Skagit Diking and Drainage Special Purpose Districts
2025 Flood Risk Management Guidance Document

Executive Summary

The Skagit River is the U.S. West Coast's third-largest river by discharge volume, and the natural forces we contend with as a community are immense. With climate change and sea level rise posing new variables, careful strategic planning is paramount to our community's long-range safety and viability. For these reasons, flood risk management and mitigation are core local government functions.

Skagit County diking and drainage districts ("Districts") are public taxing districts that own, operate and maintain the Skagit's system of levees, dikes, tidegates, flood gates, pump stations and other drainage infrastructure. The Districts are principally responsible for protecting the Skagit Valley from river and marine flood risk. To that end, we have developed careful plans that are grounded in our generations of experience as well as best available science.

This document provides an overview of the Districts' purpose, role and function, and our close working relationship with Skagit County government. This document also provides a synopsis of the Districts' systems and long-range plans to protect the Skagit Valley, its infrastructure, its farmland, and its people from flood risk.

Regulatory Authorities

The Districts were formed under RCW 85 in the late 1800s and early 1900s. Collectively, the Districts are responsible for the operation and maintenance of the system of diking and drainage infrastructure that provides flood risk reduction to nearly 60,000 acres of Skagit County. This area includes the cities of Mount Vernon, Burlington and LaConner, globally significant farmland, numerous small rural communities, and billions of dollars' worth of critical public infrastructure, such as the Anacortes water treatment plant, highways, pipelines, power sub-stations, fire departments, and schools.

The Districts' publicly-elected commissioners collectively have generations of experience in the construction, operation and maintenance of the Skagit's diking and drainage infrastructure.

The Skagit's diking and drainage districts are unified by common interest in strategic plans, engineering, permitting and regulatory matters. To that end, fourteen Districts have formed two organizations to represent them on these matters of common interest: The Skagit County Dike and Drainage Flood Control Partnership ("Dike Partnership") and the Skagit Drainage and Irrigation Districts Consortium LLC ("Drainage Consortium"). The Dike Partnership is focused on issues related to the levees along the mainstem of the Skagit River. The Drainage Consortium works with member Districts across the Skagit and Samish Deltas, providing a holistic and coordinated approach to environmental, regulatory and permitting issues impacting the Skagit's integrated system of dikes, levees and drainage.

Dike Partnership and Drainage Consortium staff have significant technical expertise and knowledge relevant to the construction, operation, maintenance, repair and design of diking and drainage infrastructure, as well as significant expertise in hydrologic, hydraulic, and hydrodynamic modeling, environmental permitting and regulation, and other relevant matters.

In addition, the Districts work very closely with Skagit County government, which maintains roads, bridges, and certain drainage infrastructure across the Skagit and Samish Deltas that are integrated with the Districts' infrastructure systems. The County also supports the Districts by providing taxation, revenue collection and payment systems, while working closely with the Districts at both an operational and policy level to ensure that land use regulation, permitting systems, and other County actions support District plans and operations.

Dike and Drainage Infrastructure

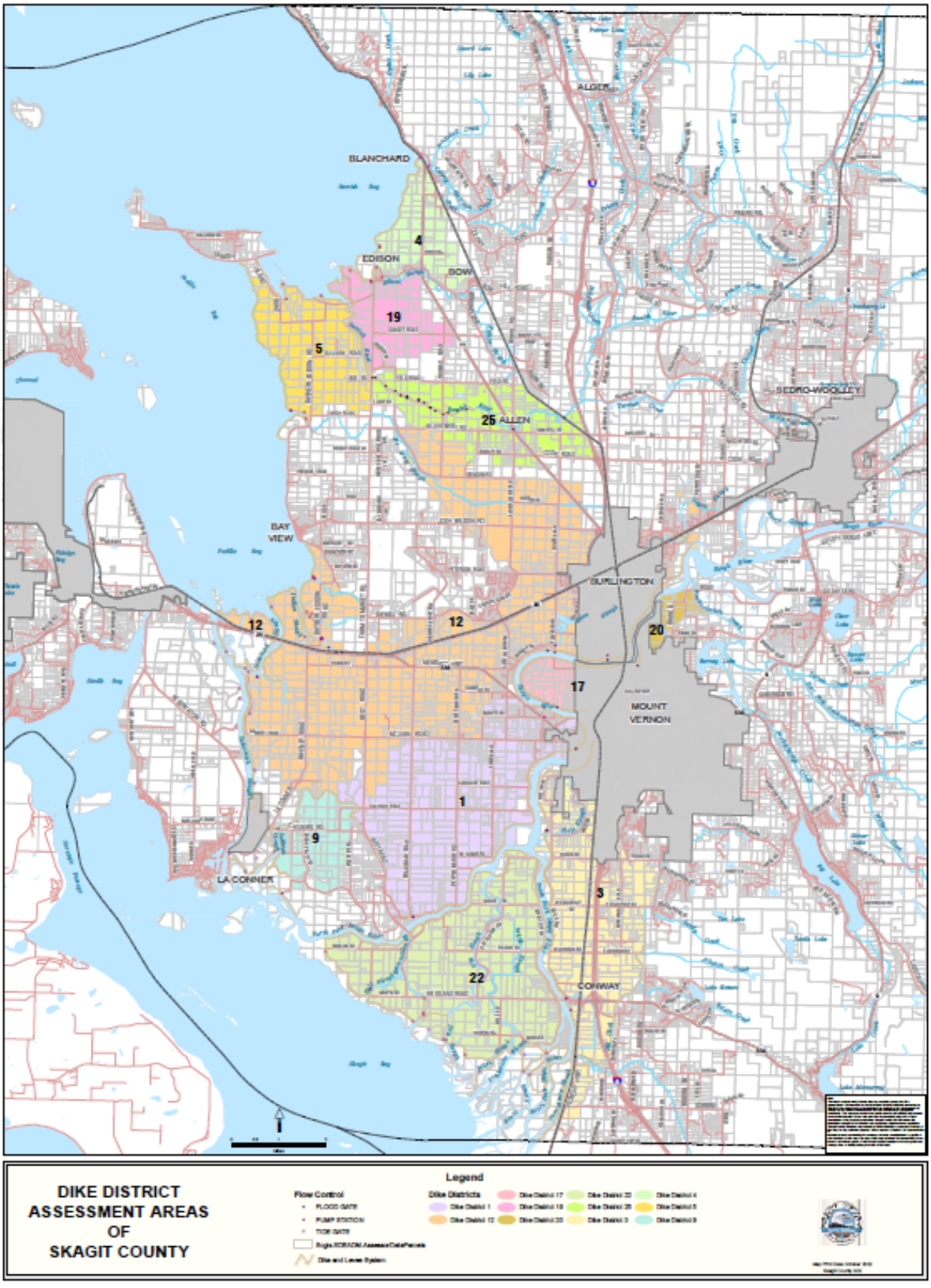
Collectively, the Districts are responsible for Skagit and Samish River levees and marine dikes along Skagit, Padilla, and Samish Bays that reduce the risk of riverine and coastal flooding (Table 1, Maps 1 and 2)[1].

Table 1. Summary of Diking and Drainage Infrastructure

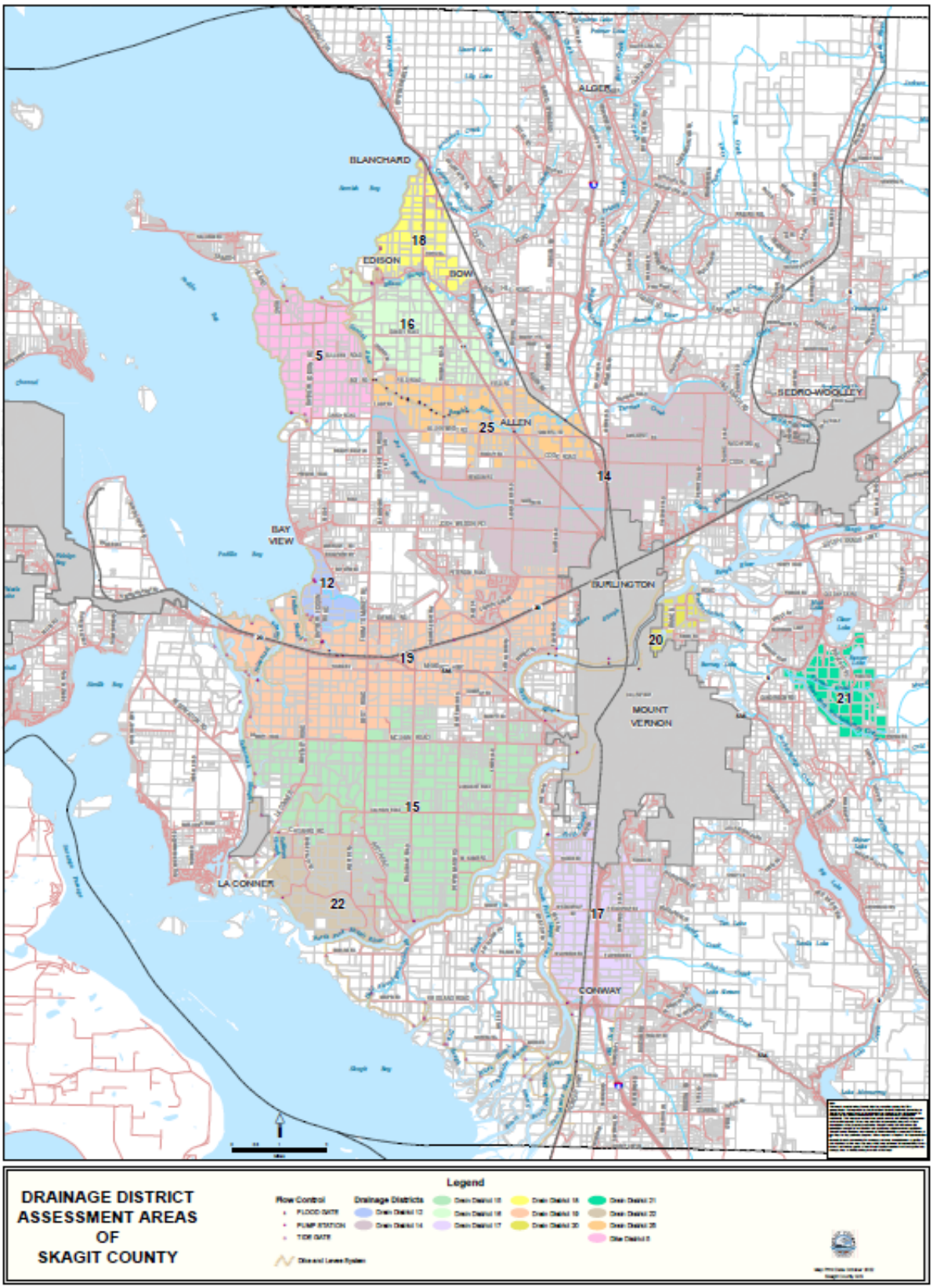
Dike / Drainage Infrastructure	Miles	number
Marine Dikes	25.7	
Samish River Levees	11.3	
Skagit River Levees	50.5	
Tidegates		63
Floodgates		30
Pump Stations		12

In addition, the Districts operate and maintain a system of tidegates, floodgates, and pump stations. During normal operations, this drainage infrastructure system works to drain local runoff. During flood events, this infrastructure system works to drain seepage and floodwater to reduce the time and geographic extent of floodplain floodwater inundation.

[1] Collectively the Dike Partnership and Drainage Consortium member districts include: Dike District 1, Dike District 3, Dike and Drainage District 5, Dike and Drainage District 12, Drainage District 14, Drainage District 15, Drainage District 16, Drainage District 17, Dike District 17, Drainage District 18, Drainage District 19, Drainage District 22, Consolidated Dike and Drainage District 22, Dike and Drainage District 25



Map 1. Skagit County Dike Districts



Map 2. Skagit County Drainage Districts

Overview

The 2025 Flood Risk Management Guidance Document is organized to provide guidance in five main areas of focus specific to flood risk and related management goals.

Skagit River Levees

- Maintain enrollment in the PL84-99 Program
- Implement levee improvements consistent with the Corps' Skagit GI Study
- Partner with Skagit County to obtain appropriate flood storage at the Skagit's hydroelectric dams
- Partner with the cities of Burlington and Mount Vernon to reduce flood risks in urban areas
- Partner with Skagit County to protect roads, people, and private property

Samish River Levees

- Repair, maintain and improve the structural integrity of existing levees
- Partner with Skagit County to protect roads, people, and private property
- Partner with Skagit County to install flood return structures

Marine Dikes

- Obtain programmatic permits for work below the High Tide Line (HTL)
- Repair, maintain and improve the structural integrity of existing marine dikes
- Improve marine dikes based on predictions for sea level rise
- Incorporate segments of private dike into public ownership
- Partner with Skagit County to protect roads, people, and private property

Floodplain Hazard Planning and Drainage

- Prepare and maintain FEMA Hazard Mitigation Plans
- Obtain programmatic permits for the repair and replacement of tidegates, floodgates, and pump station outfalls

Habitat Restoration

- Partner with federal, state, tribal and local governments to implement projects aligned with the Skagit Chinook Recovery Plan
- Partner with other entities to implement voluntary habitat projects aligned with the Drainage Fish Initiative

Skagit River Levees Guidance

The Skagit River mainstem levees are operated and maintained by Dike Districts 1, 3, 12, 17, and Consolidated Dike District 22. All of these levees are enrolled in the US Army Corps of Engineers ("Corps") Public Law ("PL") 84-99 Program.

Maintain enrollment in the PL84-99 Program

The Districts responsible for the operation and maintenance of the Skagit River mainstem levees are enrolled, active, and in good standing in the PL 84-99 Program. PL 84-99 is the Corps' statutory authority to provide emergency support to State and Local governments prior to, during, and after flood events. Pursuant to PL 84-99, the Corps provides both emergency technical and direct assistance in response to flood and coastal storms. Because the Corps is a key element of our community's emergency planning and response, continued PL 84-99 eligibility and participation is a critical component of our flood risk management plans.

Accordingly, the current guidance is to continue to operate and maintain Skagit River mainstem levees in accordance with the PL 84-99 program. Activities include routine maintenance, inspections, prompt repair of damage following flood events, and capital investments to improve levee safety and integrity.

Skagit River Levee improvements consistent with the Corps GI Study

Between 2008 and 2015, Skagit County worked with the Corps, the Districts and the community on the Skagit River Flood Risk Management General Investigation ("Skagit GI"). The Skagit GI was comprehensive in nature, and ultimately identified the *Comprehensive Urban Levee Improvement Alternative* as the preferred option – because it was the only alternative that indicated positive net benefits (Corps, 2014). The Dike Partnership, Drainage Consortium, Districts and Skagit County believe that the Skagit GI's analysis and recommendations provide our community with a rational, comprehensive and appropriate strategy to address flood risk reduction in the lower Skagit River basin.

Consistent with the preferred alternative identified by the Skagit GI, the Districts do not intend to raise Skagit River levees in the rural landscape. A comprehensive program to set back and raise Skagit River levees to achieve 100-year FEMA flood risk protection would (i) cost many billions of dollars; (ii) involve the condemnation of large areas of developed and rural lands; and (iii) could only be economically supported and justified through community plans that involve extensive future development of the Skagit's farmland/floodplain.

Skagit River mainstem levees certified for a 100-year flood would encourage the rapid conversion of Skagit farmland to urban and suburban development, as occurred in the Puyallup River valley and other farming communities to our south. The Dike Partnership, Drainage

Consortium and Districts support our community's long-standing farmland preservation goals reflected by Skagit County's Comprehensive Plan, land-use policies, and codes.

The Skagit River is prone to intense but short duration floods. As the Skagit GI Study reflects, drawdown storage in the reservoirs behind Skagit's hydroelectric dams is a proven way to mitigate the risk of large floods, by "taking the top off" the very largest floods. Working in partnership with Skagit County, the Districts obtained a safe level of drawdown flood storage at Puget Sound Energy's Baker River Hydroelectric Project, through the Baker Project's 2007 Federal Energy Regulatory Commission ("FERC") relicensing process.

Under federal law, of the first operational purpose of Seattle City Light's (Seattle) Skagit Hydroelectric Project is to reduce Skagit Valley flood risk. Nevertheless, since the dams' construction, Seattle has avoided federal licensing requirements that would assure our community a safe level of flood storage drawdown at Seattle's dams.

The principal opportunity for flood storage drawdown is at Ross Reservoir, the largest and uppermost of Seattle's three dams on the Skagit. This was demonstrated by the November 2021 Skagit River flood event, a flood of record. Due to fisheries resource obligations that required Seattle to spill water in early fall to augment streamflow, Seattle had resultantly drawn down the Ross reservoir level far below that which is required by Seattle's current federal license. As such, the additional drawdown fortuitously provided significant additional flood drawdown storage beyond that required by Seattle's current federal operating license. The Corps, which takes over operations at Baker and Ross in the event of flood emergency, utilized <u>all</u> of this additionally available storage to detain flood water and reduce the peak flood stage. Without this additional, unprogrammed storage, the Corps estimated that Skagit River flooding at Mount Vernon would have been *+/- 8 feet higher during the 2021 flood event*, which likely would have caused catastrophic damage to Burlington, Mount Vernon and the rest of the Skagit Valley below the dams.

Adequate flood storage at Seattle's Ross reservoir is absolutely necessary for our community's safety. Seattle's 50-year federal dam license is up for renewal in 2025, providing an opportunity to obtain an appropriate and safe level of Ross flood storage. Since 2020, the County and Districts have intensively participated in the federal relicensing of Seattle's dams, prioritizing additional flood storage at Ross reservoir for inclusion in Seattle's new federal operating license.

After several years of extensive analysis and challenging negotiations, the County and Districts – working closely with Skagit tribes and federal resource agencies – were able to secure agreement with Seattle to provide a safe and appropriate level of Ross storage.

The County, Dike Partnership, and Drainage Consortium are currently working with Seattle and other stakeholders to finalize a Comprehensive Settlement Agreement for federal approval that will secure our right to safe flood storage for the next fifty years. It is vitally important that Skagit County cities and other units of local government continue to support this effort.

Partner with the Cities of Burlington and Mount Vernon to reduce risks to urban areas

In urban areas such as Mount Vernon, the Dike Partnership and Districts have supported projects implemented to reduce localized flood risk in dense urban centers, such as the Mount Vernon floodwall project.

Samish River Levees Guidance

The Samish River levees are operated and maintained by Dike, Drainage and Irrigation Improvement Districts 5 and 25. These levees are not currently enrolled in the PL 84-99 Program.

Repair, maintain and improve the structural integrity of existing levees

The districts responsible for the Samish River levees are prioritizing the operation and maintenance of the existing levee system. These Districts and the Drainage Consortium are working to identify options for improving the structural integrity of the exiting levees in specific locations.

Partner with Skagit County to protect roads, people, and private property

The Districts will continue to partner with Skagit County to improve protection of roads, people, and private property during flood events. This includes active participation in the ongoing update of Skagit County's Comprehensive Plan and Hazard Mitigation Plan.

Partner with Skagit County to install flood return structures

The Drainage Consortium and Districts are also focused on working with Skagit County to obtain the necessary environmental permits and to secure construction funding for several flood return structures. These structures were selected and designed based on the results of a flood study funded by the Federal Highway Administration ("FHWA"), conducted by Skagit County. The goal of this study was to identify actions in the Samish delta that would reduce the duration of time I-5 is inundated following a large flood event or Skagit River levee breach. The actions identified and the flood return projects that were selected/designed are based on modeling conducted by Northwest Hydraulic Consulting ("NHC").

Marine Dike Guidance

The Skagit's marine dike system stretches from the Skagit River's South Fork near Conway to Blanchard at the north end of the Samish delta. The marine dikes are not currently enrolled in the PL84-99 Program.

The Skagit/Samish marine dike system forms the definitive boundary between nearshore/estuary habitat and uplands managed for human usage, most of which is prime farmland. Long-term planning for the potential impacts of climate resiliency and coastal resiliency involves consideration of the trade-offs between habitat restoration and farmland preservation. The most productive approach to reconciliation direct dialogue between Skagit local and tribal governments agencies, through the ongoing Skagit and Samish Estuary Solutions Group ("Estuary Solutions Group").

The Estuary Solutions Group is a funded, facilitated body that has brought together Skagit tribes, the County, the Districts and state/ federal resource agencies around specific plans to prioritize and execute top-ranked estuary restoration projects, using a highly disciplined and strategic approach. Using prior work conducted as part of the Skagit Estuary Restoration Strategic Assessment ("ERSA"), the highest priority projects have largely been identified[2].

Along with Skagit County, the Drainage Consortium and Districts' objectives are to ensure that major Skagit estuary restoration projects are (i) aligned with and advance Endangered Species Act ("ESA") recovery goals; (ii) increase community resilience to climate change and sea level rise; and (iii) secure the viability of Skagit farmland and minimize its conversion to other uses.

Over the last two years, the Estuary Solutions Group has made tremendous progress in bringing the County, Districts and Skagit Treaty Tribes together around a common understanding of the facts, and a orderly, strategic, long-range approach to our mutual objectives. Among other things, Skagit County is currently negotiating major land acquisition to facilitate the aforementioned plans.

Drainage Consortium and Districts are prioritizing participation in the Estuary Solutions Group, and have requested additional funding through the state legislature for this work for the upcoming biennium.

Obtain programmatic permits for work below the High Tide Line ("HTL")

Currently, due to asserted Endangered Species Act obligations, the Districts are unable to secure federal permits for dike and tidegate repairs below the HTL due to the unsupportable cost of proposed mitigation. In addition to discussing these issues in the context of the Estuary

[2] More detail related to the ERSA project is provided in the Habitat Restoration Section of this document

Solutions Group, the Districts are prioritizing the development of a streamlined process for obtaining federal permits to ensure that dike and tidegate repairs below the HTL can be completed in a timely and predictable fashion.

Repair, maintain and improve the structural integrity of existing marine dikes

Currently, the Districts are prioritizing the operation, maintenance and repair of existing marine dikes. This work includes mowing, inspections, dike leveling, and repair of damage above HTL after coastal storms.

Improve marine dikes based on predictions for sea level rise

Drainage Consortium staff and District commissioners have centrally participated in three major projects that have helped inform our long-term coastal resilience plans. Each of these projects provided methods of hydrodynamic modeling and predictions for sea level rise, which will be verified against University of Washington predictions.

The Skagit Hydrodynamic Modelling ("HDM") Study included detailed hydrodynamic modeling of the lower Skagit River and Skagit/ Padilla bays, and an evaluation of the existing marine dike system, based on a future condition that included 1.87 ft of sea level rise, and a 2080 Skagit River hydrograph corresponding to the moderate emissions scenario (A1B-IPCC) (PNNL 2017). This analysis is useful when evaluating potential climate vulnerabilities and investments in climate-resilient public infrastructure.

The Fir Island Farm Restoration Project and the Wiley Slough Repair Project were implemented by WDFW working in close coordination with Consolidated Dike, Drainage and Irrigation Improvement District 22 (Fir Island). These projects involved the extensive rebuilding of over two miles of marine dike. The final design of the marine dikes used results from detailed and site-specific hydrodynamic modeling that took into account sea level rise predictions, coastal waves, and storm surge to characterize flood hazards in the vicinity of the projects; ultimately the marine dike was constructed to an elevation approximately two feet higher than the historic dike.

To advance long-term improvements in the safety and integrity of marine dikes, the Drainage Consortium and districts will work with Skagit County Department of Emergency Management ("DEM"), Washington State DEM, and the Federal Emergency Management Agency ("FEMA") to obtain funding for continued analysis of coastal flooding risks and implementation of infrastructure improvement projects.

Incorporate segments of private dike into public ownership

The Drainage Consortium and Districts are prioritizing working with owners of private dikes to bring those dikes up to a consistent and safe condition, and then incorporate those segments of dike into the appropriate and adjacent diking district.

Floodplain Hazard Planning Drainage Guidance

Prepare and maintain FEMA Hazard Mitigation Plans

The Dike Partnership, Drainage Consortium and Districts acknowledge that existing Skagit River levees provide an estimated 50-year level of protection. This means that floodplain inundation is possible in the event of a large flood or Skagit River mainstem levee breach. Experiences during the 1990, 2005, 2009 and 2021 floods provide on-the ground knowledge of flood hazards, flood risks and inform management priorities.

The Dike Partnership, Drainage Consortium and Districts coordinate closely with Skagit County and the local community to develop and maintain FEMA Natural Hazard Mitigation Plans. Consistent with these plans, the Dike Partnership, Drainage Consortium and Districts actively participate in flood awareness week, host public meetings, participate in flood readiness exercises, and coordinate with the Skagit County Emergency Operations Center during flood events.

The Dike Partnership, Drainage Consortium and Districts recognize that the potential impacts of climate change may influence the seasonality, magnitude, and frequency of river flooding, which may and increase flood hazards.

During our negotiations with Seattle City Light for safe flood storage at Ross Dam, the question of climate change and its impact on Skagit River flooding was intensively debated. In its filings with the federal government, Seattle took the position that climate change will not appreciably increase Skagit River flooding. Relying on best available science, the Districts and County took the position that flood-producing atmospheric rivers will occur somewhat earlier and be somewhat larger over the next century, posing an incrementally larger flood risk for our community. In part for this reason, we insisted on a safe and appropriate level of Ross reservoir flood storage. We stand by our position, as well as our belief that the recommendations of the Corps GI study, taken holistically, provide an appropriate and rational response to the additional Skagit riverine flood risk that climate change presents over the next century

In addition to the Corps GI study's preferred alternative related to diking and levee protection, the Drainage Consortium and Districts' management priorities include investment in the planning and implementation of improved flood return structures and tidegates in both the Samish and Skagit deltas. In the event of a large flood or levee failure, it is critical that flood waters can be efficiently and rapidly drained from the floodplain to reduce inundation impacts to a variety of land uses and critical infrastructure. In part to prepare our community for the potential impacts that climate change poses, the Drainage Consortium and Districts are focused on obtaining the necessary state and federal permits to maintain, repair, and replace critical tidegate and floodgate infrastructure.

As previously noted, the Dike Partnership, Drainage Consortium, and Skagit County have worked closely over the last five years on the Seattle City Light federal relicensing process to successfully negotiate additional flood storage at the Ross Reservoir. This is the most cost-effective way to reduce flood risk in the lower valley. Any additional analysis of flood hazards and actions to reduce flood risk in our community must be led by Skagit County government, and must align with Corps and FEMA guidance documents.

Obtain programmatic permits for the repair and replacement of tidegates, floodgates, and pump stations

Currently, Districts have been unable to secure federal permits for the repair or replacement of existing tidegates and floodgates. Drainage Consortium and Districts are prioritizing the development of a streamlined process obtain federal permits to ensure these repairs can be completed in a timely and predictable fashion.

Habitat Restoration Projects Guidance

Between 2012 and 2017, the Dike Partnership and Districts participated in the Skagit Hydrodynamic Modeling (HDM)/Estuary Restoration Strategic Assessment (ERSA) project, led by Washington Department of Fish and Wildlife (WDFW) and the National Marine Fisheries Service (NMFS), under the umbrella of the Skagit Farm, Fish, and Flood Initiative (Friebel et al 2017). A variety of governments and community organizations representing salmon recovery, flood risk, and agricultural interests participated in this project/study[3].

The ERSA study combined best available science, local knowledge, and community values to identify and prioritize estuary restoration actions that will increase habitat for salmon and at the same time provide flood risk reduction benefits and ensure long-term farmland viability. The Dike Partnership, Drainage Consortium, and Districts believe this work resulted in the best strategic approach for prioritizing restoration project concepts in the Skagit and Samish deltas. The Skagit County Board of Commissioners has repeatedly affirmed their support for the ERSA study as a rational way to harmonize tribal, District, County and agricultural interests.

Consistent with the ERSA study, the Drainage Consortium and Districts are strategically focused on top tier ESA/Chinook recovery projects identified in the 2005 Skagit Chinook Recovery Plan, as further refined by the ERSA study.

As previously mentioned under marine dikes, the Drainage Consortium and Districts are committed to continue to work with Skagit Treaty Tribes, WDFW, National Marine Fisheries Service, and Skagit County through the ongoing Estuary Solutions Group.

The Drainage Consortium, Districts and Skagit County believe that working through the Estuary Solutions Group will continue to center Skagit tribal and local government in collaborative, strategic dialogue. We believe that the Estuary Solutions Group the most realistic approach to ensure that the Skagit remains a stronghold for wild salmon and retains a functioning farming economy over the long term.

The Drainage Consortium and Districts will continue to support smaller scale voluntary restoration projects consistent with the goals of the Drainage Fish Initiative Memorandum of Understanding.

[3] **Project Team**: NOAA Restoration Center, The Nature Conservancy, Washington Department of Fish and Wildlife, Seattle City Light, Skagit Conservation District, Skagit County Consolidated Diking Improvement District #22, Skagit County Dike District #3, Skagit County Dike District #17/Dike Partnership, Skagit Watershed Council, Skagitonians to Preserve Farmland, Western Washington Agricultural Association, Upper Skagit Tribe, U.S. Geological Survey. **Skagit Farm, Fish and Flood Initiative Members:** NOAA Restoration Center, Skagit County Dike District #17/Dike Partnership, Skagitonians to Preserve Farmland, Washington Department of Agriculture, Washington Department of Fish and Wildlife, Western Washington Agricultural Association

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