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*Washington
Department of*
**FISH and
WILDLIFE**

*SKAGIT WILDLIFE AREA
ISLAND UNIT
FINAL ALTERNATIVES ANALYSIS*

Analysis by: Washington Department of Fish and Wildlife Staff

Preferred alternative selected by: WDFW

Input Provided By: Island Unit Advisory Group and the public

Final Draft Revision

The Final Alternatives Analysis has been written using the Draft Alternatives Analysis as a base document and using the track changes feature of Microsoft Word to highlight revisions that have been made to the text in the document since the Draft Alternatives Analysis was issued. The track changes will show the text additions that have been made in blue. Changes will be indicated with a line down the left-hand margin on each page. Only minor clarifications were made in the body of the report.

Three new sections of the report, the Preferred Alternative (Ch. 6), Stakeholder and Public Engagement (Ch. 2.4) and Appendix B: Advisory Group and Public Comments, will not show track changes because the information provided in those sections is new.

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Acronyms and Abbreviations

Corps	Army Corps of Engineers
ESA	Endangered Species Act
GSD	Greater Skagit Delta
LIDAR	Light Detection and Ranging
NAVD88	North American Vertical Datum 1988
NMFS	National Oceanic and Atmospheric Administration—National Marine Fisheries Service
O&M	Operations and maintenance costs
RMT	WDFW Regional Management Team
SHDM	Skagit Hydrodynamic Modeling Study
SLR	Sea level rise
SRFB	Salmon Recovery Funding Board
SRKW	Southern Resident Killer Whale
TFI	Tidegate Fish Initiative
USFWS	U.S. Fish and Wildlife Service
WDFW	Washington Department of Fish and Wildlife

1. Executive Summary

The Island Unit is located on two diked islands in a tidally-influenced reach of the South Fork Skagit River. The Washington Department of Fish and Wildlife (WDFW) has owned and managed the Island Unit since the 1950s to produce crops for over-wintering waterfowl. The site is sometimes referred to as the "farmed island" and is used primarily by waterfowl hunters.

WDFW assessed land management alternatives to determine how best to respond to emerging issues including aging infrastructure on the site, anticipated sea level rise, and changing habitat needs. The Island Unit is a priority area to restore habitat for salmon because it was historically a tidally-influenced estuarine area that provided critical rearing habitat for juvenile Chinook salmon. The [Skagit Chinook Recovery Plan](#)¹ identifies estuarine habitat as the highest priority for recovering salmon in the area.

WDFW conducted an alternatives analysis, which is a planning process used to evaluate a range of choices relative to a set of identified criteria, to assess four possible conceptual designs ("alternatives"). The alternatives ranged from no restoration to restoration of the entire site. This effort was a high-level analysis using landscape-scale assessment tools and existing data. Criteria were intended to capture the primary considerations WDFW needs to consider when comparing alternatives, and they include WDFW policies, agreements and obligations, costs and funding, fish and wildlife needs, community values and climate change resilience. Criteria were applied to the alternatives using data (where available) as well as qualitative information and best professional judgement of WDFW staff. Technical memos were developed to inform the alternatives analysis and can be found in the appendices of this document.

A project Advisory Group and the public provided input during the process. The Advisory Group was formed to provide input at multiple points during the analysis, and members included stakeholder, tribal and governmental representatives. A 30-day public comment period, virtual meeting and online comment tools provided multiple means for the public to provide input.

The preferred alternative is Alternative 4, which involves restoration of the entire 270-acre site to estuary. This alternative has the clearest path to implementation, provides the greatest benefits to ESA-listed species, and received the highest rating across a broad range of criteria.

2. Introduction

2.1 Site Description

The Island Unit is comprised of two islands in a tidally-influenced portion of the lower south fork Skagit River (Figure 1). Key features on the site are presented in Figure 2. The site is currently managed primarily for the production of high calorie crops for winter waterfowl forage. Approximately 141 acres of the 270 acre site is actively managed for waterfowl forage. The remainder of the site is comprised of dikes, trees, shrubs, ponds and ditches. Dikes and tidegates isolate and protect the site from tides and river flows, making it possible to produce forage crops. Water control structures allow for drainage of farmed and managed areas in the spring and summer, and water retention during the fall and winter to optimize foraging for dabbling ducks. Supplies and equipment are barged and boated across Freshwater Slough to the site from a landing at the Headquarters of the Skagit Wildlife Area on Fir Island. Four unimproved boat landings on the site provide the primary points of access for recreational users. A bridge provides access for pedestrians and WDFW vehicles and equipment from the west island to the east island across Deepwater Slough.

¹ <http://skagitcoop.org/wp-content/uploads/Skagit-Chinook-Plan-13.pdf>

Over time issues guiding the management of the site have changed as explained in the background below.



Figure 1. Project site location in the south fork Skagit River within the Skagit River delta.

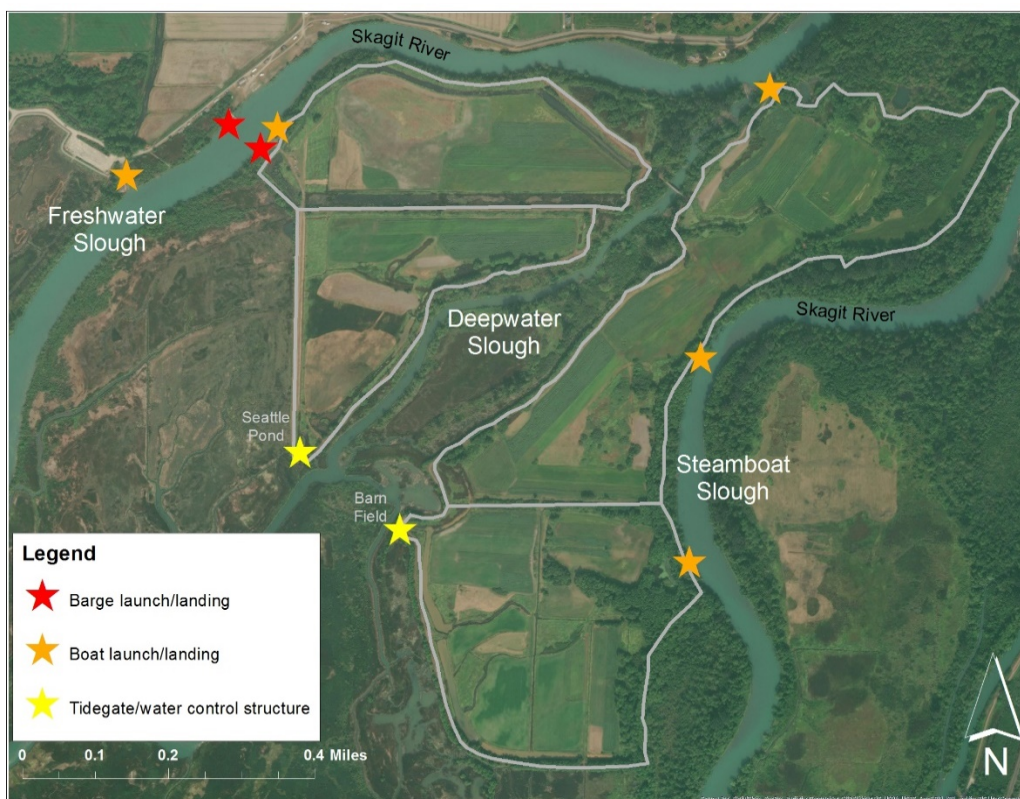


Figure 2. Current site layout.

2.2 Background

The Washington Department of Fish and Wildlife (WDFW) purchased the Island Unit in the 1950s to produce enhanced forage for over-wintering dabbling ducks and geese and as a hunting area. At the time it was purchased the diked area was approximately 470 acres. For many decades after it was purchased by WDFW portions of the diked area were used to produce enhanced and managed winter waterfowl forage.

Since the 1950's, additional considerations related to site management have arisen. In the late 1990's, when Chinook salmon populations were recognized as declining, an alternatives analysis was completed to assess a restoration of the site. At the time the site was comprised of approximately 470 acres that were isolated from tides and river flows behind dikes and tidegates. WDFW selected an alternative to restore a portion of the site to estuary and maintain the remainder of the site in enhanced winter waterfowl forage production. In 2000, the Deepwater Slough project was completed and approximately 200 acres were restored to estuary. This project was authorized under Section 1135 of the Water Resources Development Act of 1986, which allows the Army Corps of Engineers (Corps) to plan, design and build modifications to existing Corps projects, or areas degraded by Corps projects, to restore aquatic habitats for fish and wildlife. [An operation and maintenance agreement was put in place upon completion of the project.](#) Completion of the past project does not preclude future restoration at this site.

Since 2000 additional issues have arisen that WDFW must respond to. First, infrastructure on the site has aged; some no longer work as designed, is difficult to repair or replace and, in some cases, is at risk of failure. Dikes have been damaged by floods, and dike repairs have become more difficult to fund and permit. Tidegates and water control structures are not performing as designed, and are at risk of failure.

Due to concerns about the tidegate and water control structure at the southwest end of the east island (called the Barn Field tidegate), starting in 2014 WDFW sought permits and funding for replacement. Through the permitting process, tribes raised concerns about continuing to cut off access to historic habitats for Endangered Species Act (ESA)-listed Chinook salmon and asserted that replacement of the tidegates should require compensatory mitigation. These concerns were not resolved and WDFW withdrew permit applications. WDFW and tribal interests met to determine a pathway forward. The decision was made to conduct an alternatives analysis to look at future potential management options for the site. Concurrent attempts to obtain funding for replacement of the Barn Field structures were not successful. Additional details on the tidegate and water control infrastructure function, condition and attempt at replacement (including mitigation requirements) are outlined in Appendix A.

Second, the listing of Puget Sound Chinook as threatened under the Endangered Species Act, and the identification of estuary as a limiting factor for recovery, raised the importance of estuary restoration in the Skagit delta. In response to this listing, the Island Unit was identified as a priority area for estuary restoration in several planning documents and agreements. Additional ESA-listings of species directly and indirectly tied to estuary habitats have occurred since 2000, namely bull trout, steelhead trout, and Southern Resident killer whale.

Lastly, the effects of climate change have become better understood in the past few decades, and anticipated changes will affect WDFW lands. At the Island Unit, sea level rise and changing river flows are anticipated to put additional strain on infrastructure, potentially causing more frequent and severe damage to dikes and tidegates, and changing the conditions under which tidegates were designed to operate. This is likely to result in reduced drainage capacity and a greater need for repairs.

As WDFW began this alternatives analysis, it was important that the implications of all potential management options were understood. We acknowledge that there are trade-offs to any decision that is made regarding management of lands owned by WDFW. The intent of this alternatives analysis is to consider the range of issues that affect a decision and to understand the trade-offs that would result from a given alternative so that WDFW could make a fully informed decision. We compiled existing information and engaged interested and affected

parties in order to better understand the issues and trade-offs that would result from a given decision. We considered both site-scale and landscape-scale issues. This document outlines the process and considerations that were used for the alternatives analysis.

2.3 Decision-Making Process

WDFW assesses and makes decisions about restoration on agency-owned lands through a process called the restoration pathway. The restoration pathway outlines a process that is intended to ensure that major restoration project decisions on WDFW land are reviewed by WDFW staff with a diversity of expertise and that stakeholders and external parties have opportunity to provide input. To follow the restoration pathway, WDFW organized the following decision-making process specific to this project:

- A WDFW core project team consisting of regional staff from Habitat and Wildlife programs is responsible for day-to-day management of the project and execution of the project process. This team is also responsible for drafting project documents, compiling input, and recommending a preferred alternative to the WDFW Regional Management Team (RMT).
- A WDFW Skagit District Team consisting of staff from all programs provides input at key points in the project.
- A project advisory group consisting of stakeholders with diverse interests, government agencies and tribes provides input at key points in the project (the group specific to this project is described in detail in Section 2.4 and Appendix B).
- A broader portion of the public not on the advisory committee has an opportunity to comment.
- The Regional Management Team (RMT) consisting of local managers of each of the WDFW programs and the Regional Director reviews the core project team's recommendation and decides on a preferred alternative.
- The Regional Director decides whether to elevate the preferred alternative decision to relevant Program Directors within the agency.
- Upon completion of this decision process, the preferred alternative moves forward to the subsequent project phase.

2.4 Stakeholder and Public Engagement

Stakeholder and public engagement is an important aspect of the alternatives analysis process. Part of the restoration pathway process, described above, includes hearing from affected stakeholders, tribes and governments and addressing, to the degree possible, their input and concerns regarding the issues and considerations used to develop and select a preferred alternative.

WDFW hired Ross Strategic to guide and support staff in developing and carrying out a stakeholder and public engagement process for the project.

Advisory Group

A project advisory group comprised of stakeholder, governmental and tribal representatives was convened to provide input to WDFW on several aspects of the alternatives analysis.

Stakeholder members agreed to reach out to their broader community of interest and strived to represent their community's perspective in Advisory Group discussions. Meeting materials can be found on the [advisory group website](#)² (under "meeting calendar"). More detail on the advisory group selection process, charter, and meeting summaries can be found in Appendix B.

² <https://wdfw.wa.gov/about/advisory/iuag>

Public Comments

A public comment period on the [Draft Alternatives Analysis Report](#)³ was held from November 16, 2020 to December 16, 2020. Comments were submitted online, by email, and by mail. In addition, WDFW hosted a virtual open house via Zoom Webinar on December 2nd, 2020 from 6-8pm. Twenty-one individuals provided oral comments at the virtual open house. In addition, WDFW received 198 written comments submitted online, by email or through the mail. A complete compilation of all comments is included in Appendix B of this report. In addition, a summary of comments with key themes was prepared by Ross Strategic and is also included in Appendix B.

Public comments were reviewed by the WDFW project team and RMT, and were used in considering the preferred alternative (see Ch. 6). Many of the comments received were already addressed in the report. Where clarification or correction in the report was needed, we edited this report in track changes. For other comments, especially those we received multiple times, we added to the frequently asked questions (FAQ) on the [project website](#)⁴ and included in Appendix B.

3. Conceptual Design Alternatives

The grant that funded the alternatives analysis was scoped to include an assessment of 3-4 alternatives ranging from no restoration to full restoration. This meant 1-2 partial restoration alternatives were included. This effort is a high-level analysis using landscape-scale assessment tools and existing data; analysis of detailed engineering solutions and structures is not within the scope of this analysis. Current site layout and features, elevation and actively managed field acreages are shown in Figures 2, 3 and 4. Potential actions considered for each alternative as part of this project phase include:

- Removing or replacing tidegates/water control structures.
- Removing, repairing, or setting back dikes.

Additional design components can be included after the preferred alternative is selected in order to provide the best outcome for all interests within the selected alternative.

As previously described, infrastructure that supports current management of the Island Unit is in disrepair and at risk of failing. When it fails, it will not be possible to manage the Island Unit as it is currently managed for enhanced and managed winter waterfowl forage, and it will not be fully functional estuary habitat for Chinook and other fish and wildlife. In order to maintain current management, some action will be required. For these reasons “No Action” was not considered viable and instead a “No Restoration” alternative was considered. This is represented and described below as Alternative 1 (Figure 5).

Other considerations include features that can be seen in elevation data from the site (Figure 3). Perimeter dikes protect the east and west islands from high river flows and tides, two dikes bisect the west island and a low berm bisects the east island. Elevations inside the dikes (managed fields) generally range from 5 to 9.5 feet NAVD88; dike tops range from 13 to 20 feet NAVD88. Perimeter dikes isolate the site from tidal and riverine flows that would otherwise create and maintain estuary habitats. Water surface elevations outside the dikes range from approximately 3.5 to 13 feet NAVD88.

For development of partial restoration alternatives, we considered the following:

- In order to maintain enhanced and managed winter waterfowl forage and manage water levels the barge landing must remain in the same location on the west island.

³ https://wdfw.wa.gov/sites/default/files/publications/02189/wdfw02189_0.pdf

⁴ <https://wdfw.wa.gov/species-habitats/habitat-recovery/nearshore/conservation/projects/island#FAQ>

- Flood protection and water level management structures must be maintained and improved (dikes, tidegates and water control structures). As noted in Appendix A, the existing tidegates and water control structures are aging and in need of replacement and the existing dikes have experienced minor overtopping. When considering sea level rise projections, dikes will need to be raised in order to withstand future conditions.
- Making use of existing features is assumed to reduce construction cost.
- Differences in elevation across the site affect drainage when farmed and potential habitat types when restored.
- Natural water flow (tides and river) and sediment movement that forms and maintains channels, moves nutrients, seeds, and wood around and supports native vegetation must be restored in order to provide sustainable estuary and salmon rearing habitat.

Tidal channel length and area was predicted for alternatives that include partial or full restoration (Alternatives 2-4). The best locations for where channels should be constructed as well as breaches to connect constructed channels through the dike footprint were also determined for Alternatives 2-4 (Appendix C).

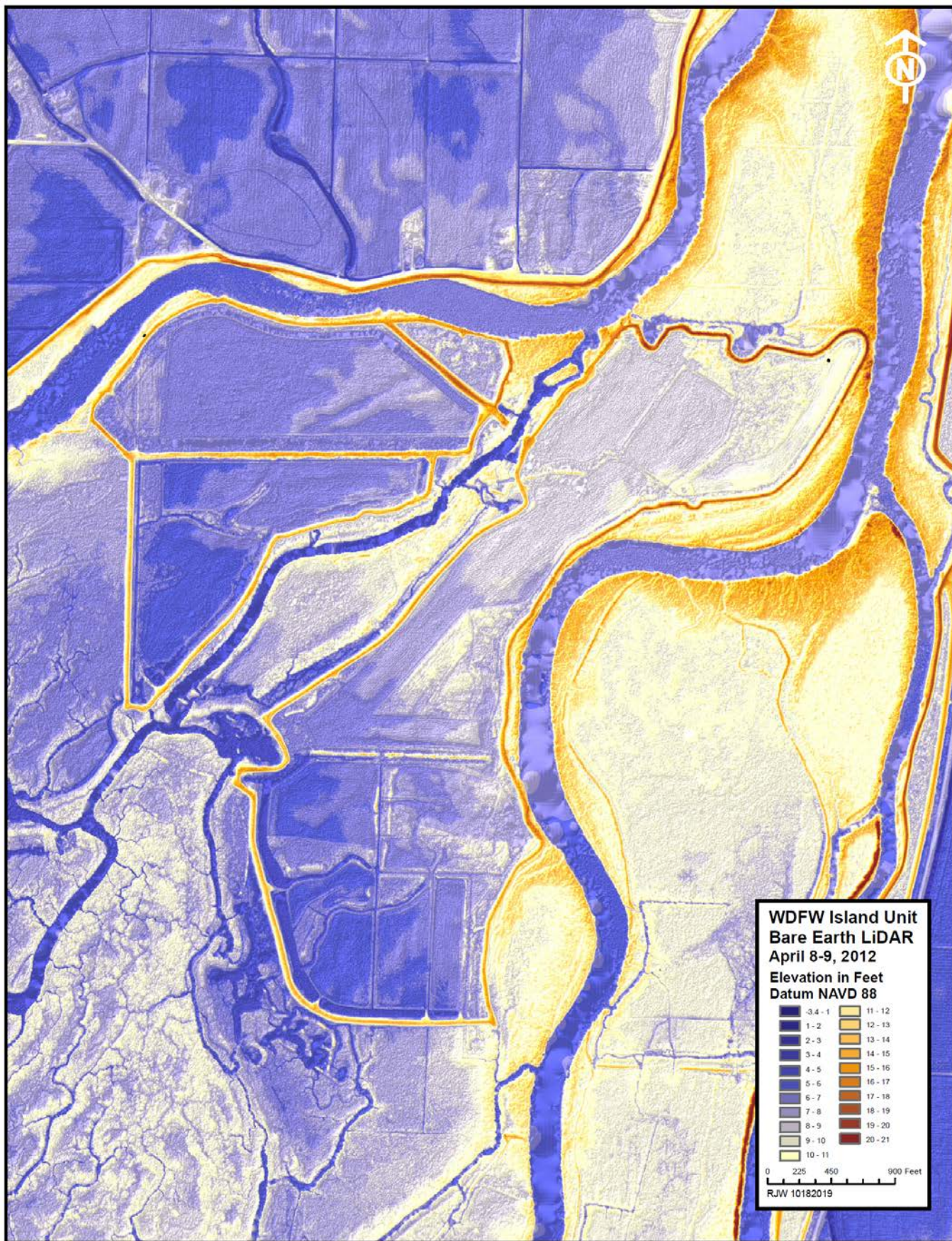


Figure 3. LiDAR elevation data on the site.



Figure 4. Approximate acreages of actively managed fields on the Island Unit in 2019. Field acreages are not equal to the total acreage of the site. Portions of the site are vegetated with trees and shrubs, some are too wet to be farmed, or are comprised of drainage ditches and cross-dikes, and some are permanent and seasonal freshwater wetlands. In fields where conditions are too wet to till and plant crops, pasture grasses are mowed. The total farmed acreage is different each year, depending on staff resources, drainage conditions, infrastructure function and progress toward increased acres of enhanced/managed winter waterfowl forage production over time.

3.1 Alternative 1: No Restoration

Alternative 1 (Figure 5) would involve replacing both the Seattle Pond and Barn Field tidegates (tidegates on west and east islands, respectively) and water control structures. All dikes would be raised to ensure they can withstand near-term sea level rise, and erosion areas would be addressed. In this alternative 0 acres are restored to estuary, and 270 acres are maintained under current management, including 141 acres of enhanced/managed winter waterfowl forage production. Mitigation would be required for areas that continue to be isolated from tidal and riverine processes by tidegates.



Figure 5. Alternative 1: no restoration.

3.2 Alternative 2: Partial Restoration—East Island

In Alternative 2 (Figure 6) the Seattle Pond tidegate and water control structure on the west island would be replaced; dikes on the west island would be raised to ensure they withstand near-term sea level rise, and problem erosion areas would be addressed. The east island would be restored to tidal and riverine influence by removing 50-100% of the dike length and constructing channels (Figure 7). In this alternative 170 acres would be restored to estuary and 100 acres would be maintained under current management, including 54 acres of enhanced/managed winter waterfowl forage production. Mitigation would be required for areas that continue to be isolated from tidal and riverine processes by tidegates.

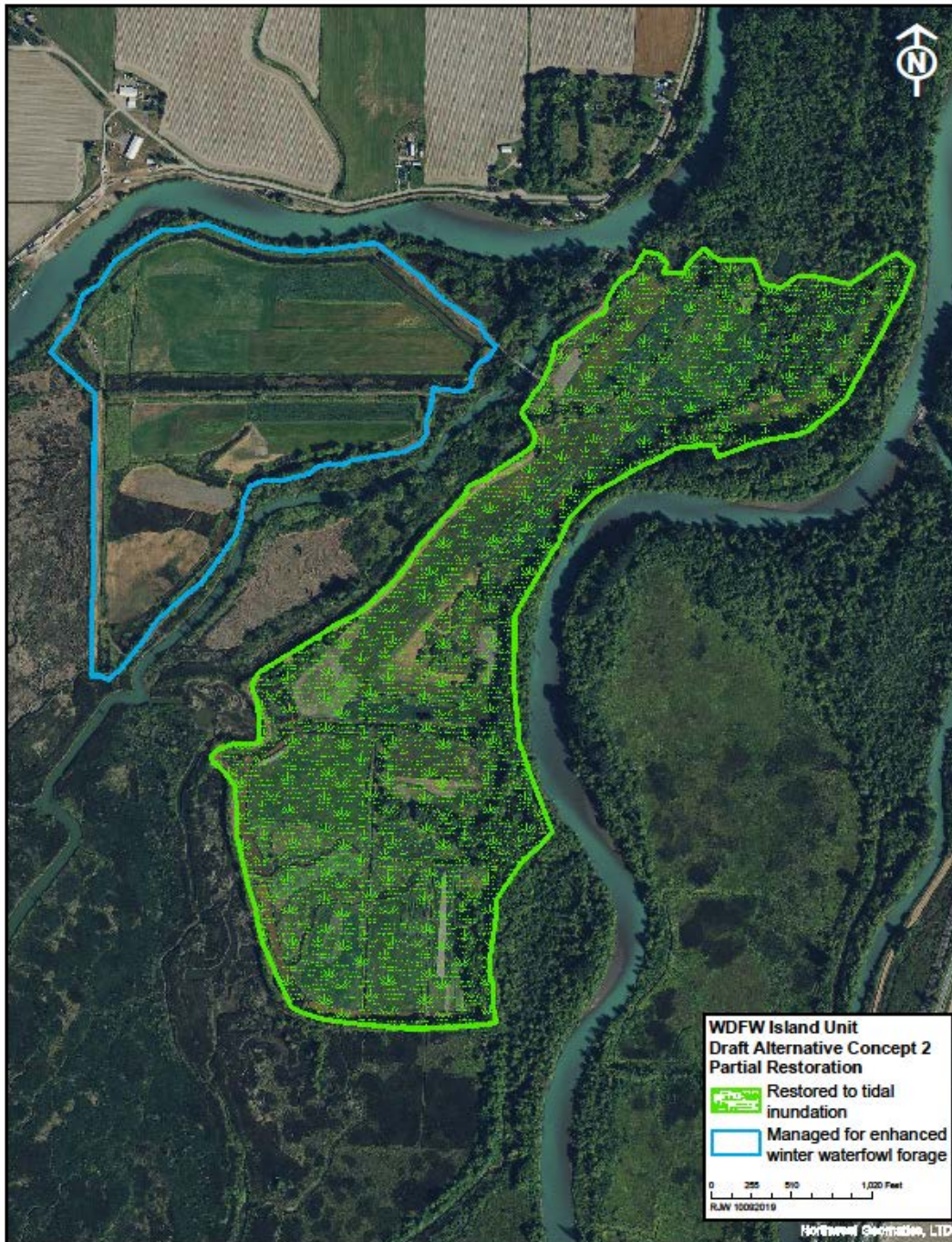


Figure 6. Alternative 2: partial restoration—east island.

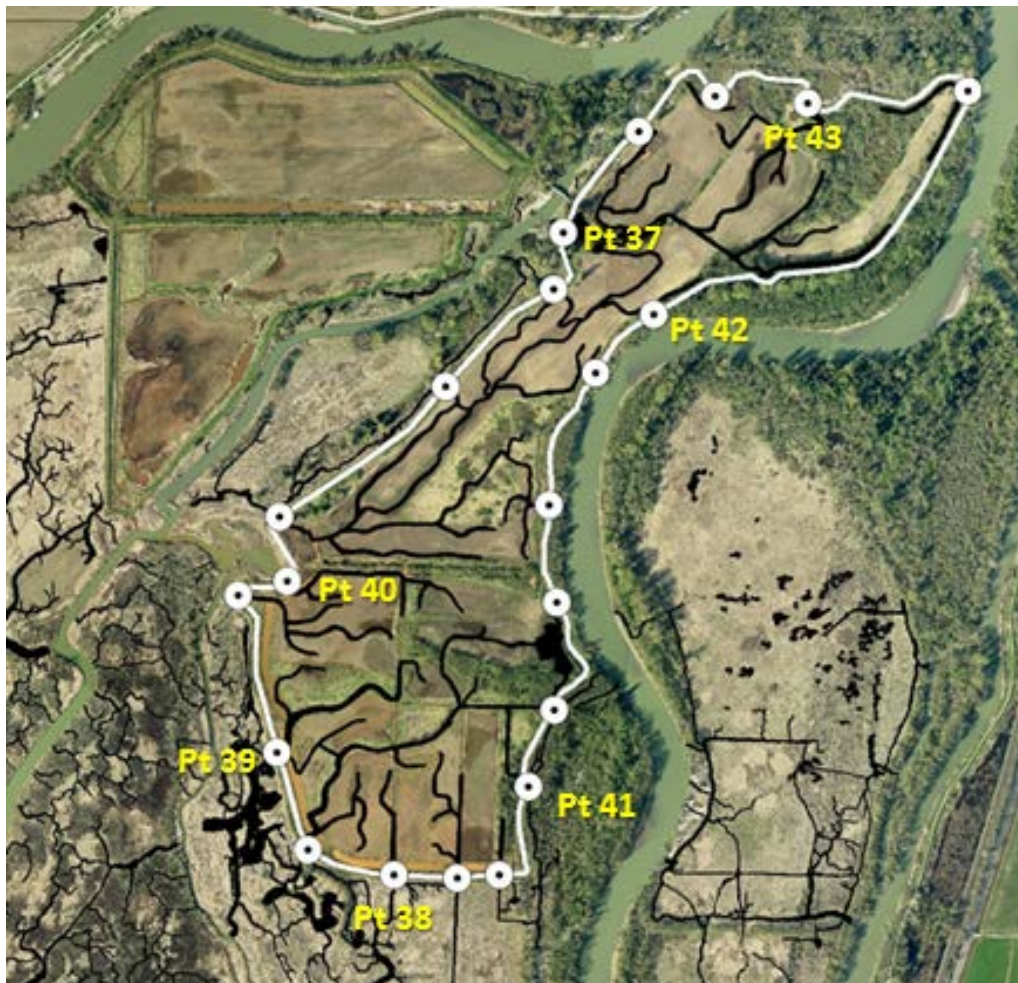


Figure 7. Channel locations and outlets for Alternative 2. Tidal channels are black lines. Tidal channel outlets are shown as white dots with a black center. "Pt ##" labels are related to Chinook smolt estimating methods and are explained in Appendix C. (From Beamer and Hood, 2020)

3.3 Alternative 3: Partial Restoration—Levee Setback

Alternative 3 (Figure 8) maintains current management on a portion of each island and makes use of existing features for setback dikes. Dikes would be removed over 50-100% of their length in areas to be restored to tidal and riverine influence, and tidegates and water control structures would be replaced on both islands within setback dikes. All remaining dikes would be raised to ensure they withstand near-term sea level rise, and erosion areas on the dikes that are not moved would be addressed. This would restore estuary on the lowest elevation areas. Channels would be constructed in areas restored to tidal and riverine influence (Figure 9). In this alternative 110 acres would be restored to estuary and 160 acres would be maintained under current management, including 81 acres of enhanced and managed winter waterfowl forage production. Mitigation would be required for areas that continue to be isolated from tidal and riverine processes by tidegates.

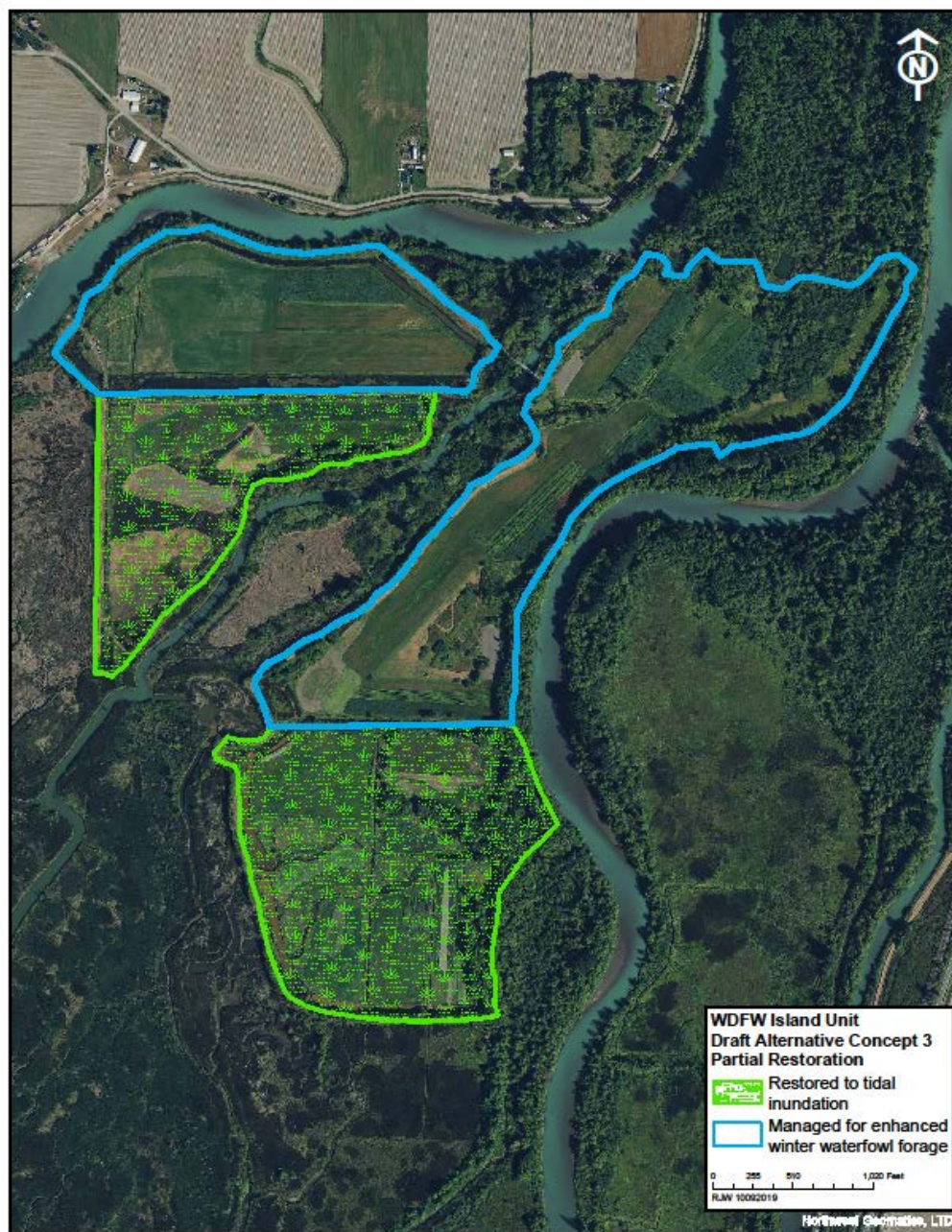


Figure 8. Alternative 3: partial restoration – levee setback

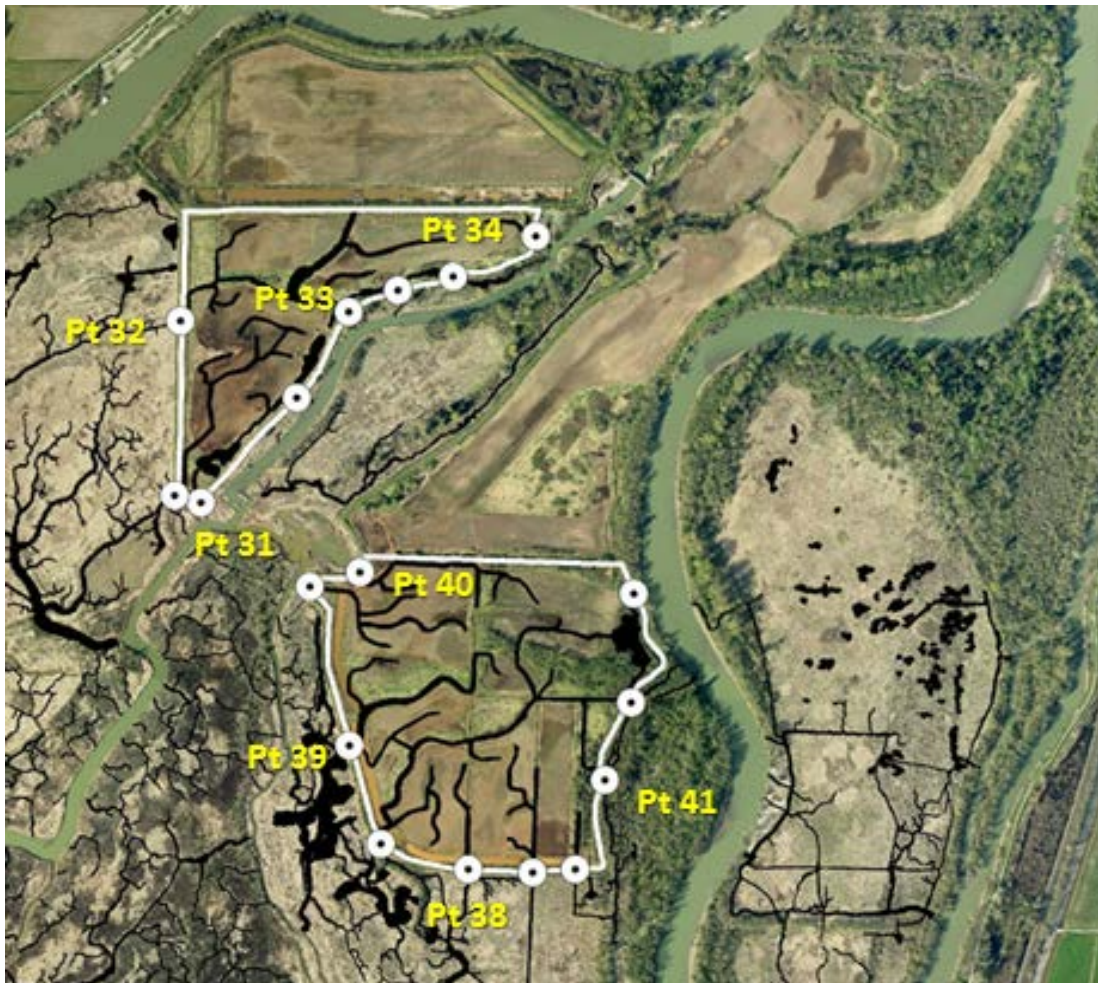


Figure 9. Channel locations and outlets for Alternative 3. Tidal channels are black lines. Tidal channel outlets are shown as white dots with a black center. "Pt ##" labels are related to Chinook smolt estimating methods and are explained in Appendix C. (From Beamer and Hood, 2020)

3.4 Alternative 4: Full Restoration

Alternative 4 (Figure 10) would involve removing all tidegates, water control structures and 50-100% of the dike length to restore tides and river flows to both islands. Channels would be constructed throughout the site (Figure 11). In this alternative 270 acres would be restored to estuary and 0 acres would be maintained under current management. No mitigation would be required.

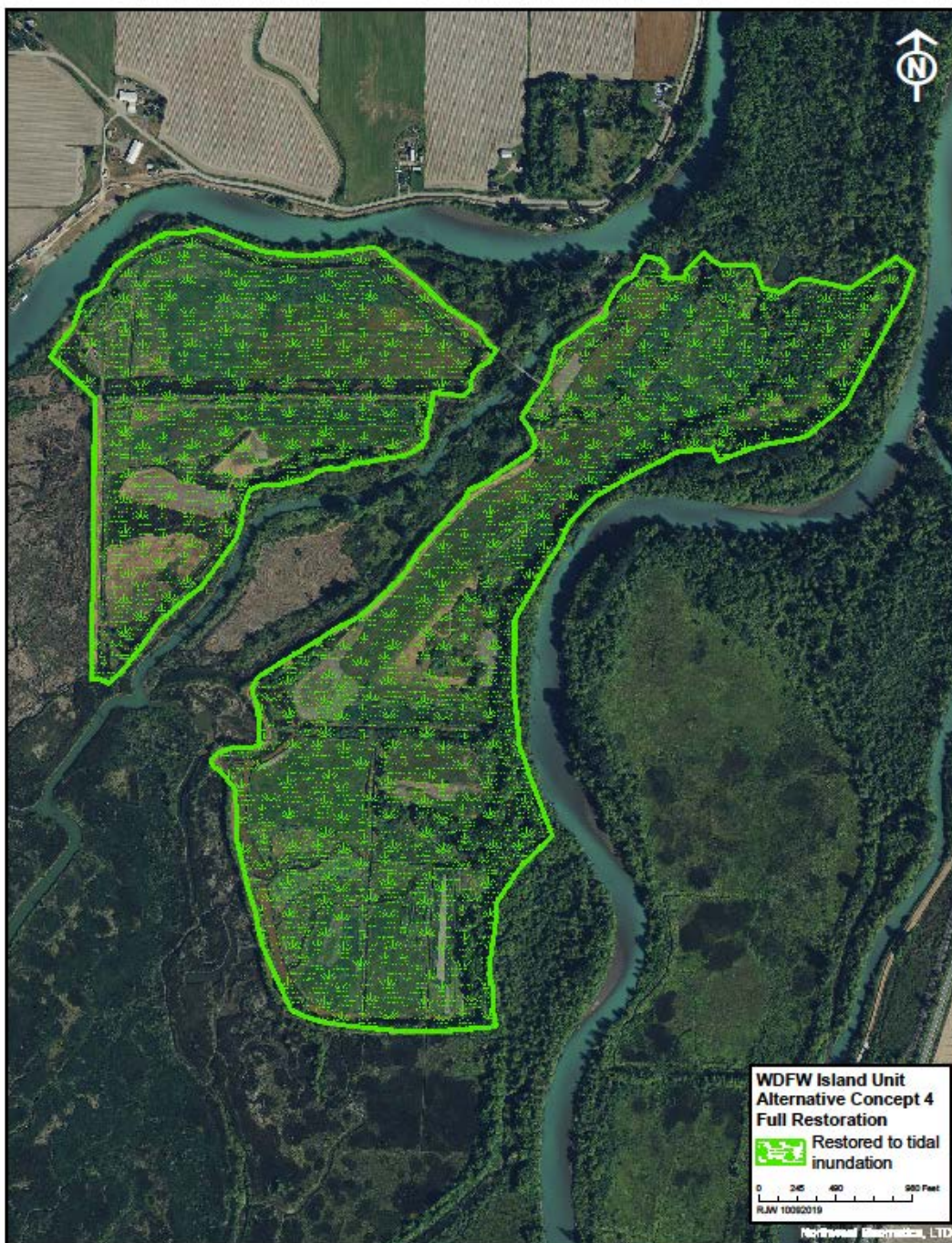


Figure 10. Alternative 4: full restoration.

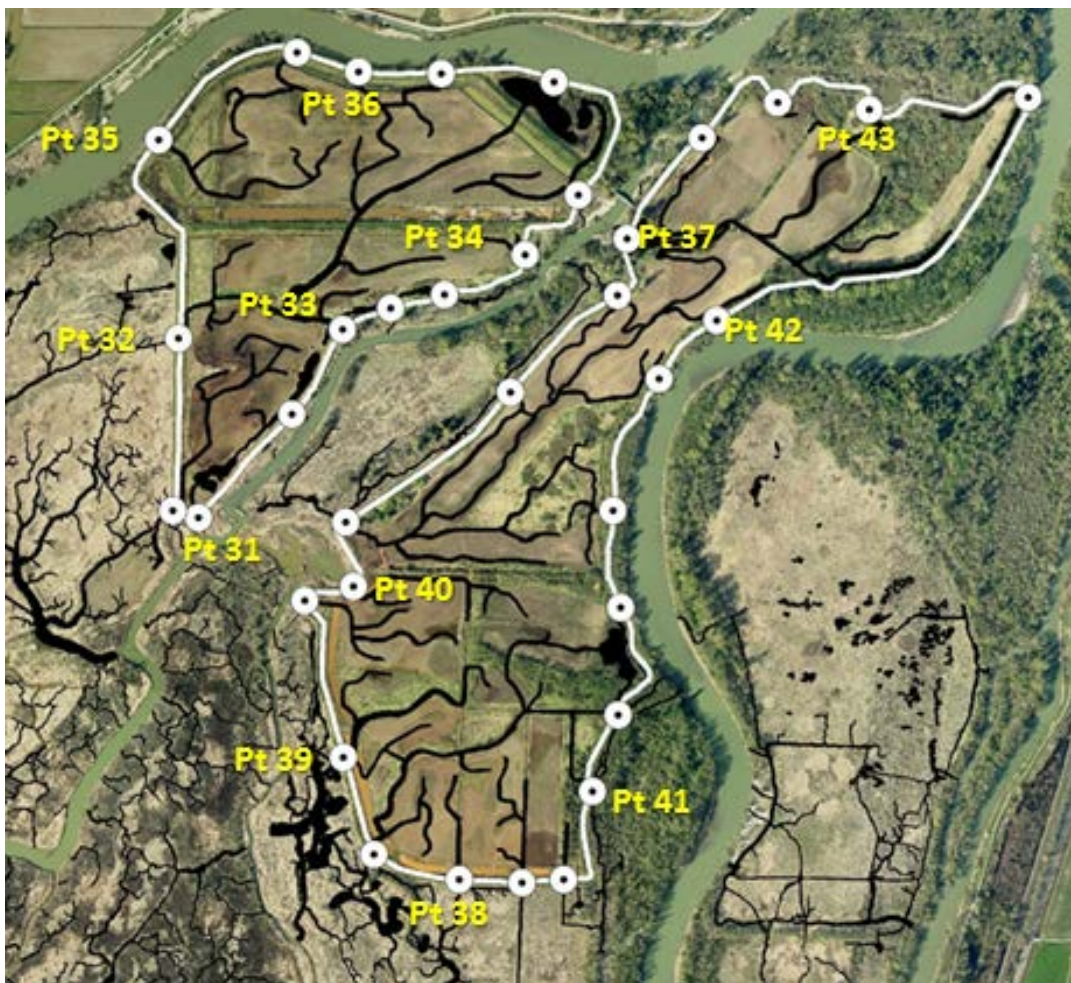


Figure 11. Channel locations and outlets for Alternative 4. Tidal channels are black lines. Tidal channel outlets are shown as white dots with a black center. "Pt ###" labels are related to Chinook smolt estimating methods and are explained in Appendix C. (From Beamer and Hood, 2020)

4. Criteria

This effort is a high-level analysis using landscape - scale assessment tools and existing data. Criteria are intended to capture the primary considerations WDFW used to compare alternatives.

Not all criteria have quantifiable metrics associated with them. This is due to a lack of data for a given topic or because the topic is value-based and therefore difficult to quantify. In these cases best professional judgement of WDFW staff was used after collecting input from the advisory committee. All criteria are qualitative unless otherwise noted.

A note about tribal treaty rights: WDFW jointly manages fisheries resources and collaborates with tribes to recover depleted fisheries resources including the habitats on which they depend. Although this is not included as a criterion below, this is an overarching principle that guides our work. Tribal treaty rights are explained by the [Northwest Indian Fisheries Commission](https://nwifc.org/about-us/fisheries-management/)⁵ as follows:

"The tribes in Western Washington fish commercially, and for subsistence and ceremonial purposes. They fish for all species of salmon and steelhead in marine and freshwater areas of Puget Sound and the Washington coast.

⁵ <https://nwifc.org/about-us/fisheries-management/>

US v. Washington (the “Boldt Decision”) in 1974 reaffirmed tribes as co-managers, along with the State of Washington, of fisheries resources. Co-management means that the tribes and the State of Washington, through the Washington Department of Fish and Wildlife (WDFW), are jointly responsible for managing fisheries and hatchery programs, and that they collaborate in regional efforts to recover depleted fisheries resources.

4.1 Management, Regulatory & Policy Considerations

4.1.1 WDFW Policies

*Declaration of purpose—Department lands: [WAC 220-500-010](https://apps.leg.wa.gov/wac/default.aspx?cite=220-500-010)*⁶

“The primary purpose of department lands is the preservation, protection, perpetuation and management of fish and wildlife and their habitats. Public use of department lands may include fishing, hunting, fish and wildlife appreciation, and other outdoor recreational opportunities when compatible with healthy and diverse fish and wildlife populations.”

This language implies that conservation of fish and wildlife and their habitats is the priority purpose of WDFW lands.

*Policy 5003: [Managing the 21st Century Salmon and Steelhead Initiative](#)*⁷

Relevant sections: *“WDFW lands provide opportunities for salmon recovery; WDFW lands have historically been purchased and managed for big game, waterfowl, fish and upland birds. Management of these lands has not always addressed the needs of salmon and steelhead. WDFW must develop and implement management plans for WDFW lands with additional emphasis on habitat needs for salmon and steelhead.”* (pg. 6)

This language implies that salmon and steelhead habitat needs are a component of land management decisions on WDFW lands.

*Policy 5004: [Department’s Conservation Initiative and Guiding Principles](#)*⁸

Relevant sections: *“We practice conservation by managing, protecting, and restoring ecosystems for the long term benefit of people, and for fish, wildlife, and their habitat; We work across disciplines to solve problems; We integrate ecological, social, economic, and institutional perspectives; We embrace new knowledge and apply best science; and we collaborate with our co-managers and conservation and community partners.”* (pg. 2-3)

This language implies that we work collaboratively, using best available science from across a range of disciplines and interests to accomplish our work.

Policy 5211: [Protecting and Restoring Wetlands](#)

Relevant sections: *“WDFW will accomplish long-term gain of properly functioning wetlands where both ecologically and financially feasible on WDFW-owned or WDFW-controlled properties; WDFW will promote the restoration of original hydrology, elevations and native plant communities.”*

This language puts a clear focus on providing functional wetlands that rely on natural processes. We will consider the geomorphic setting and ability of a given alternative to support and sustain habitats over the long-term.

⁶ <https://apps.leg.wa.gov/wac/default.aspx?cite=220-500-010>

⁷ <https://wdfw.wa.gov/publications/00036>

⁸ https://wdfw.wa.gov/sites/default/files/about/advisory/hcicag/documents/implementation_guidance/pol-5004.pdf

Information from the geomorphic assessment and water surface elevation technical memo (Appendix D) will be used to evaluate alternatives relative to this criterion.

Washington State Wildlife Area Goals 1 – 3⁹

- Goal 1: *“restore and protect the integrity of priority ecological systems and sites”*
- Goal 2: *“sustain individual species through habitat and population management actions where consistent with site purpose and funding”*
- Goal 3: *“provide fishing, hunting and wildlife related recreational opportunities where consistent with goals 1 and 2”*

This language mirrors the purpose of state lands with the additional caveat that actions must be consistent with site purpose and funding. Site purpose for the Island Unit is being determined now through this alternatives analysis process, and will be based on past obligations and current needs as reflected in the full range of criteria presented in this document.

4.1.2 Obligations and Agreements

Acquisition Funding Obligations

The Pittman-Robertson Act, also known as the Federal Aid in Wildlife Restoration Act, was approved by Congress in 1937. The purpose of the Act is to provide funding for restoration of wild birds and mammals and to acquire, develop, and manage their habitats. Funds are derived from an 11% federal excise tax on sporting arms, ammunition, and archery equipment, and a 10% tax on handguns. These funds are collected from the manufacturers by the Department of the Treasury and are apportioned each year to the states by the U.S. Fish and Wildlife Service (USFWS) on the basis of formulas that consider the total area of the state and the number of licensed hunters in the state. WDFW purchased portions of the Island Unit with federal Pittman-Robertson (P-R) funds in 1951¹⁰. Specifically, the acquired land was intended “for the propagation of game and as a public hunting area.” The remaining parcels on the Island Unit were acquired in the early 1950’s using state wildlife funds, generated from the sale of fishing and hunting licenses. State wildlife funds have no identified management agreement as a part of the acquisition process.

While P-R funds were used to acquire portions of the Island Unit, WDFW cannot currently use P-R funds to complete some of the activities required to manage enhanced forage on the Island Unit, as USFWS does not permit the use of these funds for activities that have the potential to injure or take an endangered species. P-R funds cannot be used for activities such as chemical treatments for crop production or weed control. Although agricultural activities may not have a direct impact on ESA-listed salmon, steelhead and bull trout, federal funds cannot be used without a Habitat Conservation Plan approving the specific agricultural activities.

As part of the alternatives analysis, WDFW developed a waterfowl and shorebird technical memo (Appendix E) described in section 4.2.3 and evaluates site and landscape scale hunting access as described in section 4.3.4. Information in these sections is intended to inform the WDFW and USFWS determination of compatibility of the selected alternative with P-R funding. If the preferred alternative includes restoration, WDFW and USFWS will make this determination in the subsequent phase of project planning.

⁹ <https://wdfw.wa.gov/sites/default/files/publications/01810/wdfw01810.pdf>

¹⁰ P-R Project Agreement W-45-L

Alternatives Analysis Funding Obligations

The alternatives analysis must be consistent with contractual obligations associated with the Salmon Recovery Funding Board (SRFB) grant¹¹, which is funding the alternatives analysis. It must be consistent with the grant scope, which includes considering 3-4 alternatives that range from no restoration to full restoration.

House Bill 1418

- [House Bill language](#)¹²
- [House Bill 1418 Report: Tidegates and Intertidal Salmon Habitat in the Skagit Basin](#)¹³

House Bill 1418 was passed by the state legislature during the 2003 Regular Session. This bill is also known as the Tidegates and Intertidal Salmon Habitat in the Skagit Basin bill. House Bill 1418 was passed specifically to exempt tidegates and drainage infrastructure from fish passage requirements. The legislation provides that if a limiting factors analysis finds that there is insufficient intertidal habitat for salmon recovery, WDFW and the County may jointly initiate a salmon intertidal habitat restoration planning process. This bill specifies that the planning process result in a “long-term plan for intertidal salmon habitat enhancement to meet the goals of salmon recovery and protection of agricultural lands” and that the plan “shall consider all other means to achieve salmon recovery without converting farmland” and finally that the “proposal shall include methods to increase fish passage and otherwise enhance intertidal habitat on public lands...”. The task force established by this house bill developed a plan that identified Wiley Slough, Leque Island, Milltown Island, and Deepwater Slough Phase 2 (Island Unit) as Tier 1 areas for future restoration.

Migratory Bird Management

Migratory birds are cooperatively managed between state, federal and international entities. All migratory birds (a total of 1,093 species) are protected under the Migratory Bird Treaty Act (1918), and associated treaties between the United States with Canada, Mexico, Japan and Russia. It is acknowledged in these agreements that wetland habitats during different seasons (breeding, wintering and migration) are needed to achieve and maintain long-term conservation of population levels, distributions, and patterns of migration for the protection of migratory birds. It is under this framework that state law and regulations must consider proposed actions and activities to be consistent with agreed upon protections.

Coordination among partners related to the Migratory Bird Treaty Act (1918) and four international treaties, include:

- Flyway Councils that serve as the interface between state, federal and international entities for all regulatory decisions. The four flyway councils facilitate state, federal, and international coordination of migratory bird conservation and management, including development of conservation plans to serve as guiding documents.
- The four international migratory bird plans, the North American Waterfowl Management Plan, the United States Shorebird Conservation Plan, the North American Waterbird Conservation Plan, and the Partners In Flight Conservation Plans serve as the guiding principles to align MBTA, the treaties and the North American Wetland Conservation Act.
- The North American Wetland Conservation Act (1989) encourages partnerships among public agencies and other interests to: 1) protect, enhance, restore, and manage an appropriate distribution and diversity of wetland ecosystems and habitats associated fish and wildlife in North America; 2) maintain current or

¹¹ RCO agreement #17-1159P

¹² <http://lawfilesexternal.wa.gov/biennium/2003-04/Pdf/Bills/House%20Passed%20Legislature/1418-S2.PL.pdf?q=20200915082107>

¹³ https://wdfw.wa.gov/sites/default/files/about/advisory/iuag/smith_et_al_2005_tide_gate_salmon_recovery_analysis_skagit.pdf

improved distributions of wetlands associated migratory bird populations; and 3) sustain an abundance of waterfowl and other wetland associated migratory birds.

- Migratory Bird Joint Ventures, in coordination with the flyway council's state agencies, are cooperative, regional partnerships that work to conserve habitat for the benefit of birds, other wildlife, and people addressing the bird habitat conservation issues found within their geographic area. Each joint venture has a Strategic Plan that outlines habitat acreage goals to fulfill objectives and agreements of the four migratory bird plans. The south fork delta of the Skagit River falls within the High Priority areas identified in all four migratory bird plans (see [USFWS mapping tool](#)¹⁴)

*[Skagit Tidegate Fish Initiative Implementation Agreement](#)*¹⁵

The Skagit Tidegate Fish Initiative (TFI) is a signed agreement between WDFW, Western Washington Agricultural Association, National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NMFS), USFWS and commissioners from each of the twelve Skagit Diking, Drainage and Irrigation Districts that manage tidegates. The TFI includes 1) an implementation agreement to achieve functional estuary restoration by linking estuary restoration with long term drainage maintenance needs through a system of credits and debits, and 2) a biological opinion from the NMFS. The implementation agreement was developed by staff from the signatories as well as the US Army Corps of Engineers, Washington State Department of Ecology, and the Governor's Office. The implementing agreement is based on the Skagit Chinook Recovery Plan, House Bill 1418, and the need to maintain and replace tidegates. The agreement is a "collaborative effort by the participating parties to support estuarine restoration projects within the Restoration Area that are consistent with and provide a direct contribution to achieving the goals and objectives of the Skagit Chinook Recovery Plan" and that the agreement "will provide a system of checks and balances to assure that mutually supportive actions will occur in a timely and cooperative manner throughout the 25-year duration of this Agreement." Island Unit/Deepwater 2 is identified as a potential project that contributes to the goals outlined in the agreement.

4.1.3 Future Cost and Funding

[Funding availability and relative implementation and construction cost](#)

The total cost and likelihood of funding for construction is considered. Cost estimates include all design, permitting, mitigation and construction costs. Infrastructure design will reflect climate change predictions such as sea level rise, and take site limitations, such as power not being available, into account. Implementation cost is a quantitative metric and prediction of funding availability is a qualitative metric. Implementation costs are assessed in the Opinion of Probable Construction Cost technical memorandum (Appendix F).

[Funding availability and relative cost for operations and maintenance \(O&M\)](#)

The total annualized cost and likelihood of funding for operation and maintenance will be considered. Cost estimates will include operation and maintenance of dikes, tidegates, blinds and other infrastructure; farming and moist soils management; and control of weeds and other undesirable species. Major repairs to dikes and tidegates will not be included. O&M costs are a quantitative metric and prediction of funding availability is a qualitative metric.

¹⁴ <https://fws.maps.arcgis.com/apps/MapSeries/index.html?appid=632303c8dd8547e19b2b3198fac45078>

¹⁵ https://wdfw.wa.gov/sites/default/files/about/advisory/iuag/tfi_ia_final_4_21_10.pdf

4.2 Fish and Wildlife Needs

4.2.1 ESA-Listed Chinook and Southern Resident Killer Whale Recovery

Endangered Species Act – Background

Congress passed the Endangered Species Act (ESA) in 1973, recognizing that the natural heritage of the United States was of "aesthetic, ecological, educational, recreational, and scientific value to our Nation and its people." It was understood that, without protection, many of our nation's living resources would become extinct.

The listing of a species as endangered makes it illegal to "take" (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to do these things) that species. Similar prohibitions usually extend to threatened species. Federal agencies may be allowed limited take of species through interagency consultations with NMFS or USFWS. Non-federal individuals, agencies, or organizations may have limited take through special permits with conservation plans. WDFW's ability to manage both recreational and commercial fisheries is directly impacted by the ESA listing of Chinook salmon and Southern Resident Killer Whales. There are individual criteria for ESA-listed Chinook and Southern Resident Killer Whales below. Other species of ESA-listed fish are captured below under Food fish and game fish in section 4.2.2.

ESA-Listed Puget Sound Chinook salmon

Puget Sound Chinook were listed as Threatened under ESA in 1999. In response to Chinook salmon being listed under the Federal Endangered Species Act, WDFW co-authored the Skagit Chinook Recovery Plan (SCRP) with the Skagit River System Cooperative, which represents the Swinomish Indian Tribal Community and Sauk-Suiattle Indian Tribe. The SCRP identifies estuary habitat as a limiting factor for Chinook recovery and places estuary habitat in the highest priority category for restoration. The plan also identifies Deepwater Slough Phase 2 (Island Unit) as a high priority project.

The Skagit Chinook Recovery Plan goal for the estuary is to provide space for an additional 1.35 million smolts, which is a gain of approximately 2,700 acres of estuary. Large sites that support extensive channel area and are located close to migration pathways provide the greatest value toward Skagit Chinook recovery. The Island Unit is identified as a potential estuary restoration site in the Skagit Chinook Recovery Plan (referred to as the Deepwater 2 project). The following reports provide background information:

- [Skagit Chinook Recovery Plan](#)¹⁶
- [Estuary appendix](#)¹⁷

Alternatives are assessed based on their alignment with recommendations in the Skagit Chinook Recovery Plan, and their ability to provide habitat for rearing juvenile Chinook. Quantifiable metrics that will be included are:

- Predicted acres of estuary (project footprint)
- Predicted acres of channel habitat (allometric model)
- Smolt carrying capacity (Skagit Chinook carrying capacity model)

Information from the tidal channel and Chinook salmon technical memo (Appendix C) is part of what is used to evaluate alternatives relative to this criterion.

¹⁶ <https://wdfw.wa.gov/sites/default/files/about/advisory/iuag/skagit-chinook-recovery-plan.pdf>

¹⁷ <https://wdfw.wa.gov/sites/default/files/about/advisory/iuag/skagitchinookrecoveryplanappendix-d-estuary.pdf>

ESA-Listed Southern Resident Killer Whale (orca)

Southern Resident Killer Whales (SRKW) have been listed as Endangered since 2005 and a [recovery plan](#)¹⁸ was completed in 2008. While other populations of killer whales feed primarily on harbor seals or sharks, the primary prey species of SRKW is Chinook salmon. Several factors have been determined to be contributing to the decline of SRKW including prey availability, chemical contaminants, oil spills, vessel interactions and vessel sound. The Southern Resident Orca Task Force identified Chinook production as a core strategy for SRKW recovery. As the largest producer of Puget Sound Chinook, the Skagit River is considered especially important for the production of wild Chinook. NOAA and WDFW found fall Chinook from the Skagit River to be among the top priority stocks for SRKW (see [Southern Resident Killer Whale Priority Chinook Stocks Report](#)¹⁹) Recovery of fall Chinook in the Skagit is limited by the lack of estuary habitat and would benefit from estuary restoration.

4.2.2 Food fish and Game fish²⁰

Estuary restoration is generally driven by the need to protect or recover a species listed under the Endangered Species Act (ESA) and in the Skagit Delta estuary restoration is focused on ESA-listed Chinook. ESA listed bull trout and steelhead are also found in Skagit estuary habitats along with many fish species that are not ESA listed. Pink, chum, and coho salmon, coastal cutthroat trout, and sturgeon are among the food fish and game fish species found occupying estuary habitats in addition to ESA listed Chinook, steelhead, and bull trout.

Skagit estuary research methods have been specifically designed to capture and address questions about Chinook. Because of the limited scope of the research relatively little has been learned about the roles and estuary life histories of other foodfish and gamefish species. However researchers have gleaned new information that has shed additional light on food fish and gamefish use of the estuary. Below is a summary of our current understanding.

Bull trout were listed as threatened throughout Washington in November 1999. Research done on bull trout has shown a complex life history with individuals observed hundreds of miles from their natal streams entering estuarine and freshwater habitats to forage. The Skagit estuary provides high value foraging for juvenile bull trout originating from the Skagit as well as adult bull trout from the Skagit and other Puget Sound stocks.

Puget Sound Steelhead were listed as threatened under the ESA in 2007. The understanding of how steelhead use the estuary is limited and until recently they were not thought to use the estuary beyond passing through it as smolts migrating to the ocean and returning as adults to spawn. Recent estuary research using new trapping methods has found parr stage juvenile steelhead in estuary habitats. Parr stage steelhead in Puget Sound steelhead populations are known to be rearing fish as opposed to actively migrating.

Coastal cutthroat trout (searun and resident forms) are a popular fishery, but not much is known about the abundance and life history of the species in the Skagit. We do know that estuary habitats are used by both juvenile and adult coastal cutthroat.

Coho are found in freshwater tidal estuary habitats of the Skagit River where juvenile coho rear for an extended period prior to outmigrating as smolts. Chum and pink salmon are known to occupy Skagit estuary habitats for

¹⁸ <https://repository.library.noaa.gov/view/noaa/15975>

¹⁹ <https://www.fisheries.noaa.gov/webdam/download/103504571>

²⁰ *What are Food fish and Game fish? Food fish include salmon, sturgeon, halibut, bottomfish (such as rockfish and lingcod), forage fish (such as anchovy, herring and sardine), common carp, shad, tuna, mackerel, and others. Game fish include bass, burbot, catfish, crappie, grayling, perch, northern pike, tiger musky, suckers, sunfish, trout (including steelhead), landlocked salmon (such as chinook and coho salmon, and kokanee in designated waters listed in the Sport Fishing Pamphlet), walleye, whitefish and others.*

about a week during the seaward migration and research from other river systems has suggested they may occupy estuary habitats for up to three weeks.

There is much to be learned about estuary habitat use by fish species other than Chinook. Despite what is not known about use by other food fish and game fish species, all species share the fact that while present in estuaries, regardless of how briefly, they benefit from access to these habitats.

4.2.3 Shorebird and Waterfowl Conservation

Migratory birds travel vast distances, and their habitats and populations are managed and monitored at multiple scales. For waterfowl, continental habitat needs are agreed to by the U.S., Canada and Mexico under the Pacific Flyway Council. Management and population objectives are developed and described in the North American Waterfowl Management Plan, and then broken down into regional and smaller planning areas. Washington State is part of the Pacific Coast Joint Venture which is broken down into sub-basin planning areas; the Skagit is in the North Puget Sound Lowlands sub-basin. Breeding population surveys, harvest data and local waterfowl flights all inform population status and management actions for waterfowl.

The U.S. Shorebird Management Plan was completed by USFWS in 2000. The goal of this plan is to ensure that adequate quantity and quality of *shorebird* habitat is maintained at the local level and to maintain or restore *shorebird* populations at the continental and hemispheric levels. The Greater Skagit Delta is designated as a site of Regional Importance under the Western Hemisphere Shorebird Reserve Network.

Wintering waterfowl and shorebirds use the Greater Skagit Delta (Samish, Padilla, Skagit and Port Susan Bays), including the Island Unit, for resting and feeding. The effect of restoring estuary habitat on waterfowl and shorebirds is not well-documented or understood. The limited studies and data that are available related to the value of managed upland vs. tidal estuarine habitats for waterfowl and shorebird conservation in the Greater Skagit Delta is described in the waterfowl and shorebird technical memo (Appendix E).

For this criterion we consider the importance of the Island Unit and how it is managed to waterfowl and shorebirds that winter in the Greater Skagit Delta. Information from the waterfowl and shorebird technical memo (Appendix E) is used to qualitatively evaluate alternatives relative to this criterion.

4.3 Community Interests

4.3.1 Agriculture

Both House Bill 1418 and the Tidegate Fish Initiative (TFI) are key considerations for the agricultural community. Links and descriptions of these agreements are included above. HB1418 required that a plan be developed to recover Chinook salmon with the least impact to private commercial farmland. The TFI identifies the restoration of the Island Unit as a project that would generate credits and therefore provides a benefit to the agricultural community and their need to maintain drainage infrastructure.

In addition to HB1418 and TFI, which provide benefits to agricultural interests, the [Skagit Hydrodynamic Modeling \(SHDM\) Project](#)²¹ also highlighted the importance of certain projects to agriculture for a variety of reasons. This study is another key consideration for the agricultural community related to Island Unit.

²¹ <https://wdfw.wa.gov/publications/02123>

Acknowledging that not all restoration projects hold the same value in terms of Chinook recovery or other community values, the HDM project sought to prioritize potential projects using a quantitative, multiple-interest framework and applying the best available science. Agricultural, flood risk and Chinook recovery interests were included in the assessment. The project evaluated 23 projects for their relative benefits and negative impacts to farm, fish and flood interests. Based on the results, the Island Unit project is in the highest priority group of projects.

4.3.2 Passive Recreation

It is important to note that this site is not used by many passive recreational users due to access being by boat only. Because passive recreational use is limited, the specific users and their preferences are relatively unknown. We assume some enjoy wildlife viewing and bird watching; others enjoy walking, photography or kayaking. We assume that some value ease of access by boat and then on foot as described below in the waterfowl hunting section, while others may prefer native estuarine habitats where dynamic processes shape landforms and conditions change frequently. A variety of habitats, species and experiences are likely valued by limited numbers of passive recreational users on and around the site.

For these reasons, passive recreational use will be considered, but we did not conduct detailed analysis of this topic related to the alternatives.

4.3.3 Recreational Fishing

The primary consideration for recreational fishing is whether proposed actions support the recovery and health of fishable populations. The ESA-listing of Puget Sound Chinook salmon, in particular, has constrained fishing seasons internationally, nationally, and within Washington coastal and Puget Sound waters, and river systems. There are six identified unique Chinook populations in the Skagit system and all of those have specific limits on how much harvest from each population or summed populations is allowable. When fishery managers model fisheries, harvest levels for each and every Chinook population from the Skagit and all Washington Chinook populations are estimated to make sure no population is over-fished. If a stock falls into critical status, it gets even more protection which often leads to severe curtailment of opportunities because all fisheries are managed to minimize impacts to the critical stock. Actions that support the recovery of Chinook, including restoring estuary habitat for juvenile rearing, can preserve and increase fishing opportunities in the Skagit River, Puget Sound, and beyond.

Ease of access on the site is not included in this criterion since recreational fishing is primarily boat-based or from marine shorelines in Puget Sound and not from riverine or estuarine shorelines at the site.

4.3.4 Waterfowl Hunting

There are both site-scale and landscape-scale considerations when it comes to assessing waterfowl hunting opportunity.

At a site scale, considerations that are taken into account when assessing this category are the type and variability of forage that is grown to attract waterfowl throughout the season and the number of hunting parties the site can support at any given time based on the layout of the site. Another consideration at the site scale is ease of access, which includes boat access to the site and ease of walking on the site. In terms of boat access, the primary consideration is the number and location of boat landings for a variety of watercraft (kayaks, trailered boats, etc.). Ease of walking includes the character of the walking surface (mostly mowed dikes, managed fields and ditches with predictable water levels vs. evolving channels, vegetated marsh and logs with changing water levels), which influences the predictability of walking conditions. Each of these site scale metrics is assessed qualitatively by WDFW staff with input from the advisory group.

On a landscape scale, the availability of similar huntable forage types and acreages throughout the Skagit delta and broader North Puget Sound region is a consideration within the waterfowl hunting criteria. WDFW completed

an inventory of all lands managed through its Wildlife Areas and Private Lands Access Program within Region 4 and specifically in the Skagit delta, comparing acreage numbers between 2000 (prior to salmon recovery projects) and 2016. The habitat type categories are: enhanced forage, managed forage, non-forested upland, intertidal, and riparian (tree/brush). This method is proposed because it is an easily measured and objective way to assess how WDFW's contribution to habitats that support hunting opportunities have changed on a landscape scale.

Additionally, existing data is compiled to evaluate the amount of hunt days statewide, county-wide and at the site scale to give a rough characterization of how the Island Unit and Skagit County relate to Objective 104 in the [July 2015-June 2021 WDFW Game Management Plan](#)²², which statewide is to "Maintain hunter numbers between 35,000-45,000 and recreational use days between 300,000-500,000, consistent with population objectives."

4.4 Climate Change Resilience

Long-term resilience to climate change effects such as sea level rise and changing weather patterns and river hydrology are considered. While sea level rise predictions for a 50-year time horizon is incorporated into how construction costs are developed, this criterion considers whether each alternative is resilient to the anticipated effects of climate change over a longer time frame and ways each alternative is resilient given that there is uncertainty in how factors affecting the Island Unit will change. The ability for habitats to migrate and the potential for flood risk reduction will be part of this criterion. Information from the geomorphic assessment and water surface elevation technical memo (Appendix D) is used to assess this criterion.

²² <https://wdfw.wa.gov/sites/default/files/publications/01676/wdfw01676.pdf>

5. Analysis of Conceptual Design Alternatives

Alternatives are rated for each criterion using the summary rating system in Table 1. Ratings are determined relative to current conditions. Some criteria did not “fit” the rating system. In those cases alternate rating systems are explained in individual criterion sections below. As noted above in the introduction to section 4, some criteria are assessed based on quantitative information and data, and some criteria are assessed based on qualitative information and best professional judgement of WDFW staff.

Table 1. Summary system used to rate alternatives relative to each criterion.

Substantial positive change	++
Positive change	+
Some positive effects, some negative effects	+/-
Comparable to existing conditions	√
Negative change	-
Substantial negative change	--

The summary ratings for each alternative and each criterion are provided in Table 2 and explained in the text below. Ratings provide a summary only and not a complete understanding of all implications of a particular alternative relative to a criterion. The detailed implications are described in the the text throughout section 5. Also, please note that a negative change (-) or substantial negative change (--) does not mean that the alternative provides no remaining value or benefit for the criterion in question.

Lastly, the table is intended to capture the primary issues (criteria) that affect a decision regarding future management of the Island Unit. The ratings in the table will not be summed to provide a “total rating” per alternative, or to rank the alternatives from highest to lowest.

Table 2. Summary ratings for each alternative relative to each criterion.

	WDFW policies					Agreements & obligations					Costs and funding			Fish and wildlife needs							Community interests				Resili- ence	
NOTE: the ratings in this table are a summary only; for a complete understanding of the ramifications of each alternative to a criterion, please read the entirety of Section 5	Purpose of dept lands	Policy 5003: salmon & steelhead initiative	Policy 5004: conservation initiative	Policy 5211: protecting & restoring wetlands	State wildlife area goals	Acquisition funding obligations	Alt analysis funding obligations	House Bill 1418	Migratory bird management	Skagit tidagate fish initiative	Cost and likelihood of implementation funding	Likelihood of O&M funding	Relative cost of O&M	ESA-listed Chinook	ESA-listed orca/SRKW	Food fish & game fish	Shorebirds - site scale	Shorebirds - GSD scale	Waterfowl - site scale	Waterfowl - GSD scale	Agriculture	Passive Recreation	Recreational fishing	Waterfowl hunting	Climate change resilience	
	Alt 1: No Restoration	+/-	-	+/-	-	+/-	yes	Yes	-	+/-	-	not likely	un-certain	√	-	-	-	√	√	+	√	-	√	-	+	-
	Alt 2: Partial Restoration (east island)	+/-	+	+/-	+	+/-	TBD	Yes	+	+/-	+	un-known	un-certain	√	+	+	+	+	+	+/-	√	+	+/-	+	-	+
	Alt 3: Partial restoration (levee setback)	+/-	+	+/-	+	+/-	TBD	Yes	+	+/-	+	un-known	un-certain	√	+	+	+	+	+	+/-	√	+	+/-	+	-	+/-
	Alt 4: Full restoration	+/-	++	+/-	++	+/-	TBD	Yes	++	+/-	++	very likely	un-certain	√	++	++	+	++	++	--	-	++	+/-	++	--	++

5.1 Management, Regulatory & Policy Considerations

5.1.1 WDFW Policies

Declaration of purpose—Department lands: WAC 232-13-020

Conservation of fish and wildlife and their habitats are the priority purposes of WDFW lands. Hunting and fishing and other recreational opportunities are allowed when compatible with the primary uses. Each alternative will conserve habitats for a different suite of species. All alternatives will provide hunting, fishing and other recreational opportunities. For this reason all alternatives received a “+/-”.

Policy 5003: Managing the 21st Century Salmon and Steelhead Initiative

Alternatives differ in their ability to contribute to salmon and steelhead habitat needs, which are a component of land management decisions on WDFW lands.

- Alt 1 does not provide any habitat for salmon and steelhead. Although Alternative 1 does not decrease the habitat value for salmon compared to the baseline condition, by rebuilding infrastructure to restrict salmon access it would commit WDFW to continuing the current management for a longer period of time than current infrastructure supports. For these reasons Alternative 1 received a “-”.
- Alt 2 provides 170 acres of additional habitat for salmon and steelhead so it received a “+”.
- Alt 3 provides 110 acres of additional habitat for salmon and steelhead so it received a “+”.
- Alt 4 provides 270 acres of additional habitat for salmon and steelhead so it received a “++”.

Policy 5004: Department’s Conservation Initiative and Guiding Principles

All alternatives involve working collaboratively and using best available science from across a range of disciplines and interests to accomplish our work. For this reason all alternatives received a “+/-”.

Policy 5211: Protecting and Restoring Wetlands

Alternatives differ in their ability to provide functional wetlands that rely on natural processes and are appropriate for the geomorphic setting where the site is located. Additional information related to this criterion can be found in the Geomorphic Assessment Technical Memo (Appendix D).

- Alternative 1 provides important freshwater wetlands that have been lost from the landscape. Providing them at this location, however, is not consistent with the natural processes or geomorphic setting of the site. Current site infrastructure and management specifically excludes original hydrology, processes that shape elevation and native plant communities. In this location, tidal and riverine processes allowing the flow of sediment, nutrients, organisms and wood are the natural processes that shape functional wetlands appropriate to the site. Alternative 1 would continue to exclude original hydrology, processes that shape elevation and native plant communities. For these reasons, Alternative 1 received a “-”.
- Alternative 2 provides 170 acres of additional area subject to natural processes appropriate for the site location. For this reason, Alternative 2 received a “+”. Additionally, with restoration of the entire east island, more natural hydrology is possible for the lower south fork Skagit. In essence, the “plug” in the lower river caused by Island Unit levees is reduced.
- Alternative 3 provides 110 acres of additional area subject to natural processes appropriate for the site location. For this reason, Alternative 3 also received “+”. Note that the natural hydrology is not restored at a reach level to the same degree it would be with Alternative 2 because more of a “plug” would remain with Alternative 3.

- Alternative 4 provides 270 acres of additional area subject to natural processes appropriate for the site location and maximizes the functional wetland appropriate for this location. Additionally Alternative 4 removes all barriers (levees) to natural hydrology in the lower south fork at the Island Unit. For these reasons, Alternative 4 received a “++”.

Washington State Wildlife Area Goals 1-3

Similar to the purpose of state lands, wildlife area goals focus on restoring and protecting the integrity of priority ecological systems and sites, and sustaining species through management actions. All alternatives will restore, protect and manage priority ecological systems for some species and preclude ecological systems for other. For these reasons all alternatives received a “+/-”.

5.1.2 Obligations and agreements

Acquisition funding obligations

Funding sources for acquisition often have requirements related to the original grant. To consider changes in the management of such acquisitions, consultation with the grant source about the compliance expectations must occur. In this particular case, Pittman-Robertson funds are the only funds used for acquisition of the Island Unit that have specific obligations. A portion of the property was purchased with P-R funds “for the propagation of game and as a public hunting area.” The system developed for rating alternatives relative to a particular topic/criterion compares relative benefit or impact of a proposed action with existing conditions. In this case, we are asking whether a particular action is compatible with funding obligations.

Because Alternative 1 is comparable to current conditions, there is certainty that it is compatible with P-R obligations so it was given a “yes”. Alternatives 2-4 would provide habitat for game species and be open for public hunting, and so appear to be consistent with P-R obligations. However, because these scenarios would involve changes to each of these elements, additional discussion with USFWS will be needed in the subsequent project planning phase if one of these alternatives is selected. Due to the need for this additional discussion , Alternatives 2-4 were given “to be determined.”

Although there is uncertainty in this element at this phase of the project, there is certainty that WDFW must confirm compliance with this criterion in the next project phase if a restoration alternative is selected.

Alternatives analysis funding obligations

SRFB funds for this project require considering 3-4 alternatives that range from no restoration to full restoration. Alternatives that are being considered as part of the analysis meet this requirement. Similar to the P-R rating discussion, we are asking whether a particular action is compatible with funding obligations. For this reason, all alternatives were given a “yes.”

House Bill 1418

Estuary restoration on public lands in support of Chinook recovery is a key feature of HB 1418, and the subsequent report identified restoration at the Island Unit (Deepwater 2) as a Tier 1 priority for restoration. It is the only Tier 1 project that has not been restored.

- Alternative 1 does not restore estuary on public lands and does not restore any portion of a Tier 1 project. Because new infrastructure has a longer life-span than current infrastructure, we assume the opportunity for restoration is not possible for many years. For these reasons Alternative 1 received a “-”.

- Alternative 2 provides 170 acres of additional estuary habitat on public lands within a Tier 1 project footprint. For this reason Alternative 2 received a “+”. Because new infrastructure has a longer life-span, we assume the opportunity for additional restoration would not be possible for many years.
- Alternative 3 provides 110 acres of additional estuary habitat on public lands within a Tier 1 project footprint. For this reason Alternative 3 received “+”. Because new infrastructure has a longer life-span, we assume the opportunity for additional restoration would not be possible for many years.
- Alternative 4 provides 270 acres of additional estuary habitat on public lands and maximizes restoration within a Tier 1 project footprint. For these reasons Alternative 4 received “++”.

Migratory Bird Management

Changes to wetland habitats have implications for migratory birds that are managed under the migratory bird treaty act and subsequent treaties and plans. Because specific site-management requirements are not outlined in the agreements that come from the Migratory Bird Treaty Act, site management decisions are not vetted with the state and federal agencies involved. It is unknown how the proposed changes would be viewed by various state and international partners. Elsewhere in this document we evaluated shorebird and waterfowl needs, two of the classes of migratory birds. In general waterfowl are thought to benefit from enhanced and managed waterfowl and shorebirds are thought to benefit from estuarine habitat.

- Alternative 1 continues management similar to existing conditions except that replacing infrastructure improves conditions for management activities associated with enhanced and managed waterfowl forage and at the same time precludes restoration of estuarine habitats important for shorebirds for a longer period of time. For these reasons, it received a “+/-”.
- Alternative 2 changes management of a portion of the site to native estuarine wetlands. Because waterfowl and shorebirds have different habitats needs, Alternative 2 received a “+/-”.
- Alternative 3 changes management of a portion of the site to native estuarine wetlands. Because waterfowl and shorebirds have different habitats needs, Alternative 3 received a “+/-”.
- Alternative 4 changes management of the site to native estuarine wetlands. Because waterfowl and shorebirds have different habitats needs, Alternative 4 received a “+/-”.

Skagit Tidegate Fish Initiative Implementation Agreement

The Tidegate Fish Initiative Implementation Agreement (“TFI”) balances the needs of districts that manage and maintain tidegates with progress toward estuary restoration goals for Chinook recovery. Estuary restoration benefits both salmon recovery and those that rely on drainage. Through the TFI agreement, estuary restoration results in credits that can be used when tidegate maintenance or repairs are needed.

- Alternative 1 does not restore estuary and generate credits. Because new infrastructure has a longer design life than current infrastructure, we assume the opportunity for restoration and credits is not likely for many years. For these reasons Alternative 1 received a “-”.
- Alternative 2 provides 170 acres of additional estuary habitat and generates approximately 170 credits. Although Alternative 2 does not maximize the number of acres restored and credits generated, it is still a significant gain. For these reasons Alternative 2 received a “+”.

- Alternative 3 provides 110 acres of additional estuary habitat and generates approximately 110 credits. Although Alternative 3 does not maximize the number of acres restored and credits generated, it is still a significant gain. For these reasons Alternative 3 received a “+”.
- Alternative 4 provides 270 acres of additional estuary habitat and generates approximately 270 credits. For these reasons Alternative 4 received a “++”.

5.1.3 Future Costs and Funding

Funding availability and relative implementation and construction cost

The likelihood of funding and cost of implementation have been combined into a single criterion.

The “Opinion of Probable Construction Costs” was developed by WDFW’s Region 4 Habitat Engineer (Appendix F). Because alternatives are conceptual at this stage, construction costs are provided as a general basis for comparison only, and are considered in combination with the likelihood that funding could be obtained for a particular alternative. Estimated costs were derived from actual costs from similar nearby projects and adjusted for inflation to the year 2020. Cost estimates include design, permitting, construction, construction inspection and oversight, mitigation and contingencies. For partial and full alternatives, natural estuarine hydrology may be restored by removing less than 100% of the dike length. For this reason a range of costs is provided that represents removal of 50-100% of the dike length.

Funding for any of the alternatives will be done through competitive processes and will target funding sources that focus on the type of management that a particular alternative supports. Funding for alternatives that have ecosystem benefits such as estuary restoration, natural processes restoration and restoration of habitats for ESA-listed species is available. Numerous state and federal grant programs fund actions that have ecosystem benefits. These funding sources prioritize actions that maximize restored acreages, fully restore natural process, are cost-effective, provide climate resilience and are supported in local and regional plans such as the Skagit Chinook Recovery Plan, Puget Sound Action Agenda and assessments associated with the Puget Sound Nearshore Ecosystem Restoration Project, among others. Estuary restoration on WDFW-owned land has ranked very well and been funded in the past.

Funding for the “no restoration” alternative is uncertain. Based on past experience, obtaining funding through WDFW’s capital budget process for infrastructure replacement in support of current site management at Island Unit is not likely. Other funding sources that could be used to replace infrastructure and allow for current management to continue are sources such as Duck Stamp and WWRP State Lands Development funds. However, these sources generally provide a much smaller amount of funding relative to salmon and ecosystem funding sources, and increasingly value actions that provide long term sustainability. Similar to the funding obligations rating discussion above, this is not a benefit or impact relative to existing conditions. Instead we are using a system of relative likelihood, ranging from very likely to very unlikely.

- The opinion of probable construction cost for Alternative 1 is \$6.5M. Alternative 1 actions support management that does not meet ecosystem or salmon funding sources’ priorities, and so would not be funded by salmon and ecosystem sources. It is also very unlikely to be funded through non-salmon and ecosystem funding sources due to the low dollar amounts of funding provided through these sources

relative to the cost and also due to questions about long-term sustainability. For these reasons, funding for Alternative 1 is considered “very unlikely.”

- The opinion of probable construction cost for Alternative 2 is \$8.2-10.4M. Alternative 2 is the lower-cost partial restoration alternative and provides 170 acres of estuary. The cost of removing infrastructure on the east portion of the site is relatively low compared with setback levees and tidegates on both islands. In addition, Alternatives 2 provides greater process restoration and climate resilience and is, therefore, likely to be funded by salmon recovery and ecosystem restoration sources. However, funding to upgrade infrastructure on the west island in support of enhanced winter waterfowl forage production is not consistent with ecosystem and salmon recovery funding priorities and is more costly than non-salmon sources can provide. For these reasons, funding for Alternative 2 is considered “unknown.”
- The opinion of probable construction cost for Alternative 3 is \$9.9-11.7M. Alternative 3 is the higher-cost partial restoration alternative and provides fewer (110) acres of restored estuary, less process restoration and less climate resilience than Alternative 2 or 4. In addition, the cost of building a setback levees on both the east and west islands increases the cost-benefit ratio compared to Alternative 2 from a salmon recovery and ecosystem restoration perspective. Funding for setback dikes as part of restoring the southern portions of each island could be covered by salmon and ecosystem restoration sources, but the likelihood of funding for other site upgrades through these sources is unknown. Funding these site upgrades is more costly than non-salmon sources can provide. For these reasons, funding for Alternative 3 is considered “unknown.”
- The opinion of probable construction cost for Alternative 4 is \$9.3-13.0M. Alternative 4 provides full process restoration, maximizes the restored acres, provides the greatest climate resilience and has the lowest cost-benefit ratio from a salmon recovery and ecosystem restoration perspective because infrastructure is removed and not upgraded. All of these factors mean Alternative 4 is well-aligned with ecosystem restoration and salmon recovery funding priorities. For these reasons, funding for Alternative 4 is considered “very likely.”

Funding availability and relative cost for operations and maintenance (O&M)

Current operation and maintenance funding for the Island Unit comes through the wildlife program budgeting process. It is a combination of funding from Wildlife General Fund and program-generated income, and a very small amount of P-R funds for select activities. O&M funding levels through the Wildlife General Fund and P-R are difficult to predict in any given biennium. Although O&M funding levels over the past decade have been adequate to manage the site for enhanced and managed winter waterfowl forage, projected state budget shortfalls for the FY21-23 biennium could impact O&M funding levels for the Skagit Wildlife Area. Funding for O&M activities such as cattail control have historically been funded with competitive grants. Funds for O&M activities associated with any of the alternatives comes with some degree of uncertainty as it relates to the source and amount of funds. For this reason, all alternatives received a rating of “uncertain.”

Relative cost of O&M

Cost estimates were developed by WDFW Wildlife Area and Weed Crew staff (O&M costs: Appendix G). Operation and maintenance funding costs include applicable current site management costs and/or the cost of future estuary management actions such as weed control, depending on the alternative. Cost estimates include labor, materials and equipment for the following categories: administration, ferrying/prep/miscellaneous, field

prep/planting/spraying, dike and field mowing/maintenance, equipment maintenance, drainage/water control, blind construction/ maintenance, noxious weed survey and noxious weed control.

Current management relies on arrangements that allow WDFW to manage the site for less cost than fair market value for similar services. These arrangements include the lease of a barge for \$1/year and a dedicated and skilled volunteer labor force that contributes well over 100 hours per year (136 hours in 2019). These arrangements may or may not continue into the foreseeable future. Management costs in the year 2019 were \$41,382, which includes \$7,670 in volunteer labor.

For future O&M cost-estimating purposes, a range of costs is provided for each alternative. For each alternative we provide a range of costs that considers the following:

- Because the certainty of the current barge and volunteer labor arrangements into the future is unknown, costs for alternatives that include current management on all or a portion of the site are also unknown. We developed a range of costs where the low end of the range assumes current arrangements continue and the high end assumes WDFW would have to pay more for barging and equipment. We did not include fair market rates in the high end of the range for services currently provided by volunteers.
- Because the amount of weed establishment in restored areas is uncertain, the amount of weed control that might be needed is also uncertain. As such, the O&M costs for alternatives that include partial or full restoration include a range where the low end of the range includes weed survey only and no weed control and the higher end of the range includes survey and control of weeds on all restored acres.

The ranges and ratings for each alternative are as follows:

- Annual O&M costs for Alternative 1 are estimated to be \$41,382 to \$54,836. This is similar to the amount that is currently spent on O&M at the site so Alternative 1 received a “v”.
- Annual O&M costs for Alternative 2 are estimated to be \$25,890 to \$58,860. This is similar to the amount that is currently spent on O&M at the site so Alternative 1 received a “v” Annual O&M costs for Alternative 3 are estimated to be \$35,643 to \$60,459. This is similar to the amount that is currently spent on O&M at the site so Alternative 1 received a “v”.
- Annual O&M costs for Alternative 4 are estimated to be \$7,862 to \$52,600. This is similar to the amount that is currently spent on O&M at the site so Alternative 1 received a “v”.

5.2 Fish and Wildlife Needs

5.2.2 ESA-listed Chinook and Southern Resident Killer Whale Recovery

ESA-listed Puget Sound Chinook salmon

Recommendations from the Skagit Chinook Recovery Plan include increased estuary habitat (area and smolt carrying capacity). Quantitative metrics used to compare the alternatives are predicted acres of estuary, predicted acres of channel habitat and predicted smolt carrying capacity. Channel acres and smolt carrying capacity numbers are taken from the Tidal Channel and Chinook Salmon Technical Memo (Appendix C).

- Alternative 1 would provide no gain in estuary acres, channel acres or smolt carrying capacity. Because infrastructure would be updated, we assume no restoration is likely for some period of time. For these reasons, Alternative 1 received a “-”.
- Alternative 2 would provide 170 acres of estuary, 6.79 acres of channel and room for 45,776 (predicted range = 37,371 - 53,692) additional smolts. For these reasons, Alternative 2 received a “+”.
- Alternative 3 would provide 110 acres of estuary, 4.47 acres of channel and room for 29,135 (predicted range = 26,116 - 32,309) additional smolts. For these reasons, Alternative 3 received a “+”.
- Alternative 4 would provide 270 acres of estuary, 10.31 acres of channel and room for 72,820 (predicted range = 59,377 - 86,035) additional smolts. It would also maximize outcomes for Chinook on the site. For these reasons, Alternative 4 received a “++”.

ESA-listed Southern Resident Killer Whale (SRKW)

This criterion considers estuary restoration to increase the availability of the SRKW primary prey (Chinook), and the importance of Skagit Chinook, in particular, for SRKW. The rationale for rating alternatives using the SRKW criterion mirrors the rationale and rating for the Puget Sound Chinook salmon criterion above. Although the relationship between increases in estuary and benefits to SRKW is not direct, ratings took into consideration that prey availability is a key strategy for SRKW recovery and Skagit Chinook’s particular importance amongst Chinook stocks for SRKW.

- Alternative 1 would provide no gain in estuary acres, channel acres or smolt carrying capacity. Because infrastructure would be updated, we assume no restoration is likely for some period of time. For these reasons, Alternative 1 received a “-”.
- Alternative 2 would provide 170 acres of estuary, 6.79 acres of channel and room for 45,776 (predicted range = 37,371 - 53,692) additional smolts. For these reasons, Alternative 2 received a “+”.
- Alternative 3 would provide 110 acres of estuary, 4.47 acres of channel and room for 29,135 (predicted range = 26,116 - 32,309) additional smolts. For these reasons, Alternative 3 received a “+”.
- Alternative 4 would provide 270 acres of estuary, 10.31 acres of channel and room for 72,820 (predicted range = 59,377 - 86,035) additional smolts. It would also maximize outcomes for Chinook on the site. For these reasons, Alternative 4 received a “++”.

5.2.1 Food fish and Game fish

Since all species described in this criterion spend time in estuaries, we assume they derive some benefit from access to these habitats.

- Alternative 1 does not provide any habitat for food fish and game fish. Although Alternative 1 does not decrease the habitat value compared to the baseline condition, by rebuilding infrastructure to restrict fish access it would commit WDFW to continuing the current management for a longer period of time than current infrastructure supports. For these reasons Alternative 1 received a “-”.
- Alternative 2 provides 170 acres of additional estuary habitat so it received a “+”.
- Alternative 3 provides 110 acres of additional estuary habitat so it received a “+”.
- Alternative 4 provides 270 acres of additional estuary habitat. While this is more habitat than in alternatives 2 and 3, the relative amount of benefit food fish and game fish experience from additional estuary habitat is unknown, so Alternative 4 also received a “+”.

5.2.3 Shorebird and waterfowl conservation

Refer to the Waterfowl and Shorebird Technical Memo (Appendix E) for information related to this section.

Shorebirds – site scale

Although shorebirds use the Island Unit under certain conditions provided by current management (wet, unvegetated soils), shorebirds are primarily tied to intertidal marshes and mudflats. Any increase in estuarine habitats at the site scale will benefit shorebirds.

- Alternative 1 would not provide any additional estuary habitat, which is similar to existing management. For this reason, Alternative 1 received a rating of “v”.
- Alternative 2 would provide 170 acres of additional estuary habitat. For this reason, Alternative 2 received a rating of “+”.
- Alternative 3 would provide 110 acres of additional estuary habitat. For this reason, Alternative 3 received a rating of “+”.
- Alternative 4 would provide 270 acres of additional estuary habitat. For this reason, Alternative 4 received a rating of “++”.

Shorebirds – GSD scale

Shorebirds are highly mobile and routinely move within the GSD. The habitats they use are primarily estuary and adjacent farmland; many species do not venture inland as far as waterfowl to seek foraging and resting habitats. In addition, estuary habitat losses continue to occur due to coastal erosion and human impacts. Consequently, as estuary is restored and intertidal shorebird habitat increases, shorebird populations will likely also benefit at the GSD scale. As such the ratings for this criterion are the same as those for the site-scale shorebird criterion.

- Alternative 1 would not provide any additional estuary habitat, which is similar to existing management. For this reason, Alternative 1 received a rating of “v”.
- Alternative 2 would provide 170 acres of additional estuary habitat. For this reason, Alternative 2 received a rating of “+”.
- Alternative 3 would provide 110 acres of additional estuary habitat. For this reason, Alternative 3 received a rating of “+”.
- Alternative 4 would provide 270 acres of additional estuary habitat. For this reason, Alternative 4 received a rating of “++”.

Waterfowl – site scale

At the site scale, waterfowl benefit from farmed forage (enhanced and managed winter waterfowl forage) and carefully managed water levels that optimize ducks’ ability to access the forage. A reduction in acres managed as they are currently managed on the Island Unit will reduce the calories available to waterfowl at the site scale and reduce waterfowl numbers that congregate on the site. It is important to note that for partial and full restoration alternatives, a change from managed and enhanced winter waterfowl forage to estuary forage is not a total loss of forage value, but a reduction in forage value. The caloric value of estuarine systems for waterfowl in the Pacific Northwest has not been quantified, but is thought to be significantly lower than enhanced and managed forage.

Managed and enhanced forage result in concentrated waterfowl use and therefore increased hunting pressure which is a source of disturbance. Current management and hunting disturbance have changed waterfowl behavior so that the majority of foraging and resting activity on site occurs during non-hunting hours (hours of darkness) from mid-October until the end of January. Conversely, estuarine habitats experience less hunting disturbance per acre because concentrations of waterfowl are lower. Hunter use and disturbance would likely be reduced in areas restored to estuary.

Because forage availability (caloric value and water levels that support foraging) are thought to be the largest drivers in waterfowl conservation at the site, those factors were the ones used to develop the summary ratings below.

- Alternative 1 maintains 270 acres as is, including 141 acres in enhanced/managed winter waterfowl forage production. With updated infrastructure that provides more reliable water control, water level management at the site will be improved. For these reasons, Alternative 1 received a rating of “+”.
- Alternative 2 maintains 100 acres as is, including 54 acres of enhanced/managed winter waterfowl forage production. Similar to Alternative 1, with updated infrastructure water level management at the site will be improved. 170 acres of the site will be restored to estuary, resulting in a loss of 87 acres of forage production. Waterfowl forage is available in the restored estuary but has lower forage plant density and caloric content. Access to food resources is only available at certain tides. For these reasons, Alternative 2 received a rating of “+/-”.
- Alternative 3 maintains 160 acres as is, including 81 acres of enhanced/managed winter waterfowl forage production. Similar to Alternative 1, with updated infrastructure water level management at the site will be improved. 110 acres of the site will be restored to estuary, resulting in a loss of 60 acres of forage production. Waterfowl forage is available in the restored estuary but has lower forage plant density and caloric content. Access to food resources is only available at certain tides. For these reasons, Alternative 3 received a rating of “+/-”.
- Alternative 4 does not maintain any portion of the site in enhanced/managed winter waterfowl forage production and water levels are no longer managed. Waterfowl forage is available in the restored estuary but has lower forage plant density and caloric content. Access to food resources is only available at certain tides. For these reasons, Alternative 4 received a “--”.

Waterfowl – Greater Skagit Delta (GSD) scale

Waterfowl use many habitat types and food resources across the greater Skagit delta (GSD). Because the Island Unit is small relative to areas that waterfowl use within the GSD, changes in management at the Island Unit are unlikely to result in a decline in the winter waterfowl population at the GSD scale, but rather shift the number of dabbling ducks to disperse across the larger landscape. We assume at a landscape scale that any loss in forage value at the site will be made up for on the larger landscape, but WDFW does not control the management of the larger landscape, which adds uncertainty to the outcome of all alternatives.

- Under alternatives 1-3, the Island Unit will continue to contribute to production of waterfowl forage with the highest caloric content within the GSD. For these reasons, alternatives 1-3 received a rating of “√”.
- Alternative 4 received a “-” because under this scenario, the Island Unit provides a reduced contribution to waterfowl forage at the landscape scale, and waterfowl would rely more heavily on the ability of

surrounding lands that are not controlled by WDFW to provide forage. Note that waterfowl populations are not expected to decline at the landscape scale under this scenario.

5.3 Community values

5.3.1 Agriculture

In addition to HB1418 and TFI (captured above), the Skagit Hydrodynamic Modeling (HDM) Project also highlighted the importance of certain projects to agriculture. The Island Unit project is in the highest priority group of projects based, in part, on maximizing benefits and minimizing negative impacts to agriculture. For these reasons restoration of the site is considered positive for agriculture.

- Alternative 1 would not provide any restoration at Island Unit and infrastructure upgrades ensure the site is not restored to estuary for the foreseeable future. For these reasons, Alternative 1 received a “-”.
- Alternative 2 would provide partial restoration of the Island Unit site. For this reason, Alternative 2 received a “+”.
- Alternative 3 would provide partial restoration of the Island Unit site. For this reason, Alternative 2 received a “+”.
- Alternative 4 would provide full restoration of the Island Unit site, maximizing the benefits and minimizing the negative impacts of restoration on agriculture. For these reasons, Alternative 4 received a “++”.

5.3.2 Passive recreation

Passive recreational users enjoy a variety of activities and experiences (e.g. birdwatching, photography, etc.) and value different habitat types. We assume that updating infrastructure maintains the status quo for recreational users, and any change provides benefits for some users and negatively impacts others. For these reasons, Alternative 1 received a “v” and all others alternatives received a “+/-”.

5.3.3 Recreational fishing

Estuary habitat restoration that provides additional rearing habitat is an important action in the recovery of Puget Sound Chinook salmon. Gains in Puget Sound Chinook numbers are closely linked to increased fishing opportunities within Washington coastal and Puget Sound waters and river systems, including recreational fisheries. Increased estuary habitat also supports the health of other food fish and game fish that provide important recreational fisheries. As a result, the ratings and rationale in this criterion mirror those for the “Chinook salmon” criterion above: gains in estuary habitat (including predicted acres of estuary, predicted acres of channel habitat and predicted Chinook smolt carrying capacity) are positive; continuing to isolate areas is negative.

- Alternative 1 received a “-”.
- Alternative 2 received a “+”.
- Alternative 3 received a “+”.
- Alternative 4 received a “++”.

5.3.4 Waterfowl hunting

Site scale considerations: Preferences on the type and style of waterfowl hunting are very subjective and personal. However, as it relates to this alternatives analysis WDFW staff and waterfowl hunters suggested that the following factors should be considered: 1) The availability of enhanced winter waterfowl forage which attracts high concentrations of waterfowl use through the whole hunting season. 2) The number of hunting parties supported by the site which can include number of blinds and non-blind-based hunting opportunities. 3) Site access which includes the number of boat landing sites and predictability of walking conditions.

Although factors 1-3 would be reduced or altered in alternatives that reduce the amount of acres under current management, hunting in native and restored estuary is valued and preferred by some hunters and would be allowed on any portion of the site that is restored.

Landscape scale considerations: The availability of similar huntable forage types and acreages throughout the Skagit delta and broader North Puget Sound region was also considered. The forage types considered include: enhanced forage, managed forage, non-forested upland, intertidal, and riparian (tree/brush). An inventory of WDFW-managed lands within the Skagit delta that are open for public hunting compared how habitat types within those lands have changed since 2000 (refer to the Hunted Habitats memo in appendix H). The summary finding of that inventory is that WDFW has continued to provide a diverse portfolio of waterfowl hunting land in the Skagit delta and huntable habitat acreages have increased in every category since the year 2000 except for the “enhanced waterfowl forage”, which has decreased by 547 acres, and a slight decrease in “riparian/brush” and “non-forested upland” habitat, which aren’t preferred by waterfowl hunters.

In addition to the considerations listed above, WDFW compiled existing data to help contextualize the contribution of the Island Unit in its current management regime with Skagit County and statewide numbers. Recent estimates from WDFW’s Small Game Questionnaire indicates that total waterfowl hunter days afield is below the 300,000 statewide objective stated in the WDFW Game Management Plan (Objective 104). Skagit County ranks 2nd amount Washington counties, providing an average of 20,000 waterfowl hunter days afield. This ranks Skagit County 36th out of 3,115 counties nationally. A considerable portion of this hunting effort occurs on public lands, with 64.7% of hunters within the Pacific Flyway indicating they hunt on public land with 64.3% indicating the lack of public places is a moderate to very severe problem and 26.3% indicating it is a very severe problem ([National Survey of Waterfowl Hunters: Summary Report for the Pacific Flyway](#)²³).

WDFW has counted boat trailers parked at the two nearest boat launches to the Island Unit at Headquarters and Conway between 2016-2019 during waterfowl hunting season. These counts total 5,253 boat trailers over four hunt seasons, which averages as 1,313 boats per season. The percentage of these boats that hunt at the Island Unit as opposed to other sites nearby is uncertain, as is the number of hunters per boat. However, these numbers do indicate that a meaningful percentage of hunting effort within Skagit County occurs at the Island Unit and vicinity.

- Alternative 1 at the site scale would maintain or slightly increase the acreage in managed and enhanced waterfowl forage production (141 acres) to attract high concentrations of waterfowl, support the same number of hunting parties and provide similar access as current conditions. Updated infrastructure would provide more reliable drainage and water level management. At the landscape scale, this

²³ https://nawmp.org/sites/default/files/2018-03/National%20Survey%20of%20Waterfowl%20Hunters%20Pacific%20Flyway_1_0.pdf

alternative would maintain the “enhanced waterfowl forage” category in the broader greater Skagit delta area. For these reasons Alternative 1 received a “+”.

- Alternative 2 at the site scale would provide fewer acres of managed and enhanced waterfowl forage production, support fewer hunting parties and provide fewer boat landings. However, updated infrastructure on the west island would provide more reliable drainage in support of forage production and more reliable water level management in winter for hunters. At the landscape scale, this alternative would reduce the “enhanced waterfowl forage” category by 54 acres and would add 170 acres of intertidal habitat. For these reasons, Alternative 2 received a “-”.
- Alternative 3 at the site scale would provide fewer acres of managed and enhanced waterfowl forage production, support fewer hunting parties and provide fewer access points. However, updated infrastructure on the northern portions of each island would provide more reliable drainage in support of forage production and more reliable water level management in winter for hunters. At the landscape scale, this alternative would reduce the “enhanced waterfowl forage” category by 81 acres and would add 110 acres of intertidal habitat. For these reasons, Alternative 3 received a “-”.
- Alternative 4 at the site scale would eliminate managed and enhanced winter waterfowl forage production from the site meaning high concentrations of waterfowl would be unlikely to congregate on the site. The number of hunting parties the site could support would likely be reduced. Boat in access would not be provided at established landings. Walkability and boat access of the site would be less predictable since it would be controlled by tides and river flow/flood conditions. Wood and debris have the potential to block channels. At the landscape scale, this alternative would reduce the “enhanced waterfowl forage” category by 141 acres in the greater Skagit delta and would add 270 acres of intertidal habitat. Hunters who prefer “enhanced waterfowl forage” habitats would likely use alternative WDFW sites on the landscape, and this could lead to higher hunter pressure on existing sites. For these reasons, Alternative 4 received a “--”.

5.4 Climate change resilience

There are three considerations included in the application of this criterion: the potential for habitat migration; long-term climate resilience to changing river hydrology and sea level rise; effect on flood risk in the lower south fork Skagit River. In general isolating areas behind levees does not provide space for habitats to migrate. River hydrology that is anticipated to become more “flashy” (including higher and more frequent flood flows) in combination with long-term sea level rise (SLR) predictions will put infrastructure at risk. And leaving structures in the lower south fork creates a “plug” that backs up flood waters and increases water levels in this reach of the river. Removing structures that block flow reduces flood risk and makes the larger system more resilient to changing hydrology. For more information, refer to the Geomorphic Assessment Technical Memo (Appendix D).

- Alternative 1 would not provide any space for habitats to migrate because it would continue to isolate 270 acres of uplands behind levees and tidegates. Infrastructure would be at risk of damage from larger and more frequent river floods in combination with SLR. Leaving both the east and west islands surrounded by levees leaves a large plug in the lower south fork Skagit, which backs water up during floods and puts upstream areas at higher risk of flooding. Updated infrastructure would ensure these issues persist for a longer period of time. For these reasons, Alternative 1 received “-”.

- Alternatives 2 is the more resilient of the partial restoration alternatives. Alternative 2 would leave infrastructure on site, which would be at risk from higher and more frequent flood flows and SLR, but Alternative 2 would also provide improved resilience in a couple of ways. Alternative 2 would provide 170 acres of restored estuary containing a wide range of elevations where habitats could migrate over a long timeframe, and it would remove part of the “plug” that blocks flood flows passing through the lower south fork Skagit. For these reasons, Alternative 2 received a “+”.
- Alternatives 3 is the less resilient of the partial restoration alternatives. Alternative 3 would provide 110 acres where habitats could migrate but these areas are relatively similar in elevation so would not provide for migration over as long a timeframe. Infrastructure left on site would be at risk from higher and more frequent flood flows and SLR. Lastly, Alternative 3 does not remove the “plug” that blocks flood flows passing through the lower south fork Skagit; in this way it is essentially the same as Alternative 1. For these reasons, Alternative 3 received a “+/-”.
- Alternative 4 would provide significantly more climate change resilience than existing conditions. This alternative would provide 270 acres of restored estuary containing a wide range of land elevations for habitat migration over a long timeframe. Alternative 4 also removes all infrastructure from the site, which removes barriers to flood flows in the south fork Skagit and eliminates the risk of damage to infrastructure on site associated with higher and more frequent flood flows and SLR. For these reasons, Alternative 4 received a “++”.

6. Preferred Alternative

The preferred alternative is Alternative 4 – Full Restoration. Figure 12 illustrates current conditions and Figure 13 illustrates the key features and actions that are included in Alternative 4.

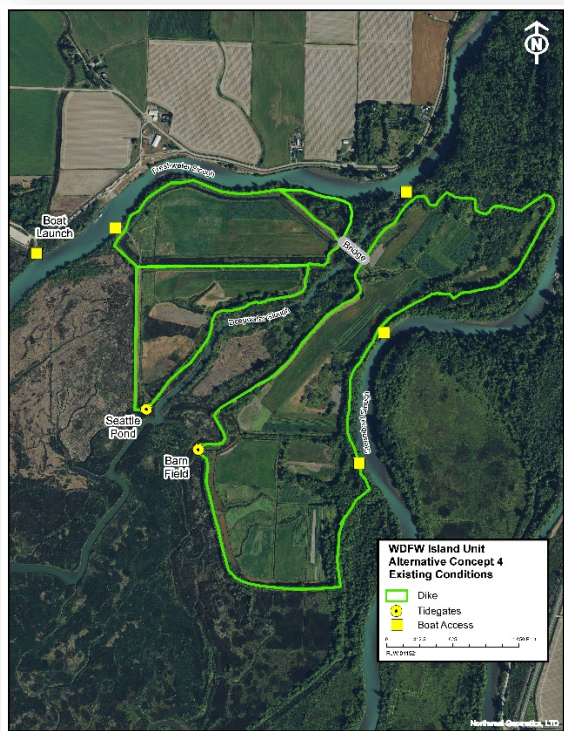


Figure 12. Current conditions

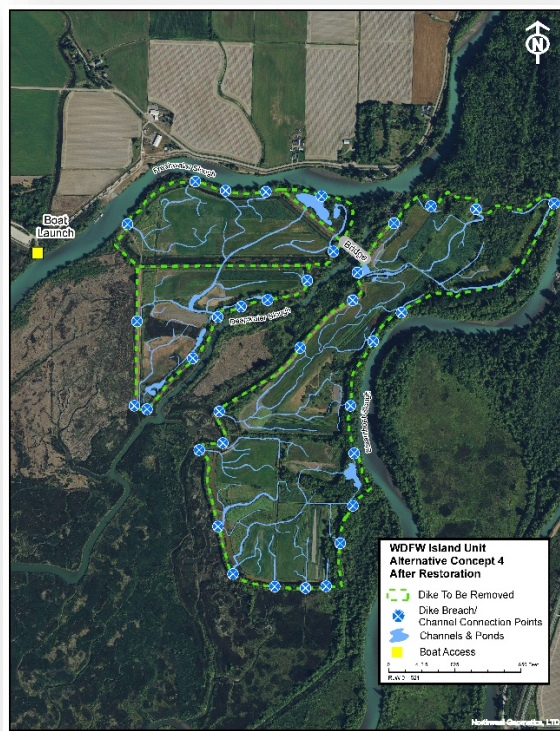


Figure 13. Full restoration conceptual design. Additional features to support recreational access and habitat restoration objectives may be added to the site during the next phase of design. The bridge may or may not remain in place

Reasons for Selecting Alternative 4

Alternative 4 was selected as the preferred alternative for the following reasons:

Clear pathway to implementation

Alternative 4 is the only alternative that would not require compensatory mitigation, which has been a hurdle WDFW has not been able to overcome on past infrastructure replacement efforts. Alternative 4 is also the most likely alternative to compete well for implementation funding. There are various issues/challenges with the other alternatives in their likelihood for funding.

Significant support of ESA-listed species

Alternative 4 provides the greatest opportunity for return of estuary functions and benefits to ESA-listed species. Estuary habitat is a key limiting factor for the recovery of ESA-listed Chinook salmon in the Skagit. The estuary restoration goals for the Skagit include restoring 2,700 acres of habitat or enough space to support 1.35M additional smolts. While 400-500 acres have been restored to date, many more hundred acres are needed. Alternative 4 will provide 270 acres of estuary and is predicted to provide habitat for approximately 72,000 additional smolts.

The primary prey of Southern Resident Killer Whales (SRKW) is Chinook salmon so the recovery of ESA-listed SRKW is closely linked to estuary restoration as well. Maximizing acres of estuary at this site will also maximize the benefit to SRKW.

Although less is known about the use of estuary by ESA-listed steelhead and bull trout, both species are found in the estuary and so we can assume they derive some benefit from estuary habitat as well. The greatest number of additional acres will provide the greatest benefit to these species.

Highest summary ratings

Alternative 4 provided the most positive summary ratings over the other alternatives. It received the highest summary rating in the following categories:

- Policy 5003: salmon and steelhead initiative
- Policy 5211: protecting and restoring wetlands
- House bill 1418
- Skagit Tidegate and Fish Initiative
- ESA-listed Chinook salmon
- ESA-listed Southern Resident Killer Whale
- Shorebirds
- Agriculture
- Recreational fishing
- Climate change resilience

Trade-offs associated with Alternative 4

The trade-offs associated with Alternative 4 are the two criteria where it received the lowest summary rating:

Waterfowl Conservation – Site Scale

Waterfowl are drawn to the site by enhanced, high calorie forage that is planted and managed by WDFW. Forage available in restored estuary is thought to contain fewer calories per acre than enhanced and managed forage. The implementation of Alternative 4 will reduce the calories per acre available for dabbling ducks and other waterfowl at the site scale. At the landscape scale, there is forage available to support waterfowl populations.

Waterfowl Hunting

Alternative 4 will result in a loss of a specific hunting experience for waterfowl hunters. Enhanced and managed forage production attracts large concentrations of dabbling ducks. Diked areas not subject to tides provide a

more predictable environment in which to hunt. We heard from Advisory Group members and in public comments that many individuals have deep connections to the experiences, relationships and the physical place itself provided by current management at Island Unit. Comments characterized a sense of loss when previous estuary restoration projects occurred on other WDFW-owned properties in the Skagit Wildlife Area. It is clear that Alternative 4 will be felt as a loss by many waterfowl hunters.

Additional Alternative 4 Considerations

Additional concurrent steps are needed during the design and implementation of Alternative 4. WDFW leadership emphasized these two follow up items:

- Identify and assess potential opportunities to add waterfowl habitat and hunting opportunities on the landscape in coordination with multiple community partners including tribes, agriculture groups, waterfowl hunters, conservationists and funders. WDFW is committed to working with waterfowl hunters and partners to identify and implement alternative hunting opportunities. While these hunting experiences will likely not be the same as those offered at the Island Unit, WDFW's commitment is that they be real and meaningful to waterfowl hunters. These efforts will require a considerable commitment of WDFW staff time and resources.

TIMELINE: internal and stakeholder/community discussions will begin with limited in-hand funding and staff capacity; more comprehensive exploration of methods, funding mechanisms and long-term agreements requires additional funding. WDFW will seek additional funding for the FY22-23 fiscal year.

- Revisit the funding framework for long-term management of the site (weed management, maintenance of access- and recreation-related structures). The change on the Island Unit to estuary habitat will change management actions, which may require alternate funding. Additional funding may be needed within the Skagit Wildlife Area if recreational use patterns change and there is more use of other units.

TIMELINE: WDFW will begin O&M funding discussions. If alternate and/or additional budget needs are identified, WDFW will seek funding.

Additional follow up items:

- Ensure compliance with Pittman-Robertson acquisition funding obligations.
- Obtain funding for and complete design, permitting, construction and monitoring of the project.
- Complete studies identified in the geomorphic assessment technical memo as the project advances.
- Develop a Monitoring and Adaptive Management Plan for the site that contains methods to determine whether the design objectives are being met and adaptive management actions that might be needed over time.
- Work with the Island Unit Advisory Group and other recreational users to generate ideas about how to optimize benefits for all user groups within the project design including recreational access, hunting and waterfowl habitat considerations.
- Address impacts to the greater Skagit Wildlife Area through the Skagit Wildlife Area Management Plan update process.

Reasons for Not Selecting Other Alternatives

The primary reasons for not selecting Alternatives 1, 2 or 3 are:

Funding Challenges

Funding for Alternative 1 is unlikely based on the high project cost and limited available funding sources for actions that support waterfowl management. For instance, State Migratory Bird Stamp funds available state-wide

for the FY 21-23 biennium are \$1.2M. Funding for Alternatives 2 and 3, which include replacing tidegates/water control structures and repairing and reinforcing dikes, is uncertain because it is unlikely that salmon and ecosystem funding sources would pay for actions that maintain infrastructure in support of waterfowl forage production and associated hunting.

Mitigation Requirements



When WDFW was pursuing permits for replacement of the Barn Field tidegate (2014-2017), the location and quantity of mitigation and funding were hurdles the agency couldn't overcome. We expect that this would continue to be a significant challenge for Alternative 1 and likely for Alternatives 2 and 3.

Effects on ESA-Listed Species

Alternative 1 provides no benefits to ESA-listed species and Alternatives 2 and 3 provide limited benefits to ESA-listed species. No restoration or partial restoration of public lands, which are prioritized for estuary restoration in several Skagit-specific plans linked to Chinook recovery, does not provide sufficient progress toward recovery goals.

Climate Change

Maintenance and repairs of infrastructure that will face sea level rise and more frequent and severe storms and river flows pose an increasing risk and liability to WDFW. Leaving infrastructure in place (Alternatives 1, 2 and 3) leaves WDFW exposed to those risks and liabilities.



APPENDIX A: BARN FIELD AND SEATTLE POND TIDEGATES AND WATER CONTROL STRUCTURES

Barn Field and Seattle Pond tidegates and water control structures

This document is intended to outline the current tidegates with no change to the designed function of current structures.

Overview

The Island Unit is comprised of two islands, each of which is protected from tides and high river flows by dikes. Tidegates and water control structures located on each island were designed and built to manage water surface elevations. Tidegates allow drainage in support of farming (i.e. enhanced/managed winter waterfowl forage production) and water control structures provide the ability to flood these crops to improve access for waterfowl to feed. The structure on the west island is known as the Seattle Pond tidegate and the one on the east island is known as the Barn Field tidegate.

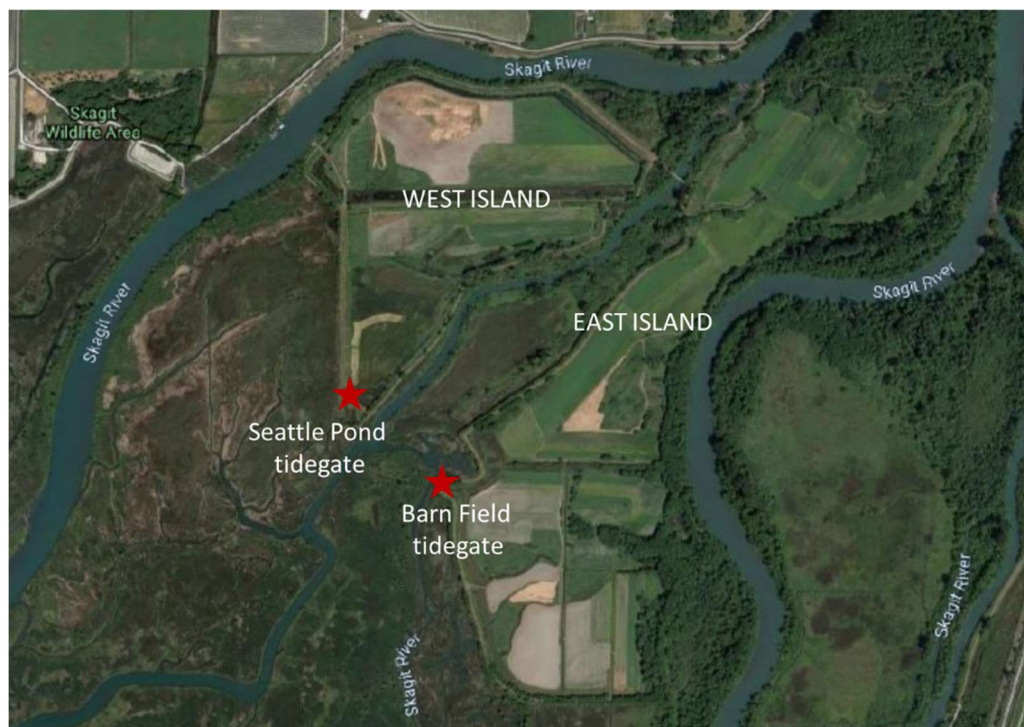


Figure 1. Location of tidegates and water control structures on the Island Unit site.

Over the decades since they were built, these structures have performed well but now have exceeded their projected life expectancy and are currently not functioning as designed. The current condition of the tidegates and water control structures restrict the management options on the Island. WDFW land managers have adapted planting and management to accommodate the restricted water management capacity. Active management of the site (mowing and cropping) is still possible, however, as the system continues to degrade this may become more difficult. Failure of one or both tidegates or culverts could result in dike failure. It is unknown whether WDFW would be able to farm any portion of the site if dikes failed, but given the elevation of the site relative to tidal elevations it seems unlikely that any portion of it could be farmed, and it is certain that WDFW would not be able to farm as much of the site as is now possible.

Structure Description:

The water control structures on the Island Unit combine multiple features that allow for control of water movement both onto and off the site. At both the Seattle Pond and Barn Field tidegates, there is a culvert that extends through the dike. On the exterior of the dike (tidal side), there is a top-hinge flapgate-style tidegate attached to the culvert. This gate is closed except when interior water surfaces are high enough relative to exterior water surfaces to push the gate open. As such, each gate keeps tidal water from entering the site but allows water to drain out when the tides drops below a certain level. Each tidegate is also connected to a threaded rod (known as a screw gate), which can be used to raise the tidegate above the culvert opening and allow water onto the site.

On the opposite end of each culvert (interior of the dike), there is a flashboard riser. The flashboard riser allows land managers to add and remove boards to control the water levels on the interior of the dike. Added boards retain water on the site; fewer boards allow water to drain out.

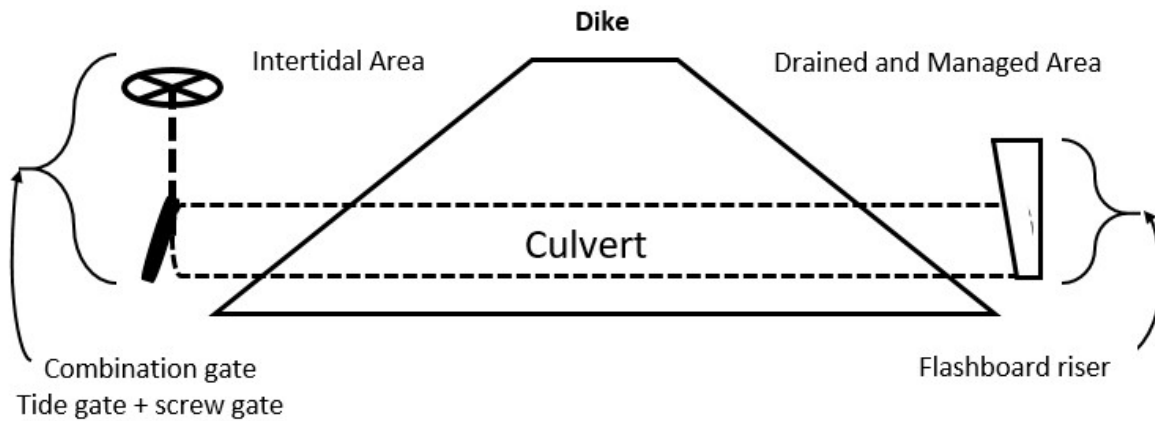


Figure 2. Schematic of Barn Field and Seattle Pond tidegates and water control structures.

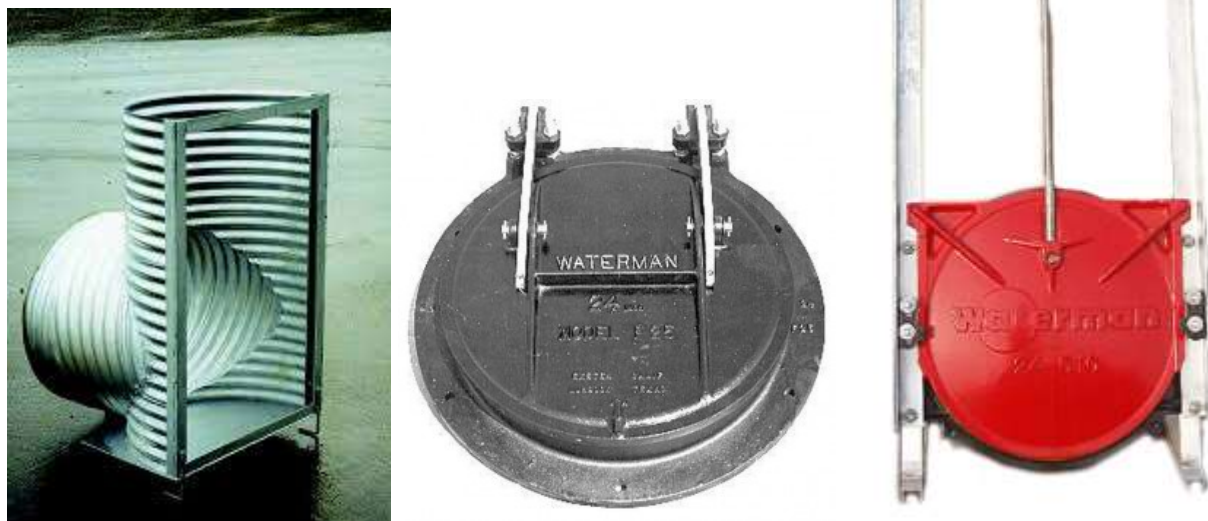


Figure 3. Typical flashboard riser with metal channel for addition of boards to control water levels on site (left), typical top-hinge flapgate-style tidegate which is pushed open when interior water is higher than exterior/tidal water (middle), and typical screw gate with frame to raise or lower gate over culvert opening (right).

Barn Field tidegate and water control structures:

The Barn Field tidegate has been leaking for a number of years. Since the structure is under water on all tides it is difficult to determine the exact cause of the leak. An attempt to examine the structure with an underwater camera did not yield any definitive information due to the cloudy water conditions. It could be that the tidegate is not sealing completely, that the culvert is corroded and allowing water to enter through holes in the culvert between the tidegate and the dike, or that water is piping along the sides of the culvert through the dike. The screw gate has not been used for several years due to the concern of failure. As such the gate has not been raised to allow free flow of water onto the site. The flashboard riser appears to slow water draining from the site but does not restrict water entering during some higher tides and high river levels.

The assumption is that to repair the structure would require the removal and replacement of the combination tidegate, culvert and flashboard riser with a similar or improved design.



Figure 4. Barn Field water control structures on waterward side of the dike. Footbridge to platform with screw gate controls.



Figure 5. Barn Field water control structures on waterward side of the dike. Culvert with tidegate on end and frame for raising with screw mechanism.



Figure 6. Barn Field water control structures on landward side of the dike. Flashboard riser with foot bridge.

Seattle Pond tidegate and water control structures:

The Seattle Pond tidegate functions as intended with the flapgate opening when water levels on the site are high enough to push it open and closing at all other times. It does not allow tidal water on to the site. The screw gate, however, has not been used for several years due to the concern of failure. As such the gate has not been raised to allow free flow of water onto the site. Additionally, the interior flashboard riser is not working properly. The riser is not connected to the culvert passing through the dike so it does not hold water on the site when boards are inserted.

The assumption is that to repair the structure would require the removal and replacement of the combination tidegate, culvert and flashboard riser with a similar or improved design.



Figure 7. Seattle Pond water control structures on waterward side of the dike. Footbridge to platform with screw gate controls



Figure 8. Seattle Pond water control structures on landward side of the dike. Flashboard riser with foot bridge and hand rail.

Tidegate Replacement

Replacement of the culverts and tidegates have been identified as a WDFW capital need for many years. Replacement was proposed as part of the Deepwater Slough restoration project. However once the two-island alternative was selected, meaning water would once again flow through Deepwater Slough, the need for a bridge became essential. There was not enough project funding available to replace the drainage infrastructure and build the bridge, and so funding was used to build the bridge.

Since that time, Skagit Wildlife Area staff have developed funding requests for the tidegate replacement through the WDFW capital budget and the Migratory Bird Stamp processes. The capital funding requests did not rank well when compared to the other agency capital needs. WDFW received funding through the Migratory Bird Stamp process for design and planning, but other project obstacles led to the design and planning being abandoned (more on obstacles below). In addition the estimated full replacement cost was more than the Migratory Bird Stamp process alone could fund.

In 2014, a local waterfowl hunting supporter, who had grown up hunting the Island, was aware of the need for tidegate replacement and the lack of funding to do so. This supporter proposed that his construction company provide the equipment and the operators to perform the tidegate replacement at no charge. WDFW Wildlife Program staff supported examination of how WDFW could work with a private contractor in this way. The decision was made to apply for permits to replace the Barn Field tidegate (more details below) based on a preliminary design completed by WDFW's Capital Asset Management Program (construction group) staff. CAMP had some discussions with the private construction company but ultimately WDFW could not move forward with the project due to a lack of funding for design, permitting, mitigation, materials and construction oversight.

Starting in 2014 WDFW attempted to obtain permits for replacing the Barn Field tidegate. Below are key milestones in the permitting process:

- A State Environmental Policy Act (SEPA) application was submitted to replace the Barn Field Tidegate with no mitigation and a Determination of Non-Significance was issued (DNS 15-004, January 2015)
- Skagit River System Cooperative (SRSC) opposed the DNS (January 2015) suggesting that a replacement structure would need to allow fish passage and tidal exchange; WDFW subsequently withdrew the SEPA application (January 2016)
- WDFW assessed the feasibility of installing a self-regulating tidegate to support management of the site for farmed waterfowl forage production while also providing juvenile salmon habitat and determined that it would not be feasible due to conflicting water management objectives in spring and early summer (April 2016).
- Conversations began with SRSC about what mitigation would be sufficient if the tidegate were replaced with a standard tidegate (not self-regulating).
- WDFW and SRSC tried to negotiate a path forward. WDFW proposed that North Leque be used as mitigation for tidegate replacement. However, SRSC was not willing to support the continued exclusion of salmon from the site for an underdetermined period. SRSC was willing to support the temporary replacement of the tidegate if the Island Unit design and permitting was underway and restoration happened within 10 years. An MOU was drafted (September 2016)

but never signed because WDFW was not comfortable committing to the cost of a temporary replacement or the eventual restoration project without a public process.

- WDFW wrote a letter to SRSC outlining its path forward, which was to move forward with permitting using North Leque as mitigation.
- WDFW applied for SEPA again, applying the Tidegate Fish Initiative formula to calculate required mitigation acreage with North Leque proposed as mitigation, and a DNS was issued (DNS 16-074, December 2016).
- SRSC didn't agree with using North Leque because it was already intertidal and too far away from pathways used by Skagit juvenile Chinook. They wrote another SEPA response outlining why they didn't believe it was sufficient mitigation and requesting an Environmental Impact Statement (January 2017). WDFW withdrew SEPA again (April 2017).
- NOAA advised WDFW not to apply for federal permits without coming to agreement with the tribes (SRSC).
- An email dated April 14, 2017 contained points of agreement from a meeting between Larry Carpenter (WDFW Commission), Larry Wasserman (Swinomish Tribe) and Bob Everitt (WDFW Region 4 Director). It documents an agreement that WDFW will apply for funding to complete a feasibility study (currently described as an alternatives analysis), and outlines a potential short term solution where if a full restoration design is selected in the feasibility study, the tidegates may be replaced until they are removed during the restoration project within seven years of their repair.
- WDFW applied for and received a Salmon Recovery Funding Board grant (January 2018) to complete a feasibility study.
- In September 2019, WDFW reached out to SRSC staff to review their position on tidegate replacement. Their position has not changed.

Findings

At this time, issues around replacement of the tidegates have not changed.

- The tidegates and water control structures are in disrepair and at risk of failing.
- Funding is not available for replacement.
- Skagit River System Cooperative supports full restoration of the site and does not support repair or replacement of infrastructure on the site, including tidegates and water control structures.

APPENDIX B: STAKEHOLDER AND PUBLIC ENGAGEMENT

PREPARED BY WASHINGTON DEPARTMENT OF FISH AND WILDLIFE AND ROSS
STRATEGIC

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Advisory Group Process

Background

Stakeholder and public engagement was an important aspect of the Island Unit alternatives analysis process. The intent of stakeholder and public engagement was to gather feedback from affected stakeholders, tribes and local governments and to address, where possible, their input and concerns regarding the issues and considerations used to develop and select a preferred alternative. WDFW hired Ross Strategic, an independent consulting firm, to guide and support WDFW staff in developing and carrying out the stakeholder and public engagement process for the project. WDFW convened an Advisory Group as the principle stakeholder engagement mechanism and held a virtual public meeting to gather public feedback on Island Unit management alternatives.

Stakeholder Engagement

Stakeholder engagement for the Island Unit alternatives analysis process was primarily via inclusion of stakeholder representatives on the project Advisory Group. [Tribal and government agency representatives were also part of the Advisory Group as described in the next section.] This group met several times at key points throughout the project to provide their feedback and perspectives to WDFW. The Advisory Group included representatives from various interests in WDFW natural resource policy in general and management of the Island Unit in particular.

Advisory Group Formation

WDFW posted a public announcement on July 29, 2019 regarding the upcoming alternatives analysis process and soliciting applicants for the stakeholder Advisory Group. WDFW received 27 applications prior to the deadline of 5:00 pm on August 19. Several applications and inquiries received after the deadline were not considered. The project team and Ross Strategic reviewed the individual's applications based on the following criteria:

- Have experience collaborating with people who have different perspectives or values to work together toward consensus.
- Can commit to attending approximately four in-person meetings (2-3 hours each) from September 2019 through August 2020*, with potential for additional public meetings/open houses to hear public input.
- Are well connected to their respective interest group, agree to reach out to their broader community of interest, and strive to represent their community's perspective in deliberations.

- Are willing to learn about issues relevant to the Island Unit and have an openness to new information.
- Have a background in a subject area relevant to management of the Island Unit (e.g. waterfowl, salmon recovery, hunting/recreation, and agriculture.)

**Note: The project timeline was subsequently modified to reflect a later start date (late 2019) and end date (early 2021)*

Advisory Group Members

After reviewing applications, 17 individuals were recommended for an interview by Ross Strategic. Ross Strategic met with these applicants in-person, mostly in Skagit County, and interviewed each applicant using a set of pre-written questions. Information from the interviews was used to further narrow the potential members of the Advisory Group. Interview information also provided initial stakeholder insight on current and proposed Island Unit management.

WDFW regional and senior management in the habitat and wildlife programs reviewed the list of proposed stakeholder members to the Advisory Group and the acting WDFW Region 4 Director approved the final list. WDFW invited the following 13 people, representing a wide range of interests, to participate as stakeholder representatives in the Advisory Group:

- Amber Parmenter, conservation
- Bob Cooper, recreational fishing
- Brandon Roozen, agriculture
- Darrell Tawes, waterfowl hunting
- Greg Green, conservation*
- James Ono, waterfowl hunting
- Jed Holmes, birding
- Jeff Osmundson, birding
- John Stein, salmon recovery
- Reb Broker, waterfowl hunting
- Richard Brocksmith, salmon recovery
- Rick Billieu, waterfowl hunting
- Roger Goodan, recreational fishing

**Note: Greg Green withdrew from the Advisory Group for personal reasons*

In addition, WDFW invited several individuals to participate in the Advisory Group as ex officio members. These individuals were eligible to participate as ex officio members by virtue of their position or office, so these members did not go through the application and review process. WDFW reached out to the Swinomish Indian Tribal Community, Samish Indian Nation, Upper Skagit Indian Tribe and the Sauk-Suiattle Indian Tribe to invite their participation and input in the process. One of the options presented to tribes was to participate as ex officio members of Advisory Group. Tribal representatives that chose to participate included:

- Greg Hood, Skagit River System Cooperative (representing Swinomish and Sauk-Suiattle)
- Rick Hartson, Upper Skagit
- Scott Schuyler, Upper Skagit

WDFW invited governmental representatives to participate as ex officio members of the Advisory Group, with the following individuals and organizations expressing interest:

- Dana Dysart, US Corps of Engineers
- Erin Murray, Puget Sound Partnership
- Janet Curran, NOAA
- Jenna Friebel, SCDIDC (special purpose districts)
- Karina Siliverstova, Skagit County
- Laurel Jennings, NOAA
- Michael See, Skagit County
- Rich Carlson, USFWS

Lastly, five WDFW staff participated in the Advisory Group in an ex officio capacity:

- Belinda Rotton
- Bob Warinner
- Jenny Baker
- Loren Brokaw
- Seth Ballhorn

Advisory Group Charter

The Island Unit Advisory Group adopted a [charter](#) as both a reference document and guide for Advisory Group members. The Charter provided background information and details around the Advisory Group's purpose, described as follows:

WDFW is convening the Island Unit Advisory Group to get input and feedback related to changing land management challenges and opportunities at the Island Unit from diverse interests. The Advisory Group will provide input as WDFW develops and assesses alternatives ranging from no restoration to full restoration to address failing infrastructure and balance WDFW's obligations, objectives and community needs.

The charter also described membership, member expectations, and Advisory Group input and WDFW decision-making authority.

Advisory Group Ground Rules

The Advisory Group adopted a set of 11 [ground rules](#) to provide a framework for interacting with one another throughout the process. The ground rules affirmed Advisory Group members' agreement to work together in good faith, strive for honest and direct communication, attend all scheduled meetings, and focus on interests in lieu of taking positions. The ground rules described Ross Strategic's role as a neutral, third party facilitator during the process.

Advisory Group Meetings

The Advisory Group met between November 2019 and November 2020, with a final meeting anticipated in early 2021. The first two meetings were in-person, with subsequent meetings (post March 2020) held virtually due to COVID-19 restrictions. During these meetings the Advisory Group was asked to provide the following:

- Time to do cross-interest learning to understand all the issues WDFW would need to consider
- Input on draft alternatives
- Input on draft criteria that were used to compare alternatives
- Input on application of the criteria
- Ideas for maximizing multiple stakeholder values within the preferred alternative

WDFW also invited Advisory Group members to tour the Island Unit on October 31st 2019. Most Advisory Group members participated with WDFW staff.

Prior to each meeting, Ross Strategic distributed an agenda and supporting materials for Advisory Group members to review and WDFW posted these materials to the Advisory Group [website](#). At the end of each meeting, the facilitators invited members of the public to provide comments to the Advisory Group. Ross Strategic drafted a summary of each Advisory Group meeting and WDFW posted all meeting summaries and presentations to the Advisory Group website. A brief description of Advisory Group meetings is provided below.

Meeting 1 (November 1, 2019 at Padilla Bay Interpretive Center, Mount Vernon)

During Meeting 1, Advisory Group members introduced themselves. WDFW provided a presentation on the Island Unit project background and goals, and rationale for convening the Advisory Group. Ross Strategic provided a summary of themes from the interview process, and the Advisory Group reviewed a proposed calendar of meeting dates and topics. The Advisory Group also considered a list of information requests developed by Ross Strategic and based on discussions with Advisory Group members. WDFW presented four draft alternatives for Island Unit management and Advisory Committee members provided initial feedback. The four draft alternatives included:

1. No restoration actions at Island Unit and entire 270 acres maintained as is with a focus on enhanced winter waterfowl forage production.
2. Partial restoration, with 170 acres of the east “lobe” restored to estuary and 100 acres maintained as is with a focus on enhanced winter waterfowl forage production.
3. Partial restoration, with 110 acres total on the bottom of each “lobe” restored to estuary and 160 acres maintained as is with a focus on enhanced winter waterfowl forage production.
4. Full restoration with 270 acres restored to estuary.

Meeting 2 (February 3, 2020 at Skagit Station Meeting Room, Mount Vernon)

For Meeting 2, WDFW reviewed the management alternatives introduced during Meeting 1 and heard additional feedback from Advisory Committee members. WDFW then introduced the draft criteria which the WDFW project team intended to apply to the four management alternatives as part of its analysis. WDFW also coordinated a series of presentations to Advisory Group members with the goal of providing the most accurate, up-to-date information on the following key areas of interest:

- Chinook and Estuaries
- Chinook Harvest Policy and Management
- Waterfowl Conservation
- Hunt Access and Habitats
- Agricultural Agreements and Assessments
- Infrastructure Condition and Management

These presentations were prepared by subject matter experts from WDFW and other organizations. Advisory Group members had the opportunity to ask questions after each presentation.

Meeting 3 (March 16, 2020 remote via conference call and video)

Meeting 3 was dedicated to Advisory Group discussion and feedback on the draft criteria for evaluating the Island Unit management alternatives. Advisory Group members considered several questions as a starting point for this discussion:

- Are there any categories missing?
- Are there details within categories that are missing?
- Is there anything else WDFW should consider related to criteria?

WDFW noted Advisory Committee members’ comments on the draft criteria for consideration and Ross Strategic summarized the comments in the meeting [notes](#). Prior to and following Meeting 3, Ross Strategic and WDFW participated in several conference calls with groups of Advisory Committee members to ensure they understood the draft criteria, how they criteria would be used, and any feedback on the draft criteria. At the request of Advisory Group members, WDFW also distributed a [document](#) with further detail on the draft criteria.

Meeting 4 (October 26 and November 4, 2020 remote via conference call and video)

Meeting 4 consisted of two parts. Part one took place on October 26 and involved WDFW providing a presentation regarding application of the criteria to the four Island Unit management alternatives. Advisory Group members asked clarifying questions as needed. Part two of the meeting took place on November 4 and featured in-depth Advisory Group questions and observations about the WDFW project team's application of the criteria. Meeting [notes](#) are available on the Advisory Group website.

Meeting 5 (Scheduled for March 8, 2021 remote via conference call and video, after publication of this report)

Meeting 5 will include discussion of the preferred Island Unit management alternative and anticipated next steps. The group will also discuss exploring what it means to maximize values under the preferred alternative; how to accommodate the range of interests at Island Unit under the preferred alternative and what the process will look like as ideas are implemented. Meeting notes will be posted on the [Island Unit Advisory Group website](#).

Key Themes from Public Comments

Prepared by Ross Strategic

Overview

The following themes were distilled from over 200 comments received from members of the public on the draft Alternatives Analysis for the Island Unit. Members of the public submitted their comments in several ways: Verbally during the December 2 public meeting, via written comments to the Island Unit Alternatives Analysis website, via email to WDFW staff, and by regular mail to WDFW staff. Many of the comments received included a high level of detail around the proposed management alternatives; this summary is intended as an overview of general themes and does not contain the specificity in these comments. A complete compilation of all comments is also included in this appendix.

The summary below reflects the content of the comments WDFW received. Many of the comments received reflect the opinion of the individual that submitted them, and in several cases these opinions contradict each other. Additionally, some of the comments are supported by existing data and evidence while others are based on incomplete information, assumptions, and/or speculation. The summary below does not differentiate between the two, but simply reflects what was received.

Some of the points made were directly addressed in the report already. Where clarification or correction in the report were needed, WDFW edited the report in track changes. For other comments, especially those received multiple times, WDFW added to the frequently asked questions (FAQ) on the [project website](#).

Key Themes

Theme 1: Previous salmon habitat restoration projects both in the Skagit Delta and elsewhere have not resulted in demonstrable improvement to salmon populations and have resulted in invasive plant species takeover of restored areas.

Commenters stated that despite several habitat restoration projects in the north Puget Sound/Skagit area including Wiley Slough, Leque Island, and Milltown Island, quantifiable benefits of habitat restoration to endangered salmon populations is not clear. Similarly, commenters pointed to habitat projects on the Columbia River that have not resulted in improved salmon populations. Experience with other salmon habitat restoration projects in the Skagit Delta shows that cattails will take over and require further action to control and will not benefit juvenile salmon.

Theme 2: The proposed Island Unit restoration forces a choice between preserving habitat for fish or waterfowl.

Commenters stated that the hunting community is being asked to choose between waterfowl hunting opportunities and salmon habitat restoration. Waterfowl hunters and conservationists worked diligently to preserve and protect waterfowl starting in the early 1900's and continue to do so today; a similar effort from the fish conservation community should be put forward to prevent further loss of salmon

populations. Conversely the fishing community is being asked to make the same choice, between waterfowl and salmon. And many people enjoy both hunting and fishing and consider themselves conservationists.

Theme 3: Full restoration is the only alternative that fulfills multiple WDFW obligations to the greatest extent possible.

Commenters noted that full restoration is the best alternative to fulfill WDFW's obligations to increase habitat pertaining to Chinook salmon populations and the Endangered Species Act, and to support tribal treaty rights. WDFW must adhere to HB1418, which prioritizes restoration of state lands over privately-owned lands. Given the limited options in the Skagit Delta, restoration of Island Unit is essential to meet this priority. WDFW should also select the restoration alternative that maximizes Chinook smolt production per acre of converted commercial farmland and preserves the agricultural landscape through the Skagit Delta Tidegates and Fish Initiative Implementation Agreement, which supports infrastructure maintenance, repair, and replacement.

Theme 4: Island Unit provides a unique hunting opportunity that cannot be replicated on any public lands in Washington.

Commenters feel that Island Unit is unique among publicly owned hunting lands on the west coast and reverting the property to tidal estuary will irreversibly remove an area which has provided an experience for generations of hunters. Replacement lands, though helpful, cannot recreate the experience provided by Island Unit. Island Unit has supported waterfowl hunting and should be preserved for future generations to enjoy. The private lands program does not adequately replace the quality hunting opportunities provided by Island Unit.

Theme 5: Restoration will have negative impacts on waterfowl (and potentially other bird species) in the Skagit Delta.

Commenters stated that they think restoring Island Unit to tidal estuary will negatively impact waterfowl in the Skagit estuary by moving them into agricultural areas with resultant impacts on farming. Agricultural production in the Skagit Valley is shifting and the current crops provide less "waste forage" for waterfowl. Island Unit is an important wintering area for migrating waterfowl and they believe removing the forage for them will be detrimental to their health. Some hypothesize that it will also negatively impact migrating birds' flight paths. Waterfowl populations follow a boom and bust cycle and require consistent, reliable habitat throughout their migration pathway/lifecycle. Furthermore, there were concerns that the alternatives analysis does not consider collateral impacts to species such as bald eagle, hawks, raptors, owls, or shorebirds if full restoration were to occur.

Theme 6: If the agency opts for restoration at Island Unit, WDFW should commit and secure resources for expanding hunting opportunities in the Skagit Delta on public lands and through the private lands access program.

Commenters recommended that if Island Unit is completely or partially restored to tidal estuary, WDFW should use all available resources and secure additional resources to create additional waterfowl hunting opportunities elsewhere in the Skagit Delta. They believe replacement land funding should be required prior to restoration of the Island Unit.

Theme 7: Full restoration of Island Unit is important for salmon populations as well as the broader Puget Sound ecosystem.

Commenters stated that the Skagit Chinook recovery plan identifies the lack of estuary habitat as one of the major limiting factors for Chinook salmon in the Skagit watershed. Island Unit is a highly ranked project under the Skagit Hydrodynamic Model (HDM) Alternatives Analysis and full restoration provides the greatest habitat value. Estuary habitat restoration is the cornerstone of the Skagit Chinook Recovery Plan and progress in the Skagit estuary is not possible without WDFW lands or support for farmland conversion. Full restoration at Island Unit is critical because endangered Chinook require this habitat to provide a chance for populations to rebound. Restoring Chinook populations is a key part of repairing the Puget Sound ecosystem, including endangered southern resident killer whales which depend on Chinook as a food source. They believe that waterfowl are thriving in the Skagit Delta and will continue to do so, whereas salmon are struggling and need additional habitat.

Theme 8: Myriad other factors have a greater impact on salmon population health than local habitat availability.

Commenters think factors other than habitat availability have a greater influence on salmon populations, such as ocean conditions, predators, hatchery production, sea lions, dams, toxic runoff, and tribal netting. Commenters believe these factors should be addressed before pursuing habitat restoration at the Island Unit.

Theme 9: Projected costs of Island Unit restoration do not justify the benefits.

Commenters believe the cost of restoring Island Unit does not justify the anticipated benefits to salmon. They think WDFW should also consider the economic impacts of full restoration, as there are currently significant economic benefits to the area (e.g., Conway) from visiting waterfowl hunters, bird watchers, and other users. State and federal funding for enhanced waterfowl forage is limited and they think it should be used to protect existing opportunities such as Island Unit. On the other hand, state and federal funding is readily available for salmon restoration projects.

Theme 10: Alternatives 2 and 3 are potentially acceptable compromise approaches.

Several commenters supported alternative 1 but noted that if restoration at Island Unit proceeds, alternatives 2 or 3 are preferable (commenters varied on support for 2 versus 3). Other commenters made the same point but with support for full restoration (alternative 4) and willingness to accept alternatives 2 or 3 as a compromise.

Theme 11: Restoring Island Unit partially or in full will have significant negative impacts on waterfowl hunting opportunities and continues a WDFW trend to deemphasize the agency's mission to provide and manage hunting opportunities.

Commenters feel fully restoring Island Unit to tidal estuary will push hunters out toward the bay and into more dangerous tidal situations as well as leading to overcrowding and conflict at other public hunting lands. In the absence of WDFW investment in public land opportunities, waterfowl hunting will only be accessible to individuals with the means to purchase their own lands, leases, or club memberships. They state that hunting fees/licenses continue to increase but are concerned that WDFW is limiting hunting opportunities and full restoration would continue this trend. They feel the hunting

community is being asked to disproportionately make the greatest sacrifices in service of salmon recovery.

Theme 12: Full restoration will help prepare the Skagit Delta for climate change impacts.

Commenters noted that climate change is an important consideration. Anticipated sea level rise and changing river flows will increase the cost of maintaining the Island Unit in its current condition and therefore should influence WDFW to move toward full restoration.

Theme 13: Historic funding and previous management agreements around Island Unit support alternative 1.

Commenters mentioned that Island Unit was purchased with Pittman-Robertson funds to support migratory waterfowl and changing the use of the Island Unit from this original purpose could result in a conversion. It is also not appropriate to use hunter-derived funds for a fish-driven objective. The 1999 agreement between US Army Corps of Engineers and WDFW obligates WDFW to maintain and improve the infrastructure on Island Unit. This includes the dikes, fields, and tide gates. Any restoration of Island Unit would violate this agreement. Commenters believe that the State of Washington also agreed to the Deepwater Slough project with the understanding that no further restoration at Island Unit would be pursued. There were concerns that Island Unit restoration is inconsistent with WDFW Policy 5211 which emphasizes no net loss and long-term gain of wetland areas and functions.

Theme 14: Legislation and existing agreements do not require WDFW to pursue full restoration at Island Unit.

Commenters believe HB 1418, the Skagit Chinook Plan, and the TFI make incorrect assumptions about or do not consider other objectives (aside from restoration) such as fiscal constraints and need for mitigation. Commenters expressed that although restoration is desired by these policies and agreements, it is not required.

Theme 15: The alternatives analysis has several flaws and is biased toward full restoration.

Commenters noted that several factors would improve the alternatives analysis, including more detailed analysis of climate change effects, reframing full restoration as “resilience” rather than restoration, and more holistic consideration of human values and activities at Island Unit. The majority of WDFW’s budget is directed towards fisheries work and comments expressed concerns that the alternatives analysis is biased toward salmonids. Commenters felt that the criteria analysis is misleading and does not adequately reflect the value of Island Unit as a managed hunting area, with several specific notes including improper rating and justification for future costs and funding for alternative 1, lack of acknowledgement that other types of tidegate structures are available and could be used for multi-species benefit, and assumption of climate change impacts.

Theme 16: Other work in the Skagit Wildlife Area should take precedence over a decision on Island Unit restoration.

Commenters noted that WDFW should ensure that completing the remaining infrastructure work at other locations such as Wiley Slough is not delayed or deprioritized because of restoration actions at Island Unit. WDFW should also wait until the Skagit Wildlife Area plan update is complete before reaching a decision on Island Unit as this will provide a broader view of impacts.

Disclaimer: Comments 1 through 21 were provided verbally during the December 2, 2020 virtual public open house. The comments were transcribed by software and then reviewed and edited by WDFW staff for accuracy as best as possible; however, some of these comments may contain transcription errors.

	Comment	Source	Name
1	I'm in favor of the full restoration. But in full appreciation of the fact that we would be sacrificing certainly an important part of the waterfowl area, I feel that there should be a caveat in there that some sort of conversation should be initiated officially, with WDFW about what we can do to replace it either on public lands or other lands that are owned by the department. My second comment is that I understand that there's been similar projects in the Willapa Bay, commonly known as dike busting, where full restoration was enacted. And the argument there and the goal there being would be increased fish habitat. That was achieved, but the results seem very questionable whether the habitat has been successful. I think it would be worthwhile if you haven't investigated Willapa Bay and see if there's any similarities to what the conditions they face there might exist in the Island Unit. I'm not sure the conditions are the same. The science might be completely different. But I think it would be worth checking because apparently this has been done long enough that there's a history that points towards either being successful or not successful.	Public Open House	Bob Cooper
2	I support no restoration to the Island Unit. And I got a few reasons that I'd like you to hear. Number one, disrespect. Koetje donated hundreds of thousands of dollars to support waterfowl habitat, through the farmed islands, and to flood the islands would destroy this habitat. Washington Department of Fish and Wildlife: Key word is wildlife. So it doesn't make sense to destroy one to salvage another. I'm an active hunter as well. And I can tell you from firsthand experience, that the Island Unit supports tens of thousands of migratory birds. Not only does this support the feeding and help aid waterfowl to migrate south, but it also supports reduced pressure from farmers. You know, these birds are going to go feed in farmer's fields and they're going to destroy crops. So and there has been nothing mentioned, to restore a different waterfowl site. Not for the restoration of salmon, but for waterfowl. If the site's flooded, are we going create another Island Unit to help out waterfowl because of this, nothing's been mentioned. And if funding is an issue, we can wait, we pay way too much in taxes through WDFW. So we can wait a year we don't need to plant crops next year. We don't need to fix the tide gates. And we've already flooded headquarters and Milltown. And where's the evidence that show that this has helped restore salmon habitat? You know, I've hiked in there for many years now since I've been eight years old. And I've never seen smolt jumping. You know, it's very common to see small salmon small jumping in here. 50,000 licenses were purchased in Skagit Valley. I bought my waterfowl license for \$83 that's \$4 million. So let's just take a second there. And you know what a great resource that we have at the farmed islands, let's say we don't have funding to replace tidal gates, let's reconsider if this \$4 million isn't enough I don't know what to say there. But I will volunteer my own time to come fix it. I'm a marine engineer and I'm familiar with these valves and I feel like I could definitely offer some valuable manpower there. We're on the topic of salmon habitat and getting better returns let's release all our smolts out of the hatcheries instead of 20%. It lets you know that wild fish conservation is a last-ditch effort I mean, we need more salmon so let's utilize our hatcheries that are already in place and release our smolts. You can probably tell I'm pretty emotional, because this is a very personal topic for me.	Public Open House	Keith Webster
3	Farmed Island is the only thing like that on the entire West Coast, anywhere from California, Mexico border all the way up. There is nothing like it anywhere. And the most amazing thing is that it is public property. So anyone can go out there and enjoy it not just during hunting season, but also during the spring, during the summer, and go out and see just that amazing area and to be able to be away from everyone. There is nothing like that anywhere here in Washington for sure, let alone the whole West Coast. Just like some of the other people have mentioned. All that farmland, yes, birds can feed on farmed fields. But anybody that's driven around the Skagit Valley, during this time of year sees that every field that could be turned over was turned over. And there is not an abundance of feed, just setting there on the banquet plate like Curran and Greg and Belinda do for the Skagit Wildlife Area. That is amazing. And I'm very disappointed that through this entire process, there has been no real effort put into trying to measure the amount of birds that use that area. We haven't even done a bird count in the Skagit Valley in the last three years. So how many birds are there? Anybody can pie in the sky and the department can very easily just push it away going, "Oh, it doesn't really support that much. It's not that big a deal." Which dovetails into previous comments from somebody else about the restoration and how amazing it is. Well, last year, we got to finally, in almost 20 years of time, to do a spring Chinook fishery. Seven fish were caught. Documented by the Department for over 10,000-man hours on the river for seven fish. Is the juice really worth the squeeze? That's the real question. And then the next thing is, is we have lots and lots of projects that have gone on. When is the department going to put any effort into any other restoration projects or any other type of wildlife in this state? Some people like to hunt. When will the department put some sort of effort into it? And if we lose all this ground to not only be able to hunt, but just being able to forage these waterfowl? What is the department going to do to actually put good feed on the ground so birds have somewhere to eat? To address the comment about dike busting and everything though: All those dikes out there on farmed Island and pretty much everywhere in Skagit County have all been here since the 1900s. So I don't think that we can really say that the dikes are the issue going on with salmon fishing and unless the department really truly wants to fair share the take of returning	Public Open House	Reb Broker

	Comment	Source	Name
	salmon out and monitor everyone that is out there fishing, then I have a hard time getting behind any of this. Talking about how oh well this is this is only a local thing. Well to hit on the local thing in 2014. There was 50,000 migratory licenses sold in Skagit County, that's Skagit County not the whole state, the whole state of Washington sells over 50,000 Migratory Bird licenses every year. That's waterfowl hunters. And like everybody keeps talking about what is that we are running out of space. I mean, I have been handing out flyers every day of the week between headquarters and the Conway boat launches. I count anywhere from seven to 27, 28 boat trailers at those boat launches, just since the start of this thing on the 15th of November. And WDFW knows exactly how many people are going out there and using this space. So where are we going to go just like everybody else keeps talking about we the waterfowling community? More so than any other user group we have bent over backwards and have constantly been told "Don't worry about it will take care of you will get something else". And we have never gotten anything to replace any of our money. Don't tell me private lands because that crap goes away every single year. Nothing that the state provides anybody with a license that any resident of the state can go out and make use of 365 days a year, not just 107 days during waterfowl season. The other part is, is both of my boys shot their first ducks ever at the island. And why did I take them there? Because I wanted it to be something special. And I wanted to guarantee that they were going to get a shot. Obviously, there are a lot of people that actually took the time to attend this open house. And this also goes to the Regional Director, of all of us not in support of restoring the island: How much of this hour and 35 minutes of our lives, puts credence into the department's decision? And that's all that's all I have. Thank you.		
4	We are all enormously well aware of the ducks and the geese in the Skagit Delta. They're having a ball down here. But currently, the levels of birds coming in are simply enormous. Beyond anybody's expectation. Unfortunately, we can't say the same thing about the salmon returns, the salmon are an endangered species. The steelhead are the endangered species on a river. So what we do in terms of restoration, is we should emphasize what we can do for the fish, much more than what we can do for the ducks. So I would like that. The engineering and the evaluation process, as it goes through, is to focus on what we can do to have more fish next year than we have this year. Because we are in a deep, deep problem. The fish part of it is overfishing. But in this particular circumstance, we're talking about environment and what we can do to make it more appropriate and positive for more salmon next year than this year. And that's all I had to say. Thank you.	Public Open House	Roger Goodan
5	I would like to do alternative one. Because when they did the last restoration, and to go pheasant hunting, they told us that they would take the money and they would find another site in Skagit County. And then the last meeting they had no clue what I was talking about. So my belief is the fact that when you take away the duck hunting, and you'll tell people, "yeah, we'll replace the duck hunting". And two or three years later, there will be no duck hunting, and somebody says, "Oh, well, I don't know what happened to that money. That was before my time. I'm so sorry. Too bad." And I think that happens a lot. So there's a lot of people that take kids out there and everything else and unless you have future hunters coming into the system, you will no longer have official wildlife.	Public Open House	Mark Kimball
6	I'm an avid waterfowl hunter. I've been in the area hunting for probably coming up on six years. I'm also a fisherman. Public hunting land is very, very hard to come by. If you go out to the Farmed Island on any given weekend, even some weekdays, you'll see it's packed to the gills. It's providing opportunity to get out and pass on traditions to their families, so on and so forth. If you take away this unit, the Samish unit north of there is going to end up clogged up all the time, and waterfowlers are not going to have anywhere to go. There hasn't been really any evidence that the salmon restoration project has been working in the past. But we know that those farmed islands are working for bringing ducks and geese in. With that being said, I just don't support flooding the islands. I also hope that they would be able to tell the fishermen - make it more obvious the fact that in supporting this restoration project, quote, unquote, you are actually flooding public hunting land. And I don't know if that's something that's made very obvious to people that aren't hunters. Maybe they think that it's just something that's going to help the salmon habitat thrive and that they're going to get better fishing out of it. People go out and they can fish anywhere, anytime as long as it's within regulations. They're not going to run out of areas to fish. And there's a few other issues. I think that it's the dwindling salmon population other than habitat for the smolts.	Public Open House	Michael Lowe
7	I'm a waterfowl Hunter, and also a salmon fisherman. The issue I see with this proposal is that waterfowling is a very local specific thing. And what one of the other gentleman explained is that this is one of the premier public hunting areas, you know, for sure, in Washington, and maybe even the West Coast. And, you know, looking through your packet, you know, it's stated right there, in your information packet. On average, this, you know, 200 acres supports 24 hunters, if you divide that out over the entire 103-day hunting season. And so that primarily is probably going to happen on weekends, and holidays, and things like that. And so where are those people going to go to enjoy the sport, which already is suffering from decreased participation, which will inevitably affect, the department's ability to, help and plan waterfowl related things? So, I think the fact that it is used so heavily, and bang for your buck, the amount of smolts that you will get by flooding this area cannot be determined. And with all the available data, and all the other places that have had the dikes busted, there's been no real ROI. All that's really happened is that you've taken away opportunity from other users with no plan to replace it. Furthermore, this island represents 25% of the farmed waterfowl habitat in	Public Open House	John Groat

	Comment	Source	Name
	the Skagit. So you really are picking a spot on the map that is going to have the highest impact to the user group and the user group that pays for it. With the tidal areas, we probably would have seen that with the last 20 years, salmon are on a three- or four-year cycle. And we would have seen that. So I think without a plan of mitigation for another area, and it's not just, "hey, here's some dry land, shoot ducks on it." If the department bought an area that has been known for good duck production and we're going to plant 250 acres of corn, leave it standing and allow people to go out and hunt it. Without that it's just definitely a swipe and a slap to the face of specific user group that is going to bear the brunt of this change with no real notice that that island stays farmed or not. In terms of salmon returns. With the amount of, you know, harm potential with the completely, no ROI evidence. It shouldn't be supported, and no changes should happen. Thank you.		
8	I've been involved with the Skagit Wildlife Area and the Skagit Valley for a very long time, especially with swans and more recently with the snow goose issues and the farming issues with now a million snow geese coming off of Wrangel Island this this last fall. So contrary to popular opinion, there is life without an adipose fin. And I understand that we need more salmon habitat. But how do you replace 1 million duck use days currently on the Island Unit? And that's what it supports - 1 million duck use days. By pushing it all onto the private farmland it only adds to the issue of crop damage and an already overloaded private farmland by waterfowl. And we're losing waterfowl-friendly farming as fast as we seem to be losing everything else. And so you now have fewer farmers farming for wildlife friendly crops. And then you have fewer farmers who are allowing the waterfowl hunting. And also there is an ecotourism aspect to some of this as well. And considering opening up land to hunters in the Skagit Valley, I know that you've constantly been looking at the Johnson/Debay Slough. This is highly opposed not only by myself, but by the Wildlife Commission itself in a written document. So we need to have those discussions before you make a decision. No one has talked about this. And it's a very important issue, not only to me, but to the hunters, who are important as well. There are consequences intended and unintended that need to be at least openly discussed. When you talk about options, you don't give anything which is very typical of government agencies. And no one has gone down that thread yet. When will you look at the more unintended consequences that would be detrimental to many private landowners in the community? Farmers are also an endangered species in the Skagit and beyond. So I think that this needs a lot more consideration before you look like you're planning to just do alternative four. That's what I have to say. Thank you.	Public Open House	Martha Jordan
9	I've been hunting the Skagit for 28 years. And I chase spring Chinook for probably 60 days a year. I don't support restoring Island Unit. It's a loss of opportunity for hunters that has been happening consistently. We have losses of opportunity all over the state and are consolidating into less and less areas. These areas are extremely crowded already. But everybody deals with it. You're going to put hunters into smaller spaces. And it's quite frankly, it's unacceptable. And we're talking about increasing habitat for smolt, they're not there. They're not there, you're talking about increasing the capacity of a hotel when there's 10 occupants. If you guys want to bring some fish back, you know, the earlier comment of 1000s of raw hours put out there, I was one of those guys that put in hundreds. And I hooked one fish that I know was a King. Out of the 1800 fish that returned to the Cascade hatchery you lethally spawned 900, just this last year, with over 2 million eggs used or created? That's not operating at capacity, you could produce more fish. This sounds to me like bending at the knees to private interest groups that care about fish. You're not putting forth the effort to get fish into the system. You'd be asking me to put Kings before ducks. You're taking my two top things and asking me to choose. I want habitat for fish. We're losing fish in the saltwater. I think a lot of people know that. We have habitat issues. There's no doubt about it. But you're also not trying to put fish into the system. This last year using 50% for lethal spawn with 1800 fish returning is not what we had a couple years ago. Couple years before that. You've had opportunities to put fish back, but you don't. And we talked about funding. As somebody who lives in this country, I'm having a hard time hearing about funding when the cost of one 500 pound bomb could absolutely put a lot of fish in the river. This is completely unacceptable and right in line with the with an agenda of less opportunity for hunters. And this isn't a sport, hunting and gathering your food is not a sport. That mentality - we should do something about that. Because if we consider this a sport will continue to have opportunity taken away from us.	Public Open House	Dan Rodriguez
10	I'm a conservationist, fisher and hunter and I belong to Washington waterfowl, and a number of other groups. I think it's inappropriate to use the rising ocean levels from global warming, for project justifications. Those are predictions - they're not cast in stone, and they may be lower and they may be higher. Not only that, we now have the opportunity to turn global warming around. And if we all stand together, we can do that. Secondly, I think this project is trading waterfowl habitat for fish habitat. BPA and the Army Corps of Engineers have completed 60 projects of salmon habitat restoration on the Lower Columbia, that's 7000 acres since 2007. And if you look at the salmon runs they have continued to drop. And this is the same in Puget Sound. You guys put in lots of restoration habitat, but the runs have continued to drop. So I don't see this as being an effective method of bringing the salmon back. I know you have documents that there's lots of smolt in the restored areas, but it's not transferring to bringing fish back. And the focus needs to be on returning fish to the Sound and to the rivers. And so that's all I got.	Public Open House	Albert O'Connor
11	I'm 22-year-old University of Washington student. I'm an avid public lands hunter and I've been hunting the valley since I was a little kid. Some 17 years ago, some of my fondest memories have been out of this island unit. Now, since the restoration project of headquarters, we've already	Public Open	Andrew Voels

	Comment	Source	Name
	seen a big decrease, you know, six, eight years ago, on the other public land available, causing major unsafe opportunities for hunters up north and it's really taken away our hunting opportunities. My main concern with this project is the lack of great waterfowl hunting. Without this land, I will not be able to take my friends and future generations of my family to hunt, great memories that I can't pass on. We're seeing a major decline in good quality public land habitat and us waterfowlers are being taken advantage of. I do not support this restoration project. And as an avid salmon fisherman, I'm aware of our salmon issues, but I personally believe that there are other measures that the WDFW can take. Now you may say us waterfowlers aren't going to be losing that habitat because it's going to be flooded. But it's the quality hunting and the amount of people you can fit, and the memories made on that public land that you will forever be taking away.	House	
12	I've been a hunter and fishermen in this state for the past 20 years. I grew up salmon fishing the rivers and the salt water. And I am for alternative one, no restoration. I experienced the headquarters flooding. I felt and saw no increase in our salmon runs. I think as most others have spoke about the idea of getting rid of one amazing waterfowl public hunting area in exchange for the hope that the salmon fishery on the Skagit River will increase for wild fish. I think that is not an acceptable idea as a license buyer and 100% I agree with what somebody else has mentioned about how this is hunting for me and fishing for me - it's not a sport. It's a means for me to fill my freezer and put food on the table for my family and friends every year. And I rely on that sustenance and Island Unit is one of the more rare areas in our state and on the west coast to hunt waterfowl and I think it would be a great loss if that was taken away from us. I would love to see people take the time think of other alternatives to try to increase salmon runs in our state, we could do that through means of getting rid of dams, reducing the amount of gill nets and ghost nets in the rivers. We could put more money towards our hatcheries.	Public Open House	Alexander Webster
13	I was born in the late 50's here in Washington State. And I started out in 1970 commercial gill netting here in Puget Sound. And when I got out of college, in 1978, to date I've worked in the Marine community with commercial fishermen both in Alaska, Washington, Oregon and California. I'm currently a Washington State volunteer as a hunter education instructor. I'm a sport salmon fisherman, a member of Puget Sound anglers, and I volunteered for Long Live the Kings. So my view on this, the correct issue for no impact on climate change is to not restore this existing natural habitat. And if our goal truly is salmon enhancement, the correct way to enhance salmon is by improving our hatcheries, adding more hatcheries. Our existing hatcheries are currently getting some investment put in them due to salmon, being so low in population, and our Orcas are endangered. And we also need to take a close look at enhancing herring. All throughout Alaska, you'll see wonderful, vibrant herring stocks, with herring included in the food chain. That's the catalyst to wonderful salmon enhancement. So we have to take a look at that. We do not have to reinvent the wheel here in Washington. I've worked with fisheries near Kodiak Island. It's a complete success for salmon enhancement, where our state both through taxpayer dollars, the Robertson Pittman act and Sportsman's dollars would get far better return on investment, putting this money into hatcheries. Forget this small postage stamp piece of property which I do love to hunt on. And let's look at hatcheries. Take a look at what Alaska does - we don't have to reinvent the wheel here and waste our money.	Public Open House	Scott Webster
14	I'm a public land waterfowl hunter. Also a steelhead and salmon fisherman and you know, I do advocate for wild fish also. I'm in favor of no restoration on the Island Unit. I think that ruining maybe, as others have said the absolute best public land, if not the West Coast, is absolutely wrong. I think it goes without saying that public land hunters in Washington are not very well represented. Despite the fact that we buy our licenses with some level of assurance that you'll either maintain opportunity or perhaps gain opportunity to hunt. And I'm not saying I want Orcas to die or salmon runs to continue their downhill slide. But I just think we need to look at other issues. Then during these restoration projects, I mean, it's one thing if the headquarters restoration, Milltown others have had significant increases in our salmon repopulation and I'm just not seeing it. And it's like maybe it would help, but it would assuredly ruin this extremely historical and very important waterfowl hunting access, like I don't know, really where I would find anything similar to this? I don't have the money for a lease. I know a lot of people that are here do not. I just think it's very important that we maintain access to places like this and I want to take my children. I've only been a waterfowl hunter. Like for years, I've hunted my entire life, and I've been unable to find anything really like the Island Unit as far as puddleduck production. I mean, I was hunting it today. I've never seen more birds flying in than I did today. And it's hard to ignore that. It just seems like the rate or the rate of investment just isn't there. And I really would like to see no restoration on the island.	Public Open House	Miles Titland
15	Thank you to Brendan and Jenny Baker. This is not an easy decision I know you guys have to make. We want to express our support for option four, we're very supportive of the full option - that hasn't come to our organization lightly. As I hope many folks who work with us know we are cognizant of House Bill 1418. And want to continue pushing that out front, which is obviously leading part of this decision and then also the Tidegates and Fish initiative. And the important work that is doing to help with infrastructure. So with that said, though, I also want to point out another document that I want DFW to pull off the shelf. This was signed circa 2008 - 2009. Its guidance on DFW, vision for conservation of land acquisition for the Skagit Delta, a memorandum of agreement that came about after the work around Wiley Slough, circa 2008, when that was finishing up and replacement lands issue. So while we're supportive of fully flooding and developing IU fish habitat, we understand the need to	Public Open House	Allen Rozema

	Comment	Source	Name
	address replacement lands. And we want to encourage WDFW to work within that original framework that was hammered out between Western Washington Ag and the agency and all the stakeholders on identifying a process to deal with replacement lands and focusing on acquisition strategies to provide and makeup hunting opportunities.		
16	I'm an avid waterfowl hunter, avid big game hunter upland hunter as well as fishermen. And I just want to join in tonight and say that I am in favor of option one, which is no restoration. You know, for context, I'm a transplant here to Washington, and I have duck hunting experience in over 10 states all on public land. And I can tell you that this farmed Island Unit is a tremendous resource for both waterfowl and hunters. It really is world class. You go out there, you know any night at dark this time of year and witness the support it provides to 1000s and 1000s of waterfowl as they pour in to forage and build up their strength and reserves for their continued migration south as well as just surviving the winter locally. Getting rid of this resource, I find it hard to believe that it will have no impact on waterfowl, especially as you look at the degradation of waterfowl habitat, across this nation. Our flyways are critical and infrastructure to support waterfowl is just as critical. As habitat for salmon, we shouldn't trade one for another. I will also say it provides opportunity, as a lot of us know, finding good quality habitat where you can have a quality hunt, with friends and family is hard to find. And it's always being attacked and being reduced and is never given back to us. So until it's in writing that any habitat taken away will be given back to us, that's of the same quality, I don't trust it. The other thing I'll say is, when it comes to salmon, I'm a big salmon fisherman too. And steelhead. I've fished in New York, I fished the Great Lakes. I lived in Alaska for a number of years, and I fished all the major salmon species up there, and also here in Washington. So I fully believe in trying to support wild fish populations. But I find it hard to believe that 250 acres will really make any impact on the Chinook population, we've undertaken a number of restoration projects already in estuaries. And there is no true evidence to show significant impacts to improving the population. In my opinion, from what I've read, in my own research and listening to other organizations speak, that are huge advocates for salmon populations, the problem is in the ocean and the problems are in the spawning habitat. If you don't fix those first, estuary means nothing. And I think that's where we need to focus if we really want to help the salmon population recover. It's not in the estuary habitat.	Public Open House	Andrew Hansche
17	Island Unit is a rare opportunity, a unique place that, like many have said before me that you cannot find anywhere else. I'm an avid fisherman. I love to fish. But I would be more inclined to support these restoration projects if I'd seen more from the previous projects. The numbers don't add up. You've got other projects going on the schedule right now. You've already taken away the headquarters and Leque Island. I know I'm repeating what a lot of these guys have said. But it just doesn't make sense to me to take a rare unique and a very, very special place to a lot of people to try to restore a salmon run that I think could be managed better, with less commercial fishing. Everybody has an opinion on it. There's a lot of ways to go about it without stripping away hunter's spots. There are less and less hunting spots. And if you had to look at the numbers and the condition of the birds, what that island does for those birds, putting them back on grounds, nesting grounds in better condition, it's a rare opportunity and it would be a poor choice to get rid of it. So I would support no restoration.	Public Open House	Wayne Logsdon
18	I'm a sixth generation Anacortes resident and I have grown up ever since I was little hunting out there, as well as salmon fishing out in the Puget Sound. I love to be out in the outdoors. I spend about 60 days afield duck hunting. Many of those are out at the Island Unit. And one thing that would help a lot of us that are advocating for this would be good quantitative numbers. We've seen these projects at Milltown Island and headquarters. And it's tough to see marginal gains in salmon habitat that don't equate to good strong numbers. I think we can all agree that many people who fish, it's a lifestyle out here. And I know what the state wants to do is put the funds to the best use. And I think what should be done to help persuade us duck hunters that it should be restored back to estuary is: show us the numbers. The number of waterfowl that use that habitat and that feed in that habitat stage here in their migration. Compared to salmon returns, like others have mentioned, they have been low amongst other projects. And we're just not seeing the evidence that 250 acres of extra salmon habitat - seems like a very marginal amount to cancel out that much migratory waterfowl land that gets hunted frequently. And the last five years it has blown up in popularity. And for a while it was kind of a secret spot. Now it's not and now it's one of the most popular spots that you can hunt because of how good it is and how many waterfowl stage there and hang out in there. So with that said, I think numbers would really speak volumes. Let us see some salmon returns compared to waterfowl numbers and show us that this much acreage gain in salmon estuary would help this much more than it would help waterfowl, which would be a fair evaluation.	Public Open House	Jay Kieser
19	I'm a lifelong resident of Washington State I've grown up in this state hunting and fishing all my life. So I support the resources with all of my heart and knowledge, my passion as well. However, when I look at the data that's behind all of these restoration projects right now, it's becoming more and more evident over the years that the one thing, there's only one thing that's consistently true in the information that we're being provided. And that is that waterfowlers are taking the short end of the stick. So with the information that's been provided to us tonight, the only factual piece of information that's actually there, that's quantitative is that the waterfowlers are going to be impacted. If this restoration takes place, there is nothing saying there that's any sort of factual information that's going to say that the salmon are coming back. The supporting	Public Open House	Steve Christensen

	Comment	Source	Name
	evidence does not show from previous restorations, that this has any impact on restoring salmon to our rivers. If it did, I would be in full support of actually restoring these habitats and bringing salmon back because I'm equally as passionate of waterfowl, as I am a salmon fisherman. I fish all over the Puget Sound, I've fished the ocean, I fish everywhere in the state. But this does not get it done. For us. The only thing that this does is impact waterfowlers and I will even go on record and say that I probably haven't been to Island Unit in over five years, six years. Because it is so popular. It's not that I don't enjoy it. It's a fantastic place to go waterfowling and supports a tremendous amount of waterfowl in that space. So I support option one - zero restoration at this point until there's better data to support it.		
20	I was in Skagit County for 20 years. I remember when they first put in the lower section of the Island Unit restoration. And now it's full of cattail. Now, this last year, they spent a bunch of time and they cleared the cattails. There is nothing productive about the past restoration, the previous portions of the island for salmon. Last year, I had some friends and family come up from Vancouver to come hunt the Island Unit. And I took my boat all the way around the island and there were 17 boats, seven of which were just on the lower landing. I was blown away because I only hunted it probably like five or six times. And I gotta tell you, the place is packed every time. I find it really unfortunate that this has more to do with the state's need for acres for their agreement than it has to do with actually improving salmon habitat. I was out on one of the sites the other day and I was watching the salmon come on in. And the amount of seals that were attacking the salmon was astronomical. three weekends ago, well actually it was a little longer than that ago, I went on out to take my daughter hunting and I turned into a bunch of seals and I turned around and there must have been 100 head of seals in the slough feasting on salmon. There is no way on God's green earth that with the amount of cattails that will infest this place without doing something for predators that will solve this problem. I've literally sat there drinking my coffee in my boat and seals push salmon on the beach and eat them when they come back in the water. This is a feel-good measure. This is checking the box. I don't know how else to describe it. But that's what this is. Farmed Island is a very special place and God help the farmers. When the late season comes around and we're trying to chase snow geese off the farmer's fields. Where are those geese going to go? When you flood the farm fields that are on the island unit, where they're going to go, you can't hunt department land.	Public Open House	Jason Bolser
21	I know there's a lot of people that would love to volunteer to upgrade the tide gates that are in question. There's approximately 50,000 ducks in Skagit Bay that rely on this island for a food source. The upgrade to the tide gates there would be plenty of volunteers that would love to upgrade them and put some financial funds towards that, the people would come forth to do the work. I know that that would be available.	Public Open House	Craig Backlund
22	I commend and greatly appreciate the comprehensive work done throughout the evaluation process by the Island Unit Advisory Group, and the supporting technical analyses done by the Skagit River System Cooperative and the Washington Department of Fish and Wildlife (WDFW). Of the alternatives presented in the report, I support and recommend the adoption of Alternative 4 (Full Restoration) described in the Skagit Wildlife Area Draft Alternatives Report. The 2005 Skagit Chinook Recovery Plan concludes that the loss of tidal delta habitat is a prime limiting factor for Chinook juveniles in the Skagit watershed (2005 Skagit Chinook Recovery Plan, pages 16-27). Alternative 4 would directly address this limiting factor and the historical loss of tidal delta habitat by restoring 270 acres of habitat. As the Draft Report points out, the “[p]redicted juvenile Chinook carrying capacity for the Full Restoration alternative is 72,820 (range: 59,377 - 86,035) smolts per year when including fish benefits for channel area formed due to indirect effects of the project in adjacent marshes downstream”. (Analysis Report, page 35) Even at the lowest figure in this range, the increased carrying capacity for Chinook in Alternative 4 exceeds the highest range number for any other alternative. This positive impact on Chinook is in addition to a better scoring on climate change resilience, and a more beneficial impact on Southern Resident killer whales, shorebirds, and agriculture. However, I also acknowledge the impacts to other public/recreational interests (including hunting access) and that several diverse interests must be considered in reaching a decision. The Island Unit has long been a prized area for waterfowl hunters, bird watchers, small watercraft users and others. Many of those involved in such activities are local residents, landowners, farmers and visitors from distant areas that bring economic benefits to the area. I encourage WDFW to explore alternative designs to the preferred alternative that would better accommodate these interests. Perhaps portions of the raised dikes could be retained as disconnected segments that would not dramatically affect restoration potential while maintaining some user accessibility. I also urge revisitation of the concept of “replacement lands”, a process whereby WDFW, agricultural interests and recreation user groups work together to find places where recreation, displaced by restoration work, can be enhanced or encouraged. Salmon restoration is a long-term endeavor. Much of the estuarine restoration work on public lands has been completed and the Island Unit may be the last significant parcel left in the Skagit watershed for such work. A project should be initiated here before turning the estuary restoration focus on private lands. There is a need to bring along support from all interests in order for salmon restoration to be successful. Thank you for the opportunity to comment. Bob Everitt	Online Form	Bob Everitt
23	I would prefer that nothing was done. But since I don't believe that's realistic I will choose option three	Online Form	Vic Stevens
24	Doing option 3 and flooding half is the best way to go	Online	Robbie

	Comment	Source	Name
		Form	Stevens
25	Hi, I am a waterfowl hunter/bird enthusiast and have been following this closely and in my personal opinion I feel option 1 of no restoration would be the right decision here. But I understand the issues you guys face and feel like option 3 would be the way to go and could potentially benefit both sides. That area is key for forage production and losing all of it would be damaging for waterfowl. Thank you	Online Form	Matt Freidig
26	Plan 3	Online Form	Larry McCormick
27	I support alternative #1.	Online Form	Marty Elmore
28	As a duck hunter of 77 years of age, who has enjoyed and I support alternative #1. Rehabilitation of the island for the enhancement of waterfowl will continue to provide opportunities for generations of youths to come, as they have for myself and the many who came before. It's a small investment in our youth! appreciated all aspects of the island since 1957 in both hunting, observing and the conservation of waterfowl,	Online Form	Robert Elmore
29	I vote for Alternative #3, as an avid duck hunter.	Online Form	Mark Roetcisoender
30	I am a life long Skagit resident and waterfowl hunter. I started hunting on the islands with my father when I was very young. If we have to lose more forage ground, then I support option 3. Options 2 and 4 are unacceptable. The land was originally purchased by hunters using hunt license fees to pay for it. The lose of more ground needs to be compenated by the creation of more hunting grounds.	Online Form	Morris Johnson
31	I am 58 hunted and guided eastern Washington via potholes res in the 80s and 90s it was the best hunting opportunity to harvest birds all the while Skagit headquarteres properties island and mainland was and the island is the premier hunting opportunity in the state period.option 1 is my recommendation I have seen the island loose a 1/4 due to dike failed then mainland premier walk in area gone Stanwood property gone and then you try and give us private property with blinds on properties that haven't shot a bird in over 10 years yet you brag about them being there the reservation is taken up by peta tree huggers the samish unit is harassed by colorfully coated bird watchers and dog walkers and come on man if really want to save salmon cut the Indians NETS and lastly if u don't know now the estuary u try to make go dry leaving small holes of water feeding the fish eating birds to clean house I talked people servaying shocking waters at headquarters they found almost nothing lastly if u take any of the island u might as well take all there would be too much pressure to be any good we would be lukcky to hunt 6 parties 40years ago 60 hunters on the island I've hunted there for 48 years and your 40 blinds is a joke please charge more for licenses and leave at least what we have left island goes and then the Laravic property is goes I and hundreds more will be done with Wa hunting thank you for the opportunity to give my opinion	Online Form	Lewis
32	I support alternative 1	Online Form	Pat Garrett
33	I do not recommend any restoration. Leave it as it is.	Online Form	Jeff Lander
34	I strongly oppose alternative 4. I would support alternative 3. Total removal of the existing dikes that provide waterfowl habitat/forage to do something that may or may not improve salmon survival does not seem like a reasonable solution. Make improvements that support both salmon habitat while continuing to provide valuable forage for wintering waterfowl.	Online Form	Scott Witman
35	Option #1 No Restoration. The WDFW Waterfowl Advisory Group (Waterfowl-WAG) response has provided clearly laid out argument for Option #1 and WDFW should respond appropriately.	Online Form	Rick Sheridan
36	I support alternative one, the farmed island is one of the best public hunting opportunities and the west coast. Once you lose an area to public recreation it is gone forever. This also pushes hunters out to the bay front and puts them in more dangerous tidal situations many are not equipped for. There are many other areas in the state with massive environmental problems that need to be addressed and badly need funding. Now new studies about tire pollution and runoff and toxic chemicals killing salmon is potentially an extremely expensive problem to solve, and the cleanup for that problem could take years. As Washington's population increases I would think increasing areas to recreate would be a priority for WDFW and their hunter outreach programs. I certainly don't understand how you encourage hunting by taking away areas to hunt.	Online Form	Timon Gasowski
37	Leave it the way it is. No change. Fix the gates if they need it.	Online Form	Kevin Inman
38	My name is Devin and I am an avid waterfowl hunter of Washington state. In addition to my hobby, I am in the final semester of my Masters' in Conservation Biology. I feel that I can provide a unique perspective on the island unit restoration. I feel that WDFW's analysis regarding sea level rise and funding are the strongest points regarding restoration of the island unit. This entire area will be exceedingly difficult to manage in the	Online Form	Devin Downes

	Comment	Source	Name
	coming decades with regards to sea level rise and investing state funds in the no restoration plan could result in an opportunity cost for other units in the area. Furthermore, losing out on federal funding would likely make a full restoration impossible. Chinook salmon could certainly benefit from the restoration of the island unit. As sea level rise continues, sections of estuary habitat will be flooded to the extent that it can no longer support vegetation. If WDFW is truly serious about salmon restoration, then they will have to start planning to institute buyouts of private farmland in the area. This habitat area will be diminished with time, and it would be a waste of money and effort to invest in a solution that is not effective. I expect that purchasing private land to restore will be difficult and receive little to no cooperation. Although I have not researched the topic extensively, I cannot find any studies detailing the utilization of the restored headquarters habitat by chinook salmon. It would be wise to ensure these restoration projects have a degree of efficacy and in fact support the species they have been restored for. I understand that WDFW will likely flood the island unit, just as they have done with the headquarters unit and the Stanwood area. Western Washington's waterfowl hunters are losing quality public land locations to hunt at an alarming rate, and I expect that public hunters will have little opportunity in several decades. Without further investment in new public land opportunities for Western Wa waterfowlers, this sport will become a discipline of privilege whereas only those rich enough to purchase land, leases or club memberships will be able to experience quality hunts on a regular basis. WDFW ought to consider waterfowl hunters and develop an additional planted crop waterfowl unit in the next decade.		
39	I do not agree with what your trying to do at all. There are thousands of birds that use that island as a food source and for resting. The money I pay towards conservation will not go to this project I refuse it if this happens I will be moving states and never allow anyone I know to help the WDFW out ever again. This is a disgrace.	Online Form	Bryce esary
40	The game island and surrounding marsh provides the region with the most productive waterfowl habitat. The benefactors of this habitat is shorebirds who frequent the island when the tide is high. Other befactors include raptor who feed on the birds. By removing an area so special you also limit the enthusiasm moving forward from younger generations of waterfowl hunters. I think there are alot of issues with salmon in the Puget sound so there should be plenty of other places across the state that need work done before the game island.	Online Form	Skyler guess
41	Remove dikes, go back to original before duked	Online Form	Pam Pritzl
42	I support alternative#1	Online Form	Curran Cosgrove
43	Support 1 or 3. Why is wdfw not have a plan to replace any of the Lands water Fowler's Have lost over the years	Online Form	Reb Broker
44	Hi Bartley Stokes Sr. I have hunted on farmed Island my entire life. I started at the age of 10 years old with a family friend. And now I have both of my 2 son hunting the island with me as well. It would be a shame, no a disaster if this wonderful hunting land was taken away from the generations of hunters that I've had the opportunity to hunt on farmed island. I totally support Alternative 1 regarding farmed island! just fix the floodgates, do the right thing. Don't destroy this land like they did to the land over near headquarters across the river. The salmon will not spawn in a swamp full of cat tails. Thank you for your attention in this very important matter. Go alternative 1	Online Form	Bartley Stokes Sr.
45	I have hunted the Skagit island unit for over 30 years. During that time, I have developed a great love for the area and would like to see it preserved for the future with plan 1. The funding cost is the lowest and I believe could be funded with the help of private industry, donations, du, duck stamps etc. I spent several hours reading the various plans and my takeaway is that most important thing is to preserve this hunting area for future generations. Predator control of sea lions, seals, and other fish eaters can help the fish. Increasing hatchery production makes sense too. I truly believe this is a special area worth saving and I believe we can have both fish and ducks in greater numbers. I was surprised not to find any mention of the benefits of the area to hawks, eagles, small birds, including blackbirds, deer, and all of the other creatures I have seen out there. Some of my best memories are just sitting there watching nature. The projected sea level rise in only several inches in 50 years, so I don't think that is much of a concern in the near future. Also, the Tribal report doesn't even mention plan 1. To me, plan 1 is best. Thank you for the opportunity for me to voice my opinion. Keith Knutson	Online Form	Keith Knutson
46	Don't do it!!!	Online Form	James towne
47	As an avid waterfowl hunter, and a leaseholder of a dike cabin adjacent to the Island Unit, I have been hunting the island areas for 10+ years. These islands are CRUCIAL for hunters, as they serve as areas which are not tidally influenced, nor exposed to weather and wind, like other areas of Skagit bay delta and the Wildlife Area. Due to the borders of the wildlife area's no-hunting zones, limited areas of foliage and vegetation coverage exist which hold water for the placement of decoys for waterfowl. I believe the Draft Alternatives Analysis Number 1 (No restoration) is the BEST option which does not further disturb the current delicate estuarial ecosystem, but also preserves historic hunting lands for accessible	Online Form	Patrick M Trivett

	Comment	Source	Name
	public use without significant barriers to entry. Alternative 3, although not serving any of the interests of the local waterfowl hunters is the SECOND most acceptable option given its proposed impact upon areas of the Island Unit. WDFW does not need to do an inventory of adjacent access points or lands. They are not EVEN close to the QUALITY of the Island Unit's hunting. When barriers to entry exist and more public lands are being shuttered to hunters, it is unconscionable that any option but Alternate 1 is suitable. A delicate balance must be struck for all interests, but making this decision based upon being "boxed into a corner" so to speak by tribal objections to permit submissions, is essentially putting NO EFFORT forth to maintain an asset of the public, one that is USED by man. Such evaluation resulting in any significant change of use seems to be a slippery slope which must be looked at with considerable review and should not be arrived at in an arbitrary and capricious manner.		
48	I support alternative #1.	Online Form	Nolan Berlin
49	Please see attached.	Online Form	Sandra Lepper
50	I support alternative 1	Online Form	Zach Anderson
51	Alternative 1 no restoration	Online Form	Shanen Averbeck
52	I support #1 option	Online Form	Brad Otto
53	I support alternative number 1	Online Form	Jacqueline Perry
54	I fully support the WAG recommendation for for OPTION #1 - NO RESTORATION	Online Form	Thomas Irwin
55	No restoration.	Online Form	Aerol Paden
56	No restoration. Focus efforts on nonnative marine mammals.!	Online Form	Brandon Kakalecik
57	I think that the island shouldn't be flooded at all. I feel like hunters are unfairly targeted when it comes to salmon restoration. With us already loosing leque island as a hunting area, I don't feel as if it will benefit us in any way to loose another major section of public hunting	Online Form	Brandon petroskie
58	I am recently retired and new to Washington. My only option to hunt is places set up by the State as I own no farmland to hunt on. I ask that consideration be taken for those of us who are dependent upon hunting areas such as this.	Online Form	Paul Skinner
59	I just started hunting farmed Island this year and thoroughly enjoyed it. I have been taking my 8 year old son with me. I vote for no restoration! I plan to keep hunting the island for years to come. No restoration!!	Online Form	Justin petroskie
60	Vote for proposal 3. Seems very little confirmation of restoration success, so let's not put all eggs in one basket. We know for sure the crops benefit wild birds and recreation so why eliminate it totally?	Online Form	Maynard Axelson
61	No Restoration	Online Form	Terry Raynes
62	No restoration.	Online Form	Sam Roth
63	No restoration.	Online Form	Michael Lohr
64	My opinion is that the "No Restoration" option should be chosen. Public hunting access in Western Washington is severely limited, and the benefits to the Salmon populations are not evidently quantifiable.	Online Form	Matthew Reat
65	No restoration. This is a much needed grocery store for waterfowl.	Online Form	Graig Ward
66	Please see attached letter.	Online Form	Richard Brocksmith
67	I want no restoration of the island unit. Island unit should continue to be planted for winter forage for migratory waterfowl. We do not need	Online	Joseph

	Comment	Source	Name
	additional loss of habitat as was the case with Headquarters. I want to see my fees go where they make the most impact.	Form	Molitor
68	I am strongly opposed to this restoration-- it will be a disaster for waterfowl and waterfowl hunters	Online Form	Spencer Martenson
69	Please proceed with Option 1 - no restoration. Waterfowl hunter licensing costs continue to increase, but WDFW continues to shut down more and more public access to waterfowl hunting. We want our money used to help us have more success hunting waterfowl, not used for fish restoration. WDFW's long-time mis-management of the region's fisheries is not a reason to negatively impact waterfowl hunting. If Farmed Island is fully or partially restored, what is WDFW's proposal for opening up new land for waterfowl hunters in that area? Where are those waterfowl going to go when their food source of 70 years disappears? There isn't a plan. And that's how we all know WDFW doesn't really care about waterfowl hunters and will always prioritize fisheries over waterfowl and use the revenue from our licenses to support fishing activities.	Online Form	Conner W.
70	The island unit is one of the last public farmed areas for waterfowl winter forage and hunting opportunities and is crucial in maintaining that balance in our local area.	Online Form	michael skinner
71	No restoration	Online Form	Toby miller
72	Taking away one of the best public land duck hunting areas in Washington is a bad idea. Ruined smith farm doing the same thing already.	Online Form	Johnny Austin
73	keep land open to hunting. Ever growing populations and new hunting involvement is really putting pressure on hunting grounds. Need as much open as possible!	Online Form	Brock Akers
74	I am writing to you as a lifelong conservationist who grew up in Conway, WA in support of Alternative 1 (no restoration) of the Farmed Island. I have had a long history with the Farmed Island beginning as a child when I helped with the planting of the fields in the spring. My Eagle Scout project was to construct two duck blinds on the Island, the Point Blind and Fireman's Hole Blind. Over the years I have heard many stories of successful hunts out of the blinds including stories of children's first birds from parents proud to see the Skagit Valley waterfowling tradition continued. Ironically, I do not recall ever hunting out of them myself. The Island was originally purchased in the 1950s to create a haven for wintering waterfowl and to provide hunting opportunities. The WDFW, conservation groups and private donors have worked tirelessly and with passion to ensure this vision was realized. Just this year there are dozens of vehicles at each launch every weekend using the Island. Across the state opportunities for waterfowling are reducing at a steady rate from both changes in public land management and private land opportunities getting bought up or shut down due to liability. Like everything, a balance between user groups need to be struck. The waterfowling community has lost a lot of land, it is important that the Island remain a cultivated public waterfowling area as it was always envisioned and intended to be.	Online Form	Kenneth H Packard
75	I fully support the full restoration option (option #4). While the needs of all users need to be taken into consideration, the highest priority area for salmon habitat restoration is this area and salmon habitat restoration practitioners have been directed to restore public lands first. The more public lands we can restore to meet the Salmon Recovery ESA goals, the less impact it will have on private landowners.	Online Form	Alison Studley
76	As of 1999/2000 in the Skagit Delta area there has been approximately 620 acres of waterfowl forage area removed and flooded into chinook estuary. To date there appears to me no scientific data that these areas are producing more chinook salmon. ie (fewer and fewer opportunities for a sport fisher to harvest said salmon). Past directors of DFW have deemed the island unit as a top 3 waterfowl habitat area in the state of Washington. To lose this one of a kind unit and no way to mitigate replacement, would be a travesty. I am all in favor in Alternative 1.	Online Form	Darrell Tawes
77	Please see the attached comment letter from the Orca Salmon Alliance member organizations. If you have any questions, please feel free to reach out to me. Thank you.	Online Form	Robb Krehbiel
78	I strongly support Alternative 4 Full Restoration to return 270 acres of diked land back to critical salmon habitat. This is a rare opportunity, perhaps the last major opportunity in Skagit County, to significantly improve salmon habitat in the Skagit River watershed using public lands. Increasing the salmon population in the Skagit River benefits the ecosystem, resident orcas and the community at large.	Online Form	Lynne Wenberg-Davidson
79	Recognizing the reduction in hunting I still fully support Option 4. This option provides the largest near term benefit to smolt survival in the Skagit river system. As a former bird hunter and hopefully continuing fisherman Skagit fisheries needs this win for the salmon! This Option 4 also buys time for the agricultural community to adapt to future required changes such as stream & river setbacks to help mitigate water temperatures missing TMDL goals. Yes it's good hunting ground but it's great salmon habitat	Online Form	Douglas Davidson
80	Please don't down size our available hunting areas.	Online Form	Stephen schauls
81	We as hunters spend hundreds of dollars per person per year in licenses and passes, and all you do is think of ways to limit the public land access!!! Leave that unit ALONE!!!!!! If you start taking away land it's going to push more hunters into the southern skagit lands, and all that land	Online Form	Johan west

	Comment	Source	Name
	will be useless, because there will be to many hunters all trying to hunt a small area! The birds Will never land there then!!!!Turning that unit back to estuary is the worst idea!! We all know that it will do NOTHING to help the salmon!!!!!! Salmon hate mud, getting rid of the dikes would hurt the salmon run not help it!!! If you want to help the salmon, stop the Indians from gill netting the mouths of the rivers!!!!!!!!!!		
82	Please do not change anything in Fir Island. We don't have many public land spots to hunt anymore as it is. This would be a huge blow. As a young person I can not afford expensive hunting leases and I only hunt public land. Please think of the next generation of hunters.	Online Form	Dillon E.
83	This needs to be kept open for public use/duck hunting.	Online Form	Tyler Palmer
84	Enough is Enough! WDFW took half of the Island unit 20 years ago. 221 acres of public hunting access lost. Eight years later WDFW flooded the Headquarters Unit 180 acres of public hunting access lost. Most recently Leque Island was flooded. 250 acres of public hunting access lost. WDFW was mandated by Governor Christine Gregoire to provide replacement lands for lost public access. We have yet to see it some 12 years later. Not one acre has been replaced in Skagit County yet 650 acres of freshwater wetland habitat for dabbling ducks has been eliminated. The Quality Hunt Private lands program is not a replacement of public lands either. At best it provides mediocre hunting opportunities, and has continually lost enrollment in the program since its inception. The WDFW mantra of "You can still hunt there" is a joke! You know it as well as we do that what is left of these lands post these projects is just plain treacherously dangerous to try and access for hunting. Not one of these projects has resulted in Salmon Recovery in any meaningful way except on paper. Paper fish are not real fish and WDFW knows that. These projects are effectively eliminating access to public lands and waterfowl conservation as whole in the Skagit Valley. "Conservation" of one species at the expense of another is not conservation! What it is, is the nail in the coffin of public hunting in the Skagit Valley! NO RESTORATION ON THE ISLAND UNIT! WDFW and the Tribes have taken enough!!	Online Form	Tracy Anderson
85	Please reconsider. if you want to help restore salmon populations ban gill netting..	Online Form	Mark Stewart
86	I am tired of hit-and-miss solutions to the salmon/steelhead decline. Planting trees and giant culverts don't offset netting the fish in rivers as they return to spawn. There are less opportunities for waterfowlers to find public hunting areas and this is not one to destroy.	Online Form	Ken Miller
87	I truly hope Fir Island is kept as a wonderful place for to enjoy hunting waterfowl. I've hunted Fir island for 20yrs, taught my kids to hunt here and hope they continue to have this public resource to enjoy. Without Fir Island other areas would be overcrowded and opportunities wry limited. Wed be forced to drive to Eastern WA. Please keep Fir Island for the public to enjoy!!!	Online Form	Anthony
88	Please do not do restoration work on the island. It is a vital hunting spot and provides access to countless hunters. There are more and more hunters every year and it's already becoming hard to find locations to hunt. Please I beg you, keep this land for hunting!!!!!!	Online Form	Benjamin Lindhardt
89	As a 23 year old girl I never imagined that hunting would be something I enjoyed until one early morning. I woke up at 1am and drove the 3 hours up to the island. My boyfriend spoke about his hunts on the island growing up and I knew I wanted to experience the same joy I saw on his face as he relived the experiences through his stories. That morning we launched the boat his father bought to build memories with his son doing what they loved, waterfowl hunting. Our dog Duke sprang to life as the we loaded the decoys and headed up river. Before first light I listened to the sound of ducks and anxiously awaited shooting light. A few minutes after shooting light a beautiful Drake mallard circled the decoys and I heard "take him". I will never forget standing up with that shotgun and watching that bird fly in front of me like it was in slow motion. I pulled the trigger and shot my first duck. Duke ran for the retrieve, I shook with adrenaline and my boyfriend and his dad celebrated the joy of watching me on my first hunt. That day I became a hunter. I have made many early trips to the island to hunt since that day. I have made so many memories with friends and strangers that became friends along the way through our love and passion for the sport. This is the only place I have waterfowl hunted and the only place I wish too. The island has brought me so many memories that I hope to share with my children and future hunters. As an avid fisherman and hunter I have been blessed with some amazing salmon fishing throughout the state but to see a spot that brings so many waterfowlers together be widdled away breaks my heart. The island started my love for hunting and I would hate to see one of the best waterfowl hunting spots in western Washington become anything less than that. Please, do not destroy the prime hunting and acreage the island provides for so many of us. Fir Island is unique and cherished by all of those who make the trek to enjoy this wonderful piece of land. The memories built here last a lifetime and having Fir Island to hunt and the choice of the many blinds that give us the opportunity to be where the birds are is what keeps me buying a small game license and duck stamp year after year. I worry that losing this prime peice of waterfowl hunting will discourage hunters and lessen small game license and duck stamps purchased. I fear that this will lead to less income for the state and even less opprotunity for the people who will still want to enjoy their home state. Please do not destroyed this land that so many enjoy as a waterfowlers sanctuary. I would be disheartened to see the opprotunity lessend for us hunters who enjoy more than just the meat but the memories, experiences, and friends we gain along the way.	Online Form	Chantel Pittman

	Comment	Source	Name
90	Please don't take one of the last premier duck hunting locations in Washington state. I have been hunting ducks for over 20 years, all across our great state. I can tell you that this location is the best consistent hunting available. Duck hunting in our state has become a rich mans game. If you don't have the cash flow for a lease you are just about of of luck now a days. Fir Island has been the saving grace for many duck hunters. If the Island is taken away you are robbing waterfowlers of the best opportunities. I make a point to invite veterans and youth to hunt the island. I feel it is important to introduce our future generation to this great sport and lifestyle. I know the island is the best bet for them to enjoy themselves and bag a few birds. Everything about the island is a positive experience for our youth hunters, and if that's gone so is the sport. Another issue to consider is the amount of traffic surrounding areas will get if the island is closed. I feel there would be major impact in a negative way. Fir Island hosts a lot of hunters every week. I just don't think other smaller public land areas could take the pressure. Please keep our waterfowl opportunities open. I drive 3 hours just to hunt this one spot. Many people venture even further to enjoy this gem. Don't take away our best Western Washington hunting opportunity.	Online Form	Joseph Barrett
91	I recommend alternative 1. The island unit should be maintained for wintering ducks and public use.	Online Form	Jamie Brevig
92	I support alternative 1. I support maintaining the island unit waterfowl habitat	Online Form	Kyle Brevig
93	I strongly support full restoration of the site (option 4). Wetlands are nature's critical infrastructure to absorb and disperse storm and tidal surges, which will intensify in years to come. Maintaining a system of dikes and tide gates will become more difficult and expensive under these conditions. Secondly, a natural estuary provides food and habitat for the broadest web of life, which in turn benefits ESA-listed fish and Orcas, and a whole host of migratory birds that are not hunted, but arguably more threatened than geese and ducks. As a hunter and fisherman, I am not unsympathetic to the shotgun hunters' loss of a nice site. These hunters, however, are vastly outnumbered by the citizens who depend on a healthy riparian habitat for sustainable tribal, sports and commercial fisheries; not to mention the tourism benefits of healthy Orca and non-game migratory bird populations. These benefits of full restoration underpin my support of Option 4.	Online Form	Daniel Houston
94	Our public land is already overrun by locals and out of towners who use our resources for waterfowl. changing any part of this island will severely impact the great waterfowl hunting this county is know for. i have hunted this island for decades and it would be a shame for WDFW to mismanage another species (Waterfowl) as changing the current landscape of this island would dramatically hurt the waterfowl in our region and cause our great flyway to be irrelevant like other counties in the area..	Online Form	Rey Cantu
95	Whatever the plan is, please continue to allow waterfowl hunting in the Skagit area.This is the only reason my family buys hunting licenses. Waterfowl hunters are low extremely impact, contribute to the local economy and fees contribute to state funding via the WDFW. Thank you.	Online Form	Fred Green
96	I have hunted and fished the Skagit area for over 50 years. I have witnessed the decline of the salmon and steelhead runs in the Puget Sound ecosystem and the improvements in hunting and bird populations (Ex: eagles , snow geese, ducks, and swans). I have not personally observed improvements to the chinook runs due to the various estuary restoration projects and as such am not a strong advocate for continuing the practice until scientific proof is provided (how is it the Green River chinook seem to be fairly viable with zero natural estuary, yet the Stilliguamish with a fairly expansive estuary is struggling mightily?). I also have experienced the "take aways" of opportunities in these estuary restoration projects (Ex: headquarters and Leque Island pheasant release programs and waterfowl agricultural/feed supplementation) without mitigating those losses to hunters. I'm disappointed that this proposal overlooks the larger impact and doesn't offer a mitigation to the waterfowl hunters (for example, restoring the Island Unit to an estuary environment and adding another quality hunting property similar to the Samish Unit). With that in mind, I endorse Option 1 and reluctantly Option 3. Bottomline: show us proof the estuary habitat is the key to unlocking the chinook survival mystery before doubling down on the hypothesis, and offer an mitigation for the proposed loss of quality hunting opportunity that the Farmed Island Unit offers before proceeding with option 4. Another observation/comment: more attention needs to be paid to the North Fork, which has a much smaller estuary footprint than the South Fork. Thanks for providing the opportunity to comment!	Online Form	Jerry Holmes
97	This proposal to blow the dikes at the island unit for salmon restoration will seriously impact the opportunities hunters have to chase waterfowl. The island unit has been planted for 70 years and provides food for 50,000 ducks on Skagit bay. Taking away this food sources will have serious repercussions for migrating birds and alternate flight paths. Instead of getting rid of a this historic hunting sight how about we focus on sea lion and Commorant predation and increase hatchery production. Please consider the alternative which leaves this island unit how it is, so future generations can enjoy the rich waterfowl hunting in provides.	Online Form	Mike Surdyk
98	Do not take away prime public hunting lands for a restoration project that will not actually improve salmon stocks. Washington has bigger problems with salmon stock which you all choose to ignore. Work on those and leave hunting lands accessible to hunters.	Online Form	Timothy J Tinghino
99	I've been hunting the Skagit Island Unit for many years. I learned to hunt waterfowl there and in Eastern WA. Many folks are unable to make the	Online	Vasilios Pallis

	Comment	Source	Name
	trip over the pass to Eastern WA and the Island Unit offers one of the most attractive and reasonable alternatives. If we lose the opportunity for this public hunting gem, the amount of pressure on other areas will increase dramatically and create a more complicated set of problems. Please, preserve and if possible, make the necessary improvements to the Island Unit - an incredibly important element of our hunting in Western WA.	Form	
100	Count me in for No Restoration! Oh Boy! Here we go again. 20 years ago this was not a good idea. Still not a good idea...for salmon restoration or waterfowl. If the State and the Salmon Uber alles folks could ever figure out that the salmon problem is not a lack of resting area for juveniles (what a load saying it is the critical issue!), and that the major problem salmon encounter is ALL upstream and in the ocean. Logging, roads built for logging, silt caused by logging and roads, pollution, no cover/loss of habitat upstream, warming water temps, dams blocking off hundreds of miles of spawning grounds. Warming oceans, predation from seals, Sea Lions, Cormorants, Terns, etc...Overfishing by Native American tribes, etc...on and on. I get it. There is no money to be made or lost in waterfowl hunting. Salmon, not so much. Too bad no one in the State or Federal agencies can't figure out there is money to be made in waterfowl hunting. Build it. Work with landowners securing leases, building blinds, Promote it, and they will come! Hard for anyone in government to think even remotely out of the box. Lots of money involved with salmon, mostly from the tribes suing the State, and winning! The State would do more for salmon recovery if they just paid the tribes to NOT fish. And if they want to fish, fine. Just have to use dip nets, spears and build fish weir traps the way their ancestors did. No modern tech allowed! Work on fixing upstream and ocean habitat, then talk about resting areas for young smolt. At the current rate, and continued FUBAR by WDFW and the Feds, there will be no fish resting anywhere. Please for the sake of all that is holy, leave the Farmed Island as the Waterfowl area it is now. Breaching the farmed island (again) for salmon restoration, at this point in time is fruitless with all the other ecological harm that has been done to the Salmon Habitat from Ocean to spawning beds. Not to mention all the duck stamp dollars that go for what? You can't reverse what has already been destroyed. Kinda like making Coal "King" again! Benefits very few and does harm to the majority. I remain.... Respectfully yours	Online Form	Eric Sims
101	I believe that Alternative 3 is the most beneficial for hunters and anglers in our community. Hunting locations are getting harder and harder to come by (thank you for the FFTH areas btw). Alternatively 1 is not an option because some form of restoration needs to be achieved. Alternative 2 is also not productive because hunters would not be as spread out.	Online Form	Matthew Bennett
102	I favor option 4. The removal of dikes on both Skagit islands.	Online Form	Ralph Lloyd
103	Please select option #1. Do not waste taxpayer dollars on this unit. Replacement land must be included if restoration were to occur. Option #1	Online Form	Lori Skiba
104	Congratulations to WDFW for compiling such a well-informed alternatives analysis for the Skagit Wildlife Area (SWA) Island unit. The alternatives and potential effects of those alternatives are clearly described. It is clear that Alternative 4 (Full Restoration) is the most logical approach for accomplishing long-term sustainability and improved fish habitat for this location. It is also consistent with other restoration actions in the SWA and adjacent coastal and inland areas. There are three things that would improve the analysis, especially relative to Alternative 4:(1) Although the effects of climate change are considered, the information is mostly general and non-quantitative. There is a wealth of recent scientific information on the effects of climate change on sea-level rise, hydrology, groundwater, tidal surges, flooding, sedimentation, estuarine ecology, coastal vegetation, and fisheries in western Washington, including in the Skagit Basin. Little of that is considered in the analysis, but it needs to be in order to ensure long-term resilience of aquatic and terrestrial systems in the SWA. It would be relatively easy to prepare a table that lists each of the ecosystem components, potential effects, management actions that address those effects, and scientific references. This would essentially be risk assessment/risk management for climate change, a key to long-term sustainable management of desired ecosystem conditions.(2) It would be appropriate to consider proposed Alternative 4 more as building resilience than as restoration. This is not just about semantics. Aquatic and terrestrial systems in western Washington have been irrevocably altered through more than a century of major land-use activities. Most of the terrestrial landscape in and adjacent to the SWA has been converted from forests and riparian areas to agriculture. There is an extensive network of dikes and drainage ways. Fish populations have been greatly reduced. Functional ecosystems are now mostly remnants. As a result, true restoration to previous conditions and species distributions is no longer possible. Therefore, the context for this project is more appropriately to build resilience in structure and function to accommodate (not resist) a warmer climate with associated stressors and disturbances, not to return to previous conditions which are no longer attainable.(3) In addition to the good things proposed in Alternative 4, I recommend a more holistic consideration of human values and activities in the Island Unit, SWA, and beyond. For example, this would be an opportunity to increase the distribution and abundance of native plant species. The native vegetation component in non-flooded and periodically flooded portions of the SWA is relatively poor. Planting native species would be a straightforward, moderate cost activity, conducive to volunteer projects that would appeal to many local organizations. An additional benefit would be improved habitat for a broad range of bird (beyond	Online Form	Dr. David L. Peterson

	Comment	Source	Name
	waterfowl and shorebirds) and mammal species. Viewing wildlife, especially birding, is a major recreational activity in Skagit County and SWA, attracting thousands of people and contributing significantly to the local economy. I realize that these issues are not at the core of the analysis, and that the Island Unit itself is not a prime target for recreation. However, a broad social, recreation, and economic context will be valuable in generating long-term public support and value for the project.		
105	Option 1 is the best and only option. There is no proven data that Option 2, 3 or 4 will save salmon when compared to the cost of these options. Stop wasting our tax dollars	Online Form	Richard Skiba
106	After a review of the proposed document, only alternative 2 will provide reasonable accommodation to waterfowl & hunting since Alternative is not given serious consideration. The advisory process has been skewed to exclude the importance of waterfowl hunting that was the original genesis of the site.	Online Form	Tom Kearns
107	I am 24 years young and grew up learning the values of life and nature from this very island alone. This land has been a part of my family tradition for many years. I want to be able to take my son or daughter out hunting the way my dad did for me. The tradition is sacred. Our Indian heritage as well is being threatened. The people wanting to flood this islands believe that salmon will spawn in these waters. I am a biology major and I know for a fact that 1000 of years of evolution with salmon has been taken place, but their spawning grounds are as ancient and as sacred and never changing from then and to now. Taking away this land is unnecessary. Let this resource stay as it is. And let the waterfowlers of Washington enjoy this resource as we have for many years. I hope the right choice is made.	Online Form	Austin Michael Stokes
108	How is this up for debate still? Every year the last three years I've heard the island unit will have its dikes broken, which would ruin an extremely centrally located waterfowl hunting destination used by many. Every year I see newcomers out there getting involved in hunting, whether it is a father and a son/daughter or a group of responsible young adults. This should be a dead issue. With as much as us hunters pay, wdfw can keep the island, continue planting crops on it for winter feed for waterfowl. There is already adequate backwaters for salmon habitat so that is not an argument. anyone that disagrees, has not explored the marsh out there plain and simple. Keep the island unit, unchanged. it's hands down the best public land waterfowl destination on the west side of the state. If wdfw doesn't protect it, then they have failed the hunting/conservation community.	Online Form	Michael homan
109	This 268 acres of public land is indisputably the most utilized waterfowl hunting area on the western side of our state. It is not only a great place to get youth out, but also elderly and disabled hunters alike. A unique sheet water experience that is harder to find access to with each passing year. Please re consider leaving the island as it is. If the budget doesn't have the money to mow or maintain. Let it run it's more natural course, but don't destroy what's left of a wonderful place.	Online Form	Harrison Homan
110	Option 1 is the best. Public waterfowl hunting areas are already at capacity. Removing any acreage will not help this. Also, the Skagit/Padilla bays are important wintering areas for migrating waterfowl. Removing important forage for these birds will be detrimental to the health of the waterfowl population. Causing one species to suffer at the expense of another is not good practice. Migratory birds are habitual. These units have been farmed for waterfowl forage for many decades and using these units is a learned trait. Removing them could cause issues with the health of the waterfowl population which like salmon is already depleted from historical numbers.	Online Form	Bill Kosmas
111	I want to see the department go with alternative 3. It is the only mutually beneficial alternative to all parties. I live 3 minutes away from a wildlife area that provides waterfowl hunting opportunities (not very good ones to say the least) and I choose to make the drive an hour to get to the best project the department has ever put together. It would really be a shame to see this go away. I understand the need to do restoration work and that is why I support alternative 3. The WDFW already is dealing with a decline in liscence and tag sales, and has a serious PR issues as seen on social media, lots of justified and unjustified hate comments. Listen to both the people and the wildlife, it's what the department is there for. Thank you for your time.	Online Form	Nicholas Brown
112	I support full restoration of the site.	Online Form	Andy Bruland
113	To whom it may concern: My name is Adam Gilbert. I have lived the majority of my life in Mount Vernon, WA as this area holds a special place in my sole that cannot be found anywhere else I've traveled. The biggest attraction is the natural resources this area provides. I am an active and avid sportsman who takes part in all that this area has to offer. I hunt small and big game. I hunt Waterfowl and I am also an angler! It is my belief that this project was thrown together without paying any attention to the damaging effects that flooding any part of farm Island would create. Flooding Farm Island will have its biggest impact on Waterfowl. Our area ranks as one of the best flyways in the entire nation! Destroying 268 acres of planted nutrients that have been in place for many decades on a whim that doing so may help salmon counts is irresponsible on behalf of WDFW..NO DATA shows that this method has worked anywhere else in our state!! so why now? what is different this time? The answer is nothing..It is grossly negligent of this department to even consider any proposal other than leaving the island as is when this department is	Online Form	Adam M. Gilbert

	Comment	Source	Name
	turning a blind eye to the future outlook of waterfowl in our area. Why has this department not included alternative public land use options for hunter if faze 2-4 was to be approved? is this department honestly this blind to see that public land use for waterfowl is already overly crowded? As it stands now, our public land areas are already over used. for example at the Samish Unit on any given day there can be 4-5 cars already in the parking lot at 2:30am. Thirty minutes before legal shooting time there is a constant of hunters running around trying to find a place to sit, ultimately too close to other hunters which results in scaring away of birds, projectiles falling onto hunters and truthfully hunters walking out scaring up anything in the fields just to return to they're vehicles as there's not room for them. Farm Island is a place that I frequent to escape the madness other public hunting areas create. I started hunting this area last season after learning of its existence. I participated in the WDFW tour of the unit before the season. I think anyone who reads this comment regarding these proposals should understand this area is not just used by locals. I know of people who use this island frequently as far as port orchard during waterfowl season. my brother in law comes from Blaine just to hunt this unit. my nephew from Ferndale, and multiple friends from the Everett area. they come here because our area is the BEST so why would a department whose sole goal is conservation do anything that would harm exactly that! Listening to the public comment period tonight for almost two hours it is clear that the vast majority of those involved think as I do. The only option WDFW should be considering is option one! do nothing and leave the unit as is.. flooding of any part of this unit is irresponsible. fix or replace the 2 tide gates needing attention and don't be concerned by dikes that have been in place longer than anyone in Skagit County. In closing I ask again, is your proposals worth the damaging effects 268 less acres for waterfowl & hunting would create? will your attempt to help an issue at sea create another issue later on land when these birds change migration paths? starve? or create even worse overcrowding at remaining public sites? destroy private farm land as a result of no food? have you calculated the impact of lost revenue WDFW may lose as a result of fewer waterfowl licenses being bought due to the tens of thousands of disappearing birds that visit this site per day? I am a father of 3 who hopes to one day be able to take my children to Farm Island and continue the tradition this units purpose was intended to be. everlasting memories with friends and family hunting birds while enjoying the best nature has to offer! Sincerely, Adam M. Gilbert		
114	No restoration for the island unit. About 8 years ago Wylie slough recreation unit hundreds of public acres were restored with no plan to enhance or provide more public hunting or fishing public areas. There should not be one side losing all opportunity while the other side(tribal entities) dictate how our public lands should be used. Has there been any real salmon restoration on the south fork of the skagit for many years? Why can't the WDFW put more money into salmon hatcheries instead of taking land from fisherman and hunters who enjoy the outdoors and pay for those opportunities through our licenses and taxes. No restoration until there is proof that the Wylie slough unit restoration is providing more fishing and hunting opportunities for fisherman and hunters.	Online Form	Adam Avery
115	Please just leave it alone. As the state fills with people areas to hunt are fewer and fewer. Flooding will not produce anymore salmon . It will just fill in with weeds and cat tails as has the other area that where flooded. Leave as much for the only groups that even uses this land. The hunters.	Online Form	Tom Elliott
116	You'll ruin generations of tradition and one of the best on only public spots in Skagit that's worth a damn.	Online Form	Daniel Griffin
117	Alternative 4, Full restoration, clearly makes the most sense in the long term. This option provides for salmon and other habitat restoration at a greater level. In addition, with projected sea level rise the cost and functionality of maintaining the current, or even partial, dikes is prohibitive and counterproductive in the long run. Adaptation to climate change will require retreat from the current shorelines and restoration of estuarine habitats. Hardening of infrastructure such as dikes will need to be concentrated further upland and to defend homes and critical facilities, not areas such as Farm Island which are better suited for habitat restoration. Sincerely -Scott A. Andrews, Mount Vernon	Online Form	Scott Andrews
118	I would prefer no "rehabilitation" . Option number one works for me.	Online Form	Boyd Ulsh
119	Hello - I am an Oregon resident and hunt throughout both Oregon and Washington. I support Alternative #1. It is my hope that the access of this public access duck hunting area is preserved so I can bring my young son to it in the coming years. Seldom have I been to such an amazing place as Farmed Island. The family and good friends that I duck hunt with there and have introduced me to the area has a decades long history of sustainably putting healthy meat in the freezer and enjoying the beauty and bounty of Skagit Valley. It is with great respect for the conservation work that needs to happen to preserve all species and represent all people, please do not destroy this area.	Online Form	Alex Keeve
120	As both an avid fisherman and waterfowl hunter the only option I can support is Alternative #1. Sadly restoring this 200+ acres is not going to be anymore effective at restoring salmon than it was to restore the Headquarter & Leque Island units. Since Headquarter & Leque Island units were restored we have only seen a continued decline with salmon with shorter seasons and opportunities leading me to believe neither were the problem to begin with. If real change is going to happen with salmon we all know it needs to start elsewhere (hatchery production maybe) and not by removing this 200+ acres that benefits wintering waterfowl. Having had the privilege to hunt this area for over 30 years with 3 generations	Online Form	Michael Grace

	Comment	Source	Name
	it would be sad to see it restored with no alternatives for waterfowl hunters in the area and opportunities decreasing on public land. Maybe it's time WDFW starts supporting more than just fish? Thank you for the opportunity to comment.		
121	I think it would be in everyone's best interest if there were no restorations.	Online Form	Tiffany Williams
122	I oppose any further estuarian restoration projects on the Skagit river system, including those slated for the farmed island unit of the Skagit wildlife area, known as deepwater slough restoration project. The proposed restoration has unconvincing best available science to justify spending monies to remove levees, but there is convincing historical science that shows the area is a much more valuable critical resource as a upland freshwater waterfowl habitat. This is preferred as compared to a brackish water habitat that would be created to justify spending taxpayer dollars towards a project that only benefits the employees paychecks of wdfw and the paychecks to the contractors employees, not to the fish and wildlife you are commissioned to protect.	Online Form	Walter Edward Schaplow
123	Please do not chance farm island at all. Your have already ruined Spencer island. The pheasant release site in standwood. By removing this island not only do you stop all public hunting in the area but you also destroy major duck habitat that won't help for fish migration.	Online Form	Trevor Kowal
124	I'd prefer that you leave Farmed Island alone, but if you must address the salmon habitat issue, I'd be in favor of alternative #3. This keeps a lot of the migratory water fowl habitat in place, while still contributing some of this island to salmon restoration.	Online Form	Ed Cogswell
125	Given the noted immediate need for dike replacement on the West island, I was surprised that there was not an alternative where the West island was restored to natural conditions and the East island was maintained for agriculture/winter waterfowl production. The proposed restoration activities do a good job of focusing salmon recovery enhancements on public land before making improvements on private lands, which is good for the local community, the state, and our ecosystems. Given the data and analysis provided in the plan, Alternative 4 should be pursued 1st. If funding or other resources are a limiting factor, Alternative 2 should be considered as the back-up plan. Alternative 2 provided the second most positive results for the ecosystem across the board, as compared with Alternative 4, which provided the best results for everything but winter waterfowl concentrations. If Alternative 4 is pursued, WDFW should take more deliberate action to enhance existing state owned lands (perhaps in the Samish River Delta) for drawing in winter waterfowl concentrations so that they have less incentive to feed on private lands and damage soil and plant resources for local farmers.	Online Form	Emmett Wild
126	As someone who has hunted his entire life on Farmed Island known as island unit, I don't want to see the island flooded whatsoever. I recommend conceptual design alternative Alternative 1! No restoration! I have spent my entire life hunting on farmed island. My two sons and my two grandsons are now hunting with me through the years. Generations of hunting will be lost forever if the island is flooded. Look how poorly the flooding across the river in the pheasant hunting area near headquarters has done. The idea of salmon spawning in that new flooded land. We're nothing but cattails have sprung up in the entire area. It is now just a swamp. All of the trees destroyed from salt water All pushed down towards the parking lot area near headquarters. Many species of birds used to roost in all the trees in that flooded area. A glorious bird sanctuary destroyed by the flooding of all that land. Salmon will not spawn in cattails/swamps. They also took away the Spencer Island hunting area which also was flooded. Don't take away our island that thousands of Washington hunters have grown up hunting on.	Online Form	Bart Stokes
127	WDFW has already turned many good duck hunting areas back to tide land and there has not been a corresponding increase in salmon. -The Farm Island unit constitutes 25% of the enhanced waterfowl habitat in the Skagit area -The hunt area supports 24 hunters per day where has WDFW added farmed acers for these displaced hunters to hunt? My input is leave the area alone until replacement hunting opportunities have been put into use.	Online Form	John Groat
128	I have been hunting this island for waterfowl with my family for many years. Please keep it intact for waterfowl hunting. Public hunting land continues to shrink and overcrowding has become a significant problem for waterfowlers. Please choose Alternative #1 and keep this hunting area as it is.	Online Form	Eric Johnson
129	I have spent my entire life hunting on Farmed Island known as Island Unit. through the years 2 of my son's and now my grandsons are hunting the Island with me. Generations of hunting will be forever if the Island is flooded. Look how flooding the pheasant hunting area across the river near headquarters has worked for the idea of Salmon spawning! It hasn't worked! !! This area was home to many species of birds. A beautiful bird sanctuary destroyed. It is now a big swamp! Salmon will not spawn in cattails. I friends and family love hunting Farmed Island. I don't want to see it destroyed like the pheasant area by headquarters & Spencer Island as well in North Everett, Wa. Don't takeaway our Island that thousands of Washington Hunters have grown up hunting on! !!	Online Form	Bartley Stokes Sr
130	It would be a mistake to stop planting on the island and removing the dikes. There are so few places to duck hunt in Western WA. Eventually you will see hunter numbers decline and will lose revenue because there will just not be enough quality places to hunt.	Online Form	Craig Sherwood
131	I support alternative #1 no restoration	Online	Fereidoon

	Comment	Source	Name
		Form	Nehchiri
132	Please don't flood this island as it is the only good public site for duck hunting. I grew up hunting the island with dad and want to be able to teach my son the art of waterfowl hunting on the island. We already lost a lot of good land when the main land at the headquarters unit was flooded. Please save the farmed island unit, we never get back what is lost not all of us have boats big enough to go out on the salt water and be safe.	Online Form	Michael Connelly
133	Please remove dikes and gates and return to historic estuary. Prioritize threatened chinook and other salmon. Protect tribal rights, endangered orcas and anticipate sea level rise.	Online Form	David Moore
134	I believe this island is well used by waterfowlers all around the state! We as waterfowlers are are losing public lands left and right! If you actually pay attention you will notice that the island is well used all day, every day during waterfowl season! It is one of the best feeding grounds for waterfowl in skagit county and if that get taken away birds will change their patterns and habits. Possibly leaving skagit co. The smith farms salmon habit restoration heading onto camano island ,lost us waterfowlers a great piece of public land! And with the water not even holding in there at all times and the water temps in the summer there is no way that place will help the salmon population! All you did was destroy what little public land waterfowlers have left in western wa. This is a big concern and this island should be left and farmed strictly for waterfowl habitat! That is a NO TO CHANGES!!!	Online Form	Hunter fritz
135	Leave it the way it is. Shutting down this unit will result in other units being over hunted and will ruin the sport for many current and future waterfowl enthusiasts! Don't screw this up	Online Form	Beau
136	I strongly support draft alternative # 4.....full island/ delta habitat restoration. The plan plainly states the Skagit Chinook Recovery Plan position is estuary habitat is the highest priority for salmon recovery. Additionally: 1) the cost/benefit ratio of investing in continuing limited & seasonal public hunting on the island units, versus having forever salmon habitat to support long term sport & commercial fishing, plus more salmon for support of Orca population, makes alternative 4 most sensible. 2) Common sense of long-term impacts on the WDFW budget for alternatives 1,2 & 3 vs 4 makes alternative 4 the obvious choice. This is especially relevant given the deplorable, continuing and perpetual condition of WDFW operations budget funding. 3) Projected future rise of sea waters would most certainly increase operational costs for maintaining infrastructure proposed in alternatives 1, 2 & 3. Alternative 4 eliminates those concerns, plus allows for reduced damage to dikes upriver during river flooding periods.	Online Form	Jim Collins
137	Please re consider an reject the current proposal. Money could be better distributed an do more through the area vs this one area.	Online Form	Casey Galloway
138	Please continue to farm the islands. It is a destination for waterfowlers from all over the state as well as a staple for local hunters!	Online Form	Kyle VanderWaal
139	I feel this will displace thousands of birds that already use the island unit as their main food source. Flooding the island unit will not increase the salmon numbers. Many birds such as herons will devour the fry before they can even have a chance at life. The headquarters unit is flooded and doesn't do anything for salmon habitat. It's a death trap for hunters and the number of birds in that area is minimal to the numbers that flock to the island unit. This will do more damage than good.	Online Form	Alicia Christiansen
140	I prefer option 1, no restoration. This farmed island unit provides feed to thousands of waterfowl birds during their yearly migration. It is the feed that draws waterfowl to this island unit. Flooding this unit will offset the conservation provided to the waterfowl. It is also the last Good public access available to waterfowl hunter. The state has repeatedly failed miserably to replace habitat they have flooded, much like the death trap the state created at the League Island unit. Please do not flood this unit. A better option would be to spend the money on the hatchery programs and get them in full production. Couple this with a cormorant season. Cormorant can watch their weight a day in salmon fry a day.	Online Form	Ken Christiansen
141	No changes leave it the way it is . It is one of the more lucrative public land hunting in the state right now I would hate to see it changed	Online Form	Kendle baker
142	Don't take away this public hunting spot for something useless. Best spot to hunt around publicly. Don't flood it	Online Form	Riley Larsen
143	Taking away what few options for waterfowl hunting in our area will create other units to be over crowded even more.	Online Form	Joshua
144	Please don't ruin and take away one of the most used duck hunting spots in all the Westcoast of WA!	Online Form	Rylee chase
145	Please leave this unit unchanged. This area means a lot to local hunters and families of hunters, and will deal a large blow to the community.	Online Form	John
146	I am against a full restoration of the farmed island. Leave the island in it's current state. Do nothing. Leave well enough alone. Thank you Sawyer	Online	Sawyer Coffey

	Comment	Source	Name
	Coffey	Form	
147	The WDFW has already performed two restoration projects concerning salmon habitat restoration. The first was the Skagit headquarters restoration of 160 acres. the second was Leque Island. As to date there has been no noticeable increase in salmon populations. The only thing that has happened between these to 2 areas is that the pheasant and duck hunters have lost valuable acres of hunting access. I am against the restoration of this jewel for salmon enhancement. The losers here are the waterfowl hunting community and bird watchers. The track record of WDFW's success is nil. Do Not destroy the Farmed Island Unit. Thank you Richard Holt member WWA	Online Form	Richard Holt
148	Alt 1	Online Form	Matt Browder
149	No restoration. Please continue to support habitat for waterfowl.	Online Form	Nate Worrell
150	Stop screwing up waterfowl areas for fish	Online Form	Colby
151	I want to see the improvement of salmon and other fish. I think we need to open up the hatcheries agian. Put more restrictions on the indian community and the commercial fisheries. Floodingbduck and upland bird habitat will not only destroy the bird habitat but will not work for salmon. We need to focus on sea lions and better out fish ladders for the dams	Online Form	Gregory Hodge
152	#1 or #3 are the best options.	Online Form	Michael
153	Hello, I am writing you today to strongly encourage the WDFW to take Alternative #1 or the no restoration option to the Island Unit of the Skagit WMA. The Island Unit is a true jem of Washington public lands waterfowl hunting and it would be an absolute shame to loose access here. From so many angles the Island is important. With increasing traffic and use of public waterfowl areas, the last thing we need as public hunters is losing this vital resource. It will lead to increased traffic and conflict on other public areas and could potentially lower hunter recruitment, which we all know is a bad for the future of waterfowl hunting. Restoring the Island will most certainly lead to lower waterfowl numbers using Skagit Bay, as we all know duck numbers increase when the Island is planted. In addition, I worry about businesses in Conway and other nearby towns as there is heavy hunting traffic here, particularly on the weekends and a lack of hunters would cut into the success of these small town establishments. I am a passionate waterfowl hunter and truly love the public land of the Island Unit, hunting it no less then 3 days a week during the season. I always thought I could one day bring my children out for a day in a blind in a place I love and I hate to think that future may never be realized. Please consider Alternative #1: No Restoration and help secure a future of Western Washington Waterfowl hunting. Thank you for your time, - Miles Titland	Online Form	Miles Titland
154	I support alternative 1. This provides continued use of this land for waterfowl management/hunting use. There are already very little areas in western WA for sportsman to pursue waterfowl.	Online Form	Jon Pretty
155	Alternative 1, which is no restoration would be the best option. More and more land is either not being managed or being destroyed and limiting the public hunting. I've been coming to the island for 7+ years to hunt and is the best and least invasive place for someone without a boat well equipped enough to go out to the bay. The samish unit has too much pressure from people hunting right on top of each other and the island is equipped to alleviate hunting pressure.	Online Form	Billy Chanthamaly
156	Thank you for the supplemental video overview of the alternatives under consideration. I strongly support the Alternative 4: Full Restoration. Full restoration objectively enhances more factors than no or the two partial restoration options. Restoring a portion of this unique ecosystem will support historic migratory and resident populations of birds, fish, orca and so, so much else. Additionally, not continuing to sink money into a loosing battle with nature under the influence of climate change makes good sense. Furthermore, bolstering a tide-gate system that worsens flood risk upstream makes no sense whatsoever. Human-centric active recreation will be net-neutral if not net-gain with the shift to enhanced fishing, birding and watercraft recreation. More importantly, restoration of at risk and endangered native fish and wildlife balance/survival will be made more possible. Sincerely, Katie Novak	Online Form	Katherine Novak
157	As noted in the alternative ranking matrix, WDFW has obligations for increasing estuary Chinook rearing habitat in the Skagit Delta under HB 1418, the Skagit TFI and the Skagit Chinook Recovery Plan. Full restoration of the Island Unit is a critical component of WDFW's obligations. Alternative 4 is appropriately rated: accommodations for waterfowl interests can be worked out equitably, as they were at the Fir Island Farm and Wiley Slough projects. Skagit Conservation District strongly supports the prompt implementation of Alternative 4.	Online Form	Thomas Slocum
158	Hello, I would like to say I have hunted the game island on several occasions with my son who lives in the area. It saddens me to know that there is a potential to lose this valuable waterfowl hunting area as there is very limited public areas left to hunt. I am hoping that there can be a	Online Form	Brian Peterson

	Comment	Source	Name
	viable option to repair what is necessary and still allow waterfowlers to enjoy the area to hunt. I would vote for alternative #1. Thank You for your time		
159	I fully support alternative number 1! No restoration. Do not destroy the Farmed Island.	Online Form	Shawn C Tripp
160	I vote for Alternative 1 - No Restoration. As a Waterfowl Hunter, I hunt in both these locations and would like to keep it how it is without any major changes to the land.	Online Form	Brandon Kizer
161	The island unit is one of the most popular duck hunting areas in Washington state and I've been hunting it for over 10 years. I'd like to see alternative #1 where duck hunters are still able to hunt these very well managed fields. Being a fisherman I also see the importance of habitat restoration, but there has to be an option where both sides win. Public duck hunting opportunities are already very limited in western Washington and getting rid of these fields would highly congest the few remaining public areas. I hope you reconsider your plans and allow the fields to stay as they are. Thanks for your time	Online Form	Sean Moser
162	I support alternative 4: the full restoration of the site! Just a side note, In thinking about public understanding of projects, I would think it would be helpful to describe the alternatives in their section in less technical more detailed language. Or Is there way to have a document that is designed for the public that references sections?	Online Form	Michelle E Murphy
163	While I support salmon recovery, I think maintaining water fowl hunting areas in Western Washington is essential.	Online Form	Janet Whitney
164	I support this position and document.	Online Form	dave scott
165	It doesn't seem like your analysis gave very much importance to the waterfowl that rely on this site or the public access it provides to those waterfowl. However I feel that most people would agree that's one of the biggest positives about that site. Being one of the few, dwindling public access site for waterfowl viewing/hunting on the west side of the state it saddens me to see it go. Based on the analysis given it already looks like a decision has been made. Although I hope at least some of the site will remain diked.	Online Form	Tyler Swain
166	No restoration, they don't work and you have failed to put more fish in our rivers leave the game unit for waterfowl hunting	Online Form	David Dundin
167	The flooding of the headquarters unit that already happened ruined a great public walk in duck hunt area along with a pheasant release site. The area is now almost impossible to access even with a small boat along with the hunting being no where near as good as it used to be. Leque island was just flooded and WDFW could have dug ponds and made bridges or atleast blinds in that area but they did nothing instead. Once again destroy another public walk in hunting area for duck and yet another pheasant release site being shut down. The farmed island unit is one of the last local areas near where I live that is actually worth hunting.	Online Form	Richard parks
168	Why are we going to flood an area when this isn't the issue? The issue is an over population of sea lions, netting the rivers, and dams. Why isn't something boing done about that? This area is a resting area and breeding area for many species of waterfowl, flooding this area out will push mass numbers of ducks and geese out of our area.	Online Form	Ryan Van Akker
169	I believe it to be unnecessary to take away the best hunting area in western WA. There have been so many restoration projects recently to help protect the Salmon. Please allow this site for hunting purpose's as it's been for many years!	Online Form	Jeremiah Langley
170	In reviewing the draft alternatives analysis, I would prefer that we stay with option 1, no restoration. The island unit provides critical food and rest areas for waterfowl, as well as great hunting opportunities. Because it is only accessible by boat, the island does not receive the same ridiculous hunting pressure that the Samish Unit for instance, receives. With that said, the Lower landing does get crowded at times, and taking away from any of the areas we have there to hunt would be terrible. Please consider that this is a very popular waterfowl hunting area, and there are a great number of waterfowl using the area at all times. To take away from that would be detrimental. Thanks.	Online Form	William Walker
171	As a young waterfowl hunter begging in the sport for my first year, the island unit is a hub for my friends and I to converge for sport, recreation, fellowship, and food. A place to connect with friends from different parts of the state, a common ground we share together. Losing the Island Unit would be a devastating blow to waterfowl community. A place we explore, learn to master, and appreciate what it does for people and waterfowl. I would like to request that the island continue to stay under current management and remain a mecca for waterfowl and waterfowl hunting. If the department decides that they must flood the island please, at least consider leaving the 160 acres of the island under current management. This option creates a problem that is already an issue with how many people can use the island. It is a popular place to hunt waterfowl and restricting the area to hunt just exacerbates the problem. Please consider my comments and concerns. Sincerely, Grant Duchesne	Online Form	Grant W Duchesne

	Comment	Source	Name
172	I feel like this is not a corrective action for recovering salmon populations. We need to look at getting rid of Gill netting and possibly down sizing catch limits.	Online Form	Troy Francis
173	I prefer Option #4. The loss of waterfowl forage under this option is not significant given the abundance of such forage in Skagit County, while the gains in salmon habitat are indeed significant, especially in terms of providing a critically needed food source for the resident orca population.	Online Form	John S. Farnsworth, PhD
174	I appreciate the work that went into building the Alternative Plans and the excellent presentation - easy to understand and follow the criteria laid out. It is obvious to me, that Alternative 4 - Full Restoration serves the Puget Sound best and provides the most benefit overall. Alternative 4 has my full support.	Online Form	Kirk Hale
175	No restoration is needed. Restoring that land will add 0 salmon to the population and destroy a classic waterfowling spot. How do I know this? Because the last restoration didn't impact salmon either. The real problem doesn't lay with habitat for the salmon. Everyone knows the real issues but refuse to discuss them. It doesn't matter because WFWD has already made up their mind and will destroy this habit and in 10 years find another piece of ground for salmon even though it's not the problem. Please Washington pull your head out.	Online Form	Steven
176	Fix the tide gates and the island unit should be farmed for waterfowl and other bird species. Fish restoration projects are a waist of money and time!! Less fish now than ever, get the tribes to pull their nets out of river and you'll see fish again if it isn't to late. Pour wildlife management is why we are in this predicament. Please don't lose another viable recourse that is used by many for recreation purposes all year long. The fish restoration project at the departments wildlife area on fir island is a absolute waist of a recourse with zero benefits to fish!!! Pull your heads out!	Online Form	Jason Jefferson
177	Alternative 4, full restoration, is the preferred alternative as it offers the greatest amount of benefits, especially for fish. Waterfowl hunting will be impacted, but the expense and environmental impact of maintaining current conditions for hunting are out weighted by the benefits of restoration.	Online Form	Kenneth Schultz
178	By way of background, here is the basis of my familiarity with the greater Skagit area: I have been walking, paddling, photographing the area for 45 years. This includes the greater Puget Sound area as well. I have watched your introductory video and looked at/read most of your 145 page report. Here are my conclusions: 1) You have decided to implement Alternative 4 and are seeking concurrence from the broader public community. 2) There is little analysis of "lessons learned" from prior estuary restoration projects both within the GSD and the greater Puget Sound area. I had to get to appendix E at page 119 to see bird impact analysis, much of which said "we don't really know and haven't studied much." 3) Your bird impact analyses were primarily focused on water birds. The word "eagle" doesn't appear anywhere in your report. With the south fork dike breaches from a few years ago, the inundation of salt water has directly resulted in the loss of two active bald eagle nests. Your report makes no mention of collateral impacts, many of which I could site with my multi-decade familiarity of pre and post restoration. 4) Tide gates are a lesson learned for you. Observing the breach/trench process over the years, I see that you realized that the tidal inundation is a much greater influence on salmon habitat than you counted on. The report is very weak in describing the excavation/trenching that is necessary to provide safe salmon habitat in terms of retained oxygenated, temperature controlled, fresh/salt water. 5) As mentioned earlier in my comments, there is little/no analysis of lessons learned from other breach/trench projects in terms of salmon restoration. Some projects (e.g. Nisqually) are mature enough to assess salmon, wildlife, shore bird and raptor response. The report makes no mention of this. 6) The roll of raptors on the broader ecology is absent in the report. The breach/trench process eliminates a fundamental food source for the raptors. What is impact? No mention in the report. A word search for eagle, hawk, owl and raptor produced zero results. 7) I'll conclude with unintended consequences. Absent much if any analysis of lessons learned to-date, I am not surprised at the lack of any assessment of "what might happen." A robust report with the input from appropriate wildlife manager and biologists should make such an assessment. Please feel free to contact me if you would like further explanation, photographic evidence, etc. Thank you for the opportunity to make comment!	Online Form	Jeff Hawk
179	From history and the press release, it appears to be a certainty that the dikes will be breached, removing maybe the last safe & occasionally productive public land waterfowling area in Western Washington, and netting what the rest of the island unit, and most of the "restored" marsh areas (Ebey Island, etc.) have devolved into - cheatgrass-clogged mires unsuitable for rearing chinook (or any other marine species), feeding foraging waterfowl, or providing a place for public recreation. At the same time, WDFW has been frantically advertising encouraging folks to try hunting, as its budget has dwindled with low hunter recruitment numbers. In a more perfect world, the folks at WDFW would pay at least a tiny bit of attention to the enormous contributions of organizations like Ducks Unlimited, Washington Waterfowl Association, Delta Waterfowl, Trout Unlimited, etc., and the hunters and fishers who eagerly donate time and money to further the preservation of wild places and the ecosystems they enable. But, the dikes will no doubt be dynamited.	Online Form	WILL KRAUSE
180	Hello,	Email	Mary Sinker

	Comment	Source	Name
	<p>I support fully restoring the Skagit Wildlife Area Island Unit because ecosystem restoration projects that benefit salmon are very important. Shorebirds and other species will also benefit. This area was historically an estuary and should be restored to provide the best ecological benefit for our taxpayer dollars.</p> <p>Sincerely, Mary Sinker Stanwood WA</p>		
181	Plz do not flood one of the only walking spots for us waterfowlers it would be a huge devastating impact on all of us who use it	Email	
182	<p>I have grown up in Conway and lived here for most of my forty years. I grew up hunting the game island and and my children also partake in waterfowl hunting the island with me every year. I am strongly against any restoration to the island, I have witnessed the states other restoration projects and they just turn into cattail swamps and it ends up being a waist of taxpayer/sportsman's money. I have gone to presentation out at bay view last year and I know this is proposed for fish habitat, the state has done countless other projects along the skagit river and I have yet to see an increase in salmon In the last twenty years. I would think that the money the state puts up to do these projects would be better put towards figuring out how to limit and record the amount of fish the native nets are taking out of the system. It's not hard to see when the fish numbers started to decrease after the Bolt decision. Politics should have no place in managing the public's renewable resources.</p>	Email	David Dundid
183	<p>Good Morning,</p> <p>My name is Keith Webster and I'm a resident in Anacortes, WA. I am an active salmon fisherman throughout Puget sound and love the idea of conservation of salmon habitat. Unfortunately, the restoration of this estuary would cause the destruction of a vital food source for waterfowl. The island unit feeds thousands of waterfowl allowing for these birds to attain the required energy for their long migration south. The sacrifice of waterfowl habitat for salmon habitat isn't logical.</p> <p>We have already sacrificed the headquarter unit next to the island unit for salmon habitat. The headquarter unit was also a vital food source for waterfowl that was destroyed. I actively hike around the Headquarter unit and I have never seen smolt jumping in these now tide dependent waters. There needs to be evidence that the Headquarter unit is actually supporting smolt habitat before considering flooding the island unit.</p> <p>I won't buy a hunting license, fishing license, or duck stamp in all years to come if the island unit is decided to be flooded. A lot of waterfowl hunters will also stop buying licenses if this unit is flooded. I will further my financial support to other states fish and wildlife departments. I want no restoration to the island unit. Please do not flood this waterfowl sanctuary.</p> <p>Respectfully, Keith Webster Marine Engineer</p>	Email	Keith Webster
184	<p>Good Morning,</p> <p>My name is Peter Sladich and I am reaching out to express my concern against flooding the island unit on the Skagit valley river. These islands are a vital habitat for waterfowl and other wildlife. I'm am very strongly against flooding this unit and I think it would be a poor decision.</p> <p>-Peter Sladich</p>	Email	Peter Sladich
185	<p>I have been hunting the game island for almost 40 years.</p> <p>One more time the hunting community gets pushed aside by fisheries. The idea that you would take some of the best and well known public hunting on the West Coast away from the average citizen is beyond me!</p> <p>It's getting so hard to find a place to hunt already with clubs and leased land. Then to take this away from me and my friends in unimaginable. You take away all winter blackmouth fishing which infuriates the fisherman. Now you want to take away the hunting!!</p> <p>My question is who do you think you represent, because the way I see it you don't represent me and the rest of the license buying community.</p> <p>Boyd Bode-Mount Vernon WA</p>	Email	Boyd Bode
186	Re: Changes to Skagit Wildlife Area Farmed Island UnitI am writing in regard to the proposed changes to the use and management of the Farmed	Email	Martin Taylor

	Comment	Source	Name
	<p>Island Unit of the Skagit Wildlife Area. My input includes two subjects. The first is the WDFW's legal agreement of 1999 with the Army Corps of Engineers to maintain the Farmed Island Unit infrastructure. The second is a personal testimony in support of maintaining the current use and management of the Island Unit. In 1999 an agreement was entered into and signed by Elise Kane, Director of the Habitat Lands Program of the WDFW and Colonel James M Rigby of the Army Corps of Engineers (https://usace.contentdm.oclc.org/digital/collection/p16021coll7/id/1766). This agreement involved the WDFW's responsibilities following completion of the Deepwater Slough project conducted by the Corps. This agreement included the following WDFW commitment (Article III Paragraph B): "The government (Corps of Engineers), after consultation with the Non-Federal Sponsor (WDFW), shall determine the improvements required on lands, easements, and rights of way. Such improvements may include, but are not necessarily limited to, retaining dikes, waste weirs, bulkheads, embankments, monitoring features, stilling basins, and dewatering pumps and pipes. The Government (Corps of Engineers) in a timely manner shall provide the Non-Federal Sponsor (WDFW) with general written descriptions of such improvements to fulfill its obligations under this paragraph." This agreement clearly requires the WDFW to maintain and improve the existing dikes, fields, tide gates, and general infrastructure on the Farmed Island Unit of the Skagit Wildlife Area. Additional comments by the Puget Sound Nearshore Ecosystem Restoration Project demand action in clear violation of the agreement between the Corps of Engineers and the WDFW. These comments include this: "A pedestrian bridge that extends between the two islands would be removed after dike lowering." Although anecdotal, this comment indicates a disregard for legal commitments, both regarding dike lowering and bridge removal. In a democratic society it is not acceptable to make up the rules as we go. Commitments and agreements must be honored for civil society to flourish and endure—as President elect Biden wisely reminds us. The WDFW/Corps of Engineers agreement entered into in 1999 binds Washington State to honor that agreement now. It binds Washington State and the WDFW to maintain the dikes, water management structures, and fields on the Farmed Island segment of the Skagit Wildlife Area. On a more personal note. Hunting for recreation and subsistence is a time honored tradition in our nation. For the common woman or man of modest means quality opportunities to hunt grow increasingly rare. The Farmed Island Unit of the Skagit Wildlife Area is a jewel in that spirit. Women and men who are not wealthy enough to join a duck club or pay a guide can hunt successfully there. It is the premiere public hunting area on the west coast. It should be preserved, nurtured, and maintained as it is for future generations. Best Regards, Martin Taylor</p>		
187	<p>I would like to strongly give my support for alternative #1 for the use of the Island Unit. As a public waterfowl hunter that has hunted on this land for the past 25 years, I feel every effort should be made to keep this opportunity available to the waterfowl hunters of the State of Washington. We have very few places where we can hunt. Please "SAVE THE ISLAND"! Regards, Harvey Musselman Avid Waterfowl Hunter</p>	Email	Harvey Musselman
188	<p>Keep our public land open and accessible to the public! Keep it open for hunting, fishing, wildlife and birdwatching. Avoid falling prey to private self interests!</p>	Email	Jake Wicken
189	<p>Hello, I am writing to you today to urge you to adopt Alternative #1: No Restoration for the Skagit Farmed Island hunt area. As an advocate for wild fish as well as a waterfowl hunter, I understand our imperiled fish population need all the help they can get. However is it worth ruining some of the best, if not the best public land waterfowl hunting in the entire state to achieve that? After the "restoration" at Milltown, Skagit Headquarters and other tidewater areas had lackluster results are 270 additional acres really going to be the key to restoring our salmon runs in Skagit Bay? The plan to destroy the Island Unit without giving Waterfowl Hunters and more importantly Waterfowl themselves any replacement land is a slap in the face to sportsman in Washington who buy licenses and duck stamps every year with an understanding they will have quality places to hunt, not constantly losing opportunities and thus, the state loses license sales. Again, please consider going through with Alternative #1: No Restoration. Thank you for your time, -Sara Titland</p>	Email	Sara Titland
190	<p>Please don't take anymore hunting lands from us.</p>	Email	Casey Parker
191	<p>Hello, I am writing you today to urge the State to adopt Alternative #1: No Restoration for the Skagit Farmed Island Hunt Unit. I understand the difficulties faced by our salmon and steelhead populations around Puget Sound, but is the flooding of 270 acres of prime waterfowl feed and hunting land really worth the results we "might" see to our fish populations? I think we all know the previous restorations to Milltown, Headquarters and others around the area have had a negligible impact on salmon recovery. The hunting at the Farmed Island is some of the best public land waterfowl hunting on the west coast and it would be awful to lose it, especially since the State is not offering any replacement land to hunt. Not to mention the amount of birds this piece of land feeds every winter cannot be ignored. Any evening of the winter you can see shocking numbers of waterfowl landing on the island just before dark. Is it really worth losing all that just to hope flooding the island will maybe do something for salmon? When so far that has not been the case? I once again urge the state to go forward with Alternative #1: No Restoration for the Skagit Farmed Island Unit. Thank you, -Tom Titland</p>	Email	Tom Titland
192	<p>I love the island unit for duck hunting purposes. This unit offers many options for many hunters to hunt. I would hate to see this unit restoration</p>	Email	Joe Colman

	Comment	Source	Name
	turn into something that would sacrifice hunting. Thanks joe Colman Mount Vernon wa		
193	Please do not make any changes to the Skagit. When I go to Nisqually, it breaks my heart to see what had once been an oasis for wildlife and its now fairly desolate. I haven't seen the research to support that it was any kind of success. Please don't make the same mistake at Skagit. E. Snow PS. I went to OSU in Wildlife Science.	Email	E. Snow
194	Hello, I recommend to not conduct any restoration on the island. There's becoming very limited good waterfowl hunting within the state and this will only limit it more. If restorations take place the planting will stop which creates a bad environment for hunters and duck harvests. Please stop destroying hunting areas like what happened in Stanwood.	Email	Mike Cynkar
195	Dear Sirs, the Skagit Wildlife Area (formally titled the Skagit Game Range) was purchased with the intent of providing "managed" waterfowl habitats as well as natural habitats for the ultimate purpose of facilitating public hunting opportunities for the sportsmen and women (sportsmen) of Washington State. Over the last three decades, it has become more and more difficult for sportsmen to find "productive" public hunting areas. Rich urban dwellers in Washington State have purchased or leased a majority of the waterfowl habitats (farm acreage, etc.) that were formally available to public hunting, making it just that more difficult for the average hunter to find productive hunting areas. Data has proven that the Skagit Wildlife Area Island Unit is the most productive hunting area on the entire Skagit Wildlife Area, and probably the most productive public waterfowl hunting area in Washington State. It is essential that these opportunities are preserved for the average sportsmen, or hunting, like everything else in Washington State will quickly become a "rich man's sport!" With this in mind, the Skagit Wildlife Area Island Unit should be preserved and maintained as managed waterfowl habitat for overwintering waterfowl as well as public hunting. I would strongly recommend Alternative #1 as the "preferred" alternative. Washington Department of Fish and Wildlife should also provide the necessary maintenance funding for the area. This funding will allow the infrastructure on the area to be maintained in order to facilitate the waterfowl enhancement projects that are implemented annually on this site. If the need exists to implement a "compromise" alternative, it should be Alternative #3. Throughout the existence of the Skagit Wildlife Area, millions of state and federal dollars have been spent maintaining this incredible area (the Island Unit) and it would not be "fiscally responsible" to allow this well managed, unique public resource to no longer be maintained for its intended purpose. Sincerely, John Garrett	Email	John Garrett
196	I am totally confused at how flooding the farmed islands is going to help salmon! I am totally against this as the general outdoors man has lost pretty much all fishing as it is but then to lose waterfowl areas is rediculois. If we lose more and more then our state loses out .	Email	Richardr Gardner
197	I have lived within a ¼ mile of the Skagit Wildlife Area Island Unit for 35 years. Farmed Island has been my companion as I walk the Conway and Milltown dikes. Just this past Spring I watched wood ducks roosting in the trees along its shoreline. My family and I have been regular visitors to Farmed Island, paddling our canoe around it, walking along it, and it has become our family late summer ritual to swim to its northernmost sandbars. I have read with great interest WDFW's proposals for an estuary restoration project involving Farmed Island. I am writing to express my full support of Alternative 4, the Full Restoration Alternative for the Skagit Wildlife Area Island Unit. As WDFW acknowledges in its Skagit Wildlife Area Island Unit Draft Alternatives Analysis, "the preservation, protection, perpetuation and management of fish and wildlife and their habitats" is the primary purpose of WDFW lands. For many years the Skagit Wildlife Area Island Unit has been managed by WDFW for "enhanced/managed winter waterfowl forage production". The Draft Alternatives Analysis states that the Island Unit is "small relative to areas that waterfowl use within the Greater Skagit Delta", and that changes in management at the Island Unit are unlikely to result in a decline in the winter waterfowl population on the Greater Skagit Delta. Winter waterfowl on the Greater Skagit Delta are thriving and will continue to thrive even if WDFW ceases to grow food for waterfowl on the Farmed Islands. Historically, the Skagit River has served as an important nursery for all 5 species of Pacific salmon, including the endangered Chinook salmon, but as the human population of Skagit County has increased, the habitat needed for young salmon to grow has decreased significantly. According to a 4/22/19 King News report, "The Skagit River Valley has lost more than 50 percent of its floodplains and Chinook salmon runs are just 10 percent of what they once were." Alternative 4 would restore the Skagit Wildlife Island Unit to estuary, providing much needed habitat for the endangered Chinook as well as other Skagit River fish. It is anticipated that	Email	Anne Winkes

	Comment	Source	Name
	<p>the Chinook population will expand as their habitat expands. In turn, enhancement of Chinook habitat will contribute to the recovery of the Southern Resident Killer Whales for whom Chinook salmon are a major food source. Our family’s enjoyment of Farmed Island will be enhanced too as we watch it return to its natural estuarine state. In sum, I fully support Alternative 4, the Full Restoration Alternative, for the Skagit Wildlife Area Island Unit. Alternative 4 will enhance salmon population at little or no cost to the waterfowl population of the greater Skagit delta. Thank you for your consideration,</p>		
198	<p>To whom it may concern,I am an Eagle Scout from Seattle Wa. who has hunted the Skagit island unit for nearly 20 years. We hunt on average 10 trips to the skagit per year. Every weekend that we make the drive up I-5 we usually see 2 or 3 other duck hunting rigs heading to the same spot. That means that a large number of people take their Seattle paychecks and spend them in Skagit county throughout the season at restaurants, bars, gas stations, and sporting goods stores. The gas stations in Conway will take a big hit. The Island unit is also the most productive hunting unit in the state as far as duck hunting numbers. This historic hunting opportunity is irreplaceable. NO OTHER SPOT IS EQUAL. Washington state duck hunting has become a sport for the wealthy as the only productive hunting comes from private lands or gun clubs, which is why protecting quality public land hunting is so important. My grandfather has photos of his hunting trips in Tukwila where southcenter mall is now. That is an example of how quickly an area can change and how a good opportunity can be lost forever to future generations unless protected by willful hunters. The Skagit is the last remaining good duck hunting area for public land hunters on the west side. Salmon run restoration is important, but it’s unfair to force hunters to bear the burden of solving the salmon problem when the responsibility isn’t evenly distributed. I look to Seattle where the only river running through the city, the Duamish river, has sprawling homeless camps on its shores and piles and piles of trash and feces littered on its banks. In one instance near 1st ave South, they are building a multi-million dollar treatment plant across from a sprawling camp, so we are literally spending millions to clean the river while shitting in it across the bank. This is ok, but hunters need to adapt to changes? Are we living in fantasy land? Our Governor wants to run Joe Bidens EPA and he can’t keep the only river in Seattle clean! This scene plays out at all of our rivers. The state also can’t seem to run a treatment plant that doesn’t overflow into Puget sound two or three times a year (Westpoint) , but somehow the Skagit needs to change? Car tire additives are the suspected source of the dwindling coho salmon size and survivability, but let’s put the burden on duck hunters at the skagit? It couldn’t possibly be the fact that developers have run amuck and sold out Puget Sound with the blessing of our city councils, and at the dismay of local Washingtonians. Lets not put the burden on them though, when they are the ones getting rich and avoiding all the problems of overdevelopment. The lack of leadership here kills me. The feds have allocated money and want to see change, so I feel like a frog on the highway about to get flattened by a steamroller, but please know that a lot of people care about this area and don’t want to see any changes that destroy our beloved island unit. Best Regards, Jon Talmadge</p>	Email	Jon Talmadge
199	<p>To Whom It May Concern – I am in favor Option #1 – NO RESTORATION for the following reasons: 1. The Skagit HMA was purchased with Pittman-Robertson Funds for the specific purpose of waterfowl and wetland habitat in support of migratory waterfowl. 2. The proposed restoration prioritizes one species (fish) over another species (waterfowl), an unauthorized conversion from the original intent; will likely result in a mandated reversion of P-R funds back to the USFWS; and will be a loss to already limited winter waterfowl habitat and destroy one of the premier waterfowl hunting sites in the entire state of Washington. 3. Over the past 20 years the current proposed project represents the fourth (4th) project undertaken by WDFW at the Skagit HMA targeted for fish-driven restoration. The consequences are always the same – no proof that even one more salmon smolt has been produced. 4. In a presentation provided to the Island Unit Advisory Group, even in the best-case scenario this site does not reach the smolt capacity objective, i.e., (35 million more smolts annually, which is predicted to require 2,700 acres of estuary restoration, Estuary Restoration Strategic Assessment (ERSA) 2020-02 quoting the Skagit Chinook Recovery Plan (2005)). 5. Before WDFW destroys more habitat, WDFW needs to go back and monitor the results of prior restoration projects. (An NRC 1992 Study by Frissell and Nawa, examined 161 aquatic habitat enhancement structures on 15 streams in western Oregon and Washington and found over 18% had failed outright, and 60% were damaged or ineffective. Without monitoring, restoration failures go undetected and uncorrected. (at Page 6) 6. Instead it undoes 70 years of successful waterfowl management, in alignment with international guidance, in the blink of an eye. 7. If the fish restoration proponents had proof of any of these past efforts being successful, they would be shouting it from the roof tops. Plain and simple, they are not! 8. Mitigation is not a viable alternative for one simple reason – there is no available private farmland for sale in the general Skagit HMA area. It is for this same reason that no prior allocated funds for mitigation of the Leque Island Fish Restoration Project have ever been spent. Respectfully submitted, John T. Arrabito</p>	Email	John T. Arrabito

Seth Ballhorn
Nearshore Communications Manager
Washington Department of Fish and Wildlife
North Puget Sound Regional Office
16018 Mill Creek Boulevard
Mill Creek, WA 98012-1541

Comments submitted electronically

RE: Skagit Wildlife Area Island Unit Alternatives Analysis

Dear Mr. Ballhorn,

Whale and Dolphin Conservation (WDC) is the leading global charity dedicated to the conservation and protection of whales and dolphins. We are submitting these comments in regard to the Skagit Wildlife Area Island Unit Alternatives Analysis and in support of Alternative Four: Full Restoration. This alternative would restore 268 acres of estuary habitat at the mouth of the Skagit River, which is expected to benefit endangered Chinook salmon and Southern Resident orcas. Specifically, Alternative Four will support sustainable salmon recovery by increasing estuary habitat, with negligible impacts on local wildlife and recreation opportunities, and will help the region be ecologically and economically resilient to impacts from climate change.

The Southern Resident orcas are a distinct population of fish-eating orcas and are highly dependent on Chinook salmon as their primary prey. The community now numbers just 74 individuals, their lowest population abundance in over 40 years.¹ Although the orcas face a multitude of threats, including environmental contamination, physical and acoustic disturbance, and oil spill risk, a lack of available prey is widely recognized as the most significant factor impeding their recovery. Increased mortality and decreased fecundity in the population have been correlated with coastwide indices of Chinook salmon abundance, and a lack of adequate nutrition has led to changes in their social structure, decreased presence in their core summer feeding areas, an increase in stress hormones, and a pregnancy failure rate of 69%.² For their immediate survival and future recovery, the Southern Residents need abundant, diverse, and accessible Chinook salmon throughout their range.

Washington State has made steady progress to address the threats faced by these orcas; however, much more work is needed to restore salmon runs in the Northwest and California, particularly through protection of remaining habitat and restoration of what has been lost. The final report and recommendations from the recent Southern Resident Orca Recovery Task Force is a guide for near-, mid-, and long-term actions to support orca, salmon, and ecosystem recovery. Goal 1 in the report is to increase Chinook abundance, and recommendation 1 is to “significantly increase investment in restoration and acquisition of habitat in areas where Chinook stocks most benefit Southern Resident orcas.”³

According to the Washington Department of Fish and Wildlife, Northern Puget Sound fall salmon stocks (including those in the Skagit River) are the highest priority stocks for the Southern Residents. The Skagit Chinook Recovery Plan identified the loss of estuary habitat as a primary limiting factor for Chinook salmon recovery. The Recovery Plan has a goal of restoring 2,700 acres of estuary habitat to produce an additional 1.35 million smolts. WDFW’s review of the Alternatives finds that Alternative Four, full restoration of the Skagit Wildlife Area Island Unit, would provide enough habitat for 59,377 to 86,035 additional smolts, making this restoration project important to achieving the overarching recovery goal for Skagit River Chinook, as well as increasing Chinook abundance for Southern Resident orcas.

¹ Population data from Center for Whale Research, www.whaleresearch.com.

² Ford, J.K.B, G.M. Ellis, and P.F. Olesiuk. 2005. “Linking prey and population dynamics: Did food limitation cause recent declines of ‘resident’ killer whales (*Orcinus orca*) in British Columbia.” *Fisheries and Oceans*; Ford J.K.B et al. 2010. “Linking killer whale survival and prey abundance: food limitation in the oceans’ apex predator?” *Biology Letters*, 6:139–142; Ward E.J, E.E. Holmes, and K.C. Balcomb. 2009. “Quantifying the effects of prey abundance on killer whale reproduction.” *Journal of Applied Ecology*, 46: 632–640; National Marine Fisheries Service 2008. “Recovery Plan for Southern Resident Killer Whales (*Orcinus orca*).”; Proposed Revision of the Critical Habitat Designation for Southern Resident Killer Whales: Draft Biological Report. National Marine Fisheries Service, September 2019. Available: <https://www.fisheries.noaa.gov/action/critical-habitat-southern-resident-killer-whale>; Wasser S.K. et al. 2017. “Population growth is limited by nutritional impacts on pregnancy success in endangered Southern Resident killer whales (*Orcinus orca*).” *PLoS ONE* 12(6): e0179824, <https://doi.org/10.1371/journal.pone.0179824>

³ Southern Resident Orca Task Force: Final Report and Recommendations, November 2019



Alternative Four is also the most sustainable long-term option for resilience and cost-effectiveness to address climate change impacts. Existing infrastructure in the refuge is threatened by sea level rise and changes in the timing and velocity of runoff. Upgrading or building more infrastructure devices will likely only provide near-term benefits and does not guarantee protection from future climate change impacts.

We urge WDFW to adopt Alternative Four for the Skagit Wildlife Area Island Unit, to help support salmon recovery and provide more prey for Southern Resident orcas. Thank you for the opportunity to comment on this project, and please do not hesitate to reach out for more information.

Sincerely,



Colleen Weiler
Jessica Rekos Fellow for Orca Conservation
Whale and Dolphin Conservation

WHALE AND
DOLPHIN
CONSERVATION





December 14th, 2020

Seth Ballhorn
Nearshore Communications Manager
Washington Department of Fish and Wildlife
North Puget Sound Regional Office
16018 Mill Creek Boulevard
Mill Creek, WA 98012-1541

Comments submitted electronically

RE: Skagit Wildlife Area Island Unit Alternatives Analysis

Dear Mr. Ballhorn,

Thank you for the opportunity to provide public comments on the Skagit Wildlife Area Island Unit Alternatives Analysis. On behalf of the thirteen undersigned member organizations of the Orca Salmon Alliance (OSA) and our supporters, please accept these comments in support of Alternative 4: Full Restoration. Alternative 4 would restore 268 acres of estuary habitat at the mouth of the Skagit River, which is expected to benefit endangered Chinook salmon and Southern Resident orcas. Specifically, Alternative 4 will support sustainable salmon recovery by increasing estuary habitat, with negligible impacts on local wildlife and recreation opportunities, and will help the region be ecologically and economically resilient to impacts from climate change.

OSA is a coalition of local, state, and national organizations that supports projects and policies that prevent the extinction of the endangered Southern Resident orcas and that advance the recovery of Chinook salmon, the Southern Resident orcas' preferred prey. Restoring the Skagit River estuary is an important action that the Washington Department of Fish and Wildlife (WDFW) can take to substantially support salmon and orca recovery efforts.

In 2018, people across the Pacific Northwest and around the world mourned together as the Southern Resident orca mother J35 (Tahlequah) carried her dead calf through the Salish Sea for seventeen days and over 1,000 miles. This tragedy highlighted the plight of these endangered orcas and delivered a clear call to action. Washington State has made steady progress in reducing the threats these orcas face and created a comprehensive roadmap for action in the recommendations from Governor Inslee's Southern Resident Orca Task Force.

As a recent sign of hope for the population, on September 4, 2020, Tahlequah successfully gave birth to a healthy calf. But these orcas remain precariously close to extinction, largely because their primary prey, Chinook salmon, have also collapsed throughout their range.

At this crucial time for the whales' survival, it is essential that we take action to support sustainable salmon recovery, so these orcas have enough food to raise the next generations.

To do this, it is critical to restore salmon populations throughout the orcas' range: from the Fraser River in the Salish Sea to the Central Valley in California. According to WDFW, Northern Puget

Sound fall salmon stocks (including those in the Skagit River) are the highest priority stocks for the Southern Residents.¹ The Skagit Chinook Recovery Plan identified loss of estuary habitat as a primary limiting factor for Chinook salmon recovery.² The Recovery Plan has a goal of restoring 2,700 acres of estuary habitat to produce an additional 1.35 million smolts. According to WDFW, full restoration of the Skagit Wildlife Area Island Unit in Alternative 4 is predicted to provide enough habitat for 59,377 to 86,035 additional smolts, making this restoration project important to achieving the overarching recovery goal for Skagit River Chinook.

Alternative 4 also has negligible impacts on other wildlife and recreation opportunities. For example, although full restoration of the Skagit Wildlife Area Island Unit may reduce waterfowl hunting opportunities locally, at the landscape-scale WDFW does not expect Alternative 4 to negatively impact waterfowl populations as there are ample forage opportunities elsewhere. OSA encourages WDFW to prioritize the recovery of endangered salmon and orcas at the Wildlife Area.

Finally, Alternative 4 is the most sustainable long-term option for resilience and cost effectiveness in the face of climate change. Changes in run-off timing and velocity and sea level rise threaten existing refuge infrastructure (dikes and floodgates). Infrastructure upgrades are only likely to provide near-term benefits, and given the estimated costs, such investments are not an efficient or strategic use of Department resources. Instead, full restoration would create a range of varying land elevations in the estuary, which will support long-term habitat migration as the climate continues to warm and change.

We encourage WDFW to adopt Alternative 4: full restoration of the Skagit River Wildlife Area Island Unit. As the state agency tasked with managing and recovering Washington's wildlife, WDFW plays an essential role to support the long-term recovery of endangered salmon and Southern Resident orcas, Washington's State Marine Mammal. The full restoration of the Skagit River Wildlife Area Island Unit is an important and significant action that the Department can take to achieve these goals.

Sincerely,

Robb Krehbiel
NW Representative
Defenders of Wildlife

Giulia Good Stefani
Senior Attorney, Oceans
Natural Resources Defense Council

Amy Carey
Executive Director
Sound Action

Rein Attemann
Puget Sound Campaign Manager
Washington Environmental Council

Colleen Weiler
Jessica Rekos Fellow
Whale and Dolphin Conservation

Sophia Ressler
Washington Wildlife Advocate/Staff Attorney
The Center for Biological Diversity

¹ NOAA Fisheries West Coast Region and Washington Department of Fish and Wildlife, June 22, 2018. Southern Resident Killer Whale Priority Chinook Stocks Report. Available at: https://archive.fisheries.noaa.gov/wcr/publications/protected_species/marine_mammals/killer_whales/recovery/srkw_priority_chinook_stocks_conceptual_model_report_list_22june2018.pdf

² Skagit River System Cooperative and Washington Department of Fish and Wildlife. 2005. Skagit Chinook Recovery Plan. Available at: <http://skagitcoop.org/wp-content/uploads/Skagit-Chinook-Plan-13.pdf>

Howard Garrett
President
Orca Network

Lovel Pratt
Marine Protection and Policy Director
Friends of the San Juans

Chris Connolly
Pacific Northwest Field Representative
The Endangered Species Coalition

Whitney Neugebauer
Director
Whale Scout

Alyssa Barton
Policy Manager
Puget Soundkeeper Alliance

Susan Anderson
Communications and Education
Wild Orca

Nora Nickum
Ocean Policy Manager
Seattle Aquarium

**Skagit Audubon Society**

P.O. Box 1101

Mount Vernon, WA 98273

December 11, 2020

Washington Department of Fish and Wildlife,
North Puget Sound Regional Office
Attn: Seth Ballhorn
16018 Mill Creek Boulevard
Mill Creek, WA 98012-1541

Re: Skagit Wildlife Area Island Unit

Dear Mr. Ballhorn,

Thank you for the opportunity to comment on the potential estuary project on the Skagit Wildlife Area Island Unit. As a stakeholder advisor over the last year or so I have had the opportunity to study and review information presented in the several meetings of the group. In recent weeks I have also presented that information to interested members of the Skagit Audubon Board. We represent over 370 members living in and around Skagit County.

As stated in WDFW's Draft Alternatives Analysis Report, you are considering a restoration project to respond to changes at the site in the broader landscape. Aging infrastructure, shifting habitat needs and potential sea level rise and the recovery of Puget Sound Chinook are indeed important issues. One of the social issues that was at the forefront of the Advisory Group discussions was the historic use of the "farmed island" for waterfowl hunting. The area was first modified in the late 1800's, when it was diked, and has been used since the 1950's to provide winter forage for waterfowl. Many hunters, young and old, have used the boat-in only site for hunting access and many hold fond memories for this particular area. We, members of Skagit Audubon, appreciate that the site is unique and in losing this area as it is today, the waterfowl hunters may not find replacement access locally. There has also been some concern voiced over the potential shift to private farmlands that may occur as waterfowl lose this food source.

While we appreciate these concerns we of Skagit Audubon feel that we must remain consistent with our mission statement: To conserve and restore natural ecosystems, focusing on birds, other wildlife and their habitats for the benefit of humanity and the earth's biological diversity. We feel that the option for full restoration best meets our mission.

We support Option 4, full restoration, as the best use of the Island Unit, restoring several hundred acres of estuary habitat thereby contributing to the limited number of acres available to meet the needs of critical Chinook

~ to conserve and restore natural ecosystems, focusing on birds, other wildlife, and their habitats for the benefit of humanity and the earth's biological diversity ~

habitat. While we typically focus on birds, the recovery of Chinook is also very important to Skagit Audubon and the larger community. As noted in the materials presented, "Post settlement diking, dredging and filling the delta have severely limited the historic extent of delta habitat." This project represents significant potential to restore 268 acres of estuary habitat to its pre-settlement condition and support the recovery of Chinook. Therefore, we support full restoration.

Thank you for the opportunity to be part of the advisory group. If you need more information regarding our input do not hesitate to ask. One additional note is that I feel that the facilitators from Ross Strategic did a nice job. The meetings were on time and well organized. Also, the staff of WDFW who participated were very good at reaching out to group members and providing information in a timely manner. Overall, the management of the advisory group for this project was well done.

Sincerely,

A handwritten signature in black ink, appearing to read "Jeff Osmundson". The signature is fluid and cursive, with a long horizontal line extending to the right.

Jeff Osmundson, President
president@skagitaudubon.org
Skagit Audubon Society
P.O. Box 1101
Mount Vernon, WA 98273-1101



December 15, 2020

Washington Department of Fish and Wildlife,
North Puget Sound Regional Office
Attn: Seth Ballhorn
16018 Mill Creek Boulevard
Mill Creek, WA 98012-1541

Re: Skagit Wildlife Area Island Unit

Dear Mr. Ballhorn,

I am writing on behalf of the board of Skagit Land Trust, who represent over 1,500 members, to comment on the alternatives which Washington Department of Fish & Wildlife is considering for the Island Unit of Skagit Wildlife Area. For reasons cited in this letter, the Trust supports full restoration of the Island Unit; that is, Alternative 4 of the options presented in the *Skagit Wildlife Area Island Unit Draft Alternatives Analysis*.

Since its founding in 1992, Skagit Land Trust has focused on conserving wildlife habitat, agricultural and forest lands, scenic open space, wetlands, and shorelines for the benefit of our community and as a legacy for future generations. The Trust has protected over 8,500 acres in Skagit County and more than 46 miles of river and marine shoreline. In addition to holding conservation easements on private lands, the Trust manages and restores fish and wildlife habitat on lands the Trust owns in fee.

Many of Skagit Land Trust's restoration efforts are related to the needs of salmon, which makes the potential restoration of the Island Unit's Farmed Island of particular interest to the Trust's members. Restoring public lands supports Skagit Land Trust's mission just as does restoration of our own properties.

It is well known that the Skagit River is key to rebuilding the much diminished population of Puget Sound Chinook. Research by fisheries biologists consistently reports that the single most important factor in recovering the Skagit's Chinook is the availability of sufficient estuarine rearing habitat where smolts gain size and survivability before venturing into marine waters. As described in the *Draft Alternatives Analysis*, estuarine wetlands also support other fish species, some with severely decreased populations. Skagit Land Trust is very conscious of the tremendous loss of this essential habitat and the great importance of restoring it wherever

possible. We are equally aware of how contentious restoration can be as it always affects the interests of multiple parties, some negatively and others positively.

As mentioned on page 21 of the *Alternatives Analysis*, Washington State House Bill 1418 of 2003, (the “Tide gates and Intertidal Salmon Habitat in the Skagit Basin” bill) prioritized restoring estuarine habitat on public lands before seeking to do so on private property. Restoring estuarine habitat in the Island Unit is one more step towards recovering badly needed salmon rearing habitat and doing this on public land. We note, in addition, that restoring the Island Unit was listed as a high priority in various studies of the most important areas for bolstering the Puget Sound Chinook population. Skagit Land Trust supports this goal and, therefore, supports Alternative 4 among the options presented; that is, full restoration of Farmed Island to estuarine habitat.

We listened closely to the comments at WDFW’s December 2nd open house concerning the Island Unit alternatives and were not surprised to hear how important Farmed Island is to the waterfowl hunters who spoke. Many described long years of connection to this special place where so many thousands of ducks come to feed on foods planted for them. Clearly, there are connections of family activity to this place and shared experience going back, in some cases, generations. At the same time, conditions have not remained the same. Changing river flows related to climate change have damaged and will continue to damage Farmed Island’s infrastructure. Sea level rise will also affect the present situation. And the fact remains that without regaining more estuarine rearing habitat, Puget Sound Chinook will likely not survive. Their demise will have severely detrimental effects on the few remaining Southern Resident Killer Whales and on the ecosystem of the Skagit River and its shores where many species of animals and plants depend on returning salmon. The cultural and economic importance of recovering Chinook and other fish populations and the ethical imperative of preventing human-caused extinction add to the urgency of restoring the habitat these fish need. Waterfowl populations are healthy and have habitat options; Puget Sound Chinook are in jeopardy and do not have other places to go.

We appreciate that WDFW has a difficult decision to make, one which will inevitably please some people and anger others. We believe that restoring the essential habitat that Chinook need, and that will benefit many other species as well, is what needs to be done. Skagit Land Trust urges you to select and implement Alternative 4; i.e., full restoration to estuarine wetland.

Thank you for the opportunity to comment and thank you to the staff, consultants, and advisory group members who have brought such expertise and care to this project.

Sincerely,

/s/ *Jim Glackin*

Jim Glackin
President, Skagit Land Trust



Council of Members

- American Rivers
- Aspect Consulting, LLC
- Children's Museum of Skagit County
- City of Anacortes
- City of Burlington
- City of Mount Vernon
- City of Sedro-Woolley
- Fidalgo Fly Fishers
- Forterra
- Geo Engineers, Inc.
- Long Live the Kings
- Mount Baker-Snoqualmie National Forest
- Natural Systems Design
- North Cascades Institute
- North Cascades National Park
- Padilla Bay National Estuarine Research Reserve
- Port of Skagit
- Public Utility District #1 of Skagit County
- Puget Sound Energy
- Puget Sound Partnership
- RE Sources for Sustainable Communities
- Salish Alliance
- Samish Indian Nation
- Seattle City Light
- Skagit Audubon Society
- Skagit Conservation District
- Skagit County
- Skagit Fisheries Enhancement Group
- Skagit Land Trust
- Skagit River Bald Eagle Awareness Team
- Skagit River System Cooperative
- Tetra Tech
- The Nature Conservancy
- Town of Hamilton
- Town of La Conner
- Trout Unlimited – Wild Steelheaders United
- Upper Skagit Indian Tribe
- Washington Department of Fish and Wildlife
- WA State Dept. of Ecology
- Washington Water Trust
- Western WA Agricultural Association
- Wildcat Steelhead Club
- Wild Steelhead Coalition
- WSU Skagit County Extension

December 16, 2020

WDFW, North Puget Sound Regional Office, Attn Seth Ballhorn
16018 Mill Creek Boulevard
Mill Creek, WA 98012
submitted via email to skagitwla@dfw.wa.gov

Dear Mr. Ballhorn:

Thank you for the opportunity to comment on WDFW's alternatives analysis for the Island Unit in the Skagit Wildlife Area Unit. I was privileged to be a member of your Advisory Group over the last year, and after conferring with Skagit Watershed Council's Board of Directors, believe we had a robust discussion with enough information presented to make educated decisions about the path forward at the Island Unit.

The Skagit Watershed Council advocates for full restoration of the Island Unit, plus a robust waterfowl habitat and waterfowl hunting enhancement plan in the Deepwater Slough, Milltown Island, and Wiley Slough areas, including planting native vegetation to improve habitat for a broad range of bird, mammal, and fish species.

Full restoration, alternative 4, not only maximizes salmon habitat and salmon productivity, but also optimizes climate resilience and cost efficiency. This alternative clearly exceeds the other alternatives in these and many other factors analyzed. The imminent threat to salmon and orca whale viability, the importance of estuary restoration in particular to their recovery, and the lack of restoration alternatives elsewhere in this critical area of Puget Sound, cements our resolve.

Having participated in the Advisory Group, we are keenly aware of the importance of this unique area to waterfowl hunting. While managed forage for hunting and salmon rearing habitat are mutually exclusive, waterfowl habitat and more passive hunting do not preclude salmon habitat restoration generally. We believe that a focused effort should be made to preserve and enhance aquatic habitat and hunting blinds throughout the restoration areas of Deepwater and Milltown Islands. We also support a concurrent planning effort to expand the land base for both fish habitat and managed forage hunting access in adjacent areas to Wiley Slough headquarters.

Skagit Chinook salmon simply will not recover without Skagit Estuary restoration. SWC is confident that estuary restoration is working for this purpose, as has been studied and reported on by many programs, including a joint effort with the Northwest Fisheries Science

Center at NOAA called the Intensively Monitored Watersheds Program. Each estuary restoration site that has been monitored shows juveniles are staying longer in less crowded rearing areas and delaying their departure to the Salish Sea. New information points to increasing adult returns due to estuary restoration, providing hope that we can overcome other pressures that are worsening (such as ocean conditions) with this practice.

The Skagit Chinook Salmon Recovery Plan (SRSC and WDFW, 2005) was written more than 15 years ago. Substantive progress has been made since then, but estuary habitat restoration, the cornerstone of our Plan, has slowed considerably. No further progress in the estuary can be made without WDFW lands, or some change in the agricultural community's support of farmland conversion, which does not seem imminent.

We look forward to supporting the remainder of your planning and design process and advocating for funding for implementation of Alternative 4.

Sincerely,

A handwritten signature in blue ink that reads "Richard Brocksmith". The signature is written in a cursive, flowing style.

Richard Brocksmith

Executive Director, on behalf of the Board of Directors

WDFW Island Unit Comments:

As someone very familiar with the Wiley Slough and Fir Island areas, I am opposed to more expensive and unnecessary flooding of the acreage proposed. Principally, these actions are not long term solutions to providing salmon habitat. In addition, there is a continued focus on salmon at the expense of hundreds of other species. I feel this is entirely for economic reasons which should NOT be an excuse to destroy other species. After the dikes were removed at Wiley, HUNDREDS of trees died. These trees were an important resource for migratory birds (no economics there) who's populations are, and continue to be at risk. Immediately the slough has filled with sediment and cattails, creating shallow water, and the water temperature, completely exposed without the tree covering, cannot be beneficial to salmon fry.

As a longtime guardian of our wild places, this looked like bad science and millions of wasted dollars. In a few years this will be filled with sediment, cattails, and logs and no place for salmon fry, or anything else. It seemed that someone wrote lots of lovely "studies" funded by the tribes and the state, that this would somehow "improve" salmon stock, so they could be fished out for profit. It really felt like that old philosophy "we had to destroy the village in order to save it". As a taxpayer I was shocked and really angry at the process and theory behind these projects, and the lack of real long term planning.

Meanwhile, the swans, dabbling ducks, geese, short eared owls, harriers and all other bird species come at the bottom of the list of "wildlife" that you are supposed to be serving. Only salmon seem to matter, yet salmon are still declining, the whales that eat them are starving, and none of the real issues are being addressed.

What would work better? SMALLER areas of both public and private land along streams and even dikes (flatten their height near the sound) that would provide the shelter and water for salmon, as well as some other species (maybe plant some trees? That would be shocking to me! The trees planted at Wiley seem to have a very large mortality rate). Maybe a system like the CREP Riparian buffers, only in this case to create wetland. Walking along the dikes in Stanwood along Port Susan and Skagit Bay are acres and acres of land that seem to be used for little more than occasional hay and fodder, and many are barren. These look to be in a perfect situation for creating salmon habitat, particularly Douglas Slough area.

For all the brainpower that seems to have gone into these projects, there seems to be very little creativity. What happened to all the whole ecosystem theories I studied in college? Where are your control areas? Why are you only targeting single species restoration? How are these sites being monitored? How sustainable, long term, are these "restored" ecosystems?

This process, and specifically this project, need to be abandoned and reconsidered with a whole ecology, multispecies approach, or good money will be thrown after bad ideas..

Sincerely,

Sandra Lepper

Conway, WA

To Whom It May Concern,

As a 6th generation Anacortes resident and lifelong duck hunter and a product of many waterfowlers above me, I am a fan a proposal Number One; No Restoration. There are many reasons for this opinion and I will touch on them in this letter in hopes of conveying the importance of this unit.

The first reason I am a fan of No Restoration is that this unit is THE number one producer of waterfowl and one of the premier areas to hunt in the Skagit Valley. On any given day, not only will you find an abundance of birds, however you will also find an abundance of hunters. I have been hunting this area since I was 10 years old and the amount of waterfowlers who frequent the area have increased 10x in the last 10 years. It has become a tried and true place for many, many duck hunters and for many, is a lifestyle and a way of living. A walk in the hours leading to shooting light will result in thousands of birds foraging and stocking up fat reserves on their migration south. A loss of this food source would alter the Skagit Valley flyway and reduce birds holding the Fir Island area, simply put. Not too many places can provide food for this many birds.

The second reason I am a fan of No Restoration is that the numbers are not there. As everybody in the local waterfowl community knows, there have been islands already blown out and removed to "Restore" estuary units. This is the same for the majority of the HeadQuarters unit. Since the decimation of these areas, there has been no significant return of salmon of any majority. If the removal of the island is so essential for salmon recovery, then there must be science to back it. There are many of us, myself included, who are avid salmon fisherman and would absolutely love to see bountiful returns of fish. However, the numbers are NOT there to back it up and the consequences on the waterfowl of the region would be MUCH greater than the improvements of salmon runs.

The third reason for my position is simply local history and sporting opportunities. Since the decimation of the islands and HQ, a promise to restore hunting area has not been met. The original plans when the destruction of the previous islands occurred was to return to the local hunters, hunting grounds suitable for waterfowl. This has not been met and replacing the quality of the hunting offered on this unit is not possible. It is truly an amazing spectacle and amazing piece of property to hunt. There are MANY of us in this community who would be happy to donate funds and assist in making the island operate as intended.

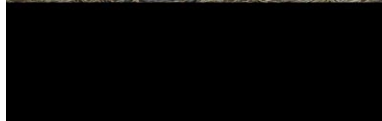
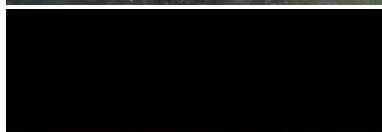
There is truly NOTHING like it. Ask anybody, on any given day about it. The love and passion for the Island Unit runs deeper than any other hunting area in the valley. Thank you for taking the time to read my input. I truly hope the decision to keep Skagit County one of the premier waterfowling areas in the nation prevails and many generations to come can experience the many joys of the sport.

Best regards,

Jay Kiesser

[REDACTED]

[REDACTED]



I am in support of option 1 – No Restoration.

The Island Unit was initially purchased using Pittman Robertson funds. The island was established for Waterfowl conservation and hunting opportunities. The WDFW has done a spectacular job of maintaining this resource and through the employees that support the SWA have followed through in meeting the mission and objectives of the department.

The primary justification for the purchase of lands comprising the SWA has been the fact that the Skagit Delta is one of the major waterfowl wintering areas in the Pacific Flyway. It was recognized that the area provided unique wildlife habitats and that its purchase would assure its preservation as well as make it available as a multiple use recreation area for the citizens of Washington State. The primary purpose was to provide Waterfowl foraging food, hunter and recreation opportunities. It was the intention of the Department of Game to continue acquiring land in this area until a maximum amount of this unique habitat was preserved in state ownership.

A majority of the acquisitions on the SWA have been by fee purchase contracts using game funds which were 75 percent reimbursable by Pittman Robertson funds or by land exchange agreements.

Deepwater Slough Restoration Project (Alternative #9) was approved in 1996 retaining 165 acres of existing fields in grain production and reinforcing/building new dikes for protection of these fields.

This alternative opened a diked slough (Deepwater Slough) between the west and east island units that would provide passage for adult Salmon with an additional 250+ acres of channel and intertidal marsh created for juvenile salmon.

This alternative combined with the tens of thousands of existing acres of estuary in the Skagit delta should be sufficient enough to provide for salmon estuary acreage.

The alternative was agreed to by the state of Washington and public/private stakeholders through an advisory committee.

The WDFW has once again reneged on previous agreements through the initiation of the latest advisory committee and analysis.

The Farmed Island represents a unique ecological landscape not found in any other area in Washington State. It provides habitat for Waterfowl, Raptors, Songbirds, Mammals, amphibians and invertebrates.

Losing habitat with this level of diversity for the unproven potential of generating additional Salmon is a step in the wrong direction. The Sportsman in this state have funded this unit for years and should be allowed to continue to do so.

Island unit restoration is a violation of the original intent of the use of P.R. Funds 50 CFR Subpart J - Real Property

- [§ 80.134 How must an agency use real property?](#)

(a) If a grant funds acquisition of an interest in a parcel of land or water, the [State fish and wildlife agency](#) must [use](#) it for the purpose authorized in the grant.

- [§ 80.135 What if an agency allows a use of real property that interferes with its authorized purpose?](#)

(a) When a [State fish and wildlife agency](#) allows a [use](#) of [real property](#) that interferes with its authorized purpose under a grant, the [agency](#) must fully restore the [real property](#) to its authorized purpose

- No WDFW policies or goals support Waterfowl conservation.
- No recent studies were completed that assesses the impact to waterfowl at this site or the greater Skagit delta area.
- No impact analysis has been completed for Waterfowl Habitat loss in Washington State.
- Pacific Flyway waterfowl numbers continue to drop, but NO studies exist to determine solutions and NO conservation efforts have been established.
- We should be looking at better methods of improving the existing island unit for waterfowl and other wildlife as a conservation measure. Not trading one species wellbeing for another.
- No replacement lands will be purchased by WDFW to mitigate the loss of the Farmed Island and other Waterfowl habitat areas re-purposed to fish recovery.
- No additional land will be farmed by WDFW as mitigation to the loss of this Waterfowl foraging land.
- Replacement land funding and purchasing should be a requirement prior to repurposing state lands established for conservation.
- There is no organization or committee within WDFW that is tasked with finding replacement land.

- Adding hunting opportunities through the Private Lands Program is beneficial however, it should not be used as a means for mitigation of the loss of the Island unit.
- There is no research at a six sigma level that supports the benefits to Salmon recovery through land breach re-purpose actions?
- A No net loss of hunting lands initiative must be initiated in Washington.
- Invasive Cattails will replace other plant species after saltwater inundation. This area will require long term maintenance at a considerable cost to the public.
- Alternatives analysis options 2, 3 and 4 do not support the mission and objectives of the North American Waterfowl Management Plan.

Rick Billieu

Washington Waterfowl Association

December 15, 2020

Washington Department of Fish & Wildlife
North Puget Sound Regional Office
Attn: Seth Ballhorn
16018 Mill Creek Boulevard
Mill Creek, WA 98102-1541

Subject: Island Unit Draft Alternatives Analysis

Dear WDFW:

I am reaching out in response to the public comment for the Island Unit Draft Alternatives Analysis. Prior to my comments, I want to recognize the hard work that went into this analysis. It is clear that agency staff dedicated a significant amount of time and resources into this analysis, which included managing an advisory committee on a complex issue. That work should be recognized and appreciated by the agency and the public. Thank you for your efforts.

I am in support of Alternative 1 – No Restoration to protect one of the most unique examples of waterfowl management and waterfowl hunting opportunities on public land in western Washington.

The Island Unit, called “Farmed Island” by the waterfowl community, offers numerous public blinds, provides safe hunting access and opportunity, reduces competition on public/private lands, and is one of the best examples of enhanced waterfowl forage. The loss of this site to partial or full restoration will negatively impact the viability of waterfowl hunting in one of the most cherished regions by waterfowlers – the Skagit Valley. The true uniqueness of this site warrants further consideration than was provided in the Alternative Analysis criteria.

As a member of the WDFW Waterfowl Advisory Group (WAG), it is my duty to act as a liaison between WDFW and the waterfowl community by providing input on migratory game bird concerns, waterfowl seasons and regulations, public access, and the use of state migratory bird stamp revenues. I am also a conservationist, trained wildlife biologist, fisherman, and a new waterfowl hunter. It is with this background that I provide my comments and concerns regarding the proposed restoration alternatives of the Island Unit Draft Alternatives Analysis.

As a Washington resident, I recognize the challenges salmonid species face and the importance they have for Washington. Habitat loss, overfishing, oceanic conditions, climate change, and habitat degradation are some of the primary threats facing the survival of our endangered salmonid species. Salmon provide a recreational, economic, cultural, and spiritual connections to the livelihoods of Washingtonians. Restoring these species should be a priority. Nevertheless, I do not believe that restoration efforts should conflict so strongly with one of WDFW’s primary stakeholder groups nor should it seek to remove the decades of contributions that the Island Unit has provided for migratory bird species, waterfowl hunters, and recreationists.

As a conservationist, I recognize the need for collaborative governance when addressing the modern threats and challenges of wildlife management. Multi-benefit approaches must be taken to find compatible solutions for addressing conservation goals with limited public resources. The waterfowl community must be a part of salmon restoration, while at the same time, the salmon conservation community must play their part to protect access, opportunity, and longevity for the hunting

community. To-date, I do not believe WDFW has done their part to unify these two stakeholder groups. Salmon concerns have dominated agency priorities while waterfowl community interests have struggled to maintain even a marginal piece of the agency's budget.

As a member of the WDFW Waterfowl Advisory Group (WAG), it is my due diligence to provide WDFW with my reflections on the proposed restoration alternatives of the Island Unit Alternatives Analysis. The WAG has provided a separate letter listing their concerns and options forward, which I support. My comments are additive and come from concerned members of the waterfowl community:

- Given the mission of the WAG, a representative should have been selected as an ex officio member of the advisory committee. WAG members provide a wealth of waterfowl knowledge and are key liaisons in the waterfowl community. Further conversations regarding the Island Unit must include representatives from the WAG.
- State and federal funding is limited for enhancing waterfowl forage, acquiring public land for waterfowl hunting, increasing opportunity through the private lands access program, and restoring waterfowl habitat. Given the lack of funding and opportunity to enhance hunting opportunity, protecting such a unique site should be an agency priority.
- State and federal funding is readily available for salmon restoration projects. Significant restoration work is occurring throughout the Puget Sound, Skagit Watershed, and nearby estuaries. There are other opportunities to restore habitat in the Skagit and nearshore habitat that will not have such a drastic impact on waterfowl forage and public hunting access. The very fact that WDFW received funding to conduct an Alternative Analysis demonstrates the enormous amount of funding available state-wide for salmon restoration.
- The statement that the agency is comfortable transitioning a Pittman-Robertson (PR) funded acquisition and managed site to a salmon restoration project is concerning. Hunting based dollars have supported the restoration and protection of waterfowl for decades. Alternatives 2-4 undue the historical contributions and legacies of generations of hunters and strains the utility of using future dollars for waterfowl protection. The PR program legacy is driven its ability to acquire land at a price/scale that is no longer feasible under current funding levels, development pressures, and price of land. Protecting PR funded projects needs to be an agency priority.
- If the lack of funding available to fund Alternative 1 is a key issue, the WAG has provided options to address this in their statement letter. The waterfowl community would like to see more effort from WDFW towards filling this funding gap. While the 21-23 legislative session is limited as a result of COVID-19, a legislative request is an excellent opportunity to fill this funding gap. The agency has the authority and political will to make this funding happen.
- The Alternative Analysis criteria are biased towards salmonids. Over three quarters of the agency's budget is directed towards fisheries work. Agency policies will always be centered on fisheries, which confounds the Alternative Analysis criteria. As a result, the criteria used overshadows the importance of other agency Priority Habitats and Species, which have state and federal obligations and recovery plans.
- The Alternative Analysis was written as if the decision was already made. Limited space in the report was afforded to discussing the well-known uniqueness of this site, the impacts to waterfowl forage, and the reality of hunting access in Skagit. While in contrast, impacts to salmonids are referenced in nearly every section of the report.
- Research by the Skagit River System Cooperative has indicated that salmonid species use a variety of nearshore habitats and estuaries, outside of their native river systems, during their life history stages. This demonstrates that restoration efforts in other watersheds and

nearshore habitats has the potential to support Skagit River salmonid species and by virtue Southern Resident Orca Whales.

- Inclusion of Southern Resident Orca Whale, at a minimum, has the appearance of pre-determined intent. There are a number of opportunities listed in the Governors Orca Task Force recommendations to protect orcas, including increasing hatchery production which the agency was afforded significant funding for in the 19-21 biennium. Surprisingly, the agency submitted this funding source as part of the governors requested 15% budget cuts.
- The statement that the timeline driving this Alternative Analysis report is related to contractual obligations associated with a Salmon Recovery Funding Board grant is concerning. This decision has significant impacts to a primary stakeholder of WDFW and should not be rushed.
- Proposed alternatives 2-4 do not provide adequate mitigation measures. WDFW has been unsuccessful mitigating other restoration activities (Leque island) in the Skagit, another loss to waterfowl hunting opportunity and a nearby salmon restoration project. If proposed alternatives 2-4 are selected, mitigation is necessary. However, it is doubtful WDFW will be successful in finding private property in the Skagit or public land parcels in WDFW's inventory to replace the enormous number of public hunting binds, waterfowl forage habitat, and the 1,500 hunter days afield the Island Unit provides.
- Agricultural production is shifting in the Skagit Valley, limiting future hunting opportunity. Instead of corn, grain, and potatoes, agricultural production is shifting towards cruciferous plants, berries, and wine. These food products offer no "waste forage" for waterfowl, further limiting the availability of migratory forage. Additionally, this transition limits the quality of hunting opportunities in the private lands access program.
- WDFW is facing a shortage of funding from license sales. By removing key public waterfowl access sites, the agency will be further limiting hunting opportunities for waterfowlers. As a new waterfowl hunter, I've learned that hunting access is extremely competitive. Finding an open private access site is challenging, hunting public land is often crowded and unsafe, and the public lands access program reservation system is so broken that it does not afford equitable opportunity, which creates challenges for WDFW to recruit and retain new waterfowl hunters. The Island Unit provides a unique setting: numerous safe public hunting blinds, easy access with a kayak which is an affordable and low entry purchase compared to a boat, and opportunities for new hunters to find open hunting sites.
- WDFW has already achieved partial estuary restoration on the site, adding quality habitat for salmonid species. Protecting the remaining property for waterfowl access should be an agency priority. Salmon restoration projects are occurring state-wide, while waterfowl habitat restoration and hunting access is nearly stagnant. Wins for salmonids can be achieved in areas with less conflict with a primary stakeholder group of WDFW.

In closing, I recommend the agency pursue Alternative 1 – No Restoration. This is too important of a decision to rush and not have a strategic plan that addresses the impacts to waterfowl winter forage and waterfowl hunters. The Island Unit represents one of the most unique examples of waterfowl management and waterfowl hunting opportunities on public land in western Washington. Alternatives 2-4 would represent the fourth project undertaken by WDFW targeted for fish restoration with similar consequences for waterfowl food and hunting opportunity. To-date, no actionable results have provided equivalent function for either ducks or the waterfowling community. This highlights a systematic problem by WDFW leadership. The agency must find solutions that do not compromise agency stakeholder groups.

A proper assessment, in accordance with steps outlined in the multi-agency, statewide Wetland Mitigation Plan, should be completed and the Pacific Birds Habitat Joint Venture should be an active participant in providing guidance consistent with the North American Waterfowl Management Plan. Finally, any further actions should involve a representative of the WAG, to ensure the waterfowl community is properly informed and engaged in the discussion and decision.

Thank you for your time and considerations.

Sean Williams

Moont Vernon WA 98273
November 28, 2020

Dear Mr. Ballhorn,

A few thoughts on the potential restoration of the Skagit Wildlife Area Island Unit.

All but ten years of my life (83 yrs) have been spent farming adjacent to the Skagit Wildlife Area and many years of doing crop share agreements with WDFW on land that is now gone as a result of the Headquarters restoration project which was projected to cost 4.5 million dollars but has now exceeded three times that and still hasn't been completed. My idea would be to finish a project before starting new ones. Maybe do a project on Milltown Island or one in the North Fork of the Skagit River.

I'm totally opposed to a full restoration of the Island Unit because hunting opportunities for the common man are getting fewer and fewer because of hunting clubs and guide services tying up private land that you may have been granted permission to hunt on in years past. The Island is probably the best hunting area for the public on the West Coast. It would be a taking that could never be replaced.

Concerning ^{lagging} tide gates, I know for sure there are gates available that could be installed that would allow for fish passage. It could all be completed during one good low tide.

There are those who say you can still hunt after a restoration is completed and that is true but I can tell you from experience that ducks are not attracted

to cattails and success in that type of environment is very marginal at best. I was very involved back in the late 1990's in the Deepwater Slough restoration for which I was a strong proponent. I recall there was a signed agreement between WDFW and the Army Corps of Engineers and some other entities as well that the remainder of the Island would be maintained, including tide gates, for the foreseeable future. WDFW should honor and stand by that agreement.

Sincerely,
Dallas R. Wylie
Dallas R. Wylie

DEAR WASH. FISH & WILDLIFE,

I

I AM A LIFETIME WASHINGTON RESIDENT WHO HAS ENJOYED OUR STATES BEAUTIFUL RIVERS, LAKES AND MOST OF THE BODIES OF SALTWATER AS A BOATER, FISHERMAN, SCUBA DIVER, WATERFOWL WATCHER & HUNTER. I HAVE HUNTED ON "FARMED ISLAND" SINCE THE 1970S AS WELL AS THE OTHER GAME DEPT. LAND ADJ. TO CONWAY HEADQUARTERS. I APPRECIATE THE BEAUTY OF FARMED IS. AND I VERY WELL REMEMBER HOW HEALTHY AND BEAUTIFUL THE OTHER CONWAY HUNTING AREA USED TO BE PRIOR TO THAT "RESTORATION". FARMED ISLAND IS STILL A PLACE WHERE THE COMMON MAN WHO CAN'T AFFORD AN EXPENSIVE HUNT CLUB OR TO OWN A LARGE NATURAL PROPERTY CAN STILL VISIT AND ENJOY ITS NATURAL BEAUTY YEAR ROUND, NOT JUST THE HUNTING SEASON. OVER THE YEARS I HAVE WITNESSED THE DECLINE OF THE CHINOOK SALMON AND THE ORCA PODS AND I KNOW THE CAUSE AND EFFECTS AND SOLUTIONS ARE COMPLEX. SOME MISTAKES HAVE BEEN MADE, AND SOME IMPROVEMENTS TO OUR FISH & WILDLIFE NUMBERS ARE APPARENT. AS AN AVID SCUBA DIVER I WATCHED BIG CHANGES TO OUR ROCKY, STEEP SHORLINES ON WESTERN SHORES OF LOPEZ IS & SAN JUAN ISLAND DUE TO CHANGES IN LAWS & ENFORCEMENT OF THE COMMERCIAL SEA URCHIN FISHERIES WHERE OUR STATE ALLOWED COMMERCIAL DIVING FROM CALIFORNIA, ALASKA TO REMOVE ALL SIZES OF URCHINS WHICH ELIMINATED THEM FOR A NUMBER OF YEARS. THIS CAUSED INVASIVE ALWAYS IN BLOOM TYPE OF SEAWEED, IT ALSO COVERED THE ROCKS SO THE MORE NATURAL BULL KELP NO LONGER THRIVED. THE DIVERS ALSO WIPE OUT THE ABALONE POPULATION WHICH USED TO FEED ON THE UNWANTED BLOOMING, OXYGEN CONSUMING SEAWEED. ALL OF A SUDDEN THERE WAS A LOT LESS HERRING AND CANDY FISH AND ALWAYS MURKY WATER. NO BAIT NO CHINOOK SALMON & LESS ORCA WHALES CRUISING THESE SHORLINES. THIS IS A LONG EXAMPLE OF MISTAKES MADE, I THINK ANOTHER EXAMPLE OF YOUR PROPOSED RESTORATION ON FARMED ISLAND WILL BE MUCH OF THE WATER WILL BE CHECKED OUT BY THOSE PERVERSIVE THICK SMALL CATTAILS WHICH NOW GROW IN YOUR PREVIOUSLY "RESTORED" CONWAY GAME DEPT. LAND. THE SMOLT

HAVE ANY CHINOOK SALMON SMOLT BEEN SEEN?
 IN THE "ALREADY RESTORED" LAND ADJ TO THE CONWAY HEADQUARTERS BEEN SEEN SINCE THEY BREACHED THE DIKES AND THE SALTWATER KILLED MOST ALL NATURE & TREES AND VEGETATION. I WALK OUT THERE YEAR ROUND AND I HAVE NOT OBSERVED ANY CHINOOK SALMON SMOLT AMONGST THE INVASIVE CATTAILS AND DEAD TREES.

I HAVE ASKED SOME OF YOUR FELLOW GAME DEPT EMPLOYEES WHO WORK THE CONWAY LAND, AND THEY HAVE TOLD ME THAT THEY HAVE NOT OBSERVED ANY CHINOOK SALMON SMOLT IN THE WATERS OF THE PREVIOUSLY RESTORED CONWAY HEADQUARTER LAND. I WOULD THINK IF THE SMOLT WERE PRESENT YOU WOULD SEE MORE OF THE BIRDS WHO LIKE TO FEED ON THEM.

PLEASE DO THE RIGHT THING, DO NOT RESTORE ANY PART OF FARM ISLAND KEEP IT GREEN AND BEAUTIFUL. LET IT HELP SUPPORT & FEED THE MIGRATING WATERFOWL. LET THE NATURE LOVERS, BIRD WATCHERS, AND DUCK HUNTERS CONTINUE TO ENJOY THIS ISLAND WE HAVE ALL HELPED TO PAY FOR THE GOOD WORK THAT HAS BEEN DONE ON THE ISLAND. WE BUY HUNTING LIC., DUCK STAMPS, FISHING LICENCES, DISCOVERY PASSES, BOAT TABS (ECT.). HOW MUCH WAS SPENT ON THE NICE BRIDGE OUT THERE? AND THE OTHER IMPROVEMENTS. WITH ALL OF THIS SAID, PLEASE DO NOT WASTE OUR STATES TIME & RESOURCES TO CREATE YOUR PROPOSED "RESTORATION" OF FARMED ISLAND.

PLEASE DECIDE ON ALTERNATIVE 1
NO RESTORATION OF FARMED ISLAND

Thank you, for READING my COMMENTS

Paul Behnke



Paul Behnke

Arlington, WA 98223

WASHINGTON WATERFOWL ASSOCIATION
PO Box 40182
Bellevue, WA 98015



Corporate, Washington Waterfowl Assoc.

December 6, 2020

Washington Department of Fish and Wildlife
North Puget Sound Regional Office
Attn: Seth Ballhorn
16018 Mill Creek Boulevard
Mill Creek, WA 98012-1541

Dear Mr. Ballhorn:

Thank you for requesting public comments on the SKAGIT WILDLIFE AREA ISLAND UNIT DRAFT ALTERNATIVES ANALYSIS (SWAIUDAA). This technical memo is written to express **issues and concerns** on the alternative analysis.

Background Information

1. Self-full Filling Prophecy (SFP). Proponents have preconceived vision of the project and this influences the results of the analysis. Consequently, they intentionally or unintentionally select data and analyses that support their initial vision and ignore those that do not. In some instances, they fabricate their own data or analyses to implement the project. "Here is a wonderful quote by Henry Ford (1863-1846) that applies to self-fulfilling prophecies: "*Whether you think you can or you think you can't, you're right*"."

2. Reinventing Nature and Natural Process (RNNP). RNNP is **mythical**. Development activities such as logging, construction, transportation, development, and many others have impacted earth. Global warming is good example. Nature and natural processes are dynamic and constantly evolving.

3. Scientific Method (SM). Empirical method of acquiring **knowledge** and involves the following:

- a. **Observation.** Gather data and information.
- b. **Skepticism.** Challenging and evaluating the data and information collected.
- c. **Cognitive Assumptions.** Must guard against assumptions that distort interpretation of the gathered data and information.
- d. **Hypotheses.** Formulation of plan(s) or objective.
- e. **Experimental.** Measurement, testing and engineering.
- f. **Conclusion.** Objective and plan(s).

4. Trading Waterfowl Habitat for Salmon Habitat (TWHS). Implementation of salmon restoration will change the water levels at the site. During the fall and early winter, the water levels at the site will be low providing little water surface on the site for feeding waterfowl. During spring, water levels will be high and there will be more water surface for feeding waterfowl, but most the water will be too deep and the waterfowl will not be able to reach the food.

5. Thinking Outside the Box (TOB). The key here is not to put yourself in a box to begin with.

Issues and Concerns

1. Using Rising Ocean Levels. Using rising ocean levels from global warming for project justification is not appropriate. This is a **SFP**. It also does not conform to **SM (assumption that distorts interpretation of the gathered data and information)**. Rising ocean levels are not a valid design criteria for this project. These levels are predictions and not confirmed levels. There are opportunities to reverse Global Warming and actions are currently under way worldwide. Standing together we can stop or turnaround global warm. Using rising sea level for this project adds to the **negativity associated with division in our country on global warming**.

Reversing global warming will help many species including salmon, polar bears, orcas, and humans. Oceans are not a favorable environment for salmon and may be the main reason for depleted salmon runs. Reducing global warming will also reserve the rising temperatures in rivers and tributaries and land worldwide.

2. Effectiveness of Shallow Water Habitat. **BPA** and **USACE** have completed 60 projects for salmon habitat restoration consisting of 7,000 acres since 2007 on the lower Columbia River, **yet returning salmon runs have continued to decline**. The return data on the return runs is well documented. The 7,000 acres of restoration has not been

qualified nor **quantified** with monitoring (**scientific method**) hence the projects cannot be considered a success. Monitoring is an essential part of the scientific method. The end-product of implementing shallow water habitat is increasing return runs. There appears to be other factor(s) reducing the runs. Admittedly, the projects are on different rivers, but current evidence indicates that the shallow water habitat is not as effective as many maintain. The project proponents are using data from outside the project area to justify the Farm Island Unit Project. Ignoring Columbia River restoration data is a **SFP** and a nonconformance of the **SM (Cognitive Assumptions)**. Must guard against assumptions that distort interpretation of the gathered data and information). It is also not **TOB**.

On the **Greater Skagit Delta**, **WDFW** has implemented several shallow water habitat projects. In 2000 **Deepwater Slough Project** was completed and approximately 200 acres were restored to estuary. In 2010 **Wiley Slough Estuary Restoration Project** of 156 ac was completed. In 2015 **Fir Island Ecosystem Restoration Project** of 126 ac was completed. In 2019 **Leque Island Restoration Project** of 250 ac was completed. There are surely other shallow water habitat projects around the Puget Sound. As with the Columbia River, the Puget Sound salmon runs have continued to drop even with extensive restoration projects. Ignoring that restoration projects have not improved salmon runs is not appropriate and is a **SFP**, a nonconformance to the **SM (Cognitive Assumptions)**, and is also not **TOB**.

The **Fir Island Ecosystem Restoration Project** has other major short comings. Shortly after the restoration project was complete the main plant species occupying the site was **evasive brass button and cattails**. Neither of these are friendly habitat for salmon nor waterfowl. Project proponents were predicting and hoping for bulrush. Then WDFW for two years had an extensive program for planting bulrush seedlings. WDFW abandoned the bulrush seedling program because it was too costly and ineffective. The site is now a **seed bank** for invasive brass button and cattails for the Puget Sound. WDFW is using herbicide spray on the cattails which is not a prudent control especially on a site where variety of wildlife is present including young salmon. An initial waterfowl survey indicated waterfowl were not using the site after restoration and no further surveys were conducted. Presumably, there was no need for waterfowl to surveys. Many including members of WDFW consider the project a failure. This project attempted to **Reinventing Nature and Natural Process (RNNP)** is **Mythical**. Appears the best management strategy would be to close the dike breaches and return the site to the original purpose for waterfowl.

The **Leque Island Restoration Project** has major shortfalls. The information presented on this site indicates the 250 ac are mudflats. **RNNP** has not worked here for whatever reason and there is no information on salmon usage.

3. Endangered Species Act (ESA). ESA also states, “birds that migrate between countries that have agreements are to be identified and their habitats maintained to ensure they do not become extinct or threatened by proposed projects”. **Selecting passages that only apply to project purpose is SFP.** WDFW has public trust responsibility to preserve migratory waterfowl habitat. **Mitigation is not avoiding impacts to migrating birds.** The **Skagit Island Unit (SIU)** has been managed as a waterfowl restoration the 1940s. Even though with implementation of **Deepwater Slough Project** (200 ac), **Wiley Slough Estuary Restoration Project** (156 ac), and **Fir Island Ecosystem Restoration Project** (126 ac) the historical return runs have continued to drop. These projects are a **SFP** and **nonconformance of SM.** There is no evidence in the **SWAIUDAA** that the project will increase salmon runs. **Evidence** from the Columbia River System indicates the implementation of shallow water habitat has not increased the Columbia River runs. It is appropriate to use the Columbia River results for this analysis since the proponents have use other studies and data outside the Skagit Wildlife Area including:

Mid-19th Century Stream Channels and Wetlands Interpretation from Archial Sources for Three North Puget Sound Estuaries. Collins, B. 2000.

Insights into Estuary Habital Loss in the Western United States Using new Mothod for Mapping Maximum Extent of Wetlands. Brophy, L.S., ----- . 2019.

There are many more references in SWAIUDAA that identify information available outside the project area that was used to justify the SWAIUDAA alternatives.

4. Trading Waterfowl Habitat for Fish Habitat. The **SIU** has been managed as a waterfowl area in region that has been altered by humans and is a successful wildlife area. WDFW has a **public trust responsibility** to preserve waterfowl habitat and reduce impacts to waterfowl.

Shillapoo Wildlife Area (SWA) Manager conducted a study (**SM**) on the proposal to create shallow water (**South Shillapoo Floodplain Restoration Project**) habitat at the SWA and found that it would lead to 65% or as much as 80% less usage by waterfowl in the area during the fall (migrating waterfowl) if the project were built. This is primarily due to the lack of water in the area in the fall. A similar effect is predicted for the spring waterfowl migration because the water will be too deep, and the waterfowl will not be able to reach the food.

Restoring the Skagit Island Unit to tidal and riverine influence will probably eliminate or significantly reduce use of the site by waterfowl. During the fall, the site will have limited water for foraging and rest. In the spring the water will be too deep for waterfowl to reach the food and it will be impossible to farm the site for waterfowl.

“In the waterfowl conservation community, public lands, many of which were purchased for specific waterfowl habitat purposes, are viewed as the primary stable source that meets a small, but vital, component of the seasonal habitat needs and energy requirements of migratory waterfowl throughout the year. However, waterfowl foods on private lands are not consistent, as they are not purposefully planted for waterfowl benefits to offset losses of historic habitats, and therefore should not be relied upon to provide the primary resources to meet continental, state or regional population objectives.” (SWAIUDAA, 2020)

Many believe waterfowl were never endangered which is not true. Waterfowl were in danger of extinction in the early 1900s. They also believe waterfowl habitat is readily available and they will move around. This is stressful and not all habitat is of equal value. Intensive development has altered and destroyed quality water habitat.

5. State Environmental Policy Act (SEPA). SWAIUDAA is not in compliance with SEPA. Impacts to waterfowl have not been fully identified or evaluated. Available evidence demonstrates implementation of shallow water habitat does not improve returning salmon runs and has been ignored.

“Avian responses to estuary restoration projects where diked habitats are restored to intertidal conditions, usually by removing all or part of dikes, are not well documented.” (SWAIUDAA, 2020)

“Current quantitative data that compare waterfowl and other avian species use to food availability in the estuary or agricultural areas in the North Puget Sound Lowlands, including the GSD, do not exist. However, the primary objective for the Island Unit currently is to manage the site to maximize the amount of planted forage food available to ducks when the largest numbers are present in the Skagit delta (fall/spring migration and winter). Asking how the proposed alternatives affect this management objective may be helpful in predicting whether each alternative will be negative, positive, or neutral for birds at three geographic scales: Island Unit, Skagit Bay, and the Greater Skagit Delta.” (SWAIUDAA, 2020)

6. Hunter Conservation. Hunters began conservation as early as 1911 when **Delta Waterfowl Association** initiated a program to enhance nesting habitat. **Washington Waterfowl Association** began operation in 1945.

Hunters Support Conservation

- ◆ Migratory Bird Treaty Act 1918—eliminated market hunting
- ◆ Migratory Bird Hunting Stamp Act (1935) establishes Migratory Bird Conservation Fund, the Small Wetlands Acquisition Program to purchase or lease wetlands for the National Wildlife Refuge Acquisition Program
- ◆ Pittman and Robertson Act (1937) - excise tax on guns and ammunition with funds distributed among states for wildlife habitat development
- ◆ Ducks Unlimited established in 1937

All programs and organizations continue to support and be involved in conservation activities to this day

Courtesy: Washington Waterfowl Association

ATO 2019

Initiatives That Could Establish Additional Wildlife Habitat

- ◇ National Fish Stamp Program would establish a National Fish Conservation Program patterned after the Migratory Bird Hunting Program (Federal Duck Stamp) should be initiated by fishers
- ◇ National Songbird Stamp Act would establish a National Songbird Conservation Program patterned after the Migratory Bird Hunting Program (Federal Duck Stamp) should be initiated by birders

Courtesy: Washington Waterfowl Association

ATO 2019

Hunters Support Conservation depicts the greatest conservation effort in the world and was initiated and supported by hunters. This conservation continues to this day and is over 100 years old. In the early 1900s it was obvious waterfowl numbers were low and waterfowl were nearing extinction. Hunters and conservationist convinced the U.S. Congress to pass **Acts** to prevent extinction of waterfowl. Admittedly, the **Migratory Bird Treaty Act 1918** had economic impacts on market hunters, but the correct path was chosen to prevent extinction of waterfowl. **Hunters** are consider “**Waterfowl’s Best Friend**”. Fishers were aware that the salmon runs were declining but continued to over fish the salmon for decades. No conservation to preserve habitat and salmon were initiated to prevent salmon from extinction and now it is too late for several salmon species.

It is not too late for fishers to initiate a **National Fish Stamp Program**. The program could be patterned after the **National Duck Stamp Program**. This would prevent impacting **Public Trust Lands** established by hunters to avoid waterfowl extinction. Establishing a fish stamp program will have economic impacts on fishers but the correct path forward needs to be chosen. Fishers and development must accept the brunt of the loss of salmon runs and salmon species. Preserving fish habitat in the **non-public trust lands** is a key element of preventing further extinction of salmon. This can be accomplished with the National Fish Stamp Program. There is a wonderful quote from Mahatma Ghandi, “**Earth provides enough to satisfy man’s needs but not every man’s greed**”.

Conclusions

1. These comments provide data and different perspectives on the analysis and the hope is WDFW will evaluate them to the level they are intended. The comments are an evaluation of the scientific process (for lack of a better term). Wildlife issues of today are complex and difficult to assess. One of the criteria in selecting members for the Advisory Group was, “Are willing to learn about issues relevant to the Island Unit and have an openness to new information”. The expectations are the information presented in this letter receive the same level of consideration. This has not always been the case in the past.

2. **Using Rising Ocean Levels** due to global warming for project justification is not appropriate and is a **SFP**. It also does not conform to **SM**.

3. **Effectiveness of Shallow Water Habitat**. There is not any data presented that demonstrates providing shallow water habitat improves salmon return runs. Salmon return runs have continued to decline in both the **Columbia** and **Skagit** Rivers even though salmon rearing habitat has been implemented. **SFP** This data indicates there are other reasons for salmon decline including **Global Warming**.

4. **Endangered Species Act**. ESA has specific language on preserving and reducing impacts to waterfowl. Mitigation is not an option.

5. The **Skagit Island Unit** diked area was approximately 470 ac before any restoration was initiated. Alternative 4 proposes restoring 270 ac to the estuary. Therefore approximate 200 ac of the original Skagit Island Unit was restored to estuary by implementing **Deepwater Slough Project** (200ac) and **Wiley Slough Estuary Restoration Project** (156 ac) for total 556 ac. **Leaving the 270 ac** for waterfowl is the **best management practice** considering there is scientific data that demonstrates shallow water habitat restoration is not as effective as proponents claim. Proponents are sugar coating the benefits of shallow water habitat for salmon.

6.Trading Waterfowl Habitat for Fish Habitat. In general **State Wildlife Areas** are already targeted for restoration and **Public Trust Responsibility** does not allow **WDFW** compensation mitigation on **State Island Unit**. The authorizing language (50 CFR 80.135) for the establishing the Skagit Wildlife Area states: “State fish and wildlife is required to use the area for the purpose authorized in the grant”.

Initial Waterfowl surveys at **Fir Island Ecosystem Restoration Project** indicated waterfowl were not using the site after restoration. No further waterfowl surveys have been conducted. Why bother.

A waterfowl studies at **Shillapoo Wildlife Area** indicated the implementation of fish restoration on the site would significantly reduce waterfowl usage.

7. State Environmental Policy Act (SEPA). **SWAIUDAA** is not in compliance with **SEPA**.

Loss of the fish runs in the Pacific Northwest is an issue and concern and the hunting community supports implementing prudent projects that are based on sound scientific analysis. However, public trust lands are not prudent lands for fish restoration since they have been restored for other wildlife. Converting public trust land to fish habitat is one dimensional and **mythical**.

Recommendation

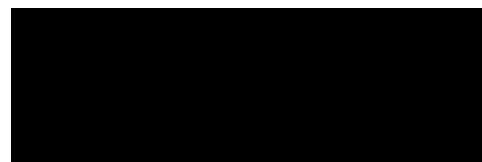
Due to the improper use of predicted **rise in sea levels, Scientific Method, Reinvention of Nature and Natural Processes, Endangered Species Act, Trading Waterfowl Habitat for Fish Habitat**, and **noncompliance** of with **SEPA**, Alternative 1, **No Restoration** is the preferred recommendation. Thank you.

Regards,

Albert (Al) O'Connor


Brush Prairie, WA 98606

Conservationist, Fisher & Hunter
WWA Board of Directors Member



WASHINGTON WATERFOWL ASSOCIATION
PO Box 40182
Bellevue, WA 98015



Corporate, Washington Waterfowl Assoc.

December 13, 2020

Washington Department of Fish and Wildlife
North Puget Sound Regional Office
Attn: Seth Ballhorn
16018 Mill Creek Boulevard
Mill Creek, WA 98012-1541

Dear Mr. Ballhorn:

There is a new study out that is looking at unfavorable ocean conditions on returning salmon runs. Results of the study indicate salmon runs have declined as much as two-thirds since 1970. We all knew this. The decrease in runs is **across the board**. The decrease has occurred in pristine rivers as well highly modified rivers. This study supports our opposition to shallow water habitat and shallow water habitat **is not the fix** proponents believe.

A statement from the David Welch, "Given the seemingly congruent decline in SARs (smolts-to-adult return rate) to similar levels, the notion that contemporary survival is driven primarily by broader oceanic factors rather than local factors should be considered. Ambitious Columbia River rebuilding targets may be unachievable because other regions with nearly pristine freshwater conditions, such as SE Alaska and northern BC, also largely fail to reach these levels". The statement is related to his study on spring and fall chinook rivers on the West Coast. Thank you.

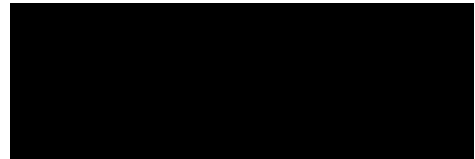
Regards,

Albert (Al) O'Connor



Brush Prairie, WA 98606

Conservationist, Fisher & Hunter
WWA Board of Directors Member



Martha Jordan

██████████
██████████
Everett, WA 98208

16 December 2020

Dear WDFW Staff,

This letter regards my comments on the Island Unit Alternatives Analysis Draft Report. I have read the documents and attended the open house virtual event earlier this month. I have been following this issue for some time and have watched and listened to your agenda and language used that strongly leans towards Alternative 4 as your preferred alternative.

While it appears to me that there is a strong push by WDFW and some of the interest groups to approve Alternative 4, there is equally a compelling reason to look more strongly at Alternatives 2 and 3. At the very least there needs to be a more accurate and thorough review of some aspects of issue so that we know for a fact that WDFW is not ignoring or violating previous agreements and funding sources.

It has been made clear to me by WDFW staff that the Island Unit is unique and provides a substantial amount of waterfowl food resources in the Skagit Valley. This is on public land and under current management provides 1 million duck use days of forage. The quality of waterfowl hunting on this site is extremely high and has been understated. There is nothing else like the IU anywhere else in the Skagit Valley. The management of the IU is currently on public land which will be eliminated and pushed to primarily private farmland. Farmers are already stressed from the substantial number of swans and snow geese and, to a lesser extent, ducks that currently use their fields. There is no replacement public lands of the high quality waterfowl habitat anywhere else in the Skagit Valley area. Your document seems to indicate that the primarily private farmland is capable of absorbing this influx of birds without causing more crop damage.

While you asked us to not ask questions, the one that has not been answered is: How many additional salmon will benefit from this project? How many more salmon will there be? I have yet to see any project done in this geographic area that comes close to predictions for salmon enhancement when taking public property and altering it solely for salmon restoration.

From my personal experience with the results of salmon restoration projects in Snohomish and Skagit counties: some projects work, and some do little or nothing to actually improve salmon recovery. The projects are done because you have the money, and/or the courts ordered you to use public land first. It appears that this may be pushing this project on a single outcome trajectory for Alternative 4. Research needs to be done to follow the project for at least 5 years regardless of which alternative is chosen, 2, 3, or 4.

I am concerned that WDFW has not given much thought or investigated the issue related to the original funding source for the Island Unit acquisition. It is stated that the entire purchase was done with Pittman-Robertson funds. Conversion of the IU to another use may violate the terms of acquisition. Yet, WDFW seems to be moving forward as if this is nothing to be concerned out before they make their decision. I strongly disagree with this premise. There are other examples in the general area where land conversion from wetland and/or upland diked to salmon restoration or has happened because the original funding source rules and constraints were ignored or substantially violated. All these were done in the name of salmon restoration and all of them violated the terms of the originally funding. Given that, no one has been held accountable for this blatant disregard for long standing agreements and this issue seems to be no exception. I suggest you investigate this issue and provide the public with answers that tell us accurately what are the facts and not just hope that the public will overlook this important issue.

My final comments relate to WDFW's stated intent to replace hunting opportunities lost at the IU with other properties in the Skagit Valley. While this sounds good, and replacement lands need to happen, the reality is, where are you actually planning to find more than 160 acres of quality waterfowl hunting land on public property. Already I am hearing that waterfowl hunting folks are talking about pressuring WDFW to open up part of Hayden Reserve and the Johnson-DeBay Swan Reserve to hunting. Perhaps they also want to take more of the Sammish Unit as well. Since there is no mention in the document or in any public forum that I am aware where this issue is being discussed, it is difficult to respond to WDFW thinking and planning. Taking any land out of Reserve status for hunting is absolutely NOT the right answer. Before this trend gets any traction you need to have a very public process if it includes changing the status of any Reserve designated properties or changing the boundaries of these properties. This review process must include all parties who might have or currently have an interest in the various Reserves in Skagit County.

I support either Alternative 2 or 3 as a compromise that will benefit salmon as well as lessen the impacts to waterfowl and the economics and recreational benefits of hunting. I appreciate the opportunity to comment on this report.

Respectfully,

A handwritten signature in cursive script that reads "Martha Jordan". The signature is written in black ink and is positioned below the "Respectfully," text.

Martha Jordan

December 15, 2020

Washington Department of Fish and Wildlife,
North Puget Sound Regional Office
Attn: Seth Ballhorn
16018 Mill Creek Boulevard
Mill Creek, WA 98012-1541

Submitted via e-mail

RE: Public Comment on habitat restoration project options for Skagit Wildlife Area Island Unit

Dear Seth,

The Skagit County Drainage and Irrigation Districts Consortium (Consortium) is a cooperative organization established to support the viability and advancement of the twelve-member special purpose districts (districts). I would like to thank you and the Department of Fish and Wildlife (WDFW) for conducting such a comprehensive and informative public process and for allowing me the opportunity to participate in the Island Unit Advisory Group meetings. On behalf of the twelve member districts, the Consortium would like to express support for the Full Restoration Alternative for the following reasons.

All of the member districts, Western Washington Agricultural Association, WDFW, and NOAA Fisheries are signatory to the Skagit Tidegate Fish Initiative (TFI). One of the main tenants of the TFI is for the signatory parties to work together to develop and prioritize restoration concepts that balance salmon recovery goals and farmland protection. Since the TFI was signed the signatory parties have worked together, along with landowners, and The Nature Conservancy to complete the Fisher Slough Restoration Project and the Fir Island Farm Restoration Project. The TFI Implementation Agreement identifies the Full Restoration Alternative of the Island Unit as a high priority project and is critical to the long-term success of the TFI.

The Consortium also supports the Full Restoration Alternative because it meets the intention of Washington State House Bill (HB) 1418, which prioritizes restoration projects for salmon recovery on public lands to avoid conversion of private farmland. The HB 1418 directs the state to develop *“A long-term plan for intertidal salmon habitat enhancement to meet the goals of salmon recovery and protection of agricultural lands.”* It goes on to state that the proposal shall consider all other means to achieve salmon recovery without converting farmland. Importantly, HB 1418 directs WDFW to work with other public landowners to develop an initial salmon intertidal habitat enhancement plan for public lands in Skagit County.

The 2005 Chinook Recovery Plan, which was co-authored by WDFW, identifies the Full Restoration Alternative (Deepwater Slough Phase 2) as a high priority project. Additional evaluation of this project conducted between 2012 and 2017 in the Alternatives Analysis of Restoration Project Concepts across Farm, Fish and Flood Interests: Skagit Hydrodynamic Model Project, also prioritizes this project not only because it has tremendous value for Chinook Recovery, but also because it provides benefits to the agricultural community by prioritizing public lands for restoration and through the generation of TFI credits, and because it has no effect on flood control or drainage infrastructure.

Finally, while the Consortium supports advancing the Full Restoration Alternative, we would like to reiterate how important it is that WDFW prioritize the much needed repairs of the Wiley Slough setback levee and if necessary secure additional resources to ensure both projects can proceed.

Thank you again for the opportunity to participate in the Island Unit Advisory Group and for your consideration of these comments.

Sincerely,

A handwritten signature in blue ink that reads "Jenna Friebel". The signature is written in a cursive style with a large initial "J" and a long, sweeping underline.

Jenna Friebel
Executive Director

December 11, 2020

WDFW North Puget Sound Regional Office
Attn: Seth Ballhorn
16018 Mill Creek Boulevard
Mill Creek, WA 98012-1541
By email: SkagitWLA@dfw.wa.gov

Dear Mr. Ballhorn,

Thank you for the opportunity to comment on the Skagit Wildlife Area Island Unit restoration project alternatives.

The Seattle Aquarium supports Alternative 4, the full restoration of the Island Unit. By removing all tidegates, water control structures and 50-100% of the dike length, this alternative will restore tides and river flows to both islands, benefiting endangered species and building coastal resilience to climate change.

As the largest producer of Puget Sound Chinook, the Skagit River is especially important for the production of wild Chinook. The Island Unit is critical rearing habitat for juvenile Chinook salmon and estuarine habitat recovery is the highest priority for recovering endangered salmon in the area. Alternative 4 will maximize estuarine acreage and fully restore natural processes to the area, which will benefit endangered salmon, endangered orcas, and other species. Fall Chinook from the Skagit River are among the top priority stocks for the southern resident orcas, making increased Chinook production a vital component of orca recovery. Alternative 4 is predicted to provide enough habitat for 59,377 to 86,035 additional smolts.

In addition to having the greatest benefits for endangered species, Alternative 4 would also be the most effective option for strengthening coastal resilience to climate change. Sea level rise and changing river flows are anticipated to put additional strain on the infrastructure at the Island Unit. This could potentially cause more frequent and severe damage to dikes and tide gates, resulting in reduced drainage capacity and the need for more frequent and expensive repairs. Alternative 4 would remove the water control structures and create a range of varying land elevations in the estuary, allowing for natural shore and habitat migration in the long term as sea levels rise.

Given the urgency of climate action and the dire situation facing salmon and southern resident orcas, we must prioritize opportunities to maximize benefits for endangered species, recover vital habitat and enhance climate resilience. We encourage WFW to adopt Alternative 4.

Sincerely,

A handwritten signature in blue ink that reads "Erin Meyer". The signature is written in a cursive, flowing style.

Dr. Erin Meyer
Director of Conservation Programs and Partnerships
Seattle Aquarium

Tuesday, December 15, 2020

Washington Department of Fish and Wildlife
North Puget Sound Regional Office
Attn: Seth Ballhorn
16018 Mill Creek Boulevard
Mill Creek, WA 98012-1541

Re: Island Unit Draft Alternatives Analysis – Support for Alternative 4, Full Restoration

Dear Mr. Ballhorn,

Skagitonians to Preserve Farmland (SPF) is a nonprofit organization founded in 1989 by local farmers to ensure the continued viability of Skagit Valley agriculture and its required infrastructure through farmland protection, advocacy, research, education, and public awareness.

SPF is committed to helping achieve the Chinook Recovery Goals for the Skagit Delta through the spirit and intent of the 2005 Skagit Tribal/Agricultural Alliance and through our participation and commitment to the mission and goals of the 2013 Farms Fish Flood Initiative (3FI) and through our support of the Tidegate Fish Initiative (TFI).

Through the 3FI framework and resulting *Skagit Delta Hydrodynamic Model* and Alternative Analysis for the Skagit Delta along with the 2009 *Guidance on WDFW's Vision for Conservation and Land Acquisition for the Skagit Delta*, we are expressing our support for **Alternative #4, Full Restoration**.

Our organization has worked closely with WDFW since 2008 through multiple projects including but not limited to the Wiley and Fisher Slough Restoration Projects and have participated with WDFW in 3FI, TFI and the Skagit Hydrodynamic Modeling efforts that has identified a suite of restoration projects to support recovery efforts through the TFI Agreement. Based on these efforts, we believe **Alternative #4 - Full Restoration**, will balance the goals of salmon recovery and the goals for long-term sustainable agriculture in the Skagit Delta.

Our organization understands the challenges that face WDFW and we applaud and stand by the tremendous work WDFW has undertaken in part, with the 3FI partners, to bring parity and balance between restoring and protecting our critical habitats while also protecting our State's agricultural lands of long-term commercial significance and our critical agricultural drainage and irrigation infrastructure.

If you have any questions about our support or desire please contact me by phone at 360.336.3974.

Sincerely,

Allen Rozema
Executive Director

December 14, 2020

Washington Department of Fish and Wildlife
North Puget Sound Regional Office
Attn: Seth Ballhorn
16018 Mill Creek Boulevard
Mill Creek, WA 98012-1541

Subject: Waterfowl Advisory Group comments on the draft restoration alternatives proposed by WDFW on the Skagit Wildlife Area – Island Unit

To the decision-makers at WDFW;

The WDFW Waterfowl Advisory Group (Waterfowl-WAG), are providing requested comment on the restoration alternatives proposed by WDFW on the Skagit Wildlife Area – Island Unit.

The Waterfowl-WAG's preferred alternative is Alternative 1 – No Restoration, as this alternative is the only one presented that is within the original fund-source's intent of acquisition and protection when these lands were purchased in the early-1950s, it is the only one that provides benefits to an incredible number of waterfowl that depend on this site for winter food (likely the best example of waterfowl management on *public land* in Washington), and is the only one consistent with the Washington Department of Fish and Wildlife's stated purpose within state law. Any other alternative should be considered a conversion and mitigated appropriately.

The Skagit Wildlife Area-Island Unit is hallowed ground for both the ducks and duck hunters. For almost 70 years, this 141 acres, known to the waterfowling community as the "farmed island", has contributed more than 70 million duck-energy-days (days of duck food) and provided recreational opportunity to 10,000s of waterfowl hunters in Washington, many travelling from far outside of Skagit County.

The Waterfowl-WAG, consists of 20 volunteers appointed by the WDFW Director to serve as a liaison between WDFW and the waterfowling community. Collectively, this group contains more than 300 years of waterfowling experience. We represent individuals who have hunted this site for decades, those taken and trained in the art of waterfowl hunting by fathers and friends, and a group who has been fundamental to the user-driven model of waterfowl conservation, a tradition since the 1930s. Acquisitions like the "farmed island", made in the 1950s, were and still are core to the principles of waterfowl management, taken to heart by both state and federal agencies attempting to compensate for the extensive impacts to wetlands, both freshwater and tidal, critical to sustaining populations at already reduced levels. Deviation from this core tenant and original intent, without maintaining function, is inconsistent with the most recent update to the international North American Waterfowl Management Plan and represents a troubling interpretation of WDFW's mission and obligations to the waterfowl resource and recreational user groups who have provided the funding to maintain this obligation. While duck populations recently reached historic continental population highs, history has shown us repeatedly booms are always followed by bust-cycles, and unless waterfowl habitats needed throughout their entire annual lifecycle are secured and protected for these vital functions, we are doomed to repeat the past. Case in point, the continued concerns over northern pintail, a highly prized harvest species that has been in the most restrictive bag-limit the past two seasons. Mallard, northern

pintail, wigeon, and green-winged teal all depend extensively on this site, every year, from October through March.

It is important to emphasize, Alternatives 2-4 would represent the fourth project undertaken by WDFW targeted for fish-driven restoration with similar consequence of displacing both waterfowl food and waterfowl hunters, and to date no actionable results have provided secured equivalent function for either ducks or the waterfowling community. This highlights a systematic problem by WDFW leadership that has chosen to *prioritize* their mission to move projects forward, rather than find ways to compromise in order to find solutions. Ease, ignorance, and excuses are not adequate replacements for waterfowl food and places for waterfowl hunters to pass on this conservation tradition.

The Waterfowl-WAG would like to highlight several issues and concerns brought up while reviewing the Draft Alternatives Analysis report and provide specific comments and recommendations:

WDFW policies:

- 1) The ranking and supporting statement provided would be true if this was newly acquired public land, but that is not the case in this decision (5.1.1). The supporting statement should read: “Each alternative will force WDFW to prioritize a species’ habitat, at the cost of another.” Alternatives 2 through 4, represent a conversion from original intent and are a loss to already limited winter waterfowl habitat and long coveted and relied upon waterfowl hunting sites on the ground.
- 2) Policy 5211 is not consistent with guidance given by the Interagency wetland mitigation guidance to which WDFW co-developed. The selected language also ignores the explicit statement provided in Policy 5211: ‘Guides the department’s management of wetlands and emphasizes **“no net loss and long-term gain” of wetland areas and functions**’. The wetland management activities currently implemented for the reason of providing winter waterfowl forage, attempt to mimic wetland habitats that have been lost; in other words, replacing a function lost on the landscape nearly a century ago. Taking this function away does not constitute protection or conservation, *it clearly represents and perpetuates further loss*.
- 3) The selected justification from the Washington State Wildlife Area Goals 1-3, has the appearance of selecting criteria to fit a desired outcome. These goals ignore a much broader context provided in the 52-page document. This also completely ignores a specific management plan for this Wildlife Area. Most concerning is any decision for the presented alternatives set, is being considered in isolation of the rest of the Skagit Wildlife Area. This Wildlife Area is on the cusp of updating its overall Wildlife Area Plan, and we fail to see how a rush to a decision now is providing that Advisory Committee the appropriate context to inform their discussions.

The Waterfowl-WAG recommends that for Alternatives 2 through 4, and before any actions are initiated on the ground, steps be taken by WDFW to develop a Wetland Mitigation Plan striving to achieve ‘no net loss and long-term gain’ (consistent with policy 5211), and develop a detailed strategic waterfowl management plan, in consultation with entities charged with implementing waterfowl population and wetland acreage objectives (example: the North American Waterfowl Management Plan Committee and Pacific Birds Habitat Joint Venture).

WDFW Obligations and Agreements:

- 4) The statement that the timeline driving this Alternatives Analysis report is related to contractual obligations associated with a Salmon Recovery Funding Board grant is concerning.

- 5) Under Funding Obligations, the statement suggesting the use of fishing and hunting licenses revenue was used to match Pittman-Robertson federal dollars is deceitful; the agency was not merged at this time. Further to retrospectively assess allowable uses of 70-year old state revenue is misguided. Taking advantage of hunter-derived funds (intended explicitly for wildlife-related activities under Federal Aid in Wildlife Restoration Act, aka Pittman-Robertson funds) for a fish-driven objective is not appropriate. To date, no fishing-derived funds have successfully been used to acquire or protect *replacement lands* to account for prior conversion activities, an agreement WDFW made with the waterfowling community.
- 6) The individuals involved in a sequence of decisions did not hold the ultimate authority to make such decisions, and entities that should have been included in the considerations were not. In succession, the considerations in, House Bill 1418 (2003), the Skagit Chinook Plan (SCP, 2005) and the Skagit Tidegate Fish Initiative (TFI, 2010; note: this project was only identified as a potential project) made three critical overreaching assumptions: 1) that no other objectives existed that should be considered, 2) that no existing fiscal constraint or objective was insurmountable, and 3) that no mitigation would be required for existing function and objectives. This is made abundantly clear in the SCP description for the Deepwater Slough-Phase 2 (p.189) project when it stated: **“Pressure from private landowners could press this project site into an earlier phase of restoration. Presently the site services a single user group. Making it a potential target by other user groups who would prefer to see restoration pressures realized by WDFW.”**
- 7) In other words, this project is not required, but rather it is desired. In a presentation provided to the Island Unit Advisory Group, even in the best-case scenario this site does not reach the smolt capacity objective (Feb. 3, 2020), but it undoes 70 years of successful waterfowl management, in alignment with international guidance, in the blink of an eye.
- 8) We disagree with the ranking provided under Migratory Bird Management, at a minimum, the Full Restoration alternative substantially changes WDFW’s contribution to the long-term stability of winter waterfowl populations and does not provide any measures to counter the continued net-loss of enhanced forage function; *replacement lands*.

WDFW Future Cost and Funding:

- 9) The rating and justification of “very unlikely” for Alternative 1 is misguided and disingenuous. As recently as March 2015, the Waterfowl-WAG recommended expenditures from the state Duck Stamp revenue and elevated this ask to highest priority under the Capital Budget portion of this expenditure. This group would do so again. This has the appearance of pre-determined action.
- 10) Wildlife-funding should not be used to cover O&M costs associated with cattail control. Any alternative that introduces tidal condition must come with appropriated (non-hunter derived) funds to anticipate this persistent and re-occurring problem. Every neighboring restoration in this area has resulted in this invasive cattail, yet leaving WDFW constantly seeking short-term grant funds, for what is a known long-term active management problem. No ‘natural process’ has solved this problem for WDFW.
- 11) All tidegates are not the same. While supporting documentation looks at typical agricultural tidegate structures, we would like to stress other types exist and have been used successfully for multi-species and multi-benefit restoration projects in portions of the Pacific Coast, as well as elsewhere in the country. All options in design and feasibility should be explored.

The Waterfowl-WAG recommends that WDFW consult with entities familiar with waterfowl conservation and restoration projects (not just the Region 4 Habitat Engineer) to conduct a more thorough evaluation of funding alternatives and costs, and to explore the variety of tidegate infrastructure that has been used successfully out of state. The Waterfowl-WAG reiterates, state Duck Stamp funds have been previously recommended to address tidegate infrastructure at this site and would encourage thorough evaluation of design and feasibility options, including lessons learned from partners with familiarity and experience with these types of projects.

The Waterfowl-WAG recommends that cost estimates for Alternatives 2 through 4, must consider adequate replacement of function for both waterfowl food and waterfowl hunter days afield. This should be evaluated in concert with the recommendation provided under “WDFW policies” and should be reliant on secured funds, not short-term grants.

WDFW Fish and Wildlife Needs:

- 12) The obligations and intent tied to the Island Unit when purchased, were made in the recognition of extensive loss of wetland function necessary to sustain waterfowl populations. While wetlands are not “listed”, WDFW recognizes many wetland types as “Priority Habitats” and reflects this intent of no-net loss and long-term gain for wetland areas and function. The Endangered Species Act, established 20 years after the acquisition of this site, has certainly added a layer of complexity, but does not override the original intent of protection or the need to keep function that is severely impacted in the surrounding.
- 13) Inclusion of Southern Resident Killer Whale, at a minimum, has the appearance of pre-determined intent. As stated above, the best-case scenario fails to reach smolt capacity objectives, the justification provided for the ranking is misleading as to its direct relationship to the rankings provided. No equivalent far-reaching considerations are given to the other species of waterfowl that would be impacted by under Alternatives 2 through 4.
- 14) Not all acres are created equal and linear feet of channel during the spring does not describe the habitat required by ducks or that is desired by duck hunters in providing recreational opportunity and access to public land.
- 15) To date, as presented by WDFW (Feb. 3, 2020) from previous nearby “restoration” actions, public lands are at a deficit for providing acres of “enhanced forage”, and WDFW chooses to pretend “managed forage” acres are equivalent; **To make the difference clear; enhanced forage has food, managed forage acres (like silage cut corn fields) does not.** These types are not equivalent in function and represent a net-loss. It is worth noting, the ~200 acres of “gained” enhanced forage is ***paid for by the revenue derived from the sales of Migratory Bird Permits (your waterfowl hunters), prompted by the past “restoration” activities, and is the only means to encourage commercial agriculture to contribute to the problem statement.*** Additionally, it is preposterous for WDFW to believe private land sites obtained through federal grant funding is “secure”, particularly without any strategic plan or long-term agreements in place.
- 16) Restoration activities in this same region of the Skagit River estuary were conducted under the well-documented premise that replacement lands would be sought by the department to offset the impacts to waterfowl forage (function) and waterfowl hunters (recreational opportunity). WDFW has repeatedly failed to live up to these promises, and this proposed action represents a far greater impact than any of the previous actions. **The waterfowl community is not asking to gain, we are simply asking that WDFW maintain equivalent function and recreational opportunity before further actions are undertaken.**

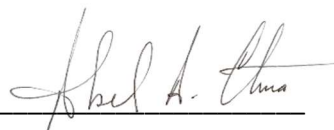
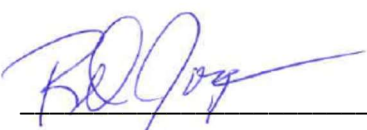
The Waterfowl-WAG strongly recommends, WDFW seek ways to solidify waterfowl forage through acquisition, conservation easement or re-strategizing agricultural leases on their lands, AND to secure waterfowl hunter sites through acquisition, easement, or private land contracts; consistent with objectives clearly articulated in the North American Waterfowl Management Plan, and WDFW’s Game Management Plan, and as demonstrated by public-private partnership examples.

In closing, the Waterfowl Advisory Group would like to emphasize, this is too important of a decision to rush and not have a strategic plan that addresses the impacts to waterfowl winter forage and waterfowl hunters. The Island Unit represents one of the most unique examples of waterfowl management and waterfowl hunting opportunities on public land in western Washington. The true uniqueness of this site was not adequately addressed in the alternative analysis criteria or narrative, demonstrating a lack of attention to one of WDFW’s primary stakeholder groups. The Waterfowl-WAG has established through past prioritization of these types of expenditures from the state Duck Stamp fund, because that is what state law mandates WDFW to do; to improve wetland habitats and access to the public, on public lands, in Washington. We ask WDFW to recognize that **NONE** of the public land parcels in WDFW’s current inventory have the potential to provide, let alone mitigate, **1 million duck-energy-days annually** nor to absorb an additional **1,500 duck hunter days afield**. This can not be ignored. A proper assessment, in accordance with steps outlined in the multi-agency, statewide Wetland Mitigation Plan, should be completed and the Pacific Birds Habitat Joint Venture should be an active participant in providing guidance consistent with the North American Waterfowl Management Plan.

Finally, **the Waterfowl-WAG requests a briefing by a WDFW decision-makers, not a field staff messenger, once a final alternative is selected.** We hope the department decision-makers practice due diligence before a final alternative is selected, that would include providing waterfowl managers the opportunity to craft a strategic waterfowl management plan that thoroughly evaluates consequences of changing the fundamental function being provided by current management practices on public land.

Thank you for time and attention.

Waterfowl Advisory Group

	12/14/2020		12/14/2020
Abel Cortina (Chair)	Date	Bob Jorgenson (Vice-Chair)	Date

- CC: WDFW Fish and Wildlife Commission
 WDFW Director
 WDFW Wildlife Program Director
 WDFW Region 4 Director
 WDFW Waterfowl Manager
 North American Waterfowl Management Plan Committee
 Pacific Birds Habitat Joint Venture Coordinator
 USFWS Wildlife and Sport Fish Restoration Program Coordinator



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
NOAA Restoration Center
1201 NE Lloyd Blvd., Suite 1100
Portland, Oregon 97232

December 15, 2020

Kelly Susewind, Director
Washington Department of Fish and Wildlife (WDFW)
P.O. Box 43200
Olympia, WA 98504-3200

Dear Mr. Susewind:

On behalf of NOAA's Restoration Center, I would like to express my strong support for full estuary habitat restoration at WDFW's Island Unit/Deepwater Slough Phase 2 property in the Skagit Wildlife Area. This 268-acre property is located on two diked islands in a tidally-influenced reach of the South Fork Skagit River. The WDFW has owned and managed Island Unit/Deepwater Phase 2 since the 1950s to create winter forage for over-wintering ducks and geese and to provide for public waterfowl hunting. The NOAA Restoration Center participates as an ex-officio member of the Island Unit Advisory Council.

As your agency moves forward with assessing land management options for Island Unit/Deepwater Slough Phase 2, please consider the importance of the area for salmon recovery. This property was historically a tidally-influenced estuary that provided critical rearing habitat for juvenile salmon, including threatened Puget Sound Chinook salmon. The 2005 Skagit Chinook Recovery Plan identifies protection and restoration of estuarine habitat as the highest priority for recovering salmon in this watershed, with Island Unit/Deepwater Slough Phase 2 ranking as a Tier 1 project among the highest priority actions.

Island Unit/Deepwater Slough Phase 2 has also been identified in multiple other planning efforts as a high priority project for salmon recovery. Island Unit is the last publicly owned property in the Skagit Delta and it is identified among the Tier 1 highest priority projects in the 2005 House Bill 1418 Report: Tidegates and Intertidal Salmon Habitat in the Skagit Basin. The findings in this report were developed by multiple stakeholders representing both salmon recovery and agricultural interests in the Skagit Delta. Island Unit/Deepwater Slough Phase 2 is also a priority restoration action under the Skagit Tidegates and Fish Initiative, an agreement between NMFS, WDFW, and all of the dike, drainage, and irrigation districts in the Skagit Delta that own and manage tidegates. In addition, Island Unit/Deepwater Phase 2 ranks as a Green Project in the

Skagit Hydrodynamic Model (HDM) Alternatives Analysis. Green Projects ranked as first priorities for implementation because these projects best balance salmon habitat restoration, community flood risk reduction, and agricultural interests in the Skagit Delta. The Skagit HDM Alternatives Analysis provides a blueprint for advancing salmon recovery through its collaborative, multi-benefit actions. The Skagit HDM framework is well supported by the Skagit Farm, Fish, and Flood Initiative (3FI) partners as the pathway for advancing salmon recovery.

Given the uniqueness and substantial size of the property, the broad community support and benefits for salmon recovery at Island Unit/Deepwater Slough Phase 2, I strongly encourage WDFW to pursue full estuary habitat restoration at the site to support salmon recovery. This project is vitally important for Puget Sound Chinook salmon recovery in the Skagit Basin.

If you need further information, please contact Laurel Jennings, NOAA Restoration Center, at laurel.jennings@noaa.gov.

Sincerely,

×

Megan Callahan Grant
Northwest Regional Supervisor, NOAA RC

Cc: Amy Windrope, WDFW
Brendan Brokes, WDFW
Jennifer Steger, NOAA
Elizabeth Babcock, NOAA
Janet Curran, NOAA
Laurel Jennings, NOAA



*Western
Washington
Agricultural
Association*

December 16, 2020

To: Washington Department of Fish and Wildlife, North Puget Sound Regional Office
Attention: Seth Ballhorn *via email*

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Owen Peth

Dan Gunderson

Andy Schuh

Re: Western Washington Agricultural Association public comment on the Washington Department of Fish and Wildlife Island Unit draft alternatives analysis report

Dear Mr. Ballhorn,

Western Washington Agricultural Association (WWAA) respectfully provides to following public comment relating to the Washington Department of Fish and Wildlife's (WDFW) Island Unit alternative analysis process and report.

On April 1, 2010, WDFW entered into the Skagit Delta Tidegates and Fish Initiative Implementation Agreement (TFI), with the National Oceanic and Atmospheric Administration (NOAA), WWAA, and twelve Skagit County special purpose districts (Districts). As the Districts TFI agent, WWAA's comments incorporate and represent their interest on this matter.

The TFI "...*facilitate(s) the achievement of functional estuarine habitat restoration within the Skagit delta area in a manner that will result in the least possible impact to established agricultural lands in the Skagit Delta...*" (TFI IA, 2010). The TFI remains in place, with all parties participating and complying with mutually agreed commitments. Collaboration on the landscape continues to progress Chinook restoration conversations with private landowners.

Foundational to the TFI, the legislatively established premise that State lands identified as suitable and potential Chinook habitat, will be prioritized and utilized prior to privately held Skagit delta farmland. While multiple estuary restoration projects have been completed and are being developed within the TFI implementation area, WDFW's Island Unit (Deepwater Slough) remains a priority site for restoration. WWAA and Districts emphasize a critical TFI element;

"If recovery goals are still not being achieved after the ten-year time horizon, the WDFW will come under increasing pressure to restore the remaining habitat at the Deepwater Slough site. This would likely involve the complete removal of levees around each of the two lobes left after the first Deepwater project. Increase tidal delta rearing habitats in scrub-shrub zone." (TFI IA, 2010)

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E-mail: info@westag.org

As WDFW's TFI partners, WWAA and Districts applaud the Department's current efforts to implement restoration at this site. At the same time, WWAA and Districts encourages WDFW maximize Chinook smolt capacity and production, regardless of the overall scale of the selected alternative. As prioritized in the TFI and reflected in WDFW's Skagit Hydrodynamic Modelling Project, WWAA and Districts urge the Department to seek and select project alternatives and designs which 1. makes most efficient use of agricultural lands, in terms of maximized Chinook smolt per converted acre of converted land, and 2. preserves the agricultural landscape through continued tidegate maintenance, repair, replacement.

Lastly, as WDFW decides which Island Unit restoration alternative best balances Department mandates and commitments , WWAA and Districts remind leadership that infrastructure work still remains to finish the Wiley Slough Restoration Project. While anticipated Chinook benefits are reportedly higher than anticipated, expected drainage and dike improvements associated with this project have not yet been completed. WWAA and Districts believe that while both Island Unit and Wiley Slough projects significantly advance Chinook recovery, Department goals and commitments extend beyond a single species and interest, and should occur in a way that one is not prioritized for funding or completion at the cost of the other.

When the Department is interested in additional dialogue or coordination with WWAA or Districts on Island Unit project alternative selection, Wiley Slough repair planning and progress, or TFI implementation, please contact Brandon Roozen, broozen@westag.org.

Respectfully,



Brandon Roozen
Executive Director

Enclosure: CDID 22 February 25, 2019, Wiley Slough Project Repair and Funding Letter
WWAA June 25, 2020, Wiley Slough Project Repair and Funding Letter

Cc:

Skagit County Diking District No. 3
Skagit County Dike, Drainage and Irrigation District No. 5
Skagit County Dike, Drainage and Irrigation District No. 12
Skagit County Drainage and Irrigation Improvement District No. 14
Skagit County Drainage and Irrigation Improvement District No. 15
Skagit County Drainage and Irrigation Improvement District No. 16
Skagit County Drainage and Irrigation Improvement District No. 17
Skagit County Drainage and Irrigation Improvement District No. 18
Skagit County Drainage and Irrigation Improvement District No. 19
Skagit County Drainage and Irrigation Improvement District No. 22
Skagit County Consolidated Diking Improvement District No. 22
Skagit County Dike, Drainage and Irrigation District No. 25



Skagit River System Cooperative

11426 Moorage Way • P.O. Box 368 LaConner, WA 98257-0368

Phone: 360-466-7228 • Fax: 360-466-4047 • www.skagitcoop.org

16 December 2020

Brendan Brokes
Northwest Regional Director
Washington Department of Fish and Wildlife
16018 Mill Creek Blvd
Mill Creek, WA 98012
Via email: bbrokes@dfw.wa.gov

RE: Skagit Wildlife Area Island Unit alternatives analysis

Dear Mr. Brokes:

The Skagit River System Cooperative, a fisheries and environmental services consortium of the Swinomish Indian Tribal Community and the Sauk-Suiattle Indian Tribe, is taking this opportunity to formally comment on the alternatives analysis prepared by the Washington Department of Fish and Wildlife (WDFW) for potential restoration of the 270-acre Island Unit of the Skagit Wildlife Area.

We strongly urge WDFW to choose the full restoration alternative for the Island Unit project for the following reasons:

[1] The State of Washington has a paramount responsibility and obligation to uphold tribal treaty rights by recovering Chinook salmon populations in the Skagit Basin, and Puget Sound, to a level of abundance capable of sustaining tribal fishing rights. The full restoration alternative is the only alternative that responds fully to this responsibility and obligation.

[2] The decision criteria that your agency has developed for the alternatives analysis clearly show that the full restoration provides greater habitat value than any other option. Of the decision criteria that distinguish between restoration alternatives, the full restoration option provides maximum value for two of two criteria in the category of WDFW policies, 2 of 2 criteria in the category of WDFW agreements and obligations, 1 of 1 criteria in the category of costs and funding, 4 of 6 criteria in the category of fish and wildlife needs, 2 of 3 criteria in the category of community interests, and 1 of 1 criteria in the category of resilience, i.e., the full restoration option is superior to all other alternatives according to 12 of 15 criteria.

[3] The State of Washington has a paramount responsibility and obligation to its citizens to recover Chinook salmon, a threatened species under the Endangered Species Act. Extinction of this species, which is so important to the culture and economy of the region,

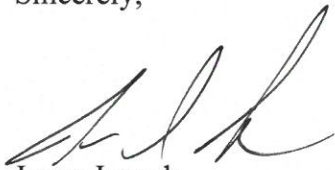
is not an option for WDFW, an agency directly responsible for fish and wildlife resources of the state. The full restoration alternative is the only alternative that responds fully to this responsibility and obligation. Conversely, foregoing full restoration would threaten recovery of Chinook salmon, while not benefitting any other threatened or endangered species.

[4] The State of Washington must lead salmon recovery by example, as mandated by House Bill 1418 of 2003, wherein it is stated that habitat restoration for salmon recovery should be prioritized on public lands. Extensive historical habitat loss, coupled with mandated prioritization of public lands, means that all ecologically appropriate public lands should be restored to natural condition to recover threatened Chinook salmon. Given severely limited opportunities for appropriate habitat restoration on public lands in the Skagit Delta, the full restoration alternative is essential.

[5] To recover threatened Chinook salmon, the Skagit delta needs to provide habitat for 1.35 million more smolts annually, which is predicted to require 2,700 acres of estuary restoration and improving access to existing estuary habitats. However, restoration opportunities within the Skagit delta are limited to only a few areas due to topographic, geomorphic, and landownership constraints. The Skagit Chinook Recovery Plan proposed twelve candidate restoration areas that, if restored, could achieve the 1.35 million new smolts annually goal. Because of the limited geographic restoration opportunities, the practice of restoring only partial footprints of candidate sites on public lands is not likely to achieve Skagit Chinook salmon recovery goals for estuary habitat. There are simply not enough feasible restoration opportunities to pursue this “splitting the baby” approach. Thus, full restoration at the Island Unit site is necessary.

All of the above lead inexorably to only one conclusion: The State of Washington has a paramount responsibility and obligation to recover threatened Chinook salmon and the only restoration alternative that maximizes the State’s ability to meet that responsibility and obligation is the full restoration alternative for Island Unit habitat restoration. Anything less would be an abdication by the State to adhere to its co-management responsibilities, achieve its fish habitat restoration policy goals, and meet its obligations to the Swinomish and Sauk Suiattle Tribes. Thank you for your consideration of our comments.

Sincerely,



Jason Joseph
Board Chairman, Skagit River System Cooperative

cc: Kelly Susewind, Director, Washington Department of Fish and Wildlife

Frequently Asked Questions

Projects that have been completed don't look like they're working – they just look like shallow, muddy places that are too hot for fish to survive and are invaded by cattails. What information do you have to show that they're actually working?

Monitoring results from several projects indicate that as soon as areas are restored, juvenile Chinook occupy all the habitats they provide, including ponded marshplain (shallow, sometimes muddy habitats), distributary channels, and blind tidal channels. Juvenile Chinook are found on restored sites at similar densities as they are found in native estuary habitats. They use restored areas with a variety of water temperatures, possibly using the variation in temperature to feed and grow more quickly. Excerpts from individual restoration site monitoring reports are included below.

Results from Deepwater Slough

“Results from each year (2001-2003) showed juvenile Chinook salmon were present in distributary and blind channel habitat at both treatment and reference sites. The results demonstrate that juvenile Chinook salmon colonized the restored habitat within the project area in the first year after construction. In fact, higher densities of juvenile Chinook salmon were often found in the treatment areas than in the reference areas.”

“the new habitat created by the Deepwater Slough restoration project is being used by juvenile Chinook salmon at similar levels to other habitat found within the Skagit estuary.”

Results from Wiley Slough

“three to four years after dike setback restoration was completed, juvenile Chinook are benefiting from the restored habitat due to both impoundments and channels currently present within the dike setback areas of the Wiley Slough Restoration Project.”

“juvenile Chinook salmon are using the restored areas of both Wiley and Teal Slough lobes (west and east of spur dike, respectively) at seasonal density levels consistent with other long term monitoring sites within the Skagit River estuary.”

“Juvenile Chinook salmon may be keying in on the slightly warmer and saltier water in the Wiley lobe for growth advantages (e.g., more efficient conversion of food to fish body weight; better quality –higher calorie– or more abundant prey). Statistically significant positive relationships were detected between water temperature and salinity and juvenile Chinook density. These observations are consistent with the idea that fish may have a metabolic advantage by occupying the Wiley lobe compared to the Teal lobe.”

Results from Fisher Slough

“mean fork length of juvenile Chinook rearing in Fisher Slough increased substantially during the spring and summer months, when temperatures were energetically more favorable for growth”

“Increased mean fork length observed in juvenile Chinook salmon rearing in Fisher Slough associated with the dike setback was likely not only a result of the increase in magnitude in seasonal water surface temperature but more importantly due to the increased spatial variability in water surface temperature associated with the dike setback.”

Results from Fir Island Farm

“Over the four years of beach seine sampling, we caught over 80,000 fish comprised of 21 different species.”

“Analysis of seasonal density of juvenile Chinook salmon at Fir Island Farms compared to long term monitored reference sites in the Skagit tidal delta suggests that the restored habitat of Fir Island Farms is utilized by juvenile Chinook consistent with levels of other areas within the Skagit tidal delta.”

The Chinook carrying capacity, or number of juvenile Chinook a site is able to hold, has been estimated for project sites that have been or could be restored since the Skagit Chinook Recovery Plan was written in 2005. No single restoration project can meet the estuary restoration goals for Chinook recovery (2,700 acres or 1.35M smolts; more on this below). However, each project contributes to the goal. Current habitats at Fir Island Farm provide a carrying capacity of approximately 64,000 smolts and Wiley Slough has a carrying capacity of approximately 367,000 smolts. Carrying capacity for each site could change as available habitats are altered by erosion, sedimentation, or sea level rise.

In terms of vegetation, the establishment of native plant communities has been different at each restoration site. Invasive vegetation can colonize restoration sites due to their disturbed nature. Cattail expansion is occurring throughout the Skagit delta, and cattail has become established on some restoration sites. It is a priority to control cattail when funding is available to allow for the development of more diverse native plant communities because in general, monocultures of any plant don't provide high-quality habitat. At the Fir Island Farm Reserve, WDFW has located and treated individual plants and the site is free of cattail so far. On other sites like Deepwater Slough, cattail has become established and control measures have made some progress when funds are available. There are other restoration sites where specific restoration actions (more channels, more breaches) may be preventing or limiting the amount of invasive vegetation that establishes, and restoration scientists are studying that now. At the same time, we don't fully understand the impact of cattail on juvenile salmon and the food they eat in the estuary. Research around this question is a priority for local scientists, and funding is currently being sought to better understand conditions that enable cattail to become established in estuaries and the impact of cattail on fish and other organisms.

For more information, please read our handout on [The value of estuary habitat restoration for Skagit Chinook salmon recovery](#)

With millions of dollars already spent on salmon habitat restoration and hundreds of acres restored back to estuary, why are we not seeing increased fishing opportunities?

Salmon populations are affected by numerous factors, including habitat conditions, ocean conditions, fishing (both direct harvest and as by-catch), predation, competition, and dam operations. Estuary habitats are important rearing areas as juvenile salmon feed and grow before heading out into Puget Sound. We know from monitoring restoration project sites that juvenile Chinook salmon are using restored areas at densities similar to surrounding marshes and we are starting to see better survival of Chinook salmon smolts due to increases in estuary habitat. However, impacts they experience during

other stages of their life mean that the increased survival at a young age does not yet translate directly into detectable gains in adult Chinook returning to the river to spawn.

Fishing opportunities in Puget Sound are affected by the condition of all stocks that could potentially be impacted by a fishery. The listing of Puget Sound Chinook salmon under the federal Endangered Species Act (ESA) in the late 1990s curtailed fishing opportunities as protections for these stocks went into place. The Skagit River system on average produces more than half of the wild Chinook that return to Puget Sound. Fishing for wild Chinook in Puget Sound will continue to be constrained due to limiting Chinook stocks from neighboring river systems.

There has not been a recreational fishery targeting wild Chinook in the Skagit River since 2009, but a future fishery does appear to be within reach with gains in adult returns. When the escapement forecasts substantially exceed 14,500 Chinook, which it has come close to doing in the last five years, sport fisheries for these stocks become an option in the Skagit River. We know that smolts with access to estuary habitat have a greater chance of surviving to adulthood and contributing to escapement forecasts.

Why don't we just stop all fishing for a year or two? Wouldn't that help recover salmon without doing all this habitat restoration?

Fishing in Puget Sound and each river including the Skagit River is carefully managed by WDFW and tribes (co-managers) under the authorization and supervision of the National Oceanic and Atmospheric Administration (NOAA) fisheries as required by law. Puget Sound Chinook are federally listed under the ESA and fisheries for Chinook are the most scrutinized throughout Washington. While it may seem counterintuitive for NOAA to allow any harvest of an ESA-listed species within its jurisdiction (waters of the United States, NOAA has no control over harvest in Canadian Waters except through negotiated terms in the Pacific Salmon Treaty), NOAA's position on harvest in fisheries is that carefully administered harvest will not impede Chinook recovery, and simply restricting harvest will not lead to recovery of Puget Sound Chinook.

Why don't we increase hatchery production instead of doing habitat restoration to recover ESA-listed Chinook and other salmonid populations and increase fishing opportunities?

In general, most hatchery programs have one of two major goals: to increase fishing and harvest opportunities to a variety of constituents, and/or to promote the conservation of natural populations. Sometimes hatcheries use parents from the wild to get more juveniles with wild (natural origin) genes so they can help rebuild the population. Hatchery production also provides ecosystem services such as food for southern resident killer whales and transport of nutrients from marine waters to rivers and streams. Although hatchery programs may seem extremely advantageous, they must be managed properly to reduce risks.

Fishery-related risks

A major concern of hatchery programs is that they intensify fisheries that incidentally impact naturally reproducing fish, including ESA-listed species. Most Chinook salmon sport fisheries in marine waters of Washington are mixed-stock fisheries, which means hatchery fish are in the same area at the same time

as naturally reproduced fish that may come from many different stocks, some of which may be severely depressed. To provide opportunity to catch abundant hatchery fish without incidentally harvesting natural origin fish, only hatchery fish, which have had their adipose fins removed, can be kept by anglers (called a mark-selective fishery). However, in mark-selective fisheries, naturally reproduced fish are incidentally (and unavoidably) caught and released as bycatch and a proportion of all released bycatch will die as a result of the encounter. So, when hatchery fish abundance is high and fishing effort is high, the number of naturally reproduced fish caught increases as well. This can set up a situation where lots of hatchery fish are in the system and there's no way to harvest them without doing harm to naturally reproduced (natural origin) stocks. If lots of hatchery fish are not harvested and end up on the spawning grounds (strays), other problems are created (addressed below). In addition, not all mixed-stock fisheries are mark-selective so harvest may directly impact both hatchery and naturally produced fish. Similar to above, high abundance of hatchery fish can lead to increased harvest and further suppression of naturally reproduced fish.

Ecological risks

There are also ecological risks associated with increasing hatchery production for the sake of harvest opportunities. Generally speaking, salmon hatcheries artificially spawn and rear fish in a controlled environment relative to the natural environment allowing hatcheries to increase survival, size, and condition from egg to smolt life stages. Once released, hatchery smolts of ideal size and condition could outcompete naturally reproduced fish for forage in rearing habitats like estuaries. Emerging research suggests that at certain times, hatchery fish do occupy estuary habitats, which can result in the estuary filling up to capacity and the potential for native origin fish to be displaced. A large number of hatchery smolts could also attract and increase predation, subsequently increasing predation on naturally reproduced juveniles.

Genetic risks

Hatchery programs could also pose genetic risks to ESA-listed populations. If not managed properly, loss of genetic diversity can occur. As a result, fish can become less able to survive the many challenges they face in the course of their lives, potentially having negative effects on the population. If hatchery-raised fish are used to produce additional generations of hatchery-raised fish, and hatchery offspring excessively stray and spawn with natural origin fish on the spawning grounds, the genetic pool on the spawning grounds is reduced.

Managing risks

WDFW works closely with federal agencies and our tribal co-managers to manage hatchery populations to reduce potential fishery-related, ecological, and genetic risks. Several hatchery reform measures have been implemented to reduce these risks, including managing hatchery program size, adjusting release strategies, and monitoring and tracking gene flow to reduce the impacts on naturally-reproducing fish. In producing adult salmon for a variety of stakeholders, hatchery programs use hatchery reform management strategies to work collaboratively with habitat restoration activities towards the goal of providing adequate forage and increased smolt survival in estuaries.

There are thousands of acres of estuary in Skagit Bay already – why do we need more? What difference will a few more hundred acres make?

Salmon habitat from the headwaters to Puget Sound have been impacted for over 150 years, resulting in habitat degradation and losses. Now, just a fraction of historic habitats are available to salmon. In the late 1990s when Chinook salmon were listed under the federal Endangered Species Act, it was estimated that only 13% of estuary habitats preferred by Chinook salmon remained in the Skagit delta. The Skagit Chinook Recovery Plan identified the estuary as a bottleneck to Chinook salmon population recovery. Even if more spawning habitat were available, many of the young salmon coming down the river would not survive because there is not enough rearing habitat (including estuary) for them to feed, grow, and transition to saltwater. The Recovery Plan identified a need to provide space for an additional 1.35 million out-migrating smolts, which was estimated to be approximately 2,700 acres of additional estuary habitat. Several hundred acres of estuary have been restored since the plan was written. There is still a need to restore more estuary to meet recovery plan goals and achieve a healthy and sustainable Chinook salmon population in the Skagit watershed. No single project will achieve the goals. Multiple projects will be needed to reach the recovery plan goals for the estuary.

Why isn't restoration being done on private lands? Why is all the restoration being done on public lands?

With the remaining need for additional estuary, restoration will have to happen on public and private lands. There are several reasons that restoration has been completed and continues to be considered on public lands first. [House Bill 1418](#) required prioritizing actions for Chinook recovery that did not negatively impact commercial farmland, and specifically prioritized estuary restoration on public lands. A [subsequent report](#) that prioritized projects categorized Deepwater II (Island Unit) as a Tier 1 project, with Tier 1 projects being the highest priority projects for implementation. It is the only Tier 1 project that has not been completed to date. Additionally, the Island Unit was identified as a priority project through the [Skagit Hydrodynamic Modeling Project](#), which assessed 22 estuary restoration project concepts throughout the delta for their ability to maximize benefits and minimize impacts to farm, fish, and flood interests.

Will waterfowl populations decline without enhanced forage at the Island Unit?

Waterfowl congregate on the Island Unit because of current wetland management activities, which provide a high concentration of calories and water level (depth) management designed to optimize food availability for dabbling ducks. Estuary wetlands also provide forage for dabbling ducks, however our understanding of the relative value and availability of these food resources is not complete due to lack of studies and data in Puget Sound. From studies in other regions, we know the concentration, timing, and availability of these foods is different from farmed forage. It is assumed that estuaries typically provide lower density food resources with lower caloric value than enhanced forage, and those calories tend to be available during the fall and spring rather than winter. In addition, water levels fluctuate with the tides, limiting the amount of time water depths allow dabbling ducks to reach food. The mosaic of estuarine and other habitats on the landscape provides diverse food resources that dabbling ducks and other waterfowl rely on.

Food resources are available on the larger landscape of the greater Skagit Delta in the estuary, on other WDFW-managed lands, and on private farmland. There is some uncertainty related to relying on private lands to meet the forage needs of dabbling ducks for several reasons. Food on the larger landscape is utilized by dabbling ducks, as well as geese and swans. Also, changes in agricultural crop types and harvest efficiencies can impact food available to waterfowl, as forage available on commercial farmland is any left after harvest, whereas WDFW lands provide food grown solely for waterfowl. From past assessments of landscape-scale food resources, it is assumed that forage available on the Island Unit is relatively small compared to food resources available on the larger landscape. Therefore, the number of overwintering waterfowl is not expected to decline with full or partial restoration of the Island Unit. However, local concentrations of waterfowl on the Island Unit will likely change as dabbling ducks disperse across the larger landscape to seek food elsewhere.

For additional information, please read the Appendix E: Waterfowl and Shorebird Technical Memorandum.

WDFW has committed to providing replacement lands to offset waterfowl hunting opportunity losses associated with previous restoration projects. Why haven't replacement lands been provided?

WDFW remains committed to continue providing a broad portfolio of land available for waterfowl hunting in Skagit County and throughout North Puget Sound. Appendix H: Changes in WDFW-Managed Land and Habitat Types Since 2000 details how habitat types and huntable acres provided by WDFW have changed over the past 20 years since estuary restoration projects began. The acreage tables in the appendix show that enhanced forage grown for waterfowl in the Skagit Wildlife Area has decreased by 547 acres in that timeframe, while most other habitat types and the overall huntable area has increased. While many species and people on WDFW-managed lands benefit from the overall growth of the wildlife area, WDFW has heard from waterfowl hunters that intertidal sites are more challenging to access and fields with enhanced forage are preferred. Because of this, WDFW has continuously sought new opportunities to improve waterfowl hunting access and enhanced forage, commonly called "replacement lands".

WDFW initially focused on acquisition of new land as the preferred tool to offset the impact of changing access and habitat types. A few compatible properties with willing sellers were identified over the years. WDFW completed internal approval processes to pursue acquisition funds, and staff submitted grant applications for funding. Each funding application so far, however, has been unsuccessful in grant rounds that compete with other projects throughout the state and country. The main challenges to overcome for funding are:

- 1. Property values in the North Puget Sound region are higher on a per-acre basis than most other areas, and*
- 2. there are fewer linkages between non-intertidal habitat and recovery of species listed in the Endangered Species Act in this region when compared to others.*

In addition to funding challenges, WDFW also acknowledges prior agreements with the agriculture community, which recognize that conversion of private farmland should be focused on salmon recovery. Pursuit of acquisition for other purposes requires additional collaboration. Although acquisition of replacement land has been challenging, WDFW will continue to pursue this tool when appropriate and available.

Although acquisition of replacement land for enhanced forage has largely been unsuccessful to date, there are several other tools WDFW has used that have been more successful.

- 1. The [Private Lands Access Program](#) has continued to grow over the past several years and now consistently provides 1,500-2,000 acres of huntable property in the region through agreements with private landowners, some of which provide enhanced waterfowl forage.*
- 2. WDFW has recently started exploring partnerships with other public landowners to facilitate opening new properties to waterfowl hunting. A recent example is the [300+ acre property at Smith Island](#) managed by Snohomish County.*
- 3. WDFW has improved habitat for waterfowl and hunters on properties within the Skagit Wildlife Area. Two examples are a project on the 400+ acre [Samish Unit](#) that increases the ability to control water for farming enhanced forage, and restoring wetlands on the adjacent 100+ acre [Samish River Unit](#).*
- 4. Several boat launches and parking lots are currently funded that are intended to improve access to existing WDFW waterfowl hunting properties.*

If the area is restored, will public hunting be allowed?

Yes, public hunting would be allowed in areas restored to estuary. As we move into the next design phase, we'll be looking for ways to improve waterfowl hunting access into the design.

The criteria used to assess alternatives seem weighted toward issues that would end up pointing to a particular outcome/preferred alternative. How were criteria developed?

Draft criteria were developed by the cross-program project team. Internal to WDFW, Region 4 (North Puget Sound region) staff from Wildlife, Fish, and Habitat programs and the state waterfowl section manager reviewed the draft criteria and provided input. The [Island Unit Advisory Group](#) also reviewed the criteria and provided input. A number of changes were made as a result of this input, including revising/reorganizing criteria and adding new criteria. All of these groups were also asked for their input on the application of the criteria to the alternatives and whether the summary ratings and descriptions were accurate.

What is the next stage of the project?

The next stage of the process is for WDFW to secure funding to design and obtain permits for the restoration project. Construction is not likely to begin for several years. WDFW will continue to seek input from waterfowl hunters on the design of the restoration project, as well as how to increase waterfowl hunting opportunities throughout the region.

SEPTEMBER 24, 2020

APPENDIX C: TIDAL CHANNEL AND
CHINOOK SALMON TECHNICAL
MEMORANDUM

HABITAT AND JUVENILE CHINOOK BENEFIT PREDICTIONS DEEPWATER
PHASE 2 RESTORATION ALTERNATIVES

ERIC BEAMER AND GREG HOOD
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Memorandum

To: Jenny Baker, Washington Department of Fish and Wildlife

From: Eric Beamer and Greg Hood, Skagit River System Cooperative Research Program

Date: September 24, 2020

Subject: Habitat and juvenile Chinook benefit predictions Deepwater Phase 2 Restoration Alternatives

This memo is fulfillment of an agreement between the Skagit River System Cooperative Research Program and the Washington Department of Fish and Wildlife (WDFW) under WDFW Contract No. 20-15696 where we make predictions of (1) the length, number, and area of tidal channels that will result from three Island Unit of the Skagit Wildlife Area restoration alternatives (Full Restoration, Alternative 2, Alternative 3); (2) landscape connectivity calculations for their conceptual tidal channel restoration designs; and (3) a carrying capacity estimate for juvenile Chinook salmon for each alternative.

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Introduction

In this memo we make predictions of (1) the length, number, and area of tidal channels that will result from three Island Unit of the Skagit Wildlife Area restoration alternatives (Full Restoration, Alternative 2, Alternative 3); (2) landscape connectivity calculations for their conceptual tidal channel restoration designs; and (3) a carrying capacity estimate for juvenile Chinook salmon for each alternative. Making these predictions required development of a conceptual restoration design for each alternative, which are also presented here. It should be noted that the conceptual restoration design for the chosen alternative will be subject to future modification as it is transformed into a final restoration design, depending on project constraints that may be encountered by engineers and biologists in the course of project development. This is standard procedure for tidal marsh restoration projects. Consequently, the estimates of juvenile Chinook carrying capacity made in this memo are preliminary and should be used only for the purposes of comparing the three restoration alternatives. Final estimates of carrying capacity will depend on the final restoration design and as-built surveys.

Methods

We predicted tidal channel habitat, landscape connectivity, and juvenile Chinook carrying capacity for three Island Unit of the Skagit Wildlife Area restoration alternatives (Full Restoration, Alternative 2, Alternative 3).

Tidal Channel Habitat

Restoration Alternative Footprint: We predicted channel habitat metrics for the restoration footprint of each alternative using three different methods 1) Standard Allometric Prediction (Hood 2007), 2) Tide Range-Adjusted (TRA) Allometric Prediction (Hood 2015), and 3) Conceptual Design. The standard (Hood 2007) and TRA (Hood 2015) allometric methods are empirical regression models, i.e., patterns in reference marshes are used to predict outcomes in restoration marshes. The standard allometric model uses marsh area alone to predict channel metrics. The TRA allometric model is a more recent method reflecting that geographic variation in tidal channel allometry is also influenced by tide range, storm wave fetch, and sediment supply. Both allometric models are scaling logarithmic relationships, so confidence intervals for predictions have wide margins of uncertainty. To reduce uncertainty in predictions we also used a conceptual design method which identifies channel planform locations using historical aerial photos/surveys and topography. The conceptual design method produces design-specified values of channel metrics, rather than statistical predictions. Thus, there are no statistical uncertainties in the design. Tidal channel metrics for each of the three methods are 1) total channel length, 2) number of channel outlets, and 3) channel area.

Adjacent Downstream Marshes: Tidal marsh restoration through dike breaching or removal can have direct effects on channel network geometry in the restored site, as well as indirect effects on the channel network of the existing adjacent tidal marsh (Hood 2004). Restoration of upstream tidal prism via new tidal channels or restored tidal marsh surface drainage area will typically increase the width and surface area of downstream tidal channels in existing adjacent downstream

marsh as the channels adjust (erode) to accommodate the increased tidal prism contributed by the newly restored site. Channel length is less likely to be increased unless new tidal channels develop in the downstream marsh. To quantify new channel area that would likely be created in adjacent downstream marshes as a result of the alternatives, we compared downstream channel changes (before vs. after restoration) influenced by the Wiley Slough Restoration and Deepwater Phase 1 Restoration projects. We found in the twelve mainstem tidal channels, downstream tidal channel mainstem widths increased by 29% on average, while surface areas increased 31%. We applied the 31% value for channel area increase to existing tidal channel mainstems in adjacent downstream marsh polygons for each of the Island Unit restoration alternatives.

Landscape connectivity

Landscape connectivity, or large-scale connectivity, refers to the relative distances and pathways that salmon must travel to find habitat over a very large area. As this concept is applied in the Skagit River delta, landscape connectivity is a function of both the distance and complexity of the pathway that salmon must follow to specific habitat areas (e.g., candidate restoration sites). Connectivity decreases as complexity of the route the fish must swim increases and the distance the fish must swim increases. Within the delta, the complexity of the route fish must take to find habitat is measured by the distributary bifurcation order and distance traveled. Habitat that is less connected to the source of fish has lower densities of fish. We use landscape connectivity to help predict juvenile Chinook benefits for candidate restoration areas and to interpret juvenile Chinook monitoring results from sites throughout the Skagit tidal delta.

Landscape connectivity was calculated adequately for potential fish migration pathways to the three Island Unit of the Skagit Wildlife Area restoration alternatives (Full Restoration, Alternative 2, Alternative 3) as part of the SHDM projects. Detailed methods are described in Beamer et al. (2016). Maps, showing fish migration pathways, used to calculate landscape connectivity values are attached as Appendix 1.

Juvenile Chinook carrying capacity predictions

Juvenile Chinook carrying capacity was predicted using an empirical model developed for the Skagit Chinook Recovery Plan that predicts carrying capacity estimates for candidate restoration projects within the Skagit tidal delta based on channel area and landscape connectivity. Overall, the model explained 68% of the variation in seasonal Chinook density at six sites over eleven years. The habitat factor (i.e., landscape connectivity) explained 37% of the variation while density dependence (outmigrants) explained the remaining 31%. The methods are described in Beamer et al. (2005) (pages 89-94). Juvenile Chinook salmon carrying capacity is based on two variables: 1) wetted area available to fish; and 2) landscape connectivity. Both variables are positively correlated with juvenile Chinook abundance (i.e., larger habitat areas and higher connectivity values result in higher estimates of juvenile Chinook carrying capacity).

We calculated juvenile Chinook carrying capacity based on the average (and range) landscape connectivity estimates and predicted channel area using the Conceptual Design method.

Results

Full Restoration

Channel predictions: The Full Restoration alternative is comprised of two hydrologically distinct areas, a 67.6 ha area on the east side of Deepwater Slough and a 40.6 area on the west side of Deepwater Slough (Figure 1). The standard allometric predictions for the Full Restoration alternative for channel length, channel outlets, and channel area are 22,525 m, 45, and 4.682 ha., respectively (Table 1). The tide range-adjusted allometric predictions for channel length, channel outlets, and channel area are 8,110 m, 24, and 1.846 ha., respectively. The conceptual design predictions for channel length, channel outlets, and channel area are 16,900 m, 35, and 3.519 ha., respectively. Additionally, the Full Restoration alternative is predicted to create 0.653 ha of new channel habitat in adjacent downstream marsh areas (Table 1).

Landscape Connectivity: Landscape connectivity values for the Full Restoration alternative will vary by the 35 different channel outlet locations (Table 4, Figure 1). Average landscape connectivity estimates for the Full Restoration alternative is 0.039582 (range: 0.032273 - 0.047257) in the western polygon and 0.034799 (range: 0.028465 - 0.040754) in the eastern polygon (Table 1).

Chinook Carrying Capacity: Predicted juvenile Chinook carrying capacity for the Full Restoration alternative is 72,820 (range: 59,377 - 86,035) smolts per year when including fish benefits for channel area formed due to indirect effects of the project in adjacent marshes downstream (Table 1).

Alternative 2

Channel predictions: Alternative 2 is comprised of one hydrologically distinct area, a 67.6 ha area on the east side of Deepwater Slough (Figure 2). The standard allometric predictions for Alternative 2 for channel length, channel outlets, and channel area are 14,760 m, 26, and 3.205 ha., respectively (Table 2). The tide range-adjusted allometric predictions for channel length, channel outlets, and channel area are 5,285 m, 14, and 1.254 ha., respectively. The conceptual design predictions for channel length, channel outlets, and channel area are 11,320 m, 21, and 2.458 ha., respectively. Alternative 2 is predicted to create 0.289 ha of new channel habitat in its adjacent downstream marsh area (Table 2).

Landscape Connectivity: Landscape connectivity values for Alternative 2 will vary by the 21 different channel outlet locations (Table 5, Figure 2). Average landscape connectivity estimates for Alternative 2 is 0.034799 (range: 0.028465 - 0.040754) (Table 2).

Chinook Carrying Capacity: Predicted juvenile Chinook carrying capacity for Alternative 2 is 45,776 (range: 37,371 - 53,692) smolts per year when including fish benefits for channel area formed due to indirect effects of the project in adjacent marshes downstream (Table 2).

Alternative 3

Channel predictions: Alternative 3 is comprised of two hydrologically distinct areas, a 16.5 ha northern area on the west side of Deepwater Slough and a 28.1 ha southern area on the east side of Deepwater Slough (Figure 3). The standard allometric predictions for Alternative 3 for channel

length, channel outlets, and channel area are 7,380 m, 26, and 1.220 ha., respectively (Table 3). The tide range-adjusted allometric predictions for channel length, channel outlets, and channel area are 2,754 m, 14, and 0.505 ha., respectively. The conceptual design predictions for channel length, channel outlets, and channel area are 7,594 m, 18, and 1.248 ha., respectively. Alternative 2 is predicted to create 0.563 ha of new channel habitat in its adjacent downstream marsh areas (Table 3).

Landscape Connectivity: Landscape connectivity values for Alternative 3 will vary by the 18 different channel outlet locations (Table 6, Figure 3). Average landscape connectivity estimates for Alternative 3 is 0.036688 (0.032273 - 0.041236) in the northern polygon and 0.031145 (range: 0.028465 - 0.034031) in the southern polygon (Table 3).

Chinook Carrying Capacity: Predicted juvenile Chinook carrying capacity for Alternative 3 is 29,135 (range: 26,116 - 32,309) smolts per year when including fish benefits for channel area formed due to indirect effects of the project in adjacent marshes downstream (Table 3).

Discussion

In this section we discuss differences in the habitat prediction methods for the Island Unit of the Skagit Wildlife Area restoration alternative footprints, and their use in three planning documents: Skagit Chinook Recovery Plan (SRSC and WDFW 2005), Skagit Hydrodynamic Model Project (Beamer et al 2016), and this memo.

Differences between habitat prediction methods

Restoration Alternative Footprint: As one moves upstream from the bay along the Skagit River's large distributaries, tide range declines, so the tidal energy available to scour tidal channels also declines. Tidal geomorphological processes gradually transition to fluvial geomorphological processes, until at the head of tide (near Mount Vernon) tidal processes disappear and fluvial processes completely take over. The standard allometric model does not take the effect of varying tidal range within deltas into account, so it may over-estimate tidal channel count, length, and area in marshes that are located in more landward (upstream) portions of the tidal-fluvial energy gradient where tidal energy is diminished. To account for tides, the TRA-allometric model interpolates tide range from the bay (full range expression) to the head of tide (zero tide) according to the distance along the distributary channels from the bay. It then applies results from comparisons between tidal river delta marshes in Puget Sound with varying tide ranges (Hood 2015). However, these results could not entirely distinguish the effects of tide range and fetch, which were autocorrelated. Thus, while the logic of accounting for tide range seems sensible, there is uncertainty about the interaction between tide range and fetch. Additionally, extrapolating from differences between Puget Sound river deltas and applying those patterns to a tidal-fluvial gradient within a large river delta, like the Skagit, violates a basic principle of regression analysis, i.e., thou shalt not extrapolate outside of your range of observations. Or in other words, differences between river delta systems may be different and controlled by different processes than differences within a river delta system along a tidal-fluvial process gradient. Thus, there are concerns about indiscriminately applying either allometric model (standard or TRA) to the Island Unit alternatives analysis, because the proposed restoration site is located farther upstream than are any of the Skagit

Delta reference tidal marshes and so it may be affected by tidal and fluvial processes to a different degree than downstream reference marshes, and in a way that is challenging to predict.

To bound our predictions for the Island Unit alternatives analysis, we applied both the standard allometric model and the TRA-allometric model to the proposed alternatives (Tables 1-3). The result was that the TRA-allometric model predicted approximately half the tidal channel count, length, and area as did the standard allometric model, with the difference between the two models increasing as marsh area increased. This large discrepancy leads to two risks: overpredicting vs. underpredicting the amount of tidal channel that should result from tidal marsh restoration. The ecological and socio-political consequences of these risks are asymmetrical. If we over-predict channel geometry, the consequence will be that the over-excavated tidal channel networks will resize (partially fill with sediment to become smaller) over time to reach their appropriate equilibrium condition. During this period of adjustment to equilibrium, salmon production will be higher than the eventual equilibrium, but decline until equilibrium conditions are met. From observations of over-excavated systems in the Skagit Delta, it appears that the time required for such an adjustment could be on the order of a couple of decades (unpublished observations). However, if we underpredict channel geometry, the consequence will be that the under-excavated tidal channel network could take many decades, perhaps as many as 7 or 8 decades, to erode to a larger equilibrium size (Hood 2019), during which time salmon production will be impaired relative to equilibrium conditions. The reason for this asymmetry in adjustment to equilibrium is that formerly agricultural soils can be resistant to tidal erosion, often containing a clay-dominated plow pan, i.e., a hard pan formed by plowing that sorts the sediment by grain size so that fine sediments cohere into clay, by compression of the sediment by heavy farm machinery, and by loss of sediment organic material to oxidative decomposition. If it is determined that underprediction has occurred there will be pressure for additional rounds of restoration on the site to more rapidly achieve appropriate levels of salmon production. Further rounds of restoration will entail greater economic and political costs. Clearly, overprediction is preferable to underprediction.

Our third approach, conceptual planform channel design, was implemented and compared to the standard and TRA allometric models in this memo (Tables 1-3). This approach consisted of identifying historical tidal channel remnants within the restoration site, identifying topographic lows from 2012 and 2019 lidar and from ponded areas in aerial photographs, and incorporating existing excavated drainage ditches and ponds where this seemed appropriate. These features were all included in a conceptual planform design to identify the potential locations of future restoration site tidal channels. Historical channel remnants were identified by their sinuous form, which contrasts with typically straight drainage ditches that intersect each other at right angles. Topographic lows were used to site locations where tidal channels could be excavated. The resulting tidal channel network was then compared to the standard and TRA allometric model predictions. The aim of this approach was to produce a channel network design responsive to site conditions, and intermediate between both allometric predictions so that an appropriate estimate of fish production could be facilitated. However, the conceptual design was also intentionally biased in favor of the standard allometric prediction to reduce the risk of underprediction. It should be noted that the conceptual planform design can be used to estimate channel network length, but not to directly estimate planform channel widths. Channel widths and depths will be calculated

during later engineering design stages once a final restoration alternative has been chosen. The purpose of the conceptual design is to site the potential restoration channels and allow estimation of channel network lengths. Consequently, channel network areas for the conceptual designs were estimated with reference to the standard allometric prediction using the following equation: conceptual design channel area = standard allometric channel area prediction x conceptual design channel length/standard allometric channel length prediction.

Some existing ponds and drainage ditches were retained in the conceptual restoration design for several reasons: 1) they can provide habitat to salmon in their existing location, 2) the ponds, which were excavated to provide waterfowl habitat, can continue to do so if retained, 3) retaining, rather than filling, the ponds and ditches can reduce excavation and filling costs, and 4) retaining these features in the conceptual design can provide some flexibility to engineers in their final design if they require places to dispose of dike sediments to balance cut/fill estimates. It should be noted, that while retained ponds can provide habitat for juvenile salmon (and waterfowl), once connected to the tidal channel network and associated sediment supply the ponds are likely to fill with sediment over the course of several decades and be converted to tidal channels. This process has been observed at several locations in the South Fork Skagit Delta tidal marshes (unpublished observations).

Adjacent Downstream Marshes: Not all of the proposed new channels openings in the restoration design connect to downstream channels (Figure 1). Many connect directly to large river distributaries, e.g., Freshwater Slough, Deepwater Slough, Steamboat Slough. These large distributaries will be minimally affected by site restoration, river discharge being the overwhelmingly dominant force structuring the distributaries, so potential downstream effects on river distributaries were not calculated. However, direct connection of restoration site tidal channels to river distributaries greatly increases site connectivity for salmon accessibility. Other proposed tidal channel openings connect to large downstream ponds that were historically excavated to provide waterfowl habitat. These ponds are slowly filling with sediment and this will continue even with a new connection to a restored upstream tidal channel, as has been observed for the Deepwater Slough restoration project implemented in 2000. Thus, downstream effects of tidal channel restoration were only calculated when the downstream (off-site) connection was to a blind tidal channel, and the effects were only calculated for the mainstem channels of the downstream blind tidal channels, not for any tributaries to the mainstem channel, which were deemed to be minimally influenced by project site restoration.

We believe the approach described above, based on observed channel widening after restoration results applied to specific blind channel in adjacent downstream marshes, is more accurate than the standard allometry model approach used for the Skagit Hydrodynamic Model Project described in Beamer et al. (2016).

History of juvenile Chinook capacity estimates

Predicted habitat areas and fish benefits for the Island Unit of the Skagit Wildlife Area have been included in at least two prior documents related to Skagit estuary restoration: 1) the 2005 Skagit Chinook Recovery Plan (SRSC and WDFW 2005) (herein, SRP) and 2) the 2016 Skagit Hydrodynamic Model Project (herein, SHDM). A main purpose of the SRP and SHDM was to list

candidate restoration projects that would contribute to the SRP's overall goal for estuary restoration. SRP and SHDM listed projects were largely at a conceptual stage so it should be recognized that many factors could change as individual projects are developed and move through various stages from "conceptual" to "fully designed" and ultimately "built." The 2005 SRP was the first presentation of the Deepwater Slough Phase 2 project concept. The SHDM project, in 2016, further developed the full restoration concept by completing an estuary-wide update of landscape connectivity to reflect changes that had occurred within the Skagit's distributary channel network and to include an estimate of the indirect (downstream) benefits of restoration which were inferred by Hood (2004). The Island Unit Alternatives Analysis is a next step toward refining habitat and juvenile Chinook salmon estimates for the three alternatives portrayed in this memo.

Below, and in Table 7, are summaries of the SRP and SHDM estimates for Deepwater Slough Phase 2 in contrast to results predicted for the IUAA full restoration alternative in this memo.

SRP: The SRP's estimates for the Deepwater Slough Phase 2 project used a preliminary version of the standard allometric model (Hood 2007 was not published yet) applied to a 108.5 ha footprint. The SRP a) did not account for adjacent downstream marsh effects and (b) only used one landscape connectivity value for the entire footprint area.

SHDM: The SHDM estimates for the Deepwater Slough Phase 2 project used the published version of the standard allometric model (Hood 2007) applied to a 108.57 ha footprint. The biggest difference between the SHDM and SRP Chinook carrying capacity estimates are because the SHDM project a) included an adjacent downstream marsh effect using the standard allometry method applied to 61.17 ha of adjacent marsh, (b) used updated landscape connectivity values for the Skagit delta, and (c) used a range of landscape connectivity values applied to the project footprint to reflect variability in how fish migration pathways vary across such a large area.

IUAA (Conceptual Design method): For reasons stated in the discussion section above, we believe the Conceptual Design method and our presented downstream effects method based on observed channel widening after restoration provide the best estimates for predicted habitat for the Island Unit Area. Additionally, we point out there is no change in landscape connectivity results between the IUAA (this memo) and SHDM documents and the SRP, SHDM, and IUAA all used the same juvenile Chinook carrying capacity model so no variance in estimated fish benefit between documents is due to a changing fish model.

Table 1. Channel, landscape connectivity, and juvenile Chinook carrying capacity predictions for the Deepwater Slough Phase 2 **Full Restoration Alternative**. Channel predictions are shown for three methods: standard allometric prediction (SA), tide range-adjusted allometric prediction (TRA), and conceptual design (CD) methods. Chinook carrying capacity is shown for the channel prediction from the CD method.

Polygon (from Figure 1)	Marsh Area (ha)	Method	Channel Predictions			Landscape Connectivity			Chinook carrying capacity (smolts/yr)		
			Count	Length (m)	Area (ha)	ave	low	high	ave	low	high
Western polygon	40.6	SA	19	7,765	1.477	0.039582	0.032273	0.047257			
		TRA	10	2,824	0.592						
		CD	14	5,580	1.061				20,136	16,385	24,082
downstream of west (new channel)					0.364				6,908	5,621	8,262
Eastern polygon	67.6	SA	26	14,760	3.205	0.034799	0.028465	0.040754			
		TRA	14	5,285	1.254						
		CD	21	11,320	2.458				40,961	33,439	48,044
downstream of east (new channel)					0.289				4,816	3,931	5,648
Total (within restoration footprint)									61,096	49,824	72,125
Grand Total (footprint + downstream)									72,820	59,377	86,035

Table 2. Channel, landscape connectivity, and juvenile Chinook carrying capacity predictions for the Deepwater Slough Phase 2 **Alternative 2**. Channel predictions are shown for three methods: standard allometric prediction (SA), tide range-adjusted allometric prediction (TRA), and conceptual design (CD) methods. Chinook carrying capacity is shown for the channel prediction from the CD method.

Polygon (from Figure 2)	Marsh Area (ha)	Method	Channel Predictions			Landscape Connectivity			Chinook carrying capacity (smolts/yr)		
			Count	Length (m)	Area (ha)	ave	low	high	ave	low	high
Eastern polygon from "Full" alternative	67.6	SA	26	14,760	3.205	0.034799	0.028465	0.040754			
		TRA	14	5,285	1.254						
		CD	21	11,320	2.458				40,961	33,439	48,044
downstream of east (new channel)					0.289				4,816	3,931	5,648
Total (within restoration footprint)									40,961	33,439	48,044
Grand Total (footprint + downstream)									45,776	37,371	53,692

Table 3. Channel, landscape connectivity, and juvenile Chinook carrying capacity predictions for the Deepwater Slough Phase 2 **Alternative 3**. Channel predictions are shown for three methods: standard allometric prediction (SA), tide range-adjusted allometric prediction (TRA), and conceptual design (CD) methods. Chinook carrying capacity is shown for the channel prediction from the CD method.

Polygon (from Figure 3)	Marsh Area (ha)	Method	Channel Predictions			Landscape Connectivity			Chinook carrying capacity (smolts/yr)		
			Count	Length (m)	Area (ha)	ave	low	high	ave	low	high
Northern polygon	16.5	SA	11	2,497	0.376	0.036688	0.032273	0.041236			
		TRA	6	1,001	0.170						
		CD	8	2,920	0.440				7,729	6,790	8,697
Downstream of north (new channel)					0.363				6,387	5,612	7,187
Southern polygon	28.1	SA	15	4,883	0.844	0.031145	0.028465	0.034031			
		TRA	8	1,753	0.335						
		CD	10	4,674	0.808				12,036	10,990	13,162
downstream of south (new channel)					0.200				2,983	2,724	3,262
Total (within restoration footprint)									19,765	17,781	21,859
Grand Total (footprint + downstream)									29,135	26,116	32,309

Table 4. Summary of landscape connectivity for the Full Restoration alternative.

Polygon (from Figure 1)	Fish migration pathway used (See Figure 1 for point locations)	
	Point name	Landscape connectivity
Western polygon	Point 31	0.032273
	Point 32	0.033263
	Point 33	0.039979
	Point 34	0.041236
	Point 35	0.043482
	Point 36	0.047257
Eastern polygon	Point 37	0.0375828
	Point 38	0.028572
	Point 39	0.028465
	Point 40	0.033513
	Point 41	0.034031
	Point 42	0.040754
	Point 43	0.040676

Table 5. Summary of landscape connectivity for the Alternative 2.

Polygon (from Figure 2)	Fish migration pathway used (See Figure 2 for point locations)	
	Point name	Landscape connectivity
Eastern polygon from "Full" alternative	Point 37	0.0375828
	Point 38	0.028572
	Point 39	0.028465
	Point 40	0.033513
	Point 41	0.034031
	Point 42	0.040754
	Point 43	0.040676

Table 6. Summary of landscape connectivity for the Alternative 3.

Polygon (from Figure 3)	Fish migration pathway used (See Figure 3 for point locations)	
	Point name	Landscape connectivity
Northern polygon	Point 31	0.032273
	Point 32	0.033263
	Point 33	0.039979
	Point 34	0.041236
Southern Polygon	Point 38	0.028572
	Point 39	0.028465
	Point 40	0.033513
	Point 41	0.034031

Table 7. Summary of habitat and juvenile Chinook carrying capacity predictions for the Island Unit Area of the Skagit Wildlife Area. SRP is the 2005 Skagit Chinook Recovery Plan, SHDM is the 2016 Skagit Hydrodynamic Model Project, and IUAA is the Island Unit Alternatives Analysis (results from Table 1 in this memo).

Planning Document (habitat prediction method)	Predicted Channel area (mid-point)	Landscape connectivity	Chinook carrying capacity (smolts/year) (mid-point)
SRP (Standard)	4.5 ha	0.045 ^a	95,516
SHDM (Standard)	9.1 ha (includes 4.37 ha downstream effect)	range 0.028-0.047	160,000
IUAA (Conceptual Design method)	4.172 ha (includes 0.653 ha downstream effect)	range 0.028-0.047	72,820

^a The SRP (page 189) erroneously reports connectivity as 0.026. Beamer et al (2005) reports the correct connectivity estimate as 0.045 (see Table 7.1 on page 43).

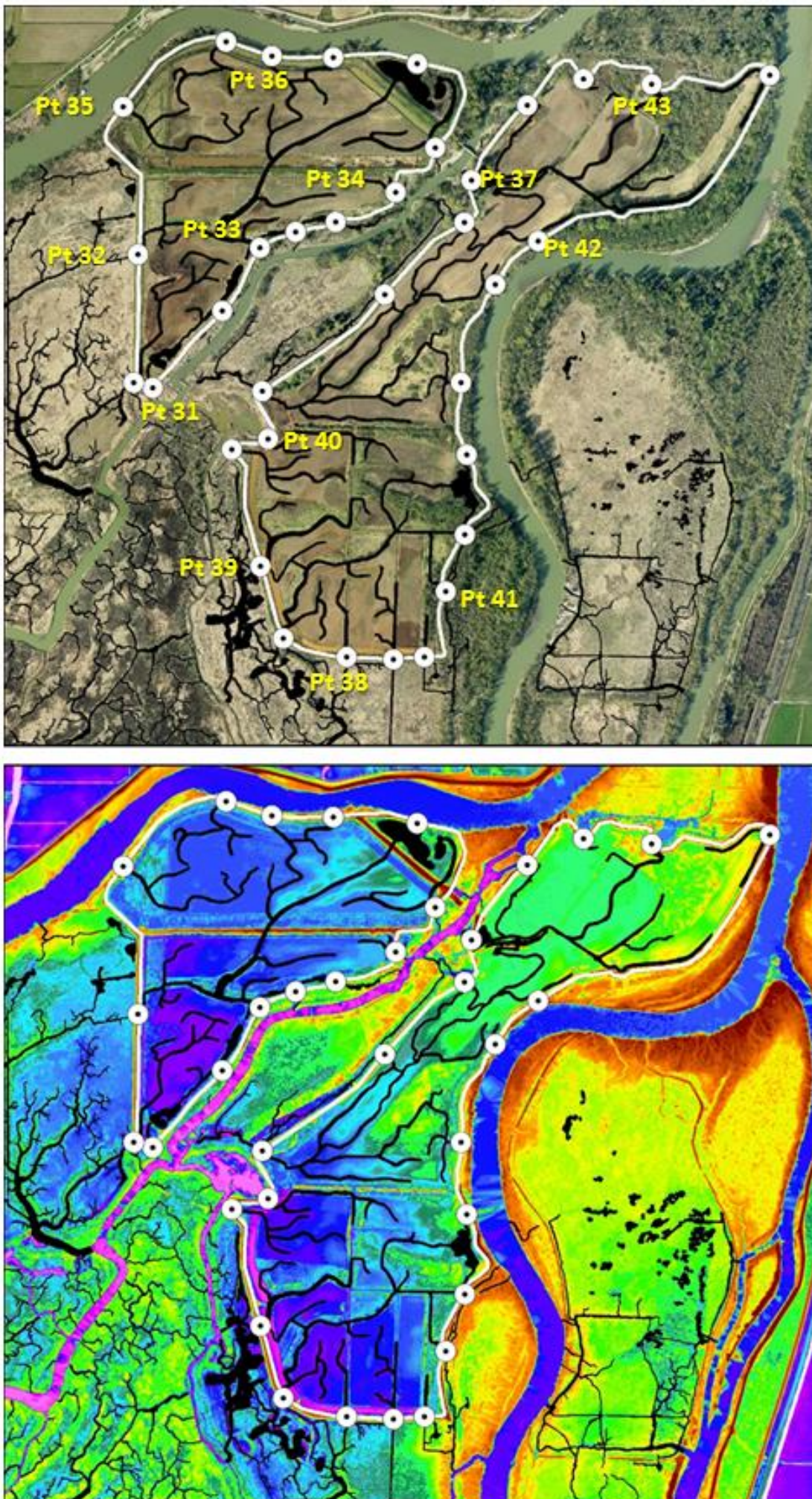


Figure 1. Map of the conceptual design method for the *Full Restoration Alternative* depicting locations of channel outlets and channel. The top panel is shown over an orthophoto; the bottom panel over 2012 LiDAR. Hydrologically distinct polygons are bounded by white outlines. Tidal channel outlet points are shown as white dots with a black center. The channel outlet points used to calculate Landscape Connectivity values are labeled. Channels are shown as black lines.

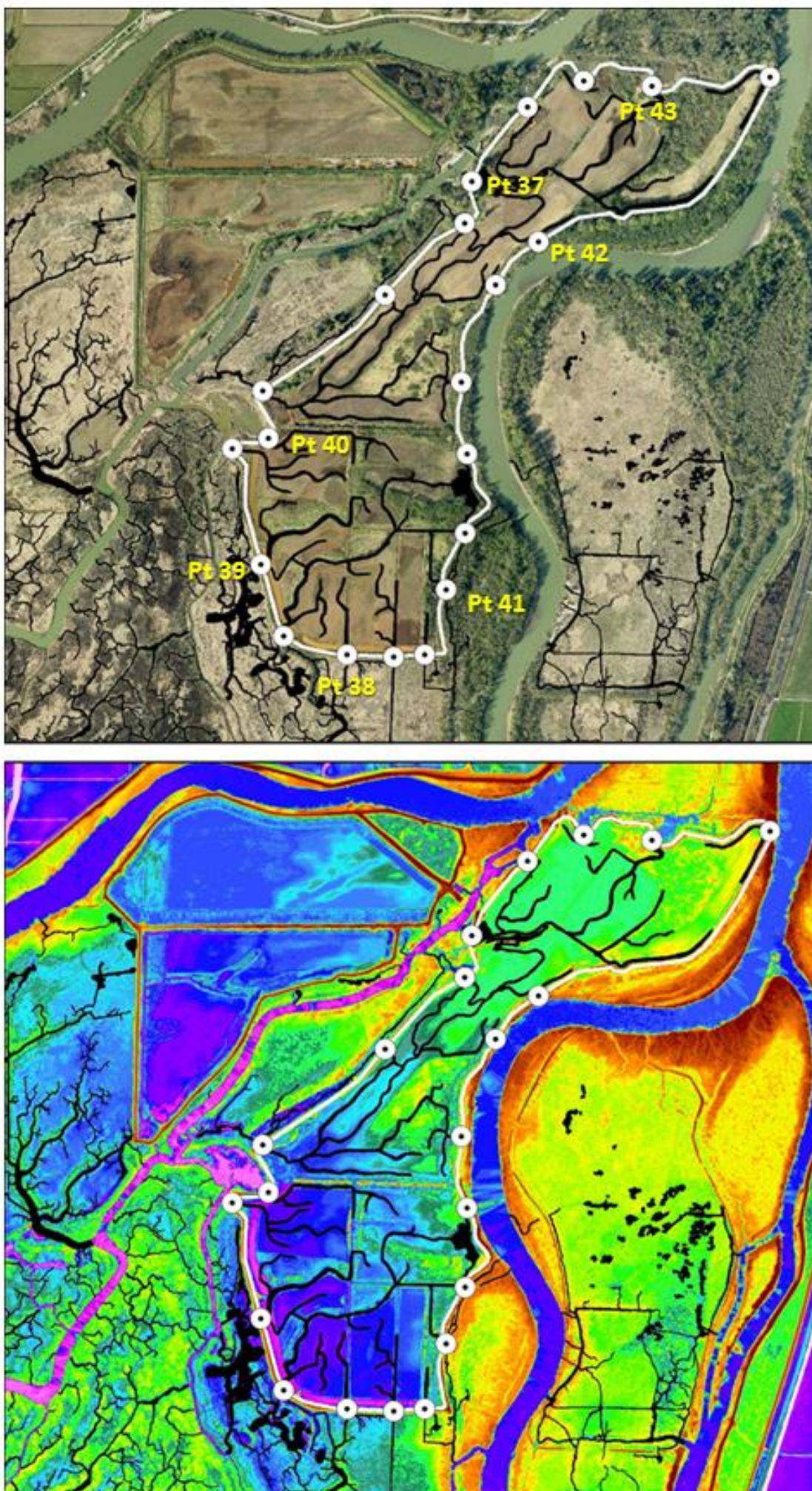


Figure 2. Map of the conceptual design method for *Alternative 2* depicting locations of channel outlets and channel. The top panel is shown over an orthophoto; the bottom panel over 2012 LiDAR. Hydrologically distinct polygons are bounded by white outlines. Tidal channel outlet points are shown as white dots with a black center. The channel outlet points used to calculate Landscape Connectivity values are labeled. Channels are shown as black lines.

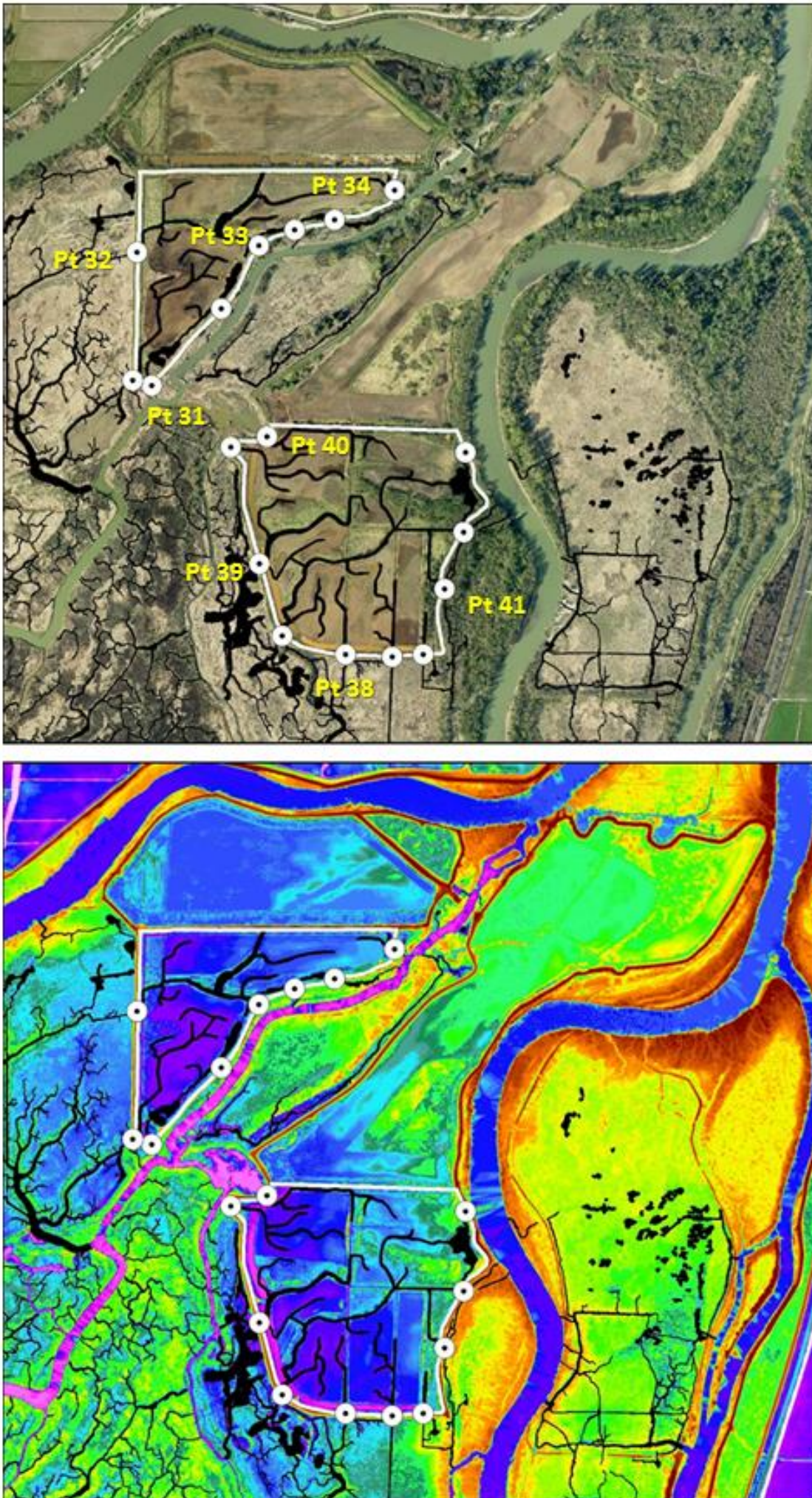
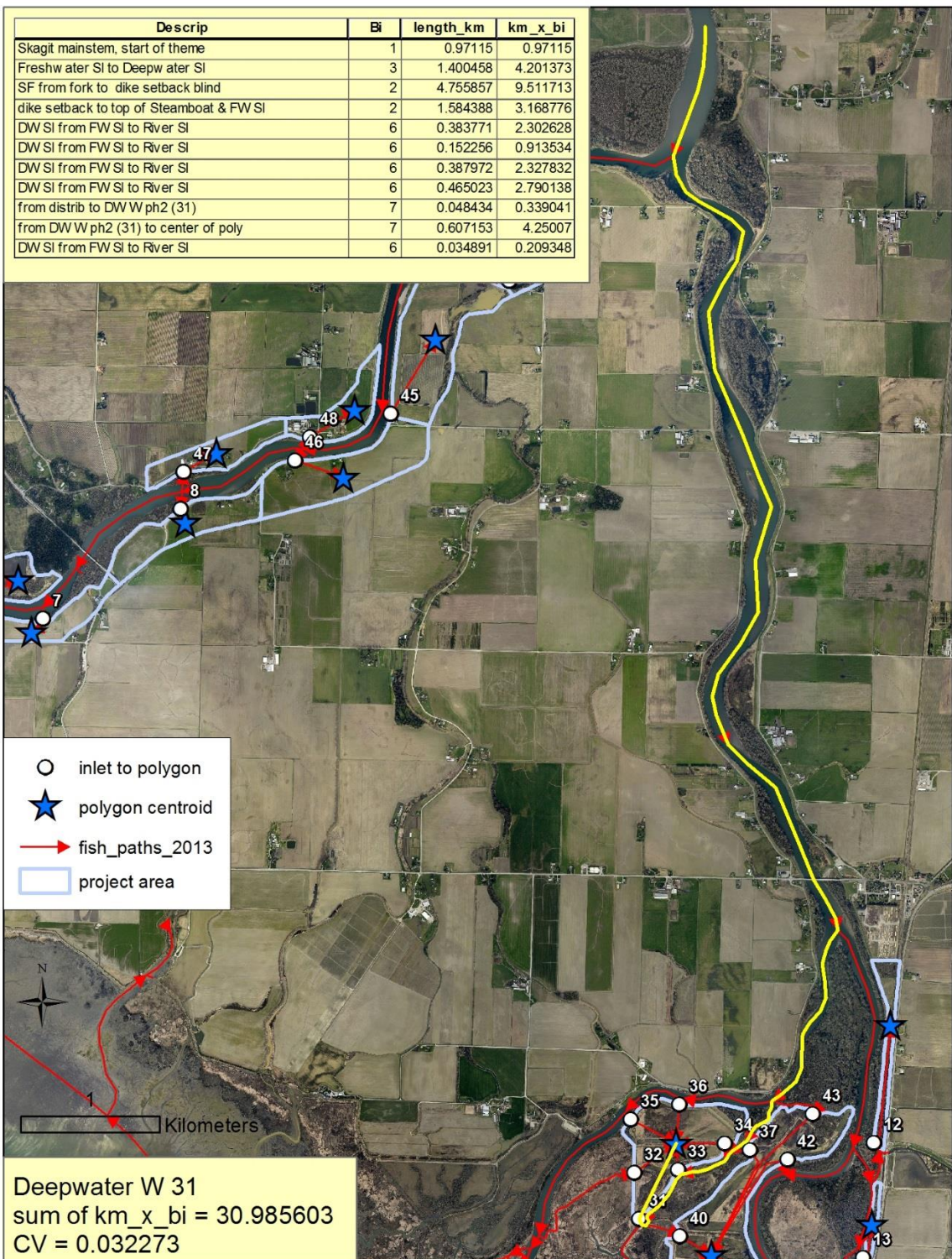


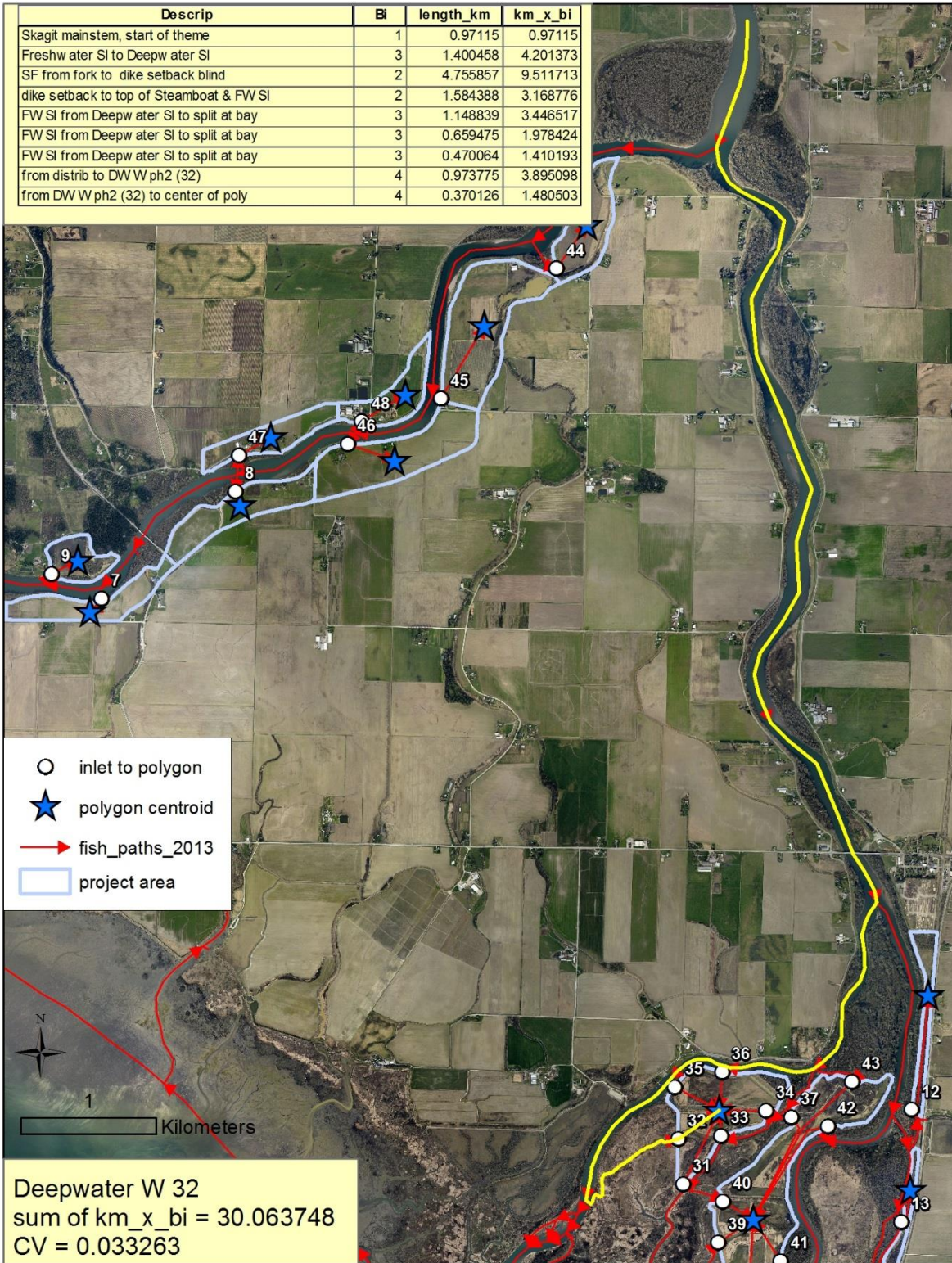
Figure 3. Map of the conceptual design method for *Alternative 3* depicting locations of channel outlets and channel. The top panel is shown over an orthophoto; the bottom panel over 2012 LiDAR. Hydrologically distinct polygons are bounded by white outlines. Tidal channel outlet points are shown as white dots with a black center. The channel outlet points used to calculate Landscape Connectivity values are labeled. Channels are shown as black lines.

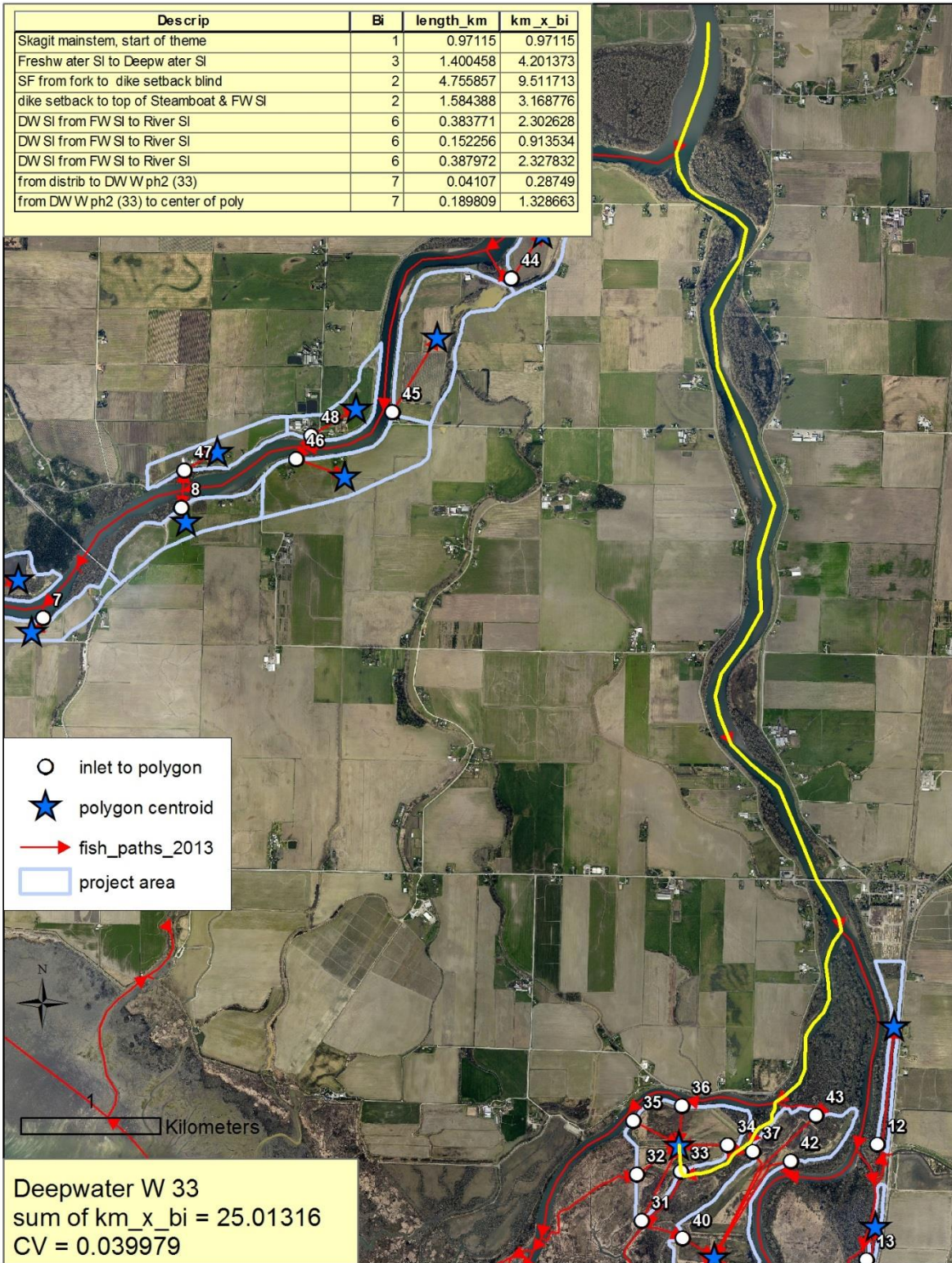
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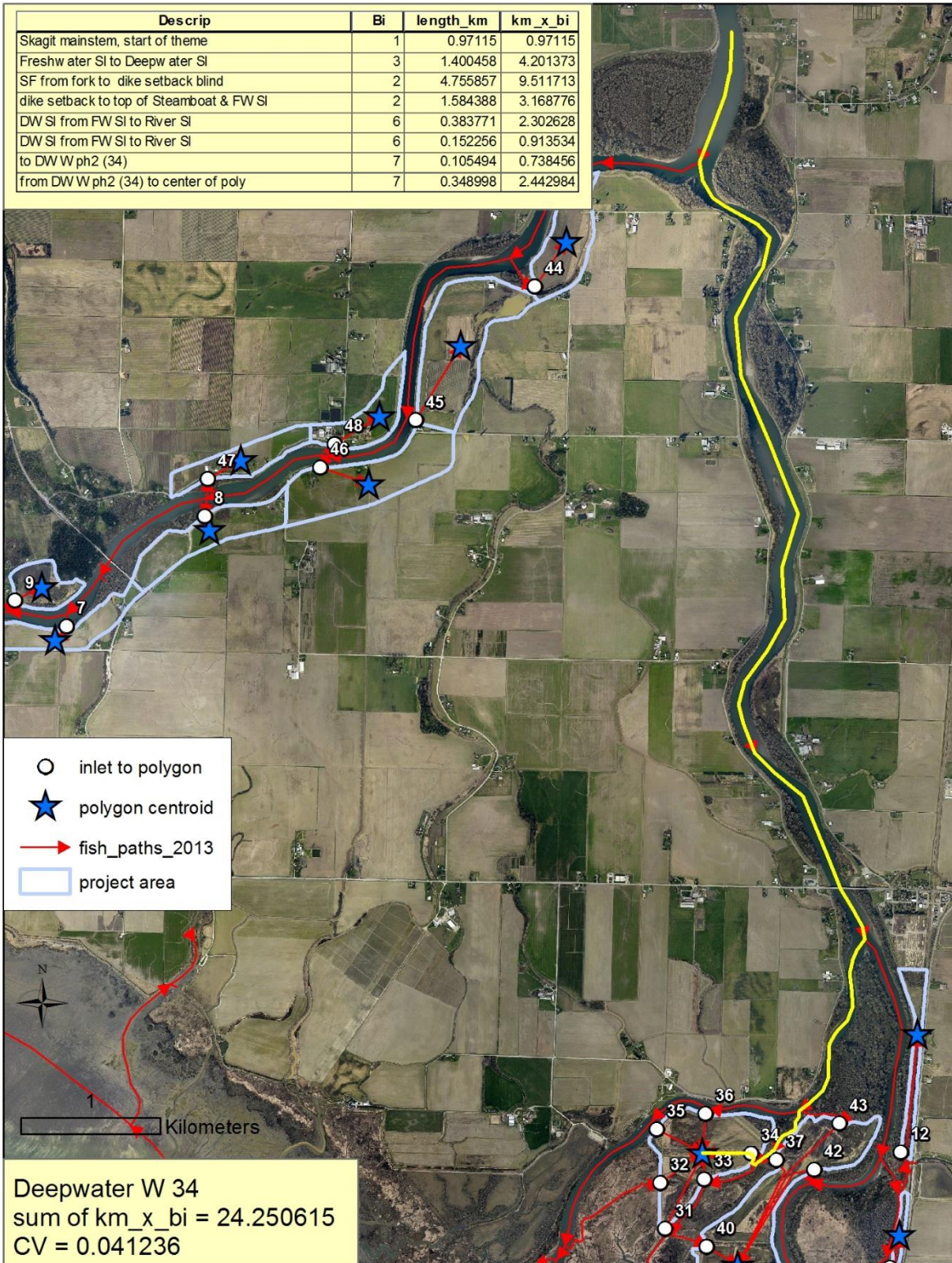
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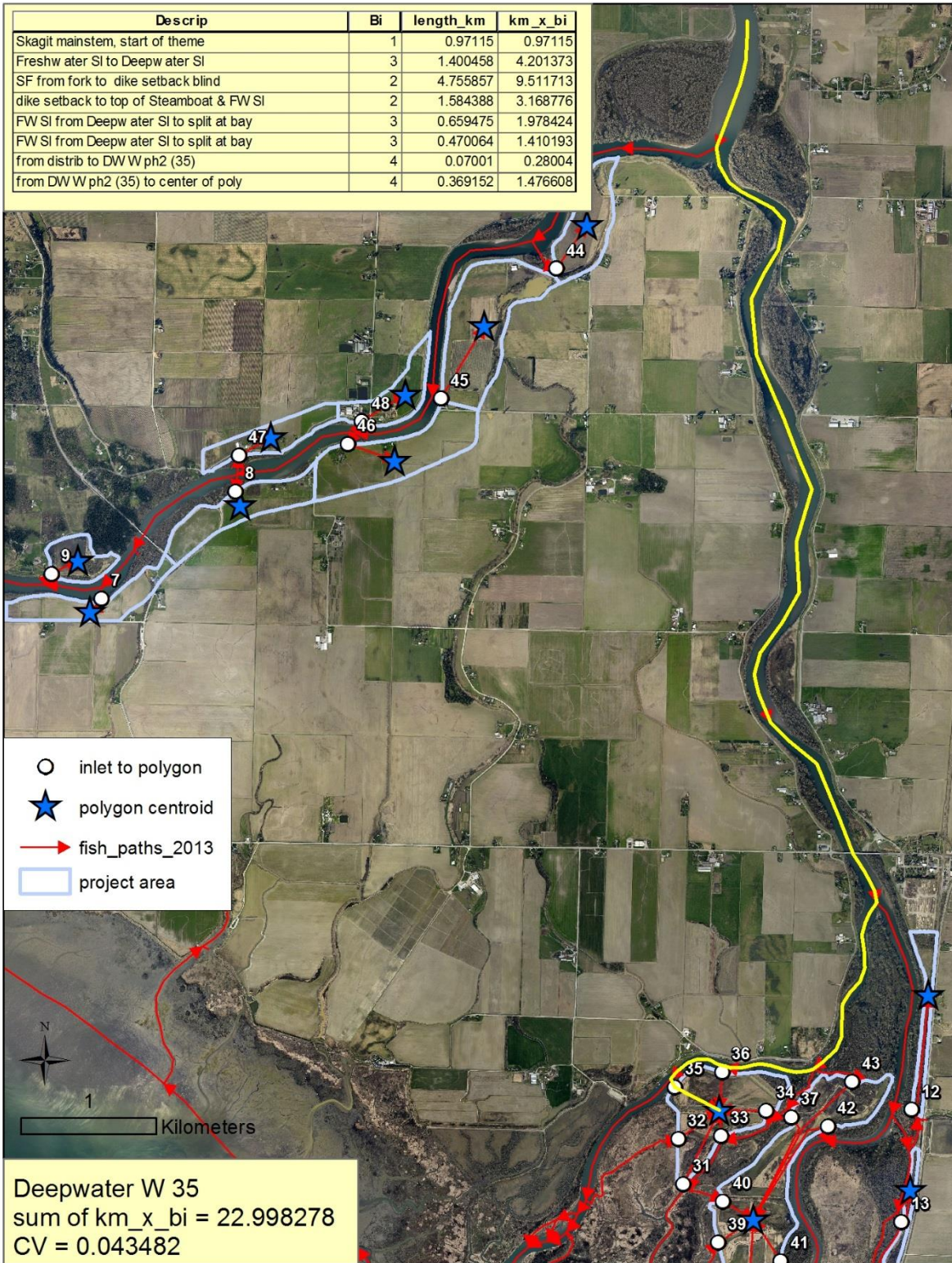
Appendix1. Fish migration pathways and landscape connectivity calculations.

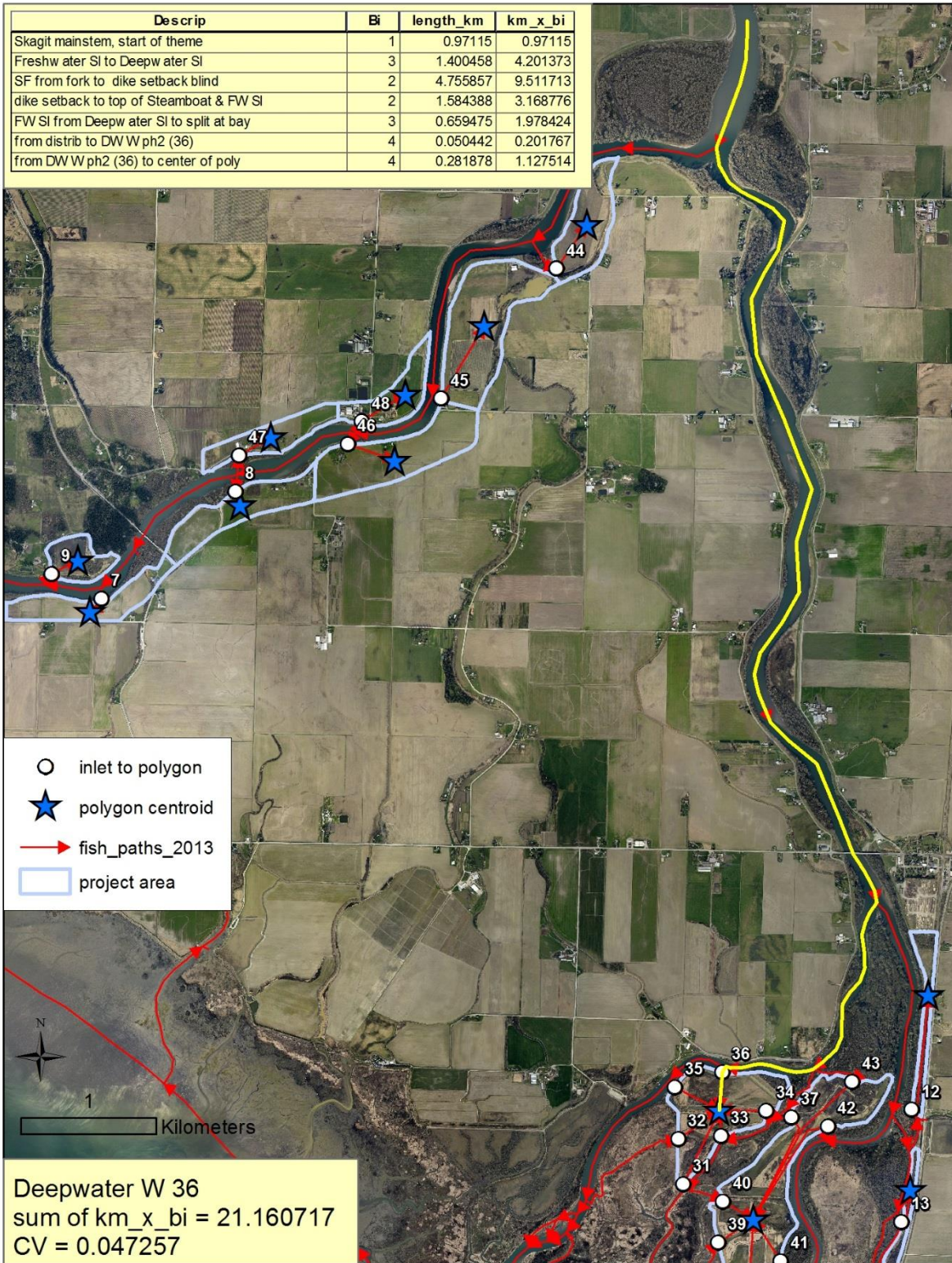


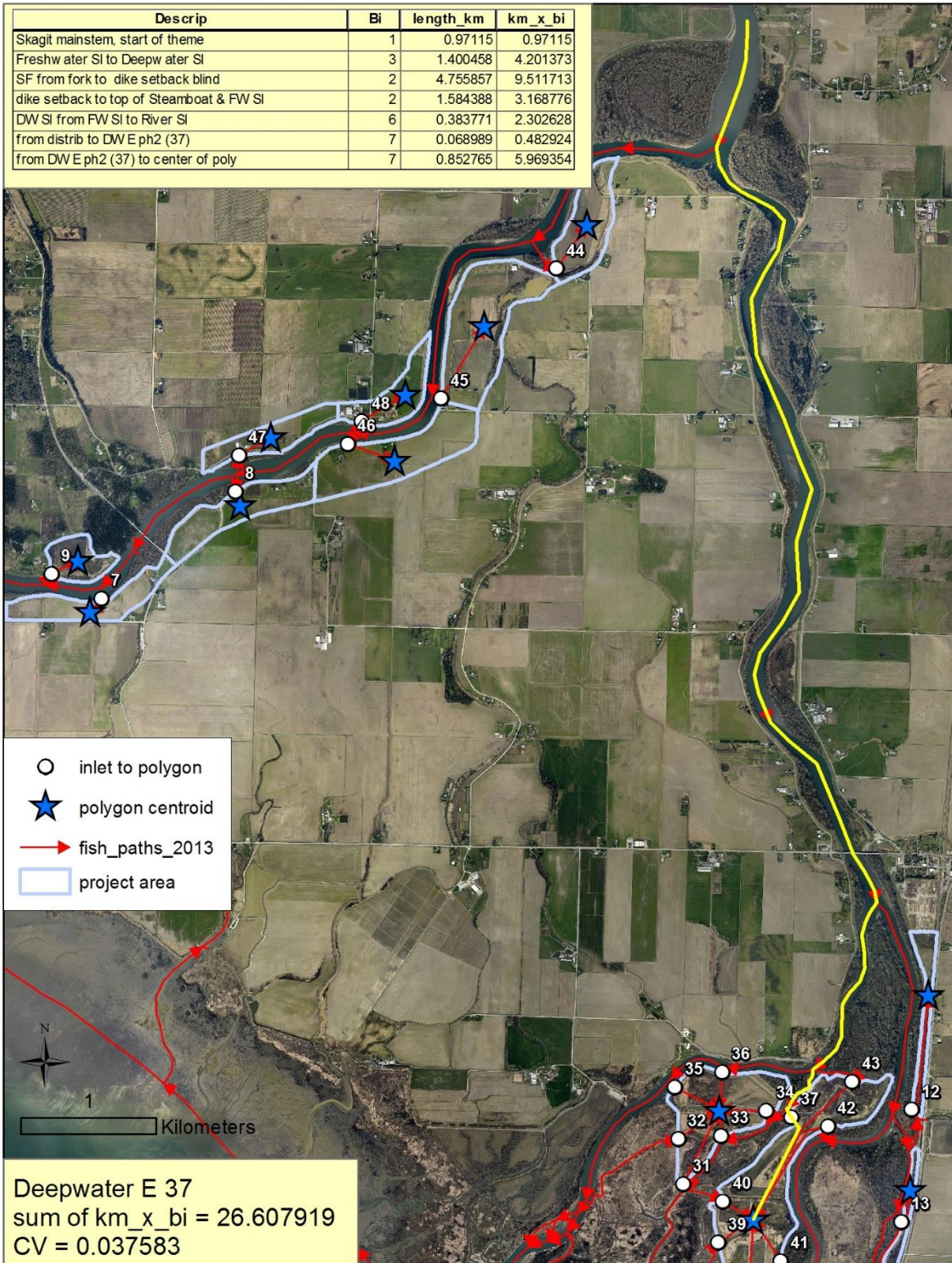


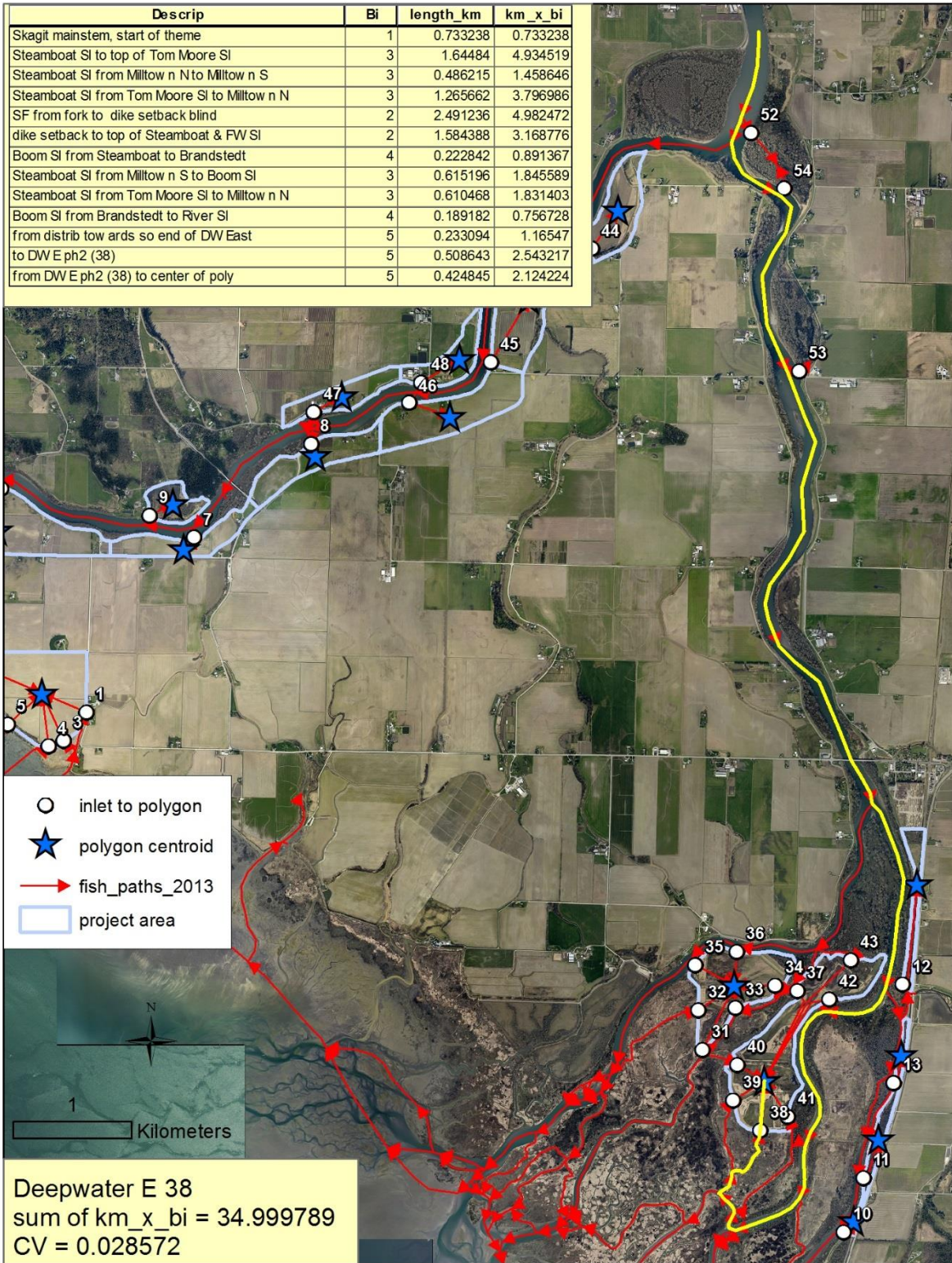




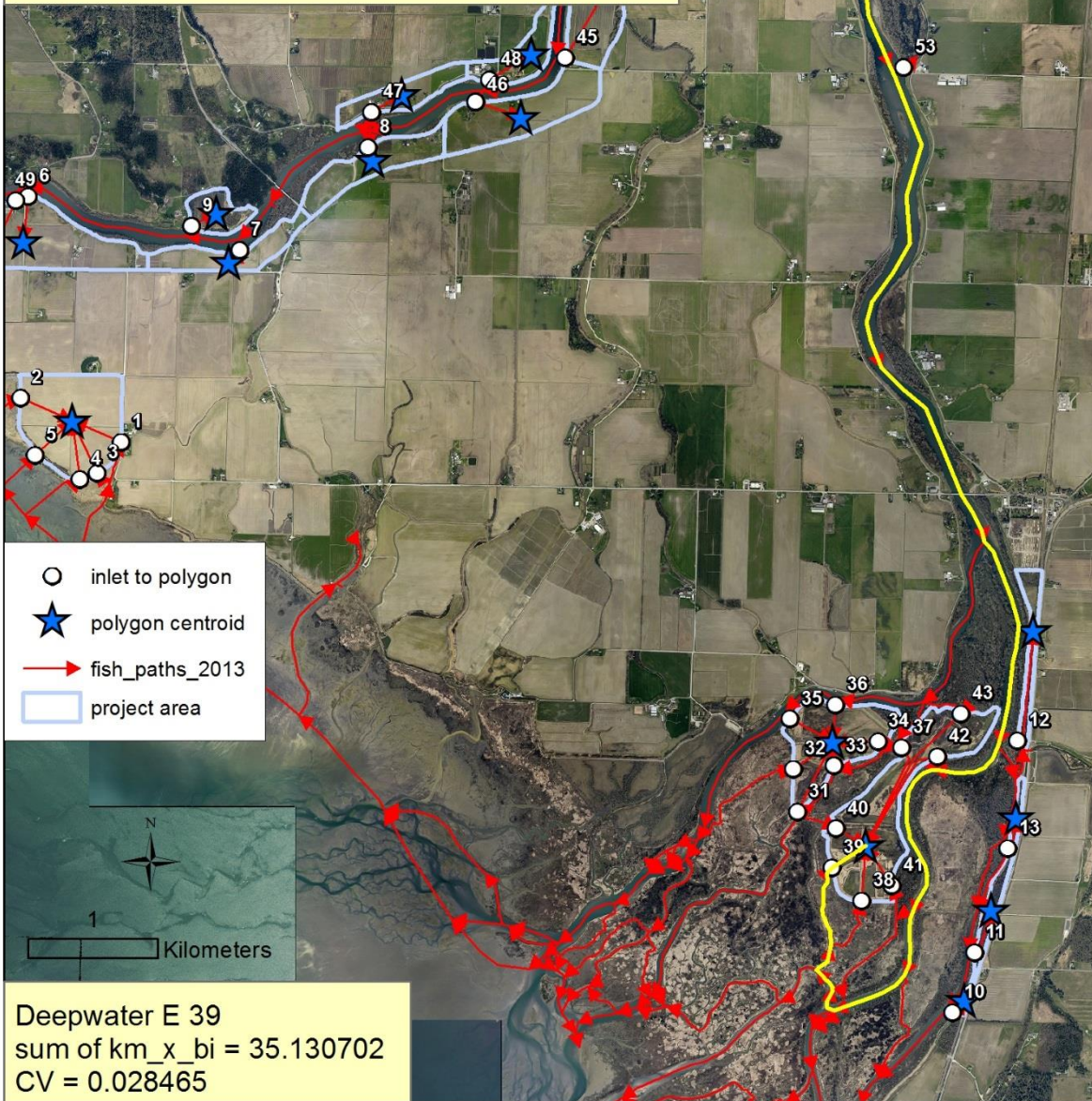


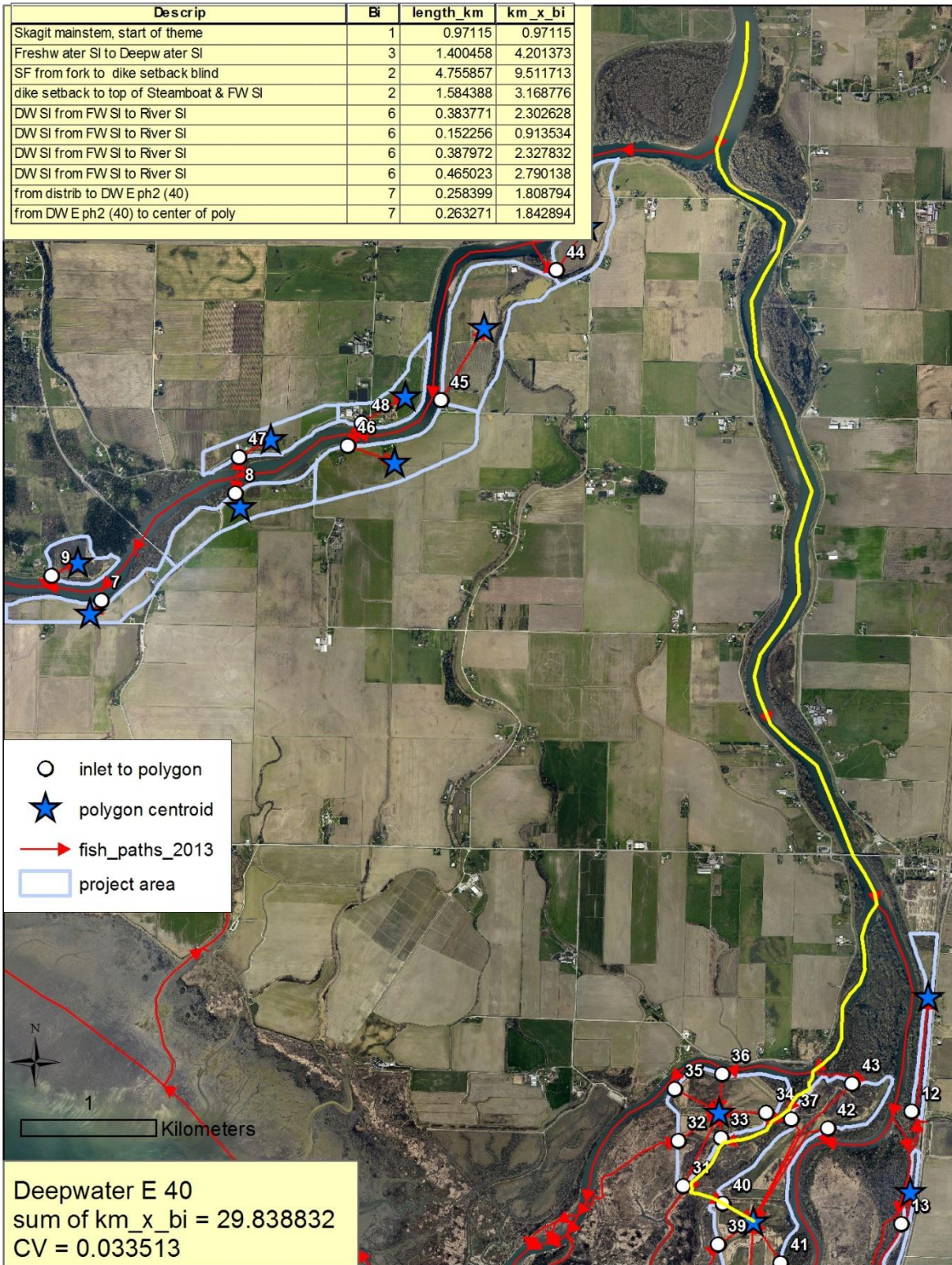


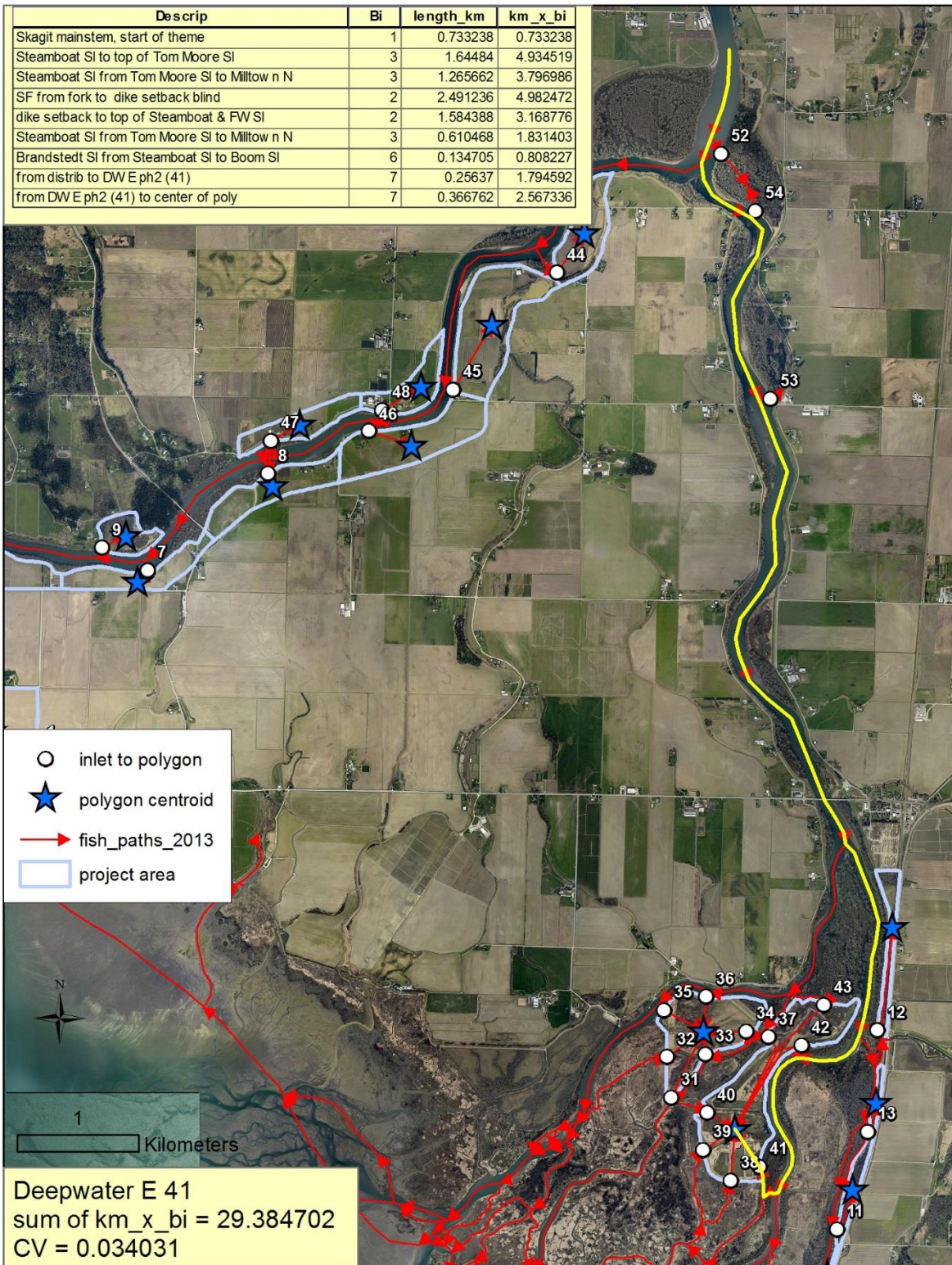




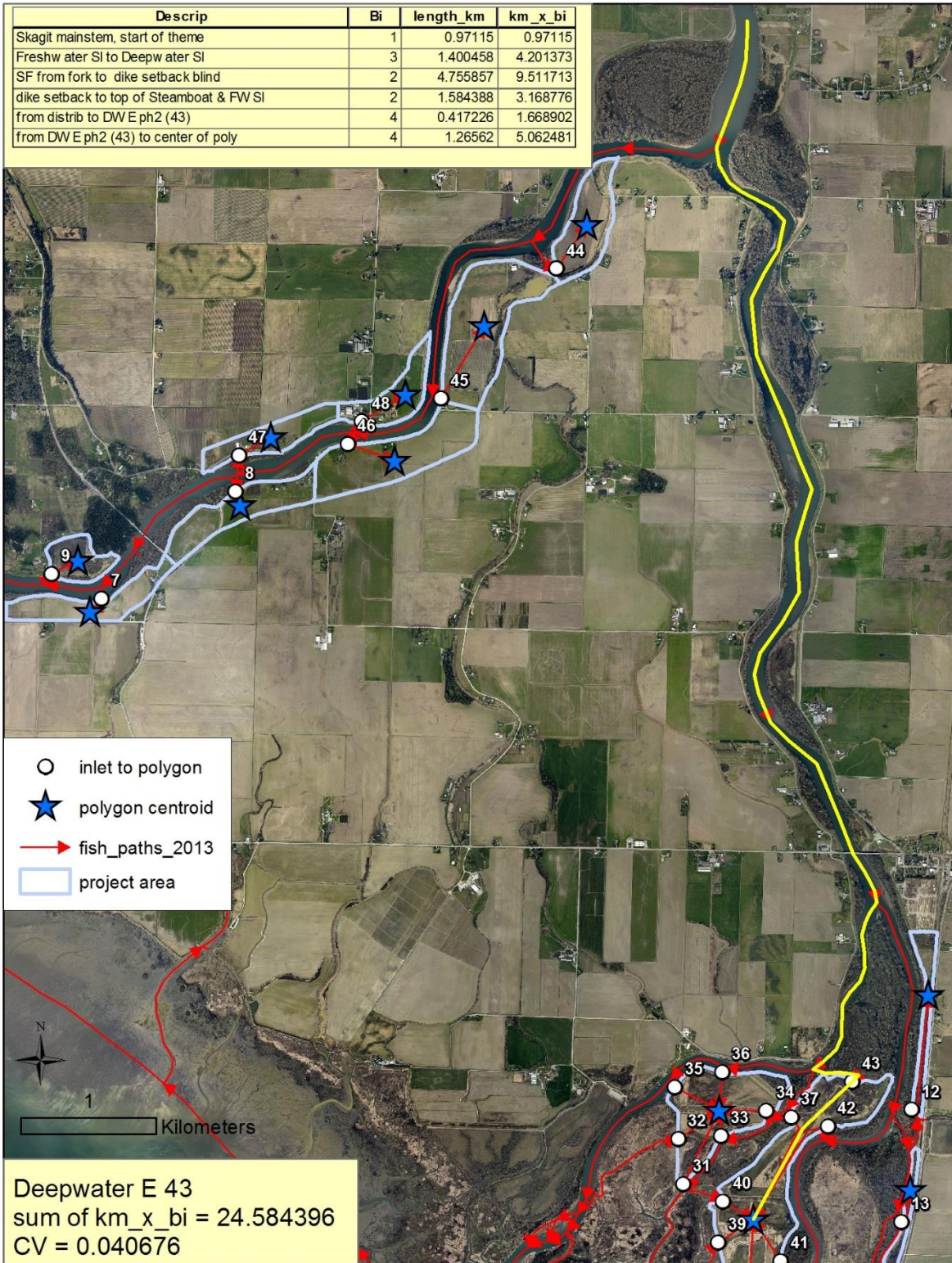
Descrip	Bi	length_km	km_x_bi
Skagit mainstem, start of theme	1	0.733238	0.733238
Steamboat SI to top of Tom Moore SI	3	1.64484	4.934519
Steamboat SI from Milltow n N to Milltow n S	3	0.486215	1.458646
Steamboat SI from Tom Moore SI to Milltow n N	3	1.265662	3.796986
SF from fork to dike setback blind	2	2.491236	4.982472
dike setback to top of Steamboat & FW SI	2	1.584388	3.168776
Boom SI from Steamboat to Brandstedt	4	0.222842	0.891367
Steamboat SI from Milltow n S to Boom SI	3	0.615196	1.845589
Steamboat SI from Tom Moore SI to Milltow n N	3	0.610468	1.831403
Boom SI from Brandstedt to River SI	4	0.189182	0.756728
from distrib tow ards so end of DW East	5	0.233094	1.16547
to DW E ph2 (39)	5	0.646839	3.234195
from DW E ph2 (39) to center of poly	5	0.312832	1.56416













APPENDIX D: GEOMORPHIC TECHNICAL MEMORANDUM

ISLAND UNIT PRELIMINARY GEOMORPHOLOGY ASSESSMENT

WASHINGTON DEPARTMENT OF FISH AND WILDLIFE

Island Unit Preliminary Geomorphology Assessment

Prepared by:



*Washington
Department of*
**FISH and
WILDLIFE**

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Introduction/Purpose

The Island Unit is a part of the Skagit Wildlife Area. The Island Unit is located between Freshwater Slough and Steamboat Slough in the delta of the South Fork of the Skagit River and consists of two separate islands divided by Deepwater Slough (Figure 1). Portions of each island are ringed by dikes that isolate these areas from tides and river flows. The length of the site spans a key transition zone between the fluvial (riverine) environment of the South Fork Skagit River and the tide dominated Skagit Bay. Elevations on the site range from approximately 5-9.5 feet NAVD88.

Much of this area was converted to agriculture prior to the General Land Office Survey (GLO) in 1889, and subsequent navigation projects in the south fork Skagit blocked distributary channels and diked off tidal marsh and blind tidal channels. A portion of the site was restored to estuary in 2000. The remaining 270-acre diked area is currently used to produce managed and enhanced winter waterfowl forage. Areas outside the dikes support emergent and scrub-shrub plant communities to the south and forested floodplain wetlands to the north. The Skagit Chinook Recovery Plan identifies estuary rearing area as a limiting factor for recovery of Chinook salmon and the remaining diked area of the Island Unit is identified as a potential restoration project.

The purpose of this report is to provide information about the geomorphic setting of the site and complete a preliminary geomorphic analysis of possible restoration scenarios. This memo is also intended to provide information related to criteria, including:

- WDFW's wetland policy (policy 5211), which includes the following relevant sections:
 - *WDFW will accomplish long-term gain of properly functioning wetlands where both ecologically and financially feasible on WDFW-owned or WDFW-controlled properties;*
 - *WDFW will promote the restoration of original hydrology, elevations and native plant communities*
- Climate change resilience, which includes the following considerations:
 - infrastructure resiliency in the face of sea level rise and changing river flows
 - habitat migration
 - flood risk reduction

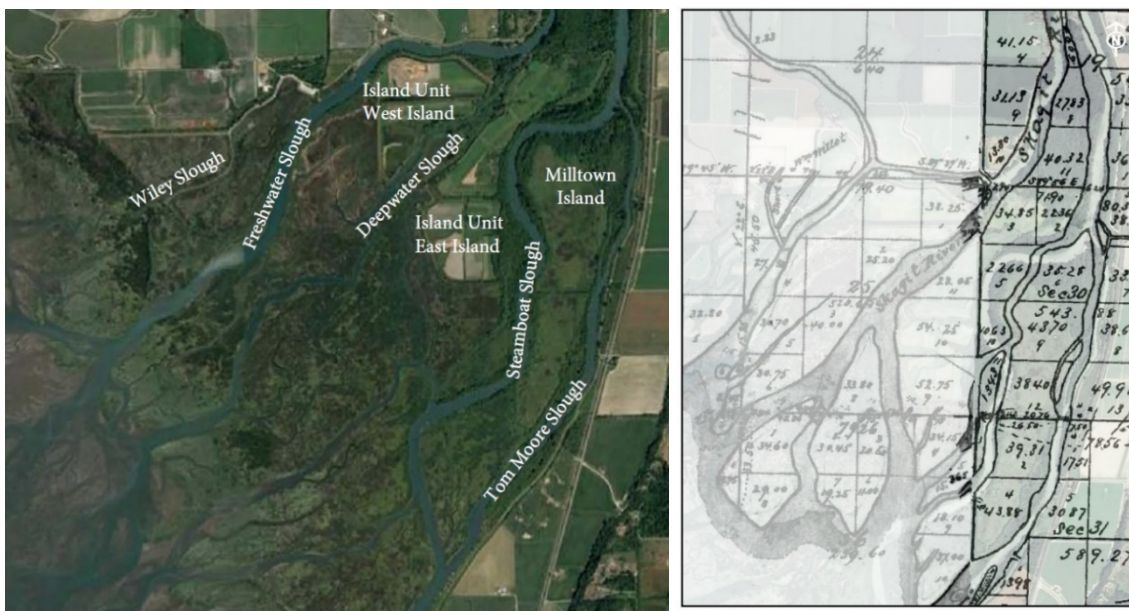


Figure 1 – Location Map and GLO Survey Circa 1889

Alternatives

Four different alternatives are being assessed through an alternatives analysis for the Island Unit (Figure 2). Alternative 1 assumes only infrastructure upgrades with no dike/levee removal. Alternative 2 assumes removal of all dike/ levees on the east island. Alternative 3 assumes removal of dikes/ levees on the southern portions of both islands with setbacks to connect the existing dikes/ levees. Alternative 4 removes all dikes/ levees.

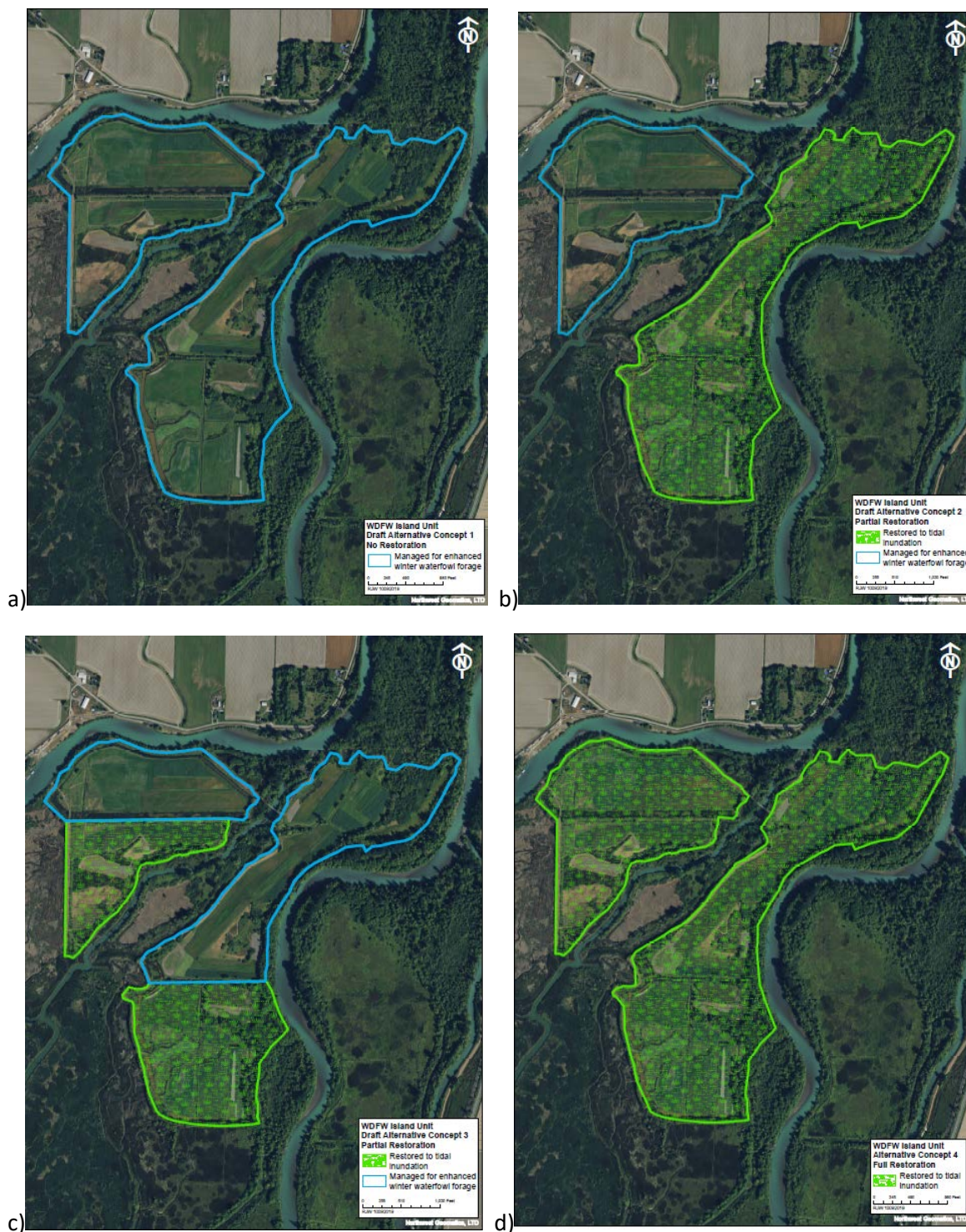


Figure 2 – Alternatives being assessed for the Island Unit site. a) No Restoration/Alternative 1 b) Restoration of the East Island/Alternative 2 c) Restoration of the Southern Half of Each Island/Alternative 3 d) Full Restoration/Alternative 4

Post settlement diking, dredging, and filling in the delta have severely limited the historic extent of delta habitat. Comparison of a historic reconstruction of the Skagit delta by Collins (2000) with mapping done from 1991 aerial photos by Skagit River System Cooperative (Beamer et al. 2000) shows a net loss of 74.6% of tidal delta estuarine habitat area (Figure 4).

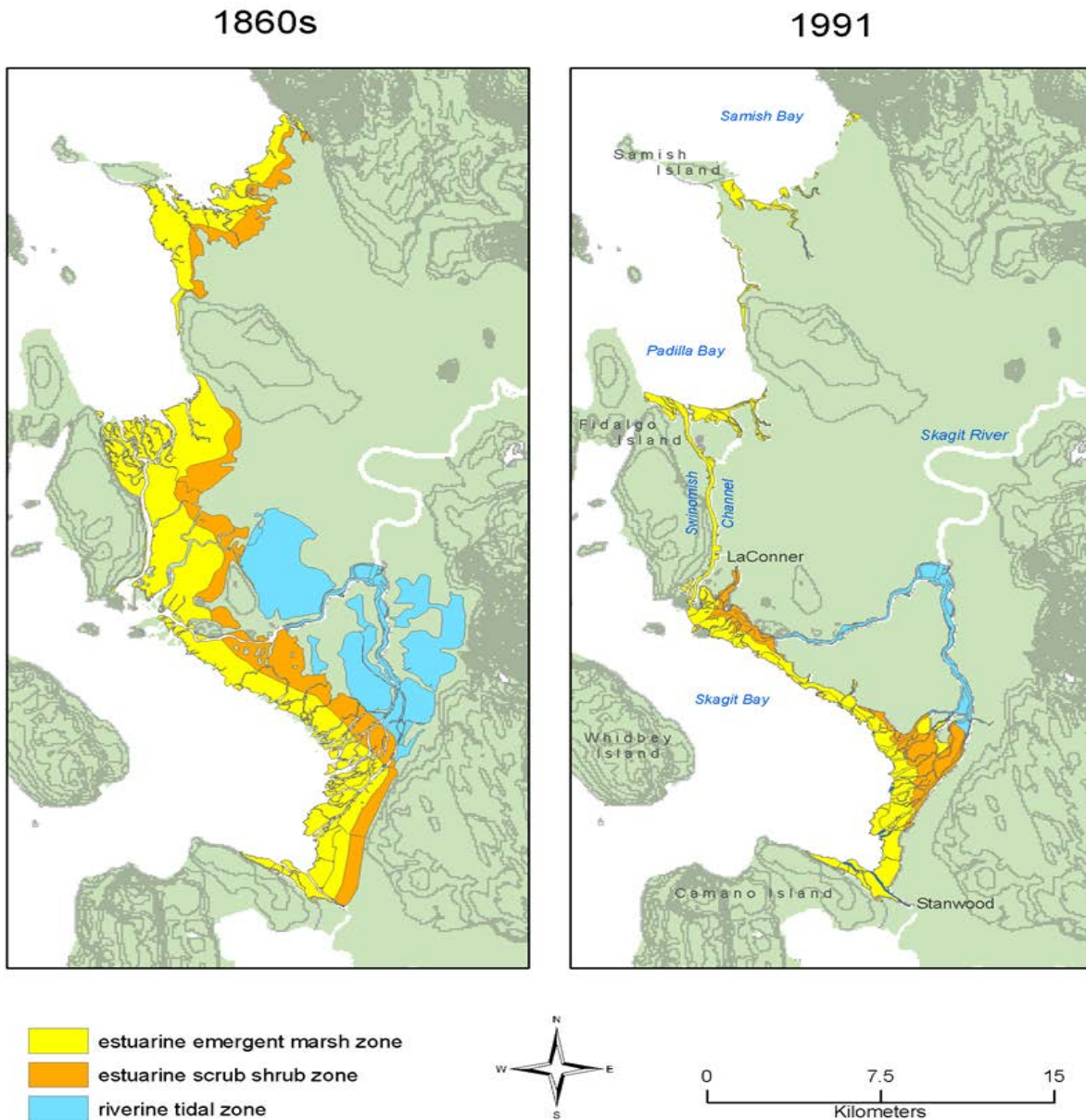


Figure 4 - Changes in estuarine habitats, 1860s to 1991. From Beamer et al, 2005 (<http://skagitcoop.org/wp-content/uploads/Appendix-D-Estuary1.pdf>).

An estuary restoration project completed in 2000 removed portions of the dike around the perimeter of each island and removed dikes that had extended across the upstream and downstream ends of Deepwater Slough (Figure 5). As a result, natural hydrology was restored to portions of each island, and riverine and tidal flows were reestablished through Deepwater Slough. This project was authorized under Section 1135 of the Water Resources Development Act of 1986, which allows the Corps to plan, design and build modifications to existing Corps projects, or areas degraded by Corps projects, to restore aquatic habitats for fish and wildlife.



Figure 5 - Restoration actions completed in 2000. (Figure from <http://skagitcoop.org/programs/restoration/deepwater-slough/>)

Water Surface Elevation Summary

The Island Unit is located in a tidally influenced reach of the lower south fork Skagit River where both river flows and tides affect the water surface elevation at any given time. Water surface data has been collected for two separate projects in this reach. Data was collected in support of the Skagit Hydrodynamic Modeling (HDM) project at multiple sites including in both Steamboat Slough (HDM 5) and Freshwater Slough (HDM 4) adjacent to the Island Unit (Figure 6). The Milltown Island Restoration Feasibility project included eight data collection sites, and four of those are in main channels close to the Island Unit (Figure 7). The water surface data at all sites presented in this memo ranged from 3.5 feet to 13 feet NAVD88 within the periods of record, with a few outliers (Table 1). Island Unit project site ground elevations inside the dikes generally range from 5 feet to 9.5 feet NAVD88, and dike elevations range from approximately 13 feet to 20 feet NAVD88 (Figure 8). Although no water surface elevation data is available from within the dikes, the site is isolated from natural riverine and tidal hydrology by dikes and tidegates.

Water surface elevation data was analyzed using RStudio to calculate average, maximum and minimum daily water surface elevations (Figures 9, 10, and 11) for the HDM 4, HDM 5, and Milltown S2 data, which have the longest period of record of any sites in the project area.



Figure 6- Water surface elevation data collection points associated with the Skagit HDM project.

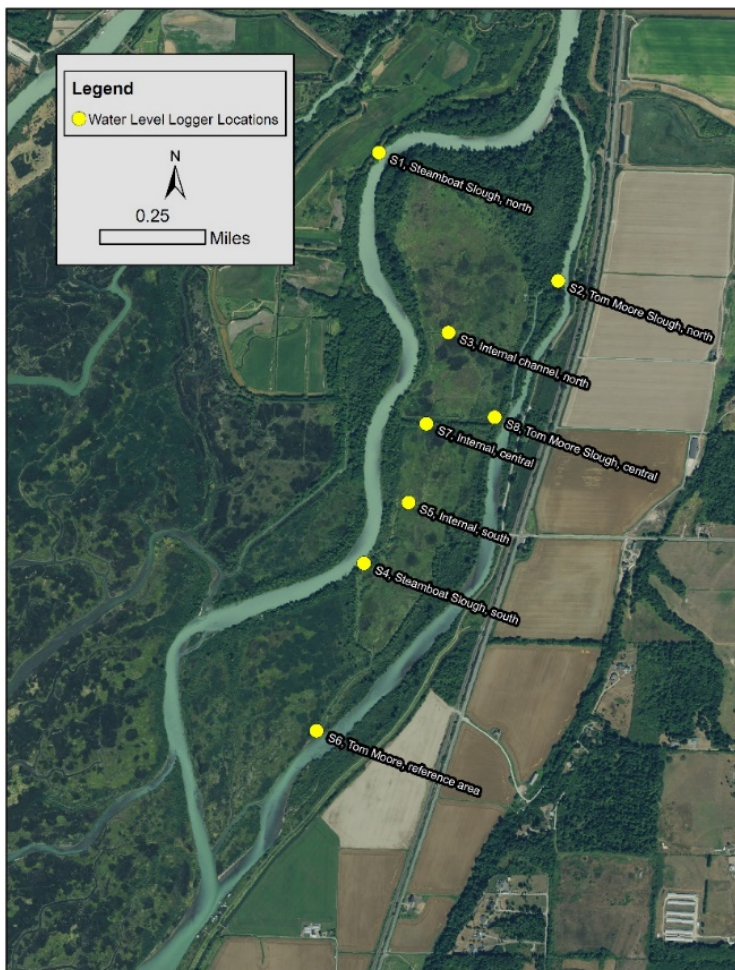


Figure 7 - Water surface elevation data collection points associated with the Milltown Island Restoration Feasibility project

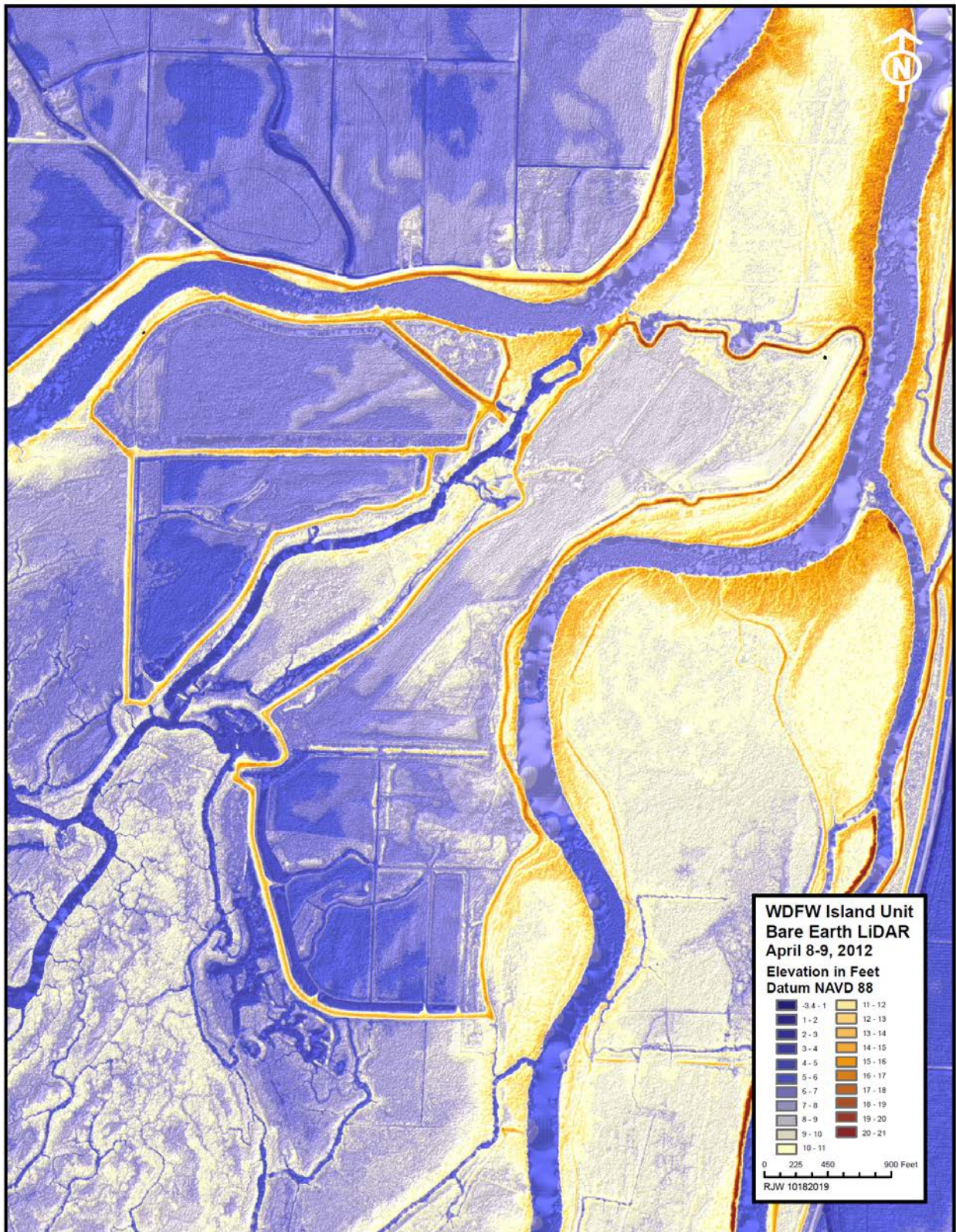


Figure 8 - Island Unit Ground Elevations

Table 1 - Summary statistics and dates for water surface elevation data collected at several points near the Island Unit. WSE data is presented in feet NAVD88.

Site	HDM 4	HDM 5 ¹	Milltown S1 Steamboat N ¹	Milltown S2 Tom Moore N	Milltown S4 Steamboat S	Milltown S8 Tom Moore S
Average WSE	8.2	7.7	7.9	7.4	7.2	6.0
Minimum WSE	5.6	4.2	3.8	3.7	3.7	1.1
Maximum WSE	13.5	13.9	12.3	14.0	11.9	11.9
Data Start Date	11/5/2014	11/5/2014	1/25/2017	1/26/2017 ²	1/25/2017	1/26/2017
Data End Date	5/27/2015	5/27/2015	3/22/2017	12/15/2017	2/22/2017	12/15/2017

1. HDM Site 5 and Site S1 are at the same location. The HDM dataset is from 2014/2015 and the S1 dataset is from 2017.
2. Data is unavailable between 5/15/2017 and 8/27/2017.

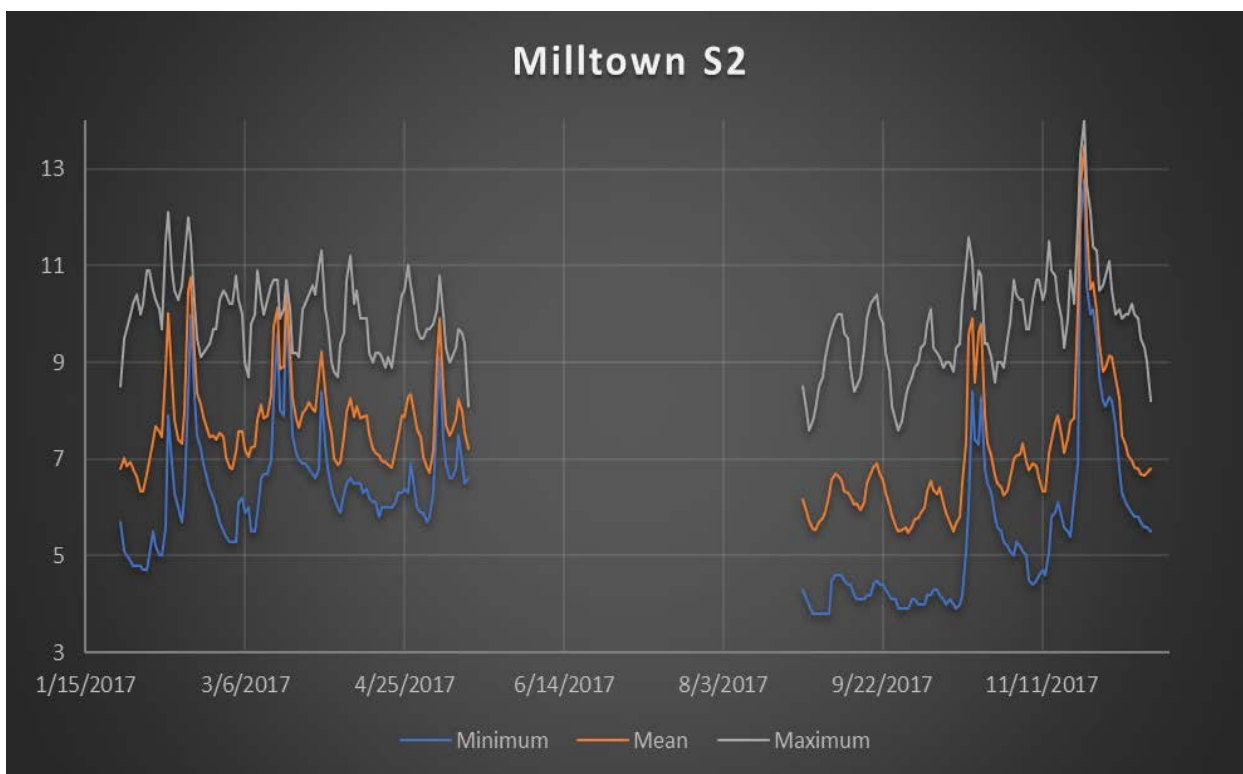


Figure 9 - Mean, Minimum, and Maximum Daily water surface elevations (in feet NAVD88) at Milltown S2

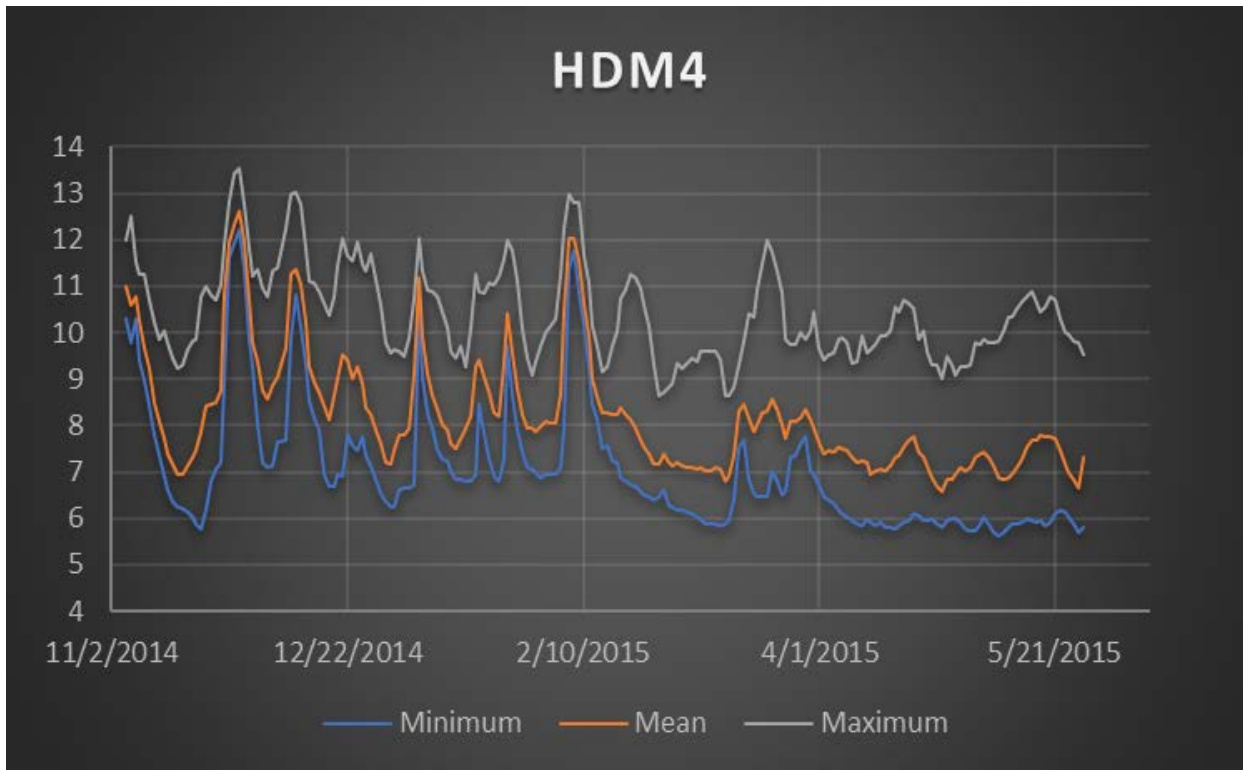


Figure 10 - Mean, Minimum, and Maximum Daily water surface elevations (in feet NAVD88) at HDM Site 4

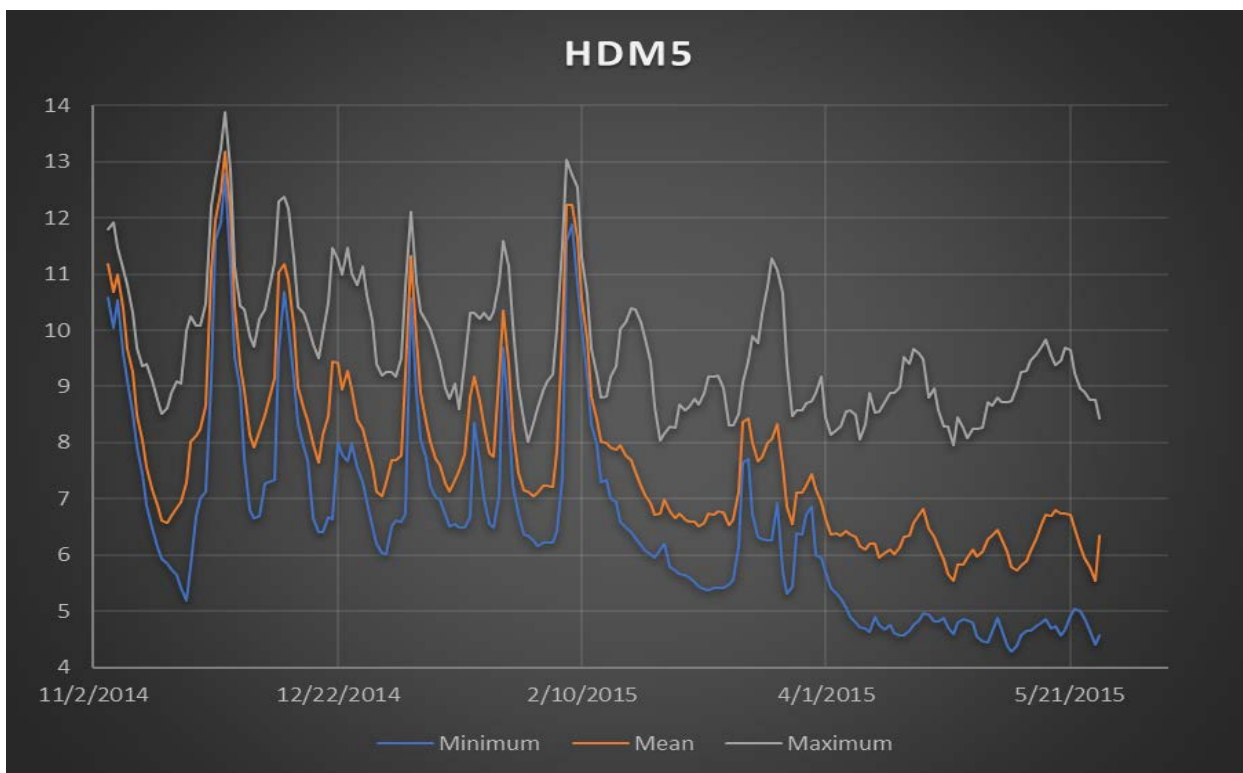


Figure 11 - Mean, Minimum, and Maximum Daily water surface elevations (in feet NAVD88) at HDM Site 5

Evaluation of Tidal Inundation

This section provides an analysis of water surface elevations in the lower south fork Skagit River and the depth and duration of inundation that could occur if a portion or all of the footprint of the Island Unit were reconnected to natural hydrology. Existing recent water surface elevation data was used in the analysis.

Sites HDM 4 and HDM 5 contained the longest record of water surface elevation data for the locations closest to the Island Unit and were used to evaluate the amount of time the site would likely be inundated with water under partial or full restoration scenarios. The data is comparable to the other sites for other years, as can be seen in Table 1. Although the HDM data does not span a full year with all seasons represented, it provides water surface elevations through much of the wintering waterfowl and juvenile Chinook migration season so it provides useful data for understanding water surface elevation at the site.

Table 2 summarizes the percentage of time the water surface will be higher than a given elevation. Figure 12 provides a histogram of the percent of time water surfaces exceed a given elevation from November to May.

Table 2- Percent of time water surface is above given elevation by month based on data collected at site HDM 4 and HDM 5 during Nov 2014-May 2015. Ground elevations are in feet NAVD88.

Ground elevation	November	December	January	February	March	April	May	Total
4	100%	100%	100%	100%	100%	94%	100%	100%
6	96%	100%	100%	99%	88%	45%	68%	88%
8	63%	68%	54%	52%	31%	17%	20%	44%
10	35%	27%	16%	21%	3%	1%	1%	15%
12	11%	2%	0%	5%	0%	0%	0%	2%

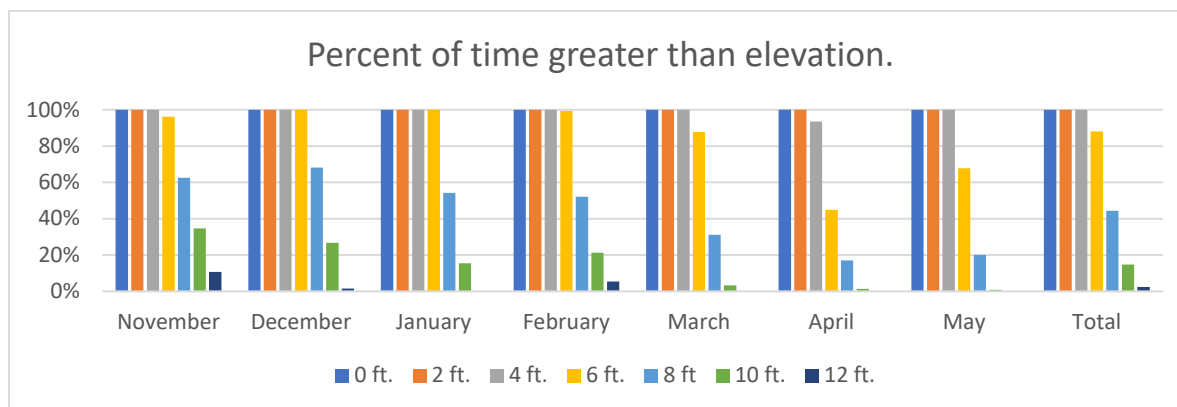


Figure 12 - Histogram of HDM 4 and HDM 5 data showing the percent of time a given elevation is inundated at Island Unit.

Based on the data that has been collected at the HDM 4 and HDM 5 sites, which span November 2014 to May 2015, predictions can be made about what to expect in terms of inundation of the Island Unit under partial or full restoration scenarios (Figures 13-16). The data from 2014-2015 is similar to that in 2017 (Table 1). The Mount Vernon Gage shows that the two seasons presented here fall within a “normal” year. The southern halves of the west island and the east island are nearly all less than 8 feet NAVD88 and are likely to be under water over half of the time from November to February if dikes are removed (Figure 14). Nearly the entirety of both islands are less than 10 feet (Figure 15). Areas less than 10 feet will likely be submerged for over 25% of the time in November and December if dikes are removed.

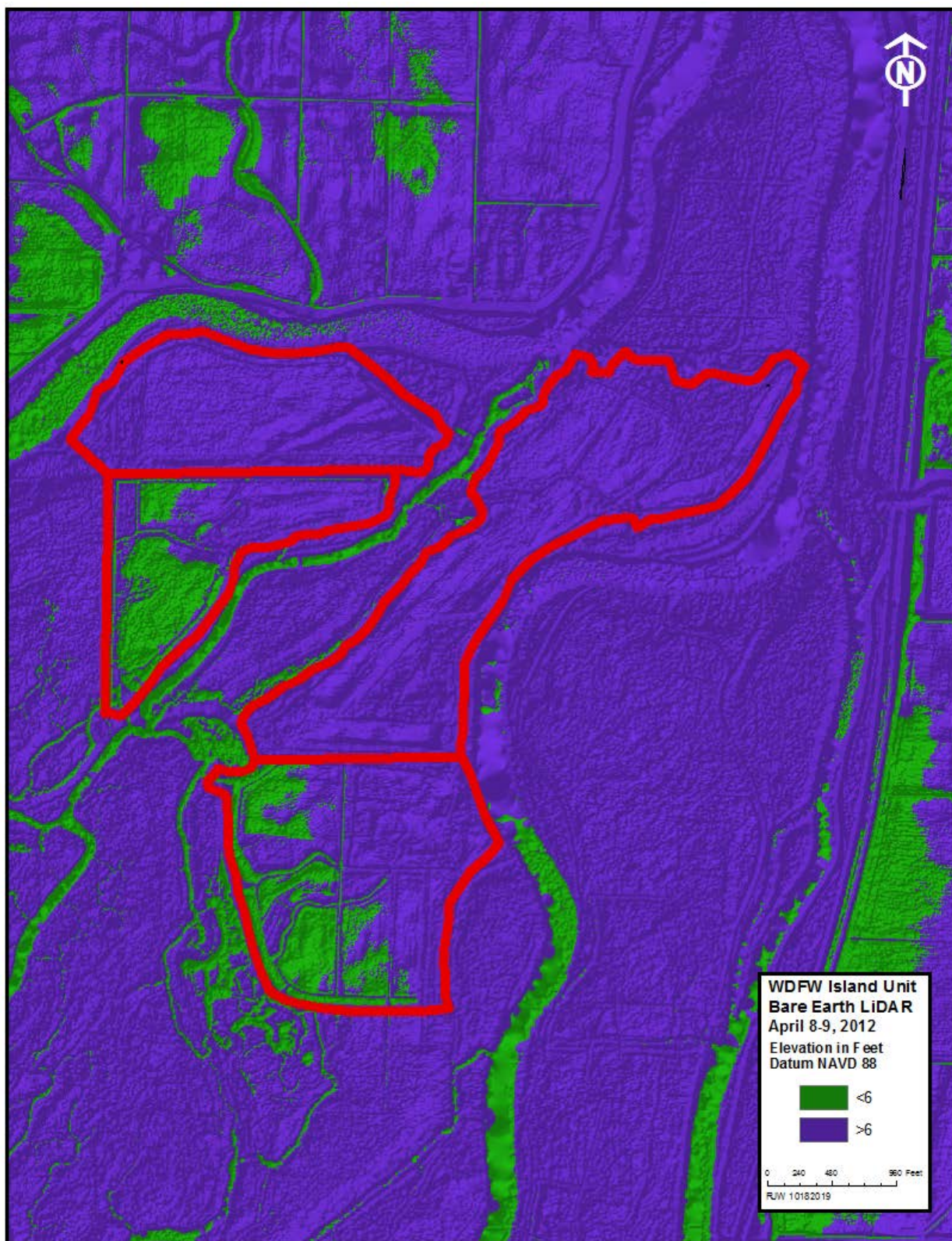


Figure 13 - Inundated Areas when water surface is at 6 feet NAVD88

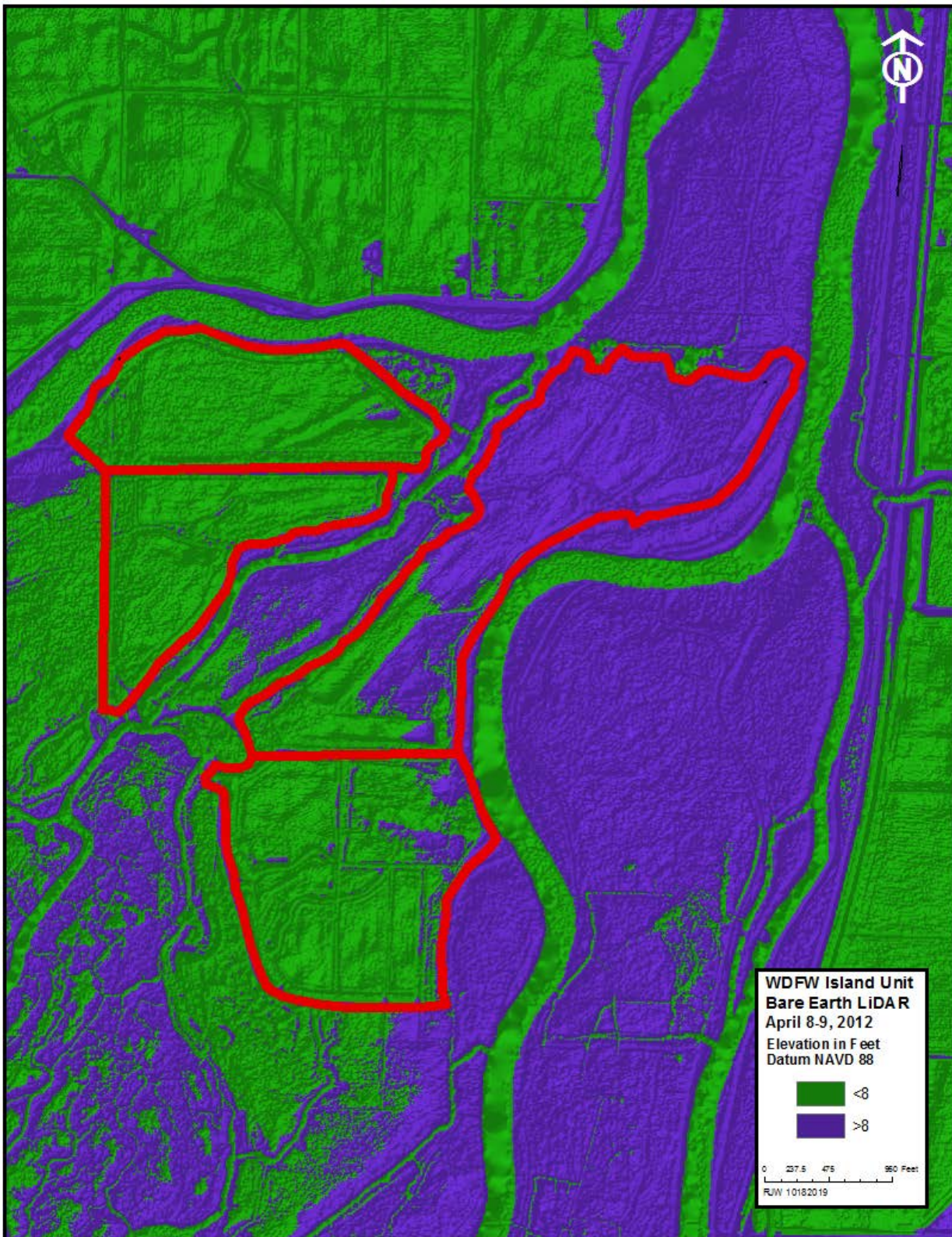


Figure 14 -Inundated Areas when water surface is at 8 feet NAVD88

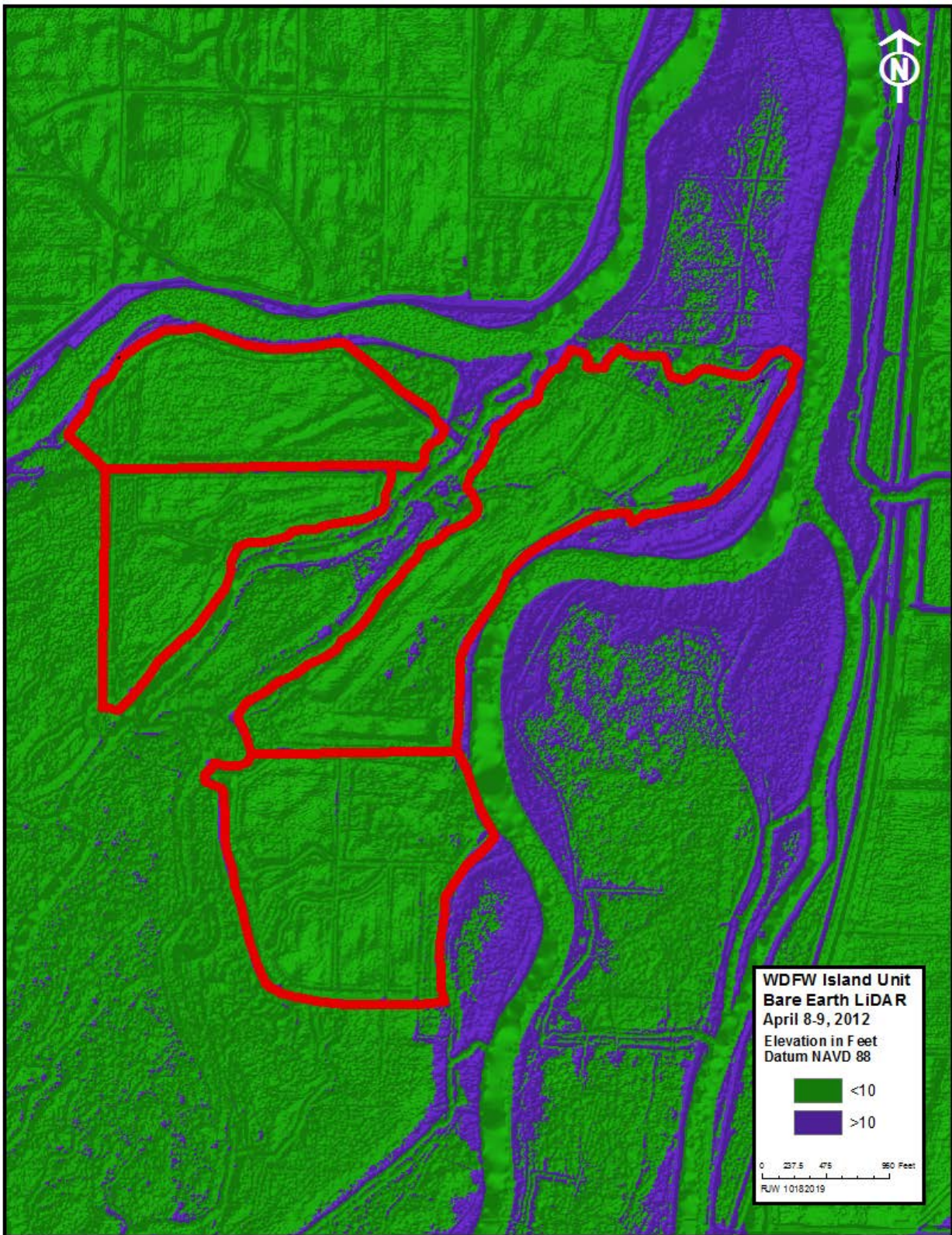


Figure 15 -Inundated Areas when water surface is at 10 feet NAVD88

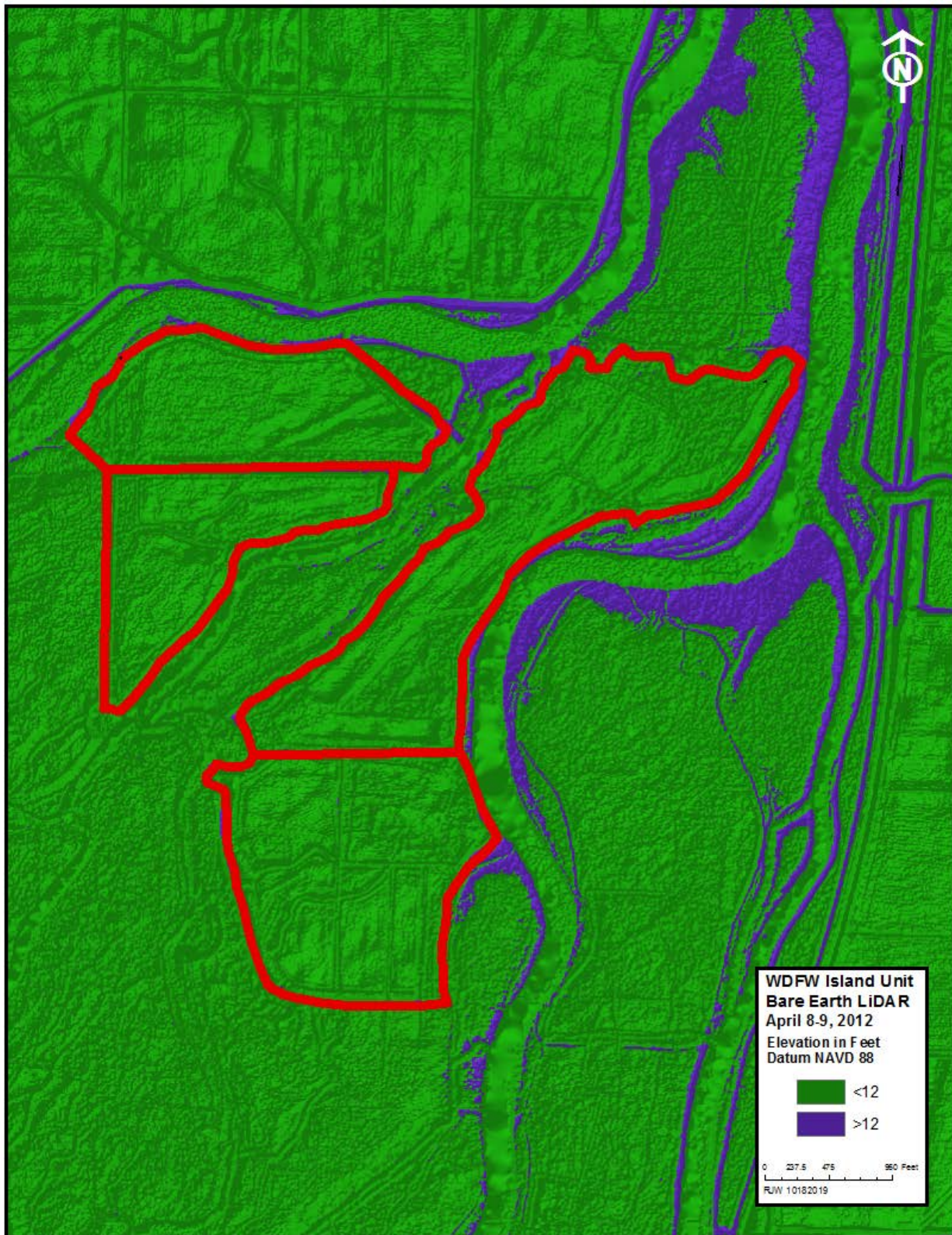


Figure 16 - Inundated Areas when water surface is at 12 feet NAVD88

Tidal Channels and Breaches

Tidal channel length and area was estimated by Greg Hood, PhD at Skagit River System Cooperative (SRSC) (Beamer 2020). SRSC used a conceptual design method based on habitat created at neighboring projects and reference natural marshes to estimate tidal channel length and area (Table 3). Figure 17 provides a schematic layout of the tidal channels.

Table 3 - Predicted Tidal Channel Length and Area

	Predicted Channel Area (ac)	Predicted Channel Area (SF)	Predicted Channel Length (ft)
Alternative 2	6.07	264,571	37,129
Alternative 3	3.08	134,331	24,908
Alternative 4	8.70	378,774	55,432

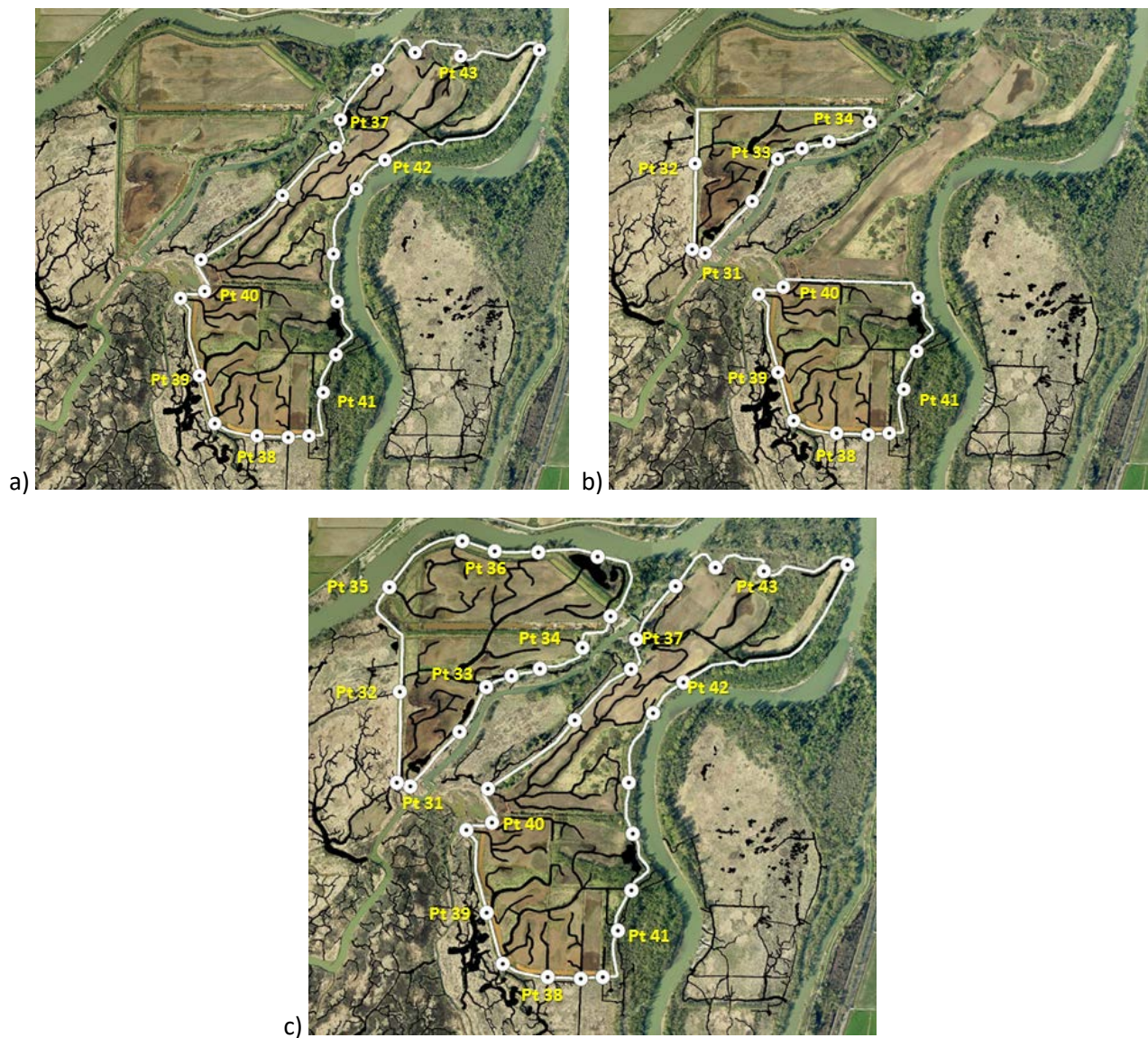


Figure 17 – Conceptual tidal channel layout and channel connections. a) Alternative 2, b) Alternative 3, and c) Alternative 4. Tidal channels are black lines. Tidal channel outlets are shown as white dots with a black center. “Pt ##” labels are related to Chinook smolt estimating methods and are explained in Beamer and Hood 2020.

Sediment Dynamics

The Skagit River is generally aggrading from Sedro Woolley to Skagit Bay (Grossman, in prep). Georeferenced survey data from 1999 to 2014 was analyzed to show that in the North Fork of the Skagit River, the bed has aggraded between 2 and 5 feet, which continues a trajectory seen prior to that time period as well. The South Fork Skagit River does not have an equal period of data but has been characterized as a moderate aggradation reach (Figure 18). At the time of the analysis the south fork conveyed approximately 40% of the river sediment, had a lower gradient than the north fork, and had equal tidal influence. These factors promote sediment trapping.

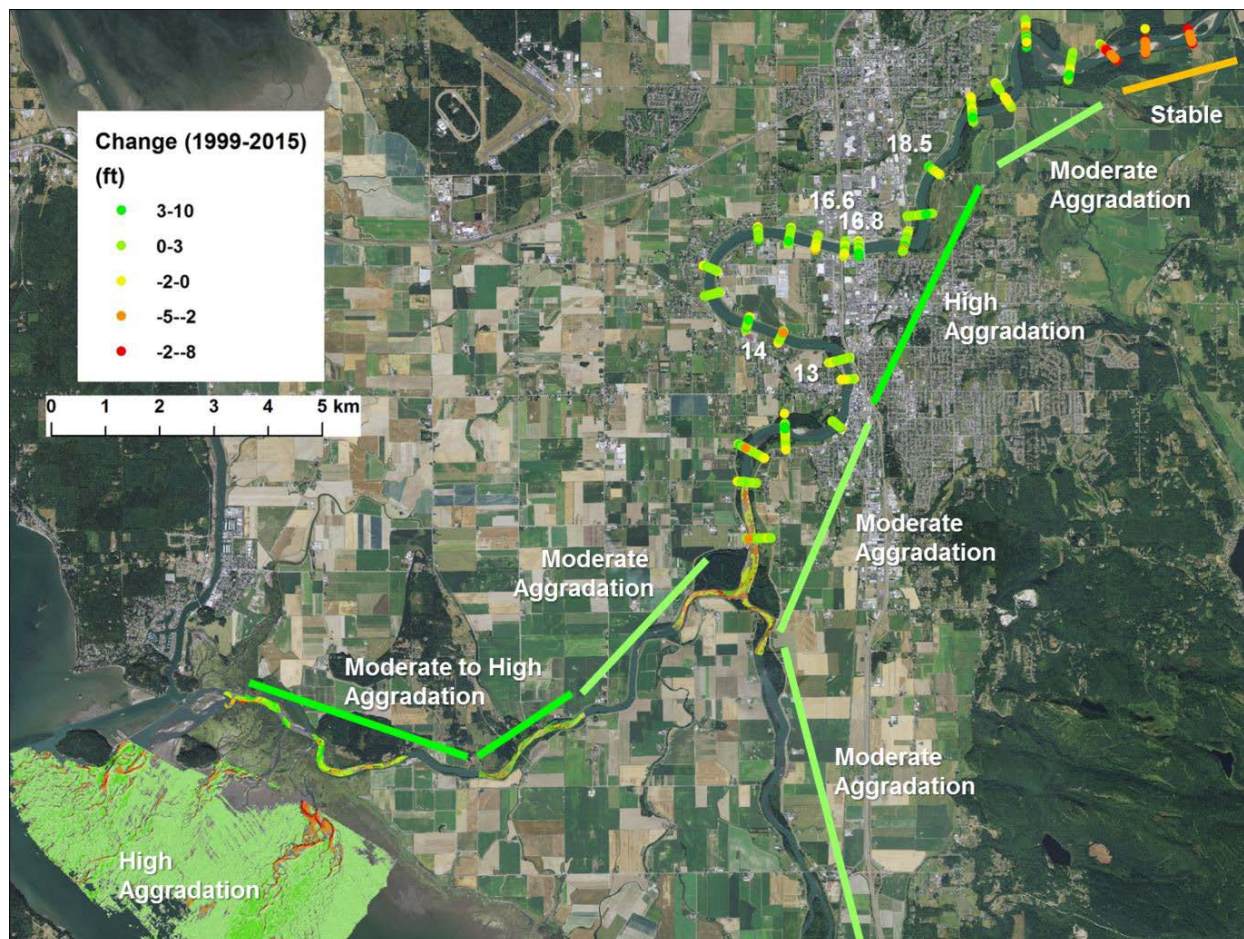


Figure 18 - Map showing the sediment aggradation regime of the lower Skagit River and delta (from Grossman, in prep)

Skagit Hydrodynamic Model

The Skagit HDM project included modeling restoration scenarios throughout the delta to understand the impact of restoration on several factors related to salmon habitat and flooding. Two model outputs are relevant to this geomorphic memo: change in flood water elevations and changes in shear stress (erosion/deposition potential). In both cases current conditions (equivalent to “no restoration/alternative 1”) are compared with a full restoration scenario (Alternative 4). The model run that included Island Unit also included two other restoration projects that were far enough away that the impacts of each project were distinct from each other. The other two projects were in the North Fork of the Skagit River and in the Swinomish Channel. Models are predictive tools that estimate changes, but there is some degree of uncertainty in the results.

Changes in Flood Water Elevation

Model runs were done to look at how full restoration at the Island Unit would impact water surface elevations (WSE's) during two river flow and tide conditions: 1) a 50% annual possible exceedance high flow (Q2 = 62,000 CFS) and a low spring tide (-3.3 ft), and 2) river flood flows (QFlood = 93,200 CFS) and high spring tide (10.4 ft NAVD88). Under both scenarios there were decreases in water surface elevations over significant distances of the river (Figures 19 and 20). Below are details on the flood flow/high tide scenario.

The flood flow scenario was defined as a peak discharge rate at the Mount Vernon gage of 93,200 CFS and a spring high tide of 10.4 ft. Under this combination of river flow and tidal elevation, the model predicted the WSE to be near the top the river levees. When comparing no restoration with full restoration, there was a WSE reduction of 0.3 feet at the North Fork split to over 3 feet at the upstream end of the Island Unit (approximately 4.5 miles). This is due to removal of the “plug” in the outlet of the south fork Skagit River that is formed by the dikes at Island Unit. Partial restoration alternatives were not modeled. However, the “plug” effect would be somewhat reduced with Alternative 2; it would likely not reduced with Alternative 3. During discharge less than Q2 on the river water surface elevations will only be minimally changed downstream of the project site (Figure 18).

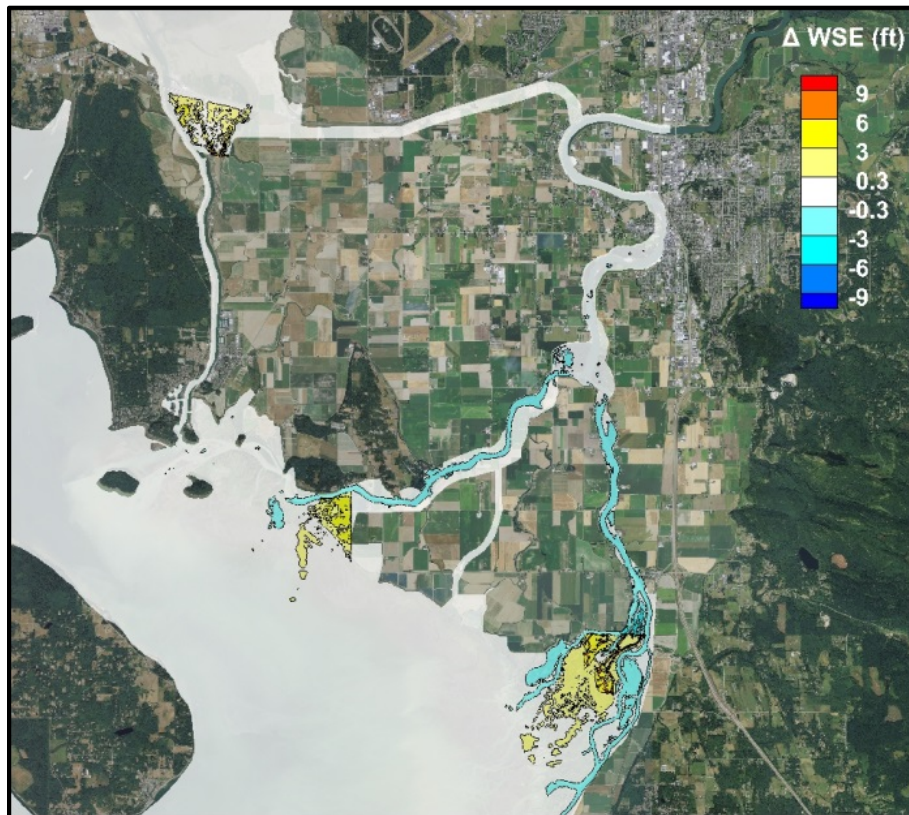


Figure 19 - Contour map of change in WSE from baseline to full restoration with Q2 river flow and low tide. (Whiting et al, 2017)



Figure 20 - Contour map of change in WSE from baseline to full restoration with flood flow in the river and high tide. (Whiting et al, 2017)

Changes in Shear Stress

Modeling was done to look at how full restoration at the Island Unit would impact shear stress, which is a measure of river energy used to predict sediment transport and meandering. Two model runs were completed for baseline/no restoration conditions and two model runs were completed that allowed a comparison of existing conditions (no restoration) with full restoration. For each pair of runs, the following conditions were modelled: (1) peak shear stress during a full tidal cycle and low river flow (12,000 CFS) and (2) shear stress during Q2 flow (62,000 CFS) and low spring tide (-3.3 ft). Figure 21 provide the shear stress predicted by the model under a no restoration scenario and Figure 22 provides the change in shear stress that is predicted by the model under conditions mentioned above due to the removal of the dikes/levees at the Island Unit.

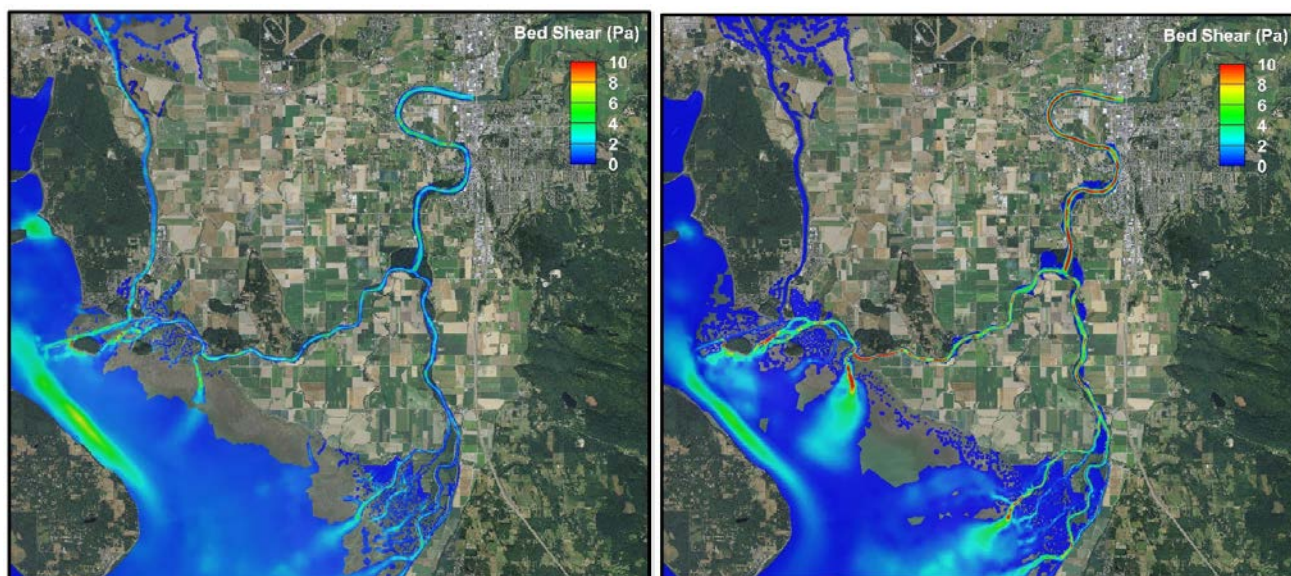


Figure 21 - Contour maps showing shear stress under existing conditions (no restoration) during two conditions: (left) peak shear stress during a full tidal cycle and low river flow, and (right) Q2 river flow and low spring tide. (Whiting et al, 2017)

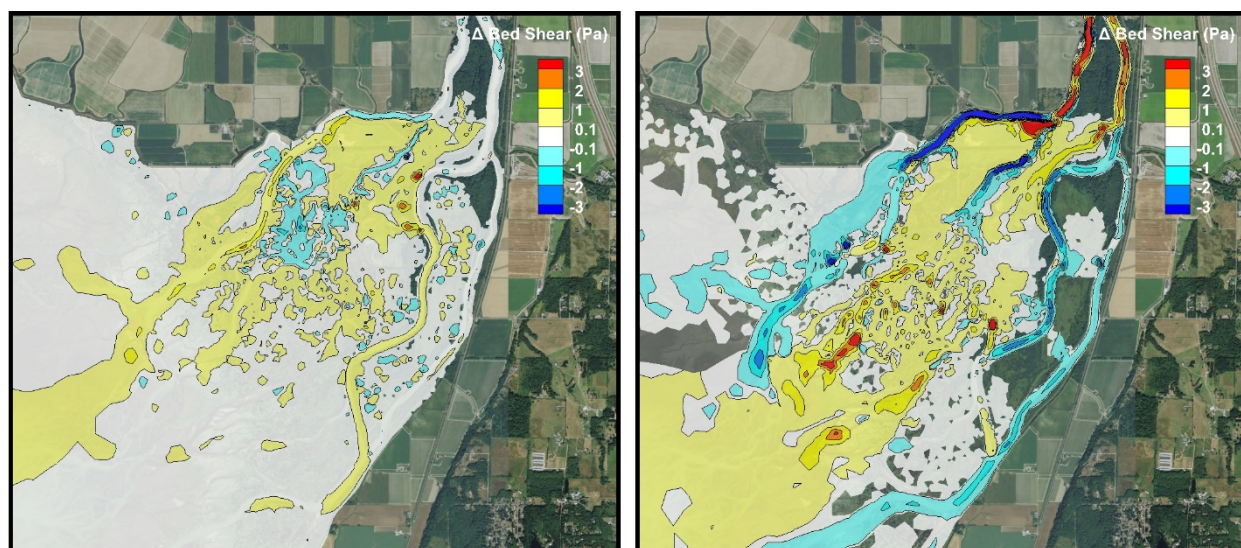


Figure 22 - Contour maps showing change in bed shear stress between existing conditions to "with project" conditions during two conditions: (left) peak shear stress during a full tidal cycle and low flow, and (right) Q2 river flow and low spring tide. (Whiting et al, 2017)

During the 2 year (Q2) river flow and low spring tide with full restoration, the predicted shear stress increases at the inlet to Deepwater Slough and decreases by 2 to 3 Pascals within Freshwater Slough. The Skagit Delta consists of fine-grained material of silts and very fine sands. A consistent 2 Pascal increase in shear stress could change sediment mobilization from silts to very small gravels (<4mm). These results indicate that energy in the channels could change as a result of dike removal at Island Unit. If this predicted change did occur, over time it is possible that the discharge within Freshwater Slough could decrease and the discharge in Deepwater Slough could increase. However, modeling results represent a finite point in time under particular conditions and do not account for consistent changes in dynamics that would shape the channels in this reach. Shear stress and other factors that shape channels in this part of the river should be investigated further during the next phase of design.

Elevation and Vegetation

In tidal marsh systems, specific vegetation species and plant communities correlate with marsh surface elevation resulting from changes in salinity, inundation frequency and duration, and other factors. Vegetation currently on the Island Unit is supported by diking and drainage and is not reflective of native estuarine vegetation communities that would be expected at the site. Vegetation community predictions for full restoration of the Island Unit were completed as part of the Skagit HDM project as well. Complete methods and sources are provided in the final report (Friebel et al, 2017). The vegetation zone elevation ranges (in feet NAVD88) used in the HDM analysis were:

- Mudflat: Less than 3.0
- Emergent Marsh: 3.0 – 7.9
- Shrub-Scrub: 8.0 – 9.9
- Floodplain Riparian: Greater than 10

Mudflat is unvegetated; emergent marsh is vegetated by non-woody plants, scrub-shrub zones support woody shrubs and non-woody vegetation, and floodplain riparian supports trees and shrubs. The acreages on the Island Unit within each vegetation elevation zone are provided in Table 4. There is no predicted mudflat but there are significant acreages predicted in each of the three other vegetation zones. This means the site would provide a wide range of habitats under the full restoration scenario (Alternative 4).

Table 4 - Acreages within the Island Unit that are predicted to support different vegetation communities for Alternative 4 (Full restoration)

mudflat or submerged	emergent marsh	scrub-shrub	floodplain riparian
0	149.1	66.6	52.1

No analysis was done for partial restoration alternatives, the only vegetation zone information we have for those alternatives is what can be interpreted from viewing elevation LiDAR maps (Figure 8). Alternative 2, which involves restoring the east island, contains a range of elevations and would support a range of vegetation communities. Alternative 3, which involves restoring the lower elevation southern portions of both islands, would mean only lower elevation vegetation zones would be restored.

Existing Levee/Dike Condition and Impacts

The levees at Island Unit have been damaged and, at times, breached over the last few decades. Most recently, on the north side of the west island Freshwater Slough migrated into the left bank leaving the levee in poor condition there. Repairs were made sometime between 2007 and 2009. Current problem areas exist near the inlet to Deepwater Slough and should be fortified if left in place. The other dikes and levees are visually in acceptable condition, but should be evaluated during design.

Climate Change

Current models predict that both sea level rise and changes in river hydrology are occurring at a progressively faster rate over time. Island Unit infrastructure and management will be affected by these changes.

Sea Level

The predicted sea level rise for 2070 for the Puget Sound was calculated with the US Army Corps of Engineers Sea Level Curve Calculator (USACOE 2019). The intermediate estimated sea level rise is 0.81 feet. The low estimated rise is 0.34 feet and the high estimated rise is 2.30 feet.

River Hydrology

Table 5 presents the predicted change in hydrology in the Skagit River estimated by Lee et al, 2016. They predict that Q2 discharge will increase by a factor of 1.7 by 2080. The effect of increased hydrology has not been modeled, but this would be a significant change in water surface. Removal of the dikes within the Island Unit could possibly decrease the effect of the increase in discharge.

Table 5 - Skagit River 2080 Q2 predicted discharge (Lee et al. 2016).

Recurrence	Units	2015	2080
2-year Discharge	Cubic Feet per Second	62,000	103,237

Long Term Sustainability

Channels in the lower Skagit River are changing under current conditions/no restoration. Channels migrate naturally (which is why we see bank/dike erosion issues on the northern side of the west island) and data shows that it is an aggrading reach (Grossman, in prep). Changes in SLR and river flows will cause channel changes even without changes at Island Unit. More frequent and severe high flows will increase the energy that causes scour and sediment movement. SLR will increase the area over which river flows are backed up and the area over which tidal processes shape the land.

Our understanding of what might happen under partial or full restoration scenarios is limited. Modelling results from a single point in time indicate that dike removal will change where channel energy might increase and decrease. However channel changes are a result of energy acting over time and not a single point in time. Further investigation is needed to fully understand how channels might change under any of the alternatives. Using the best available current data, predictions have been made and are included below.

Tidal Channels

Daily WSE rarely drop below 6 feet NAVD88 during winter (Figure 8 and 9) , presumably due to higher river flows at this time of year, constructed tidal channels in areas below elevation 6 feet NAVD 88 (Figure 13) may infill during winter with sediment from the bay. Primarily these areas are found in Alternatives 3 and 4. These areas will likely be ponded and provide habitat over a larger area than just in the channels during this time as has been seen on other restoration projects such as the Wiley Slough Restoration Project (Beamer, 2015). The channels will likely redevelop during spring when river flows are lower and WSE drops below 6 feet NAVD88 on low tides.

Slough Avulsion

The removal of the dikes/levees in Alternative 4 and to a lesser extent in Alternative 2 is predicted to change shear stress in this reach during certain conditions, which may increase the chance of a higher discharge into Deepwater Slough. The predicted decrease in shear stress within Freshwater Slough may aggrade the slough and decrease scour risk on the right bank levees of the Skagit River. This reach of the Skagit River is generally aggrading and, although sediment transport may increase through the reach immediately after construction, it is possible that the delta will respond and the river will generally trend towards aggradation with local changes in channels within the delta.

Vegetation

Under full or partial restoration scenarios the vegetation community within the Island Unit would likely develop as predicted by the vegetation zones associated with ground elevations described above. As sea level rises, sediment is likely to deposit on the marsh surface and may keep pace with SLR. If sedimentation does not keep pace with SLR, the vegetation communities are likely to migrate to higher elevations.

Infrastructure

Climate change may have substantial impacts on the dike system. Sea level rise (SLR) would increase the need for raising the elevation of the dikes and could result in increased damages. Water levels will reach dike-top elevations more frequently, which would result in more frequent overtopping. More frequent and higher water levels against the dikes also increases dike saturation and seepage. Overtopping, saturation and seepage contribute to dike instability, erosion and failure. In addition, increases in the frequency and size of river flood flows due to climate change may increase the shear stress within the Skagit River. The increased shear stress would increase scour and require fortification of the dike system. Improvements to the dike system in the case of no restoration or partial restoration should be considered.

Climate change impacts will also likely have significant impacts on operation of the tidegates. The tidegates work on gravity so water drains out when water outside the dikes is lower than water on the land side of the dikes. As SLR occurs, there will be less time during each tidal cycle when water is low enough on the bay side of the dikes to drain via gravity. This will result in reduced drainage capacity, which will likely limit management activities such as mowing and crop production.

Conclusions and Recommendations

This preliminary geomorphic assessment provides limited information about geomorphic changes that might be expected as a result of full or partial restoration at the Island Unit site. Preliminary conclusions include:

- The project area is in a dynamic geomorphic and hydraulic setting that is appropriate for restoring estuarine processes.
- This reach of the river will experience changes due to ongoing geomorphic processes as well as climate change even without a change in management at Island Unit.
- Removal of dikes may change flow and sediment conditions within the estuary.
- Dike removal and channel construction is anticipated to restore natural hydrology, elevations and native plant communities.
- Restoration would allow vegetation communities and habitats to adapt and migrate with sea level rise.
- Removing sections of the “plug” in the lower river caused by dikes would likely reduce flood risk during certain events.
- Infrastructure in this location will face increasing challenges in the face of sea level rise and changing river flows.
- Increasing frequency and size of floods and higher tides could result in more frequent and severe dike damages.
- Gravity operated tidegates will provide reduced drainage capacity as SLR reduces the amount of time water can flow off the site.

If full or partial restoration is pursued, it is recommended that additional analysis be completed in the subsequent design phase related to:

- Potential for channel changes (avulsion, scour and sedimentation)
- Inventory of dike condition

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JULY 15, 2020

**APPENDIX E: WATERFOWL AND
SHOREBIRD TECHNICAL MEMORANDUM**
MONITORING AVIAN RESPONSE TO ESTUARY RESTORATIONS IN THE
GREATER SKAGIT DELTA: A REVIEW OF RELEVANT PROJECTS

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Monitoring Avian Responses to Estuary Restorations in the Greater Skagit Delta: A Review of Relevant Projects

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Wildlife Program, Washington Department of Fish and Wildlife

July 15,2020

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1.0 Introduction and Background

In this document, we summarize research, survey, and broad-scale management information relevant to the questions below:

- What consequence would restoring part/all of the Island Unit have on waterfowl and shorebirds at the Island Unit?
- What consequence would restoring part/all of the Island Unit have on waterfowl and shorebirds within the Greater Skagit Delta (Samish, Padilla, Skagit, Port Susan Bays and adjacent lands and intertidal areas)?
- At what geographic scale(s) do we see measurable impacts (positive or negative) to waterfowl and shorebird populations by changing management at the Island Unit?

Site-specific data do not exist regarding precise habitat functions or food resources available for any species in either agricultural lands or the estuary in the Greater Skagit Delta (GSD), which is comprised of Port Susan, Skagit, Padilla and Samish bays and their associated uplands. Decisions regarding the effects of restoration alternatives for the Island Unit must therefore be based on inferences from limited research that has occurred in the GSD and other relevant information.

The questions posed by the project are focused on the site and GSD scale, and specifically on the potential impacts of changes in site management on the waterfowl and shorebirds that use the Island Unit and the GSD.

We've structured the document to discuss waterfowl and shorebird ecology in separate sections, although we recognize that species use of the area overlaps. Where possible, we discuss relevant material at the GSD or larger scale first and step down to smaller scales as appropriate.

1.1 Broad-scale Waterfowl Management

Migratory birds travel vast distances, and their habitats and populations are managed and monitored at multiple scales. All migratory birds are protected by federal law (Migratory Bird Treaty Act 1918), and under federal authorization, waterfowl harvest is allowable through coordination with state, federal, and international entities via the Pacific Flyway Council. Waterfowl hunting is conditioned upon sustainable populations and monitoring to inform decisions. For waterfowl, continental management and population objectives are developed and described in the North American Waterfowl Management Plan agreed to by the U.S., Canada, and Mexico. Continental objectives are then broken down into regional and smaller planning areas. Washington State is part of the Pacific Birds Habitat Joint Venture, which is broken down into sub-basin planning focus areas based on Level III Ecoregions

designated by the Environmental Protection Agency; the Greater Skagit Delta is in the North Puget Sound Lowlands sub-basin. Breeding population surveys, banding operations, harvest data, and local waterfowl flights all inform population status and small and large-scale management actions for waterfowl.

In the waterfowl conservation community, public lands, many of which were purchased for specific waterfowl habitat purposes, are viewed as the primary stable source that meets a small, but vital, component of the seasonal habitat needs and energy requirements of migratory waterfowl throughout the year. Joint Ventures, striving for habitat goals to sustain continental waterfowl populations, have demonstrated it takes much more than public lands to meet the annual food requirements of waterfowl in a particular region. However, waterfowl foods on private lands are not consistent, as they are not purposefully planted for waterfowl benefits to offset losses of historic habitats, and therefore should not be relied upon to provide the primary resources to meet continental, state or regional population objectives. Thus, current management relies on food and habitat resources that come from a variety of land management and cooperative partnership actions.

1.2 Broad-scale Shorebird Management

Shorebird management across regional and international boundaries is also considered under the Pacific Flyway Council, and conservation plans are developed by technical committees convened by the Council. The US Shorebird Conservation Plan (Senner et al. 2016) provides a scientific framework to determine species, sites, and habitats that most urgently need conservation action. These national assessments were used to step down goals and objectives into 11 regional conservation plans, of which the Northern Pacific Coast Plan pertains to Washington (Drut and Buchanan 2000). The primary goals of these plans are to increase and stabilize shorebird populations by protecting and restoring estuarine, beach, rocky intertidal and freshwater wetlands. Management strategies are recommendations and do not commit agencies to specific actions or schedules.

Winter surveys intended to monitor population trends at the flyway scale have been conducted annually through the Pacific Flyway Shorebird Survey, administered by Point Blue Conservation Science, since the winter of 2012-2013. In the GSD, these surveys are conducted from several estuarine sites among the bays. However, these surveys are designed to determine population trends at the flyway geographic scale and should not be applied at a site specific, or GSD level. Surveys to determine overall shorebird numbers in the GSD have not occurred in over a decade.

1.3 Island Unit and GSD Description

The Island Unit is managed within the Skagit Wildlife Area, which is located within the GSD. The GSD includes Samish, Padilla, Skagit and Port Susan Bays and contains a mix of unmanaged habitats (estuary) and managed (agriculture). The GSD is a very large area comprised of *approximately* 5,450 acres of nearshore emergent estuarine marsh and 42,300 acres of associated upland areas that are generally managed as farm crops, berry production or pasture (Hamer, unpublished data using available GIS layers and limited to ≤ 5 m in elevation). The value of the GSD for waterfowl was identified in the 1940s by the US Fish and Wildlife Service, who acquired large portions of the lower Skagit River delta.

The diked areas are former tidal marsh that was converted in the late 1800s to establish agricultural lands. In the 1950s, Washington Department of Fish and Wildlife (WDFW) acquired lands owned by the US Fish and Wildlife Service (USFWS) in the GSD, creating the Skagit Wildlife Area. The current diked portions of the Skagit Wildlife Area that front Skagit and Padilla Bays include 810 acres that are actively managed to produce enhanced/managed winter waterfowl forage; this includes the Island Unit.

The Island Unit covers approximately 268 acres on two islands in a tidally-influenced reach of the South Fork Skagit River within the Skagit River delta and adjacent to Skagit Bay. Currently, WDFW manages approximately 140 acres of agricultural fields on this site to produce enhanced (seed-bearing) and managed (non-seed bearing) waterfowl forage. This forage consists of a variety of “agricultural” food sources (e.g., corn, barley, millet, fava beans, buckwheat) as well as moist-soil or naturally occurring vegetation (e.g, smartweed, yellow nutsedge, Bidens). Water control structures allow for the retention of water within the fields to improve food availability for dabbling ducks and other water birds in the winter. Although peak use of the site by waterfowl occurs from early November until late December, the variety of forage types provides for easily accessible food resources from early October through spring return-migration in March and April. As a popular waterfowl hunting site, the Island Unit is a highly disturbed area during daylight hours from October through January, which forces nearly all of the waterfowl feeding at this site to occur at night during these months. Consequently, it is difficult to monitor waterfowl use of the Island Unit during the time of year when use is at its greatest, and no attempts have been made to quantify waterfowl numbers there.

Estuary restoration projects in Washington, and specifically in the GSD, have been designed to address habitat objectives for listed salmonid species, especially Puget Sound Chinook, identified in federal recovery plans under the Endangered Species Act. Avian responses to estuary restoration projects where diked habitats are restored to intertidal conditions, usually by removing all or part of dikes, are not well documented.

1.4 General Large-Scale Summary of Avian Monitoring Projects Relative to Estuary Restoration Projects

Although there are several projects associated with river deltas in Puget Sound that altered or removed dikes or berms to improve intertidal habitats for fish, none funded long-term avian response monitoring and very few surveyed birds to establish baselines prior to executing the restoration actions. These omissions result from grant sources focused on salmonid responses, of which very few provide funds to address birds whose populations are generally not considered critically imperiled. Recognizing this information gap, the Puget Sound Partnership conducted a survey to understand the scope of avian monitoring that has occurred to date (Koberstein et al. 2017). This paper looked at 21 berm and/or dike removal projects initiated in Puget Sound between 1994 and 2016, of which 14 incorporated some form of bird monitoring. The primary objective of the paper was to collate methods these projects used as a precursor to developing standardized research and monitoring techniques that can be incorporated into future estuary restoration projects to help inform avian conservation actions. Secondly, the authors looked for inferences that could be drawn from the projects and found a variety of responses, likely linked to the variety of assessment methods each employed, as well as the many differences among the sites themselves.

Projects that completed post-restoration monitoring reported mixed effects relating to bird use of the restoration area immediately after restoration. For examples, Port Susan Bay Preserve reported changes in community composition post restoration, from passerines and dabbling ducks as the dominant taxa groups to dabbling ducks, shorebirds and geese. JimmyComeLately Creek Estuary reported a decrease in overall abundance and no change in species richness, but saw an increase in some groups of waterbirds, such as dabbling ducks. Nisqually Refuge found an increase in waterbird abundance post restoration. Lastly, monitoring in Wiley and Deepwater Sloughs found that waterfowl and shorebirds used large, well-drained channels at low tide, but avoided large channels that did not drain. This inventory revealed a mix of patterns in bird response to estuary restoration.

Koberstein (2017) documents the fact that avian monitoring has not been performed in a consistent manner on restoration sites pre- and/or post-project. Without site specific data related to habitat conditions and use of habitat resources throughout the year, we cannot state with certainty how bird use may be affected by the restoration activity at a site-specific or larger scale. Habitats (freshwater wetland and upland vs. tidal marsh) as well as food resources (enhanced winter waterfowl forage vs. tidal marsh vegetation) will change with restoration. The impact of this change would depend on the scale of consideration (site, local, and regional) as it relates to habitat type, function, and availability to specific avian species pre- and post-project. The size and extent of the habitats available to ducks/shorebirds annually, the highly dynamic nature of both farming practices and natural conditions in the intertidal habitats, weather, animal behaviors, etc. make designing studies to determine the effects of restoration projects on all the species that rely on the GSD problematic.

The amount of food resources available is one metric that determines how birds will use a particular site. Current quantitative data that compare waterfowl and other avian species use to food availability in the estuary or agricultural areas in the North Puget Sound Lowlands, including the GSD, do not exist. However, the primary objective for the Island Unit currently is to manage the site to maximize the amount of planted forage food available to ducks when the largest numbers are present in the Skagit delta (fall/spring migration and winter). Asking how the proposed alternatives affect this management objective may be helpful in predicting whether each alternative will be negative, positive, or neutral for birds at three geographic scales: Island Unit, Skagit Bay, and the Greater Skagit Delta. In general, waterfowl life history and annual energetic requirements are probably better researched than shorebirds and some of this information is discussed below.

2.0 Waterfowl Ecology

2.1 Midwinter Waterfowl Surveys

It's important to recognize that bird distributions within and among the bays of the GSD are influenced by many factors, such as weather, tides, food resources, predators, social bonds, and human disturbance.

WDFW staff have conducted periodic aerial surveys of open water portions of the four bays of the GSD since the 1954-55 waterfowl season. These surveys have been conducted once per month from October through January, when possible, but the January count has been the most consistently conducted. Caution should be used in making comparisons between years of data (Eggeman and Johnson 1989) because of uncertainty related to:

- non-defined transects (however, in tidal regions there are reasons to not have set transects as the underlying "available habitat" is highly dynamic and constantly changing),
- as a northern latitude wintering area, annual variation in counts can be influenced by temperature and open-water conditions on the landscape (Lovvorn and Baldwin 1996), and
- the role of hunting pressure on waterfowl distribution in the GSD.

These local surveys have been a long-term component of the Midwinter Waterfowl Survey (MWS), a nationwide effort to survey the number of waterfowl in areas of major concentrations on their wintering grounds and were the primary survey to determine the status of wintering waterfowl throughout the Pacific Flyway. At the local level, they provide insights into whether population targets, established within the framework of the North American Waterfowl Management Plan (NAWMP) and the Pacific Birds Habitat Joint Venture (PBHJV) are being met within available habitat for specific counties or landscape planning areas. The PBHJV has established waterfowl management zones at the

ecoregional scale. The Island Unit is located within the North Puget Lowlands (NPL) ecoregion that includes Whatcom, Skagit, Island, San Juan and Snohomish counties and is defined by the west slope of the Cascade Mountains, the floodplains of major Puget Sound Rivers, the northern part of Puget Sound, the large islands of San Juan and Island counties, and the straits that encircle the San Juan Islands and connect the inland waters of British Columbia to the Strait of Juan de Fuca (Petrie 2013). Management units are then stepped down and delineated along county boundaries and population objectives are set and assessed by county. For Skagit County, waterfowl counts are recorded for each bay (Skagit, Padilla and Samish), and population trends are assessed by combining those counts.

In the summary figures below, the January MWS counts for the four most prevalent dabbling ducks, mallard, northern pintail, American wigeon, and green-winged teal are compared against the species-specific regional population objectives for Skagit County. The 1955-2014 data are used to develop the long-term average populations of breeding ducks (LTA), and the 80th-percentile of the LTA (80-LTA). Waterfowl are subject to highly variable reproduction cycles, relative to weather and other environmental factors. To account for periodic fluctuations in production on the breeding grounds, it is useful to examine both the LTA and 80-LTA to clarify these cycles when accounting for population changes (NAWMP 2014 Addendum, Fleming et al. 2019).

We present data for the period following 1986, as several key policy and conservation efforts were initiated then. The figures and text below provide Skagit County summaries of species-specific long-term averages, most recent 10-year average, and the number of years the count has been above both the LTA and 80-LTA during the span of survey years. Statistics for each of the dabbling duck species is as follows:

Mallard (MALL): The long-term average count for mallard in Skagit County bays is 80,345, with a recent 10-year average of 87,047. Annual counts have exceeded the LTA in 17 of 30 years and 8 of the past 10 years. Annual counts have exceeded the 80-LTA in 13 of 30 years and 5 of the past 10 years (Figure 1).

Northern Pintail (NOPI): The long-term average count for Northern pintail in Skagit County bays is 37,432, with a recent 10-year average of 41,223. Annual counts have exceeded the LTA in 10 of 30 years and 5 of the past 10 years. Annual counts have exceeded the 80-LTA in 3 of 30 years and 1 of the past 10 years (Figure 2).

American Wigeon (AMWI): The long-term average count for American wigeon in Skagit County bays is 48,318, with a recent 10-year average of 45,862. Annual counts have exceeded the LTA in 19 of 30 years and 7 of the past 10 years. Annual counts have exceeded the 80-LTA in 7 of 30 years and 4 of the past 10 years (Figure 3).

Green-winged Teal (AGWT): The long-term average count for Green-winged teal in Skagit County bays is 6,300, with a recent 10-year average of 10,146. Annual counts have exceeded the LTA in 11 of 30 years and 8 of the past 10 years. Annual counts have exceeded the 80-LTA in 6 of 30 years and 4 of the past 10 years (Figure 4).

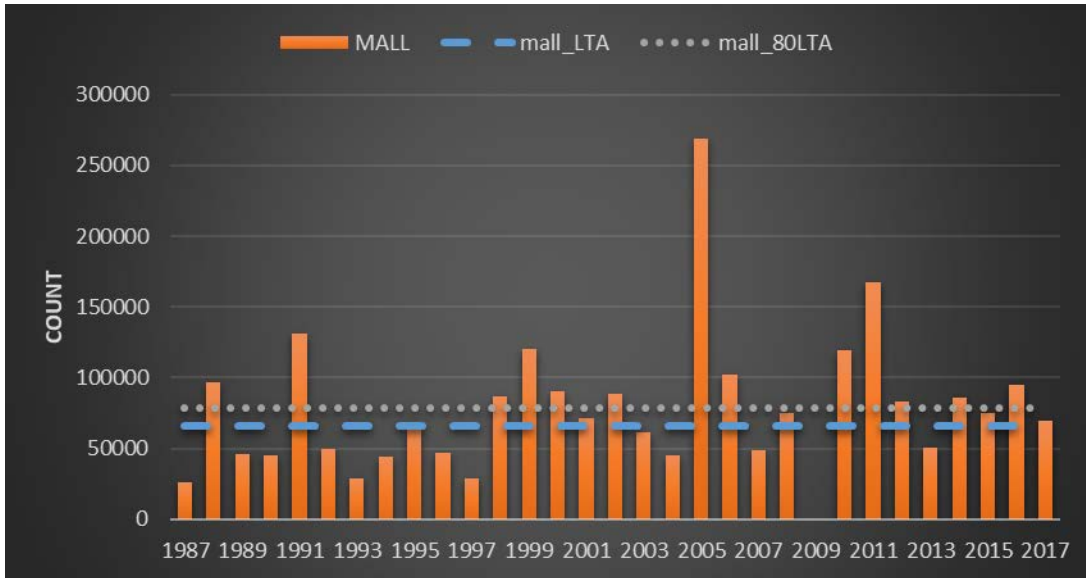


Figure 1. Average mallard numbers for Skagit County bays

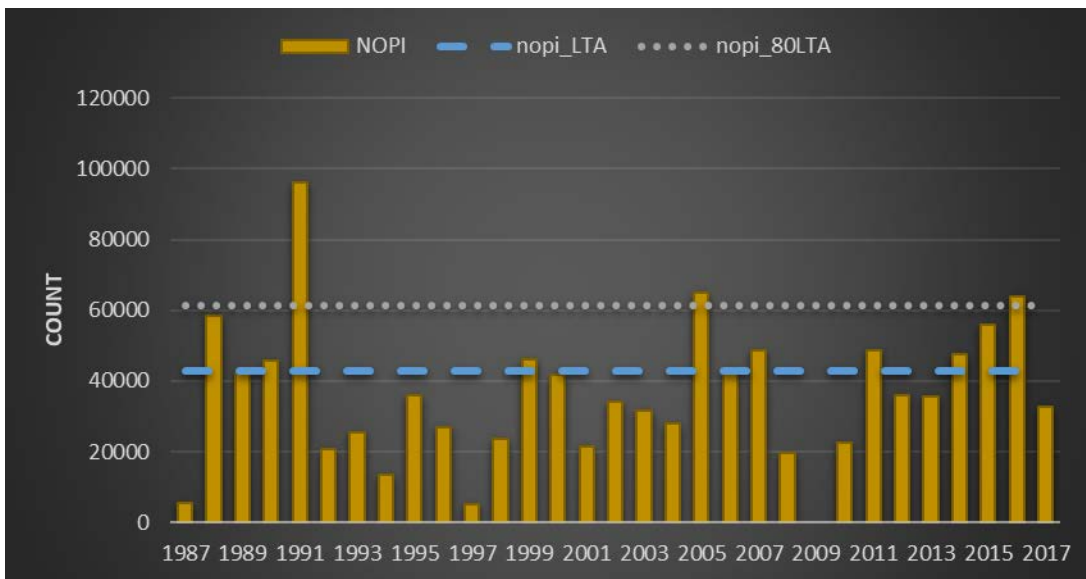


Figure 2. Average northern pintail numbers for Skagit County bays

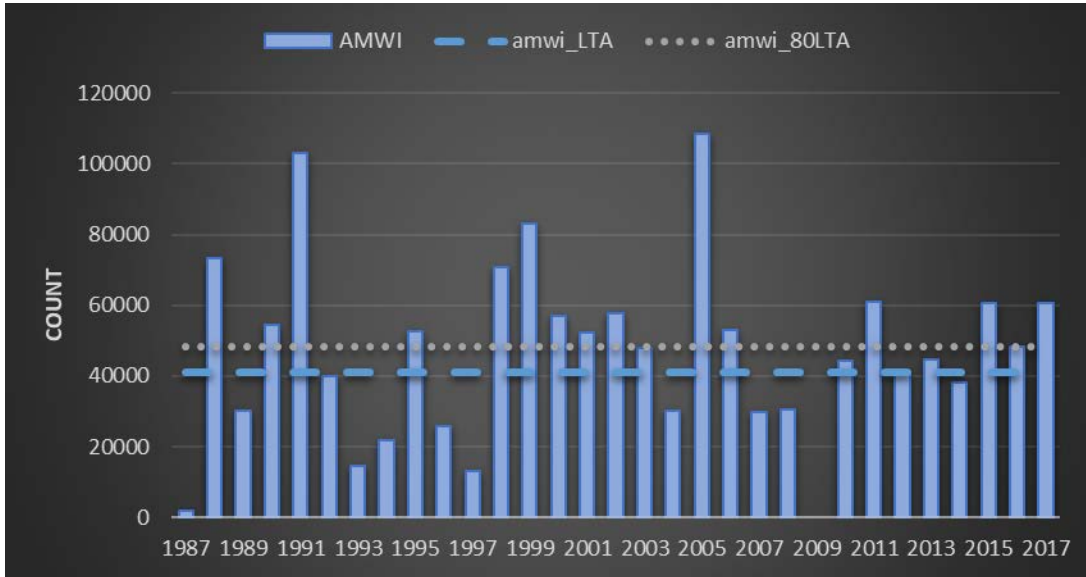


Figure 3. Average American wigeon numbers for Skagit County bays

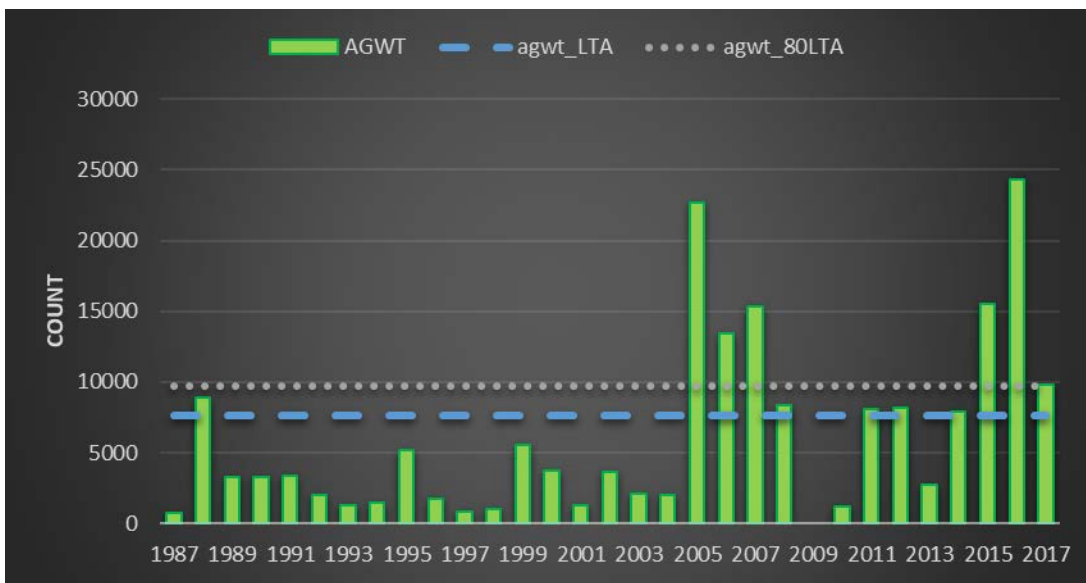


Figure 4. Average green-winged teal numbers for Skagit County bays

2.2 How to Apply the Skagit County Bays Midwinter Waterfowl Counts

We’ve been asked whether these survey data could be used to show the impact on wintering waterfowl populations for dike setback/removal projects completed in the GSD since 2000 due to the long-term nature of the data set. This survey was not designed to examine habitat changes or effects on waterfowl use and distribution. There are several factors in, and outside of, the GSD that result in

changes in waterfowl population numbers. The long-term result of site-specific restoration projects to waterfowl is a complex question that cannot be answered with waterfowl trend data alone.

The most appropriate application of these data is as a check on the “carrying-capacity,” defined as the ability of the landscape to meet food and habitat needs of a certain number of waterfowl, of the system as a whole. As such, the North American Waterfowl Management Plan (NAWMP 1986, 2014, 2018 Update) and the Migratory Bird habitat Joint Ventures have set waterfowl population objectives and targeted conservation efforts to improve wetlands and other habitats important to the persistence of migratory bird populations (Andres et al. 2020). Recently, Fleming et al. (2019) developed regional population objectives for waterfowl during the non-breeding season. Petrie et al. (2011), combined population objectives with migration chronology data to calculate “duck-energy-days” (DEDs). These calculations are then used to determine the amount of food needed to sustain a specified number of ducks in a given area, and allow landscape conservation planners and regional land managers to factor these needs into management actions. The North Puget Lowlands accounts for 17,982,386, 26,659,750, and 11,317,284 DEDs during the fall, winter, and spring period, respectively, representing 39.9%, 57.4%, and 51.5% of the western Washington total duck-energy-day demands (Figure 5). Clearly, the North Puget Lowlands, and by inference, the contributions of the GSD are highly important in maintaining robust waterfowl populations in Washington.

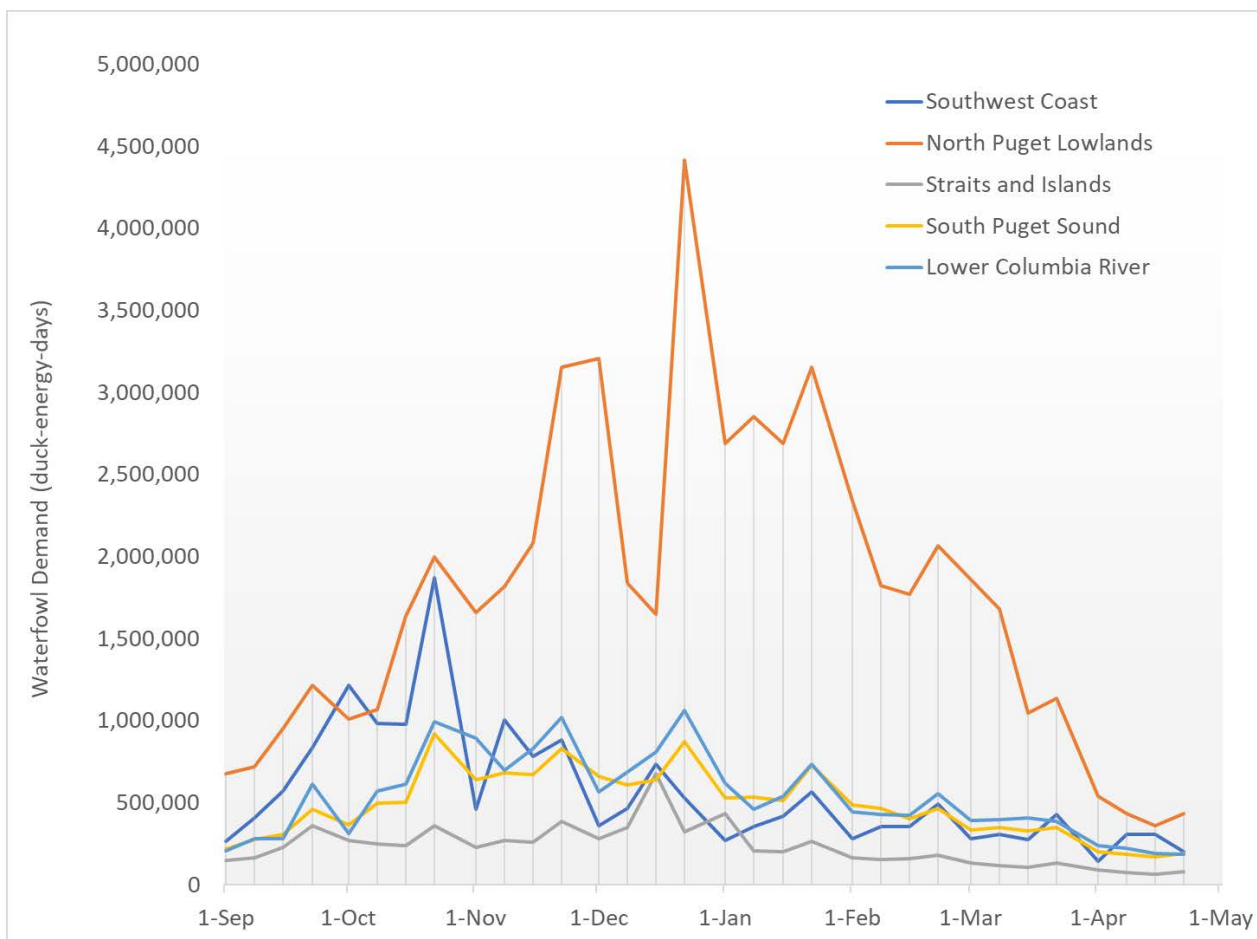


Figure 5: Comparison of duck energy days among 5 geographic management areas in western Washington

2.3 Waterfowl Food Resources

Waterfowl have a minimum daily energy requirement (resting metabolic rate) that must be maintained for survival (Miller and Eadie 2006). The daily energy requirement for a dabbling duck is approximately 312 kilocalories per day, compared to 614 kilocalories per day for a snow goose and 1,106 kilocalories per day for a swan (Petrie et al. 2012). It is well documented that waterfowl forage requirements shift from more plant-based food items in the fall and winter (e.g., seeds, leaves, tubers) to more animal or protein-based food items in the spring (e.g., invertebrates, fresh-growth leaves). Thus, waterfowl require a mixture of habitat types on the same landscape to facilitate longer lengths-of-stay in a particular region (Lovvorn and Baldwin 1996).

Many waterfowl forage items or habitat types have values for biomass and true metabolic energy documented in peer-reviewed literature. However, there may be regional or site-level differences in

these values. In general, natural plant types produce lower yields (biomass) and are of lower digestible energy content compared to plant types in managed systems or agricultural production. Agricultural plants typically provide more kilocalories of energy per gram and occur at higher density (grams/acre) than native plants. Thus, dabbling ducks seeking 312 kilocalories of food would need to forage in larger areas or for longer periods of time on natural plant types than on agricultural plants. Under a natural plant foraging scenario, the need for low disturbance areas increases in order to allow ducks more time to forage. Hunting is a form of disturbance that occurs during daylight hours. In managed systems that allow hunting, large numbers of birds forage at night when disturbance is low and high calorie foods are available.

If enough food is not available on the landscape when waterfowl need to access it, individuals will seek food elsewhere. How far they seek that food is dependent on proximity of alternate sources and the ability to access those sites. However, a consequence of having to seek foods further away from their previous distribution is an increase in the base food energy required for flight - the most energetically expensive activity.

2.4 Local Waterfowl Research and Monitoring Projects

Aside from the waterfowl surveys described above, funding for avian monitoring projects in the GSD has been limited. However, a few local studies have been conducted in the GSD and are summarized below. Because they were conducted at the GSD scale or smaller, these projects provide insight into how ducks might respond to potential changes to current management of the Island Unit.

Slater (2004) conducted avian surveys at three habitat types associated with Skagit and Port Susan Bays: mudflat, intertidal marsh, and agricultural fields, from late winter to early spring in 2003 and 2004. Sampling occurred over four periods: February 9 – 21, March 8 – 21, April 5 – 18, and April 26 – May 9. Each site was surveyed during a low and a high tide event in each sampling period. During the time period surveyed, they found that mean duck density appeared to be higher on agricultural sites managed for wildlife compared to commercial agricultural sites, and duck density did not appear to vary in response to tide on either the commercial or wildlife-managed agricultural sites. Duck density declined on agricultural sites during their spring sampling periods coinciding with the initiation of migration and increased farm activity. Within the agricultural sites, Slater (2004) found that ducks were most frequently observed in flooded fields and low vegetation, and were seen less often in human-made ditches and ponds, high vegetation or bare soil. Duck density was significantly correlated with the percent of standing water surveyed. The proportion of observations in flooded habitats for the most common dabbling duck species was substantially higher than what was available, suggesting that

agricultural habitats with standing water were preferentially selected by dabbling ducks, probably because flooded conditions allow for easier access to seed and invertebrate foods.

Within intertidal marsh habitats, Slater (2004) found four species represented 95% of the individuals counted: mallard, American wigeon, northern pintail, or green-winged teal. Mean duck density on marshes was generally higher during high tide and exhibited a declining trend over the tidal cycle. Duck density was significantly correlated with the percent of standing water in the marshes. Green-winged teal, northern pintail and American wigeon were observed in flooded marshes in greater proportion than was available; mallards used flooded marsh habitats in proportion to what was available. Mallards were the most abundant species, although high densities of northern pintail were seen in the first two sampling periods. Both mallard and northern pintail were usually more abundant on marsh transects at high tide, but their numbers declined substantially during spring sampling periods. In contrast, green-winged teal density increased in the spring periods, which may have coincided with southern populations migrating north and using the GSD as a staging area. American wigeon were moderately abundant and did not appear to be as strongly influenced by tide.

Slater (2004) detected nine species of ducks on tide flats, and the four most common birds were mallard, American wigeon, northern pintail and green-winged teal. Mean relative abundance was substantially higher at low tide than high tide, and this pattern was seen for all the major species. Ducks used flooded tide flats as well as exposed flat, supporting observations that ducks congregate near the tideline.

Conclusions from Slater (2004):

- Dabbling ducks appeared to partition agricultural habitats with respect to commercial and wildlife-managed areas, a likely result of differences among species in food preferences and foraging strategies.
- Gadwall and northern shoveler, the two flooded specialists, preferred the stable water levels at TNC's upland site adjacent to Port Susan Bay [which was a flooded impoundment at the time of the surveys] and were rarely seen in other agricultural or estuarine habitats. Both species prefer muddy, freshwater wetlands and are rarely associated with brackish habitats (Ehrlich et al. 1988 in Slater 2004).
- Mallard and wigeon did not exhibit a preference between commercial and wildlife-managed agricultural habitats. Wigeon are grazers and prefer stems and leafy parts of plants, which makes them particularly adapted to agricultural landscapes. Mallards are omnivorous,

opportunistic, and a generalist feeder, allowing them to utilize a variety of agricultural and urban landscapes (Drilling et al. 2002 in Slater 2004).

- Pintail and green-winged teal appeared to avoid commercial agricultural habitats. Both species utilize commercial agricultural habitats (Lovvorn and Baldwin 1996 in Slater 2004), so it is unclear why they avoided it here. In this study, both species were strongly associated with flooded fields, and the wildlife-managed sites may have been more flooded than commercial lands.
- Duck density was generally lower in agricultural than emergent marsh habitats in the GSD, and this pattern was observed for each of the four most common dabbling ducks: mallard, American wigeon, northern pintail, and green-winged teal. Slater states: *“This result suggests that any perceived cost to duck populations by marsh restoration is unwarranted, and that, in fact, marsh restoration would be beneficial to ducks. Moreover, there is little compelling evidence to support the notion that marsh restoration is detrimental to duck populations. In the northwest, wintering mallard, northern pintail, and green-winged teal feed on seeds of abundant marsh plants (Carex, S. americanus, S. validus), and on animal matter including insect larva and gastropods (Burgess 1970, Eamer 1985); wigeon feed on Carex roots, filamentous algae, and leaves and seeds of other marsh plants. Although Lovvorn and Baldwin (1996) found that tidal flat habitats alone could not support wintering duck populations, they acknowledge that dabbling ducks can feed in areas of tidal marsh instead of farmland as long as areas are available.”*
- Slater further states: *“With the extensive losses of tidal and non-tidal wetlands across the Pacific Northwest and in the GSD, we recognize that agricultural habitats are important in supporting the large duck populations in this area.”*

Virzi et al. (2017) censused birds prior to, and immediately after, the dike was removed at Fir Island Farm in August 2016. This study was of relatively short duration and spanned one survey season for winter, spring and summer pre-restoration and one fall, spring and summer period post-restoration. During this study’s timeframe, the numbers of birds at Fir Island Farm declined substantially immediately after dike removal and they saw a change in species composition between pre- and post-restoration. Reduced site use by waterfowl accounted for the drop in overall bird numbers. Waterfowl counts decreased by 93% at Fir Island Farm while at the same time counts increased by 138% at Leque Island.

“Counts of abundant species at Fir Island Farm pre-restoration (e.g., mallard and American wigeon) declined substantially post-restoration. Other notable waterfowl declines included

bufflehead, green-winged teal and pintails. snow geese counts were also substantially lower at Fir Island Farm post-restoration, and trumpeter swans were not observed at all. One explanation for the observed change in waterfowl abundance at these sites could be that waterfowl use at Fir Island Farm decreased in response to local site conditions immediately post-restoration”.

They also noted that the waterfowl species that declined at Fir Island Farm post-restoration also declined at their reference site at Wiley Slough during the same period, which might indicate other factors contributed towards the observed patterns of site use. The difference in duck numbers seen at post-restoration Fir Island Farms compared to unrestored conditions at Leque Island may reflect the variety of food resources within the GSD (including wildlife-managed sites like the Island Unit) and birds’ abilities to exploit them, but the scope of this study was too limited to explore that concept further.

In contrast to Virzi et al. (2017), Woo et al. (2015a) saw a 30-fold increase in snow goose numbers within two years post-restoration at Port Susan Bay Preserve compared to pre-restoration numbers. They also saw a shift in community structure from freshwater-preferring ducks to generalist dabbling ducks such as mallards.

3.0 Shorebirds

3.1 Local Shorebird Research and Monitoring Projects

Slater (2004) found that shorebirds were substantially more abundant in estuarine habitats compared to agricultural habitats, but observed distinct patterns of habitat use between marsh and tidal flat habitats in relation to season. In the marsh, shorebird density was low during the winter period, but high during spring migration when marsh specialists, such as least sandpipers and greater yellowlegs, were abundant. In contrast, shorebirds were abundant on tidal flats in the wintering period when large flocks of dunlin were observed. Shorebirds were only observed on large channels that drained, similar to observations of waterfowl in channel habitats. These types of channels provide important habitat to marsh specialists: greater yellowlegs, dowitchers, and least sandpipers because they provide foraging opportunities and safe harbor when the marsh is dry. During a two-hour survey of channels in the South Fork Skagit River area on an ebb tide in the fall more than 50 individuals of yellowlegs and dowitchers were counted.

Slater and Lloyd (2010) examined shorebird response to flooded agricultural fields designed to mimic freshwater wetland availability. They found the wetlands that resulted from maintaining flooded fields

supported more shorebirds than two other traditional agricultural practices, grazing and forage harvest, both of which may provide habitat for shorebirds when vegetation is kept short. They saw seasonal variations in the response of shorebirds to flooding, likely related to soil moisture and the availability of standing water across the landscape, and crop heights. Fall migration by shorebirds corresponds with the peak of the growing season and with generally warm and dry weather in the Pacific Northwest. During this period, agricultural fields have low soil moisture and no standing water, high levels of farm activity, and crops that are at their peak in height, all factors likely to dissuade shorebirds from using agricultural fields.

Slater et al. (2011) looked at winter habitat selection by dunlin in the GSD by following radio-equipped birds during three winter sampling periods. Tidal flat and marsh habitats were the highest ranked habitats selected by dunlin in the GSD. Foraging efficiency was presumed to be highest for dunlin in estuarine habitats in both the Skagit and Stillaguamish River deltas, as tidal flats in nearby regions have been shown to support high densities of shorebird prey (Baldwin and Lovvorn 1994, Shepherd 2001 *in* Slater et al. 2011).

Tidal flat areas characterized by finer sediments such as south Skagit Bay supported the highest concentrations of foraging dunlin. An area downstream of the largest remaining area of estuarine marsh in the Skagit River Delta Marsh habitat followed tidal flat in importance. Within the marsh, dunlin were restricted to low marsh habitats and were regularly observed foraging in low marsh substrates in areas where vegetation had died back or in areas where both vegetation cover and height was low and bare patches of mud were present. Some of the heavily used marsh habitats appeared to contain sediments with a greater proportion of organic matter and finer-grained particles than areas of tidal flats that were apparently avoided. For example, dunlin were regularly observed foraging in marsh habitats along the bayfront of Fir Island, but rarely ventured beyond the marsh edge where tidal flat substrates were dominated by sand (Slater et al. 2011).

From Slater et al. (2011):

“The importance of marsh habitats to dunlin in the estuarine environment likely extends beyond simply providing habitat for foraging or roosting. Marsh habitats are a primary driver of food webs in the estuarine environment, contributing large amounts of detritus as vegetation dies back annually.

Tidal flats are the recipients of this influx of productivity, and the quality of tidal flat habitats to species like dunlin and other shorebirds may be driven, in part, by the amount of intact marsh habitat. If so, estuaries with large areas of intact marsh should have higher quality tidal flats

that support great numbers of individuals. In the Skagit and Stillaguamish River deltas, the area of tidal flats has remained stable. In contrast, marsh habitats have been severely reduced in the area due to diking and drainage for human development. Consequently, we suggest that marsh restoration activities will contribute significantly to the conservation of dunlin and other shorebird species both directly, by providing foraging and roosting habitat, and indirectly by increasing habitat quality of adjacent tidal flat habitats.”

Agricultural habitats are known to be important to dunlin as high tide foraging and refugia habitats in coastal habitats, particularly at night (Colwell and Dodd 1997, Shepherd 2001, Evans Ogden 2002, Conklin and Colwell 2007 in Slater et al. 2011). Slater et al. (2011) also found that dunlin used agricultural habitats in the Skagit and Stillaguamish River deltas. Dunlin locations in agricultural habitats were > 23% in each year of the study, and all marked individuals had home ranges that included some agricultural habitats. Agricultural habitats were usually used by dunlin at night, were close to the estuary, and few locations were found > 6 km from the shoreline. *“Stable isotope ($\delta^{13}C$, $\delta^{15}N$) measurements of whole dunlin blood and their prey revealed that while dunlin used primarily estuarine habitats, they also depended to a large degree on adjacent agricultural lands. These findings are similar to those found for dunlin wintering on the Fraser River Estuary, Canada, and are consistent with several studies of shorebirds using estuaries in Europe (reviewed in Evans - Ogden et al. 2005).”* (Slater et al. 2011). Thus, we know that shorebirds will seek invertebrate prey when wet upland habitats are available, and do not only forage in tidally influenced habitats.

In agricultural habitats, Slater et al. (2011) found that dunlin used bare soil, winter cover crops, and crop residue habitats in similar proportions; the use of pasture, other agriculture and woody agriculture was extremely rare. The most apparent feature of agricultural fields associated with use by wintering dunlin was the presence of saturated soils. In general, observations of Dunlin using agricultural habitats were infrequent until winter precipitation resulted in saturated soils and patches of standing water on fields. From Slater et al. (2011): *“Overall, this study reinforces the importance of both marsh and agriculture habitats, and suggests that different strategies may need to be encouraged for each region. Restoration of estuarine habitats will likely provide the greatest benefit to dunlin by creating new habitat and by increasing the quality of existing habitats. However, under the current landscape, agricultural habitats remain important as alternative foraging and refugia sites, particularly those fields that are adjacent to the estuary. Results from this study suggest that saturated agricultural fields with bare ground or low levels of vegetation cover are important habitat features for wintering dunlin, but additional research to identify the specific characteristics that dunlin favor is needed to refine conservation strategies on agricultural land”.*

At Fir Island Farms, Virzi et al. (2017) saw an increase in shorebirds post-restoration. Dunlin counts increased by 85% at Fir Island Farm, while counts at Leque Island and Wiley Slough decreased by 50%. Western sandpiper counts increased by 67% at Fir Island Farm, while counts at Leque Island decreased by 70%. Shorebirds began using Fir Island Farm in greater numbers almost immediately following restoration. Post-restoration Virzi observed foraging shorebirds of nine species in much higher numbers than previously seen at this site during a visit on 23 September 2017.

Woo et al. (2015a) saw increases in shorebird use of the restored marsh and mudflats at Port Susan Preserve 2-3 years after dike removal. They also saw changes in the restored area's sediment quality there post-restoration. Percentages of silt and clay increased, while sand decreased. Densities of amphipods, polychaetes, oligochaetes and, to a lesser extent, bivalves also increased in the restored area (Woo et al. 2015b), which probably influenced the increased numbers of foraging shorebirds seen in their surveys.

Site use by secretive marshbirds remained low post-restoration at Fir Island Farms. However, two species that were not detected during line transect surveys at Fir Island Farm pre-restoration were seen post-restoration: Sora and Virginia rail. It is possible that detection probability increased post-restoration due to increased visibility at this site resulting in these observations. However, the authors did not have enough detections to draw conclusions regarding the effects of dike restoration actions on secretive marshbirds (Virzi et al. 2017).

4.0 Conclusions

4.1 Waterfowl

Public land managers recognize the importance and timing of the various habitats that our state provides to fulfill the annual life cycle requirements of migratory birds. Waterfowl distributions are not uniform across the landscape and, given significant losses of tidal and non-tidal wetlands in the coastal wetlands of the Pacific Flyway (Brophy et al. 2019), management of the Skagit Wildlife Area strives to contribute to the annual energy demands of waterfowl. Habitat quality and quantity is unequivocally the most important ecological component affecting populations of waterfowl and managed lands can be especially effective when the abundance, availability, and spatial distribution of food, cover, and water resources coincide with specific events in the life history of waterfowl (Baldassarre and Bolen 2006).

Changes from managed forage to intertidal estuary will change the abundance, variety and availability of resources at the Island Unit scale. Current management of the Island Unit is designed to optimize

waterfowl access to unharvested agricultural and wetland plants. A shift in management under any of the restoration alternatives will alter “managed” freshwater wetlands to more dynamic water depths and salinity. Clearly, reducing farmed forage at the site scale will reduce the number of birds that congregate there.

However, there are other food resources available within the GSD, including commercial agricultural fields, remaining WDFW or private managed forage plots, and vegetation and invertebrates in the intertidal marshes and flats. These resources are dynamic, and the quality and quantity of food they provide are unknown. The proportion of the food resources the current management of the Island Unit provides compared to food available in the GSD is unknown. We know that ducks will move farther from the site to find equivalent nutrition under the restoration alternatives. However, given the size of the Island Unit compared to the estuary and agricultural fields within the four bays of the GSD, it is unlikely that reducing farmed forage at the Island Unit will result in a decline in the winter waterfowl population at the GSD scale, but rather shift the number of dabbling ducks to disperse across the larger landscape and potentially compete for forage with snow geese and swans. How waterfowl populations might change in the long term due to the alternatives considered for the Island Unit is unknown. Factors that will influence future waterfowl populations and distributions could include increasing intertidal marsh habitats, changing commercial agricultural practices that could either increase, but are more likely to reduce, food available for ducks, increasing the amount of managed forage for ducks by increasing public ownership or through partnerships with private landowners.

4.2 Shorebirds

Although the Island Unit is not regarded as a site of high shorebird use compared to other habitats in the GSD, it supports some birds under certain conditions as currently managed. As discussed above, shorebirds are primarily tied to intertidal marshes and mudflats. Agricultural habitats with saturated soils are secondarily important and this habitat type is available at the Island Unit during wet periods when vegetative cover is low or absent. However, any addition of estuarine habitat in the GSD will increase shorebird habitat and thus benefit shorebirds if all or part of the Island Unit is converted to intertidal conditions. Shorebird use in the immediate vicinity of the Island Unit will likely increase. Shorebirds are highly mobile and routinely move within the GSD (Slater 2011; Milner, unpublished data). Consequently, as intertidal shorebird habitat increases through any of the restoration alternatives, shorebird populations will likely also benefit at the GSD scale.

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APPENDIX F: OPINION OF PROPABLE CONSTRUCTION COSTS

CHANNING SYMS
WASHINGTON DEPARTMENT OF FISH AND WILDLIFE

Opinion of Probable Construction Costs

The “opinion of probable construction costs” was developed by WDFW’s Region 4 Habitat Engineer. Because alternatives are conceptual at this stage, construction costs are provided as a general basis for comparison only. Estimated costs were derived from actual costs from similar nearby projects and adjusted for inflation to the year 2020. Costs include design, permitting, mitigation, construction oversight, construction, taxes and fees, and contingency.

For all alternatives that include dike removal, there is a range of costs provided. Table 1 contains detailed cost information assuming 50% of the dike length is removed for full and partial restoration alternatives and Table 2 contains detailed cost information assuming 100% of the dike length is removed. In summary, the cost for each alternative is:

- Alternative 1: \$6.5M
- Alternative 2: \$8.2-10.4M
- Alternative 3: \$9.9-11.7M
- Alternative 4: \$9.3-13.0M

Table 1. Opinion of Probable Construction Cost for the Island Unit (50% dike removal per alternative that include dike removal)

Date: 9/28/2020										
By: Syms										
			Alternative 1 - No Restoration		Alternative 2 - East Island Restoration ¹²		Alternative 3 - Both Island Levee Setback		Alternative 4 - Full Restoration ¹²	
Description	Unit	Unit Price	Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost
Demolition/ Site Prep										
Clearing and Grubbing	AC	\$3,000	7.06	\$21,193.39	2.53	\$7,582.64	3.22	\$9,647.11	270.00	\$810,000.00
Excavation ^{1,2,3}	CY	\$15	0.00	\$0.00	63405.65	\$951,084.75	53788.35	\$806,825.25	108354.40	\$1,625,316.00
Excavation, mucky or wet ⁴	CY	\$5	0.00	\$0.00	12681.13	\$63,405.65	10757.67	\$53,788.35	21670.88	\$108,354.40
Remove Existing Bridge	EA	\$20,000	0.00	\$0.00	1.00	\$20,000.00	0.00	\$0.00	1.00	\$20,000.00
Levee Construction										
Dike Select Fill ^{5,6}	C.Y.	\$30	28208.40	\$846,252.00	10092.50	\$302,775.00	40560.30	\$1,216,809.00	0.00	\$0.00
Levee Repairs										
Riprap ⁷	CY	\$300	1500.00	\$450,000.00	1500.00	\$450,000.00	1500.00	\$450,000.00	0.00	\$0.00
Tidal Channel Work and Breaches										
Excavation ⁸	C.Y.	\$25	0.00	\$0.00	48994.66	\$1,224,866.46	24876.05	\$621,901.28	70143.29	\$1,753,582.22
Tidegate Replacement										
New Side Hinge Tidegates ⁹	EA	\$500,000	2.00	\$1,000,000.00	1.00	\$500,000.00	2.00	\$1,000,000.00	0.00	\$0.00
SUB CONSTRUCTION				\$2,317,445.39		\$3,519,714.51		\$4,158,970.99		\$4,317,252.62
Other Construction Costs										
Seeding or Planting ¹⁰	AC	\$4,000	7.06	\$28,257.85	2.53	\$10,110.19	3.22	\$12,862.81	0.00	\$0.00
Dewatering/ Defishing Site	%	10%		\$231,744.54		\$351,971.45		\$415,897.10		\$431,725.26
Mobilization	%	30%		\$695,233.62		\$1,055,914.35		\$1,247,691.30		\$1,295,175.78
APPROXIMATE TOTAL CONSTRUCTION COST				\$3,272,681.40		\$4,937,710.50		\$5,835,422.19		\$6,044,153.66
Design, Permitting, Contingency and Mitigation										
Design and Permitting	%	20%		\$463,489.08		\$703,942.90		\$831,794.20		\$863,450.52
Construction Inspection & Oversight	%	15%		\$347,616.81		\$527,957.18		\$623,845.65		\$647,587.89
Taxes and Fees	%	10%		\$231,744.54		\$351,971.45		\$415,897.10		\$431,725.26
Contingency	%	30%		\$695,233.62		\$1,055,914.35		\$1,247,691.30		\$1,295,175.78
Loss of Estuary - Mitigation ¹¹	AC	\$135,000	270.00	\$1,514,862.00	110.00	\$617,166.00	159.00	\$892,085.40	0.00	\$0.00
APPROXIMATE TOTAL COST				\$6,525,627.44		\$8,194,662.38		\$9,846,735.83		\$9,282,093.12

Assumptions

1. In full and partial restoration alternatives, 50% of levees not left in place are completely removed to elevation of surrounding ground.
2. Existing levees average 8 feet above the farm field surface.
3. When levees are removed, levee material will be sidecast or used to fill ditches and ponds landward of the levee.
4. 20% of excavation is assumed to be muck. This cost is in addition to the excavation cost.
5. Levee will be raised by 1' on all levees left in place to account for 0.8 feet of sea level rise and 0.2 feet of settlement.
6. New levee will be constructed to 9 feet above ground surface for Alternative 3 cross-dikes.
7. Existing levee is in need of repair/ armoring in places for no restoration and partial restoration alternatives. 1500 feet of repair assumed.
8. Tidal channel areas from SRSC analysis. Assumed an average of 5 feet deep. Cost assumes sidecast of material.
9. Tidegates/water control structures must be replaced for alternatives 1-3. Existing structures are replaced with concrete headwall/wingwalls and side hinge gate & associated water control
10. Seeding or Planting includes all disturbed area on sides of dike after raising.
11. Continued loss of habitat with tidegate repair is multiplied by 0.04156 per the TFI accounting formula to calculate the acres of mitigation required.
12. Bridge removal is included with alternatives 2 and 4.

Table 2. Opinion of Probable Construction Cost for the Island Unit (100% dike removal per alternative that include dike removal)										
Date: 9/28/2020										
By: Syms										
			Alternative 1 - No Restoration		Alternative 2 - East Island Restoration ¹²		Alternative 3 - Both Island Levee Setback		Alternative 4 - Full Restoration ¹²	
Description	Unit	Unit Price	Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost
Demolition/ Site Prep										
Clearing and Grubbing	AC	\$3,000	7.06	\$21,193.39	2.53	\$7,582.64	3.22	\$9,647.11	270.00	\$810,000.00
Excavation ^{1,2,3}	CY	\$15	0.00	\$0.00	126811.30	\$1,902,169.50	107576.70	\$1,613,650.50	216708.80	\$3,250,632.00
Excavation, mucky or wet ⁴	CY	\$5	0.00	\$0.00	25362.26	\$126,811.30	21515.34	\$107,576.70	43341.76	\$216,708.80
Remove Existing Bridge	EA	\$20,000	0.00	\$0.00	1.00	\$20,000.00	0.00	\$0.00	1.00	\$20,000.00
Levee Construction										
Dike Select Fill ^{5,6}	C.Y.	\$30	28208.40	\$846,252.00	10092.50	\$302,775.00	40560.30	\$1,216,809.00	0.00	\$0.00
Levee Repairs										
Riprap ⁷	CY	\$300	1500.00	\$450,000.00	1500.00	\$450,000.00	1500.00	\$450,000.00	0.00	\$0.00
Tidal Channel Work and Breaches										
Excavation ⁸	C.Y.	\$25	0.00	\$0.00	48994.66	\$1,224,866.46	24876.05	\$621,901.28	70143.29	\$1,753,582.22
Tidegate Replacement										
New Side Hinge Tidegates ⁹	EA	\$500,000	2.00	\$1,000,000.00	1.00	\$500,000.00	2.00	\$1,000,000.00	0.00	\$0.00
SUB CONSTRUCTION				\$2,317,445.39		\$4,534,204.91		\$5,019,584.59		\$6,050,923.02
Other Construction Costs										
Seeding or Planting ¹⁰	AC	\$4,000	7.06	\$28,257.85	2.53	\$10,110.19	3.22	\$12,862.81	0.00	\$0.00
Dewatering/ Defishing Site	%	10%		\$231,744.54		\$453,420.49		\$501,958.46		\$605,092.30
Mobilization	%	30%		\$695,233.62		\$1,360,261.47		\$1,505,875.38		\$1,815,276.90
APPROXIMATE TOTAL CONSTRUCTION COST				\$3,272,681.40		\$6,357,997.06		\$7,040,281.23		\$8,471,292.22
Design, Permitting, Contingency and Mitigation										
Design and Permitting	%	20%		\$463,489.08		\$906,840.98		\$1,003,916.92		\$1,210,184.60
Construction Inspection & Oversight	%	15%		\$347,616.81		\$680,130.74		\$752,937.69		\$907,638.45
Taxes and Fees	%	10%		\$231,744.54		\$453,420.49		\$501,958.46		\$605,092.30
Contingency	%	30%		\$695,233.62		\$1,360,261.47		\$1,505,875.38		\$1,815,276.90
Loss of Estuary - Mitigation ¹¹	AC	\$135,000	270.00	\$1,514,862.00	110.00	\$617,166.00	159.00	\$892,085.40	0.00	\$0.00
APPROXIMATE TOTAL COST				\$6,525,627.44		\$10,375,816.74		\$11,697,055.07		\$13,009,484.48
Assumptions										
1. In full and partial restoration alternatives, 100% of levees not left in place are completely removed to elevation of surrounding ground.										
2. Existing levees average 8 feet above the farm field surface.										
3. When levees are removed, levee material will be sidecast or used to fill ditches and ponds landward of the levee.										
4. 20% of excavation is assumed to be muck. This cost is in addition to the excavation cost.										
5. Levee will be raised by 1' on all levees left in place to account for 0.8 feet of sea level rise and 0.2 feet of settlement.										
6. New levee will be constructed to 9 feet above ground surface for Alternative 3 cross-dikes.										
7. Existing levee is in need of repair/ armoring in places for no restoration and partial restoration alternatives. 1500 feet of repair assumed.										
8. Tidal channel areas from SRSC analysis. Assumed an average of 5 feet deep. Cost assumes sidecast of material.										
9. Tidegates/water control structures must be replaced for alternatives 1-3. Existing structures are replaced with concrete headwall/wingwalls and side hinge gate & associated water control										
10. Seeding or Planting includes all disturbed area on sides of dike after raising.										
11. Continued loss of habitat with tidegate repair is multiplied by 0.04156 per the TFI accounting formula to calculate the acres of mitigation required.										
12. Bridge removal is included with alternatives 2 and 4.										



APPENDIX G: COSTS ESTIMATES FOR ANNUAL OPERATIONS AND MAITENANCE COSTS AT THE ISLAND UNIT

Cost estimates for annual O&M at Island Unit

costs include labor, materials and equipment

	current management	alternative 1/no restoration		alternative 2/east island		alternative 3/south ends		alternative 4/full restoration	
description of management	141 acres of enhanced & managed forage; 0 acres of estuary	270 acres diked including 141 acres of enhanced & managed forage; 0 acres of estuary		100 acres diked including 54 acres of enhanced & managed forage; 170 acres of estuary		160 acres diked including 81 acres of enhanced & managed forage; 110 acres of estuary		0 acres diked; 0 acres enhanced & managed forage; 270 acres of estuary	
cost category		low end	high end	low end	high end	low end	high end	low end	high end
ferrying, prep & misc	\$ 4,196	\$ 4,196	\$ 4,196	\$ 2,039	\$ 2,039	\$ 3,275	\$ 3,275	\$ 1,300	\$ 1,300
Field prep, planting & spraying	\$ 21,463	\$ 21,463	\$ 21,463	\$ 10,274	\$ 10,274	\$ 15,493	\$ 15,493	\$ -	\$ -
Dike/field mowing & maintenance	\$ 6,685	\$ 6,685	\$ 6,685	\$ 3,109	\$ 3,109	\$ 4,744	\$ 4,744	\$ -	\$ -
Equipment operation & maintenance	\$ 6,727	\$ 6,727	\$ 20,182	\$ 3,716	\$ 11,149	\$ 4,979	\$ 14,937	\$ -	\$ -
Drainage & water control	\$ 650	\$ 650	\$ 650	\$ 370	\$ 370	\$ 770	\$ 770	\$ -	\$ -
Blind/foot bridge construction & maintenance	\$ 1,660	\$ 1,660	\$ 1,660	\$ 1,660	\$ 1,660	\$ 1,660	\$ 1,660	\$ 1,660	\$ 1,660
Noxious weed survey only	\$ -	\$ -	\$ -	\$ 4,722	\$ -	\$ 4,722	\$ -	\$ 4,722	\$ -
Noxious weed survey & control	\$ -	\$ -	\$ -	\$ -	\$ 30,260	\$ -	\$ 19,580	\$ -	\$ 49,640
TOTAL	\$ 41,382	\$ 41,382	\$ 54,836	\$ 25,890	\$ 58,860	\$ 35,643	\$ 60,459	\$ 7,682	\$ 52,600
<u>Assumptions</u>	based on 2019 costs with volunteer labor rate applied for volunteer hours; 110 acres enhanced & 30 acres managed forage	volunteer labor rate applied for volunteer hours; equipment cost based on WDFW owned, leased, or donated equipment operated and maintained by WDFW	volunteer labor rate applied for volunteer hours; equipment cost is 3 times current cost to account for no barge agreement and equipment replacement and major repairs as needed	volunteer labor rate applied for volunteer hours; equipment cost based on WDFW owned, leased, or donated equipment operated and maintained by WDFW; weed survey only, no treatment on 170 acres estuary	volunteer labor rate applied for volunteer hours; equipment cost is 3 times current cost to account for no barge agreement and equipment replacement and major repairs as needed; weed survey and treatment on 170 acres estuary	volunteer labor rate applied for volunteer hours; equipment cost based on WDFW owned, leased, or donated equipment operated and maintained by WDFW; weed survey only, no treatment on 110 acres estuary	volunteer labor rate applied for volunteer hours; equipment cost is 3 times current cost to account for no barge agreement and equipment replacement and major repairs as needed; weed survey and treatment on 110 acres estuary	weed survey only, no treatment on 270 acres estuary	weed survey and treatment on 270 acres estuary

APPENDIX H: CHANGES IN WDFW- MANAGED LAND AND HABITAT TYPES SINCE 2000

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Changes in WDFW-managed lands and habitat types since 2000 within WDFW Region 4 that are available for public hunting

This document contains the results of an inventory of WDFW-managed lands within Region 4 that are available for public hunting. The inventory compared how habitat types within those lands have changed since 2000. Habitat types are defined in the section below. Table 1 provides the results. A map of the properties can be found at:

<http://www.arcgis.com/home/webmap/viewer.html?webmap=63771693b0ee4b81b949d87d6f58fc0e&extent=-122.7128,48.2096,-122.0399,48.5666>

Habitat Types Definitions

Enhanced Forage – Lands that are planted and/or managed to produce high value plants that are generally seed bearing and are left standing for forage. These plants include planted crops: barley, corn, fava beans, millet, buckwheat, and moist soil plants, including wild millet, smartweed, yellow nut-sedge, and Bidens. This also includes cover crops, unharvested crops, and harvested crop areas at the Fir Island Farms and Johnson/DeBay's Slough Game Reserves, which are managed primarily for Snow Geese and Swans, respectively. This management creates high intensity use throughout most of the winter season for waterfowl and recreational users.

Managed Forage – Lands that Wildlife Area Staff or agricultural lessees manipulate through mowing, mid- to late-summer disking, grazing, flooding or other methods to improve habitat forage quality and access, and harvested commercial agricultural crops. This category may not provide the same intensity of use over time as the enhanced category.

Non-forested Upland – Lands within the dike system that are not manipulated to produce forage.

Intertidal Native Vegetation – Lands within the intertidal zone of the Lower Skagit River and Skagit and Port Susan Bays offering a mix of native and non-native emergent marsh species.

Riparian(tree/brush) – Lands that are made up primarily of mixed coniferous and deciduous trees, scrub/shrub, and other woody or rank vegetation consider less desirable for waterfowl hunting or forage. These areas can be located within or outside of the diked uplands.

Table 1. Changes in WDFW-managed lands and habitat types since 2000 in Region 4 (continues on next page).

Unit Name	Total Unit Acres		Enhanced Forage		Managed Forage		Non-forested Upland		Intertidal		Riparian (tree/brush)		Hunted Acres		Non-Hunted Acres	
	Year 2000	Year 2016	Year 2000	Year 2016	Year 2000	Year 2016	Year 2000	Year 2016	Year 2000	Year 2016	Year 2000	Year 2016	Year 2000	Year 2016	Year 2000	Year 2016
SKAGIT WILDLIFE AREA																
Big Ditch Access	115	115	0	0	0	0	0	0	113	113	0	0	113	113	0	2
Cottonwood Island	164	164	0	0	12	12	0	0	0	0	152	152	0	0	164	164
DeBay's Slough Unit	359	359	60	60	73	73	0	0	0	0	226	226	47	47	312	312
Fir Island Farms*	297	297	249	95	0	5	0	0	27	193	21	0	0	0	297	297
Headquarters*	193	193	78	0	4	0	0	0	0	183	111	10	168	168	25	25
Island*	477	477	162	125	86	10	0	14	0	209	229	119	477	477	0	0
Jensen Access	21	21	0	0	0	0	0	0	20	20	0	0	20	20	1	1
South Leque**	317	317	222	0	0	0	0	0	60	317	0	0	297	297	20	20
North Leque*	109	109	36	0	0	0	25	0	73	73	0	0	96	96	13	13
Milltown Island*	299	299	0	0	0	0	0	0	201	201	98	98	299	299	0	0
North Fork Access	163	163	0	0	0	0	0	0	163	163	0	0	163	163	0	0
Samish	410	410	230	190	0	180	180	0	0	0	0	30	373	373	37	37
Samish River	0	104	0	0	0	10	0	94	0	0	0	0	0	10	0	94
Skagit Delta Game Reserv	329	329	0	0	0	0	0	0	329	329	0	0	0	0	329	329
Skagit Forks	0	61	0	0	0	0	0	0	0	0	0	61	0	61	0	0
South Skagit Forks	0	5	0	0	0	0	0	0	0	0	0	5	0	5	0	0
South Padilla Bay	0	245	0	20	0	225	0	0	0	0	0	0	0	20	0	225
South Telegraph	46	46	0	0	0	0	0	0	0	0	46	46	45	45	1	1
North Telegraph	14	14	0	0	0	0	0	0	14	14	0	0	14	14	0	0
Skagit Bay Estuary	10003	10003	0	0	0	0	0	0	10003	10003	0	0	10003	10003	0	0
Skagit Totals	13316	13731	1037	490	175	515	205	108	11003	11818	883	747	12115	12211	1199	1520
Skagit Net Change	415		-547		340		-97		815		-136		96		321	

* Denotes Units where an estuary restoration project has been implemented since Year 2000.

**The acreages reflect the Year 2020 total, since an estuary restoration project was implemented in 2019.

[Note: This table accompanies an online map titled "Changes in Habitat Type of WDFW Skagit Wildlife Area Units".](#)

Table 1. Changes in WDFW-managed lands and habitat types since 2000 in Region 4 (continued from previous page).

Unit Name	Total Unit Acres		Enhanced Forage		Managed Forage		Non-forested Upland		Intertidal		Riparian (tree/brush)		Hunted Acres		Non-Hunted Acres	
	Year 2000	Year 2016	Year 2000	Year 2016	Year 2000	Year 2016	Year 2000	Year 2016	Year 2000	Year 2016	Year 2000	Year 2016	Year 2000	Year 2016	Year 2000	Year 2016
SNOQUALMIE WILDLIFE AREA																
Cherry Valley	392	392	0	60	104	30	113	113	0	0	175	189	323	323	69	69
Spencer Island	174	174	0	0	0	0	0	0	0	0	174	174	174	174	0	0
Ebey Island	420	1249	0	13	0	287	0	242	0	0	420	707	0	789	420	483
Crescent Lake	359	359	110	110	0	43	3	3	0	0	246	203	349	349	10	10
Stillwater	456	456	0	60	0	73	139	6	0	0	317	317	434	434	22	22
Corson	167	167	0	6	0	0	0	0	0	0	167	161	0	0	167	167
Snoqualmie Totals	1968	2797	110	249	104	433	255	364	0	0	1499	1751	1280	2069	688	751
Snoqualmie Net Change	829		139		329		109		0		252		789		63	
WHATCOM WILDLIFE AREA																
Nooksack	627	627	12	12	118	118	397	397	0	0	100	100	500	500	127	127
Tennant Lake	360	360	0	0	0	20	125	105	0	0	115	115	40	40	320	320
Lake Terrell	1500	1500	60	60	40	40	600	600	0	0	300	300	500	500	1000	1000
Intalco	1000	1000	0	0	200	200	500	500	0	0	100	100	850	850	150	150
British Petroleum	1000	1000	20	20	100	400	400	100	0	0	500	500	800	800	200	200
Whatcom Totals	4487	4487	92	92	458	778	2022	1702	0	0	1115	1115	2690	2690	1797	1797
Whatcom Net Change	0		0		320		-320		0		0		0		0	
REGION 4 PRIVATE LANDS ACCESS PROGRAM (PLAP)																
Skagit County	0	579	0	148	0	417	0	0	0	14	0	0	0	579	0	0
Snohomish County	0	602	0	54	0	548	0	0	0	0	0	0	0	602	0	0
Whatcom County	0	771	0	20	0	751	0	0	0	0	0	0	0	771	0	0
PLAP Totals	0	1952	0	222	0	1716	0	0	0	14	0	0	0	1952	0	0
PLAP Net Change	1952		222		1716		0		14		0		1952		0	
REGION 4 TOTAL NET CHANGE	Total Unit Acres		Enhanced Forage		Managed Forage		Non-forested Upland		Intertidal		Riparian (tree/brush)		Hunted Acres		Non-Hunted Acres	
	3196		-186		2705		-308		829		116		2837		384	

Note: This table accompanies an online map titled "Changes in Habitat Type of WDFW Skagit Wildlife Area Units".