

ELEVATING EELGRASS PROTECTION IN THE SAN JUAN ISLANDS

Final Report for PEW
Charitable Trusts

San Juan County
Department of Environmental Stewardship



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January 2022



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Acknowledgments

This project would not have been possible without the participation of all the Eelgrass Protection Initiative Consortium (EPIC) partners. I'd like to take the opportunity to thank each and every one for their time and for being willing to contribute their expertise, observations, and ideas. EPIC grew out of conversations with Tina Whitman from Friends of the San Juans and Chris Guidotti from State Parks. Tina Whitman also assisted with the vessel monitoring surveys. Dana Oster from the Northwest Straits Commission also played a key role in advising on the structure of the work sessions and being willing to combine one of the sessions with the transboundary eelgrass protection group that she has established. I'd also like to thank the San Juan County Marine Resources Committee and especially those members that conducted vessel surveys: Phil Green, Christina Koons, Jeff Dyer, and Kailey Genter. EPIC was only made possible through the financial support of a Pew Charitable Trust grant and the willingness of the Northwest Straits Foundation to host the grant. Thank you particularly to Caroline Gibson who made this happen. We are grateful that Pew recognized the need and value of EPIC for the San Juan Islands. The contents of this report do not necessarily reflect the views and policies of PEW Charitable Trusts, nor does mention of trade names or commercial products constitute endorsement or recommendation for use.

This project is dedicated to the memory of Caroline Gibson, forever a champion for the Salish Sea.



MRC member Karin Roemers-Kleven examining an eelgrass bed exposed by low tides at False Bay on San Juan Island

Background

Flourishing eelgrass beds are vital to the recovery of our Salish Sea marine ecosystem and the iconic, but highly endangered Southern Resident killer whale. Over a third of the San Juan County's 408 miles of shoreline host eelgrass beds and meadows (comprised mostly of *Zostera marina*, Friends of the San Juans, 2004, Figure 1). Eelgrass habitat provides nursery and shelter to many species and also serves as a food source thus sustaining a plethora of nearshore organisms including ecologically, economically, and culturally important crab, forage fish, and juvenile Chinook salmon (Figure 2 and Figure 3, Christiaen, 2021, San Juan County Lead Entity 2022). Returning adult Chinook migrating back to their home waters through the islands and surrounding NW Straits counties (San Juan County Lead Entity 2022) are the primary food source of Southern Resident killer whales (Hanson et al. 2010, 2021) whose summer core critical habitat encompasses the San Juan Islands. Similar to the whales, eelgrass also holds cultural value to the regions' Coast Salish Tribes and First Nations (Pratt, 2022, Jamestown S'Klallam Tribe, 2016). It was traditionally used for food, and possibly also had technological and medicinal purposes. Both the leaf bases and the rhizomes of eelgrass were eaten, "*among the Kwakiutl the uncooked rhizomes, stems and leaf bases were a favorite feast food..... an entire tribe would be invited to an eelgrass feast... This feast was an important one, because the Kwakiutl believed eelgrass to be the food of their mythical ancestors.*" (Jamestown S'Klallam Tribe, 2016). This account of the importance of eelgrass as feast food and connection to their ancestors highlights the intricate linkage between the Kwakiutl and eelgrass. Eelgrass habitats not only provide important habitat functions and services (Christiaen 2021) they are also foundational to some of the Coast Salish Tribes linking them directly to their origins.



Figure 1. Eelgrass habitat in the San Juan Islands (green) and Pacific herring spawning locations (pink).



Figure 2 Dungeness crab in eelgrass. Photo: WA State DNR

Eelgrass habitats are foundational to the Salish Sea ecosystem and the Coast Salish culture but are sensitive to environmental and physical stressors. The need to strengthen the protection of eelgrass habitats was emphasized in recommendations #3, #4, and #5 by Washington State’s Southern Resident Orca Task Force (Southern Resident Orca Task Force, 2018), was highlighted as a critical component of the nearshore ecosystem in the San Juan County Marine Stewardship Area (MSA) Plan in 2007 (TNC: Evens and Kennedy 2007), the San Juan Ecosystem Protection and Recovery Plan (EPRP, San Juan County Local Integrating Organization, 2017) and is one of the 25 Vital Signs that the Puget Sound Partnership uses to track the progress of Puget Sound restoration and recovery. These local and regional plans all call for the need to reduce the rate of eelgrass decline, and the MSA Plan specifically recommends improved and coordinated policies for development, anchoring, docks, enforcement, and mitigation. Additionally, the state has a no net loss provision to protect the resource and requires compensatory mitigation should activities result in impacts to eelgrass bed extent.

While local and regional provisions are in place to protect eelgrass habitats, declines in the health and density of eelgrass beds in the San Juan Islands have continued. Like eelgrass habitats around the world, *Z. marina* in the San Juan Islands and surrounding region is sensitive to disturbance. Much disturbance may be attributed to human behaviors related to boating and shoreline modifications, however, eelgrass wasting disease has increased and may now be compounding restoration and protection efforts (Graham et al., 2021), particularly in the San Juan Islands. Annual monitoring by WA State Department of Natural Resources (DNR) has documented 4 times more sites with declines than increases in eelgrass cover around the San Juan Islands between 2000 and 2020. Sites with large declines include known Pacific herring spawning sites (e.g., Westcott Bay, Christiaen, 2021, Ferrier and Berry, 2010, Dowty and Ferrier, 2009). This contrasts with other parts of the Sound where the majority of sites remained stable or increased. The recent uptick in boating activity in the islands due to restrictions related to COVID-19 has led to increased concerns surrounding the impacts of boats, particularly related to anchors that can cause scarring. Scarring can result in eelgrass bed fragmentation, accelerating decline in the health and size of beds (Barry et al., 2020). Fortunately, human disturbances can be managed with focused attention on adjusting acceptable boater behavior.

The global pandemic has given us the opportunity to view the future which has underscored the urgent need to coordinate and leverage efforts at both the local and regional scale. A variety of work is currently underway to protect and restore eelgrass beds in the San Juan Islands, creating an excellent opportunity to integrate and leverage success through collective experience, and engaging individuals with a willingness to work together. Partners are well placed to create a model for wider regional implementation through:

- Developing and implementing meaningful solutions to compliance challenges through establishing jurisdictional partnerships and improving enforcement.
- Improving coordination of messaging and outreach methods for boaters.
- Strengthen initiatives to evaluate the effectiveness of eelgrass efforts.

These actions directly support WA State DNR's Aquatic Resources and Coastal Management priority response strategies (#2 and #3) established to advance climate resiliency through the protection and restoration of valuable marine habitat, and the recovery goals laid out in the Puget Sound Eelgrass (*Zostera marina*) Recovery Strategy (DNR, 2015).



Figure 3 Hooded nudibranch on an eelgrass blade. Image by Phil Green, San Juan County MRC

Project Goals

The goal of this project was to convene partners engaged in eelgrass conservation, research and recovery in San Juan County, forming the Eelgrass Protection Initiative Consortium (EPIC) to increase the effectiveness of eelgrass protection and recovery through voluntary and regulatory approaches in the San Juan Islands and surrounding region. We set out to achieve this through a combination of:

- Facilitating a series of online work sessions with partners from state, tribe and federal agencies, scientific researchers, local and regional non-profits, and the private sector to:
 - Improve interagency and partner coordination in eelgrass protection and recovery efforts.
 - Identify barriers and potential solutions to successful eelgrass protection, restoration, and education/outreach programs.
- Implementing a pilot monitoring effort to monitor vessel presence and compliance with volunteer anchor-out-zones within the County.

Project deliverables and approach

The following section lays out the core deliverables of this project and the general approach taken, including the methods associated with the vessel monitoring pilot study. The core deliverables for this project were as follows:

1. *Coordinate with research scientists, marine managers, and habitat protection enforcement agencies engaged in eelgrass habitat work.*
2. *Form a solutions-oriented consortium, EPIC, to develop multiple pathways forward including the establishment of new protective, anchor-out zones specifically to protect eelgrass.*
3. *Convene EPIC. This required identifying and inviting attendees, and developing the agenda, content and flow for four 2-hour virtual meetings designed to achieve project objectives.*

These deliverables were not mutually exclusive and therefore have been addressed simultaneously in terms of how the project was coordinated, how attendees were selected for invitation and how EPIC was formed. The structure, content and outcomes of virtual work sessions will then be summarized, along with the vessel monitoring efforts.

EPIC formation and coordination

Starting in February 2021 San Juan County Marine Program initiated the project by coordinating with the San Juan WA State Parks Manager, Friends of the San Juans, and the Northwest Straits Commission to identify individuals for participation. Marine and land managers, research scientists, regulators, non-profit representatives, individuals engaged in the private sector of marine surveying, and energy distribution, and the representatives of the recreational boating community were invited to participate (Table 1).

This resulted in the formation of the Eelgrass Protection Initiative Consortium (EPIC). Overall, a total of 64 individuals were invited to participate allowing for a comprehensive group with broad expertise in issues related to eelgrass protection and recovery participating on a regular basis. A full list of those invited and/or who participated is available in Appendix A1.

The project was managed through a dedicated google file that enabled the participant database to be kept up to date and shared with everyone. In addition, this file contained content and material for each work session and general resources gathered or shared over the course of the project. Access to this folder was made available to all invited participants.

Table 1. List of organizations invited to participate in EPIC

Type	Organization
Federal Agency	US Army Corp of Engineers NOAA National Park Service Fish and Wildlife Service
Coast Salish Tribal Nations	NW Indian Fisheries Commission Lummi Nation Samish Indian Nation Swinomish Indian Tribal Community Stillaguamish Tribe of Indians Tulalip Tribes
State Agency	Department of Natural Resources (DNR) Department of Fish and Wildlife (WDFW) State Parks Department of Ecology NW Straits Commission
Local Agency	Community Development Public Works Environmental Stewardship
Non-Profit	Friends of the San Juans NW Straits Foundation Preservation Trust Conservation District
Academia	University of Washington Friday Harbor Labs Cornell University
Other	OLPALCO Jen Jay Consulting Waggoners Cruising Guide

EPIC work sessions

Four work sessions were hosted over a six-month period in 2021. The first three sessions occurred in the spring prior to the Memorial Day weekend, traditionally the start of the boating season in the Salish Sea. These first three sessions were held on March 24, April 21, and May 13 (Table 2). The final work session took place in November once the main boating season had come to an end and vessel and eelgrass monitoring activities had been completed. The work sessions aimed to address:

- Facilitating interagency and partner coordination in eelgrass protection and recovery efforts in the San Juan Islands.
- Removing barriers to successful eelgrass protection, restoration, and education/outreach programs.
- Identifying and implementing coordinated pilot protection actions, and utilizing Community Based Social Marketing (CBSM) methods to address boater behavior.
- Assessing the effectiveness of implementation methods to advance regional eelgrass protection and recovery outcomes and create a model for regional implementation.

Table 2. Summary of EPIC work sessions. Session agendas and minutes are available in Appendices A2.

EPIC Session	Date	Content
1	March 24, 2021 1 – 4 pm	<ul style="list-style-type: none"> • <i>Who is doing what and where in the county – research/monitoring, restoration and protection.</i> • <i>Identify challenges.</i> • <i>Identify knowledge gaps.</i> • <i>Identify barriers to success (including jurisdictional).</i>
2	April 21, 2021 1 – 3:30 pm	<ul style="list-style-type: none"> • <i>A review of the barriers/challenges and their associated solutions identified in session 1.</i> • <i>Identification of different protection strategies, including identification for additional locations for anchor-out-zones in the San Juan Islands.</i> • <i>Identification of those engaged in outreach and what that might be.</i> • <i>Identification of who is engaged in, or interested in monitoring vessel presence and behavior at protection sites, eelgrass restoration efforts, etc.</i>
3	May 13, 2021 2 – 4 pm	<ul style="list-style-type: none"> • <i>Discuss the different goals and associated monitoring approaches used.</i> • <i>Discuss specific monitoring protocols related to 1) eelgrass presence & condition monitoring and 2) protection zone monitoring.</i>
4	November 22, 2021 1 – 3 pm	<ul style="list-style-type: none"> • <i>Summaries of monitoring and restoration activities conducted over the summer.</i> • <i>Summaries of challenges encountered.</i> • <i>Updates on progress to solutions of identified barriers.</i> • <i>Discuss how to continue the effort.</i>

While the meetings were held virtually due to the ongoing risks associated with the COVID-19 pandemic attendance was consistent and broad across groups (Appendix A1). To assist with ensuring that the goals of each meeting were met a number of tools were implemented. These included:

- Recording each meeting and making these recordings available to all participants.
- Making use of the breakout rooms on the zoom platform to allow smaller groups to engage on specific topics.
- Having a dedicated note-taker.
- Using a google jam board to collect participants input on challenges and barriers, solutions, and knowledge gaps and compiling these onto a community padlet.
- Partnering with the NWSC to combine an EPIC session (#3) with a transboundary group that is focused on eelgrass protection outreach and implementing anchor-out-zones.

Work session summaries

Session 1

The first session provided an introduction to EPIC and the goals of the project. The three-hour session was divided into two main parts comprised of focused roundtables. The first roundtable saw participants share information on eelgrass related efforts occurring within the county's waters. Dr. Bart Christiaen of the Department of Natural Resources highlighted the 90 eelgrass sites that DNR have been actively monitoring since 2000 using underwater videography. These efforts have shown that eelgrass in the San Juan Archipelago has become more fragmented and continue to decline. Dr. Drew Harvell, a marine ecologist and expert in marine diseases who has been studying eelgrass wasting disease in the San Juan Islands and throughout the Pacific Northwest also highlighted her concerns regarding eelgrass decline in the islands. Her team has been monitoring 9 sites within the islands and has documented eelgrass wasting disease. Some areas, such as Westcott Bay on the west side of San Juan Island, have experienced extensive declines in eelgrass. Friday Harbor Labs researcher, Dr. Sandy Wyllie-Echeverria shared the history of this decline with participants as well as the pilot restoration efforts that are currently underway at Bell Point within Westcott Bay. The loss of eelgrass in Westcott Bay is particularly concerning because this was once the largest spawning area for Pacific herring within the San Juan Islands.

The second roundtable focused on identifying the challenges and/or barriers that may be hindering current efforts to protect and recover eelgrass beds. Examples of issues identified included:

- The need to quantify the ecosystem services provided by eelgrass, particularly as a tool that could be used in efforts to change peoples' behavior around eelgrass (and kelp).
- Assess effectiveness of local regulations for conserving eelgrass beds.
- A need for better community planning.
- How to measure the impacts of vessels as well as manage vessels at sensitive sites.
- Permitting of protection zones and mooring buoys, and costs of buoy installation and maintenance.

Challenges related to buoy installation and maintenance were also identified as a barrier to seeing more protection zones installed. Stan Walsh representing the Swinomish Tribe highlighted the importance of combined approaches, e.g., while incentives for people to do the right thing should be used (whether that be while boating or for nearshore development) there also needs to be a regulatory backstop.

One of the core knowledge gaps identified was the need to identify the drivers of eelgrass decline. There is unlikely to be just one driver but rather a suite of reasons that vary spatially. Knowing what all the drivers are, and how they may vary by location will be critical as efforts to restore eelgrass habitat expand. It was generally agreed that by determining what is killing eelgrass it will be easier to determine what can be managed or controlled at the local level. While stressors such as temperature cannot be controlled locally, impacts from anchoring vessels can be. A better understanding of the multiple stressors will also aid in informing where to invest conservation or restoration efforts in response to warming events.

The key outcomes from session 1 included:

- A need for a shared data repository that also includes the driver data such as water quality.
- Resources database of published reports
- Produce detailed maps of where eelgrass is located so that boaters can avoid it.
- Involve boating groups when designing effective messaging
- Create working subgroups to focus on messaging, regulatory, monitoring.
- Include the WA Sea Grant Green Crab team due to concerns over European green crab invasions in eelgrass habitat.

Session 2

The second EPIC session summarized the outcomes of the first session where input had been shared to a google jam board. Participants highlighted the need to distinguish between restoration and preservation. Preserving and protecting healthy beds is an immediate action that can be taken, and the characteristics of healthy beds are known and can be used to identify candidate sites with valuable and resilient eelgrass beds. There was also discussion around the concept of no net loss as a management standard and whether or not it is actually effective. In many cases, particularly for smaller projects it is difficult to manage actions to ensure that there is no net loss of habitat, so it is rare that there is zero loss occurring. DNR scientists and managers shared that their data also suggests the no net loss policy has failed. This highlights the need to push toward a net gain standard instead. In addition, participants discussed actions such as increasing protection zones and providing additional public mooring buoys to reduce the impacts of anchoring vessels on eelgrass habitat, however, to ensure that such marine facilities are utilized by the boating community incentives may need to be developed and made available. One suggestion was to incentivize the ability to expand dock space and access at marinas where there is already impact, and thus reduce anchoring pressures on nearby vulnerable eelgrass habitats. Any actions that involve the installation of, or expansion or overwater structures (including mooring buoys) would have to be approached in such a way that they did not impinge on access to treaty and cultural resources by tribal members.

Incentives related to restoration efforts were also discussed, specifically within the context of 30 by 30 (S.Res 372) whereby 30% of US coastal waters are in protected areas by 2030 (US Department of Interior 2021). However more clarity is required around what protection means in the context of this initiative and how such an approach intersects with tribal sovereignty.

Other impacts that were added to the list included:

- Increased sedimentation resulting from both local and regional actions, especially related to the Fraser River.
- Increasing population in the islands and the increased use of desalination plants, septic systems, and sewer outfalls.
- Stormwater runoff was also highlighted as a potential cause of eelgrass decline, especially in areas that are more prone to siltation.

The WA Sea Grant Green Crab team lead was also in attendance and shared that while this region doesn't yet have the green crab densities as seen on the east coast, there have been some correlations between green crabs and eelgrass bed damage on east coast. Green crabs can damage beds directly through grazing and seed predation but their impact on eelgrass beds on the west coast is a knowledge gap.

The remainder of the session was divided into two roundtables, the first to identify protection options and sites for anchor-out-zones, and the second to identify those groups engaged in outreach and discuss ideas for developing outreach campaigns. Protection options included:

- Anchor-out-zones,
- Public mooring buoy systems,
- Broader engagement with landowners who own property adjacent to the marine environment,
- A review or assessment of septic systems adjacent to shallow embayments.

There are a number of sites that have already been identified as good candidates for anchor-out-zones in the islands. The county installed one on Lopez Island in February 2021 and 5 more (Hunter Bay, Westcott Bay, and three sites around Eastsound, Figure 4) are currently in the permitting phase in an effort being led by Friends of the San Juans (Friends). The locations currently under permitting are known herring spawning sites, popular anchorages or high-pressure areas such as some of the State Marine Parks. State Parks also has a voluntary anchor-out system that they are keen to reestablish. The NW Straits Commission is currently leading an effort to expand anchor-out-zones throughout the NW Straits region,

including in the islands. They have identified 9 [sites](#) in county waters that include those managed by the county, State Parks, and proposed by the Friends. However, not all locations are conducive to marker buoys, for example Blind Bay, on the north side of Shaw Island is a known herring spawning location, the site of a pilot restoration effort and an extremely popular anchorage site where marker buoys would be unlikely to be effective due to the presence of a small island (Figure 5 and Figure 6).



Figure 4. Locations of installed anchor-out-zones, and those currently in the permitting process for installation in 2022 in the San Juan Islands. The Odlin County Park location was installed by San Juan County the Marine Resources Committee in 2021. The remaining 5 sites are due to be installed by San Juan County and Friends of the San Juans in 2022 and are located where there is known Pacific herring spawning habitat, as indicated in pink.



Figure 5. Map showing Blind Bay, Shaw Island. This area is a popular anchorage area as well as one of the remaining spawning areas for Pacific herring in the San Juan Islands. The edges of the eelgrass beds are denoted in green and the Pacific herring spawning areas are highlighted in pink. The box highlights a particularly challenging area where boats regularly anchor but because of the location of Blind Island State Park this site would not be conducive to anchor-out-zone markers.

While voluntary anchor-out-zones are one option they do not work in every location, as shown by Figure 5. Thus, a combination of public mooring buoy systems and voluntary and/or regulated protection zones could be considered. While newer mooring systems may be more expensive to install, they also require less maintenance, reducing one of the barriers to public mooring systems. However, there are considerations surrounding how many mooring buoys can be installed in a location, including how they may impact access to marine resources especially for treaty fisheries. Anchor-out-zones are relatively straightforward to implement and are tangible short-term actions (once the permitting hurdle has been overcome). However, there are broader questions related to the capacity of the islands for boaters as well as population. Participants highlighted the need to support upgrades to marinas, pump-out stations and septic facilities.

A core component of any approach to reduce boater impacts to sensitive eelgrass habitats in the San Juan Islands and broader transboundary Salish Sea is communication and outreach to boaters. Groups on both sides of the border have initiated efforts over recent years including Friends. The Friends have produced an eelgrass map for boaters that highlights the depth contours (Figure 7). In addition to the map, Friends have developed a green boating guide that provides boaters with information and resources related to reducing their impact on the marine environment. This page also includes a series of short videos

<https://sanjuans.org/greenboating/>. The Waggoner Boating Guide has attempted to adapt the maps further to provide information specific to each popular anchorage sites in the islands, and some navigational software companies have begun to incorporate the Friends' eelgrass map into their systems. This is a direct example of proactive action on the part of the boating community and also provides an opportunity to improve partnerships and coordination to ensure that up to date spatial information is available across a broader array of software and informational platforms commonly used by the boating community.

Other boater outreach material has been produced by the Jefferson County Marine Resources Committee and the San Juan MRC has begun to incorporate messaging into boater information signage. There was agreement that there is a need to develop clear consistent messaging and branding, particularly as efforts to expand outreach throughout the region continue. The NW Straits Commission is spearheading a transboundary effort to lead the development of such a campaign with the goal of having consistency in buoy design, dockside signage, poster and other materials similar to the Be Whale Wise boater education campaign (www.bewhalewise.org).

Key outcomes from session 2:

- Improve or create county-wide mapping layers that highlight the core 'resilience features' for healthy eelgrass beds (e.g., good flow, cool temperatures, freshwater input).
- Create a dedicated eelgrass protection outreach campaign
- Expand partnerships with the boating communities to improve access to spatial information on locations of sensitive eelgrass habitats and tips on boater best practices.



Figure 6. An aerial photo of Blind Bay taken on September 6, 2020 showing over 40 boats over varying sizes at anchor in the bay. Photo: Adam Summers, Friday Harbor Labs.

ANCHOR OUT OF EELGRASS

Help recover salmon and orca by avoiding sensitive eelgrass and herring spawning habitats when boating in the San Juan Islands.



Figure 7. Boater guide to eelgrass habitats in the San Juan Islands created by Friends of the San Juans.

Session 3

Session 3 focused on monitoring approaches and was run as a combined session with the transboundary eelgrass group led by the NW Straits Commission. The session summarized monitoring methods currently in use including monitoring eelgrass habitat (e.g., by presence-absence in water surveys, aerial over flights, and scour recovery), vessel monitoring for compliance, density, and impact (e.g., scour presence), and the type of monitoring used for restoration efforts. In addition, participants discussed the different goals and monitoring approaches in use through a breakout session that saw participants choose between discussions on eelgrass presence and condition monitoring, or protection zone monitoring.

Participants discussed the types of monitoring that they have done, are currently engaged in, or that they would like to see occur. Past and current efforts included:

- Mapping the deep-water edge of eelgrass habitats throughout the county. This was first done in 2003 and participants were keen to see it repeated.
- Long-term monitoring is being conducted by DNR at 30 sites and researchers based out of the Friday Harbor labs are tracking health, disease prevalence and spread at 9 sites using a combination of underwater videography and snorkel surveys (Figure 8).
- pre- and post-monitoring of anchor-out-zones.
- Tracking vessel presence in popular embayments using a combination of AIS and aerial photographs.
- SCUBA and snorkel surveys conducted to collect data on bed boundaries, epiphytic growth on blades, and health.

Desired monitoring activities included:

- Assess the impacts of new over-water structure designs and how mitigation efforts may or may not benefit eelgrass habitats.
- Aerial surveys to monitor broad areas including anchor-out-zones. Aerial surveys can provide data on bottom scouring depending on depth, tidal state and weather conditions, as well as vessel presence and density.
- Seasonal monitoring

Aerial photography has been used in Padilla Bay, in neighboring Skagit County. The challenge with aerial survey data and digital imagery is in the amount of data generated and the time required to process the data. In 2009 San Juan County Marine Resources Committee commissioned an aerial survey effort of the county to assess vessel presence (Dismukes et al., 2010) and there is interest in repeating this, particularly as the county assesses what public marine infrastructure might be needed to mitigate the impacts of boaters. While the boating community would like to see more public mooring buoys a full assessment of mooring buoys in county waters is required first, particularly to determine status and identify illegal buoys. San Juan County is estimated to have ~2000 mooring buoys, approximately half of all mooring buoys in the inside waters of Washington State. While bringing unpermitted buoys into compliance where possible is desirable owners face challenges through the regulatory process, this is compounded by the general lack of enforcement at the state level. There is a lot of confusion over requirements and often more permits are required for a mooring buoy than a bulkhead which acts as a disincentive for people to do the right thing. Participants identified the need for greater agency communication at the state level as well as partnership between groups to allow legacy and/or abandoned marine infrastructure to be dealt with.

Session 3 culminated with the two breakout sessions to discuss monitoring related to eelgrass presence and condition, or protection zone monitoring. Discussions by the participants of the eelgrass presence and condition group included:

- The use of citizen scientists to help conduct snorkel surveys and the success of incorporating data from forage fish and kelp surveys into the state's habitat maps was used as an example. For

success there needs to be a clear connection to the research and feedback to those citizens involved.

- A need to determine what data are needed for permitting requirements. DNR shared that they rely on reviewing data from WDFW, DNR eelgrass maps, and coastal atlas in combination with site visits. There was a suggestion to create a centralized location for these data, but this comes with its own challenges, particularly related to keeping all the different sources of data current.

The value of volunteer efforts was also highlighted by the group discussing monitoring needs for protection zones. Jefferson MRC shared their approach to monitoring the protection zones they have established at Port Townsend. On San Juan Island the National Park Service has a robust volunteer program ready to engage in monitoring vessels and an anchor-out-zone at Westcott Bay. The State Parks manager, Chris Guidotti suggested that members of EPIC collaborate to monitor an area with known eelgrass decline before and after installing a protection zone at the site. This would improve our understanding of the impact of boats on eelgrass decline and more importantly, the effectiveness of anchor-out protection zones.

Key outcomes from session 3:

- Create a database of all the monitoring activities, methods used, and locations implemented as well as who is conducting the monitoring in the county. Use the database to both map the monitoring activity as well as create an inventory that can also be used to help identify gaps.
- EPIC partners collaborate to identify resources available for DNR and the county to survey buoys and other legacy marine infrastructure in the county, assess status and remove derelict and where possible unused buoys.
- Submit Letter of Intent grant application to Puget Sound Partnership to apply drone technology to advance eelgrass and kelp protection, monitoring and recovery through targeted assessments.



Figure 8. An example of footage collected via towed underwater videography. Photo: WA State DNR.

Session 4

The goal of the fourth and final work session of the 2021 EPIC effort was to review the monitoring and restoration efforts that took place in 2021, as well as to discuss any challenges encountered. The group also provided suggestions as to how to continue the collaborative effort.

Monitoring for vessel presence, density and compliance with anchor-out-zones occurred over the 2021 boating season. DNR also surveyed their long-term sites in the San Juan Islands however this data is not due to be analyzed until 2022. The MRC monitored vessel presence at 3 sites and presence and compliance with the one anchor-out site at Odlin County Park (Figure 4, and Figure 9). The Friends assisted the MRC with vessel surveys at Fishing Bay and Crescent Beach on Orcas Island (Figure 4, for more details on this monitoring effort please see the next section of this report). A research team led by Dr. Sandy Wyllie-Echeverria also tracked vessel presence and density at 11 bays using a combination of AIS and aerial survey data. This effort was presented to the MRC in January 2022. State Parks continued to count vessels at their marine parks in the San Juan Islands and reported that the numbers of larger cruising vessels appeared to decrease back to pre-COVID levels.

A restoration effort being conducted by University of Washington's Friday Harbor Labs and the San Juan Islands Conservation District, designed to initiate recovery of eelgrass through two primary methods, transplanting and seed dispersal, continued through 2021. The team reported success with their seed collection and culturing efforts, (Wilmerding et al., 2021, Brown et al., 2021) and some of those seeds are due to be deployed at the test sites at Bell Point, Wescott Bay and Blind Bay, Shaw Island.

WA State Parks are in the process of overhauling their mooring buoy system and replacing and expanding their voluntary anchor-out-zones. They reported agency momentum to see their protection zones re-established and permitting is underway despite their resource limitations. San Juan County has hired an Environmental Inspector whose is charged with tackling environmental compliance issues within the county, including shoreline compliance and over water structure issues.

Session 4 concluded with a discussion of how the group wanted to see EPIC evolve. There was broad interest in continuing to meet on an annual or biannual basis with meetings that are focused on single topic areas such as disease, restoration, protection etc. Such efforts would also provide an opportunity for the group to share progress and resources, maintain the network and partnerships and overall momentum gained through 2021.



Figure 9. A newly installed anchor out buoy demarcating the protection zone at Odlin County Park, Lopez Island

Key outcomes of session 4:

- Continue EPIC by convening annual or semiannual topic specific meetings akin to a marine managers group.
- Collaborate with DNR, Friends, the UW Friday Harbor Labs, MRC and NPS to create a pilot citizen science monitoring study to compile local knowledge on the presence and distribution of *Phyllospadix* and apply for grants to support project.
- Consider re-submitting the proposal to apply drone technology to advance eelgrass and kelp protection, monitoring and recovery through targeted assessments.
- Share information on eelgrass presence, anchor-out protection zones and new buoy locations with the boating community.

Vessel monitoring

The San Juan County Marine Resources Committee (MRC) and Friends of the San Juans (Friends) participated in a pilot vessel monitoring effort over the boating season in 2021 to monitor vessel compliance and/or presence at four sites around the San Juan Islands. These sites included Odlin County Park on Lopez where an anchor-out protection zone was installed in February 2021 (Figure 10), Bell Point in Westcott Bay on San Juan Island where a pilot eelgrass restoration project is currently located, and Fishing Bay and Crescent Beach, Orcas Island (Figure 4). The latter three locations are expected to have anchor-out-zones installed in 2022 and are also known herring spawning sites.



Figure 10. Map showing the locations of the three anchor-out-buoys installed along the outer edge of the eelgrass bed at Odlin County Park in February 2021. The green line highlights the outer edge of the eelgrass bed and the pink circles show the location of the anchor out buoys.

MRC members and Friends visited their respective sites multiple times throughout the summer including on busy holiday weekends, regular summer weekends and weekdays. Each survey consisted of counting the numbers of boats present at anchor (or on mooring buoys if present), and for Odlin County Park, the only site with an installed anchor-out-zone, how many boats were inside and how many were outside the protection zone. In addition, observers recorded the date, time, tide height, weather conditions (clear, cloudy, heavy rain, light rain, fog/mist/smoke), whether photos were taken and what type of camera was used. An example of the protocol and monitoring data form is available in Appendix A3.

Overall, 27 surveys were conducted during the monitoring period (June 26 – September 25). The majority of vessels were recorded at the Bell Point site on the west side of San Juan Island. Figure 11 and Figure 12 provide the view from the Bell point site and examples of a low boat count view (Figure 11) and a higher boat count view (Figure 12). The highest number of boats in one count was 28 (recorded from Bell Point on July 30), while the lowest was zero boats (recorded at Eastsound on September 12, Crescent Beach on July 17, and at Odlin July 6, August 1, and September 25). At Odlin, no boats were recorded inside the anchor-out-zone. An average of 0.67 boats per scan were recorded at anchor outside the buoys. The average number of boats per scan at each site are shown in Figure 13.



Figure 11. An image composite of Westcott Bay taken from Bell Point on June 28 showing boats both anchored and underway.



Figure 12. An image composite of Westcott Bay taken from Bell Point on August 23 showing boats both anchored and underway.

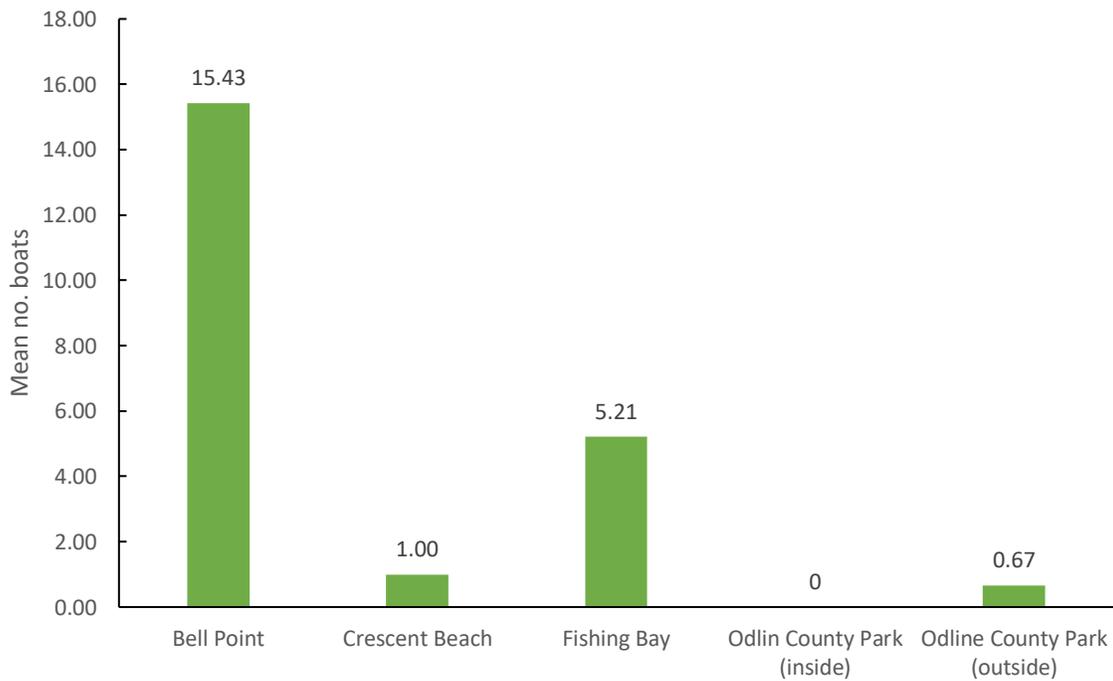


Figure 13. Summary of vessel count data per site showing the average number of boats present at each site over the monitoring period. For the Odlin County Park site where San Juan County installed an anchor-out-zone in 2021 the data show the average number of vessels recorded within the anchor out zone and the average number recorded outside the anchor-out-zone.

The MRC will continue their vessel monitoring effort in 2022 and 2023 and expand sites to include Blind Bay on Shaw Island. Compliance monitoring will be incorporated as anchor-out-zones are installed at Bell Point and Eastsound.

Coast Salish perspectives

Local Coast Salish tribes, as well as the Northwest Indian Fisheries Commission were invited to participate in EPIC sessions. Staff or representatives from the Samish Indian Nation, Swinomish Indian Tribal Community and the Tulalip Tribes joined at least one EPIC session and/or provided additional insight through follow up phone calls. None of the tribes are currently conducting eelgrass research or monitoring efforts within San Juan County though the Samish are directly involved in eelgrass monitoring at Padilla Bay, in neighboring Skagit County and the Tulalip Tribes have recently begun to invest more resources into eelgrass and kelp surveys given the importance of these marine vegetation species and the habitats that they create in the intertidal zone for salmon. Capacity to conduct the monitoring and research was noted as one of the challenges to eelgrass and kelp efforts by some of the tribes. An interest in incorporating more indigenous knowledge into research and monitoring was also noted but for some is currently limited by capacity. The Samish provide a great [example](#) of this with their kelp work in the San Juan Islands and a project such as this may also be possible for eelgrass. Projects that meld indigenous knowledge and western science together also provide a means of connecting not only the science to the local communities, but also the cultural importance of these habitats and the long-term benefits to salmon and other species that they bring. Other challenges noted included impacts from anchored vessels and projects such as dredging.

To address impacts related to boating (e.g., mooring buoys) and dredging the tribes will often use a policy platform to ensure protection of eelgrass habitats. All projects requiring a federal Army Corp of Engineers permit will be reviewed by tribes with treaty and/or cultural interests in the project site. This federal permit review process allows the tribes to carefully review projects for any impact to fisheries and other issues that concern them, such as impacts to eelgrass and kelp habitats. For example, where projects have the potential to impact eelgrass habitats, the Swinomish Indian Tribal Community now require an additional 16-foot buffer. The Swinomish have also been able to use this process to request project proponents to salvage and replant areas that would be damaged, especially in the case of dredging for navigational safety requirements. They have seen some reasonable success with these projects, highlighting the importance of using these policy route. There are opportunities for local governments to build on their government-to-government relationships with local tribes and establish partnerships that promote the development of effective local regulations and guidelines to ensure good project designs that work to limit impacts to these sensitive habitats as well as partner on outreach and messaging surrounding the importance of eelgrass habitats and boater's behavior and choices. However, any initiatives to protect eelgrass habitat from the impacts of development and boaters should first consider if they would impair access to traditional fishing areas or shellfish beds. For example, concerns related to mooring buoy and anchor-out-zone approaches include:

- Mooring buoy fields creating a barrier to traditional fishing areas and shellfish beds.
- If gill netting occurs in nearshore areas where eelgrass is also present, then anchor-out-zones may not be compatible.

Project outcomes

This project set out to create a group focused on eelgrass protection and recovery in the San Juan Islands. The result was the Eelgrass Protection Initiative Consortium (EPIC) that consisted of state agency, tribes, research scientists, local non-profits and private sector partners coming together over a series of four virtual work sessions to identify the barriers to their eelgrass efforts, discuss solutions and implement some pilot monitoring activities. The EPIC effort established new partnerships and collaborations that will more effectively progress efforts for eelgrass protection and recovery in the islands and throughout the Salish Sea region.

The key outcomes from EPIC have included:

1. An identification of the key challenges/barriers, solutions and also knowledge gaps related to eelgrass protection and recovery efforts in the San Juan Islands. These were organized onto a Padlet (Figure 14), a collaborative online tool to make and share content with others (www.padlet.com). The identified solutions were split into short-term (1-5 years) and long-term (5-10 years) actions. The core challenges identified were either the result of direct human behavior, indirect human behavior, or ecological challenges. Challenges resulting directly from human behaviors fell broadly under shoreline development planning, infrastructure, jurisdictional, and regulatory areas, while challenges indirectly linked to human behaviors included impacts of climate change, sedimentation, and invasive species. Challenges identified as ecological included limited restoration and monitoring funding, data gaps, comprehensive mapping, and impacts of predators. The solutions were organized into similar categories with the addition of 'Research' and 'Community Engagement'. The live EPIC Padlet can be viewed here: <https://padlet.com/francesr/EPIC> and the full lists are available in Appendix A4.
2. Identifying the need for a coordinated outreach and communications campaign that can be implemented Salish Sea wide and that directly involves the boating community as the key target audience. This effort is currently underway, led by the NW Straits Commission. It is building off the outreach and voluntary anchor-out-zone efforts of Jefferson MRC, San Juan MRC, Friends. It will include:
 - Detailed maps of eelgrass presence, anchor-out-zones, and public mooring buoys.
 - Best practice guidelines or tips
 - Consistent branding for signage and buoys
3. Explore the feasibility of creating a series of centralized databases to house published reports, a shared data repository, and a database of all monitoring activities (to include methods used, and locations implemented as well as who is conducting the monitoring) in the county. The Resources database has begun, and the monitoring database is in the planning stages. This monitoring database will be integral to creating an inventory that can also be used to help identify gaps. San Juan County provides a suitable area to pilot this effort before expanding to the surrounding region and the NW Straits Sound IQ (<https://nwstraits.org/our-work/soundiq/> provides platform that is already available. A component of this will be to improve or create county-wide mapping layers that highlight the core 'resilience features' for healthy eelgrass beds (e.g., good flow, cool temperatures, freshwater input).
4. Improved interagency and partner coordination. For example, WA State Parks are now in discussion with WA State DNR to obtain a bedlands withdrawal to enable to State Parks to enforce their anchor-out-zones.
5. There was much interest in continuing EPIC by convening annual or semiannual topic specific meetings akin to a marine managers group, in addition members made recommendations to

create subject specific subgroups to focus on messaging, regulatory, and monitoring. Currently the ongoing outreach and anchor-out-zone transboundary group meetings led by the NW Straits Commission is a group that is focused on messaging and outreach and numerous EPIC members are already engaged in this group. This group would also build off the partnerships established through EPIC to pursue grant opportunities for collaborative studies, examples of such collaborations include:

- WA State DNR, WA State Parks, San Juan County MRC, UW Friday Harbor Labs: Apply drone technology to advance eelgrass and kelp protection, monitoring and recovery through targeted assessments.
 - WA State DNR, Friends of the San Juans, UW Friday Harbor Labs, San Juan MRC, National Park Service: Create a pilot citizen science monitoring study to compile local knowledge on the presence and distribution of *Phyllospadix* utilizing online tools including the Seagrass Spotter app (seagrassspotter.org).
 - EPIC partners collaborate to identify resources available for WA State DNR and San Juan County to survey buoys and other legacy marine infrastructure in the county, assess status and remove derelict and where possible unused buoys. The Swinomish Indian Tribal Community have successfully done this in Skagit Bay in partnership with WA DNR providing a roadmap for San Juan County to achieve a similar effort.
 - Collaboration with Nature Conservancy to install anchor-out-zones on the north and southeast sides of Yellow Island.
6. Implement a citizen science vessel monitoring program to collect data on vessel density and compliance with anchor-out-zones. This effort will be continued in 2022 and expanded to also include Blind Bay, Shaw Island. The San Juan MRC is also seeking to implement an aerial survey to determine vessel density within county waters during the typical boating season (Memorial Day weekend to Labor Day weekend). These efforts compliment the vessel presence and density study that was conducted by EPIC members at the UW Friday Harbor Labs during 2020 and 2021. Understanding where vessels are, the embayments that are most popular and when is a crucial part to developing the effective and impactful actions and policies to mitigate the effects of vessels on sensitive eelgrass habitats.

Actions for Implementation

As a result of the 2021 EPIC effort, we expect to implement the following actions in 2022:

- Conduct vessel presence and compliance monitoring at a minimum of 5 sites around the islands.
- Install 5 additional anchor-out-zones and explore funding with Nature Conservancy for additional zones at Yellow Island Reserve.
- Support House Bill 1661 in the WA State Legislature. This bill is to conserve and restore kelp forests and eelgrass meadows in Washington State in part through establishing a kelp forest and eelgrass meadow health and conservation plan that endeavors to, by the year 2040, conserve and restore at least 10,000 acres of kelp forests and eelgrass meadows.
- Conduct aerial survey to assess vessel density in the San Juan Archipelago
- Conduct mooring buoy study to assess presence and status
- Create a pilot study to engage EPIC partners and other community members in Seagrasses monitoring using the Seagrass Spotter app to expand knowledge of spatial extent of *Phyllospadix*.
- Reconvene as a Marine Managers Group of San Juan County and increase efforts to engage federal and tribal partners.

Conclusion

The EPIC effort was timely and needed. There has been a wish for greater engagement and coordination between local partners working to protect and restore eelgrass beds in the San Juan Islands for considerable time. While this effort was restricted to online virtual workshops that inevitably saw participants suffering from zoom fatigue resulting in some loss of momentum, the eagerness to engage and broaden partnerships remains. EPIC has been the ideal forum to initiate ideas for elevating efforts focused on eelgrass protection. These project ideas will now be implemented through coordinated approaches and collaborations generated by EPIC. Going forward EPIC will be pivotal in crafting site specific guidance on where to prioritize protection and restoration efforts in the San Juans, not only for *Z. marina* but also other species of seagrasses such as *Phyllospadix* that may be more sensitive to extreme temperature spikes, such as that experienced in late June 2021. In conclusion, EPIC has created a valuable platform from which to build and expand efforts focused on eelgrass protection and restoration in the San Juan Islands that will also serve as an example for what can be achieved throughout the wider Salish Sea region.

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Appendices

A1: List of contacts and attendees

NAME	AFFILIATION	EMAIL	Expertise/eelgrass focus	Session 1	Session 2	Session 3	Session 4
Frances Robertson	San Juan County	francesr@sanjuanco.com	San Juan County Marine Program coordinator and lead staff for MRC. The one that has dragged you all into this effort.	[Green]			
Pema Kitaeff	Note taker/FHL	pema@uw.edu	Dive safety officer at FHL, experience in eelgrass surveys. Official note taker for these work sessions.	[Green]			
State Agencies							
Gabe Harder	DNR	GABRIEL.HARDER@DNR.WA.GOV	Aquatic Land Manager for the San Juan County Region	[Green]			
William House	DNR	Bill.House@dnr.wa.gov	Habitat stewardship specialist, Conducts Permit reviews for land-use applications on aquatic lands.	[Green]			[Yellow]
Helen Berry	DNR	HELEN.BERRY@DNR.WA.GOV	manager of the Nearshore Habitat Program at the Washington Department of Natural Resources. Her interests include management, protection, and monitoring of marine resources	[Green]			
Jeff Gaeckle	DNR	JEFFREY.GAECKLE@DNR.WA.GOV			[Green]	[Green]	
Bart Christiaen	DNR	Bart.Christiaen@dnr.wa.gov	Natural Resources scientists with WA State DNR. Works with the nearshore habitat monitoring team on the Puget Sound-wide eelgrass monitoring program. https://www.dnr.wa.gov/programs-and-services/aquatics/aquatic-science/nearshore-habitat-eelgrass-monitoring	[Green]			
Chris Guidotti	State Parks	CHRIS.GUIDOTTI@PARKS.WA.GOV	Manager for State Parks in San Juans. Runs a mooring buoy program, including anchor-out-zones at marine state parks and undertakes environmental protection action.	[Green]			
Lisa Lantz	State Parks	Lisa.Lantz@parks.wa.gov					
Joelene Boyd	State Parks	joelene.Boyd@PARKS.WA.GOV	WA State Parks Environmental Planner	[Green]			[Green]
Kira Swanson	State Parks	Kira.Swanson@Parks.WA.GOV	WA State Parks Environmental lanner - for Parks in San Juan County	[Green]			[Green]
Andrea Thorpe	State Parks	Andrea.Thorpe@PARKS.WA.GOV					
Marcus Reeves	WDFW	MARCUS.REAVES@DFW.WA.GOV	WDFW biologist, conducts permit reviews and has a regulatory interest in eelgrass efforts especially with regard to coordinating with WDFW enforcement.	[Green]			
Bob Warriner	WDFW			[Green]			
Tim Quinn	WDFW	Timothy.Quinn@dfw.wa.gov	Habitat Program				[Green]
Sylvia Yang	Padilla Bay	sylvia.yang@ecy.wa.gov	Research Coordinator at Padilla Bay - conducts long-term monitoring of eelgrass habitats and communities.	[Green]			

NAME	AFFILIATION	EMAIL	Expertise/eelgrass focus	Session 1	Session 2	Session 3	Session 4
Dana Oster	NWSC	oster@nwstraits.org	Marine Program Manager for the NWSC. Has created a transboundary eelgrass anchor-out-zone group with a focus on outreach messaging and establishing voluntary Anchor-out-zones.	[Green]			
Ron Thom	NWSC	thom.ronald@gmail.com	Former Governor's appointee to the Northwest Straits Commission and past chair of the Northwest Straits Commission's Science Advisory Committee. Ron brings a wealth of knowledge and expertise to the NWS initiative.				[Green]
Monica Montgomery	Jefferson MRC	monica.montgomery1@wsu.edu	Jefferson MRC Lead Staff: Manages the Jefferson MRC voluntary anchor-out-zones around Port Townsend.	[Green]		[Green]	[Green]
Federal Agencies							
Jordan Bunch	Corp of Engineers	JORDAN.A.BUNCH@USACE.ARMY.MIL	Biologist tasked with permit application processing				
Jen Steger	NOAA	Jennifer.steger@noaa.gov					
James Selleck	NOAA	JAMES.SELLECK@EARTHLINK.NET	Marine Ecologist				
Sarah Dolan	NPS	Sara_Dolan@nps.gov	Outreach coordinator for NPS in San Juan County. Interested in assisting with vessel monitoring activities at the Bell Point Site at English Camp on San Juan Island	[Green]			
Jeff Hodge	NPS	jeffery_hodge@nps.gov	Interpretive ranger for San Juan National Parks			[Green]	[Green]
Teal Waterstrat	FWS	teal_waterstrat@fws.gov	Recovery Implementation Program Coordinator				[Green]
Tribes							
Cecilia Gobin	NW Indian Fisheries Commission	CGOBIN@NWIFC.ORG	Conservation Policy Analyst and NW Straits Commissioner				
Todd Woodard	Samish DNR	TWOODARD@SAMISHTRIBE.NSN.US	Director of the Samish Nation DNR. Has conducted long-term monitoring of eelgrass in Fidalgo Bay, is particularly interested in restoration efforts and how WCC crews could help with monitoring efforts.	[Green]			
Jodi Bluhm	Samish DNR	jbluhm@samishtribe.nsn.us	Samish DNR Manager.	[Green]			
Sarah Wheatley	Samish DNR	swheatley@samishtribe.nsn.us	Project Lead for eelgrass monitoring in Fidalgo Bay for Samish DNR.	[Green]			
Mick McHugh	Tulalip	mmchugh@tulaliptribes-nsn.gov	Shellfish Program Manager				
Todd Zackey	Tulalip	TZACKEY@TULALIPTRIBES-NSN.GOV	Program Manager for the Tulalip Tribes Marine and nearshore program.				
Ryan Miller	Tulalip	rmiller@tulaliptribes-nsn.gov	Environmental Liaison Natural Resources Treaty Rights Office.				

NAME	AFFILIATION	EMAIL	Expertise/eelgrass focus	Session 1	Session 2	Session 3	Session 4
Devin Robinson	Tulalip	drobinson@tulaliptribes-nsn.gov	Field Biologist, lead for eelgrass and kelp efforts				
Lisa Watson	Lummi	LISAW@LUMMI-NSN.GOV					
Stan Walsh	Swinomish	SWALSH@SKAGITCOOP.ORG	Environmental Services Manager with the Skagit River System Cooperative. - Provide policy recommendations for the Swinomish Indian Tribal Community and the Sauk-Suiattle Indian Tribe.				
Sara Thitipraserth	Stillaguamish	sthitipra@stillaguamish.com	Director of Stillaguamish DNR				
San Juan County							
Christine Conway	SJC Public Works - Roads	christinec@sanjuanco.com	Project engineer at San Juan County Public Works, managing marine facilities.				
Byron Rot	SJC Public Works - ER	BYRONR@SANJUANCO.COM	Environmental project manager in the San Juan County Environmental Resources Division focusing on nearshore restoration and watershed management.				
Sam Whitridge	SJC Public Works - ER	samw@sanjuanco.com	Salmon Recovery Coordinator for San Juan County with the Environmental Resources Division.				
Julie Thompson	SJC DCD	juliet@sanjuanco.com	Planner with San Juan County Community Development. Conducts permit reviews, particularly for shoreline developments.				
Christina Koons	Marine Resources Committee		Chair of MRC, participates in vessel monitoring for Eastsound.				
Phil Green	Marine Resources Committee		MRC member, participates in vessel monitoring for Bell Point, Westcott Bay.				
Cathleen Burns	Marine Resources Committee		MRC Member (2019-2021)				
Jeff Dyer	Marine Resources Committee		MRC member, participates vessel monitoring for Odlin County Park.				
Research Scientists							
Drew Harvell	UW Friday Harbor Labs/Cornell University	CDH5@CORNELL.EDU	Recently retired professor at Cornell, now based at the Friday Harbor labs continuing research on eelgrass wasting disease both in the County and throughout the PNW coast.				Sent material
Sandy Wyllie-Echeverria	UW Friday Harbor Labs	zmseed@u.Washington.edu	Resident Scientist at Friday Harbor Labs, collaborating on an eelgrass restoration effort with two sites in the San Juans - Bell Point in Westcott Bay and Blind Bay on Shaw Island. Using 3 different methods for plantings including seed buoys, also pioneering a seed culturing system at the labs				

NAME	AFFILIATION	EMAIL	Expertise/eelgrass focus	Session 1	Session 2	Session 3	Session 4
Brooke Sullivan	UW Friday Harbor Labs	sulli@uw.edu	Eelgrass biologist and lecturer at FHL.				
Tom Mumford	UW Friday Harbor Labs	tommumford44@gmail.com	Retired DNR Nearshore Ecologist, started the eelgrass monitoring program in 2000.				
Elizabeth Nilles	UW Friday Harbor Labs	enilles@uw.edu	Undergraduate student at FHL working with Sandy Wyllie-Echeveria				
Yuki Wilmerding	UW Friday Harbor Labs	yw13174.2013@my.bristol.ac.uk	Undergraduate student at FHL working with Sandy Wyllie-Echeveria				
Emily Grason	WA Sea Grant	egrason@uw.edu	Marine ecologist and crab team program manager				
Mike Ramsey	Independent Researcher	miker761@gmail.com	Leading the restoration effort underway in the San Juans. Former Director of the San Juan Conservation District.				
Non-Profits							
Lisa Kaufman	Northwest Straits Foundation	kaufman@nwstraitsfoundation.org	Manage shoreline restoration projects on behalf of the Foundation and MRCs.				
Tina Whitman	Friends of the San Juans	TINA@SANJUANS.ORG	Science Director at Friends of the San Juans. Has been mapping eelgrass throughout the county and creating boater education material. Also involved in marine infrastructure mapping in the county. Tina is a member of the Salmon Recovery Technical Advisory Group and is currently funded to install 2 voluntary anchor-out-zones at Bell Point in Westcott Bay, and Eastsound, Orcas Island.				
Jess Newley	Friends of the San Juans	jess@sanjuans.org	Marine Science Coordinator at Friends of the San Juans. Involved in forage fish spawning surveys and providing eelgrass boater education material to boating groups in the region.				
Kathleen Foley	Preservation Trust	kathleenf@sjpt.org	Stewardship Manager				
Paul Andersson	Conservation District	paul@sjicd.org	Director of the Conservation District.				
Private Sector							
Chris Betcher	JEN JAY	Chris@jenjayinc.com	Senior Biologist and owner of Jen Jay Inc, a commercial diving and underwater biological company based in the San Juans. Chris has been surveying eelgrass in the County since the late 1980s.				
Beth Tate	JEN JAY & MRC	beth@jenjayinc.com	Lead Biologist at Jen Jay Inc and San Juan County MRC member.				

NAME	AFFILIATION	EMAIL	Expertise/eelgrass focus	Session 1	Session 2	Session 3	Session 4
Terry Turner	OLPALCO	TTurner@opalco.com	The eelgrass issue has long been an integral part of the core business of supplying power to the San Juan Islands, and OPALCO has played a big role in the past in regard to identifying effective (and sometimes ineffective) methods of marine construction and mitigation that protect this resource while continuing to build and maintain the underwater infrastructure that we all depend on.	■			■
Lorena and Lenard Landon	Waggoners Cruising Guide	london@waggonerguide.com	Owners and editors of the Waggoners Cruising Guide provide resources to recreational boaters throughout the Pacific NW.	■	■		■

A2: Work session agendas and minutes



ELEVATING EELGRASS PROTECTION IN THE SAN JUAN ISLANDS

Wednesday, March 24, 2021
1:00 – 4:00 pm



Virtual Meeting via Zoom, [Join Zoom Meeting](#)

Meeting ID: 823 8632 5723
Passcode: 958034
Call in number:
+1 253 215 8782 US

Agenda

1:00 pm	<p>Welcome Frances Robertson, Marine Program Coordinator, San Juan County Coast Salish Acknowledgement <i>Let us acknowledge we reside on the ancestral lands and waters of the Coast Salish people who have called this place home since time immemorial and let us honor inherent, aboriginal and treaty rights that have been passed down from generation to generation.</i></p>
1:10 pm	<p>Introduction to EPIC – Frances Robertson <i>What is EPIC and why are we convening.</i> <i>Summary of main goals of these work sessions</i></p> <ul style="list-style-type: none"> • <i>Facilitating interagency and partner coordination in eelgrass protection and recovery efforts in the San Juans.</i> • <i>Removing barriers to successful eelgrass protection, restoration, and education/outreach programs.</i> • <i>Identifying and implementing coordinated pilot protection actions, and utilizing Community Based Social Marketing (CBSM) methods to address boater behavior.</i> • <i>Assessing the effectiveness of implementation methods to advance regional eelgrass protection and recovery outcomes and create a model for regional implementation.</i>
1:30 pm	<p>Round Table Part I – All Participants <i>Participant introductions</i> <i>Identify organization/agency</i> <i>Area of interest (research/monitoring, restoration, protection)</i> <i>Share key efforts regarding eelgrass in County waters</i></p>
2:15 pm	<p>Leg-stretch tea break</p>
2:30 pm	<p>Round Table Part II – All Participants <i>Identify challenges/barriers that may be hindering efforts.</i> <i>Identify core knowledge gaps</i></p>
3:30 pm	<p>Wrap Up – Frances Robertson <i>Identify who is missing from group for post-meeting follow up</i> <i>Session 2 overview</i></p> <ul style="list-style-type: none"> • <i>Goals of session</i> • <i>Solutions to identified barriers</i> • <i>Discussion of current, planned, & future anchor our zones</i> • <i>Identify other protection options</i> • <i>Boater education material -the need for unified effective messaging.</i> <p><i>Session 3: Identify who is interested in participating in monitoring session.</i></p>
4:00 pm	<p>Adjourn meeting</p>

in Attendance: Chris Betcher, Jodi Bluhm, Jolene Boyd, Cathleen Burns, Christine Cory, Bart Christiaen, Sara Dolan, Phil Green, Chris Guidotti, Drew Harvell, William House, Pema Kitaeff, Lorena Landon, Monica Montgomery, Tom Mumford, Jess Newley, Elizabeth Niles, Dana Oster, Marcus Reaves, Frances Robertson, Byron Rot, Kira Swanson, Beth Tate, Julie Thompson, Terry Turner, Stan Walsh, Bob Warriner, Sarah Wheatley, Tina Whitman, Sam Whitridge, Todd Woodward, Sandy Wyllie-Echeverria, Sylvia Yang

1:06 PM **Welcome**, purpose of meeting is to bring together eelgrass interests. Open with Coast Salish Acknowledgement: *Let us acknowledge we reside on the ancestral lands and waters of the Coast Salish people who have called this place home since time immemorial and let us honor inherent, aboriginal and treaty rights that has been passed down from generation to generation.*

1:08 PM Introduction to EPIC *Frances Robertson*
EPIC is the Eelgrass Protection Initiative consortium, funded by Pew. There will be 4 sessions, 3 for Spring one scheduled for Fall. Hope to do some pilot monitoring efforts throughout summer. Today, Session 1 – who’s doing what in terms of research/monitoring, etc. and identify challenges Session 2 on 4/21 – solutions to barriers and what’s achievable, discussion of boater education Session 3 – mid May date to be determined, focus on protection and monitoring details

1:14 PM **Round Table Part I** – all participants, general introductions around the virtual room
-Bart Christiansen shares screen showing 90 eelgrass sites monitored since 2000 using underwater videography. In SJI’s eelgrass has become more fragmented and continues to decline.
-Drew Harvell shares screen to show figure from Groner et al (in review MEPS) with monitoring data for 9 sites in SJI’s, we’re concerned about disease and its effects on eelgrass
-Jess Newley shares screen, shows resources on Friends website (see *Resources* at end of Minutes)
-Sandy shares screen, shows history of last 2 decades of eelgrass decline and restoration methods at Bell Point in Westcott Bay. Recommends a database of published reports (academic/agency, etc.)

2:01 PM General questions
QUESTION for Drew: why is wasting disease so prevalent here where it’s relatively cool?
Drew: Likely has to do with local adaptation. Data along range shows high temperature *anomalies* result in the highest hits, not just heat. Last summer wasn’t too warm and plants did relatively well
QUESTION: is disease most prevalent in intertidal or largely in subtidal beds?
Olivia Graham has been monitoring sites in SJI’s, finds disease incidence usually lower in subtidal.
Bart: In some places, like Salmon Bank, eelgrass is deeper. Depth of subtidal grass depends on many factors. Tends to grow deeper in SJI’s, down to -5 or 6m, whereas other places more like -4m.
QUESTION: do you see other diseases on west coast, not just LABY?
Drew: yes there are a few other strange signs of other diseases not yet backed up by PCR diagnostics, also other strains of the *labyrinthia zostera*
Todd: what about green crab as a part of this discussion? We’re concerned about that in Samish and Padilla Bay. Someone from crab team should be invited – Emily Grason

2:15 PM Leg-stretch/tea break

2:18 PM QUESTION (in the chat) for Sandy: Are seeding buoys currently in place in Westcott Bay? How many? and for how long? Are they marked so boaters don't tie-up to them?

Sandy: We put out three seed buoys at Bell Point and the southwest corner of Blind Bay. The buoys are in shallow water and are marked with a labeled float. Give me a call, we can talk further.

2:31 PM **Round Table Part II** – all, what challenges/barriers may be hindering efforts?

Tom: it's about changing people's behavior around eelgrass and kelp. Quantify ecosystem services? We have local regs to conserve/protect eelgrass – how do these work? Are they being enforced or getting variances? How effective are these local regulations?

Sylvia: we have a grant research opportunity through Padilla Bay, grant available annually

Tina: we should offer incentives for good boating behavior, but I'm not ready to give up regulations. I think we need better community planning, practice saying no more often to docks etc.

Julia Thompson: it's written into codes that we protect eelgrass and surveys are required prior to building docks/mooring buoys, these protections are written into regulations.

Stan: I want there to be incentives to do the right thing but we also need a regulatory backstop

Sylvia: QUESTION about reasons for declines in eelgrass in San Juans, is there a place for shared data? Including driver data such as water quality? what are the causes of declines?

Bart: Dept. of Health has data, will send link to access historical data (see *Resources* below)

It's important to identify drivers of decline, like Drew's research has identified one. There could be many reasons eelgrass declines, vary with location. This is a **gap in knowledge**, would be great to pool data. Knowing this would also aid in restoration efforts.

Eelgrass can go through different trends, are there longer-term historical trends that mirror human population density? Going back further than our monitoring program? One candidate is WDFW herring spawn surveys, these data have been analyzed for Puget Sound proper but **not SJI's**

Tom: what science is needed? E.g. Buffers – don't hold up well because not enough data to support it.

Sandy: Some historical work by Ron Philips. And QUESTION for Bart, DNR did analysis in Westcott Bay on reasons behind decline – are they available?

Bart: Jeff Gaeckle knows more about that, I believe we didn't identify a smoking gun there

Sandy: we published 2010 paper analysis of genetic diversity of 8 sites in SJ's, which could be important factor, some sites overlap with Drew's research

Drew: We have been emphasizing results of temperature events, but there are multiple factors.

Salinity matters, influxes of freshwater can beat back disease. Separate factors causing disease, and disease is also not the sole cause of eelgrass decline. Genetic diversity is an important factor

Tom: that's a good QUESTION, what actually kills eelgrass? And on warming, what drivers can we manage or control on a local level? Things like overwater structures

Bart: Multiple stressors may inform where to conserve/restore in response to a warming event, **resilience**

Sandy: in Westcott Bay, it seems like light could be a major factor in why eelgrass disappeared and why it's hard to get back

Drew: temperature is important and stressful but can't control it. I appreciate the boat-anchoring efforts, that's a key local factor we can control, it educates about value of eelgrass beds.

Tina: QUESTION, are there related research and mapping efforts in the Gulf islands? Similar to SJI's

Dana: I'm familiar with BC side doing some citizen science programs, (see *Resources* below)

Tom: in southern hemisphere, research into more heat resistant strains of kelp, may consider same strategy for eelgrass

Sandy: marine traffic website to track anchoring, looks like anchoring inshore of buoys at Echo Bay

Chris: we've lost a lot of voluntary no-anchor zone buoys, seeing more anchoring in Echo Bay. That's one **challenge** there, measuring impact of boaters on eelgrass beds. Eelgrass also being lost at

Shallow bay, less mooring buoys and possible no-anchor zones. **Challenges** with permitting buoys

Kira: regulatory vs. education, both so important. Regulation is key but tricky, WA state parks has 110 buoys, to be in compliance need to do eelgrass surveys, that's a high cost. How do we approach this with least environmental impacts? Some buoys placed in 70's may not be sited in best place

Tom: economic justification from an ecosystem services standpoint to do the buoy maintenance?

Elizabeth: part of problem is disconnect with the public, interest in charismatic megafauna and they don't connect as much with plants. Focus on making eelgrass more applicable and fun

Lorena: more mooring buoys are fantastic. State park mooring buoys are only for boats 45' and under, DNR buoys suited for boats up to 50', so not all boats will be able to use those buoys some need to anchor out. Having detailed maps of where eelgrass is located so we can avoid eelgrass.

Bart: we have not mapped all the bays, in places where we don't have that data, the depth line published by Friends is a helpful tool

From chat: Be sure to involve boating groups when designing effective messaging, they are the target audience and will have a better idea of what works for them.

Tom: shares screen, shows data regarding carbon cycle in Puget Sound, e.g. 60-70% of carbon in rockfish comes from photosynthetic product of eelgrass and its epiphytes

Bart: especially in enclosed bays, water quality may be controllable – failing septic systems, pumping out. Water quality can affect eelgrass in several ways. QUESTION, what is known about that?

Frances: that came up last summer with high numbers of boats here, 100+ boats in Westcott and Garrison bay area. Marinas that were offering services to boats were overwhelmed, at RH motor on pump-out broke three times over the summer and freshwater use increased 600%. Likely people are pumping out even in pump-out free zones.

Byron: echo Frances, observation at Sucia State Park. Inner bay gets nasty water quality-wise with all the boaters, may be pumping out, water quality impacts of so many people in small space

Chris: we have a funded project for a boat pump out in Fossil Bay, doing some work around that

Frances: opportunity to use monitoring equipment deployed at Fossil Bay to other areas, like Garrison/Westcott

Sandy: we should acknowledge cultural value of eelgrass, colleague in Victoria, Wayne Suttle, etc. Boaters may be interested in that

Todd: Regarding logistics as this group grows, there are identifications of knowledge gaps. Also subcategories like messaging about eelgrass to community, regulatory –some natural working groups. Larger meetings to assign tasks and report back. But division of labor to not get bogged down

Agreed – there is already a defacto group established that has a focus on unified messaging - coordinated by Dana Oster, NWSC. This group is also a transboundary group so allows to tap into what is going on in BC. Session 3 here will focus on monitoring protocols and I expect this

group to be much smaller and more focused. I see this recommendation from Todd being a key outcome of this effort as we move forward over the next year.

3:27 PM Wrap up

ACTION ITEM: please email Frankie with names and contact details of anyone else who may be interested or who should be involved in this group and subgroups that may develop

QUESTION: Could regulatory side of DNR work more with State Parks on solutions?

- Start a discussion around protection options for remaining areas of eelgrass in San Juans , some areas may be well situated for anchor-out buoys but some not, so what other options are there?

- Dana has initiated a transboundary efforts on effective messaging, and how can we track those messaging/outreach efforts?

ACTION ITEM: great idea, Sandy, about the database – maybe a good project for a student

ACTION ITEM: Frankie will set up a sticky board/idea sharing forum to use after this session

3:33 PM Many thanks from everyone. Adjourn meeting

Resources Shared throughout the meeting

- green boating website, Boater brochure, shows map of anchor-out-of-eelgrass spots, videos that show damage from anchoring etc., <https://sanjuans.org/greenboating/>

- Report from Westcott Bay study (2007-2008):

https://www.dnr.wa.gov/publications/aqr_nrsh_analysis_westcott.pdf

- Bart: DOH data viewer: <https://fortress.wa.gov/doh/oswpviewer/index.html>

- Dana: Mayne Island Conservancy: <https://mayneconservancy.ca/category/outwork/our-shorelines/eelgrass-monitoring/>

SeaChange: <https://seachangesociety.com/>

- Bart: Recent paper on eelgrass declines in the Southern Gulf Islands of British Columbia:

<https://doi.org/10.2112/JCOASTRES-D-18-00112.1>

- Monica Montgomery: here's a short video the Jefferson MRC created last year that might help inform others about the no-anchor zones and importance of eelgrass in an accessible way:

<https://vimeo.com/454454469>

- Bart: DNR eelgrass data viewer <https://www.dnr.wa.gov/programs-and-services/aquatics/aquatic-science/puget-sound-eelgrass-monitoring-data-viewer>

- William House: Ecology Coastal Atlas has eelgrass presence information:

<https://apps.ecology.wa.gov/coastalatlasc/tools/map.aspx>

County Code relevant to eelgrass and nearshore habitats



ELEVATING EELGRASS PROTECTION IN THE SAN JUAN ISLANDS

Wednesday, April 21, 2021
1:00 – 3:30 pm



Virtual Meeting via Zoom, [Join Zoom Meeting](#)

Meeting ID: 823 8689 0360
Passcode: 007152
Call in number:
+1 253 215 8782 US

Draft Agenda

All material for sessions is available here:

https://drive.google.com/drive/folders/1pmKGJVuVF4N_U1TUCW4NFG7LMUpsGQr_?usp=sharing

1:00 pm	<p>Welcome Frances Robertson, Marine Program Coordinator, San Juan County Coast Salish Acknowledgement <i>Let us acknowledge we reside on the ancestral lands and waters of the Coast Salish people who have called this place home since time immemorial and let us honor inherent, aboriginal and treaty rights that have been passed down from generation to generation.</i></p>
1:10 pm	<p>Introduction to EPIC – Frances Robertson <i>Summary of EPIC for New participants</i> <i>Summary of Session 1</i></p> <ul style="list-style-type: none"> • <i>Identified challenges/barriers and associated actions (short-term and long-term) added to collaboration board so far.</i> • <i>Identified knowledge gaps on collaboration board so far.</i> <p><i>Plan for this session</i></p>
1:30 pm	<p>Break out session – groups <i>Add any remaining items to board, include solutions</i> <i>Discuss pros and cons</i></p>
1:45 pm	<p>Review of Challenges/Barriers and associated actions – All Participants</p>
2:00 pm	<p>Leg-stretch tea break</p>
2:15 pm	<p>Round Table Part I – All Participants <i>Identify protection options – pros and cons</i> <i>Identify additional locations for protection anchor out zones</i></p>
2:45 pm	<p>Round Table Part 1 – All Participants <i>Identify participants engaged in outreach – examples of materials</i> <i>Identify Participants engaged in or interested in monitoring for Session 3.</i></p>
3:00 pm	<p>Wrap Up – Frances Robertson <i>Identify who is missing from group for post-meeting follow up</i> <i>Session 3 overview</i></p> <ul style="list-style-type: none"> • <i>Goals of session</i> • <i>Monitoring protocols</i> <ul style="list-style-type: none"> • <i>Vessel counts and behavior – land based and aerial based</i> • <i>Aquatic surveys – diver surveys, underwater camera etc</i>
3:30 pm	<p>Adjourn meeting</p>

in Attendance: Paul Andersson, Chris Betcher, Christine Cory, Bart Christiaen, Jeff Gaeckle, Emily Grason, Marta Green, Phil Green, Chris Guidotti, Drew Harvell, William House, Lisa Kaufman, Pema Kitaeff, Lorena Landon, Jess Newley, Elizabeth Nilles, Dana Oster, Mike Ramsey, Frances Robertson, Byron Rot, Beth Tate, Tina Whitman, Sam Whitridge, Sandy Wyllie-Echeverria, Yuki Wilmerding, Sylvia Yang

1:05 PM Coast Salish Acknowledgement: *Let us acknowledge we reside on the ancestral lands and waters of the Coast Salish people who have called this place home since time immemorial and let us honor inherent, aboriginal and treaty rights that has been passed down from generation to generation.*

1:06 PM Overview for this meeting *Frances Robertson*
Frankie shares agenda, Mike Ramsey and Emily Grason (not at first session) introduce themselves

1:11 PM Reminder about goals of EPIC
An effort funded by Pew, aiming to facilitate coordination of eelgrass protection efforts. This is the 2nd session. Over the summer hope to pilot some monitoring efforts. Last wrap-up session in October
Brief summary of first session (last month's meeting): introductory, ID knowledge gaps & challenges. Gathered input on 'jamboard' – looks like sticky notes. Categorizes solutions, actions, etc.
Frankie summarizes main challenges, then short term vs. long term actions knowledge gaps

1:19 PM Review of the barriers/challenges and their associated solutions – are any missing?
Tina: changing climate & the complexity of eelgrass habitat
Drew: In terms of conservation, there's restoration which I think of as long term (10 year +), but also preservation. What beds can we preserve and protect. This is an immediate solution. Importance of good flow, cool temperatures, and freshwater input – those are characteristics of healthy bed. (does that mean north-facing beds are more resilient?). We have enough information to identify valuable and resilient eelgrass beds to protect. More likely we develop disease-resistant plants than a vaccine
Byron: Adding to idea of protecting good quality beds, Odlin is a healthy eelgrass bed.
Tina: do we explicitly county-wide mapping with the factors Drew mentioned as an action?
Drew: we're talking about a shoreline master plan, adding features of resilience
Sandy: there are eelgrass sites in front of Parks Bay that could be protected right away
Jeff: there is the concept of no net loss for nearshore projects. Mitigation is difficult for eelgrass, not always successful. So best if we can alter projects so there are no impacts to seagrass
Drew: I'm glad you brought that up, how effective is no net loss? Has it been successful?
Tina: no net loss is more like incremental loss, so we should push for net gain instead. Acknowledge difficulty of management on small projects and no net loss isn't equaling to zero loss
Byron: need anchor-out zones where people are anchoring, in places like Blind Bay where eelgrass is
Tina: and providing more public buoys. in Blind Bay, in first week of last July I counted 180 boats there
Beth: if we're protecting valuable places need to provide incentives for boaters to use facilities elsewhere, like marinas. Incentivize not putting in new docks, not just rules
Dana: <https://arcg.is./1e9ji5> , map of potential sites NW straits is seeking funding for, including Blind Bay (suggested by Tina for no-anchor zone expansion)

Drew: 30 by 30 is an opportunity to incentivize restoration efforts. 30% of US coastal water in protected areas by 2030. Implemented by states, WA is at forefront. Discussed a lot in Inslee's office
Jeff and Bart have data that no net loss has failed, that's a good policy to change

Bart: what do they mean by protected?

Drew: in terms of eelgrass, hoping to use human services like filtration to say it's more valuable than we've been accounting for. ACTION ITEM: Drew will try to find out more about this

Mike R: issues with the lower Fraser River and sedimentation

Byron: need those floodplains to store sediment or plume ends up here

Tina Whitman: oil spill prevention

Jeff: as population in SJI's increases and desalination increases, especially in small embayments

Tina: Now desalination is allowed as the primary water source for a subdivision. And septic, everything pumped out needs to be taken to mainland to process.

North sound of Eastsound sewer goes right into an eelgrass bed

Bart: Jeff has suggested we track 3 beds around there, 2 of them have declined a lot recently. 2 years ago samples for stable isotope analysis, tried to track signature from outfall but couldn't so far, so not able to directly tie to outfall for now. But the bed that was smack in the middle of outfall is gone now.

Byron: in-channel constructed ponds, actively filled by rains. Each needs to fill before next one fills.

Chris B: I'd like to talk to Jeff about the impact from Eastsound outflow. I suggest we spend more time testing the stormwater outfall, I think locations of eelgrass decline correlate with stormwater runoff.

I'd study stormwater first, and not talking about Eastsound sewage but in other bays the consolidation of sediment, building up higher and eelgrass going away. Tidal elevation and bottom bathymetry. That's why eelgrass does better in high current areas, sediment consolidated

Tina: I think siltation is huge, most declines are super silty

Bart: I'm not saying it's caused by sewage, but there's definitely decline in eelgrass.

Byron: the sewage in Eastsound heads south, maybe north is the stormwater from airport

Bart: (shares screen) shows decline of eelgrass at Orcas site. Figure of tracks over time, red lines show where eelgrass has been lost, on deep and shallow edges of beds

Jeff: we're looking at hypothesis of sediment changing over time, not necessarily elevation (but we have the data to look at that), but the organic matter within the sediment –if too organic tends to be more anoxic and transplants won't survive. Richer organic likely from upland development, run-off

Drew: I'm surprised to see that deep bed loss. Are you seeing that more widely?

Bart: In SJI's there are more sites declining than stable. We see declines at the shallow edge and in some cases at the deep edge. There's variability with location so I think there are different stressors.

Back in 2003 mapped the deepwater edge for the whole county; we've been discussing shallow edge more but it may be worth mapping that deepwater edge again to answer that question better

Emily Grason: impacts from green crabs to eelgrass bed – evidence from the east coast, mostly correlative, but green crabs can damage directly through grazing and seed predation. Knowledge gap is what role would that play here, relative to other stressors. So far limited evidence of interactions.

Currently don't have those densities of crab here. Eelgrass on west coast deeper than green crabs

Tina: other invasives, what about sargassum? *Z. japonica*?

Bart: not found so much in SJI's, more in central sound

Emily: the bamboo worm, on east coast facilitates eelgrass by advection of seeds to germinate

Frankie: and impacts from *ulva* spp., like in False Bay. Questions about impacts on eelgrass

Drew: no data on that but seems to be an impact. Megan has hired Wendel Raymond to look at that.

We're loaning him a drone. Question, is *ulva* propagating in the bay or coming from elsewhere?

Frankie: we're hiring an intern to look at *ulva* there next season. May have been there historically

2:02 PM break

In the chat,

Mike: limited restoration funding opportunities is a barrier. Collective move towards process-based restoration, biological restorative actions less apt to receive funding

Marta: the ecosystem services valuation for eelgrass included in the SJC oil spill risk consequences analysis is \$540/acre/year (Earth Economics 2019)

Beth: to Mike's point, until "no net loss" requirements change, people can look for mitigation options to offset a project when there aren't really a lot of options available

Drew: Parks Bay seems essential, NW-facing which could be interesting. Megan advocates for it

QUESTION: does anyone have aerial photos of crowded anchorages for outreach/education?

2:18 PM Identify different protection strategies, including identification for additional locations for anchor out zones in the San Juans.

Protection options:

This year SJC and the MRC put an anchor-out zone in at Odlin Park, marker buoys going in soon. Tina has two sites planned for Bell Point and Eastsound. Tina & Dana identified some other sites. where else?

Dana: every site in SJC is from herring spawn study

Tina: we have funding from SRFB directly linked to herring using eelgrass, also popular anchorages High pressure areas, state parks, e.g. Sucia. How to prioritize where eelgrass should be protected?

Parks Bay – area of focus for the labs

Dana: shares screen. Not all points on this map will get no anchor buoys, but these are sites we want to consider for feasibility, shows where eelgrass is relative to navigation, local buy-in and support, etc. Getting sites that deserve consideration first and then figuring out what makes sense to protect

Tina: eg. Blind Bay is tricky because there's an island there, marker buoys may be less effective there

Byron: maybe some of this can be teaching boaters about anchoring.

Sandy: what about Echo Bay, does Parks have a buoy system there?

Chris G.: there was a voluntary system we'd like to reestablish. Both there and Shallow Bay we want to establish more no-anchor buoys. We're looking at our whole buoy program. We have mooring buoys at Echo Bay but all of our buoys are being serviced. About to contract some additional buoy work. Long term program is being actively discussed. We lose marker buoys over time over loss of shackles, helical screws, etc. Part of our discussion is proper maintenance service buoys properly.

Tina: in Jefferson county they swap out marker buoys with floats in the winter to preserve them.

We're planning dock-based signage to inform boaters where eelgrass is and where to anchor

Chris Betcher: as opposed to a lot of no anchor zones, which are valuable in some places, I think as many public mooring buoys as possible would be preferable. We're using a more expensive type of mooring but requires less maintenance. Discusses some other types of moorings

- Parks Bay as a possible no-anchor zone

Dana: from a liability standpoint we can't take on maintenance of buoys but promoting no anchor - environmentally friendly buoys are perceived as more restrictive, may be less supported by tribes

Chris G: with certain number of buoys in a location, considered a marina and shellfish harvest blocked We charge \$15/night for our mooring buoys. Revenue doesn't cover maintenance.

Frankie: we've been discussing this with Waggoners, they've started a foundation to fund mooring buoys. They've indicated that a reservation system on buoys is something they'd be willing to pay a fee for. County has said more mooring buoys would need associated fees to cover maintenance.

Yuki: if mooring has a charge and anchoring doesn't, where's the incentive?

Tina: it's safer, don't worry about moving, people aren't that great at anchoring.

Chris G.: we saw a dramatic increase in boaters right after covid started,

Sandy: we've been monitoring that in marinetraffic.com

ACTION ITEM: Sandy will share what they've found there with Frankie to share with the group

Bart: at Smith Island, loss of eelgrass on south and west side of the Bay

2:44 PM We've discussed anchor out zones and a few additional locations, need for dock-based signage, public mooring buoys, any other ideas?

Sandy: boater information on the ferry, discussion with landowners adjacent to marine environment

Tina: I'd like to hear more from UW and DNR folks studying eelgrass to help us prioritize spots

ACTION ITEM: Bart can look at DNR data and maps with Tina (but data are not comprehensive).

Jeff: the year-round land use of septic systems. In shallow embayments most residents are on septic with unknown age or efficacy of systems. This could also be adding organic material into the system

Paul: is there a map of known eelgrass areas available? Many aren't coming by ferry

Frankie: waggoners guide is comprehensive and popular, bay-specific eelgrass info

Jess: <https://sanjuans.org/greenboating>

2:50 PM Identify those engaged in outreach and what that might be

Jess: we have been doing outreach to boaters. Our main tool is the map, showing depth of eelgrass

Frankie: Waggoner tried to take the info from green-boating and focus in on specific data

ACTION ITEM: connect more with Waggoner to make sure they get that info

Frankie: also reaching out on social media. Learned some outreach lessons from Be Whale Wise.

Dana: everyone interested in eelgrass is welcome to join monthly meeting, have a shared Box storage file with resources provided by Friends, County, etc. Lessons from Jefferson MRC and uniformity of image – what the buoys look like so boaters recognize them. Planning to hire a marketing firm to help with that messaging, branding. Meeting is about what we've learned on permitting, outreach.

Frankie: it would be great to get your input, Chris, on buoy design

Betcher: yes we're working on ways to minimize maintenance, improve design, I'm glad to discuss

Frankie: we have Friends, Jefferson MRC, transboundary effort spearheaded by NW Straits, other materials or ideas?

Sandy: has there been discussion at county level regarding moratoriums on dock?

Tina: I think Beth's point earlier was about our capacity – can we support upgrading marinas? Pump-out stations? Septic facilities? We're focusing on the anchor out piece but there's larger questions

Beth: anecdotally – thought they wouldn't be permitting single family docks anymore. Haven't seen that come true yet, but option would be to incentivize joint-user docks.

Tina: our current code does refer to that but no appetite for making specific areas where docks wouldn't be allowed, gets complicated with property rights

Beth: not saying they can't develop but offering incentive not to do so. Multiple agencies involved

Frances: we ran a coast Salish cultural training in December. One comment was that every dock/mooring buoy is chipping away at treaty fishing rights. Tribes may support that idea of joint use

Tina: our code has incentivized that for a long time, but people want single-use docks

Jeff: regarding public outreach, could we work with DOL on small informational card so when people register boats they get information about importance of eelgrass habitat

Frances: great idea, ACTION ITEM: let's follow up on this idea of a DOL informational card

- Ensure this information is on WDFW sites

Phil: can we put it on maps like navionics, just add a layer? and coordinate with related apps

Frankie: Nobeltec and Navionics are popular. Canadian sanctuary and west side no-go zone are on

ACTION ITEM: follow up on those, Jess is willing to help with that

Tina: as Bart said, we don't have those data for everywhere. For deeper edge we only have data from 2003. Waggoners is frustrated because we didn't have data for all the bays they wanted. We need more data, that's part of why we provided that more simplified map

Sandy: can you circulate that 2003 study? There are some nice maps in there that Jim Slocum did

Tina: just the final eelgrass mapping report? ACTION ITEM: Tina will put that in our shared box

- those are downloadable those from Friends website, also in County GIS library

Bart: could we have a list of gaps in data that are needed by Waggoners?

ACTION ITEM: Tina will follow up with Bart about that

Frankie: I'll put the report Chris Betcher mentioned about mooring in shared resources

3:16 PM wrap-up

- Great to have Emily here, please let Frankie know if anyone else should be invited. Next (third) meeting will be about monitoring methods, aerial and aquatic surveys. Please let Frankie know if you're interested in that session. Plans to combine next session with transboundary meeting, focus discussion on monitoring techniques.

- Hope to get vessel-count based method out before Memorial Day weekend, and then random selection of weekend and weekdays to monitor. Some pilots keen to help with this effort.

Tina: are you thinking about in terms of monitoring boats or also in change in eelgrass?

Frankie: could be both, number of vessels and compliance. And then possibility of diver/snorkel surveys, underwater camera surveys. It would be great to get some unified protocols established

Sandy: there's more than one species of seagrass in SJ's, surfgrasses are not as impacted by boats but they are by upland effects. Just want it on record that there are other species of concern.

Bart: we often don't go shallow enough to capture surfgrass, especially when it's on rocky ledges.

Link to shared drive,

https://drive.google.com/drive/folders/1pmKGJVuVF4N_U1TUCW4NFG7LMUpsGQr?usp=sharing



ELEVATING EELGRASS PROTECTION IN THE SAN JUAN ISLANDS

Thursday, May 13, 2021

2:00 – 4:00 pm



**San Juan County
Marine Program**



**Northwest
Straits
COMMISSION**



Virtual Meeting via Zoom,
[Join Zoom Meeting](#)

Meeting ID: 842 6585 6229
Passcode: 815431

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Agenda

All material for sessions is available here:

https://drive.google.com/drive/folders/1pmKGJVuVF4N_U1TUCW4NFG7LMUpsGQr_?usp=sharing

2:00 pm	<p>Welcome <i>Frances Robertson, Marine Program Coordinator, San Juan County</i></p> <p>Coast Salish Acknowledgement</p> <p><i>Let us acknowledge we reside on the ancestral lands and waters of the Coast Salish people who have called this place home since time immemorial and let us honor inherent, aboriginal and treaty rights that have been passed down from generation to generation.</i></p>
2:10 pm	<p>Introduction to EPIC – Frances Robertson</p> <p><i>Summary of EPIC for New participants</i></p> <p><i>Summary of Session 2</i></p> <p>Monitoring methods in use: Dana Oster, NWSC</p> <p><i>What standard methods are used and their differences?</i></p> <ul style="list-style-type: none"> • <i>Presence-absence in water surveys</i> • <i>Aerial overflights</i> • <i>Vessel compliance</i> • <i>Scour recovery</i> • <i>Restoration efforts.</i> <p><i>What are the monitoring needs?</i></p>
2:30 pm	<p>Round Table Part 1 – All Participants</p> <p><i>Acknowledge and discuss the different goals and different monitoring approaches used.</i></p> <p><i>e.g. the general differences between assessing eelgrass health and efficacy of protection zones</i></p>
3:05 pm	<p>Leg-stretch tea break</p>
3:15 pm	<p>Breakout sessions – Participants self-select group</p> <p><i>Group 1: Eelgrass Presence & Condition Monitoring</i></p> <p><i>Group 2: Protection Zone Monitoring</i></p>
3:45 pm	<p>Wrap Up – Frances Robertson</p> <p><i>Identify who is missing from group for post-meeting follow up</i></p> <p><i>Session 3 overview</i></p> <ul style="list-style-type: none"> • <i>Goals of session</i> • <i>Monitoring protocols</i> <ul style="list-style-type: none"> • <i>Vessel counts and behavior – land based and aerial based</i> • <i>Aquatic surveys – diver surveys, underwater camera etc</i>
4:00 pm	<p>Adjourn meeting</p>

in Attendance: Paul Andersson, Fiona Beaty, Chris Betcher, Maria Catanzaro, Cathleen Burns, Bart Christiaen, Jillian Dunic, Jeff Dyer, Phil Green, Chris Guidotti, Drew Harvell, Jeff Hodge, William House, Pema Kitaeff, Monica Montgomery, Jess Newley, Troy McKelvy, Dana Oster, Mike Ramsey, Frances Robertson, Devin Robinson, Dianne Sanford, Suzanne Shull, Beth Tate, Tina Whitman, Sam Whitridge, Yuki Wilmerding, Nikki Wright, Sylvia Yang

2:05 PM **Welcome**, Coast Salish Acknowledgement: *Let us acknowledge we reside on the ancestral lands and waters of the Coast Salish people who have called this place home since time immemorial and let us honor inherent, aboriginal and treaty rights that have been passed down from generation to generation.*

2:07 PM **Introduction to EPIC** *Frances Robertson*
Summary of EPIC goals and mission. Summary of Session 2 – discussion of knowledge gaps and challenges. This is session 3, focused on monitoring methods and efforts. Introductions all around

2:19 PM **Monitoring methods in use:** what standard methods are used? *Dana Oster*
Challenge of this discussion – briefly review many reasons for eelgrass monitoring.
Assessing trends: not just inventory of presence, but where is eelgrass stable and where declining.
Understanding drivers and stressors, communicating that to agencies and planners to reduce them.
Reducing physical stress from boat anchors – buoys. Are they reducing damage, allowing recovery?
Each purpose may involve different methods. Trying to streamline/coordinate.
Frankie: we'll also be monitoring for vessel compliance and hope to incorporate aerial imagery

2:28 PM Round Table Part 1 – All participants
Tina: No currently monitoring. Worked with DNR and UW to map the county-wide deep water edge in 2003, we'd like to do that again. Also interested in pre-/post- monitoring of anchor-out zones. On land-use/regulatory side, interested in data on impacts of new structure designs, mitigations.
Nikki: Sea Change monitors restoration sites for 5 years after transplants. Installed mid-line buoy systems, monitoring recovery of eelgrass around those sites. Keeping an eye on no-anchor buoys
Fiona: track vessels around no-anchor buoys. interested in other community monitoring protocols
Sylvia: an outcome of this meeting could be to gather all the monitoring needs, what methods being used where to assemble an inventory and help identify gaps. Describes grant opportunity
Drew: over last 8 years monitoring eelgrass disease as metric for health. One goal is to understand sustainability of beds, help identify resilient sites where eelgrass isn't declining. Currently monitoring 5 locations. Open to broader surveys to assess resilience. Virus is waterborne, we're beginning to track spread. Lists long term sites for past decade around San Juan Island.
Bart: we follow 214 long term sites, 30 within SJI's, sampled on 3-year rotation with underwater videography. Advantage is easily scalable to larger areas. But not as useful for smaller scale detail
Declining trends in SJI's. Interested in aerial surveys, only in sites with no-anchor zones or wider?
Dana: Want to monitor before no-anchor buoy zones are set up, also for kelp. Benefit – can cover large area in small amount of time, but not as refined. For some sites, drones more appropriate
Frankie: Already some aerial protocols established by NOAA in 2010. Also from perspective of whales, good to know where vessels are. Plan to have pilots run specific surveys, likely key places like Blind Bay, Sucia– high anchorage areas. Get a better handle on boat usage/distribution
ACTION ITEM: Frankie will put NOAA vessel count aerial survey study in shared google drive

Bart: interested in aerial surveys, useful in large shallow bays and less useful in deeper water. But vessel counts could be very useful in making the link to eelgrass damage in certain embayments

Dana: aerial photography can be tricky with eelgrass vs. photographing vessels

Suzanne: We used aerial photography in Padilla Bay. Need clear day/low tide. Need ways to distinguish long-term change from other patterns. It's a lot of data

Beth: aerial imagery good for large-scale, but we need to know exact bed boundaries with densities. Some beds have multiple bands along shoreline or fringe, \ only way we've found to do that is with SCUBA diving. It's labor intensive but can gain a lot of info, like epiphytic growth on blades, health. \

Chris: can map eelgrass with diver-towed GPS unit, see fluctuations in edges of beds in certain areas

Nikki: it's helpful to track invertebrates, storm events. Monitoring seasonally is important. We see a lot of variability in density according to temperature. Majority of our sites are in former log boom areas so looking at sediment, interested in tipping point for sulfides for eelgrass success.

Bart: Jeff Gaeckle did a study on sulfides and eelgrass survival, worked with Sylvia on that

Sylvia: we're working on that now. Sandy may have measured sulfides in San Juans

Bart: yes with Ricky Dooley, published a study on that. Sulfides oxidize quickly, difficult to measure

Yuki: we recently went out to monitor the seedlings Mike and Sandy put in last fall. We went at a very low tide. seasonal monitoring is very important for us to be able to take those opportunities

Mike: can we look for mooring buoys on surveys? both unpermitted as well as more makeshift

Frankie: I have a call with Gabe Potter to start tracking that, how many buoys are unpermitted

Tina: there was a 2009 mapping of mooring buoys, about 2000 at that time. Tried to crosscheck all county/state/federal permits. Almost nobody had all 4 permits. It's a legacy problem

Bill: I'm with DNR in Gabe's office, the leasing program. We look for hotspots to remove unauthorized mooring buoys. We've done operations around Orcas Island, focusing now on Lopez. But the process we need to go through as a government agency is extensive, many rules to follow

Bart: typically, how many are out of compliance that you need to remove?

Bill: Fisherman's bay is full of them, can't give a number. Many weird things holding these buoys in place (engine blocks, bathtubs). It's a big problem and we don't have the staff to focus on it

Chris: usually an owner is willing to bring it into compliance. They don't complain about the money but the process - length of time and lack of enforcement. Used to only need one permit

Tina: people mostly don't understand what's required, more permits for a mooring than a bulkhead.

Bill: I can see how people get frustrated when they're trying to do the right thing and their neighbor drops a concrete bucket in the water. And we haven't been able to get out to monitor with covid

Dianne: are any steps being taken to amalgamate?

Bill: it would be nice if sister agencies communicated.

Beth: this came up in last EPIC session - incentives. it's dis-incentivizing to try to get permits

Tina: trying to de-incentivize single family docks and mooring buoys are preferable. There's also a lot of legacy stuff out there, or abandoned buoys. And this group could help get more resources to DNR, find the ones that never have boats on them, easy ones to go away

Frances: this is pertinent to the discussion of eelgrass protection. I'm reluctant to put in more mooring buoys to alleviate pressure until we know what we have and what we can remove. From treaty rights perspective, we need to work in partnership with tribes to make sure that public mooring buoys won't interfere with treaty right area. Groundwork needs to be done before exploring the avenue of public-use buoys. From county perspective we're becoming more aware, moving in that direction. If we don't address impacts from recreational boaters and illegal moorings, our efforts for restoration of sensitive habitats are for naught.

3:22 PM Breakout sessions – Participants self-select group

Group 1: Eelgrass presence & condition monitoring, AKA general trends and stressors

in attendance: Paul Andersson, Chris Betcher, Maria Catanzaro, Bart Christiaen, Jillian Dunic, William House, Pema Kitaeff, Devin Robinson, Dianne Sanford, Tina Whitman, Yuki Wilmerding, Sylvia Yang

Tina: citizen scientists could be snorkeling in areas where they commonly swim. For example, when seastars declined we didn't have local baselines that could have been gathered via snorkeling

Paul: yes, just having the data, species counts – you may not know its purpose. And drones don't go talk to their neighbors the way people can, get momentum going

Dana: needs to be the connection to research and feedback to citizens that their data is going to use. What datasets for eelgrass would be useful for you in contrast to what county may need? What role could some organization in terms of pulling that together? What would help this group most?

Paul: with Mike/Yuki/Sandy they went out to the beach and saw growth. How often do we check and measure that, assess growth and survival rates?

Aerial imagery, how do we look at color shades and determine eelgrass? repeated drone flights?

Datasets, if you want to scale up seeding you need to know how successful it's been

Tina: one reason forage fish projects have been so successful is that they end up on state habitat maps, there's a whole structure around that, hundreds of hours of GIS and other processing.

Dana: we're ready to do that for eelgrass, we've got our hands full doing that for kelp.

Tina: Sandy and Tom did aerial photos in the past. Now the quality of photos is better. We should mine the photo idea as well as the citizen science piece

Paul: I don't think anyone is ready to deal with that back-end of data collection work volume

Tina: the forage fish project has been under NW Straits Commission, in collaboration with WDFW

Dana: in DNR, what are main datasets you go to in your permitting applications?

Bill: I use online resources, DFW, DNR eelgrass maps, coastal atlas. We also do site visits for every application. Direct conversation with other agencies, plus all the application materials

Dana: I'm just trying to connect needs. If some central place would be beneficial

Bart: if you're going to create a clearinghouse it needs to be kept up to date. If a lot of data sources and types, hard task to put it all together. We also have marine vegetation atlas. Interactive map, for each site you can click it on it and shows you which data sites are available.

Dana: so a map of where monitoring activities are happening and contact of who to follow up with?

Bart: Sylvia's idea. That would be very useful. I'm curious to see other data sources as well

Yuki: cool mapping site, Catastre.gov

3:48 PM Return to main session & wrap-up

Frances Robertson

Chris G. had a great idea for a pilot project to bring partners together to monitor an area in decline, monitor before and after no-anchor zone to see if boats have effect. Efficacy studies are important

ACTION ITEM: Frankie will connect a few people who could potentially be involved in that pilot

This is last session until October, we'll review summer season fieldwork and monitoring efforts.

Dana: we had a good discussion about balancing community science collaboration and how permittees use data. Would be good to create a map summarizing monitoring efforts that compile all the data. It would be difficult to maintain but some sort of inventory product we could share

Frankie: we will add notes and meeting recording to shared google drive and send around to the group, I'll try to send a few updates through the summer. Expecting a busy boating season

3:55 PM Thanks everyone. Adjourn meeting



ELEVATING EELGRASS PROTECTION IN THE SAN JUAN ISLANDS

Monday November 22, 2021

2:00 – 4:30 pm



Virtual Meeting via Zoom,
[Join Zoom Meeting](#)

Meeting ID: 841 1042 3789
Passcode: 452178

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EPIC Work Session #4

Agenda

All material for sessions is available here:

https://drive.google.com/drive/folders/1pmKGJVuVF4N_U1TUCW4NFG7LMUpsGQr?usp=sharing

2:00 pm	<p>Welcome <i>Frances Robertson, Marine Program Coordinator, San Juan County</i></p> <p>Coast Salish Acknowledgement</p> <p><i>Let us acknowledge we reside on the ancestral lands and waters of the Coast Salish people who have called this place home since time immemorial and let us honor inherent, aboriginal and treaty rights that have been passed down from generation to generation.</i></p>
2:10 pm	<p>Introduction to EPIC – <i>Frances Robertson</i></p> <p><i>Summary of EPIC for new participants</i></p> <p><i>Summary of effort to date</i></p>
2:20 pm	<p>Round Table Part 1</p> <p><i>Provide summaries of activities over the summer including monitoring and restoration</i></p> <p><i>Provide summaries of challenges encountered</i></p>
3:05 pm	<p>Leg-stretch tea break</p>
3:15 pm	<p>Round Table Part 2</p> <p><i>Provide summaries of challenges encountered</i></p> <p><i>Updates on progress to solutions of identified barriers (e.g. permitting, anchor out zone implementation, outreach and education for the boating public)</i></p>
4:00 pm	<p>Wrap Up – <i>Frances Robertson</i></p> <p><i>Eelgrass protection toolkit – should we have one and what should be on it?</i></p> <p><i>Next steps – do we wish to continue this collaborative progress?</i></p>
4:30 pm	<p>Adjourn meeting</p>

in Attendance: Paul Andersson, Chris Betcher, Bart Christiaen, Jeff Gaeckle, Chris Guidotti, William House, Lorena Landon, T. Mcleod, Monica Montgomery, Jess Newley, Marcus Reaves, Frances Robertson, Devin Robinson, Beth Tate, Ronald Thom, Amanda Thorpe, Terry Turner, Timothy Quinn, Stan Walsh, Frithiof Teal Waterstat, Tina Whitman, Sandy Wyllie-Echeverria

2:05 PM Welcome and Coast Salish Acknowledgement *Frances Robertson*
Let us acknowledge we reside on the ancestral lands and waters of the Coast Salish people who have called this place home since time immemorial and let us honor inherent, aboriginal and treaty rights that have been passed down from generation to generation.

2:07 PM Introduction to EPIC *Frances Robertson*
Today's meeting: Round table 1 to review 2021 monitoring/restoration efforts, and round table 2 to discuss challenges encountered/next steps – how we want to continue this collaborative effort. Frankie provides a recap of springtime sessions 1-3, review definition, Eelgrass Protection Initiative Consortium, and purpose/goal. Session 1: identified issues, started 'jamboard'. Session 2: discussed protection options. Session 3: focused on monitoring methods (aerial vs. SCUBA, what data are available to permitters)
Links in jam board, to review and add to: <https://padlet.com/francesr/llilv7vcoxp5j47>

2:13 PM Round Table Part 1 – REVIEW
Frankie plays short presentation by Drew Harvell's student, Lillian Aoki, dealing with intertidal eelgrass decline, discusses surveys of eelgrass wasting disease for the past 3 years. Disease levels correlate with warming temperatures over time, but no evidence of enhanced disease after the heat dome this summer.
Drew announces drone footage at other locations (Waldron, Orcas islands) also yielded some data
Other updates from 2021?
Tina: we did some anchor-out boater surveys, not exactly monitoring more like user engagement
Bart: we have done surveys at sites in SJI's but don't have data analyzed yet, should have them by January.
Frankie: MRC coordinated vessel counts at 3 main locations, one on each main Island (Bell point, Odlin, and Eastsound). Also some monitoring at Crescent Beach. At Odlin no vessels recorded inside the anchor out zone. The most vessels recorded at Bell Point in Wescott Bay. We'll continue at same locations next year.
Sandy: Yuki, Jason Hodin and I are tracking anchorage in 11 bays since late summer 2020 and will present that work to the MRC in January. With respect to seeding at Bell Point, Yuki presented a poster on that at WSN which will be made available on social media by FHL. One of the students in the BMEE class looking at historical data on seagrass presence in False Bay, 10-15 years data, he'll present on December 8th
ACTION ITEM: please put materials to share in the shared resources file (link above)
Chris Guidotti: number of large boats decreased back to pre-covid levels. Efforts now around permitting/planning for future buoy program. Working to prioritize permitting for buoy replacements, sites that need eelgrass protection and with sensitive habitat. Momentum around voluntary no-anchor zones.
Other challenges we haven't yet identified?
Teal: If there's any challenge due to compliance from DFW please reach out to me
Frankie: new environmental inspector with Dept. of stewardship, will look nearshore development

Sandy: also, we have some seeds ready now plan to deploy at Bell Point. Not using Broadcast technique, Years ago, Terry and I developed a technique we called “robust beachwrack”, can send around that paper

Terry: aren't people concerned about bringing eelgrass from one place to another? maybe same with seeds

Sandy: yes it's a concern, especially with disease. We're also analyzing eelgrass populations for genetic diversity and looking at incidence of spontaneous abortion at the flower level especially in response to heat

2:44 PM Round Table Part 2 – NEXT STEPS

Tina: I'd love to meet in person. Maybe in 2022 we can have an annual meeting in marine managers format.

Frankie: One suggestion was workshops by topic. Meetings could focus on restoration, disease, etc. Chance to share progress/resources, keep this effort/momentum going, networked and working together, not

CONSENSUS: thumbs up all around

Paul: previous meeting was 'non-silo'd'. Having a quarterly meeting, knowing it's on the horizon, would help

Frankie: the County doesn't have a marine managers' group the way it does a terrestrial managers. MRC is taking on the MSA plan, looking at specific strategies, that will guide efforts over next few decades.

Eelgrass is a key biodiversity targets in the plan and a key area of salmon recovery chapter update

Tina: with eelgrass and kelp, we have some data but not the site-specific guidance on where to prioritize protection and restoration efforts. That would be a good topic for a future meeting

Sandy: When will we focus on other species of seagrass and what they indicate about climate change. Like *Phyllospadix* –started looking at that between Lime Kiln and south beach with drone

Bart: yes, it may be more sensitive to extreme temperature spikes. In our monitoring program, we record *Phyllospadix* when we see it but not safe with our method – marine hazard. Drone monitoring sounds good

Jeff: it would be useful to see how the habitat is used and to have baseline studies to know what's being lost

Sandy: if there were students interested in that could they apply to DNR for some funding?

Jeff: students could be a great resource but we're limited on funding

Bart: it would also be useful just to compile local knowledge of locations of *Phyllospadix* on SJI

Sandy: we know there are populations on west side of SJI and in Echo Bay

Tina: just starting with ID of seagrass would be a beneficial talk for the MRC

Frankie: for funding – the Rose foundation has a Puget Sound habitat-focused grant

Sandy: should loop in National parks because I've seen *Phyllospadix* adjacent to park boundaries.

Frankie: Parks has teams on the island keen to participate on projects like this. maybe we can put together a community project. Sandy, Bart –could you think about what volunteers would need?

ACTION ITEMS: Terry volunteers to help with this. Bart will email Sandy

Bart: recap proposal to PS Partnership to fund a project that use drone imagery to look at seagrass beds in voluntary no-anchor zones. It was a pre-proposal, ranked low and never sent a full proposal

ACTION ITEM: Bart can share that pre-proposal with everyone. Maybe it can be resubmitted somewhere?

Teal: I think you're referencing a grant dealing with outreach/messaging, still keen on bouy implementation

Lorena: with Waggoner, we include maps in our cruising guide zoomed in so boaters can see where to anchor and where eelgrass is. We have e-news articles and we're happy to add any news we may have

A3: Vessel monitoring protocol

San Juan County MRC Eelgrass Protection Zone Vessel Compliance Monitoring Protocol 2021-2022

The 2022 monitoring protocols will follow those established in 2021. Monitoring will begin Memorial Day weekend and continue through to the end of September 2022. MRC members will continue to focus on the three main locations monitored in 2021, those being Odlin County Park on Lopez Island, Eastsound, Orcas Island, and Garrison Bay, San Juan Island. Should the opportunity and MRC member availability allow Blind Bay, Shaw Island may also be added to the sites monitored in 2022.

Data collection will be timed to ensure that the busy holiday weekends of the boating season are covered, as well as a selection of week days and weekend days. This will allow for a comparison of boating levels across periods with varying levels of boating activity.

Data collection times: *Memorial Day weekend through September 2022*

- Memorial Day weekend
- 4th July Weekend
- Labor Day weekend
- June: 2-3 samples weekend and week days
- July: 2 samples weekend and week days
- August: 2-3 samples weekend and week days
- September: 2 samples weekend and week days.

Data to be completed via a data forms and when available a dedicated app.

Each report must include a photo (or series of photos) taken from the identified location at each site and be taken via your cell phone camera or with an equivalent focal length to be sure to include the key points identified for each location.

For each monitoring period the following data should be recorded:

Standard data to be collected:

- Observers' Names:
- Volunteer hours
- Location: (Odlin/Bell Point/Eastsound)
- Date
- Time of day
- Wind speed
- Visibility score
- Photo image from predefined observation location

Vessel data:

- # of vessels in EPZ (for Odlin)
- # of vessel anchored outside EPZ (for Odlin)
- # total vessels at site
- # of vessels anchored in the area

If there are any additional observations, or things that observers deem important to record these should be noted down in the comments section. All data sheets and photos should be submitted to mrc@sanjuanco.com

Vessel Presence/Compliance Data Sheet for No-Anchor Zone Sites

Survey Section

Observer Name(s): _____

Location: _____

Time: _____ Date: _____

Weather conditions (circle one)

Clear

Clouds

Heavy rain

Light rain

Fog/mist/smoke

Tide height (ft): _____ Tide station: _____

Check box once photo(s) from pre-designated location are collected:

Camera type:(circle one)

iPhone/Android

DSLR w/ 50mm lens

Other: _____

Sites without anchor-out buoys:

Record number of vessels w/in field of view for site (same area covered by photo(s)): _____

Sites with anchor-out buoys: (*E.g. Odlin County Park, Port Townsend*):

Record number of vessels anchored inshore of anchor-out buoys: _____

Record number of vessels anchored offshore of anchor-out buoys: _____

Other notes:

Post-Survey Section (Optional)

Provide a sketch of the area surveyed, including approx. location of boats and locations of photo points, and other helpful landmarks if possible.

A4: Identified challenges and barriers, knowledge gaps and solutions.

Category	Challenges/Barriers	Knowledge Gaps	Short-Term Actions	Long-Term Actions
Jurisdictional & Regulatory	<ul style="list-style-type: none"> • Regulatory status • Coordinating local enforcement with state agencies • Local enforcement of unpermitted shoreline and overwater construction (docks and buoys). • Enforcement of anchor-out-zones. • Regulatory • Jurisdictional challenges • Coordinating local enforcement with state agencies • Enforcement 		<ul style="list-style-type: none"> • Establish jurisdictions to allow enforcement of protection zones. e.g. DNR provide State Parks with a bedlands withdrawal to allow enforcement of anchor-out-zones. • Streamline permitting for protection zones. • Enforce local and state regulations. • Cull meadows with high levels of wasting disease infection. 	<ul style="list-style-type: none"> • Assess the effectiveness of regulatory actions: <ul style="list-style-type: none"> • permits • Anchor-out-zones • pump-outs • Protect coastal areas: 30 by 30 where 30% of coastal areas protected by 2030. Not clear how this could be implemented in San Juan County but the County is planning to undertake an Ecological Value Assessment effort in 2023 and this will help to inform both the current areas protected and the areas that would benefit from additional protection.
Planning	<ul style="list-style-type: none"> • Septic system capacity. • Increase in desalination for freshwater as both population increases, and saltwater intrusion increases. • In channel constructed ponds preventing freshwater input to eelgrass beds. • Upland development contributing added nutrients into nearshore systems. 		<ul style="list-style-type: none"> • Shoreline Master Program and Critical Areas • Protect sites at shoreline parks, public lands. • Alter projects in the nearshore so that there is no loss of eelgrass. • Offer incentives for good behavior. e.g. for shoreline development that restores or maintains shoreline processes. • Testing stormwater runoff locations through expanded Clean Water Utility water quality monitoring. 	<ul style="list-style-type: none"> • Update SJC SMP • Determine locations of failing septic systems • Better permitting around use of desalination plants • Remove and replace creosote pilings at county marine facilities.
Infrastructure	<ul style="list-style-type: none"> • Less support for allowing marinas to expand resulting in more private docks installed. • Increase in recreational boating throughout county waters 		<ul style="list-style-type: none"> • Provide more pump-out facilities • Install more protection (Anchor-out) zones • Increase ability to and resources to allow maintenance of protection buoys 	<ul style="list-style-type: none"> • Improve placement and availability of marine infrastructure such as public mooring buoys and community dock space over single owner dock space.

Category	Challenges/Barriers	Knowledge Gaps	Short-Term Actions	Long-Term Actions
	<p>leading to more boats anchoring in sensitive areas.</p> <ul style="list-style-type: none"> • Challenges in permitting buoys (including protection buoys). • Pump-out use and access. • Oil spills and other spills. 		<ul style="list-style-type: none"> • Providing and maintaining mooring buoys to alleviate pressure from anchoring. • Determine placement, availability, and added capacity for public mooring buoys. • Support local oil spill response (IOSA) 	<ul style="list-style-type: none"> • Provide and maintain mooring buoys to alleviate pressure from anchoring at popular anchorage sites and or sites with sensitive eelgrass habitat.
Community Engagement	<ul style="list-style-type: none"> • Linking the importance of eelgrass meadows directly to activities that boaters care about, e.g., fishing and crabbing. • Designing an effective campaign that incorporates social marketing approaches. • Implementing a coordinated outreach campaign. 	<ul style="list-style-type: none"> • How is the importance of eelgrass to the public best communicated? more challenging than with more charismatic species or species viewed as having greater economic importance. • Determining the worth of eelgrass (quantify ecosystem services). 	<ul style="list-style-type: none"> • Offer incentives for good boating behavior. • Add eelgrass maps to boater GPS/navigation such as Garmin, Navionics. • produce anchorage-specific maps with eelgrass presence and depth (see tool created by FSJ) • Incorporate ecological importance of eelgrass into outreach messaging. • Incorporate historic importance of eelgrass to Indigenous lifeways into messaging. • Increase public signage with eelgrass and anchor-out-zone information. • Engage boaters in collecting water quality and temperature samples in areas they visit. • Tell stories that provide hope in outreach efforts. e.g., highlight the good things and achievements. • Anchor-out-zones • Mapping • restoration • Prioritization of sites of sites for protection. 	

Category	Challenges/Barriers	Knowledge Gaps	Short-Term Actions	Long-Term Actions
Research & Ecological	<ul style="list-style-type: none"> • Impacts of climate change on eelgrass habitat • impacts of invasive species to eelgrass beds including impacts of foraging and seed predation • impacts of sedimentation consolidation -impacts of changes to bathymetry over time, especially in quiet bays. • Transboundary challenges related to the freshwater influence from the Fraser River, especially regarding sedimentation. • Water quality-related to runoff, vessel presence, toxins etc. • Limited restoration and monitoring funding, particularly to allow for long-term monitoring. • Data gaps • Comprehensive mapping of eelgrass. • Impacts of predators, e.g., Canada Geese 	<ul style="list-style-type: none"> • understanding causes of declines and what kills eelgrass. • What drivers of e.g., temperature change, can be managed/controlled at the local level? • Do long-term declines mirror human population density in an area? Is there a correlation? • What environmental drivers (e.g., temperature change) can be managed/controlled at the local level? and how? • Could heat-resistant strains be used for restoration efforts in areas where temperature has been linked to declines? • how do invasive species (e.g., European green crab, sargassum etc.) impact eelgrass habitats? • Does growth of Ulva impact eelgrass and if so how? 	<ul style="list-style-type: none"> • Re-map deep water edge of eelgrass to see if there has been change over last 20 years. • Monitor vessel presence and density at popular anchorages as well as throughout county waters. • Conduct assessment of ecological value of eelgrass to human health and quantify ecosystem services provided by eelgrass. 	<ul style="list-style-type: none"> • Develop plants resistant to wasting disease • Create a plant vaccine for eelgrass wasting disease • Restoration of eelgrass beds • Quantifying ecosystem services • Establish a transboundary monitoring program to allow identification of long-term trends in coverage.

