established under RCW 90.58 and the SMP.

Critical Area Ordinance Update, continued

- Clallam County last completed a comprehensive update of its critical areas policies and regulations in 2004 with several minor updates since that time and is now required to complete a periodic update by December 31, 2025.
- According to State law, critical area regulations are required to incorporate Best Available Science (BAS), and any deviations from science-based recommendations must be identified, assessed, and explained.
- Jurisdictions must give special consideration to conservation or protection measures necessary to preserve or enhance anadromous fisheries.

Critical Area Ordinance Update, Gap Analysis

Main areas of consideration

- Update policies to include *no net loss* for consistency with GMA
- Providing clarity on relationship of Shoreline Master Plan and CAO
- Update wetland delineation, ratings system and qualifications of wetland professionals
- Revise wetland buffers to meet Ecology recommendations and standardization
- Update stream and wildlife habitat conservation area classifications
- Stream protection standards, including riparian area management, vegetation requirements, and mitigation
- Update hazard tree and vegetation removal requirements
- Revise wastewater, dewatering, and allowed activities provisions in CARAs

Fore more information, please visit the Clallam County Comprehensive Plan Update Web Page at:

https://www.clallamcountywa.gov/1842/Comprehensive-Plan-Update

Contacts:

- Bruce Emery, Director, DCD – (360) 417-2323, bruce.emery@clallamcountywa.gov
- Tim Havel, Deputy Director, DCD – (360) 417-2563, tim.havel@clallamcountywa.gov

Draft Changes to Critical Area and Environmental Policy
Clallam County Comprehensive Plan Update, 2025
(November 7, 2025)

The following test excerpts include proposed changes to the Clallam County Couty-wide Comprehensive Plan that relate to critical area, water resources and environmental protection. This list is not exhaustive but includes a majority of the changes being considered within the subject matter. For more information, please visit the Clallam County Comprehensive Plan Update page at:
https://www.clallamcountywa.gov/1842/Comprehensive-Plan-Update

CCC 31.02.100 General land use policies. (4) Clallam County shall reduce and mitigate the risk to lives and property posed by wildfires by using land use planning tools and through wildfire preparedness and fire adaptation measures in accordance with RCW 36.70A.070.

CCC 31.02.340 Environment and open space policies. (1)(f) Clallam County shall prioritize culvert replacement and similar issues that presently result in barriers to fish passage as part of the Six-Year Transportation Improvement Plan (TIP) process. ***[NOTE: this section was amended by Joe.]***

CCC 31.02.340 Environment and open space policies. (15) Incorporates "…oil of crude transport…" as activities from which the coastline, coastal waters and upland areas should be protected.

CCC 31.02.620 Economic development goals and policies. (1)(j)(ii)(3) Continue to enhance and protect the local marine environment by continuing to support the Clallam County Marine Resources Committee.

CCC 31.02.620 Economic development goals and policies. (1)(j)(iv)(9) Coordinate with state and federal agencies to support efforts to maintain healthy fish stocks, ensuring stable sport fishing seasons that benefit the tourism industry and sustain ~~Support efforts to maintain healthy fish stocks, in order to provide stable sport fishing seasons for the tourism industry and economic needs of~~ rural communities such as Clallam Bay and Sekiu;

CCC 31.02.820 Climate Change and Resiliency Goals and Policies.

(1)(a) Policy 1.1: Preserve land for long-term agricultural use, promote a regenerative framework, and restore ecosystem function on farms, such as wetlands and ponds, to preserve carbon sinks, promote water storage, improve soil health, and provide additional ecosystem services.

(4)(a) Policy 4.1: Work towards protecting ecosystem functions to uphold Tribal Treaty Rights and preserve culturally significant resources including but not limited to archaeological and sacred sites, ecosystems, traditional foods, plants, and resources at risk from climate change impacts. This may include incorporating riparian and stream habitat conservation measures into land use and infrastructure plans to protect salmonoid habitats (transportation, water, sewer, electricity) developed by the County in partnership with cities, Tribes, service providers, and state agencies.

(6)(a) Policy 6.1: Review and update the County's Public Benefit Rating System and explore other ways to incentivize landowners to maintain ecosystem services, such as habitat restoration, forest management, and rainwater harvesting. This could include tax incentives, carbon credits, and financial assistance programs.

(7)(a) Policy 7.1: Prepare ecosystems for climate impacts by implementing restoration actions for streams, wetlands, and watersheds, focusing on connectivity, reducing invasive species, and improving watershed processes. This includes restoring riparian vegetation, floodplains, and stream structures to protect native fish and other aquatic life. Enhance habitat and community resilience to climate change by protecting and restoring coastal ecosystems, addressing sea-level rise, and focusing on submerged aquatic vegetation for habitat and "blue" carbon storage. Evaluate shoreline restoration and cleanup efforts, including concerns for Tribal cultural resources.

(7)(b) Policy 7.2: Strengthen habitat and ecosystem resilience by inventorying and avoiding development in climate refugia and critical habitats to strive for no net loss of ecosystem attributes, with a focus on achieving net ecological gains. Expand habitat protection, quality, and connectivity through designations such as conservation areas, expanded buffers, greenbelts, wildlife and open space bridges and corridors. Incorporate climate considerations in determining permissible activities within wetlands and wildlife habitats.

(7)(c) Policy 7.3: Adopt integrated natural resource management practices to optimize habitat integrity in the face of climate impacts. Monitor invasive species and promote native, drought- and pest-resistant plants to enhance ecosystem resilience. This includes proactive restoration efforts and encouraging landowners to participate in cost-share programs and other financial assistance opportunities.

(7)(d) Policy 7.4: Protect and enhance forests through climate-smart management, prioritizing vulnerable areas. This includes implementing open space requirements, creating green belts, and enhancing urban forest management to increase carbon storage and resilience. Develop educational and incentive-based strategies to preserve private and public forests for climate resilience, carbon sequestration, and ecosystem health.

(12)(a) Policy 12.1: Require the integration of water conservation methods and technologies in the development of irrigation infrastructure within parks, recreation areas, and farms to prepare for drought. Promote the adoption of advanced irrigation technologies and practices that minimize water use and mitigate environmental impacts.

(12)(b) Policy 12.2: Seek funding from the Department of Ecology to develop and implement a comprehensive drought resilience strategy that incorporates climate projections and sets action levels for different drought stages. Encourage residents to reduce water consumption through smart grid water use, repairing infrastructure, water reclamation systems, smart irrigation technologies, and updated water rates to discourage lawn watering. Promote incentives for sustainable food cultivation.

(12)(c) Policy 12.3: Identify and implement strategies to prepare for and mitigate the effects of sea level rise and saltwater intrusion into aquifers, drainage, sewer, and septic systems. Explore grant opportunities to fund initiatives aimed at monitoring and

preventing saltwater intrusion to promote the reliability and sustainability of water supplies.

(12)(d) Policy 12.4: Develop a coordinated water systems plan to evaluate the long-term adequacy of water delivery infrastructure in response to changing hydrological patterns due to climate change. Construct and maintain water storage systems (e.g., cisterns, water towers, reservoirs) to provide backup water supplies during droughts and emergencies. Promote bringing additional rural areas and failed wells into centralized public water systems.

Raise awareness about the Department of Health's (DOH) Office of Drinking Water guidance on integrating climate constraints, contingency planning, and sustainability in water treatment, and promote the management of the Drinking Water State Revolving Fund (DWSRF) for infrastructure improvements.

(12)(e) Policy 12.5: Evaluate wastewater facilities to reduce greenhouse gas emissions and build resilience to climate impacts such as landslides and sea-level rise. This includes maximizing on-site natural gas co-generation from anaerobic digesters, exploring the proximity of wastewater facilities to high-risk areas, and improving wastewater access routes. Enhance septic water quality management and explore alternative wastewater treatment solutions in vulnerable areas.

(13)(a) Policy 13.1: Utilize the best available science and update codes as necessary to establish overlays, special zoning districts, and land-owner outreach zones to direct new development away from current and future high-risk areas and reduce risk in those areas. This may include:

• Regularly updating vulnerability assessment of climate impacts and overburdened populations, using this information to determine if and where zoning changes are necessary.

• Implementing development regulations and best practices to reduce risks from natural and climate-related hazards, including documenting climate-related risks in property records and considering financial safeguards or bonds for projects in highrisk zones. Establishing environmental justice standards for overburdened communities during Comprehensive Plan revisions to apply to zoning designations or rezoning to encourage decisions that center those who are highly vulnerable to climate impacts.

(13)(c) Policy 13.3: Integrate risks associated with future climate conditions into the siting and design of capital facilities, parks, and community assets. Support long-term visioning for vulnerable areas through equitable community engagement, including managed retreat and relocation of the most vulnerable hazardous industries and essential services. Subject to obtaining grant funding, consider working with local communities to relocate properties and essential public services from high-risk areas (floodplains, WUI), explore regulatory options to elevate or set back new structures for flood and sea level rise mitigation, and establish a development rights program to transfer rights from these areas while encouraging denser development in suitable locations.

FACET
Formerly DCG / Watershed

Draft Gap Analysis

Clallam County Critical Areas Ordinance Update

AUGUST 23, 2024

Prepared for:

CLALLAM COUNTY
Washington

Clallam County Planning Department
223 East 4th Street, Suite 4
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Facet Reference: 2401.0469.00

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The information contained in this report is based on the application of technical guidelines currently accepted as the best available science. All discussions, conclusions and recommendations reflect the best professional judgment of the author(s) and are based upon information available at the time the review was conducted. All work was completed within the constraints of budget, scope, and timing. The findings of this report are subject to verification and agreement by the appropriate local, state, and federal regulatory authorities. No other warranty, expressed or implied, is made.

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1. Introduction

With passage of the Growth Management Act (GMA), local jurisdictions throughout Washington State, including Clallam County (County), were required to develop policies and regulations to designate and protect critical areas. Critical areas, as defined by the GMA (Revised Code of Washington [RCW] 36.70A.030(5)), include wetlands, areas with a critical recharging effect on aquifers used for potable water, fish and wildlife habitat conservation areas, frequently flooded areas, and geologically hazardous areas.

An ongoing requirement of the GMA is for local jurisdictions to periodically review and evaluate their adopted critical areas policies and regulations. In accordance with the GMA, the County last completed a comprehensive update of its critical areas policies and regulations in 2004. The County is now required to update its critical areas policies and regulations by December 31, 2024. This includes the requirement to include the best available science (BAS). Any deviations from science-based recommendations should be identified, assessed, and explained (Washington Administrative Code [WAC] 365-195-915). In addition, jurisdictions are to give special consideration to conservation or protection measures necessary to preserve or enhance anadromous fisheries. A BAS document for this code update has been prepared separately (Facet 2024).

The County's critical areas policies are codified in Clallam County Code (CCC) Title 31-Comprehensive Plan, Title 27-Environment (Specifically 27.12-Critical Areas), Title 32-Floodplain Management and Title 35-Clallam County Shoreline Master Program (SMP).

This gap analysis provides a review of the current critical areas regulations, noting gaps where existing regulations may not be consistent with BAS or the GMA. It also makes recommendations for improvements to general aspects of the CAO such as clarity, consistency, ease of use etc. The primary intention of this gap analysis is to help guide the update of the County's critical areas policies and regulations.

1.1 Document Organization

Recommendations for updating the County's existing critical areas regulations are provided in Sections 2 through 7. Section 2 addresses the general provisions that are applicable to all critical areas; Sections 3 through 7 address the different types of critical areas covered by the GMA. To highlight findings of the gap analysis, a Code review summary table is provided at the beginning of each section. Where a potential gap is identified, subsections provide further discussion.

2. General Provisions

This section addresses code sections that are applicable to all types of critical areas. This includes CCC 27.12.010-27.12.070. A summary of recommended updates is provided in Table 1.

Table 1. General provisions review summary.

Code Section	Title	Review Comment / Recommendations	Reason for Recommendation
27.12.010	Statement of purpose and authority	Consider adding *no net loss* terminology.	Consistency with GMA and BAS.
27.12.015	Statement of policy	No changes required.	
27.12.020	Policy goals	No changes required.	
27.12.025	Applicability	Clarify relationship to SMP.	Clarity.
27.12.030	Regulated uses and development activities	No changes required.	
27.12.035	Activities not regulated by this chapter – exemptions	1-Recommend that exemptions be consistent with all of Chapter 27. 2-Recommend after-the-fact permit. 3-Review of emergency work. Recommend cap on area of vegetation removal.	1-Consistency. 2-Consistency with GMA. 3-Consistency with GMA and BAS.
27.12.037	Alternative standards for existing, ongoing agriculture in and adjacent to aquatic habitat conservation areas (ACHA) and wetlands	1-Ensure consistency with Chapter 27 and GMA. 2-Update rating system and buffer guidance. 3-Consider implementing Voluntary Stewardship Program (VSP).	1-Consistency. 2-Consistency with GMA and BAS. 3-Consistency with GMA and BAS.
27.12.040	Pre-existing uses	Clarify definitions for pre-existing structures and timeframes.	Clarity.
27.12.045	Review authority requirements	No changes required.	
27.12.050	Official designation of critical areas	Recommend requiring certified wetland professionals and other professional requirements for analysis.	Consistency with GMA and BAS.
27.12.055	Enforcement	No changes required.	
27.12.060	Warning and disclaimer	No changes required.	
27.12.065	Severability	No changes required.	
27.12.070	Conflict	No changes required.	

2.1 Policy goals (CCC 27.12.020)

It is recommended that the policy be updated from maintaining ecological functions to *no net loss* of ecological function for consistency with GMA language and Ecology guidance.

2.2 Applicability (CCC 27.12.025)

2.2.1 Relationship with SMP

It is recommended that this section clarify the relationship between the CAO and the shoreline master program (SMP).

2.3 Activities not regulated by this chapter – Exemptions (CCC 27.12.035)

2.3.1 Consistency with Chapter

It is recommended that these exemptions be predicated on being consistent with the chapter, so such an exemption could not be used to justify use of these practices to impact critical areas in bad faith.

2.3.2 Emergency Work

It may be necessary for emergency work to occur without standard review of a permit application, but to be consistent with the GMA and BAS it should warrant after-the-fact review to ensure appropriate mitigation for critical areas impacts.

2.3.3 Clearing non-native vegetation

Removal of non-native vegetation and replacement with native vegetation is allowed in this section. We recommend that this be capped at a limit, such as the limit for requiring a clearing and grading permit. The purpose of capping the exception is because clearing may be done in bad faith and it may be difficult or impossible after-the-fact to confirm whether removed vegetation is native or not, there are no performance standards to how much native vegetation is required, and landowners may be unable to distinguish native and non-native vegetation. Capped limits should be based on BAS.

2.4 Alternate standards for existing, ongoing agriculture in and adjacent to aquatic habitat conservation areas (AHCA) and wetland (CCC 27.12.037)

2.4.1 Risk Assessment Criteria

Table 27.12.037(A) lists risk categories and buffers for rivers, streams, lakes, and marine waters. It is unclear where the guidance comes from and if it is based on BAS. It appears to be from Clallam County Conservation District and USDA Natural Resources Conservation Service; however, it is unclear. We

recommend reviewing this guidance and being certain it is consistent with BAS as well as listing the source of the justification or rationale for buffers.

2.4.2 Updating rating systems

The department of Ecology has released updated guidance regarding water quality. On Aug. 26, 2022, the Environmental Protection Agency (EPA) Region 10 issued their final approval of the 2018 Water Quality Assessment. The new assessment serves as the most current information on fresh and marine water quality health and replaces previous assessments for Clean Water Act regulatory purposes. Decisions relying on assessment information should use the new assessment results. Additional information is provided by WDFW in "Land Use Planning for Salmon, Steelhead and Trout: A land use planner's guide to salmonid habitat protection and recovery"[1] and "Riparian Management Zone Checklist for Critical Areas Ordinances"[2].

2.4.3 Voluntary Stewardship Program

Clallam county is currently not listed on the Washington Voluntary Stewardship Program (VSP) list of participating counties. The VSP is a non-regulatory approach to assist with GMA compliance by implementing site-specific, voluntary practices. Consider using VSP program to comply with GMA on agricultural lands if future opportunities to join VSP are available.

2.5 Pre-existing uses (CCC 27.12.040)

2.5.1 Abandoned structures and uses

This section provides an allowance for building on pre-existing structures or uses but does not specify a period in which these allowances become abandoned, and the provisions no longer apply.

2.6 Official designation of critical areas (CCC 27.12.050)

2.6.1 Qualified Professionals

The Society of Wetlands Scientists has two certification categories including professional wetland scientists (PWS) and wetland professional in training (WPIT). We recommend this be clarified to require PWS certification, or other qualifying education and experience.

3. Wetlands

This section addresses code sections that are applicable to wetland areas. This includes CCC 27.12.200-27.12.215. A summary of recommended updates is provided in Table 2.

[1] *Land Use Planning for Salmon, Steelhead and Trout: A land use planner's guide to salmonid habitat protection and recovery | Washington Department of Fish & Wildlife*

[2] *rmrcaochecklist.pdf (wa.gov)*

Table 2. Wetland provisions review summary.

Code Section	Title	Review Comment / Recommendations	Reason for Recommendation
27.12.200	Applicability and purpose	Recommend updating policy to reflect current Ecology definitions and adding *no net loss* verbiage.	Consistency with GMA and other regulations.
27.12.205	Regulated uses and activities	No changes required.	
27.12.210	Classification and designation	Recommend updating delineation manual to currently accepted USACE manual and regional supplements and ranking system to Washington State Wetland Rating System for Western Washington: 2014 Update, Version 2.0	Consistency with GMA and BAS.
27.12.215	Protection standards for regulated wetlands	1-Recommend modifications to buffer regulations including widths, measurement, uses and variances. 2-Recommend modifying hazard tree definition.	1-Consistency with GMA and BAS. 2-Consistency with ISA standards.

3.1 Applicability and purpose (CCC 27.12.200)

3.1.1 Critical areas policy goals

It is recommended that the policy incorporate information about wetlands be updated to be consistent with goals of the comprehensive plan and representative state agencies such as the Department of Ecology (Ecology). Specifically, wetlands are recognized for three primary functions including water quality, hydrology, and habitat. Water quality is not identified in the purpose of this section as a function or value aimed to be protected.

It is recommended that the policy be updated from maintaining ecological functions to *no net loss* of ecological function for consistency with GMA and Ecology policy.

3.2 Classification and designation (CCC 27.12.210)

3.2.1 Delineation Manual

The code refers to an outdated Washington State Wetland Delineation Manual which is no longer current with BAS nor used by any state or federal agency. Wetlands are currently determined by the 1987 Wetland Delineation Manual by the U.S. Corps of Engineers (USACE) and the 2010 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0).

3.2.2 Wetland Rating (Functional Assessments)

This code section refers to an outdated wetland classification system. The current version of the wetland rating system is the Washington State Wetland Rating System for Western Washington: 2014 Update, Version 2.0 (Hruby & Yahnke, 2023). This should be updated to incorporate current BAS and include a clause to be updated as Ecology periodically updates the system, "as revised," or similar.

3.3 Protection standards for regulated wetlands (CCC 27.12.215)

3.3.1 Measurement of buffers

The code states that "*all buffers are measured from the regulated wetland edge as marked in the field*." To clarify this statement and be consistent with State standards, we recommend this be clarified to say the buffer is measured as a planer (horizontal) distance from the wetland edge. As written, it could potentially be misunderstood as that the buffer is measured in the field, which would erroneously shorten the buffer when slopes are present.

3.3.2 Buffer Widths

Current wetland buffers are smaller in width than the three buffer width alternatives recommend by Ecology (2018). We recommend that the code adopt one of Ecology's recommended buffer width alternative options to provide adequate protection of wetland functions and values. The allowances for minor new development, which include single family residences, allow for a large buffer reduction in the most common land use type in which these measures apply. As a result, the buffers are much lower than recommendations by Ecology.

3.3.3 Increased Buffers

The buffer recommendations provided by Ecology assume that an intact native plant community is present and functioning properly. These functions can become degraded in disturbed sites such as those which have bare soils or are converted to lawn. As supported by BAS; to meet Ecology's recommendations, the code should require increased buffers or restoration of buffers in circumstances where they are degraded. The current code states that the review authority "may," increase buffer zone widths on lands where "*the adjacent land on the development proposal site has minimal vegetative cover,*" however this is poorly defined, and the term "may" could lead to inconsistencies in how the regulation is applied. Standardized increased buffers should be *required* when buffer conditions are inadequate to provide these functions. Enhancement of a buffer to restore these functions may be done in lieu of a buffer increase.

Buffer increases for lands with steep slopes should also be required and standardized to account for the reduction of water quality functions in these areas. The code also allows for buffer increases to protect against erosion and threats to endangered species. These situations are often site-specific and species-specific, and the current code provides for flexibility in this approach.

The code also provides for buffer increases for high intensity land uses. We recommend that this approach be standardized using one of the three buffer width alternatives which account for the intensity of adjacent land uses.

3.3.4 Buffer Flexibility and Reductions

Flexibility through buffer averaging and variances is provided and discussed further in CCC 27.12.730.

If the County chooses to adopt the buffer widths and Ecology recommendations, which consider land use intensity, then buffer reductions may also be considered for high intensity land uses which apply appropriate minimization measures to reduce threats to wetland buffers.

3.3.5 Hazard Trees

We recommend that hazard trees be defined consistent with the International Society of Arboriculture (ISA) standard. Tree risk includes a consideration of the likelihood of failure and impact, and consequences of failure.

Part of a tree risk assessment process is the identification of maintenance actions which can reduce the risk of a tree to acceptable levels. We recommend including a provision in the code which requires risk mitigation prior to entire tree removal as long as it will be viable following the maintenance action and risk is reduced to an acceptable level.

We recommend that when it can be reasonably and safely accommodated, the preservation of wildlife snags and logs be required, with the prioritization of snags over logs.

A 1:1 tree replacement ratio result in a net loss of critical areas function because installed trees often fail or die, and temporal loss during the establishment period is never replaced. Therefore, the GMA policy of *no net loss* is not achieved by this provision. We recommend establishing a 2:1 replacement ratio or greater or similar policy of replacing trees that do not survive.

We recommend that hazard tree assessments be completed by qualified professional such as arborists certified by the International Society of Arboriculture (ISA) and American Society of Consulting Arborists (ASCA) that are trained and qualified in tree risk assessment such as through the Tree Risk Assessment Qualification (TRAQ) or equivalent.

3.3.6 Fencing

Consistent with the recommendations of Ecology, we recommend that a permanent wildlife passable fence be established at the wetland buffer for projects which have the potential to threaten wetland buffers, such as by people and pets which may utilize the space.

3.3.7 Stormwater

Stormwater infrastructure is allowed in a wetland buffer if minimized, although it may be beneficial to specify that minimization includes locating discharge points as far from the wetland as feasible and potentially ensuring a minimum distance to avoid direct discharge.

3.3.8 Trails and Trail-Related Facilities

We recommend that trail regulations conform to the recommendations of Ecology (2022): *Walkways and trails, provided that they are limited to minor crossings having no adverse impact on water quality. They should be generally parallel to the perimeter of the wetland, located only in the outer twenty-five percent (25%) of the wetland buffer area, and located to avoid removal of significant [as defined in ordinance], old growth, or mature trees. They should be limited to pervious surfaces to no more than five (5) feet in width and designed for pedestrian use only. Raised boardwalks utilizing nontreated pilings may be acceptable."* Trails are currently allowed up to 14 feet and have no stated restrictions or prioritization to the orientation of trails.

Interpretive centers vary in definition and size, so we recommend that they be defined for the purpose of this section. Interpretive centers may have a similar impact as other types of developments.

3.3.9 Utilities

We recommend a provision be added that utilities are located to minimize impacts to the wetland and wetland buffer, such as by crossing through the narrowest point and/or locating utilities in the outer portion of the buffer.

4. Aquatic and Wildlife Habitat Conservation Areas

This section addresses code sections that are applicable to aquatic and wildlife habitat conservation areas (Fish and Wildlife Habitat Conservations Areas). This includes CCC 27.12.300-27.12.325. A summary of recommended updates is provided in Table 3.

Table 3. Aquatic and Wildlife Habitat Conservation Areas (AWHCAs) provisions review summary.

Code Section	Title	Review Comment / Recommendations	Reason for Recommendation
27.12.300	Applicability and purpose	No changes required.	
27.12.305	Regulated uses and activities	1-Recommend standardized stream classifications per DNR. 2-Modify designation of Class I WHCA.	1-Consistenty with BAS and GMA. 2-Clarity and consistency with GMA.
27.12.310	Classification and designation	No changes required.	

Code Section	Title	Review Comment / Recommendations	Reason for Recommendation
27.12.315	Protection standards for aquatic habitat conservation areas	1-Recommend further defining OHWM. 2-Recommend considering riparian management zones per WDFW guidelines.	1-Clarity. 2-Consistency with GMA and BAS.
27.12.320	Protection standards for Class I wildlife habitat conservation areas	No changes required.	
27.12.325	Protection standards for Class II wildlife habitat conservation areas	No changes required.	

4.1 Classification and designation (CCC 27.12.305)

4.1.1 Stream Types

To standardize stream classifications across the State, the Department of Natural Resources (DNR) recommends adopting the Permanent Water Typing System (WAC 222-16-030). The current definitions section utilizes the Interim Water Typing System in WAC 222-16-031. The Permanent Water Typing System is similar to interim system with some notable differences including combining Type 2 and Type 3 streams into Type F.

4.1.2 Wildlife Habitat Conservation Area Designation

Class I and Class II wildlife habitat conservation areas (WHCAs) require a resource to be mapped, however, not all suitable habitats for these species are currently inventoried. We recommend that this section be updated to remove the clause requiring mapping to allow resources identified by County staff, consulting biologists, or other resources to be considered in such designation.

Class I WHCAs also include "*Habitats targeted for preservation by federal, State and/or local government which provide fish and wildlife habitat benefits, such as important waterfowl areas identified by the U.S. Fish and Wildlife Service*." This is a very broad category of habitats and potential government agency maps which can be used to justify Class I WHCA determination. It is recommended that this section be specified to reduce ambiguity in what may be considered in the category.

Class II WHCAs include "*priority habitats not classified as Class I for State listed candidate and monitor species*." Suitable habitats for state listed species are not formally designated as *priority habitats*, rather *priority habitats* are a habitat type with unique or significant value to many species. Based on the imprecise use of terminology, it is unclear what is being designated as a Class II WHCA. We recommend that this be updated to specify habitats suitable for candidate species. "*Monitor species"* is an outdated term and can be removed from the designation language.

4.1.3 Mapping Resources

A list of resources available to the County for assisting in the determination of AWHCAs is available in this code section and can be revised to include the most current resource maps.

4.2 Protection standards for aquatic habitat conservation areas (CCC 27.12.315)

4.2.1 Top of Bank

Top of bank is identified in the code as the location a buffer originates from when the ordinary high water mark (OHWM) cannot be located. The term *top of bank* is not defined in this chapter and is subject to interpretation. A clear definition should be provided to reduce ambiguity.

4.2.2 WDFW Riparian Management Zone Guidance

In 2020, the Washington Department of Fish and Wildlife published new guidance for the protection of riparian areas (Quinn et al. 2020). The guidance emphasizes a shift in terminology from the concept of "*stream buffers*" to "*riparian management zones*" (RMZs). An RMZ is defined as "*…a scientifically based description of the area adjacent to rivers and streams that has the potential to provide full function based on the SPTH [site potential tree height] conceptual framework*." Further, an RMZ is recommended to be regulated as a fish and wildlife habitat conservation area itself to protect its fundamental value, rather than as a buffer for rivers and streams (Quinn et al. 2020). Stream buffers are established in local critical areas ordinances based on the best available science and are intended to protect streams, but may or may not provide full riparian function, or a close approximation of it. To achieve full riparian function, the guidance recommends that RMZs be considered a delineable, regulatory critical area and that the guidance be applied to all streams and rivers, regardless of size and type.

Washington Department of Fish and Wildlife's current recommendations for establishing RMZ widths are based primarily on a SPTH framework. The SPTH is defined as "*…the average maximum height of the tallest dominant trees (200 years or more) for a given site class.*" Exceptions may occur where the SPTH is less than 100 feet, in which case the agency recommends assigning an RMZ width of 100 feet at a minimum to provide adequate biofiltration and infiltration of runoff for water quality protection from most pollutants, but also in consideration of other habitat-related factors including shade and wood recruitment. A 100-foot-wide buffer is estimated to achieve 95% pollution removal and approximately 85% surface nitrogen (Rentz et al. 2020). Washington Department of Fish and Wildlife recommends measuring RMZ widths from the outer edge of the channel migration zone (CMZ), where present, or from the ordinary high-water mark where a channel migration zone is not present.

RMZs or buffers that vary by location may present practical challenges for implementation and have considerations in equity. To analyze the potential range of SPTH in Clallam County, we conducted a review of the data available from the WDFW Site Potential Tree Height Mapping Tool, as described below. The WDFW dataset is not inclusive of all lands in Clallam County but is believed to be representative. When multiple SPTH for various species were provided, only the highest SPTH was used

in this calculation. The average SPTH in Clallam County is 190 ft; with a minimum of 100 ft, a first quartile of 177 ft, a median of 198 ft, a third quartile of 210 ft, and a maximum of 227 (Figure 1).

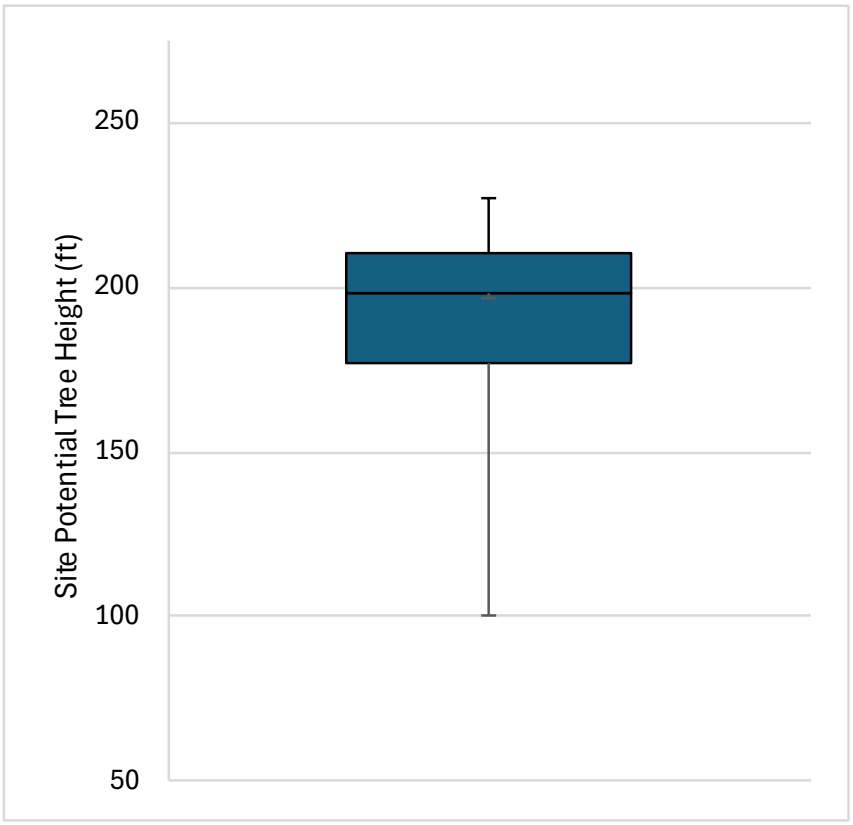

Figure 1. Box plot of SPTH distribution in Clallam County using data from the WDFW Site Potential Tree Height Mapping Tool. Upper and lower fences are Q3 and Q1 respectively with the median in the center, and whiskers are minimum and maximum; raw data was downloaded on 6/18/24.

The 150-foot buffer associated with Type 1 waters (Type S equivalent) is lower than recommended RMZ widths based on the SPTH framework. A buffer of 150 feet would be in the 9th percentile of SPTH options, meaning that a buffer of 150 feet is lower than SPTH in 91% of all riparian zones. The RMZ framework does not differentiate by stream type, so the buffers of Type 2-5 with buffers which range between 50-100 feet are well below the dimensions that are recommended by WDFW and BAS (Rentz et al. 2020).

As a part of the CAO update, we recommend that Clallam County consider buffer widths to align more closely with the RMZ width recommendations. The County may also consider extending the buffer from the edge of CMZ or OHWM, whichever is greater, to align with the RMZ buffer recommendations in Rentz et al. (2020).

5. Geologically Hazardous Areas

This section addresses code sections that are applicable to Geologically Hazardous Areas (GHAs). This includes CCC 27.12.400-27.12.855. A summary of recommended updates is provided in Table 4.

Table 4. Geologically hazardous areas review summary

Code Section	Title	Review Comment / Recommendations	Reason for Recommendation
27.12.400	Applicability and purpose	No changes required.	
27.12.405	Regulated uses and activities	No changes required.	
27.12.410	Classification and designation	Expand classification and designation to include mines and minerals. Reference DNR GIS portal.	Consistency with DNR guidelines.
27.12.415	Landslide hazard protection	Clarify buffer vs. critical area distance related to new development.	Clarity. Consistency with DNR guidelines.
27.12.420	Erosion hazard protection standards	Expand protection measures.	Consistency with DNR guidelines.
27.12.425	Seismic hazard protection standards	No changes required	
27.12.855	Geologic hazardous areas-Special requirements.	No changes required.	

5.1 Classification and designation (27.12.410)

5.1.1 Classification of mines and minerals

Clallam county classifies and designates landslide, erosion and seismic hazards in detail and is consistent with state and Department of Natural Resources (DNR) policies and guidelines. As mentioned above the classification and designation should be expanded to include mining and mineral hazards. The DNR portal is not listed as a resource for finding mapped locations of geologically hazardous areas. Consider adding a link or reference to DNR GIS portal. The designation and classification should be expanded to match DNR and Washington State Department of Commerce descriptions of geologically hazardous areas.

5.2 Landslide hazard protection areas (27.12.415)

5.2.1 Buffer vs. Critical Area Distance

A minimum buffer of 50 feet is set for major or minor new construction from the toe or edges of landslide hazard areas, however the general provisions (27.12.025 Table 1) describe this critical area being within 200 feet of a landslide, erosion, or seismic hazard area. It appears that construction would then be restricted to 250 feet of a landslide (200 feet of critical area with an additional 50-foot buffer), however it is unclear. The code further indicates that buffer reductions of less than 20 feet or development within landslide hazard areas are permissible with a geotechnical report. Other protection standards including critical facilities, forest practices, utilities, stormwater, and land disturbing activities are comprehensive.

5.3 Erosion hazard protection areas (27.12.420)

5.3.1 Expanded protection measures

This section addresses forest practices, land disturbing activities and zoning amendments, but is brief in comparison to other sections. Recommend expanding guidelines for erosion hazard protection areas.

6. Frequently Flooded Areas (FFAs)

This section addresses code sections that are applicable to Frequently Flooded Areas (FFAs). This includes CCC 27.12.500-27.12.515.The CCC is consistent with BAS and therefore, no changes are recommended at this time.

Table 5. Frequently flooded areas review summary

Code Section	Title	Review Comment / Recommendations	Reason for Recommendation
27.12.500	Applicability and purpose	No changes required.	
27.12.505	Regulated uses and activities	No changes required.	
27.12.510	Classification and designation	No changes required.	
27.12.515	Protection standards for certain development proposals	No changes required.	

7. Critical Aquifer Recharge Areas (CCC 27.12.600-615)

This section addresses code sections that are applicable to Critical Aquifer Recharge Areas (CARAs). This includes CCC 27.12.600-27.12.615. A summary of recommended updates is provided in Table 6.

Table 6. CARAs provisions review summary.

Code Section	Title	Review Comment / Recommendations	Reason for Recommendation
27.12.600	Applicability and purpose	No changes required. Section addresses potable water and surface water/recharge areas.	
27.12.605	Regulated uses and activities	BAS and GMA referenced in 27.10.101. Clear links to performance standards and permitting. Recommend adding table of regulated activities for clarity.	Clarity.
27.12.610	Classification and designation	Classification and designation align with WAC and Ecology Guidance. Edit to say, "maps available through Clallam County GIS Portal" and provide link and instructions to see layer. Provide rating of CARA on GIS layer.	Clarity. Consistency with Ecology and GMA guidelines.
27.12.615	Performance standards for certain development activities	Add table and clearer language regarding permitted and exempt activities and uses.	Clarity. Consistency with SMP.

7.1 Regulated Uses and Activities (27.12.605)

7.1.1 Clarify and consolidate regulated activities

CCC 27.12.605 refers to other sections of code with links including the General Provisions (Part 1), Performance standards for certain development activities (27.12.615), regulated uses and development activities (27.12.030) and permit application requirements (27.12.700). The regulated activities section is brief and internal links work; however, it is difficult to look at the regulated activities and code pages. Regulated uses and development activities (CCC 27.12.035) and activities not regulated by this chapter-exemptions (CCC 27.12.035) are clearly defined, however the difference between these and the regulated activities in CARAs is somewhat confusing. Consider rewriting regulated activities section to

include all activities regulated concerning CARAs with set performance standards to ensure protection of CARAs. Consider adding a table similar to Table 5 for further clarification of regulated activities.

Table 7. Regulated activities.

Regulated Activity	Applicable Regulations	Additional Comments
Aboveground/Underground Storage Tanks or Vaults	WAC 173-303, WAC 360	Regulated activities in CARAs
Agriculture		Regulated activities in CARAs
Land Divisions	CCC Title 29	Regulated activities in CARAs
Land Disturbing Activities	Stormwater Management Manual for Puget Sound Basin	Regulated activities in CARAs
Solid or Hazardous Waste Disposal Facilities	CCC Title 33 and 35	Regulated activities in CARAs
Parks, Schools, and Recreation Facilities	CCC Title 33 and 35	Regulated activities in CARAs
Storm Water Standards for Commercial and Industrial Uses	WAC 173-303, Stormwater Management Manual for Puget Sound Basin	Regulated activities in CARAs
Utility Transmission Facilities	WAC 173-303	Regulated activities in CARAs
Sewage Effluent and Sludge Disposal	WAC 246-272	Regulated activities in CARAs and in Part 1 General Provisions
Zoning and Comprehensive Plan Amendment	SEPA	Regulated activities in CARAs and in Part 1 General Provisions
Building permits	CCC Title 33 and 35	Regulated activities in Part 1 General Provisions
Public water system permit	CCC Title 33 and 35	Regulated activities in Part 1 General Provisions
Zoning conditional use or variance	CCC Title 33 and 35	Regulated activities in Part 1 General Provisions
Shoreline permit	CCC Title 33 and 35	Regulated activities in Part 1 General Provisions
Land divisions and related actions under CCC Title 29	CCC Title 33 and 35	Regulated activities in Part 1 General Provisions
Road approach permit	CCC Title 33 and 35	Regulated activities in Part 1 General Provisions
Stormwater and/or clearing grading	CCC Title 33 and 35	Regulated activities in Part 1 General Provisions

7.2 Classification and designation (27.12.610)

7.2.1 Refine CARA mapping

CCC 27.12.610 (2) references "maps available at the Clallam County Department of Community Development" however such a map could not be located online. The County delineated all lands and shorelines classified as high aquifer recharge potential and aquifer susceptibility as critical recharge areas. The GIS portal is available through the Planning Division "Multipurpose Map[3]." A layer is available under "Critical_Areas_CCC_27_12" that shows polygons of mapped CARAs, however there is no additional information. The County should clarify this and update the mapping reference. We suggest renaming the mapping reference to Clallam County GIS Portal or a similar generic title, which could include the GIS data available online. A separate critical areas map or CARA map could be added under the Planning Interactive Maps. It would be beneficial to add metadata or a description how CARAs were mapped and differentiate between low, moderate, and high susceptibility.

7.3 Performance standards for certain development activities (CCC 27.12.615)

7.3.1 Consider prohibiting or strictly regulating specific hazardous uses.

We the County specify activities in detail and identify those activities that are allowed without permit, allowed with permit, or prohibited and that buffer zones or variances be clearly described.

Ecology recommends including lists of allowed, permitted with conditions, and prohibited uses in the CARA regulations. The County should consider adding such lists to the code. Public education on best management practices (BMPs) for spills and leaks can also be improved.

7.3.2 Consider reviewing regulations for reclaimed water use and temporary dewatering

As a strategy to mitigate climate change impacts, it is recommended to review regulatory requirements for reclaimed water use and temporary dewatering during construction to ensure adequate protections are in place. Ecology recommends that jurisdictions conduct a county-specific multi-year infiltration study (ECY, 2021a).

7.3.3 Consider reducing or eliminated sewage and sludge disposal in CARAs

The Sewage Effluent and Sludge Disposal section currently reads:

"Sewage and sludge disposal, except on-site sewage disposal systems releasing less than 14,000 gallons per day and approved consistent with Chapter 246-272 WAC and local health codes must meet Class A

[3] https://clallam-county-portal-clallam.hub.arcgis.com/apps/babce258adf844ac9288f4088aa2e700/explore

reclaimed water and Class B biosolid requirements, shall be prohibited on lands designated as high or moderate susceptibility."

Consider re-writing this section for clarity and further restrict sewage disposal to smaller quantities on lands designated as moderate to high susceptibility.

To mitigate climate change impacts, it is recommended to include regulations to manage stormwater as a way to maintain groundwater recharge in CARAs. Increased winter flooding increases the likelihood of overwhelming stormwater treatment facilities and flooding roads, thereby transporting contaminants into surface water, including local streams and wetlands. The County should consider utilizing its 20-year planning horizon to manage supply and demand given climate trends and projections when reviewing stormwater management regulations (Asinas et al 2022). Regulations could include promoting and incentivizing low impact development (LID), specifically infiltration of clean runoff to support aquifer recharge.

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Best Available Science Review

Clallam County Critical Areas Ordinance Update (DRAFT)

AUGUST 23, 2024

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1. Introduction

1.1 Report Purpose

This review of the best available science (BAS) was compiled to support Clallam County's Critical Areas Ordinance (CAO) update. As a requirement of the Washington State Growth Management Act (GMA) cities and counties must "include the 'best available science' when developing policies and development regulations to protect the functions and values of critical areas and must give 'special consideration' to conservation or protection measures necessary to preserve or enhance anadromous fisheries"[1] (WAC 365-195-900). Regulated critical areas include wetlands, critical aquifer recharge areas, fish and wildlife habitat conservation areas, frequently flooded areas, and geologically hazardous areas (RCW 36.70A.030 and CCC 27.12).

BAS means the current and best available information that follows a valid scientific process as specified in WAC 365-195-900 through WAC 365-195-900. According to WAC 365-195-905, characteristics of a valid scientific process include peer review, standardized methods, logical conclusions and reasonable inferences, quantitative analysis, proper context, and references. Common sources of scientific information include research, monitoring, inventory, modeling, assessment, and synthesis (WAC 365-195-905). BAS literature reviews are a synthesis of the current scientific body of knowledge, and only resources that meet these requirements are included as reference materials for this BAS.

The BAS review is a resource for critical area management but is not intended to provide definitive answers for all policy and regulatory decisions. Policy and regulations should incorporate BAS but also necessitate decision-making processes based on societal values. Additionally, ecological systems are highly complex, and the scientific body of knowledge is constantly evolving with the advancement of new research and technology. Despite these advancements, there are limits to the current state of science and certain topics may not be fully understood. Where there is scientific disagreement in the literature about a particular subject, this review presents a range of potential ideas, theories, or findings. In accordance with WAC 365-195-920, decision-makers may opt for a precautionary, or no-risk approach, when scientific information is incomplete.

The GMA now requires CAOs to incorporate and evaluate the effects of climate change on each type of critical area. Climate change is anticipated to have a profound influence on natural systems and inclusion of these topics allows for decision-makers to respond by incorporating climate resilience into policy and regulations.

This BAS review serves as a reference for Clallam County for planned CAO updates, a component of comprehensive updates to the unified development code. Following the establishment of this BAS

[1] Anadromous refers to fish or fish species that spend portions of their life cycle in both fresh and salt waters, entering fresh water from the ocean to spawn.

review, a gap analysis will be developed to identify current shortcomings and provide recommendations on critical area regulation updates.

2. Critical Aquifer Recharge Areas (CARAs)

2.1 Definition

Critical aquifer recharge areas (CARAs) are defined in the Washington Administrative Code (WAC) 365-190-030 as follows:

> *Critical aquifer recharge areas "are areas with a critical recharging effect on aquifers used for potable water, including areas where an aquifer that is a source of drinking water is vulnerable to contamination that would affect the potability of the water, or is susceptible to reduced recharge."*

The Clallam County Code (CCC) 27.12.610 classifies CARAs as follows:

> *All Clallam County lands and shorelands shall be classified as having either a high, moderate or low aquifer recharge potential. At a minimum, classification shall be based on soil permeability and recharge potential as described within the soil survey of Clallam County. Where adequate information is available, aquifer recharge potential shall be further classified based on the recharge potential of surficial geologic materials, presence or absence of restrictive layers, surface and ground water monitoring data, well head protection areas, depth to ground water, topography (i.e., slopes), and locally adopted ground water protection plans and studies.*

The Clallam County designation specifies that lands and shorelands classified as high aquifer recharge potential and aquifer susceptibility possess a critical recharging effect on aquifers used for potable water. These areas are delineated on maps available from the Clallam County Department of Community Development. CARA areas may also be designated due to special circumstances, including areas with a high level of susceptibility or vulnerability to contamination, or known well head protection areas for Class A water systems. A well head protection area is the surface and subsurface area surrounding a well or well field that supplies a public water system through which contaminants are likely to pass and eventually reach the water well(s) as designated under the Federal Safe Drinking Water Act.

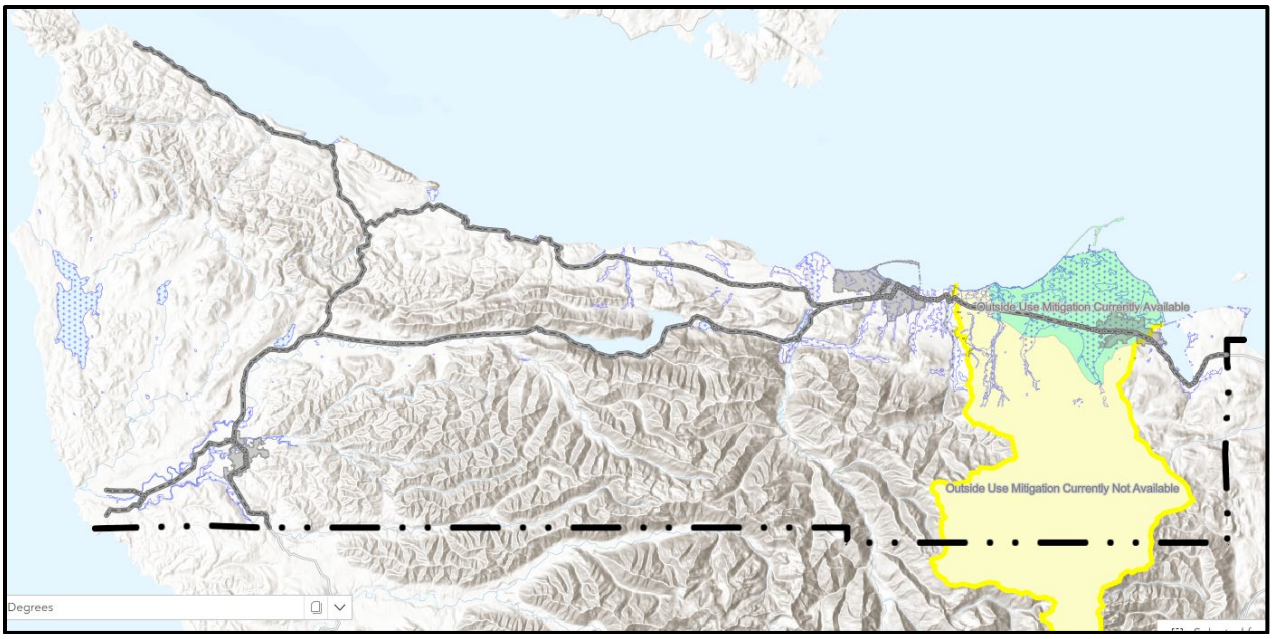

Figure 1. Clallam County CARA map.[2]

Groundwater is water that exists underground in saturated pore spaces of soil and rock. The upper surface of the saturated zone is called the water table. An aquifer is a geologic formation that readily transmits groundwater to wells or springs above ground. According to WAC 173-150-030, an aquifer is defined as *"any geologic formation that will yield water to a well or other withdrawal works in sufficient quantity for beneficial use."* Aquifer recharge occurs when water infiltrates the ground and flows to an aquifer. An aquifer can be confined or unconfined. An unconfined aquifer is one with no aquitard (a geologic formation that does not readily transmit water) or aquiclude (a geologic formation that does not allow for the transmission of water) between the water and the ground surface. A confined aquifer is a deeper aquifer that is separated from the surface by an aquitard or aquiclude and is often under pressure. Groundwater recharge areas are characterized by decreasing hydraulic head with depth (the direction of groundwater movement is downward). Groundwater discharge areas are characterized by increasing hydraulic head with depth (the direction of groundwater movement is upward, towards the surface) (Driscoll, 1986; Winter, 1998).

The Department of Ecology considers *aquifers used for potable water* as those with existing wells or and their protection area, a sole-source aquifer, planned to be used for potable water in the future, and aquifers otherwise identified as an important supply (Ecology, 2021a). Maintenance of potable water uses, and potential uses of aquifers require the management of water quality and quantity, which is covered in the following section.

[2] https://clallam-county-portal-clallam.hub.arcgis.com/apps/23bbb33c10b24b4c8706e89ae98f7add/explore (blue dotted areas are delineated CARAs and yellow/green areas represent zones under the Dungeness rule)

2.2 Functions and Values

The goal of establishing CARAs is to protect the functions and values of a community's drinking water by preventing pollution and maintaining supply. RCW 36.70A.172 requires counties and cities to 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 are also required to give special consideration to conservation or protection measures necessary to preserve or enhance anadromous fisheries (Ecology, 2021a). Since groundwater is a vital component of stream flow, it is necessary to maintain the groundwater supply to streams where needed to protect salmon and other anadromous species. Groundwater conditions can also influence geologic hazards, including landslide hazards and erosion hazards.

2.2.1 Water Quality

While CARAs serve to replenish groundwater supplies, they can also serve as a conduit for the introduction of contaminants to groundwater. Vulnerability to public water supply is primarily influenced by two main factors, the history of contamination loading and hydrogeologic susceptibility of the aquifer (WDOH, 2017).

Contamination loading refers to the quantity and types of pollutants present in an area, including exposure concentration, frequency, and chemical composition. Together, susceptibility and loading potential determine the vulnerability of an aquifer. To be considered vulnerable, an aquifer would need to be both susceptible and have significant contamination loading. For example, a highly susceptible aquifer may have a low vulnerability if the land use within the area is primarily open space, since there is minimal contamination loading. Likewise, an industrial site with multiple leaking storage containers may not create significant vulnerability if it is separated from the nearest aquifer by several hundred feet of dense glacially compressed clay.

Aquifer susceptibility refers to how easily water and pollutants can move from the surface through the ground to reach the underlying aquifer. There are many factors which influence susceptibility including the following (Eberts et al., 2013; Ecology, 2021a):

1. Characteristics of the vadose zone including depth to watertable and travel time. Travel time is influenced by hydrogeologogical factors including material composition and preferential flow paths.
2. Permeability
3. Infiltration rate
4. Chemical retardation
5. Adsorption
6. Hydraulic conductivity
7. Hydrologic and pressure gradients
8. Groundwater flow direction

9. Groundwater flow rate

Permeability of the vadose zone can be estimated from soil and geologic mapping. The Washington Department of Natural Resources (DNR) has an interactive web-based geologic map of the state which provides some insight into the permeability of the vadose zone[3]. Depth to an aquifer of a site can also be estimated by examining existing public data such as well logs in the vicinity. As mentioned above, well logs are available at the Ecology website[4]. Using nearby well data alone may be insufficient. Aquifers are managed and monitored by local water purveyors, in this case, Clallam County Public Utility District (PUD).

2.2.2 Water Quantity

Potable water and groundwater-dependent, landscape-scale ecological processes are both supported by groundwater quantity and can be influenced by land use and human activities. This section provides a description of hydrologic processes in aquifers related to water quantity and the effects of human activities on these resources.

The quantity of water available in an aquifer is a balance between recharge, storage, and discharge. Aquifers have discrete recharge and discharge areas. Since groundwater movement is the result of downward gravitational forces, the location of recharge areas in aquifers is typically at a higher elevation than its discharge areas. This is not universal because subsurface conditions may result in groundwater flow and hydrologic gradients do not always reflect surficial topography (Driscoll, 1986). Aquifer recharge can originate from rainfall, snowmelt, lakes, rivers, streams, or wetlands. Aquifer discharge occurs when water leaves the aquifer and is discharged to surface water. These areas can include seeps, springs, wetlands, streams, lakes, estuaries, and shorelines. Extraction from wells or by other means is also considered an aquifer discharge.

Land use and development typically alter the dynamics of aquifer recharge within a basin. For example, replacing forests with buildings, roads, driveways, lawns, and even pastures typically reduces the recharge to underlying aquifers, while simultaneously increasing the peak runoff rates to streams. In rare instances, however, some land uses can increase recharge rates. For example, if homes in an area receive water from a river or lake and discharge that water into septic systems, the result can be an increase in recharge to the underlying aquifer, and one that has potential for introducing contaminants (Dunne & Leopold, 1978; Winter, 1998).

Agricultural, residential, commercial, and/or industrial development may result in alterations to the natural hydrologic cycle by stripping vegetative cover, removing, and destroying native soil structure, modifying surface drainage patterns, and adding impervious and nearly impervious surfaces, such as roads and other compacted soils. The root zone is an important factor to consider because evaporation and transpiration of water by plants reduces the water available for groundwater recharge and can

[3] https://fortress.wa.gov/dnr/geology/?Site=wigm
[4] http://apps.ecy.wa.gov/welllog/mapsearch.asp

account for much or most of the rainfall during some months (Shao et al. 2019). Loss of water in stream channels and riparian areas due to water withdrawal and consumptive use of water from streams, rivers and aquifers further reduces groundwater recharge (Ecology, 2021a).

Recharge to an aquifer is dependent on precipitation and infiltration into the soil below the root zone. Infiltration below the root zone is controlled by several factors, including temperature, wind, soil type, geology, vegetation type, and land surface slope. The root zone is an important factor to consider, since evaporation and transpiration of water by plants reduces the water available for groundwater recharge and can account for much or most of the rainfall during some months (Shao, Bingcheng, & Jiming, 2019).

Changes in groundwater recharge and withdrawal of water by wells are the primary drivers of reductions in groundwater quantity. The Hirst Decision (*Whatcom County vs. Hirst 2016*) is a landmark case where the Washington State Supreme Court ruled that water is not legally available if a new well would impact a protected river or stream, or an existing senior water right. In response, Ecology collaborated with local partners to develop watershed plans under the Streamflow Restoration Act (Engrossed Substitute Senate Bill 6091) in Water Resource Inventory Areas (WRIA) 7, 8, 13, 14, and 15.

Clallam County is primarily in WRIAs 20 (Soleduc) and 18 (Elwha-Dungeness) with small portions in 17 (Quilcene-Snow) and 19 (Lyre-Hoko). The Dungeness watershed is covered under the Dungeness rule (ESSB 6091) which protects instream flows that are needed to support salmon populations. The rule is based on the Elwha-Dungeness Watershed Plan adopted under RCW 90.82.

The Watershed Planning Act (ESHB 2514) is also applicable to CARAs in Washington State. This legislation, created in 1998, encourages voluntary planning by local governments, citizens, and tribes for water supply and use, water quality, and habitat at the WRIA or multi-WRIA level. Grants are available to conduct assessments of water resources and develop goals and objectives for future water resource management.

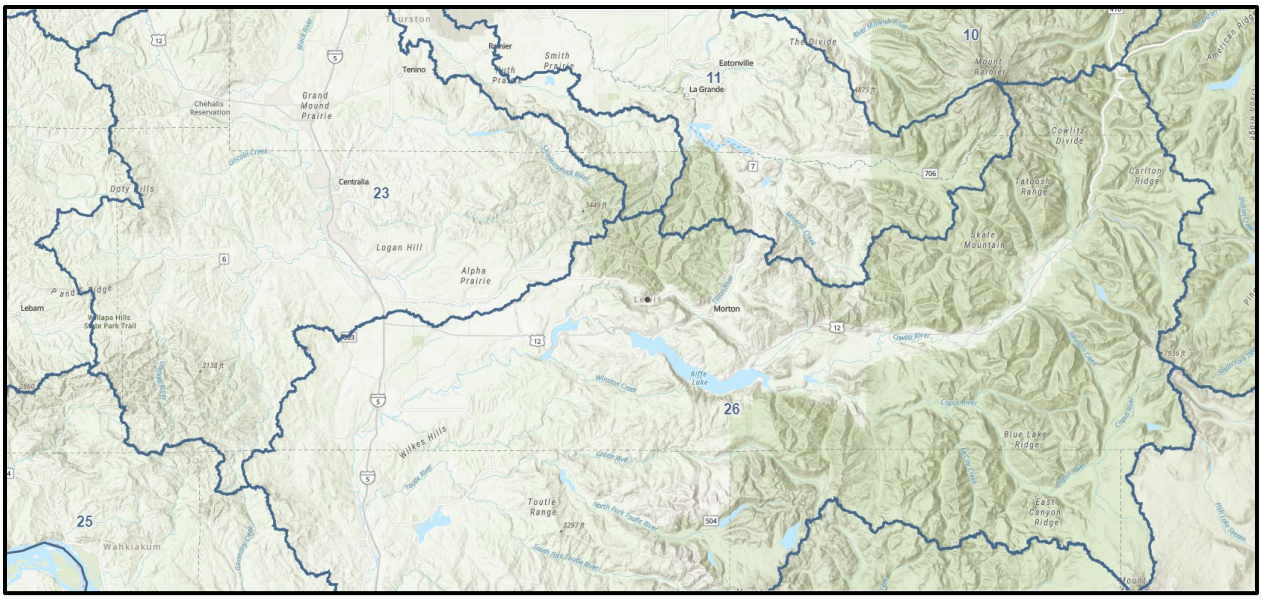

Figure 2. Clallam County WRIA Map.[5]

2.3 Key Protection Strategies

Key protection strategies for CARAs are still based on identifying and protecting CARAs through regulations and educational community outreach. Current 2021 Ecology CARA Guidance recommends the following eight steps to characterize and protect CARAs in a local community:

1. Identify where groundwater resources are located.
2. Analyze the susceptibility of the natural setting where groundwater occurs.
3. Inventory existing potential sources of groundwater contamination.
4. Classify the relative vulnerability of groundwater to contamination events.
5. Designate areas that are most at risk to contamination events.
6. Protect by minimizing activities and conditions that pose contamination risks.
7. Ensure that contamination prevention plans and best management practices (BMPs) implemented and followed. Review BMPs for infiltration designs with water quality treatment. Stormwater control usually affects the vadose zone and seasonal water tables with low risk to deeper water supply aquifers. Some exceptions are those glacial outwash plains with extensive deposits of coarse gravels near the surface.
8. Manage groundwater withdrawals and recharge impacts to:
    i. Maintain availability for drinking water sources.
    ii. Maintain stream base flow from groundwater to support in-stream flows, especially for salmon-bearing streams.

[5] https://gis.ecology.wa.gov/portal/apps/webappviewer/

Watershed planning is recommended to maintain in-stream flow as required by the 2018 Streamflow Restoration Act and for water supply planning under the 1998 Watershed Planning Act (Ecology 2021a).

Clallam County details performance standards for development activities in CCC 27.12.615. The Clallam County Land Division Code is also evaluated for development activity impacts to ground water and CARAs. CCC 27.12.865 lists requirements for mitigation plans when impacts to CARAs are unavoidable.

A hydrologic assessment is required for mitigation and must include:

1. Geologic setting and soils information of site and surrounding area;
2. Water quality data, including pH, temperature, conductivity, nitrates, and bacteria;
3. Location and depth of perched water tables;
4. Recharge potential of facility site (permeability/transmissivity);
5. Hydrologic budget;
6. Local ground water flow, direction and gradient;
7. Location, depth and other water quality data on the three shallowest wells or springs located within 1,000 feet of site;
8. Impacts on well head protection areas located within the development proposal;
9. Surface water locations within 1,000 feet of the site;
10. Discussion of the effects of the proposed project on ground water quality and quantity;
11. Recommendations on appropriate mitigation, if any, to assure that there shall be no measurable exceedence of minimum state ground water quality standards or measurable reduction in available quantity of ground water;
12. Emergency management plan; and
13. Provide for contaminant release detection.

Clallam County maintains CARA mapping and GIS layers which are available to the public via the Clallam County GIS Web Map[6]. GIS data is also available for download from the Clallam County GIS library.[7] Sole Source Aquifers (SSAs) are not present in Clallam County.[8]

2.4 Climate Change Impacts & Mitigation

Climate change impacts groundwater quality and quantity are influenced by regional trends as summarized below. Changes to surface water inputs can alter the timing, frequency, and duration of surface water presence and are projected to alter hydrologic patterns that can affect interactions with groundwater.

Clallam County prepared a Climate Action Plan in 2023 to mitigate greenhouse gas emissions from County government operations (Cascadia, 2023). The impacts of climate change are already being observed in Clallam County, including warmer maximum temperatures, rising sea levels along

[6] https://clallam-county-portal-clallam.hub.arcgis.com/apps/23bbb33c10b24b4c8706e89ae98f7add/explore
[7] https://www.clallamcountywa.gov/879/Maps-GIS-Information
[8] https://epa.maps.arcgis.com/apps/webappviewer/index.html?id=9ebb047ba3ec41ada1877155fe31356b

coastlines, and increased extreme weather events including drought and flooding. Aspects of climate change affecting CARAs include:

- Changes in precipitation levels in summers may reduce ground surface saturation during the growing season (Mauger et al. 2019). Higher temperatures will also increase the rate of evaporation in surface waters. This will likely reduce wetland areas and the groundwater recharge they provide during the dry season. This can influence streams, wetlands, and other surface waters impacted by groundwater in addition to anthropogenic consumption.

- Wildfires will introduce more particulates and contaminants into the environment, which settle on surface water and infiltrate into groundwater (Burton et al. 2016; Mansilha et al. 2020).

- Increased winter flooding increases the likelihood of overwhelming stormwater treatment facilities and flooding roads. Thereby transporting contaminants into surface water, including local streams and wetlands that can infiltrate and contaminate aquifers (Mauger et al 2019).

- Rising sea levels increases the potential for salt water intrusion into coastal aquifers (Mauger et al. 2015).

- Demand for aquifers may increase as crops require greater levels of groundwater consumption to compensate for changes in precipitation.

Altered patterns of precipitation resulting from climate change are projected to include earlier peak stream flows, increased frequency, and extent of flooding, and reduced summer flows (Mauger, et al., 2015). Groundwater is believed to be more resilient to the effects of climate change relative to surface water resources (HDR 2019). The primary stressors to aquifers are changes in the timing and amount of groundwater recharge, and increased pressure to use groundwater as surface water conditions change. Ecology recommends focusing on water conservation as a strategy to plan for climate change impacts (Ecology, 2021a).

Other stressors on CARAs that may require further study include reclaimed water use and temporary construction dewatering. Ecology recommends that jurisdictions conduct a multi-year infiltration study (Ecology, 2021a). Population growth also presents challenges for protecting CARAs as land use intensity increases (Ecology, 2021a). For example, multi-year droughts can increase reliance on groundwater source, lead to reductions in groundwater tables, aquifer depletion, and potentially result in saltwater intrusion (Asinas et. al., 2022).

2.4.1 Strategies to Manage Climate Change Impacts to CARAs

- Manage stormwater to maintain groundwater recharge in CARAs. Utilize a 20-year planning horizon to manage supply and demand given climate trends and projections (Asinas et. al., 2022).

- Design stormwater systems to better mimic natural systems and mitigate some of the functions lost elsewhere in the landscape due to changes in surface and groundwater inputs. For example, the use of roadside bioswales may be expanded. Stormwater treatment capacity may be increased as needed to protect water quality and manage water quantity.
- Planning for increased flooding can reduce the likelihood of contaminated runoff events.
- Preserve open space and concentrate urban development away from CARAs.
- If necessary, strengthen regulatory protection of CARAs. For example, the County may review the CARA mapping, determine the areas of highest risk to drinking water, and prioritize protection of those areas. The County can reduce the risk of groundwater contamination by prohibiting land uses that are high risk within high priority areas. Public outreach education on best management practices (BMPs) for spills and leaks can also be improved.
- Continue to protect CARAs by maintaining updated CARA maps and classifications.
- Review regulatory requirements for reclaimed water use and temporary dewatering during construction to ensure adequate protections are in place. This may involve additional County-specific studies.
- Continue to modify public outreach efforts to educate residents about best practices in CARAs and promote water conservation and water use efficiency programs.
- Promote and incentivize low impact development, specifically infiltration of clean runoff to support aquifer recharge.
- Balance growth and development with preservation and restoration of open spaces and native vegetation tracts.

3. Frequently Flooded Areas (FFA)

3.1 Definitions

Frequently flooded areas (FFAs) are floodplains and flood prone areas that pose a risk to public safety. FFAs also serve important habitat functions for fish and wildlife. FFAs are defined in WAC 365-190-030(8) as follows:

> *Frequently flooded areas "are lands in the flood plain subject to at least a one percent or greater chance of flooding in any given year, or within areas subject to flooding due to high*

groundwater. These areas include, but are not limited to, streams, rivers, lakes, coastal areas, wetlands, and areas where high groundwater forms ponds on the ground surface."

The Clallam County definition of a frequently flooded area is in CCC 27.12.510:

> *Frequently flooded areas shall be classified as floodways, floodplains, and special flood hazard areas. "Floodway" refers to the channel of a stream, plus any adjacent areas, that must be kept free of encroachment in order to discharge the base flood without cumulatively increasing water surface elevation more than one foot. "Floodplain" refers to the area of land that would be covered with water during a flood, and includes the floodway and the special flood hazard area. "Special flood hazard area" means the floodway and adjoining land which is subject to a one percent or greater chance of flooding in any given year, as determined by engineering studies accepted by Clallam County. Coastal high hazard areas are located within special flood hazard areas.*

3.2 Functions and Values

Floods are regularly occurring weather events that can result in destruction of property and loss of life but are also responsible for ecological processes that sustain river systems. Floods typically occur following large storm events but may also result from a collapse of impounded water, such as from a dam or levee failure, or beaver activity. FFAs are dynamic and ecologically productive environments that provide important habitats for fish and wildlife and floodplain storage that alleviate downstream flood zone impacts. These processes overlap with many of the functions of Fish and Wildlife Conservation Areas (FWHCAs) as discussed in Section 6.2.1, so this section briefly summarizes processes and functions as they relate to floodplain dynamics.

Dynamic hydrologic processes, including the mobilization of large woody debris and other allochthonous inputs, can be critical to the maintenance of fish and wildlife habitat (Naiman & Decamps 1997; Petts et al. 2005). High-flow channels carved into floodplains provide important habitat for a variety of fish species and create areas of refuge from the high-velocity flows. Streams overtop their banks during periods of high flow and deposit sediment, cumulatively forming a flood plain (Dunne & Leopold 1978; Knighton 1998). Floodplains also provide storage of floodwaters that can reduce the severity of other areas in the watershed and contribute to infiltration and aquifer recharge.

Streams are often modified to protect development from destructive floods, typically in the form of channel straightening and armoring. These modifications can cause rivers to become disconnected from their natural floodplains and associated wetlands (Booth 1990). Other land use changes associated with urbanization such as impervious surfaces and deforestation also influence floodplains by increasing the magnitude and frequency of floods (Booth et al. 2002). In landscape-level assessments, patterns of urban development, particularly impervious surface area and distribution, have been demonstrated to influence watershed functions (Alberti et al. 2006). Among these are stream channel downcutting, a process associated with watersheds that have frequent and short duration high peak flows, that further disconnects floodplains, increases in-stream erosion, and deposits sediment in downstream environments leading to blocked culverts (Booth 1990).

Flooding can result in significant economic costs from damaged homes and infrastructure, business disruption, and loss of life. Floodplains have been used for agriculture, residential development, and urbanization for centuries because the geographic locations tend to be well-suited for development during periods between floods. The proximity of development to rivers and large water bodies, and advantages in travel, transport, and discharge of waste, otherwise provide ideal settlement locations. Dikes, levees, and associated floodplain fill have been a historically common approach to protecting development, which has consequentially worsened flood impacts to some downstream areas and sometimes failed to protect the areas that were intended. Altered river dynamics, including sediment and large woody debris accumulation as well as increased flows associated with upstream land use changes, have overwhelmed some aging flood control works that have not been maintained or improved. The human and societal costs of flooding have increased over time as the population and amount of infrastructure in floodplains has increased and from climate change.

The primary river flood hazards are associated with the Quillayute River, Bogachiel River, Calawah River, Sol Duc River, East Dickey Creek, Sekiu River, Hoko River, Clallam River, Reed Creek, Elwha River, Morse Creek, and Dungeness River. River flooding hazards are primarily located near the mouths of the rivers in the northern, central, and western portions of the County, along the extent of Highways 101, 110, and 110 Spur. Ediz Hook, Port Angeles, Gibbon, and Travis spits in the mouth of Sequim Bay may become inundated with high tides and storm surges. The Clallam, Elwha and Dungeness tidal areas are also impacted by high tides and river flooding. Kinkade Island is highly vulnerable to flooding and erosion as it is in the floodplain and meander hazard zone. Several flow paths throughout Kinkade Island receive flow from groundwater and surface water. Jimmycomelateley Creek and the lower Sequim delta were also areas of historic flooding. The Jamestown S'Klallam Tribe, the Clallam Conservation District, Clallam County, and other stakeholders completed a restoration project to return the functionality of the creek's floodplain and to improve fish passage. (Clallam County, 2019)

3.3 Key Protection Strategies

Floodplain protection strategies serve the dual purpose of protecting property and infrastructure, and the ecological integrity of streams and watersheds. Clallam County developed a natural hazard mitigation plan in conjunction with ports of Port Angelos, Clallam County Public Utilities District (PUD), Peninsula College, the cities of Forks, Sequim, Port Angeles and the Elwha Klallam and Jamestown S'Klallam tribes. The purpose of the plan is to review and manage natural hazards and was most recently updated in 2019 (Clallam County, 2019). A separate Dungeness River Comprehensive Flood Hazard Management Plan was also developed in 2009 (Dungeness Flood Hazard Advisory Committee, 2009)

All development within designated FFAs is regulated by Clallam County Construction Code, Chapter 21.01 CCC. Building within the floodplain requires a flood elevation certificate completed by a civil engineer licensed in the State of Washington, demonstrating that the proposed development will not result in more than a one-foot increase in flood levels during the occurrence of the base flood discharge. In addition to the critical area buffer requirements and other applicable protection

standards of Clallam County Construction Code, CCC 27.12.515 lists conditions that apply to structures constructed within designated FFAs.

Floodplain management is generally based on a no adverse impact strategy (ASFPM, 2003). This approach requires floodplain property owners to ensure that their land use does not adversely affect flood storage or flood risk for others, including risks of flow velocities and erosion. This is commonly achieved by requiring no net increase in flood elevations. This approach protects natural floodplain processes and encourages restoration, such as reconnecting side channels and reducing armoring.

The Federal Emergency Management Agency (FEMA), in cooperation with the state, county, tribes, and local communities within Clallam County are using updated data and GIS technology to create updated Flood Insurance Rate Maps (FIRMs) to more accurately represent the risk of flooding in the area. New maps will help the community better understand flood risks, which allows for more informed decisions about how to protect against damage and loss. Currently, the flood maps are considered preliminary and open for public review and input.

Figure 3. Image obtained from Clallam County floodplain mapping application.[9]

3.4 Climate Change Impacts & Mitigation

Climate change in the Pacific Northwest is anticipated to result in wetter autumns and winters and drier summers (Mote & Salathe Jr., 2010). Climate change models predict that the frequency of atmospheric rivers, which contribute to severe deluges in rainwater and other extreme weather events, will become more frequent and severe (Mauger & Kennard, 2017; Salathe, et al., 2014). Greater flood risks are

[9] https://storymaps.arcgis.com/stories/4f2741a3af714c16b75775a1a9a8b5ed

predicted because of the increased precipitation paired with the increased frequency and intensity of extreme weather events (Ecology, 2021b). The resulting increase in floodwater elevation and expansion of floods to new areas is a risk to property and public safety. Climate change can also influence flooding in coastal areas due to sea level rise, high tides, storm surges and waves. waves (Mauger and Kennard 2017). Extreme floods impose both positive and negative effects on stream health. Impacts include physical trauma and stress to aquatic organisms, displacement or stranding, erosion and sedimentation, loss of vegetation, pollution, disruptions to food webs and spawning, and disrupted migration. As a result, extreme floods have been documented to reduce fish densities (Milner et al. 2013). However, some studies show that fish assemblages are resilient to the effects of floods at a basin scale and recover quickly (George et al. 2015). Potential positive effects include the creation of new habitats and nutrient redistribution (Peters et al. 2015).

3.4.1 Strategies to Manage Climate Change Impacts to FFAs

The Washington Silver Jackets is an interagency group that was formed in 2010 to plan and manage flood risks. This group works to develop improved estimates of future flooding, develop resources for local planners, build capacity and coordinate on resiliency, improve public engagement, and coordinate floodplain management goals (Mauger & Kennard, 2017). The University of Washington Climate Impacts Group has collaborated with the Washington Silver Jackets to integrate climate change predictions and impacts into flood management planning efforts. This resulted in the development of the report: *Integrating Climate Resilience in Flood Risk Management: a Work Plan for the Washington Silver Jackets Team* which provides a framework for strategic management (Mauger & Kennard 2017). The work plan recommendations include:

- Develop improved estimates of future flood impacts (Mauger & Kennard 2017).
- Develop resources for local planners (Mauger & Kennard 2017).
- Build capacity and coordination on resiliant floodplain management (Mauger & Kennard 2017).
- Improve public engagement (Mauger & Kennard 2017).
- Coordinate floodplain goals and mangement (Mauger & Kennard 2017).
- Maintain and update CFHMP and SMP to support stormwater management, salmonid habitat, and streamflow planning (Ecology 2021a).
- Implement and enforece Clallam County and Washington State laws and policies regarding flood prevention during permitting and development.
- Encourage and incentivize floodplain restoration actions to restore floodplain connectivity to streams and wetlands and protect or restore riparian corridors to maintain microclimate.
- Utilize the FEMA Climate Resiliency approach to support flood hazard management planning and follow grant funding opportunities.
- Refine topographic floodplain analysis to identify potential changes in floodplain extents.

4. Geologically Hazardous Areas

Consistent with WAC 365-190-030, geologically Hazardous Area are:

> *Areas that because of their susceptibility to erosion, sliding, earthquake, or other geological events, are not suited to the siting of commercial, residential, or industrial development consistent with public health or safety concerns.*

Per hazards (RCW 36.70A.030(9) and WAC 365-190-120), The four main types of geologically hazardous areas recognized in the GMA are erosion hazard areas; landslide hazard areas; seismic hazard areas, and areas subject to other geologic events such as coal mine hazards and volcanic hazards. Clallam County regulates volcanic, landslide, seismic, mine, and erosion hazard areas in CCC Chapter 27 Part 4 (CCC 27.12.400).

The purpose of regulating activities in geologically hazardous areas is to protect the public from potential risks. Geologic events may occur in hazard areas that can result in property damage, injury, and the loss of life. The type of land use in these areas influences the level of risk by increasing consequences to life and property and may increase the potential for a hazardous event in some cases. There is public interest in regulating these areas because a geologic event occurring on one property can impact surrounding areas. It is important to identify where such hazard areas are, and to ensure that activities and development in those areas are managed for safety and stability.

Although the general protective approach is to avoid disturbing geologic hazard areas, WAC 365-190-080(4) states "Some geological hazards can be mitigated by engineering, design, or modified construction or mining practices so that risks to health and safety are acceptable".

4.1 Definitions

4.1.1 Landslide Hazard Area

Landslide hazard areas are areas identified as having the potential for mass wasting due to a combination of geologic, seismic, topographic, hydrologic, or human-created factors. Regulated landslide hazard areas are classified for regulation within Clallam County by the presence of any of the following indicators in CCC 27.12.410:

Landslide Hazard Areas: Lands potentially subject to mass movement due to a combination of geologic, topographic, and hydrologic factors. The following classifications shall be designated as landslide hazards and are subject to the requirements of this chapter:

> *(i) Areas of historic, existing, or ongoing landslide activity as evidenced by downslope movement of a mass of materials including rock, soils, fills, and vegetation.*
>
> *(ii) Glaciolacustrine silt and clays on terraces.*

(iii) Slopes fifteen (15) percent or steeper with a combination of: slowly permeable silt and clay interbedded sand and gravel, and sidehill springs or seeps from perched water tables.

(iv) Soils mapped and described by the Soil Survey of Clallam County, Washington, issued February 1987, as amended, classified as having a severe or very severe erosion hazard potential.

(v) Planar slope forms sixty-five (65) percent or steeper with vertical relief of ten (10) or more feet, except areas composed of consolidated rock.

(vi) Concave slope forms twenty-five (25) percent or steeper with vertical relief of ten (10) or more feet, except areas composed of consolidated rock.

(vii) Any slopes greater than eighty (80) percent subject to rockfall during seismic shaking.

(viii) Marine coastlines including marine bluffs potentially unstable due to wave action or mass wasting and littoral dune systems which border the ordinary high water mark.

(ix) Ravines with a vertical relief of ten (10) or more feet in depth except areas composed of consolidated rock.

(x) Channel meander hazard. Areas subject to the natural movement of stream channel meanders associated with alluvial plains where long-term processes of erosion and accretion of the channel can be expected to occur. Such meander hazards are characterized by abandoned channels, ongoing sediment deposition and erosion, topographic position, and changes in the plant community, age, structure, and composition. These areas do not include areas protected from channel movement due to the existence of permanent levees or infrastructure improvements such as roads and bridges constructed and maintained by public agencies. These areas also do not include areas outside the meander hazard which may be subject to rapid movement of the entire stream channel or avulsion.

(xi) Any area located on or adjacent to an active alluvial fan or debris flow, presently or potentially subject to inundation by debris or deposition of stream-transported sediments.

(xii) Slopes that are parallel or sub-parallel to planes of weakness, such as bedding planes, joint systems, and fault planes in subsurface materials.

4.1.2 Seismic Hazard Area

Seismic hazard areas are areas subject to damage resulting from earthquake-induced landsliding, seismic ground shaking, dynamic settlement, fault rupture, soil liquefaction, or flooding caused by tsunamis and seiches. Seismic hazards are identified in the Washington State DNR Geologic Information Portal[10]. The DNR Geologic Information Portal contains information projecting the Cascadia, Seattle and Tacoma Seismic Scenarios which extend throughout Clallam County.

Regulated landslide hazard areas are identified for regulation within Clallam County by the presence of any of the following indicators:

[10] https://geologyportal.dnr.wa.gov/

Seismic Hazard Areas. Lands meeting the following classifications shall be designated as seismic hazard and are subject to the requirements of this chapter.

(i) Landslide hazard areas and materials.

(ii) Artificial fills especially on soils listed in subsection (1)(c)(iii)of this section and areas with perched water tables.

(iii) The following soil types described within the Clallam County soil survey as beaches, Mukilteo muck, Lummi silt loam, Sequim-McKenna-Mukilteo complex, and Tealwhit silt loam.

(iv) Other areas as determined by the Clallam County Building Official pursuant to 1997 Washington State Uniform Building Code, Chapter 18, as amended.

4.1.3 Mine Hazard Area

Mine hazard areas are directly underlain by, adjacent to or abutting, or affected by old mine workings such as adits (horizontal passage), tunnels, drifts, or airshafts that have the potential for subsidence.

The County does not list or describe mine hazards, however the DNR Washington Geologic Information Portal[11] shows numerous active surface mines. The portal also shows hazardous material locations such as mercury and radon, uranium bearing rocks, oil, and gas wells Erosion Hazard Areas.

4.1.4 Erosion Hazard Area

Erosion Hazard Areas regulated by Clallam County include shoreline, riverine, and soil erosion hazard areas. Shoreline erosion hazard areas include areas landward of the ordinary high water mark (OHWM) of a freshwater (lake or pond). Riverine erosion hazard areas include the channel migration zones (CMZ) of rivers listed above in CMZ section. Soil erosion hazard areas contain slopes of twenty (20) percent or greater and are classified as having severe, or very severe erosion potential by the Soil Conservation Service, US Department of Agriculture (USDA).

Clallam County defines erosion hazards areas as follows:

Erosion Hazard Areas. Lands meeting the following classifications shall be designated as erosion hazard and are subject to the requirements of this chapter:

(i) Landslide hazard areas.

(ii) Areas of existing erosion activity which causes accelerated erosion, sedimentation of critical areas, and/or threatens public health, safety, and welfare.

(iii) Any slope forty (40) percent or steeper with a vertical relief of ten (10) or more feet, except areas composed of consolidated rock.

[1111] The portal shows the County having very strong to severe shaking during a Cascadia seismic scenario, moderate to strong shaking during a Seattle seismic scenario, and light to strong shaking during a Tacoma Seismic scenario.

(iv) Concave slope forms equal to or greater than fifteen (15) percent with a vertical relief of ten (10) or more feet, except areas composed of consolidated rock.

(v) Soils classified by the soil survey of Clallam County as having a moderate, severe, or very severe erosion hazard potential.

4.2 Hazard Characterization

Clallam County defines geologically hazardous areas as areas within 200 feet of a landslide, erosion, or seismic hazard area. The County does not list or describe mine hazards, volcanic hazards, or tsunamis, however the DNR Washington Geologic Information Portal[12] shows numerous active surface mines. The portal also shows hazardous material locations such as mercury and radon, uranium bearing rocks, oil, and gas wells. The portal does not indicate any volcanic hazards; however, tsunami hazard areas are delineated along the entire coastline. The portal shows the County having very strong to severe shaking during a Cascadia seismic scenario, moderate to strong shaking during a Seattle seismic scenario, and light to strong shaking during a Tacoma Seismic scenario.

4.2.1 Landslide Hazard Area

Landslides are difficult to predict because bluff geology, sediment composition, topography, and hydrology all influence risk of failure. Steeper slopes are more prone to failure due to increased gravitational stresses (Shipman 2004). Certain land use modification and development activities have the potential to increase the likelihood of landslides, such as vegetation removal and creation of new impervious surfaces. In addition to anchoring sediments, the process of evapotranspiration by plants transforms groundwater to atmospheric vapor and intercepts rainwater (Schmidt et al. 2001; Watson and Burnett 1995). There are between 1,000-2,000 earthquakes which occur annually between Washington and Oregon, although most are small and fewer than 25% are perceptible (Cooper 2006; McCrumb et al. 1989). The probability of occurrence and risk of earthquakes depends on location, and seismic hazard areas have been mapped to identify areas with the greatest risk.

Alluvial fans are triangle shaped deposits of sediment which occur when mountainous areas approach topographically flatter areas. They are included in the concept of landslide hazard areas although they also share characteristics of flood hazard areas due to the associated risks include debris flows, flash floods, mudflows, and outburst floods. These types of flows are extremely dangerous even in small levels because of the destructive nature of swiftly moving large debris and floodwaters. The risk of flash floods and debris flows increases following wildfires due to changing hydrologic characteristics in landscapes with bare soils and lacking vegetation [Washington Geological Survey's Wildfire-Associated Landslide Emergency Response Team (WALERT), 2023].

[1212] The portal shows the County having very strong to severe shaking during a Cascadia seismic scenario, moderate to strong shaking during a Seattle seismic scenario, and light to strong shaking during a Tacoma Seismic scenario.

The DNR Geologic Information Portal provides mapping for known landslide areas within Clallam County.

4.2.2 Seismic Hazard Area

Secondary hazards associated with seismic events include liquefaction of the soil, rockfall, landsliding, dam failure, levee failure, and tsunamis or seiches. Liquefaction hazard areas within Clallam County are mapped by the Washington Department of Natural Resources, in addition to seismic site class and seismic design categories. Nearly all areas of Clallam County have some level of seismic risk, even outside of designated critical areas. The anchoring and hydrologic functions of vegetation lower the risk of slope failure and shallow-rapid landslides (Schmidt, et al., 2001).

The DNR Geologic Information Portal[12] provides mapping for known seismic hazard areas within Clallam County.

4.2.3 Mine Hazard Area

Clallam County, Washington has 246 records of mining claims on public land managed by the Bureau of Land Management (BLM).

Active and closed mines pose potential hazards because they can lead to increased risks of erosion, mass wasting, and landslides near surface mines, and subsidence over collapsed tunnels and shafts in subsurface mines. Since the potential risks of subsurface mines are not obvious, evaluation and disclosure to landowners is essential to protecting infrastructure and public safety.

4.2.4 Erosion Hazard Area

Erosion hazard areas present risks to infrastructure, the environment, and public safety. For example, erosion may undermine the foundation of buildings or other structures, and increase the risk of landslides which threaten property and human life. There is also a direct link between erosion and impacts to other aquatic critical areas including streams, ponds, and wetlands (Dubois et al. 2018).

Erosion and landslides are natural processes that contribute sediment, rocks, and large woody debris to streams and other waterbodies. The introduction of periodic pulses or chronic turbidity and suspended solids associated with erosion has been demonstrated to harm certain types of aquatic life, particularly salmonids (Bash et al. 2001). This can occur from activities such as clearing vegetation and the creation of new impervious surfaces, which can introduce sediments and pollutants to natural waterways (Booth 1991). Further discussion of the effects of erosion and sediment on streams is provided in Section 6.2.1.

The stability of erosion hazard areas is influenced by the vegetation composition, structure, and cover. Vegetation reduces erosion through rainwater interception and by anchoring soils within root networks (Booth et al. 2002; Naiman and Decamps 1997). In cleared areas, rainfall tends to concentrate

in small channels, and sediment can be mobilized as the water gains depth, volume, and increased flow. Small channels or rills can eventually develop into gullies in these types of exposed soils..

Alluvial fans are triangle shaped deposits of sediment which occur when mountainous areas approach topographically flatter areas. They are included in the concept of landslide hazard areas although they also share characteristics of flood hazard areas due the associated risks include debris flows, flash floods, mudflows, and outburst floods. These types of flows are extremely dangerous even in small levels because of the destructive nature of swiftly moving large debris and floodwaters. The risk of flash floods and debris flows increases following wildfires due to changing hydrologic characteristics in landscapes with bare soils and lacking vegetation (WALERT 2023).

4.3 Key Protection Strategies

The primary goal of protection measures for geologic hazards is to protect people and property. The primary mechanism for protecting people is limiting the risk to people by limiting the occupancy and limiting the development of essential or hazardous facilities in geologically hazardous areas.

Erosion hazards, landslide hazards, and seismic hazards can be mapped and classified. The classification systems can be used to determine site limitations and development requirements. If development is proposed within the buffer or erosion hazard or landslide hazard area, rigorous design and construction standards should be adhered to in order to prevent the development from causing instability, either at the site or elsewhere on the slope. Any such development in the hazard area or its buffer should be evaluated on a site-specific basis by a licensed geotechnical engineer or engineering geologist. Data used in such analyses should be site-specific and include subsurface exploration and testing of soils at an appropriate frequency across the site.

Additional protection strategies were identified by the SR-530 Landslide Commission following the Oso mudslide that occurred in March 2014. Recommendations from the commission include integrating and funding Washington's emergency management system, supporting a statewide landslide hazard and risk mapping program, establishing a geologic hazards resilience institute, conducting landslide investigations, and advancing public awareness of geologic hazards. Integrating Washington's emergency management system would bring together, "the Governor's office, the [state] Legislature, tribes, county and municipal government, first responders, transportation agencies, non-government support agencies, the private sector, and members of the public" (SR 530 Landslide Commission, 2014). To improve landslide hazard and risk mapping, collaboration among agencies and landowners is recommended along with risk prioritization, utilization of lidar mapping and GIS database tools. The commission recommends the governor establish a geologic hazards institute focused on education, outreach, research needed, and best professional practice guidelines (SR 530 Landslide Commission, 2014).

Per the SR-530 Landslide Commission's findings, updates to critical area regulations are recommended to better identify and regulate land uses in geologic hazard areas. This may include requiring geologic risk assessments as part of subdivision permit application reviews, slope-density regulations,

conservation easements, and grading ordinances (SR 530 Landslide Commission, 2014)). Slope-density calculation is a method for determining the number of allowable development units in subdivisions with geological hazards. Usually the steeper the slope, the fewer the number of units permitted.

Seismic hazards can be managed by applying earthquake resistant building standards to "at risk" areas. The Washington State Building Code (WAC 51-50) offers guidance from the 2018 International Existing Building Code with amendments specific to the State, including several directly related to seismic standards. Adherence to this guidance can mitigate seismic hazards.

4.4 Climate Change Impacts and Mitigation

Geologically hazardous areas, particularly erosion hazard areas, and landslide hazard areas, are anticipated to be influenced by climate change. Climate change models project warmer, drier summers, and increased precipitation in other seasons while maintaining roughly the same amount of annual precipitation (Dalton et al. 2013). Extreme precipitation events modeled by the UW Climate Impacts Group are expected to increase in intensity and frequency (Mauger et al. 2021). Increased magnitude and frequency of rain events can lead to over-saturated soils and contribute to slope instability in hazard areas. Consequentially, geologic hazard risks are anticipated to increase because rainfall intensity and duration are known indicators of landslide events (Chleborad 2006; DNR 2020). Additionally, the severity and frequency of wildfire is expected to increase, heightening susceptibility to erosion and landslide hazards (Mauger et al. 2015).

Changing climate is also anticipated to affect vegetation community composition and native plant mortality due to shifts in plant hardiness zones and species ranges (Lenoir & Svenning 2015). Existing species assemblages, canopy types, and root systems may be disrupted and displaced by invasive species. Although plant provenance is not the only indicator of a plants capability to stabilize slopes, opportunistic invasive plants often have shallow root systems and short lifespans that are less effective at anchoring soils than native counterparts. Himalayan blackberry, for example, is a wide spread invasive plant likely to displace lost plants and has shallow root system and can cause soil erosion by preventing the establishment of native counterparts (Gaire 2015). High levels of plant diversity also generally improve soil stability by combining multiple forms of root architecture (Ghestem et al. 2014).

4.4.1 Management Recommendations for Climate Change Impacts

- Encourage or require climate-informed design for development and infrastructure in or near geologic hazard areas (DNR, 2020).
- Require appropriate surface and ground water management practices for development near coastal bluffs.
- Encourage utilization of soft shore protection strategies.

- Identify and prioritize geologic hazards within the County, then update mapping as needed using current practices such as LiDAR and GIS database tools.
- Keep in communication with the Governor's office to ensure the County is included in statewide collaborative efforts to manage geologic hazard areas.
- Manage vegetation for climate resilience and slope stability.

5. Wetlands

5.1 Definition

Scientists have worked to develop a wetland definition based on scientifically defensible criteria since interest in managing and protecting wetland resources scaled up in the 1950's. At the time the Clean Water Act of 1977 (CWA) was signed into law, a definition was agreed upon and applied consistently at a national scale. It is defined as follows (33 CFR 328.3):

> *"Wetlands are 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."*

Washington State also has a wetlands definition that is similar to the CWA but includes certain exceptions for artificial wetlands. It is defined in WAC 365-190-030(22) as follows:

> *'Wetland' or 'wetlands' means areas that are inundated or saturated by surface water or groundwater 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, 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. However, wetlands may include those artificial wetlands intentionally created from nonwetland areas to mitigate conversion of wetlands, if permitted by the county or city.*

Clallam County Code defines wetlands in CCC 27.10.210 as:

> *Regulated wetlands are 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. Regulated wetlands generally include, but are not limited to: swamps, marshes, bogs, ponds, including their submerged aquatic beds 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 (adoption date of Chapter 36.70A RCW, Growth Management Act), that were unintentionally created as a result of the construction of a road, street, or highway. Wetlands created as mitigation and wetland modified for approved land use activities shall be considered as regulated wetlands.

5.2 Functions and Values

Wetland processes provide many functions that are recognized for their social, ecological, and economic benefits. Three functional categories which include water quality, hydrology (water quantity), and habitat, are typically considered to be most crucial in terms of their influence on that natural and built environment and are the focus of this analysis. Wetland values refer to the resources a wetland provides that are valued by society, for their ecological, economic, recreational, or aesthetic benefits.

Wetland functions are influenced by the hydrogeomorphic characteristics of a site which affect how water moves through a wetland system (Brinson 1993; Hruby 2014). For example, wetlands situated in depressions (depressional wetlands), have greater floodwater retention capacity than slope or flat wetlands. Wetland functions are also influenced by landscape scale and site scale characteristics including vegetation structure, hydroperiods, proximity to potential sources of pollution, and priority habitat corridors and connectivity. Many of the functions and services wetlands provide are valuable to society, such as water storage, flood protection, pollutant and nutrient attenuation, and habitat supporting fisheries (Hattermann et al. 2008). Since these functions are provided naturally, or through restoration projects they are often less costly than engineered solutions (Hattermann et al. 2008).

For regulatory purposes in Washington, wetland functions and values are typically categorized in a rating system. The most widely accepted rating system, the *Washington State Wetland Rating System for Western Washington: 2014 Update, version 2*, was developed by the Department of Ecology and is considered to be the regional standard by all regulating agencies (Hruby and Yahnke 2023). This rating system is a rapid assessment tool that evaluates wetland functions in the categories of water quality, hydrology, and habitat, among a framework of three dimensions of site potential, landscape potential, and societal value (Hruby and Yahnke 2023).

5.2.1 Water Quality Functions

Wetlands are capable of improving water quality in waterways through several physical, chemical, and biological processes including settling, filtration, diffusion, volatilization, oxidation, precipitation, adsorption, ion exchange, UV radiation, biodegradation, evapotranspiration, and biotransformation. (Shao, Bingcheng, & Jiming, 2019). Wetlands perform these functions to varying degrees depending on several factors including residence time of polluted waters, vegetation structure and density, and soil composition (Hruby & Yahnke, 2023). Wetlands uptake nutrients, particularly nitrogen and phosphorus, and mediate the effect of nutrient spikes to downstream areas (Sheldon, et al., 2005). Wetland plants

and associated microorganisms can take up and remove nitrogen through the biochemical processes of nitrification and denitrification, which occur in respective aerobic and anaerobic conditions (Sheldon, et al., 2005). Low oxygen concentrations that are common to wetland environments allow them to be sinks for copper, a heavy metal (Kerr et.al., 2009). Studies of constructed wetlands have shown wetland plants remediate pharmaceuticals and personal care products (PPCPs) to various extents (Zhang et.al, 2014).

5.2.2 Hydrologic Functions

Hydrologic wetland functions include groundwater recharge, reduction in peak surface water flows, reduced stream erosion, and flood-flow desynchronization (Sheldon, et al., 2005). Flood-flow desynchronization is a landscape-scale process where peak flows of sub-basins vary temporally in a watershed and lower the magnitude of downstream flooding (Adamus et.al, 1991). This has a cumulative effect on magnitude and intensity of individual peak flow events (Sheldon, et al., 2005).

Impervious surface area within a drainage basin has been demonstrated to alter wetland hydrology by increasing or decreasing flows from the surrounding landscape, affecting hydroperiods and flood severity (Sheldon, et al., 2005). These modified hydroperiod regimes are often accompanied by other impacts, such as stream channel erosion and downcutting, and sediment deposition (Sheldon, et al., 2005). Changes in wetland ponding depths, hydroperiods, or water level fluctuation dynamics can also impact wetland plant communities (Schueler, 2000).

5.2.3 Habitat Functions

A diverse group of fauna depend on wetlands for at least a portion of their life cycle, including wetland-associated mammals, waterfowl, fish, invertebrates, reptiles and amphibians (Kaufmann & Faustini, 2012) (Sheldon, et al., 2005). There are a diverse range of ecological variables and factures which influence habitat functions and quality, such as buffer width and condition, vegetative structure, habitat interspersion, wetland hydroperiods, and landscape setting (Hruby & Yahnke, 2023). A meta-analysis of the relative effects of landscape-scale wetland area and landscape matrix quality on wetland vertebrates found that while species abundance generally increases in landscapes with more wetland areas, the abundance of some taxa such as amphibians are more sensitive to the larger landscape condition (Quesnelle, Lindsay, & Fahrig, 2015). Native species diversity for most taxa is also negatively correlated with the degree of urbanization, though overall species richness is often greatest in areas of intermediate disturbance (Guderyahn et al. 2016; Müller et al. 2016).

Wildlife are also sensitive to water quality impairments which affect wetlands. Additionally, habitat fragmentation tends to reduce the habitat functions and values a wetland provides (Azous and Horner 2010; Sheldon et al. 2005). Land disturbance associated with urban and rural development results in habitat loss and reduces the area of buffers between wetlands and human land use impacts.

5.3 Key Protection Strategies

Wetlands are protected through government regulations at the local, state, and federal levels, with each requiring impact avoidance, minimization, and mitigation. Effective wetland protection strategies include regulatory protocols to identify and classify wetlands, assign buffer widths, and require impact avoidance and compensatory mitigation for any wetland or buffer impacts. Additionally, preservation of local and landscape-scale corridors can be protected by establishing corridor protection regulations for developments near wetlands.

5.3.1 Wetland Identification and Classification

To protect wetlands, they must first be identified by a qualified professional. The nationwide standard for wetland delineations is the 1987 Army Corps of Engineers (Corps) *Wetlands Delineation Manual* with the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region Version 2.0* (Regional Supplement). The Regional Supplement provides greater detail on determining the presence or absence of wetlands specific to the region.

The *Ecology Wetland Rating System for Western Washington* was first issued in 2004, annotated in 2006, revised in 2014, and annotated in 2023. One major change made during 2014 update provides intermediate categories for each assessed function, scoring to a high, medium, or low ranking. These were thought to better reflect the coarseness of the tool. Additional clarifications were added to the rating system guidance in Version 2 to incorporate annotations from the prior version (Hruby & Yahnke, 2023)

Jurisdictional status of a wetland can vary depending on the government agency and the statute regulations under consideration. For example, the CWA only applies to wetlands that meet specific criteria regarding connectivity to Waters of the U.S., and do not apply to isolated wetlands. Local and state wetland regulations are more broadly encompassing, but generally exclude artificially created stormwater features, for example.

5.3.2 Wetland Buffers

Wetlands in Washington are protected from surrounding land uses through buffer requirements based on recommendations from the Department of Ecology. Similar to wetlands, buffers also provide functions that have ecological, sociological, and economic benefits. Wetland buffer functions include moderation of stormwater inputs, sediment removal, pollutant abatement, microclimate, habitat for wetland-dependent fauna, habitat connectivity, and disturbance screening (Sheldon, et al., 2005). Buffer functions vary depending on a wide variety of factors, including the vegetation community, gradient, soil conditions, and adjacent land use intensity to name a few (Sheldon, et al., 2005).

In 2005, Sheldon et al. developed a synthesis of the science for wetlands in Washington which included the topic of buffer widths efficacy. In this, the topics of buffer widths relative to water quality functions, hydrologic maintenance, wildlife habitat, and disturbance barrier effectiveness are reviewed. Due to a

similarity of processes and function, studies on stream buffer widths were compiled into the synthesis (Sheldon, et al., 2005).

BUFFER APPROACHES

Ecology provides guidance for wetland buffers framed around several alternatives in Wetlands in Washington State - Volume 2: Guidance for Protecting and Managing Wetlands– Protecting and Managing Wetlands, Appendix 8-C (Granger 2005) and 2022 Ecology Guidance for Critical Area Ordinance Updates. Both guidance documents provide similar but slightly differing approaches, and both are considered to be consistent with BAS at this time.

Current Ecology wetland guidance documents outline the following primary factors to consider when determining buffer widths (Ecology 2022):

- The wetland type and the functions needing protection (buffers filter sediment, excess nutrients, and toxics; screen noise and light; provide forage, nesting, or resting habitat for wetland-dependent species; etc.),
- The types of adjacent land use and their expected impacts, and
- The characteristics of the buffer area (slope, soils, vegetation).

Three wetland buffer alternatives are presented in the current Ecology guidance for CAO updates.

As buffer determination options are reviewed, it is important to note that, "Ecology's buffer width recommendations are based on the assumption that the buffer area is well vegetated with native species appropriate to the ecoregion" (Ecology 2022). Those buffer options are:

- **Option 1.** Width based on wetland category and habitat score, if minimization measures are applied, and a habitat corridor is provided. If a habitat corridor is not provided or minimization measures are not implemented, then buffer width requirements increase. Modified buffers should be not less than 75 percent of the otherwise required buffer. Option 1 provides the most flexiblity.
- **Option 2.** Width based on wetland category and modified by the intensity of the impacts from proposed land use. Option 2 decreases regulatory flexibility and eliminates buffer averaging and reduction provisions through the application of corridors and minimization measures.
- **Option 3.** Width based on wetland category only. Option 3 is the least flexible and simplest to administer.

FUNCTIONALLY DISCONNECTED BUFFER AREAS

In urban areas, standard buffer widths are sometimes interrupted by development. When a buffer area is functionally disconnected from a wetland, Ecology recommends providing clear direction on how buffer regulations address this condition by providing specific criteria. A distinction between minor and major developments is central to determining if a functional barrier is present (Ecology 2022). Minor developments, such as trails, accessory structures, and driveways for a single residence would not completely block wetland buffer functions (Ecology 2022). Significant developments associated with

the complete loss of buffer functions include public infrastructure (paved roads, railroads), housing developments, or commercial structures. An interruption may impact all or just a portion of a buffer area (Ecology 2022).

INFLUENCE OF BUFFERS ON HYDROLOGY

Wetland buffers can mediate the effects of surrounding land use impacts, with variable interactions depending on site conditions and landscape position. Development and impervious surfaces often result in runoff to surface waterbodies which negatively alters hydrologic regimes and introduces pollutants to waterways, these impacts are reduced by the presence of wetland buffers. Infiltration of rainwater to soils in wetland buffers reduces surface flows and improves groundwater recharge. Vegetation slows the movement of surface runoff, allowing for greater time for infiltration to occur, which slows or desynchronizes hydrologic inputs into the wetland and potentially diverts them to other groundwater systems. Leaf and other vegetative litter on and in the soil also capture water and improve the soil's infiltration capacity (Castelle, et al., 1992a). Vegetation also intercepts rainwater and converts liquid water back to atmospheric vapor through evapotranspiration. Buffer characteristics that influence performance of hydrologic maintenance are vegetation cover, soil infiltration capacity, rainfall intensity, and antecedent soil moisture conditions (Wong and McCuen 1982).

Buffers also function to control erosion by slowing water flow and improving infiltration. Buffer vegetation can reduce erosion by capturing sediment before it enters the wetland, through soil stabilization by roots, and reduction in rain energy by both the vegetation canopy and organic material on the soil (Castelle, et al. 1992a). Vegetation composition and structure in buffers are important factors in the capability of a buffer to perform this function. Plants with fine roots are most effective at preventing erosion by binding the soil (McMillan 2000).

INFLUENCE OF BUFFERS ON WATER QUALITY

Buffers protect water quality in wetlands through the removal of sediment and suspended solids, nutrients, pathogens and toxic substances, and other pollutants (Castelle et al. 1992a; McMillan 2000; Sheldon et al. 2005). The ability of a buffer to improve water quality depends on several variables such as slope, vegetation composition, leaf and wood litter, soil type, the type of pollutant, size of the basin, and the fate of stormwater conveyance from adjacent land use (Desbonnet et al. 1994; McMillan 2000). Buffers are typically higher functioning when they have a structurally complex mix of trees, shrubs, and groundcovers, an abundance of downed wood and leaf litter, and low slopes (Hruby 2013). This is in-part facilitated by physical and biological processes, such as the retention, binding, and filtering of sediments and pollutants through wood or leaf litter, and the breakdown and uptake of pollutants by plants and microorganisms in the soil (Castelle et al. 1992a; Desbonnet et al. 1994; McMillan 2000). Buffer vegetation can reduce sediment input to the wetland through the stabilization of soils by roots, and reduction in runoff via rainwater interception and buildup of organic material on the soil (Castelle, et al. 1992a). Shading and wind reduction by buffer vegetation also influence water quality by maintaining cooler temperatures. Water temperature in wetlands can be critical to the survival of aquatic wildlife species, but more importantly from a water quality perspective, it helps maintain

sediment-pollutant bonds, increases the water's dissolved oxygen capacity, and limits excessive algal growth (Castelle et al. 1992a; McMillan 2000; Sheldon et al. 2005).

Approximately 50% of overall pollution removal, except nitrogen, occurs in the first 16 ft (5 m) of buffer and 70% occurs at 115 ft (35 m) (Desbonnet, et al. 1994). For sediments and suspended solids, 60% removal is achieved with a 7 ft buffer (2 m), and 80% removal is achieved at 82 ft (25 m) (Desbonnet, et al. 1994). Phosphorus removal of 60% is achieved with buffer of 39 ft (12 m), and 80% is achieved at 279 ft (85 m) (Desbonnet, et al. 1994). An analysis of a range of buffer widths by specific water quality function identified the following effective buffers: 5 to 100 meters (16 to 330 feet) for sediment removal; 10 to 100 meters (33 to 330 feet) for nitrogen removal; 10 to 200 meters (33 to 656 feet) for phosphorus removal; and 5 to 35 meters (16 to 100 feet) for bacteria and pesticide removal (McMillan, 2000; Sheldon, et al., 2005).

INFLUENCE OF BUFFERS ON WILDLIFE HABITAT

Wetland buffers provide habitat for a wide variety of wildlife species and are particularly essential for wetland-dependent and wetland-associated species that require adjacent terrestrial habitat during their life cycle. They also provide habitat well suited for non-wetland-dependent species that prefer habitat edges, use the wetland as a source of drinking water, or use the protected buffer corridors for migrations and movements.

The current body of research includes a range of studies which assess how certain focal species utilize buffers at varying widths, following disturbance events or land use changes. One study in urban King County found that bird diversity was positively correlated with the percentage of a wetland perimeter with vegetated buffers, though only a minor increase in diversity was found with the tested buffer widths of 50, 100, and 200 feet (Milligan, 1985). One literature summary reports an effective buffer range of 50 feet (15 m) for many bird species up to 3,280 feet (1,000 m) for native amphibians (Milligan 1985) (Azous and Horner 2010). Many studies recommend buffers between 150 and 300 feet with minimum buffer widths of 50 to 75 feet to provide general avian habitat (Desbonnet et.al, 1994; Ecology, 1992) . Wildlife corridor to connect wetlands is recommended by McMillan (2000) to be at least 98 feet, and Reichter (1997) recommends 490 feet as a minimum travel corridor. A synthesis by Sheldon et al. (2005) found that scientific literature suggests buffer widths for habitat protection range between 50 and 300 feet depending on factors including wetland habitat conditions, target species, buffer condition, and surrounding land uses.

In addition to providing habitat for wetland-dependent and wetland -associated species, buffers provide a barrier between a wetland and the various vectors for human encroachment, including noise, light, trampling of vegetation, and the introduction of garbage and other pollutants. Buffer widths necessary to effectively reduce impacts vary by intensity of the adjacent land use. Buffer widths of 49 feet to 98 feet can effectively screen low-intensity land uses, such as agriculture and low-density residential. High intensity land use, such as high density residential (more than 1 unit/acre), commercial and industrial, require buffer widths of 98 feet to 164 feet (Sheldon, et al. 2005). The buffer itself, and the functions that it provides, is influenced by the degree of human-related disturbance. Buffers less

than 50 feet wide experienced the most loss of buffer function related to human disturbance, and this loss is related to gradual reduction in buffer width as adjacent land uses encroach (Castille, et al., 1992b).

MITIGATION SEQUENCING

Mitigation sequencing is the structured process of avoiding, minimizing, and mitigating all impacts to a particular resource. Clallam County has incorporated mitigation sequencing into existing wetland regulations, according to CCC 27.12.840 This is consistent with federal directives to achieve no net loss of wetland functions and values. Mitigation sequencing is also required by the 2008 Wetlands Compensatory Mitigation Rule issued by the U.S. Environmental Protection Agency (2008) and WAC 197.11.768. Per current Ecology guidance for CAO updates, mitigation sequencing must be applied in the following order (Ecology 2022):

- Avoiding the impact altogether by not taking a certain action or parts of an action;
- 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;
- Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action;
- Compensating for the impact by replacing, enhancing, or providing substitute resources or environments; and/or ,
- Monitoring the impact and taking appropriate corrective measures.

COMPENSATORY MITIGATION

Compensatory mitigation may be achieved through a programmatic approach or an approved permittee-responsible mitigation (PRM) plan. Programmatic approaches utilize third-party sponsors to obtain mitigation credits, such as a mitigation bank or in-lieu fee (ILF) program. PRM is an applicant managed mitigation project. PRM is typically concurrent with wetland impacts, but it may be done in advance. Mitigation banks are state certified to ensure ecologic replacement is achieved. ILF programs collect fees and apply the funds to restoration projects within the service area. ILF programs are reviewed and approved by the Corps and Ecology. Whereas, PRM applicants must complete installation, site maintenance and monitoring, and adaptive management as needed to achieve approved mitigation plan goals and performance standards (Ecology, 2021b)

Ecology's recommendations for mitigation ratios for projects in Western Washington depend on the wetland category and type of mitigation action (Granger, et al., 2005). Mitigation ratios for direct wetland impacts are increased to account for temporal losses (Ecology, 2022). When applying

advanced mitigation, the Ecology recommended ratios account for the wetland category and proposed mitigation actions (Ecology, 2021b).

To address ecologic priorities in Washington State's watersheds, Ecology has developed additional guidance and tools for applicants, including details on using a watershed approach for mitigation site selection and the Credit-Debit Method (Hruby T. , 2012; Hruby, Harper, & Stanley, 2009). The credit-debit method is a system to calculate mitigation credits needed for a given project. The credit calculations can be used to determine compensation when utilizing in-situ mitigation, or a mitigation bank or in-lieu fee program. Depending on specific site conditions, this may result in less or more mitigation than would be required under a set the traditional mitigation ratio guidance (Hruby T., 2012).

Compensatory wetland mitigation methods in order of preference are:

1) Restoration: Re-establishment,
2) Restoration: Rehabilitation-hydrologic processes restored,
3) Creation (establishment),
4) Preservation, and
5) Enhancement.

Ecology recommends applying at least a one-to-one ratio to buffer impacts (Ecology 2022). However, if buffer modifications exceed standard allowances, such as retaining at least 75 percent of the standard buffer width, then Ecology recommends evaluating indirect wetland impacts to determine appropriate compensatory mitigation (Ecology 2021b).

MONITORING

Evaluations of wetland mitigation outcomes found that most wetland mitigation does not fully replace impacted functions and falls short of the goal of no net loss (Ecology, 2008). The goal of no net loss of wetland function cannot be achieved through mitigation alone, but may be met through several factors, including adequate monitoring and maintenance and appropriate performance standards. Factors that reduce the risk of mitigation failure include; detailed functional assessment, high success standards, detailed mitigation plans, larger bonds with up-to-date market values, high replacement ratios, and greater expertise.

5.4 Climate Change Impacts & Mitigation

Climate change is predicted to significantly impact wetland ecosystems by altering hydrology, reducing biodiversity, disrupting of carbon storage, modifying community composition, and increasing rates of disease (Aukema et al. 2017; Burkett and Kusler 2000; Lee et al. 2015). Altered hydrology and precipitation patterns from climate change may alter community composition and result in earlier drawdowns of wetlands during droughts, a process that will likely result in wetland loss (Lee et al. 2015). Wetlands may also experience greater polarity in seasonal water levels with increased ponding during

wet seasons and decreased water levels during dry seasons (Halabisky 2017). Sea level rise is also expected to change the landscape of coastal wetlands, resulting in wetland loss, spatiotemporal changes to coastal wetland distribution, and shifts in community composition resulting from disturbance, climate change effects, and elevated salinity (Burkett and Kusler 2000). Climate change impacts on biodiversity are discussed in Section 6.4. and are caused by a wide range of effects that modify habitats from historic baselines and reduce biodiversity (Aukema et al. 2017). Furthermore, warming effects may result in a disruption of carbon storage, by reducing storage rates or even reverting some wetlands from carbon sinks to carbon sources, particularly in boreal peatlands (Burkett and Kusler 2000).

Wetlands also provide functions that assist in the mediation of climate change impacts. Wetlands and wetland buffers, like riparian corridors, support a shaded and cool microclimate that provides refuge for wildlife from higher temperatures as well as wildlife corridors at a local or landscape scale (ASWM 2015). Additionally, wetlands help offset climate change through carbon storage by protecting the remineralization of organic stocks and sequestering greenhouse gas emissions (Gallagher et al. 2022). Carbon stocks in undisturbed wetlands are approximately twice as high as carbon storage in wetlands disturbed by human-driven land use changes (Nahlik and Fennessy 2016). However, it is uncertain whether this is a causal relationship or influenced by patterns of human settlement in avoiding the wettest sites which are challenging to develop. Bogs and peatlands are important carbon sinks that could release hundreds of years of stored carbon if disturbed (Nahlik and Fennessy 2016).

Although wetlands are dynamic by nature, the ability to adapt to change is has limits. For instance, alterations in stormwater runoff conditions and changes to seasonal wetland hydrologic cycles can reduce the ability of wetland soil bacteria and plants to retain, process, and sequester pollutants (EPA 2015). Climate change is also impacting native plant species distribution, and the adaptative potential and climate tolerance for native plant species is the subject of current research(Vose et al. 2012).

5.4.1 Strategies to Manage Climate Change Impacts to Wetlands

- Continue to encourage and incentivize direct wetland impact avoidance to maintain existing carbon storage.
- Continue to regulate wetland buffers to encourage and require width retention/limitations and enhancement with native vegetation. Both voluntary and required restoration planting should be paired with monitoring and maintenance that allows for dry season irrigation and adaptive management.
- Continue to manage and regulate stormwater infrastructure to avoid and minimize discharges of untreated runoff to wetlands.
- Apply increased protections to bog wetlands and associated buffers to prevent stormwater impacts that could change pH and alter sensitive plant communities.
- Consider assisted migration for seed selection of native plants from locations that are better adapted to future climate conditions.

6. Fish and Wildlife Habitat Conservation Areas (FWHCAs)

6.1 Definitions

Washington State defines fish and wildlife conservation as "land management for maintaining populations of species in suitable habitats within their natural geographic distribution so that the habitat available is sufficient to support viable populations over the long term and isolated subpopulations are not created" (WAC 365-190-130). Fish and Wildlife Habitat Conservation Areas (FWHCAs) are lands designated for this conservation action and are defined under WAC 365-190.130.

Clallam county defines these areas as aquatic and wildlife areas in the following manner (CCC 27.12.310).

Aquatic Habitat Conservation Areas

Includes those streams, lakes, marine waters and their associated wetlands and floodplains defined as shorelines of the State in the Shoreline Management Act of 1971 and the Clallam County Shoreline Master Program, which are also categorized as "shorelands" under Chapter 90.58 RCW, Shoreline Management Act, as now or hereafter amended, and those streams, lakes and wetlands which meet the criteria for Type 1 – 5 waters as defined herein.

Streams include those areas where the surface water flow is sufficient to produce a defined channel or bed. A defined channel or bed is an area which demonstrates clear evidence of the passage of water and includes but is not limited to bedrock channels, gravel beds, sand and silt beds and defined-channel swales. The channel or bed need not contain water year-round. This does not include irrigation ditches, canals, storm or surface water runoff devices or other artificial watercourses unless they are used by salmon or used to convey streams naturally occurring prior to construction.

Wildlife Habitat Conservation Area

Class I Wildlife Habitat Conservation Area. Those lands including the following:

(i) Habitats recognized by federal or State agencies for federal and/or State listed endangered, threatened, and sensitive species documented in maps or data bases available to Clallam County and its citizens and which, if altered, may reduce the likelihood that the species will maintain and reproduce over the long term. This includes known locations of nests, rookeries, or other breeding areas for species of concern recognized by local, state, and federal public agencies having jurisdiction over such species.

(ii) Habitats targeted for preservation by federal, State and/or local government which provide fish and wildlife habitat benefits, such as important waterfowl areas identified by the U.S. Fish and Wildlife Service.

(c) Class II Wildlife Habitat Conservation Area. Those lands including the following:

(i) Priority habitats not classified as Class I for State listed candidate and monitor species documented in maps or data bases available to Clallam County and its citizens, and which, if altered, may reduce the likelihood that the species will maintain and reproduce over the long term.

(ii) Priority habitats not classified as Class I. These habitats may include wetlands, aquatic conservation areas, marine bluffs, stream ravines, caves, cliffs, islands, meadows, old-growth/mature forest, snag-rich areas, talus slopes, urban natural open space, and those land and water areas identified as significant habitat corridors under the Clallam County Comprehensive Plan, CCC Title 31.

6.2 Functions and Values

FWHCA functions include the biological, chemical, and physical processes occurring on lands and ecosystems that influence wildlife. Since wildlife may include all species from the largest megafauna to microorganisms, these functions encompass a complex web of interacting ecological processes. At the highest level, FWHCAs provide wildlife with the habitat requirements necessary to survive and persist. This section discusses functions of FWHCAs most relevant to wildlife and habitat management, with a focus on streams and riparian areas. Functions of certain habitat areas are also considered if relevant to a particular societal value other than wildlife.

FWHCA values the range of societal, economic, and ecological benefits provided by these lands and the wildlife which may inhabit them. These include *indirect values* that include non-consumptive uses such as recreation, tourism, scientific research, option values (valuing future opportunities), and intrinsic existence values (Chardonnet et al., 2002). They also include *direct values*, the consumptive and productive uses such as commercial harvest, hunting, timber, and firewood (Chardonnet et al., 2002). These values represent diverse public interests and attitudes toward wildlife issues which change over time (Teel & Manfredo, 2010).

6.2.1 Streams, Lakes and Ponds, and Riparian Areas

Streams, lakes, ponds, and their associated riparian areas provide critical habitat for a diversity of wildlife species and directly contribute to surface and subsurface hydrology as well as nutrient and energy exchange across the landscape. The following section describes the functions and values most prominent to stream, lakes, ponds, and riparian area ecosystems as well as land use activities including (1) land cover and impervious surfaces; (2) recruitment of large woody debris to aquatic areas; (3) shade, temperature, and microclimates; (4) stream migration and bank stability.

Human development is well documented to negatively impact aquatic ecosystems and is often evaluated using landscape scale metrics such as impervious surface, and other land cover measures. Impervious surface is positively correlated with high flow volumes, daily streamflow variability and negatively correlated with groundwater recharge rates and summer low flow volumes (Burges et al. 1998, Jones 2000, Konrad & Booth 2005, Cuo et al. 2009). Other types of development also result in

hydrological changes include soil compaction, draining, and ditching across the landscape, and logging (Booth & Jackson 2002; Moore & Wondzell 2005). Together, these landscape modifications have been documented to reduce rates of infiltration, evapotranspiration, and groundwater storage (Sheldon et al. 2005). As a result, flows are less desynchronized and become more variable and volatile (Sheldon et al. 2005).

A study assessing changes in forest canopy, stream flows, and stream bank erosion, found that if forest retention is less than 40 percent within a watershed, unstable channels are expected to occur (Booth, Hartley, & Jackson, 2002). Increased erosion and bank instability coupled with a reduction of forest cover has been found to simplify stream morphology, leading to incised, wider, straighter stream channels (Konrad & Booth, 2005). This less dynamic stream morphology is linked to accelerated water transport and reduced temporary instream flood storage capacity (Kaufmann & Faustini, 2012). Positive correlations have been found between spawner abundance and forested areas; negative correlations were found between spawner abundance and areas converted to agriculture or urban development (Pess, et al., 2002).

RECRUITMENT OF LARGE WOODY DEBRIS TO AQUATIC AREAS

Large woody debris (LWD) plays a significant role in the geomorphic formation of streams channels by deflecting and redirecting stream flows, and influencing sediment storage, transport, and deposition rates (Quinn, T., Wilhere, & Krueger, 2020). These processes result in complex and diverse channel morphologies that include dam pools, plunge pools, riffles, glides, undercut banks, and side channels (Quinn, T., Wilhere, & Krueger, 2020). The creation of these features is also facilitated by variability in stream flow velocity which factors into scour, sediment deposition, and pool formation. Large wood actuates the downward scour necessary for streams to create pools, which provides protective cover for fish in those pools (Quinn, T., Wilhere, & Krueger, 2020).

These processes result in complex and spatially heterogeneous stream habitats which support diverse communities of aquatic species. LWD and associated habitat complexities provide conditions suitable for rearing, and refugia from predators. In one study, the density of juvenile salmonids was found to be substantially higher in streams in which LWD was experimentally introduced (Roni & Quinn, 2001). Similarly, Fausch and Northcote (1992) found that streams containing large amounts of LWD supported populations of juvenile cutthroat trout and coho salmon five times greater than streams within the same river system that had been cleared of LWD.

The aggregation of LWD and associated entrapment of smaller branches, limbs, leaves, and other material reduce flow conveyance in small streams and increase temporary flood storage (Dudley, S.J., Fischenich, & Abt, 1998). By retaining smaller organic debris, LWD provides substrate for microbes and algae, and prey resources for macroinvertebrates (Bolton, A. & Shellberg, 2001). The overall influence of LWD on biological processes is greater in smaller streams than larger ones (Harmon, M.E., et al., 1986). This is similar to the relationship with riparian areas, in which allochthonous inputs compose a greater proportion of small stream volume than large streams and are more influential on biological processes (Vannote et.al., 1980). In small channels, LWD provides a structural component in the stream that

controls rather than responds to hydrologic and sediment transport processes (Gurnell, A.M., Piegay, Swanson, & Gregory, 2002). It follows that large wood is responsible for significant sediment storage in small channels, thereby increasing channel stability (May & Gresswell, 2003; Nakamura & Swanson, 1993; Quinn, T., Wilhere, & Krueger, 2020). In a study where wood was experimentally removed from streams, Bilby (1981) found increased sediment mobilization and reduced storage. LWD that partially blocks flow may also encourage hyporheic flow through the streambed substrate (Poole & Berman, 2001; Wondzell, S.M. & Lanier, 2009).

Large wood recruitment are typically introduced to streams as a result of bank erosion, windthrow, landslides, debris flows, snow avalanches, and tree mortality due to fire, ice storms, insects, and disease (Swanson, F.J., Lienkaemper, & Sedell, 1976; Maser, Cline, Cromack Jr., Trappe, & Hansen, 1988). Large woody debris can enter channels through individual trees falling into the stream, as well as through larger disturbances (Bragg, 2000). In a comparison of 51 streams with varying channel characteristics in mature forests of British Columbia, a study found that tree mortality was the most common entry mechanism of LWD where the source could be identified (Johnston et.al,, 2011). Streambank erosion and associated channel migration is also a common method of wood recruitment in large alluvial channels (Murphy & Koski, 1989), whereas in LWD recruitment in smaller, steeper channels occurs primarily through slope instability and windthrow (May and Gresswell 2003).

The probability of a tree entering the channel decreases with distance from the streambank (McDade, Swanson, McKee, Franklin, & Van Sickle, 1990; Grizzel, McGowan, Smith, & Beechie, 2000). Past research has found that most LWD originates within approximately 30 m (98 ft) of a watercourse (Murphy & Koski, 1989; McDade et.al., 1990; Van Sickle & Gregory, 1990). In 90 percent of the 51 streams surveyed in British Columbia, 90 percent of the LWD at a site originated within 18 m (59 ft) of the channel (Johnston et.al., 2011). May and Gresswell (2003) found that wood was recruited from distances farther from the stream channel in small, steep channels (80% from 50 m (164 ft) from the channel), compared to broad alluvial channels (80 percent from 30 m (98 ft) from the channel) because of the significance of hillslope recruitment in narrow valleys.

The likelihood of downstream transport of LWD is dependent on the length of wood relative to bankfull width of the stream (Lienkaemper & Swanson, 1986). Wood that is shorter than the average bankfull width is transported more readily downstream compared to wood that is longer than the bankfull width (Lienkaemper & Swanson, 1986). Therefore, large wood is rarely transported downstream from small channels less than 5 m (16 ft) in width (May & Gresswell, 2003).

Beaver dams incorporate both small and large wood, and serve to slow water, retain sediment, and create pools and off-channel ponds used by rearing coho salmon and cutthroat trout (Naiman et al. 1988, Pollock et al. 2004). The removal of these structures throughout history has been linked to a significant reduction in coho salmon summer and winter rearing habitat in the nearby Stillaguamish River (Pollock et al. 2004). In Washington House Bill 2349, the Washington legislature states that "*beavers have historically played a significant role in maintaining the health of watersheds in the Pacific Northwest and act as key agents in riparian ecology.*" They continue with "*The benefits of active beaver populations include reduced stream sedimentation, stream temperature moderation, higher dissolved*

oxygen levels, overall improved water quality, increased natural water storage capabilities within watersheds, and reduced stream velocities. These benefits improve and create habitat for many other species, including endangered salmon, river otters, sandhill cranes, trumpeter swans, and other riparian and aquatic species." These statements indicate the policy support of beaver conservation and consistent with scientific evidence and recognize that beavers play an important role in stream ecosystems. Relocations and introductions to stream ecosystems can be beneficial wildlife management practices. Conditions for wild beaver release are provided in RCW 77.32.585. Related to this legislation, WDFW has instigated a beaver relocation program.

SHADE,TEMPERATURE, AND MICROCLIMATE

Riparian vegetation influences stream temperatures and microclimate conditions such as air temperature, wind, light, and moisture. Factors affecting water temperature and microclimate include shade, orientation, relative humidity, ambient air temperature, wind, channel dimensions, groundwater, hyporheic exchange rates, and overhead cover (Quinn et al. 2020).

Salmon and other native freshwater fish require cool waters for migrating, rearing, spawning, incubation, and emergence, with summer maximum temperature recommendations ranging from 55-68°F (EPA 2003). Thermal tolerances differ by species; salmonids here been studied frequently due to their cultural and economic importances, relative sensitivity to high temperatures, and narrow thermal tolerance (Quinn et al. 2020). Amphibians also have narrow thermal tolerances, and they are particularly sensitive to changes in microclimate conditions (Bury 2008). Several studies have documented significant increases in maximum stream temperatures associated with the removal of riparian vegetation (Beschta et al. 1987; Murray et al. 2000, Moore et al. 2005, Gomi et al. 2006). Considering the correlation between riparian vegetation and stream temperature, loss of vegetation presents a risk to the affected fish species. The importance of riparian vegetation in maintaining viable stream temperatures is clear in the literature (Quinn et al. 2020).

A number of studies have considered the extent to which various riparian zone widths modulate stream temperature. In headwater streams in British Columbia, 10 m (33 ft) riparian zones generally minimized effects to stream temperature from timber harvest, although maximum daily temperatures reached 3.6°F higher than control streams (Gomi, Moore, & Dhakal, 2006). A comparative study of 40 small streams in the Olympic Peninsula found that mean daily maximum temperatures were 2.4°C higher in logged compared to unlogged watersheds, and that logged watersheds had greater diurnal fluctuations in water temperatures (Pollock et.al., 2004). Another study of streams in Washington found that stream temperatures were most closely correlated with vegetation parameters associated with the riparian area, such as total leaf area and tree height, and that the effect of buffer width was less significant, particularly for buffers larger than 30 m (98 ft) (Sridhar et.al., 2007). These findings are consistent with an earlier study relating angular canopy density, a proxy for shading, to riparian buffer width; which found that the correlation between shade and riparian buffer width increases up to around 30 m (98 ft) (Beschta, 1987). Therefore, for buffers less than 30 m (98 ft), buffer width is expected to be more closely related to shading and stream temperatures than buffers over 30 m (98 ft).

Riparian microclimate affects many ecological processes and functions, including plant growth, decomposition, nutrient cycling, succession, productivity, migration and dispersal of flying insects, soil microbe activity, and fish and amphibian habitat (Brosofske et.al., 1997). Riparian buffers necessary to maintain forest microclimate are controlled by edge effects, which tend to extend well into forested areas adjacent to clearings. However, riparian buffers ranging from 10-45 meters in width may minimize microclimate effects related to light, soil, and air temperatures. A study of small streams in Western Washington indicated that buffers greater than 45 m (147 ft) wide are generally sufficient to protect riparian microclimate in streams (Brosofske et.al, 1997).

STREAM MITGRATION AND BANK STABILITY

Streams migrate naturally which often results in complex natural geomorphology, floodplains, and heterogeneous ecosystems. One consequence is the erosive power of streams which threaten human infrastructure. Bank stability is influenced by factors such as bank material, hydraulic forces, and vegetation (Ott, 2000). Riparian vegetation improves bank stabilization through root networks which encapsulate and anchor soil particles and rocks, thereby reducing soil movement. Vegetation also reduces the quantity of surface water runoff through rainwater capture and evapotranspiration. The effectiveness of bank stabilization is also dependent on the type of vegetation present. For example, woody vegetation tends to provide greater bank stability than herbaceous vegetation because woody vegetation has larger and firmer roots that extend deeper into the streambank (Wynn & Mostaghimi, 2007).

Bank stability is lower in urban watersheds because factors such as vegetation composition and hydraulic forces are degraded. The width of vegetated riparian buffers improves bank stability up to a distance of approximately 80 to 100 feet, after which diminishing returns limit marginal benefits (Castelle, Johnson, & Conolly, 1994)

Riparian Influence on Water Quality

Water quality is characterized by several physical, chemical, and biological factors, including temperature, suspended sediment, nutrients, metals, pathogens, and other pollutants. These water quality parameters are influenced by riparian areas, and other terrestrial environments which control shade and runoff.

Conversion of natural environments to developed sites often results in a reduction of infiltration and an increase in surface flows, resulting in sediment and contaminants to be transported more directly to receiving bodies, bypassing natural soil filtration and flow attenuation processes. Consequentially, urban areas tend to contribute a disproportionate amount of sediment and contaminants to receiving waters (Sorrano et al. 1996). Heavy metals, bacterial pathogens, as well as PCBs, hydrocarbons, and endocrine-disrupting chemicals are aquatic contaminants that are commonly associated with urban and agricultural land uses.

The full suite of sublethal and indirect effects of urban contaminants and combinations of contaminants on aquatic organisms is under study. Likely some contaminants with potentially severe repercussions for fish and wildlife have yet to be identified. For example, research in the Puget Sound region had identified mature coho salmon that return to urban creeks and die before spawning, a condition called pre-spawn mortality (Feist et al. 2011, Sholz et al. 2011). After a prolonged investigation, the specific cause of the condition has been recently attributed to 6PPD-quinone, a breakdown product of tire wear (Tian et al., 2020). Coho pre-spawn mortality is also positively correlated with the relative proportion of roads, impervious surfaces, and commercial land cover within a basin (Feist et al. 2011

Sediment

Sediment input to streams is supplied by bed and bank erosion, landslides, and upland erosion processes. These processes occur naturally but are acutely associated with and accelerated by forest practices and development activities. Other contaminants, including heavy metals and phosphorus, readily bond to suspended clay particles, and these contaminants are often transported with fine sediment in stormwater.

Excess inputs of fine sediments (e.g., silt and clay particles) into stream channels reduce habitat quality for certain species of fish, amphibians, and macroinvertebrates. Fine sediment adversely affects stream habitat by filling pools, embedding gravels, reducing gravel permeability, and increasing turbidity. In salmon-bearing streams, fine sediment fills interstitial spaces in redds, reducing the flow of oxygenated water to developing embryos and reducing egg-to-fry survival (Jensen et al. 2009). For example, highly turbid water can impair fertilization success in spawning salmonids and interfere with the respiration and reproduction amphibians (Galbraith et al. 2006; Knutson et al. 2004). Fine sediments that settle out of the water column can smother gravel and cobble streambeds that are essential habitat for salmonid spawning and for benthic macroinvertebrates.

Excessive sediment loads can significantly degrade water quality. Additionally, sediments tend to serve as a transport mechanism for other pollutants, carrying attached contaminants from upland sources to the stream channel. Suspended sediment can also cause gill abrasion in fish and interfere with foraging and predator avoidance (Quinn et al. 2020).

Vegetated riparian zones help stabilize stream banks by slowing and filtering overland flow, and temporarily storing sediment that is gradually released to both seasonal and perennial streams. Sediment filtration is also high within intermittent and ephemeral streams, presumably because of the high interface with vegetative structures and the flux in water surface elevation, which allows for sediment storage along the streambanks (Dietrich and Anderson 1998).

Upland clearing and grading can result in long-term increases in fine sediment inputs to streams (Gomi et al. 2005, Jackson et al. 2007). Numerous studies have investigated the effectiveness of varying widths of buffers at filtering sediment. These studies have typically found high sediment filtration rates in

relatively narrow buffer areas without a significant improvement in sediment retention beyond 15 meters (Abu-Zreigh et al. 2004; Parkyn 2004; Sheridan et al. 1999; Wenger 1999; Yuan et al. 2009).

However, field plot experiments tend to have much shorter field lengths (e.g., hillslope length contributing to drainage) than would be encountered in real-world scenarios (i.e., ~5:1 ratio of field length to riparian width for a field plot compared to 70:1 ratio in NRCS guidelines). Since water velocities tend to increase with field length, field plot experiments may suggest better filtration than would be encountered under real-world conditions. Additionally, field-scale experiments generally do not account for flow convergence, which reduces sediment retention or for stormwater components that bypass filter strips through ditches, stormwater infrastructure, and roads (Helmers et al. 2005; Verstraeten et al. 2006). Therefore, the effectiveness of filter strips at filtering sediment under real world conditions and at the catchment scale is likely to be lower than what is reported in field plot experiments.

Additionally, studies on sediment retention in riparian zones are often based on a single storm event, rather than accounting for sediment accumulation over time. Two of the reviewed studies used Cesium-137 to track the location of sediment deposition over many years (Wenger 1999). The findings of these studies suggest that riparian zones from 30-100 m (98-328 ft) or more may be necessary to provide long-term sediment retention and that studies of short-term sediment retention underestimate the riparian zone width needed for ongoing sediment filtration (Wenger 1999).

In addition to riparian zone width, the slope, vegetation density, and sediment composition of a riparian area have a significant bearing on sediment filtration potential (Jin and Romkens 2001). A recent model of sediment retention in riparian zones found that a grass riparian zone as small as 4 m (13 ft) could trap up to 100% of sediment under specific conditions (i.e., 2% hillslope over fine sandy loam soil), whereas a 30 m (98 ft) grass riparian zone would retain less than 30% of sediment over silty clay loam soil on a 10% hillslope (Dosskey et al. 2008) (Figure 4). This study demonstrates the effects that soil type and hillslope have on sediment retention.

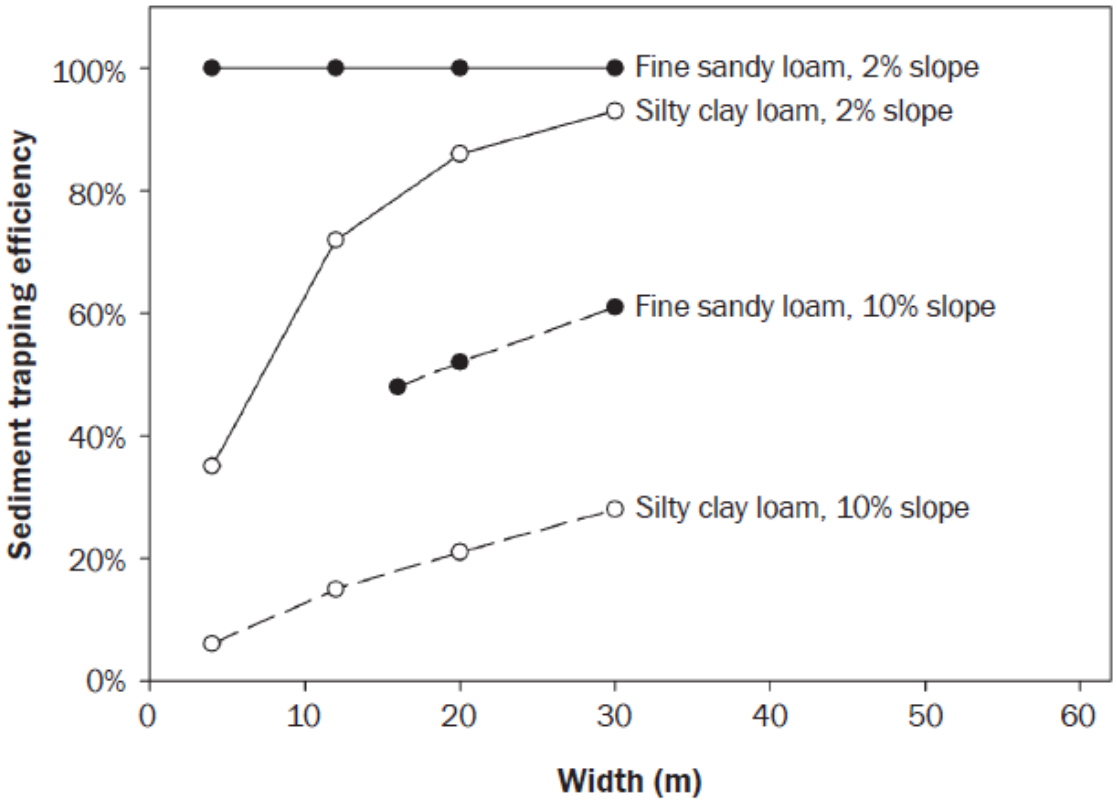

Figure 4. Sediment trapping efficiency related to soil type, slope, and buffer width. From Dosskey et al. (2008).

Multiple studies have found that larger particles tend to settle out within the first 3-6 m (10-20 ft) of the riparian zone, but finer particles that tend to degrade instream habitat, such as silt and clay, need a larger riparian zone, ranging from 15-120 m (49-394 ft), for significant retention (Parkyn, 2004).

Vegetative composition within the buffer also affects sediment retention. Vegetation tends to become more effective at sediment and nutrient filtration several years after establishment for both grass and forested buffers (Dosskey et al. 2007). Thin-stemmed grasses may become overwhelmed by overland flow while dense, rigid-stemmed vegetation provides improved sediment filtration that is expected to continue to function better over successive storm events (Yuan et al., 2009).

Nutrients

Established vegetation in a dense composition can provide effective sediment and nutrient filtration (Dosskey et al. 2007). Riparian zones can also reduce nitrogen pollution through nutrient uptake, assimilation by vegetation, and denitrification (Sobota et al. 2012). In excess concentrations, nitrogen and phosphorus can lead to poor water quality conditions, including reduced dissolved oxygen rates, increased pH, and eutrophication (Mayer et al. 2005, Mayer et al. 2007). Excessive amounts of nitrogen

and phosphorus speed up eutrophication and algal blooms in receiving waters, which can deplete the dissolved oxygen in the water and result in poor water quality and fish kills (Mayer et al. 2005).

Riparian zones can reduce nitrogen pollution through nutrient uptake, assimilation by vegetation, and through denitrification (Sobota et al. 2012). The rate of nitrogen removal from runoff varies considerably depending on local conditions, including soil composition, surface versus subsurface flow, riparian zone width, riparian composition, and climate factors (Mayer et al. 2005, Bernal et al. 2007, Mayer et al. 2007). Nutrient assimilation is also dependent on the location of vegetation relative to the nitrogen source, the flowpath of surface runoff, and position in the landscape (Baker et al. 2006).

Nutrients enter waterways through channelized runoff, groundwater flow, and overland flow. Nitrogen loading is often associated with agricultural activities, whereas low density residential development has been found to result in nitrate levels comparable to a forested basin (Poor and McDonnell 2007).

Mayer et al. (2005, 2007) found that there was little relationship between riparian zone width and removal of *subsurface* nitrates. Subsurface nitrates were removed effectively regardless of riparian zone width. Conversely, nitrate removal from *surface* runoff *is* related to riparian zone width, and 50%, 75%, and 90% of surface nitrate removal was measured at widths of 27 m (88 ft), 81 m (266 ft), and 131 m (430 ft) respectively (Mayer et al. 2007). This suggests that surface water infiltration in the riparian zone should be a priority to promote effective nutrient filtration. Where soils are poorly drained and infiltration capacity is limited, the effectiveness of nutrient removal in riparian buffers may also be limited (Wigington et al 2003).

The size and species composition of the riparian zone buffer also affects the efficiency of nutrient removal, but studies are conflicting as to whether grass, wetland, herbaceous, or forested buffers are most effective at removing nutrients (Polykov 2005). Where nitrogen-fixing species predominate, such as red alder, these buffers tend to have higher soil nitrate concentrations (Monohan 2004).

Removal of phosphorus in surface runoff by riparian buffers is dependent on the form of phosphorus entering the buffer. Whereas phosphorus that is adsorbed by soil particles is effectively removed through sediment retention within a buffer, the retention of soluble phosphorus relies on infiltration and uptake by plants (Polyakov et al. 2005). One long-term study found that phosphorus uptake was directly proportional to the plant biomass production and root area over the four-year study period (Kelly et al. 2007). If a riparian buffer becomes saturated with phosphorus, its capacity for soluble phosphorus removal will be more limited (Polyakov et al. 2005). Another long-term study found that following a 15-year establishment period, a 40-meter (131 ft) wide, three-zoned buffer reduced particulate phosphorus by 22 percent, but dissolved phosphorus exiting the buffer was 26 percent higher than the water entering the buffer, so the buffer resulted in no net effect on phosphorus (Newbold et al. 2010).

In summary, most riparian zones reduce subsurface nutrient loading, but extensive distances are needed to reduce nutrients in surface runoff. Filtration capacity decreases with increasing loads (Mayer

et al. 2005), so best management practices across the landscape that reduce nutrient loading will reduce the amount of nutrients which enter streams and other surface waters.

Metals

Although most metals can be toxic at high concentrations, cadmium, mercury, copper, zinc, and lead are particularly toxic even at low concentrations. Chronic and acute exposure to heavy metals have been found to impair, injure, and kill to aquatic plants, invertebrates, fish, and particularly salmonids (Grant and Ross 2002, Dethier 2006, Hecht et al. 2007, McIntyre et al. 2008, McIntyre et al. 2012). The toxicity of metals is influenced by a variety of factors including (Duffus et al 2002; Nagajyoti et al. 2010; Tchounwou et al. 2012; Wang & Rainbow 2008):

- Properties of the metal
- Duration, frequency, and concentration of exposure
- The form and bioavilability of the metal at the time of exposure
- Environmental conditions including water chemistry and physical properties such as pH, temparature, and salinity
- Synergistic, additive, or antagonistic interactions of co-occurring contaminants
- Species sensitivity
- Life stage
- Physiological ability to detoxify and/or excrete the metal and,
- The condition of the exposed organism.

Metals are typically transported to the aquatic environment through fossil fuel combustion, industrial emissions, municipal wastewater discharge, and surface runoff (ESV Environment Consultants 2003). In general, heavy metals and hydrocarbons (e.g., leaked motor oil, polycyclic aromatic hydrocarbons) are found in road runoff, and these contaminants can reach the County's streams directly through existing stormwater systems. Stormwater systems that circumvent buffers limit the opportunity to filter runoff through adjoining soils and vegetation. Accordingly, stream buffers are typically underutilized for treatment of metals, hydrocarbons, and other pollutants found in typical stormwater runoff.

Copper brake pad dust has also been linked to chronically depressed Chinook salmon populations (U.S. EPA 2007). The U.S. EPA is working to reduce the use of copper and other heavy metals in motor vehicle brake pads through the *Copper-Free Brake Initiative* (U.S. EPA 2015a).

Pathogens

Waterborne pathogens associated with human and animal wastes are a concern for direct and indirect human exposure. Fecal coliform bacteria, specifically E. coli, is typically used as an indicator of the possible or presumed presence of a suite of bacterial and viral pathogens. Fecal pollution tends to be positively correlated with human population densities and impervious surface coverage (Glasoe and Christy 2004). The main sources of fecal pollutants include municipal sewage systems, on-site sewage systems, stormwater runoff, marinas and boaters, farm animals, pets, and wildlife (Glasoe and Christy 2004). As municipal wastewater systems have improved treatment quality and capacity in recent years,

increasingly, non-point source pollution, including septic systems, stormwater, wildlife, and pets, is responsible for fecal contaminants in surface water (Glasoe and Christy 2004).

Herbicides and Pesticides

Commonly used herbicides, pesticides, and other pollutants may also affect aquatic communities, and the acute and chronic effects of these chemicals or combinations of chemicals are not always well understood. Additionally, effects documented in the laboratory may differ significantly from effects identified in a field setting (Relyea 2005, Thompson et al. 2004). The effects of these chemicals may be long-lasting, as has been observed for legacy pollutants such as polychlorinated biphenyls (PCBs) and polycyclic aromatic hydrocarbons (PAHs) in salmon, seabirds, and marine mammals in Puget Sound (Calambokidis et al. 1984, Ross et al. 2000, Wahl and Tweit 2000, Grant and Ross 2002, O'Neill et al. 2009).

Herbicides and pesticides may reach aquatic systems through a number of pathways, including surface runoff, erosion, subsurface drains, groundwater leaching, and spray drift. Narrow hedgerows have been found to limit 82-97 percent of the aerial drift of pesticides adjacent to a stream (Lazzaro et al. 2008). In runoff, herbicide retention in a buffer is dependent on the percentage of runoff that infiltrates the soil (Misra et al. 1996). A study of herbicides in simulated runoff found that 6-meter-wide vegetated buffers were sufficient to remove 100% of the tested herbicides (Otto et al. 2008). A meta-analysis found that filtration effectiveness increased logarithmically from 0.5 m to an asymptote at approximately 18 m (Zhang et al. 2010). In summary, relatively narrow vegetated buffers may be effective in limiting herbicides and pesticides from reaching aquatic habitats in surface runoff, erosion, and spray drift; however, and these processes are best managed through the use of best management practices in herbicide and pesticide applications to avoid contaminating groundwater (Reichenberger et al. 2007).

Pharmaceuticals

Pharmaceuticals are another class of contaminants which have been demonstrated to have negative impacts on the health of humans and aquatic organisms. There are a wide range of pharmaceutical compounds and toxicological research is variable, with many that are poorly understood. Many commonly used pharmaceuticals are found in wastewater, particularly around more urban areas (Long et al. 2013). Many common pharmaceuticals have endocrine-disrupting properties, which can affect fertility and development in non-target aquatic species (Caliman and Gavrilescu 2009). The existing and potential population-scale effects of these chemicals in the environment are not yet well-understood (Mills and Chichester 2005, Caliman and Gavrilescu 2009).

FISH AND WILDLIFE HABITAT

The primary function of FWHCAs is the role they provide as habitat for fish and wildlife. All of the functions and processes listed above relate to habitat, and this section provides additional information on ecosystems, communities, and wildlife species. Habitat is the physical place an organism occupies at any stage of its life history for a particular species. Since species have evolved and adapted to the environmental conditions within their historic range, such baseline conditions can be used to

determine types of suitable habitat. Associated habitat selection research is also conducted to refine the types of habitat preferred by a species at multiple spatial scales. The historic range of variability (HRV) is a useful metric of baseline conditions because environments change over time, particularly in response to disturbances processes and temporal shifts (Morgan et al. 1994).

The emergence of urbanization and other human development has had a profound effect on wildlife and their ecosystems, altering behavior, population dynamics and demographics, community composition, and may result in extirpations or extinctions of entire species (Gaston 2010). These impacts are largely driven by habitat loss, degradation, and fragmentation; processes that constrict habitats to smaller and smaller patches until a species can no longer persist (Wiegand et al. 2005; Young et al. 2016). The effects of urbanization on wildlife are also exacerbated by direct harvest, invasive species, pollution, and climate change which contribute to defaunation at a global scale (Young et al. 2016). Habitat loss and fragmentation are significant drivers in biodiversity loss. As described by MacArthur and Wilson (1967), the species area relationship posits that biodiversity is lower in smaller habitat patches. As land is developed, continuous tracts of native habitat are reduced to patches, which become progressively smaller and more isolated. This is compounded by fragmentation by roads, fences, buildings, and other infrastructures which restricts interpatch movements and migrations (Wiegand et al. 2005). Ecological impacts of development are often overlooked and landscape-scale changes, particularly habitat fragmentation, alter the structure and function of those ecosystems (Dale et al. 2000).

Clallam County contains ecosystems which range from alpine mountain peaks to marine waters of the Pacific Ocean and Strait of Juan de Fuca. Most of the land in Clallam County was historically forestlands at low to middle elevations, and alpine shrublands, grasslands, and parklands in the higher peaks of the Olympic Mountains (Johnson & O'Neil 2001). Marine environments, aquatic areas, and wetlands are also abundant within Clallam County (Johnson & O'Neil 2001). Each ecosystem is host to a variety of wildlife species, and the range and ecological niche of individual species may overlap several ecosystem types.

Habitat features at a local scale or micro scale are also important to patterns of habitat use by wildlife. For example, woodpeckers rely on decadent wood for foraging and nesting, and marbled murrelets require specific types of nesting platforms. Since there are innumerable wildlife species, each with specific habitat requirements, further decision relates to habitat elements common to a wide range of taxa.

Habitat composition at the local level is influential at predicting species richness and abundance. The diversity of physical and biological habitat elements in a particular area, also known as heterogeneity, is associated with species richness due to offering greater overlap in niche requirements (Callaghan et al. 2019; Parker et al. 2014). Heterogeneity can be evaluated through multiple spatial scales, and through a range of potential environmental metrics such as species richness, plant community composition, community interspersion, physical and vegetation structure, amount of edge, etc. Other local scale factors associated with species richness include patch area, habitat richness, level of management, herb,

shrub, and tree density, cover, and structure, vegetation species richness, microclimate, bare soils, and edge effects (Beninde et al. 2015).

Certain habitat types, or microhabitats have been identified by WDFW as priority habitats which are present in Clallam County. In addition to aquatic and riparian habitats discussed previously, these include biodiversity areas and corridors, herbaceous balds, old-growth/mature forests, Oregon white oak woodlands, westside prairie, caves, cliffs, talus, and snags and logs. These specific habitats are recognized for either their role as biodiversity hotspots, or because they are habitat elements critical for individual species, or groups of species.

Aquatic ecosystems, including streams, lakes, and wetlands provide habitat for a broad range of fauna including invertebrates, reptiles and amphibians, anadromous and resident fish, birds, and mammals. For example, wetlands with surface connections to salmon-bearing streams provide backwater refuge for anadromous fish when ponded water at least 18 inches deep, low flow conditions are present, and overhanging or submerged plants provide adequate cover (Sheldon et al. 2005). Aquatic invertebrates that depend on stream and wetland ecosystems are important to aquatic trophic systems or food webs (Rosenberg & Danks 1987; Sheldon et al. 2005; Wissinger 1999). Native frogs and salamanders require wetlands for breeding. Buffer conditions, habitat interspersion, wetland hydroperiod, and emergent plants are all important factors that impact amphibian richness and abundance (Sheldon et al. 2005). Waterfowl rely upon riparian ecosystems for all or part of their life cycle (Kauffman et al. 2001; Sheldon 2005). The suitability of habitat for birds is dependent on buffer condition and width, the presence of snags or other perches, corridor connections, open water, and forest canopy cover (Sheldon et al. 2005). Water-associated mammals such as beaver and muskrat also seek out well-buffered vegetated corridors, interspersed habitats with open water, and a seasonally stable water level (Sheldon et al. 2005). According to a Washington Department of Fish and Wildlife (WDFW) management recommendation plan conducted by Knutson and Naef (1997) a predominance of terrestrial vertebrate species in Washington are dependent on streams and riparian areas, including wetlands. Semlitsch and Bodie (2003) found that upland areas surrounding wetlands are core habitats for many semi-aquatic species, such as amphibians and reptiles.

Ecological resources of these aquatic areas support high levels of species diversity and abundance since they are generally structurally complex, maintain connectivity to other ecosystems, have plentiful sources of food and water, and a moist moderate microclimate (Knutson and Naef 1997). Riparian and wetland ecosystems also support a diverse range of native plant species. Wetland characteristics that are correlated with plant richness are the hydroperiod, duration of flooding, and variation in water depths (Schueler 2000; Sheldon et al. 2005).

The performance of stream and wetland habitat functions is affected to varying degrees by the width and composition of the surrounding buffers. Disturbance vectors include but are not limited to habitat loss, habitat modification, noise, light, physical intrusion by equipment, people, pets, air and water pollution, and garbage. Each of these can result in one or more of the following: disruption of essential wildlife activities, damage to native vegetation and invasion of non-native species, erosion, or fill, among others.

Cumulative impacts of direct and indirect riparian ecosystem alterations, including hydrologic changes, compromised water quality, and habitat fragmentation tend to reduce the habitat functions and values of wetlands and riparian areas (Azous & Horner 2010; Sheldon et al. 2005).

6.2.2 State & Federal designated Endangered, Threatened, or Sensitive Species

WDFW lists priority habitats and species (PHS) by county. Table 1 includes a summary of the Clallam County PHS list. As WDFW notes, habitats and species can change over time as distributions expand or contract. Clallam County includes habitat types that are known to be used or could potentially be used by bird and mammal species of interest, including those species with state or federal status and WDFW priority species.

Table 1. Clallam County priority species list (source: WDFW).

	Species/ Habitats	State Status	Federal Status
Habitats	Biodiversity Areas & Corridors		
	Herbaceous Balds		
	Old-Growth/Mature Forest		
	Oregon White Oak Woodlands		
	West Side Prairie		
	Riparian		
	Freshwater Wetlands & Fresh Deepwater		
	Instream		
	Open Coast Nearshore		
	Coastal Nearshore		
	Puget Sound Nearshore		
	Caves		
	Cliffs		
	Snags and Logs		
	Talus		
Fishes	Pacific Lamprey		
	River Lamprey	Candidate	
	Green Sturgeon		Threatened
	White Sturgeon		
	Olympic Mudminnow	Sensitive	
	Pacific Herring		
	Eulachon		Threatened
	Longfin Smelt		
	Surfsmelt		
	Bull Trout/ Dolly Varden	Candidate	Threatened
	Chinook Salmon		Threatened (Upper Columbia Spring run

	Species/ Habitats	State Status	Federal Status
	is Endangered)"		
	Chum Salmon		Threatened
	Coastal Res./ Searun Cutthroat		
	Coho Salmon		Threatened – Lower Columbia
	Kokanee		
	Pink Salmon		
	Pygmy Whitefish	Sensitive	
	Rainbow Trout/ Steelhead/ Inland Redband Trout	Candidate	Threatened
	Sockeye Salmon		Threatened – Ozette Lake
	Endangered – Snake River"		
	Pacific Cod		
	Pacific Hake		
	Walleye Pollock		
	Black Rockfish		
	Bocaccio Rockfish		Endangered
	Brown Rockfish		
	Canary Rockfish		Threatened
	China Rockfish		
	Copper Rockfish		
	Greenstriped Rockfish		
	Quillback Rockfish		
	Redstripe Rockfish		
	Tiger Rockfish		
	Widow Rockfish		
	Yelloweye Rockfish		Threatened
	Yellowtail Rockfish		
	Lingcod		
	Pacific Sand Lance		
	English Sole		
	Rock Sole		
Reptiles	Northwestern Pond Turtle	Endangered	
Amphibians	Van Dyke's Salamander	Candidate	
	Western Toad	Candidate	
Birds	Brown Pelican		
	Cassin's Auklet	Candidate	
	Common Loon	Sensitive	
	Marbled Murrelet	Endangered	Threatened
	Short-tailed Albatross	Candidate	Endangered
	Tufted Puffin	Endangered	
	Western grebe	Candidate	

	Species/ Habitats	State Status	Federal Status
	W WA nonbreeding concentrations of: Loons, Grebes, Cormorants, Fulmar, Shearwaters, Storm-petrels, Alcids		
	W WA breeding concentrations of: Cormorants, Storm-petrels, Terns, Alcids		
	Great Blue Heron		
	Western High Arctic Brant		
	Cavity-nesting ducks: Wood Duck, Barrow's Goldeneye, Common Goldeneye, Bufflehead, Hooded Merganser		
	Harlequin Duck		
	Waterfowl Concentrations		
	Golden Eagle	Candidate	
	Northern Goshawk	Candidate	
	Sooty Grouse		
	W WA nonbreeding concentrations of: Charadriidae, Scolopacidae, Phalaropodidae		
	Band-tailed Pigeon		
	Northern Spotted Owl	Endangered	Threatened
	Vaux's Swift		
	Oregon Vesper Sparrow	Endangered	
Mammals	Dall's Porpoise		
	Blue Whale	Endangered	Endangered
	Humpback Whale	Endangered	Endangered
	Gray Whale	Sensitive	Endangered
	Sperm Whale	Endangered	Endangered
	Harbor Seal		
	Orca (Killer Whale)	Endangered	Endangered
	Harbor Porpoise	Candidate	
	Northern Sea Otter	Threatened	
	California Sea Lion		
	Steller Sea Lion		
	Roosting Concentrations of: Big-brown Bat, Myotis bats, Pallid Bat		
	Townsend's Big-eared Bat	Candidate	
	Keen's Myotis	Candidate	
	Olympic Marmot	Candidate	
	Fisher	Endangered	
	Marten		
	Columbian Black-tailed Deer		
	Mountain Goat		
	Elk		
Invertebrates	Pinto (Northern) Abalone	Endangered	
	Pacific Geoduck		

	Species/ Habitats	State Status	Federal Status
	Butter Clam		
	Native Littleneck Clam		
	Manila (Japanese) Littleneck Clam		
	Olympia Oyster	Candidate	
	Pacific Oyster		
	Pacific Razor Clam		
	Dungeness Crab		
	Pandalid shrimp (Pandalidae)		
	Beller's Ground Beetle	Candidate	
	Hatch's Click Betle	Candidate	
	Western Bumble Bee	Candidate	Candidate
	Johnson's Hairstreak	Candidate	
	Makah Copper	Candidate	
	Puget Blue	Candidate	
	Sand-verbena Moth	Candidate	
	Valley Silverspot	Candidate	
	Taylor's Checkerspot	Endangered	Endangered
	Red Sea Urchin		

6.3 Key Protection Strategies

6.3.1 Streams, Lakes[13] and Ponds, and Riparian Areas

STREAM CLASSIFICATION

Aquatic areas are classified so that they can be managed and regulated based on their characteristics, fish use, and functions. Characteristics common to water typing systems are flow volume, fish use and accessibility, seasonality, and presence of salmonids. The DNR is encouraging all jurisdictions within the State to adopt the permanent water typing system upon completion of fish habitat water type mapping. The permanent system provides for four stream classes, Type S (Waters of the State), Type F (fish habitat present), Type Np (non-fish habitat stream with perennial flow), and Ns (non-fish habitat stream with seasonal flow). The water typing system is detailed in WAC 222-16-030.

[13] Lakes that exceed 20-acres are regulated separately under the Shoreline Master Program, therefore discussed BAS is focused on lakes smaller than this threshold.

RIPARIAN MANAGEMENT ZONES

In 2020, the Washington Department of Fish and Wildlife developed BAS guidance for the protection of riparian areas (Rentz et al. 2020). The guidance emphasizes a shift in terminology and framework from the concept of "*stream buffers*" to "*riparian management zones*" (RMZs). A RMZ is defined as "*…a scientifically based description of the area adjacent to rivers and streams that has the potential to provide full function based on the SPTH [site potential tree height] conceptual framework*." Further, a RMZ is recommended to be regulated as a fish and wildlife habitat conservation area itself to protect its fundamental value, rather than as a buffer for rivers and streams (Rentz et al. 2020). Stream buffers are established in local critical areas ordinances based on best available science and are intended to protect streams but may or may not provide full riparian function or a close approximation of it. To achieve full riparian function, the guidance recommends that RMZs be considered a delineable, regulatory critical area and that the guidance be applied to all streams and rivers, regardless of size and type.

Washington Department of Fish and Wildlife's current recommendations for establishing RMZ widths are based primarily on a site potential tree height (SPTH) framework. The SPTH is defined as "*…the average maximum height of the tallest dominant[14] trees (200 years or more) for a given site class.*" Exceptions may occur where SPTH is less than 100 feet, in which case the agency recommends assigning a RMZ width of 100 feet at a minimum to provide adequate biofiltration and infiltration of runoff for water quality protection from most pollutants, but also in consideration of other habitat-related factors including shade and wood recruitment. A 100-foot-wide buffer is estimated to achieve 95% pollution removal and approximately 85% surface nitrogen (Rentz et al. 2020). Washington Department of Fish and Wildlife recommends measuring RMZ widths from the outer edge of the channel migration zone (CMZ), where present, or from the ordinary high water mark where a CMZ is not present.

To apply their methodology, Washington Department of Fish and Wildlife has developed a web-based mapping tool for use in determining SPTH based on the 200-year site index. Modeled SPTH range from 75-231 feet. Where SPTH is 100 feet or more, the agency recommends RMZ establishment within one SPTH, driven by the largest dominant tree species at any location. Acknowledging that establishing functional RMZs using the recommended methods may not be practical in many developed areas, Washington Department of Fish and Wildlife recommends effective watershed management, preservation, and protection, resulting in nearly full restoration of riparian ecosystem habitat functions as is feasible within existing constraints. Washington Department of Fish and Wildlife RMZ establishment and management recommendations are detailed in their *Riparian Ecosystems, Volume 2: Management Recommendations* document (Rentz et al. 2020). Examples of watershed-scale approaches include considering stormwater management adjacent to pollution generating impervious surface areas and prioritizing impassable culverts on fish-bearing streams.

[14] Dominant trees are those which extend above the normal level of the forest canopy.

A graphical representation of the Forest Ecosystem Management Assessment Team (FEMAT) Curves are shown in Figure 5, which are considered in WDFW's recommendations for establishing the dimensions of RMZs (Rentz et al. 2020). The figure depicts the effectiveness of several functions based on buffer width from the edge of a stream. SPTH is a practical buffer dimension because it is large enough to protect nearly all riparian functions, and further increases yield diminishing returns.

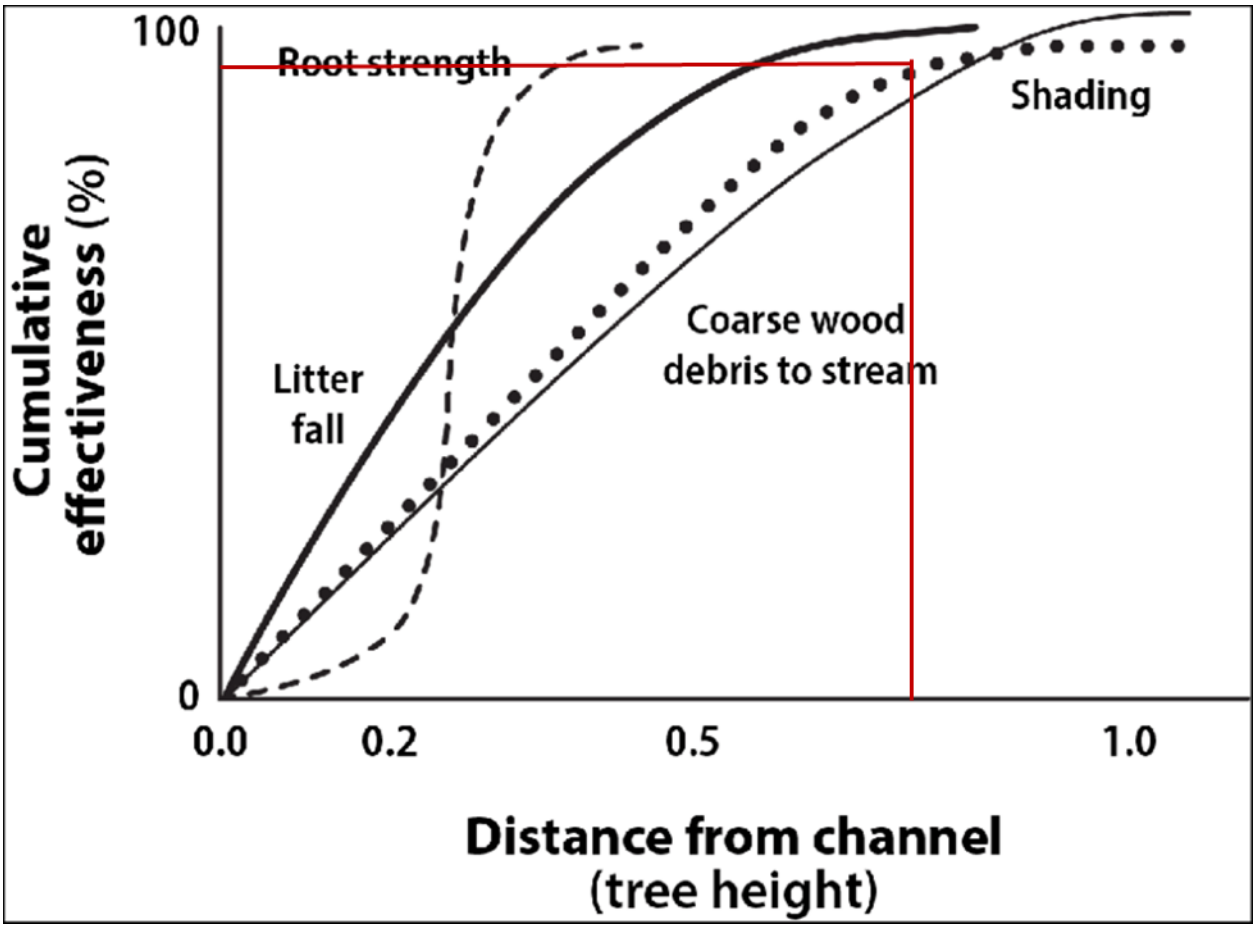

Figure 5. The "FEMAT Curves": a conceptual model of the contributions of key riparian ecosystem functions which influence aquatic ecosystems by distance and cumulative effectiveness. Tree height refers to the average relative height of the site potential tree height (reproduced from FEMAT 1993).

Many scientific studies that examine the functions and values associated with riparian areas have been conducted in forested environments. However, there are fundamental differences between forested, agricultural, and urban areas, including land use and hydrology. Riparian studies often do not account for the contribution of engineering and public works projects, such as surface-water detention facilities, which can supplement natural riparian function in urban settings.

BAS-based literature points to a range of recommended management measures and buffer considerations to help maintain habitat functions for fish and wildlife. Effective methods to reduce impacts from urbanization and manage associated runoff can include the following:

- Limiting development densities and impervious surface coverage;
- Limiting vegetation clearing and retaining forest cover;
- Concentrating impact activities, particularly roads and pollutant sources, away from watercourses;
- Limiting the total area of roads and requiring joint use of new access roads;
- Protecting vegetation and limiting development on or near hydrologic source areas;
- Maintaining densely vegetated riparian buffers with native trees, shrubs, and groundcover species;
- Low impact development (LID);
- Municipal stormwater treatment;
- Public education.

In an analysis of riparian zone ordinances, Wenger and Fowler (2000) support using approaches that allow some flexibility in how policies are implemented on a parcel scale. Whereas variable-width policies provide greater flexibility and adaptability to address site-specific conditions, it is noted that fixed buffer widths are more easily established, require a lesser degree of scientific knowledge to implement, and generally require less time and money to administer (Castelle, Johnson, & Conolly, 1994). Thus, although stream and riparian conservation measures should be based on the best available science, some level of policy interpretation must be made by a local jurisdiction.

If fixed-width buffers are implemented, buffers should be sufficiently wide to ensure that riparian buffers are effective under a range of variable conditions. The ranges of effective buffer widths (as outlined in each subsection) based on each function that were previously discussed are summarized below in Table 2.

Table 2. Range of Effective Buffer Widths for Each Applicable Riparian Function.

Function	Range of Effective Buffer Widths	Notes on Function
Water Quality		
Sediment	4-30 m (13-98 feet), up to 120 m (394 feet) for fine sediment	Filtration is widely variable depending on slope and soils.
Nutrients	Subsurface flow: not dependent on buffer width	In addition to buffer width, the rate of nutrient removal is dependent on infiltration, soil composition, and climate. Filtration capacity decreases with increasing loads, so best

Function	Range of Effective Buffer Widths	Notes on Function
	Surface flow: 15-131 m (49-430 feet)	management practices that reduce nutrient loading will improve riparian function.
Metals	NA- Appropriate buffer width not established	Stormwater system improvements to slow and infiltrate runoff could help reduce metals entering aquatic systems.
Pathogens	NA- Appropriate buffer width not established	Minimizing the density of septic systems, maximizing the distance of septic systems from aquatic resource areas, and promoting pet waste management will help limit the transport of pathogens to aquatic systems.
Herbicides	6-18 m (20-59 feet)	Best management practices during application of herbicides and pesticides can help limit leeching to groundwater.
Pharmaceuticals	NA- Appropriate buffer width not established	Best management practices for disposal of pharmaceuticals may limit potential impacts.
Bank Stabilization	10-30 m (33-98 feet)	Beyond 98 feet from the stream, buffers have little effect on bank stability.
Stream Temperature	10-30 m (33-98 feet)	Leaf cover is more closely related to stream temperature than buffer width.
Microclimate	(10-45 m) 33-150 feet	Most microclimate changes occur within 10-45 m (33 to 150 feet) from the edge, but microclimate effects extend over 240 m (790 feet) from the forest edge.
Invertebrates and Detritus	30 m (98 feet)	Areas with 10 m (33 ft) buffers exhibit changes in invertebrate community composition.
Wildlife Habitat	100 to 600 feet	Minimum width for supporting habitat varies among taxa, guides, and species. Functions include both corridor (travel and migration) and support of lifecycle stages, including breeding.
In-stream Habitat (large woody debris – LWD)	18-50 m (59 to 164 feet)	Although most LWD is recruited from the area adjacent to the stream, tree-fall from beyond 1 SPTH may affect LWD loading.

To achieve improved water quality in the County's streams, small lakes, and ponds, riparian buffer areas should be utilized effectively to provide both biofiltration of stormwater runoff and protection from adjacent land uses. Both goals can be achieved by providing dense, well-rooted vegetated buffer areas.

Biofiltration swales, created wetlands, and infiltration opportunities for specific stormwater runoff discharges can be utilized to intercept runoff before it reaches stream channels. Stormwater runoff that is conveyed through stream buffers in pipes or ditch-like channels and discharged directly to stream channels "short circuits" or bypasses buffer areas and receives little water quality treatment via biofiltration. In areas where stormwater flows untreated through riparian buffer areas, the buffer is underutilized and is prevented from providing the intended or potential biofiltration function.

FEMA FLOODPLAIN HABITAT ASSESSMENTS

In 2008, the National Marine Fisheries Service (NMFS) issued a Biological Opinion under Section 7 of the Endangered Species Act (ESA), which found that the implementation of the National Flood Insurance Program (NFIP) in the Puget Sound region jeopardized the continued existence of federally threatened salmonids and resident killer whales. As a result, NMFS established Reasonable and Prudent Alternatives to ensure that development within the Special Flood Hazard Area (100-year floodplain), floodway, CMZ, and riparian buffer zone do not adversely affect water quality, flood volumes, flood velocities, spawning substrate, or floodplain refugia for listed salmonids. Because the NFIP is implemented by the Federal Emergency Management Agency (FEMA) through participation by local jurisdictions that adopt and enforce floodplain management ordinances, FEMA has delegated responsibility to the local jurisdictions to ensure that development does not adversely affect listed species. Projects within FEMA-designated floodplains are required to prepare habitat assessments to ascertain their potential effects on federally listed endangered species. In particular, floodplain storage volumes may not be decreased, nor base flood level elevations increased.

6.3.2 Endangered, Threatened, or Sensitive Species and Species of Local Importance

Effective BAS-based strategies can be applied to protect all Federal and State endangered or threatened species and WDFW-identified Priority Species and Habitats (PHS). Not all FWHCAs are water bodies or riparian areas associated with those water bodies. WDFW, USFWS, and NMFS provide information on species-specific management recommendations for certain species that can be used to guide management at the county level or site level. There is widely available information for high profile species, though many regulated species are poorly researched and lack specific management recommendations from state agencies. Where species-specific management recommendations are available from WDFW guidance documents, those should be followed or adapted to local regulations. Examples are Management Recommendations for Washington's Priority Species; Invertebrates (Larsen 2018); amphibians and reptiles (Larsen 1997); Birds (Larsen 2018); and mammals (WDFW 2010). General recommendations for management strategies to protect terrestrial habitat are listed below.

GENERAL TERRESTRIAL HABITAT MANAGEMENT RECOMMENDATIONS

- Existing high quality habitats should be retained because habitat loss is one of the most important factors influening biodiversity and loss of species (Beninde et al. 2015).

- Generally, plan development to minimize fragmentation of native habitat, particularly large, intact habitat areas. Where large forest stands exist, manage for forest-interior species and avoid fragmentation (Donnelly and Marzluff 2004, Diffendorfer et al. 1995, Mason et al. 2007, Orrock and Danielson 2005, Pardini et al. 2005 and others).
- Manage agricultural development to limit fragmentation and edge; preserve vegetative structural diversity whenever possible in agricultural areas by retaining hedge rows and areas of native vegetation (Southerland 1993).
- Protect priority habitats that have a primary association with an ESA-list species or species of local importance by continuing to regulate for adherence to WDFW management recommendations and other applicable regulatory requirements.
- Control invasive species where needed on a site- and species-specific basis. Address invasive species specifically addressed in areas where environmental conditions tend to promote infestation, including created edges, roadways, and riparian zones where they are contiguous with developed areas that may act as a seed source (Olden et al. 2004, Pimentel et al. 2005, McKinney 2002 and others).
- Maintain or provide habitat connectivity with vegetated corridors between habitat patches (Schaefer 2003, Clair 2008, Gilbert-Norton et al. 2010 and others).
- Protect, maintain, and promote habitat features such as snags and downed wood (Blewett and Marzluff 2005).
- Manage for an increase in native vegetative cover in landscaping and discourage lawns (Nelson and Nelson 2001).
- Plan habitat areas away from roads (Fahrig et al. 1995, Lehtinen et al. 1999).
- Promote buffers of adequate width to support wildlife guilds in adjacent habitat (Ficetola et al. 2008, Semlitsch and Bodie 2003, Crawford and Semlitsch 2007).
- Identify existing habitat patches and corridors and maintain connectivity with vegetated corridors to limit fragmentation and edge habitat (Gillies et al. 2008, Gilbert-Norton et al. 2010). Preserve habitat patches of at least moderate size 35 ha (86 ac) within developed areas (Kissling and Garton 2008).
- Promote restoration of FWHCAs, buffers, and other management zones through critical area regulations and public outreach. Encourage stewardship on a parcel by parcel and county-wide scale.

6.4 Climate Change Impacts & Mitigation

Climate change is predicted to result in significant and irreversible impacts to fish and wildlife, and their habitats. Global change is anticipated to result in habitat loss and modification through temperature changes, sea level rise, ocean acidification, extreme weather events, changes in precipitation, biological invasions, food web disruptions, and disease (Lyons et al. 2022; Nagelkerken 2023). The range of effects on fish and wildlife depend on species specific interactions and may include range shifts, phenological shifts, changes to morphology and behavior, biodiversity loss, and extinction (Sattar 2021). The cumulative impacts of these factors to wildlife are anticipated to result in loss of biodiversity and increases to extinction rates (Sattar 2021).

Changes in temperatures and seasonal precipitation patterns are projected to place additional stressors on FWHCAs. Some loss of riparian vegetation is anticipated due to the stresses of climate change, primarily warmer and drier summers. A reduction in riparian vegetation potentially triggers a cascading effect. A decrease in riparian vegetation would decrease shading, increase stream temperature, decrease detrital inputs, reduce available habitat structure, and reduce stream bank stability. Changes in seasonal hydrologic cycles may increase frequency and magnitude of flashy runoff events, mobilize greater volumes of sediments and pollutants into streams, and reduce groundwater recharge that supports base stream flows in summer. FWHCA functions and values, and instream habitats are particularly negatively impacted by excess sediment discharge and deposition.

Hot dry summers are projected to reduce stream flow volumes and increase instream temperatures. This stressor is compounded by extreme precipitation events, flooding, and erosion. All these stressors reduce instream habitat quality and stress salmonid populations, including Chinook salmon, the preferred food source for Orca whales. Global warming poses a threat to freshwater fish habitat (Crozier et al. 2008).

6.4.1 Strategies to manage climate change impacts to FWHCAs

The following actions or policies have been developed by the City of Redmond (2022) in collaboration with the University of Washington Climate Impacts Group and have the potential to reduce negative climate change impacts on FWHCAs within Clallam County.

- Promote retention of significant trees and maintain tree replacement requirements.
- Encourage and incentivize enhancement and restoration of native forest patches throughout the County, particularly where connectivity to one or more FWHCAs is identified. Both voluntary and required restoration planting should be paired with monitoring and maintenance that allows for dry season irrigation and adaptive management.
- Encourage the use of local nursery plant stock grown under current conditions to increase resilience of plant communities considering climate stressors.
- Manage stormwater infrastructure to avoid and minimize discharges of increased and/or untreated runoff to streams and thereby offset the anticipated increase in intensive rainfall events. Promote the use of LIDs as a tool to effectively manage stormwater for minimal downstream impacts.
- Update and maintain regulations for habitats and species of local importance. This may include adding mapping resources to help identify the locations of potential habitats and species requiring protection and management.
- Prioritize protection of streams and riparian corridors to reduce the stresses of climate change on native fish species and anadromous fish, such as chinook salmon.

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Clallam County Marine Resources Committee Annual Work Plan: Oct 2025 – Sep 2026

Project		October	November	December	January	February	March	April	May	June	July	August	September
MRC Admin	Members	Annual work plan review. Quarterly volunteer hours (Jul, Aug, Sep) due by Oct 7.		Annual work plan review.	Quarterly volunteer hours (Oct, Nov, Dec) due by Jan 7.			Develop and plan projects. Quarterly Volunteer hours (Jan, Feb, Mar) due by April 7.	MRC annual presentation to the BOCC.		Quarterly Volunteer hours (Apr, May, Jun) due by July 7.		
	Members - Advisory	Track and respond to planning and development proposals.	Track and respond to planning and development proposals.	Track and respond to planning and development proposals.	Track and respond to planning and development proposals.	Track and respond to planning and development proposals.	Track and respond to planning and development proposals.	Track and respond to planning and development proposals.	Track and respond to planning and development proposals.	Track and respond to planning and development proposals.	Track and respond to planning and development proposals.	Track and respond to planning and development proposals.	Track and respond to planning and development proposals.
	Staff	Start of new grant year. Work on annual work plan (due Jan), website updates, and annual report (due Apr). Quarterly reports (Progress report, Matching funds/volunteer time tracking, report of agendas/minutes) due October 15. NWSC monthly report due. Monthly Clallam MRC meeting.	NWSC monthly report due. Monthly Clallam MRC meeting. Update website monthly. Work on annual report (due Apr).	Finalize annual work plan (due Jan). NWSC monthly report due. Monthly Clallam MRC meeting. Update website monthly. Work on annual report (due Apr).	Annual work plan due January 9. Quarterly reports (Progress report, Matching funds/volunteer time tracking, report of agendas/minutes) due January 15. NWSC monthly report due. Monthly Clallam MRC meeting. Update website monthly. Work on annual report (due Apr). Additional staff training with NWSC.	NWSC monthly report due. Monthly Clallam MRC meeting. Update website monthly. Work on annual report (due Apr). Additional staff training with NWSC.	Finalize annual report (due Apr). NWSC monthly report due. Monthly Clallam MRC meeting. Update website monthly.	Annual report due April 10. Quarterly reports (Progress report, Matching funds/volunteer time tracking, report of agendas/minutes) due April 15. Complete any new member or MRC member reappointment paperwork. NWSC monthly report due. Monthly Clallam MRC meeting.	NWSC monthly report due. Monthly Clallam MRC meeting. Update website monthly.	MRC project presentation to the Northwest Straits Commission. NWSC monthly report due. Monthly Clallam MRC meeting. Update website monthly.	Quarterly reports (Progress report, Matching funds/volunteer time tracking, report of agendas/minutes) due July 15. NWSC monthly report due. Monthly Clallam MRC meeting. Update website monthly.	NWSC monthly report due. Monthly Clallam MRC meeting. Update website monthly.	Closeout report due September 30. NWSC monthly report due. Monthly Clallam MRC meeting. Update website monthly.
	All - Regional Meetings, Trainings, Conferences		Northwest Straits Initiative Conference.	MRC lead staff meeting (potential).	Strait ERN LIO quarterly meeting.	NWSC/MRC staff meeting (potential).		Strait ERN LIO quarterly meeting.			Strait ERN LIO quarterly meeting.		NWSC/MRC staff meeting (potential).
	All - Outreach & Education						Plan for festivals, review educational exhibits.	Potentially produce and order new outreach materials.				Potentially produce and order new outreach materials.	Host an educational table at Dungeness River Festival and Forever Streamfest if event dates and logistics permit.
Forage Fish Monitoring		Sampling/monitoring at Cline Spit, Ediz Hook, Elwha East and Elwha West. Enter data into IFORM.	Sampling/monitoring at Cline Spit, Ediz Hook, Elwha East and Elwha West. Enter data into IFORM.	Year 2 QAPP due December 31. Sampling/monitoring at Cline Spit, Ediz Hook, Elwha East and Elwha West. Enter data into IFORM.	Sampling/monitoring at Cline Spit, Ediz Hook, Elwha East and Elwha West. Enter data into IFORM.	Sampling/monitoring at Cline Spit, Ediz Hook, Elwha East and Elwha West. Enter data into IFORM.	Sampling/monitoring at Cline Spit, Ediz Hook, Elwha East and Elwha West. Enter data into IFORM.	Sampling/monitoring at Cline Spit, Ediz Hook, Elwha East and Elwha West. Enter data into IFORM.	Sampling/monitoring at Cline Spit, Ediz Hook, Elwha East and Elwha West. Enter data into IFORM.	Sampling/monitoring at Cline Spit, Ediz Hook, Elwha East and Elwha West. Enter data into IFORM.	Sampling/monitoring at Cline Spit, Ediz Hook, Elwha East and Elwha West. Enter data into IFORM.	Sampling/monitoring at Cline Spit, Ediz Hook, Elwha East and Elwha West. Enter data into IFORM.	Summary report due September 30. Sampling/monitoring at Cline Spit, Ediz Hook, Elwha East and Elwha West. Enter data into IFORM.
Bull Kelp Monitoring					NWSC kelp kayak end-of-season meeting. Engage with volunteers to prepare background checks as needed.			Year 2 QAPP due April 4.	Check all gear to prepare for monitoring. Engage with volunteers and schedule monitoring dates.	Attend Olympic Peninsula practice session. Monitor kelp beds and input data.	Monitor kelp beds and input data.	Monitor kelp beds and input data.	Summary report due September 30.
Pigeon Guillemot: Monitoring of breeding colonies								Year 2 QAPP due April 4.	Train volunteers and assign monitoring sites.	Weekly monitoring.	Summary and training materials due. Weekly monitoring	Weekly monitoring.	Summary report due September 30. Weekly monitoring as presence dictates.
West Elwha Beach Stewardship		Twice per month filling of doggie waste bags. Survey available to beach users through QR code.	Twice per month filling of doggie waste bags. Survey available to beach users through QR code.	Twice per month filling of doggie waste bags. Survey available to beach users through QR code.	Twice per month filling of doggie waste bags. Survey available to beach users through QR code.	Twice per month filling of doggie waste bags. Survey available to beach users through QR code.	Twice per month filling of doggie waste bags. Survey available to beach users through QR code.	Twice per month filling of doggie waste bags. Survey available to beach users through QR code.	Twice per month filling of doggie waste bags. Survey available to beach users through QR code.	Twice per month filling of doggie waste bags. Survey available to beach users through QR code.	Twice per month filling of doggie waste bags. Survey available to beach users through QR code.	Twice per month filling of doggie waste bags. Survey available to beach users through QR code.	Twice per month filling of doggie waste bags. Survey available to beach users through QR code.

Olympia Oyster Restoration							QAPP due April 4.			Survey site.	Survey site.	Year 2 final report due September 30.
Pinto Abalone	Survey dives.		2025 Pinto abalone final report and copy of 2025 survey data due December 31.				2025 QAPP addendum due April 10.	Possible survey dives.	Possible survey dives.	Possible survey dives.	Possible survey dives (most likely dates).	Possible survey dives (most likely dates).
HAZWOPER / Oiled Wildlife Education Training			2025 project final report due December 31.	2026 training plan and recruitment materials due January 10.		Possible HAZWOPER / oiled wildlife training. Produce training videos for website.						

November 2025 Final Meeting Minutes

Date: Monday, November 17, 2025
Time: 5:31 – 7:09pm
Location: Hybrid meeting, Zoom and Clallam County Board of Commissioners' Meeting Room
Minutes prepared by Amelia Kalagher

Member Roll

	Member	Present?	Alternate	Present?
Academic Community	Ed Bowlby	X	Ioana Bociu	
At Large	Alan Clark (*NWSC Rep, Vice Chair*)	X	Mary Sue Brancato	
At Large	*[vacant seat]*	---	Ray Kirk	
Conservation & Environmental Interests	Nancy Stephanz	X	*[vacant seat]*	---
Development Community	*[vacant seat]*	---	*[vacant seat]*	---
District I	Jeff Ward	excused	*[vacant seat]*	---
District II	Ann Soule	X	Lyn Muench	X
District III	Mike Doherty	X	Dann May	
Jamestown S'Klallam Tribe	Christopher Burns	X	Robert Knapp	X
Lower Elwha Klallam Tribe	Allyce Miller	X	Chelsea Korbulic	X
Makah Tribe	*[vacant seat]*	---	*[vacant seat]*	---
Marine Related Recreation & Tourism	*[vacant seat]*	---	*[vacant seat]*	---
Port Angeles City Council	LaTrisha Suggs (*Chair*)	X	Navarra Carr	
Port of Port Angeles Commission	Jesse Waknitz		Katharine Frazier	X
Sequim City Council	Meggan Uecker		Kelly Burger	

Staff and Others Present
Bruce Emery (Clallam County Director of Community Development), Chase O'Neil (CC Habitat Biologist, CCMRC Project Coordinator), Rebecca Mahan (CC Habitat Biologist Manager; CCMRC Coordinator), Amelia Kalagher (CCMRC Administrative Support), Stephen Crafton-Tempel (MRC volunteer), Megan Juran (Washington CoastSavers), Angela Glore (NODC), Jonathan Strivens (CC Environmental Health), Rob Casey (prospective MRC member), John Worthington (of Sequim)

Welcome / Call to Order / Roll Call

Chair LaTrisha Suggs called the meeting to order at 5:31. Roll was called, and others introduced themselves. A quorum was present at the beginning of the meeting.

Approval of Minutes

- ***Nancy Stephanz moved to approve the October 2025 minutes, Alan Clark seconded. The motion passed unanimously and minutes were approved.***

Public Comment

- John Worthington (of Sequim) made a comment regarding the comprehensive plan.

Presentation

- Bruce Emery, Clallam County Director of Community Development, presented on the County's Comprehensive Plan update. This included a review of the mandatory elements and the new climate element, as well as the critical areas ordinance. Bruce answered several questions from MRC members and alternates, and the MRC discussed some ideas related to the comprehensive plan. Public comment is open for participation as individuals, and the MRC may try to submit a comment as a committee if time permits.

Announcements

- *Northwest Straits Initiative 2025 conference recap:* The conference was held Nov 7 & 8. Alan Clark shared that next year's conference is planned to be held in Jefferson County. *Those who attended can email their comments on the conference to Alan. Several members shared their takeaways.
- *General NWSC update:* The Northwest Straits Commission may have extra funds available that were left over from other MRCs, and they will be reaching out to MRC staff about this. Alan Clark stated that the conference functioned as the Northwest Straits Commission meeting for this month.
- *Draft 2026 workplan:* The workplan for October 2025 – September 2026 is intended to guide the MRC's work by month, and is a grant deliverable due in January. *This will be up for final approval during the December meeting, and members should submit their comments to Chase by December 5th.

Committee and Project Reports

- *Sound Toxins:* Nancy Stephanz shared that the Sound Toxins team at Feiro Marine Life Center saw increased *Dinophysis spp.* over the prior two weeks, but this had decreased this week.
- *Forage fish:* Chelsea Korbulic shared that the forage fish sampling team is more robust with Tim Cochnauer back on board, new volunteer Stephen Crafton-Tempel participating, and Chase O'Neil now fully trained.
- *Advisory sub-committee:* LaTrisha shared that there was a productive meeting with Commissioner Ozias, discussing the new advisory sub-committee and communication with elected leaders going forward, especially about emergent issues. Alan Clark and Ann Soule briefly shared about the meeting as well, and about possible comment on the comprehensive plan. *MRC members are requested to send comprehensive plan comments to Chase prior to

Thanksgiving (by 11/26/25) so the MRC may be able to compile these comments for possible consensus at the next meeting.

New or Special Business

- *Derelict sailboat at Place Rd:* Allyce Miller shared information about a derelict sailboat that has run aground at the Place Rd Elwha Beach. Megan Juran (WA CoastSavers), Rebecca Mahan and others elaborated on the boat's status, and the MRC discussed. This vessel is currently priority 2 on DNR's priority list of derelict vessels.
- Discussion of MRC member positions and education and outreach were moved to the next agenda due to time constraints.
- *Oil spills / studium generale:* The MRC discussed possible avenues and specific topics for public outreach related to oil spill prevention and preparedness, and the possibility of including this as a topic for the January 22 studium generale. *Mike, Nancy and Alan will work on this topic and come to the MRC with a proposal in December.

Discussion of next meeting date and agenda

- *Next meeting:* The next meeting will take place on Monday, December 15th. The following meetings are rescheduled to January 26th and February 23rd due to holidays.
- *Call for new agenda items:* none at this time.

Good of the Order

- None at this time.

Public Comment

- John Worthington of Sequim made a comment regarding salmon spawning habitat grade.
- Alternate Lyn Muench had emailed her takeaways from the Northwest Straits Initiative conference, and they were read out loud.

Adjourn

Chair LaTrisha Suggs adjourned the meeting at 7:09.

CLALLAM MRC MEETING AGENDA

December 15th, 2025
5:30 p.m. – 7:00 p.m.
Hybrid Meeting

Zoom meeting link: https://us06web.zoom.us/j/83769639254?pwd=FmcMflhkxw6df902xa2tsxu6UAHGVB.1
Meeting ID: 837 6963 9254
Passcode: 12345
For more information about the MRC, please contact Chase O'Neil at 360-417-2361.

Welcome by Chair LaTrisha Suggs / Call to Order / Roll

- Determination of quorum

Public Comment on agenda items, *limited to 3 minutes per participant at the discretion of the Chair*

Approval of Minutes

- November minutes

Presentation/Discussion

- Chelsea Korbulic will lead a discussion on ideas stemming from the recent Northwest Straits Initiative conference and how the MRC could consider implementing these

Announcements

- Welcome new and returning members: Rob Casey and Tim Cochnauer
- Northwest Straits Commission update – Alan Clark
- Volunteer time log: due by Jan 7 for time spent in October through December – Amelia Kalagher
- Studium Generale: January 22 at Peninsula College

Committee and Project Reports

- Project leads report only if an update is needed
- Advisory sub-committee – Ann Soule

New or special business

- Finalization / approval of 2025-2026 MRC workplan
- Discussion of MRC member positions (at-large vs specific seats for community groups)
- Education and outreach discussion
    - Potential education & outreach sub-committee (ideas: updated kid friendly festival displays, community presentations such as radio)

Discussion of next meeting date and agenda

- Next regular meeting Monday, January 26 (4th Monday, due to holiday)
- 2026 meeting schedule updated
- Speakers at future meetings

2026 Meetings

January 26 (4th Mon)	April 20	July 20	October 19
February 23 (4th Mon)	May 18	August 17	November 16
March 16	June 15	September 21	December 21

- Call for new agenda items

Good of the Order

Public Comment *limited to 3 minutes per participant at the discretion of the Chair*

Adjourn

Clallam County DCD is inviting you to a scheduled Zoom meeting.
Join Zoom Meeting
https://us06web.zoom.us/j/83769639254?pwd=FmcMflhkxw6df902xa2tsxu6UAHGVB.1

Meeting ID: 837 6963 9254
Passcode: 12345

One tap mobile
+12532050468,,83769639254#,,,,*12345# US
+12532158782,,83769639254#,,,,*12345# US (Tacoma)

Dial by your location
• +1 253 215 8782 US (Tacoma)

2026 Meetings

January 26 (4th Mon)	April 20	July 20	October 19
February 23 (4th Mon)	May 18	August 17	November 16
March 16	June 15	September 21	December 21

Chelsea Korbulic - NOAA Affiliate 12/02/2025

2025 MRC Conference Reflections: Next Steps for Clallam County

A platform for sharing ideas and brainstorming beyond with other members

Standout sessions & Resources

Justine Asohmbom DOE

0

justine_asohmbom_social_marketing_presentation_1108-2025

Panel: Building Equitable Partnerships Between MRCs and Tribes

Cecilia Gobin, Neil Harrington, Jennifer Willup and Catey Ritchie shared their perspectives on relationship-building and cultural sensitivity/responsiveness in authentic partnerships.

0

MRC Lightning Round Networking

Opportunity to hear about key projects occurring at each MRC and engage in small group discussions surrounding challenges, successes and potential partnerships.

0

Ideas to Try

brainstorm other ways to engage community in kelp

Pilot integrating underwater footage from ReefCheck surveys in FWB in outreach (reach out to LEKT Education re:VR equipment)

0

Subcommittee focused on BOCC outreach

(could also be the advisory subcommittee); write up project results and present to BOCC, capitalize on big events such as flooding or king tides to present marine resources issues to BOCC; *goal à* to increase visibility with the board (and public) and create more support for future projects

0

Quarterly meetings with 1 staff, chair/member, and new volunteer

goal to make sure new volunteers feel like they are integrating into the group/feel invested and improve retention

0

County leadership feedback

Ask each Commissioner, DCD Director, AND Health dept/Env Health directors
what marine-related concerns are on their minds and how can we help

0

Projects based on skillsets

Evaluating the skillsets we have in the group and then creating projects based on those skillsets (photography, project management, community engagers, etc.); *goal* à utilizing the immense talent the MRC has to offer!

0

Project lightning talks

Develop short and concise presentations (15 minutes of Video/PowerPoint 10-minute question and answer session) on MRC projects to take out to community groups, classrooms, and other public venues.

0

Check NOLT land resilience report for relevance to comp plans and recommend its use/utilization

0

Advocate for legislation on low-S fuels (HB 1652, SB 5519

0

More intentional social marketing campaigns

How can we narrow our education & outreach focus to identify specific
community behaviors to promote and plan a social marketing approach to those?

0

Resources Needed

Additional prepared materials for presentations and outreach

0

Evaluation metric

A tool to assess and measure efficacy of a program at the end of the presentation and over time.

0

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clear connection to county government/planning

to know when advisory input is appropriate, with good advanced notice (this has been going in a good direction lately already - thank you subcommittee!)

1

> **Chelsea Korbulic - NOAA Affiliate** 12/2/25 11:10PM
> maybe create outreach materials/training materials for new members on MRC advisory role

Collaboration Opportunity

Jefferson MRC for a dinner/networking meeting
shared meeting, ideally with an interesting presentation and social component, with Jefferson MRC. At least two previous meetings of this type are still remembered fondly even years later.

0

David Trimbach WDFW geographer
(was at the conference) doing research on cultural/social aspects of kelp gathering and harvest

0

understanding-engaging-communities-ppt-slides

Collaborative Outreach/Ed evaluation
Work with NWSC communications staff, Ecology social marketing staff, and other MRCs to see what works and what doesn't for assessment of education and outreach programs.

0

County Env Health re protecting water quality for shellfish harvest

0

“Deep handshake partners”
re recruitment and info/idea exchange, including potential stewardship course* as a good way to improve awareness of the MRC and recruit members

1

> **Chelsea Korbulic - NOAA Affiliate** 12/2/25 11:05PM
> Look at NOSC model or offer to collaborate in 2026 to add nearshore/marine habitat component? Oyster project engagement?

Other

Committee priorities for the next year

Clallam County Marine Resources Committee Annual Work Plan: Oct 2025 – Sep 2026

Project		October	November	December	January	February	March	April	May	June	July	August	September
MRC Admin	**Members**	Annual work plan review. Quarterly volunteer hours (Jul, Aug, Sep) due by Oct 7. Attend monthly meeting.		Annual work plan review. Attend monthly meeting.	Quarterly volunteer hours (Oct, Nov, Dec) due by Jan 7. Attend monthly meeting.	Attend monthly meeting.	Attend monthly meeting.	Develop and plan projects. Quarterly Volunteer hours (Jan, Feb, Mar) due by April 7. Attend monthly meeting.	MRC annual presentation to the BOCC. Attend monthly meeting.	Attend monthly meeting.	Quarterly Volunteer hours (Apr, May, Jun) due by July 7. Attend monthly meeting.	Attend monthly meeting.	Attend monthly meeting.
	Members - Advisory	Track and respond to planning and development proposals, collaborate with County officials.	Review / comment on County comprehensive plan update. Track and respond to planning and development proposals, collaborate with County officials.	Review / comment on County comprehensive plan update. Track and respond to planning and development proposals, collaborate with County officials.	Review / comment on County comprehensive plan update. Track and respond to planning and development proposals, collaborate with County officials.	Track and respond to planning and development proposals, collaborate with County officials.	Track and respond to planning and development proposals, collaborate with County officials.	Track and respond to planning and development proposals, collaborate with County officials.	Track and respond to planning and development proposals, collaborate with County officials.	Track and respond to planning and development proposals, collaborate with County officials.	Track and respond to planning and development proposals, collaborate with County officials.	Track and respond to planning and development proposals, collaborate with County officials.	Track and respond to planning and development proposals, collaborate with County officials.
	Staff	Work on annual work plan (due Jan), website updates, and annual report (due Apr). Quarterly reports (Progress report, Matching funds/volunteer time tracking, report of agendas/minutes) due October 15. NWSC monthly report due. Monthly Clallam MRC meeting.	NWSC monthly report due. Monthly Clallam MRC meeting. Update website monthly. Work on annual report (due Apr).	Finalize annual work plan (due Jan). NWSC monthly report due. Monthly Clallam MRC meeting. Update website monthly. Work on annual report (due Apr).	Annual work plan due January 9. Quarterly reports (Progress report, Matching funds/volunteer time tracking, report of agendas/minutes) due January 15. NWSC monthly report due. Monthly Clallam MRC meeting. Update website monthly. Work on annual report (due Apr). Additional staff training with NWSC.	NWSC monthly report due. Monthly Clallam MRC meeting. Update website monthly. Work on annual report (due Apr). Additional staff training with NWSC.	Finalize annual report (due Apr). NWSC monthly report due. Monthly Clallam MRC meeting. Update website monthly.	Annual report due April 10. Quarterly reports (Progress report, Matching funds/volunteer time tracking, report of agendas/minutes) due April 15. Complete any new member or MRC member reappointment paperwork. NWSC monthly report due. Monthly Clallam MRC meeting.	NWSC monthly report due. Monthly Clallam MRC meeting. Update website monthly.	MRC project presentation to the Northwest Straits Commission. NWSC monthly report due. Monthly Clallam MRC meeting. Update website monthly.	Quarterly reports (Progress report, Matching funds/volunteer time tracking, report of agendas/minutes) due July 15. NWSC monthly report due. Monthly Clallam MRC meeting. Update website monthly.	NWSC monthly report due. Monthly Clallam MRC meeting. Update website monthly.	Closeout report due September 30. NWSC monthly report due. Monthly Clallam MRC meeting. Update website monthly.

All - Regional Meetings, Trainings, Conferences		Northwest Straits Initiative Conference.	MRC lead staff meeting (potential).	Strait ERN LIO quarterly meeting.	NWSC/MRC staff meeting (potential).		Strait ERN LIO quarterly meeting.			Strait ERN LIO quarterly meeting.		NWSC/MRC staff meeting (potential).
All - Outreach & Education			Plan for festivals, review educational exhibits. Potentially produce and order new outreach materials.								Potentially produce and order new outreach materials.	Host an educational table at Dungeness River Festival and Forever Streamfest if event dates and logistics permit.
Forage Fish Monitoring	Sampling/monitoring at Cline Spit, Ediz Hook, Elwha East and Elwha West. Enter data into IFORM.	Sampling/monitoring at Cline Spit, Ediz Hook, Elwha East and Elwha West. Enter data into IFORM.	Year 2 QAPP due December 31. Sampling/monitoring at Cline Spit, Ediz Hook, Elwha East and Elwha West. Enter data into IFORM.	Sampling/monitoring at Cline Spit, Ediz Hook, Elwha East and Elwha West. Enter data into IFORM.	Sampling/monitoring at Cline Spit, Ediz Hook, Elwha East and Elwha West. Enter data into IFORM.	Sampling/monitoring at Cline Spit, Ediz Hook, Elwha East and Elwha West. Enter data into IFORM.	Sampling/monitoring at Cline Spit, Ediz Hook, Elwha East and Elwha West. Enter data into IFORM.	Sampling/monitoring at Cline Spit, Ediz Hook, Elwha East and Elwha West. Enter data into IFORM.	Sampling/monitoring at Cline Spit, Ediz Hook, Elwha East and Elwha West. Enter data into IFORM.	Sampling/monitoring at Cline Spit, Ediz Hook, Elwha East and Elwha West. Enter data into IFORM.	Sampling/monitoring at Cline Spit, Ediz Hook, Elwha East and Elwha West. Enter data into IFORM.	Summary report due September 30. Sampling/monitoring at Cline Spit, Ediz Hook, Elwha East and Elwha West. Enter data into IFORM.
Bull Kelp Monitoring				NWSC kelp kayak end-of-season meeting. Engage with volunteers to prepare background checks as needed.			Year 2 QAPP due April 4.	Check all gear to prepare for monitoring. Engage with volunteers and schedule monitoring dates.	Attend Olympic Peninsula practice session. Monitor kelp beds and input data.	Monitor kelp beds and input data.	Monitor kelp beds and input data.	Summary report due September 30.
Pigeon Guillemot: Monitoring of breeding colonies							Year 2 QAPP due April 4.	Train volunteers and assign monitoring sites.	Weekly monitoring.	Summary and training materials due. Weekly monitoring	Weekly monitoring.	Summary report due September 30. Weekly monitoring as presence dictates.
West Elwha Beach Stewardship	Twice per month filling of doggie waste bags. Survey available to beach users through QR code.	Twice per month filling of doggie waste bags. Survey available to beach users through QR code.	Twice per month filling of doggie waste bags. Survey available to beach users through QR code.	Twice per month filling of doggie waste bags. Survey available to beach users through QR code.	Twice per month filling of doggie waste bags. Survey available to beach users through QR code.	Twice per month filling of doggie waste bags. Survey available to beach users through QR code.	Twice per month filling of doggie waste bags. Survey available to beach users through QR code.	Twice per month filling of doggie waste bags. Survey available to beach users through QR code.	Twice per month filling of doggie waste bags. Survey available to beach users through QR code.	Twice per month filling of doggie waste bags. Survey available to beach users through QR code.	Twice per month filling of doggie waste bags. Survey available to beach users through QR code.	Twice per month filling of doggie waste bags. Survey available to beach users through QR code.
Olympia Oyster Restoration							QAPP due April 4.			Survey site.	Survey site.	Year 2 final report due September 30.
Pinto Abalone	Survey dives.		2025 Pinto abalone final report and copy of 2025 survey data due December 31.				2025 QAPP addendum due April 10.	Possible survey dives.	Possible survey dives.	Possible survey dives.	Possible survey dives (most likely dates).	Possible survey dives (most likely dates) - survey dives may happen later in 2026, pending schedules.
HAZWOPER / Oiled Wildlife Education Training			2025 project final report due December 31.	2026 training plan and recruitment materials due January 10.		Possible HAZWOPER / oiled wildlife training.						

DATE: December 16, 2025

TO: Clallam County Board of Commissioners (BOCC)
Clallam County Department of Community Development (DCD)
Clallam County Planning Commission

FROM: LaTrisha Suggs, Chair, Clallam County Marine Resources Committee (MRC)

SUBJ: 2025 Comprehensive Plan Update

Dear Commissioners Mark Ozias, Randy Johnson, and Mike French, DCD Director Bruce Emery, and Planning Commission members:

At its December meeting the Marine Resources Committee agreed to invoke our group's advisory responsibility to the BOCC and communicate several points of commendation as well as concern related to the Draft Comprehensive Plan Update. We understand the Planning Commission is taking comments now, so we are also addressing this input to those members.

First, we thank County staff and consultants for many significant updates that protect our shorelines and marine environment as well as for addressing climate change. We also thank Director Emery for his presentation on the plan and discussion with us last month. After review of relevant sections of the online document "Chapter 31.02 County-Wide Comprehensive Plan-11.17.25", we offer the following comments. In case it is helpful, the Addendum to this letter offers specific edits associated with each item listed below.

1. To achieve the vision of a resilient future embodied in the Comprehensive Plan Update it must anticipate change. The local environment is continually impacted by the changing climate as well as imperfectly mitigated growth/ development and we believe the Comp Plan Update is an important tool to address these issues. However, given its 10-year update cycle, the Comp Plan's vision is unlikely to be achieved without goals and policies that are bold, proactive and far reaching: in a word, "future proofed." While changes are not always predictable, current scientific literature is clear about the direction we are headed; a Plan that integrates this awareness prepares County residents and institutions and helps address potential liability.
   - The MRC will continue to work with the County to achieve the Plan's vision and in so doing fully supports strengthening and adding policies to help protect shorelines and

marine ecosystems and/or improve awareness of potential environmental change. Several instances include:
    - 31.02.340 “Env and open space policies” (1) Goals, (6) Marine Resources, (7) Habitat, (8) Runoff and Erosion, (9) Floodplains, (12) Nonpoint Source Pollution
    - Proposed 31.02.820 “Climate Change and Resiliency Goals and Policies” (7) Goal 7. Ecosystems, (8) Goal 8. Emergency Management
- The MRC recommends that designated “frequently flooded” critical areas incorporate risk areas identified in recent scientific studies on tsunamis, storm surge, and sea level rise. The updated FEMA flood risk maps as well as recently projected sea level rise maps by the Jamestown S’Klallam Tribe would be good resources; Port of Port Angeles recently published a report on tsunamis with inundation maps for Port Angeles Harbor and Sequim Bay.
    - 31.02.050 Definitions. (13) “Critical areas” includes the following areas and ecosystems: (d) Frequently flooded areas.
- The MRSC website indicates that, pursuant to RCW 64.06.080 and RCW 43.110.030(2)(e), the County requires sellers of real property with designated critical areas (such as frequently flooded areas) to disclose certain information to potential buyers. The MRC strongly urges requiring these disclosures by private sellers and realtors and including all shoreline properties, explaining potential hazards and nuisances and the potential for land use regulations. A possible precedent can be found at:
    - 31.02.420 Transportation – Goals and policies. (4) Airport (h) Policy 23

2. The MRC strongly recommends reversing the current use of terminology to prioritize “Net ecological gain” over “No net loss.” In the recent decades that “No net loss” has been a goal of the County’s Comp Plan, net loss of habitat functions and values has continued despite existing codes attempting to mitigate that loss as development occurs, according to the literature and in the MRC’s observation from our monitoring.
    - Plan language should reverse the sentence structure to first mention “working to achieve net ecological gain,” followed by “while striving for no net loss, at minimum” in these instances:
        - 31.02.340 CCC 31.02.340 "Environment and open space policies" (3) Wetlands, Policy 9
        - Proposed 31.02.820 “Climate Change and Resiliency Goals and Policies” (7) Ecosystems, (b) Policy 7.2
    - An approach we believe could achieve net long-term ecological gain is to adopt Ecology’s recommended buffer sizes and alternative restoration measures where increased widths/area is not possible. Critical area buffers are important to the function of critical areas and should be protected as described in the Best Available Science document prepared for the County. This concept should be considered for wetland critical areas, riparian/fish and wildlife habitat critical areas, frequently flooded and geologically hazardous critical areas, at minimum.

3. The transmission of oil, crude, tar sands, and all hazardous substances and materials in the Strait is a perennial concern of the MRC due to unforeseeable risks and the grave impact of spills on the marine environment. For example, there are several announced plans for additional export terminals (or expansion of through-put in terms of the Trans Mountain pipeline system) in British Columbia. We urge the County to strengthen and broaden policy statements that protect against spills. We also urge the BOCC to become more involved in opportunities to participate in State and federal rule-making opportunities involving oil, natural gas and chemical transshipment, related facility development and spill prevention and response. The BOCC should also be involved in maximizing additional protective measures, such as the implementation, home-porting and other matters related to the State-mandated new escort tug program. Pertinent elements include:
    - 31.02.340 Environment and open space policies. (15) Oil Processing and Transmission
    - 31.02.420 Transportation – Goals and policies. (1) Roads and Highways, (2) Marine Transportation

4. One of the MRC's partners in habitat protection and restoration is the North Olympic Land Trust, which has proactively conducted research and developed tools for general land management that also protect marine environments. We trust these will be beneficial to the Comp Plan Update if they haven't already been tapped:
    - "Building a Resilient Peninsula Through Local Conservation," an extensive story map and GIS mapping tools that illustrate locations impacted by climate changes and their projected intensity, NOLT and Jefferson Land Trust, circa 2022. The analysis highlights lands most likely to remain resilient with climate change; the habitat and biodiversity opportunity areas along shorelines are of particular interest to the MRC. Climate Resilience - North Olympic Land Trust
    - "The economic benefits of conserved lands, trails, and parks on the North Olympic Peninsula," a special report by The Trust for Public Land's Conservation Economics Team (TPL), 2021. This 68-page report analyzes the economic value of conserved farms, forests, trails, shorelines and parks in the North Olympic Peninsula. NOP.1_5_21.fin.LO.indd

In conclusion, the MRC leadership and staff would welcome an invitation to discuss these concerns – and ways the MRC can help. Note that the Addendum below lists specific policies and offers the MRC's recommended changes. To contact us please reach out to our County staff coordinators: Rebecca Mahan (rebecca.mahan@clallamcountywa.gov) and Chase O'Neil (chase.oneil@clallamcountywa.gov).

Sincerely,

LaTrisha Suggs, Chair
Clallam County Marine Resources Committee (MRC)

Cc: Tim Havel, Clallam County DCD
MRC staff Chase O'Neil, Amelia Kalagher, Rebecca Mahan
MRC members

ADDENDUM
Recommended edits associated with numbered items in the letter above

1. "Future proofing" and improving awareness of potential environmental change

   - 31.02.340 "Environment and open space policies" (1) Goals.
     - (c) Policy 3. The Critical Areas Ordinance and the Shoreline Master Program shall be utilized by Clallam County to help achieve environmental objectives, prevent environmental degradation, and to manage land use activities within the natural and intrinsic constraints of the landscape and shoreline. The ordinances shall be amended as necessary to implement watershed or special area studies and to maintain consistency with the Comprehensive Plan. Practices under this chapter should be evaluated ~~periodically~~ regularly (at least every two years) to ensure regulatory effectiveness in achieving stated objectives and fair notification to affected property owners.
     - (d) Policy 4. Education and incentives should be provided to the public on a regular basis to ensure their understanding of the principles behind regulatory protection and to increase support for protection outside of the regulatory framework.

   - 31.02.340 "Environment and open space policies" (6) Marine Resources.
     - (a) Policy 16. Clallam County ~~should~~ shall work to avoid ~~achieve alternatives for~~ sewage ~~treatment plant~~ discharges to marine waters (unless they achieve tertiary treatment) ~~for~~ and new or failing on-site septic systems subject to storm surge or sea level rise.
     - (b) Policy 17. Clallam County shall preserve the scenic, aesthetic and ecological qualities of the marine shorelines of Clallam County, in harmony with those uses which are deemed essential to the life of its residents, human and otherwise. Clallam County shall implement marine resource goals through the Clallam County Shoreline Master Program and/or critical areas ordinance, as now or hereafter amended.

   - 31.02.340 "Environment and open space policies" (7) Habitat.
     - (a) Policy 18. Land use practices should protect and enhance habitat corridors, diversity and richness, and ensure protection of wildlife corridors and habitat for threatened and endangered species. Wildlife corridors and riparian areas, including marine shorelines, should be maintained as important community infrastructure.
     - (b) Policy 19. Clallam County should protect, maintain and enhance fish and shellfish spawning, rearing, and migration habitat, and work to ensure harvestability of fish and shellfish. Damaged and degraded upland and marine shoreline habitat should be identified, prioritized and restored. Recognize the various levels of government which have a vested interest in protection, maintenance and restoration of habitat.

- (c) Policy 20. Clallam County shall recognize the large number of salmon and steelhead stocks, forage fish, and shorebird nesting areas, that have been classified as critical or depressed. The County shall work toward prevention of these ~~stocks~~ species from being listed as threatened and endangered through habitat restoration and land use practices which cause no further degradation to habitat needs.

- 31.02.340 "Environment and open space policies" (8) Runoff and Erosion. (Policy 21) Stormwater quality and quantity should be managed to protect shellfish beds, fish habitat, and other resources; to protect the integrity of coastal bluffs; to prevent the contamination of sediments from urban runoff and combined sewer overflows; and to achieve standards for water and sediment quality by reducing and eventually eliminating harm from pollutant discharges from stormwater and combined sewer overflows. This goal should be achieved through a variety of means including:
  - Protection of coastal bluffs and bluff vegetation by preventing unmanaged drainage;

- 31.02.340 "Environment and open space policies" (9) Floodplains and Marine Shorelines.
  - (a) Policy 22. Flood control should be undertaken in the context of varied uses including agricultural and residential, fish and wildlife habitat, water supply, open space, and recreation. Land use and related regulations and zoning should reflect the natural constraints of floodplains, meander zones, and riparian habitat zones including estuaries and marine shorelines subject to sea level rise. Flood control measures should reserve to the fullest extent possible opportunities for other uses, including public access.
  - (b) Policy 23. Flood control should be undertaken in the context of an ongoing, systematic and comprehensive approach to basin management and reservation, and for marine shoreline reaches subject to storm surge or sea level rise. Changes in land use should try to restore the natural character of rivers, ~~and~~ streams, estuaries and marine shorelines whenever reasonably possible. Public understanding of the various uses and limitations associated with flood control should be improved through a variety of educational efforts implemented on a regular basis. A stable, adequate, and publicly acceptable long-term source of financing should be established and maintained for comprehensive basin management and for comprehensive shoreline reach management.
  - (c) Policy 24. To limit potential for infrastructure damage from major and minor flood events, low intensity land use activities including ~~agricultural and~~ recreational land uses in riverine floodplain areas and marine shorelines should be encouraged, and other land uses in these areas discouraged. The need for emergency measures should be reduced or prevented through planning, structural, and nonstructural measures – with a strong preference for nonstructural habitat restoration measures.

- (d) Policy 25. To protect riverine habitat from flood damage and recognize upstream and downstream effects from flood management activities, Clallam County should require best management practices for maintaining natural river channel configurations ~~during dredging and gravel removal~~. Nonstructural measures are preferred over structural measures, but, when structural methods are necessary, they shall not obstruct fish passage. Structural flood control measures ~~should~~ shall preserve or enhance existing flow characteristics for fisheries, irrigation, and other river uses. Flood control activities should develop or improve diversity of habitat for fish and wildlife, and at minimum ~~not~~ result in no net loss ~~to fish and wildlife resources, but wherever possible develop or improve diversity of habitat for those resources~~. To protect marine shoreline habitat from flood damage and recognize up- and down-current effects from flood management activities, Clallam County should require best management practices for maintaining natural shoreline configurations. Nonstructural measures are preferred over structural measures, but, when structural methods are necessary, they shall not obstruct fish passage. Structural flood control measures shall preserve or enhance existing beach and current flow-cell patterns. Flood control activities should develop or improve diversity of habitat for fish and wildlife resources, and at minimum result in no net loss.

- 31.02.340 “Environment and open space policies” (12) Nonpoint Source Pollution.
  - Policy 30. Water resources shall be maintained in the highest quality and quantity to support recognized beneficial uses. To achieve this in the most efficient and cost-effective manner, water resource and waste management planning should be coordinated on a watershed basis across jurisdictional boundaries, and consider marine waters of Clallam County. The County should recognize and control the downstream and cumulative effects of individual practices on water resources. Education and incentives should be used as methods to prevent nonpoint source pollution.

- Proposed 31.02.820 “Climate Change and Resiliency Goals and Policies”
  - (7) Goal 7. Ecosystems. (a) Policy 7.1: Prepare ecosystems for climate impacts by implementing restoration actions for streams, wetlands, shorelines, and watersheds, focusing on connectivity, reducing invasive species, and improving watershed processes. This includes restoring riparian vegetation, floodplains, and stream structures to protect native fish and other aquatic life. Enhance habitat and community resilience to climate change by protecting and restoring marine flora and fauna and coastal ecosystems, addressing sea-level rise, and focusing on submerged aquatic vegetation for habitat and “blue” carbon storage. Evaluate and implement shoreline restoration and cleanup efforts, including concerns for Tribal cultural resources.

- (8) Goal 8. Emergency Management. Promote and implement communication, transportation response, and education on preparedness and recovery efforts to ensure that all members of the Clallam County community are ready for climate emergencies, both gradual (such as sea level rise or drought frequency) and catastrophic (such as storm surge or wildfire). Anticipate and be ready to accommodate the rise in demand for short- and long-term emergency services due to climate change impacts and understand community and individual neighborhood needs when preparing for emergency situations.

➢ 31.02.050 Definitions. (13) "Critical areas" includes the following areas and ecosystems: (d) Frequently flooded areas. *The MRC recommends that designated "frequently flooded" critical areas incorporate risk areas identified in recent scientific studies on tsunamis, storm surge, and sea level rise. The updated FEMA flood risk maps as well as recently projected sea level rise maps by the Jamestown S'Klallam Tribe would be good resources; Port of Port Angeles recently published a report on tsunamis with inundation maps for Port Angeles Harbor and Sequim Bay.*

➢ [Potential precedent for critical area disclosure requirements] 31.02.420 Transportation – Goals and policies. (4) Airport. (h) Policy 23. **Provide notice and disclosure to current, future and prospective purchasers** of lands within the Airport Overlay District **of potential hazards and nuisances** associated with aircraft operations **and the potential for** land use and height **regulations**.

- *The MRC recommends that the County provide notice and disclosure to current, future and prospective purchasers of properties with designated critical areas or shorelines of potential hazards and nuisances and the potential for land use regulations.*

2. Prioritize "Net ecological gain" over "No net loss"

➢ [As amended] CCC 31.02.250 Master planned resorts land use policies. (1) (h) The master planned resort is consistent with development regulations of the County to protect critical areas to ensure long-term net gain ~~no net loss~~ of ecological functions and values with no net loss.

➢ CCC 31.02.340 "Environment and open space policies" (3) Wetlands, Policy 9 could be re-stated as follows: "Clallam County shall work to achieve long-term net gain ~~no net loss~~ of regulated wetlands' functions and values through restoration and enhancement at the watershed scale, while allowing a reasonable use of property with no net loss, at minimum, ~~with regard to their functions and values,~~ in the short-term ~~and should work to achieve a long-term net gain in these attributes through restoration and enhancement~~."

- Proposed CCC 31.02.820 “Climate Change and Resiliency Goals and Policies” (7) Ecosystems, (b) Policy 7.2 Strengthen habitat and ecosystem resilience by inventorying and avoiding development in climate refugia and critical habitats with a focus on achieving net ecological gains of ecosystem attributes, while ~~to~~ strivinge~~~~ for no net loss, at minimum.~~. of ecosystem attributes, with a focus on achieving net ecological gains.~~ Expand habitat protection, quality, and connectivity through designations such as conservation areas, expanded critical area and all other buffers, greenbelts, wildlife and open space bridges and corridors. Incorporate climate considerations in determining permissible activities within wetlands and wildlife habitats.

3. Transmission of Oil and Other Hazardous Substances/Materials

- 31.02.340 "Environment and open space policies" (15) Oil and Other Hazardous Materials Processing and Transmission, Policy 40. The coastline, coastal waters, and upland areas should be protected from the recognized problems and depreciation which could be brought about by oil or crude transport and oil ports and development associated with an oil port, oil storage, ~~oil or crude transport,~~ and oil pipelines. Other industries with high energy and water requirements, a high pollution component, or which are incompatible with existing industries shall not be permitted. This includes, but is not limited to, oil ports and their associated developments, crude petroleum transfer facilities, tank farms and refineries, liquid natural gas transfer facilities, petrochemical plants and nuclear power and processing plants, and facilities processing any hazardous material known or proven to be hazardous.

- 31.02.420 Transportation – Goals and policies.
  - (1) Roads and Highways. (k) Policy 11. Protect wildlife habitat and prevent watershed degradation, where possible, through:
    (iii) New transportation arterials and major collectors which have the potential to transport hazardous materials should not be planned parallel to and in close proximity to marine or riverine shorelines. Transportation facilities ~~should~~ shall minimize the potential impact of accidental spillage of hazardous materials into any waterway.
  - (2) Marine Transportation.
  - [NEW– language based on similar policy under Roads and Highways] (c) Policy . Protect wildlife habitat and prevent marine water quality degradation, where possible, through:
  - (i) Due to increases in tanker, barge, container ship and cruise ship traffic, the County should advocate that expansion of marine transportation should enhance and/or restore fish and wildlife habitat.
  - (ii) Marine transportation facilities should minimize the potential impact of accidental spillage of hazardous materials into any waterway.
  - (iii) Bridges and other transportation facilities should not constrict the natural and dynamic condition of marine shorelines and estuaries.

- (iv) Design road geometrics and drainage to intercept or minimize the transport of roadway sanding materials from entering marine shorelines.
- (v) Tug boat escorts are needed in more areas; home-porting is recommended for Port Angeles Harbor.
- (vi) Ensure local spill response coordination through emergency response planning and execution, including practice exercises and training. Consult the "Strait of Juan de Fuca Geographic Response Plan" (2024) for oil spills regarding protection of sensitive marine life in each geographic area.
- (vii) Advocate at the state level for maintaining or increasing agency spill responders in Clallam County.

December 2025 Final Meeting Minutes

Date: Monday, December 15, 2025
Time: 5:31 – 7:15pm
Location: Hybrid meeting, Zoom and Clallam County Board of Commissioners' Meeting Room
Minutes prepared by Amelia Kalagher

Member Roll

	Member	Present?	Alternate	Present?
Academic Community	Ed Bowlby	X	Ioana Bociu	
At Large	Alan Clark (*NWSC Rep, Vice Chair*)	excused	Mary Sue Brancato	
At Large	Tim Cochnauer	X	Ray Kirk	
Conservation & Environmental Interests	Nancy Stephanz	X	*[vacant seat]*	---
Development Community	*[vacant seat]*	---	*[vacant seat]*	---
District I	Jeff Ward	excused	*[vacant seat]*	---
District II	Ann Soule	X	Lyn Muench	
District III	Mike Doherty	X	Dann May	
Jamestown S'Klallam Tribe	Christopher Burns	X	Robert Knapp	X
Lower Elwha Klallam Tribe	Allyce Miller	X	Chelsea Korbulic	X
Makah Tribe	*[vacant seat]*	---	*[vacant seat]*	---
Marine Related Recreation & Tourism	Rob Casey	X	*[vacant seat]*	---
Port Angeles City Council	LaTrisha Suggs (*Chair*)	X	Navarra Carr	
Port of Port Angeles Commission	Jesse Waknitz		Katharine Frazier	X
Sequim City Council	Meggan Uecker		Kelly Burger	

Staff and Others Present
Bruce Emery (Clallam County Director of Community Development), Chase O'Neil (CC Habitat Biologist, CCMRC Project Coordinator), Rebecca Mahan (CC Habitat Biologist Manager; CCMRC Coordinator), Amelia Kalagher (CCMRC Administrative Support), John Worthington (of Sequim)

Welcome / Call to Order / Roll Call

Chair LaTrisha Suggs called the meeting to order at 5:31. Roll was called, and others introduced themselves. A quorum was present at the beginning of the meeting.

Approval of Minutes

- ***Ed Bowlby moved to approve the November 2025 minutes, Nancy Stephanz seconded. The motion passed unanimously and minutes were approved.***

Public Comment

- John Worthington made a comment regarding salmon restoration and flooding mitigation efforts and expenses.

Presentation

- Chelsea Korbulic led a discussion about ideas stemming from the Northwest Straits Initiative annual conference. Ideas spanned categories including resources, ideas to try, resources needed, and opportunities. MRC members added feedback to the existing ideas, and added a few more.
    - Nancy mentioned an upcoming talk Jan 20: public Tsunami Hazards and Risks presentation, Field Arts & Events Hall, from Port of Port Angeles and WA Emergency Management Division
    - *MRC members who have additional ideas or would like to take action on existing ideas can share this, ideally prior to the January 26th meeting.

Announcements

- *Welcome new and returning members:* Tim Cochnauer is returning to the MRC after a hiatus, and he shared a bit about his background. Rob Casey is also joining the MRC as a new member, but could not be present to introduce himself at this point in the meeting.
- *General NWSC update:* No update, since Alan Clark could not attend.
- *Volunteer time log:* LaTrisha reminded the MRC to track their volunteer hours. Members can access the log through the link in Amelia's emails.
- *Studium Generale:* Nancy is preparing to present the Studium Generale lecture on Jan 22. She asked that *any feedback on the presentation be shared by Jan 8. *The event is open to the public, and all MRC members and alternates are invited to attend and participate in Q&A as it relates to their projects.
- *SeaSpan:* Allyce Miller brought up a Canadian company called SeaSpan that plans to begin operations in Q1 of 2026 for vessel-to-vessel transfer of liquefied natural gas.

Committee and Project Reports

- *Olympia oysters:* Chris Burns shared that he and other JST staff met with WDFW staff to discuss Olympia oyster restoration goals for 2026-2036 and lessons learned. Annie Raymond (JST) will present their project at the National Shellfish Association conference in Portland in March 2026.
    - The MRC discussed inviting Annie to present to the MRC prior to her conference presentation.
- *Speakers at future meetings*: This topic was moved up the agenda. Nancy Stephanz brought up the possibility of Justine Chorley (Clallam County Emergency Management) giving a

presentation, and the MRC discussed the process for scheduling speakers and the lineup for the next few months.

- *Derelict sailboat:* Chelsea gave an update on the derelict sailboat at Place Rd / mouth of the Elwha. People from several entities came together to help this progress through DNR's derelict vessel process, and it is currently scheduled for removal in December.
- *Advisory sub-committee:* Ann Soule shared the letter that the advisory subcommittee has developed to comment on the Clallam County Comprehensive Plan update. The MRC reviewed and discussed some content in this letter. **Tim Cochnauer moved to approve the letter to be sent to BOCC, DCD and Planning Commission as a "discussion draft". Allyce Miller seconded. The motion passed by unanimous consent.**

New or Special Business

- **Mike moved to extend the meeting by 10 minutes, Ann seconded.**
- *Annual workplan:* The MRC briefly discussed the annual workplan draft. One update was made: Olympia oyster surveys to take place tentatively in May/June. **The workplan was approved by unanimous consent, with that minor edit to the Olympia oyster schedule.**
- *Member positions:* Discussion of MRC member positions and education and outreach were moved to the next agenda due to time constraints.
- *Education and outreach subcommittee:* LaTrisha plans to establish an education and outreach subcommittee at the January meeting.

Discussion of next meeting date and agenda

- *Next meeting:* The next meeting will take place on Monday, January 26th (moved due to holiday). The following meeting is rescheduled to February 23rd due to holiday.
- *Call for new agenda items:* none at this time.

Public Comment

- The Chair determined public comment could not be taken at this time due to the meeting having been extended.

Good of the Order

- Mike Doherty mentioned funding provided for Tribal stewardship to address climate change and coastal impacts.
- Rebecca Mahan shared information about the Northwest Training and Testing final Environmental Impact Statement. Comment is open until January 19th.

Adjourn

Chair LaTrisha Suggs adjourned the meeting at 7:15.