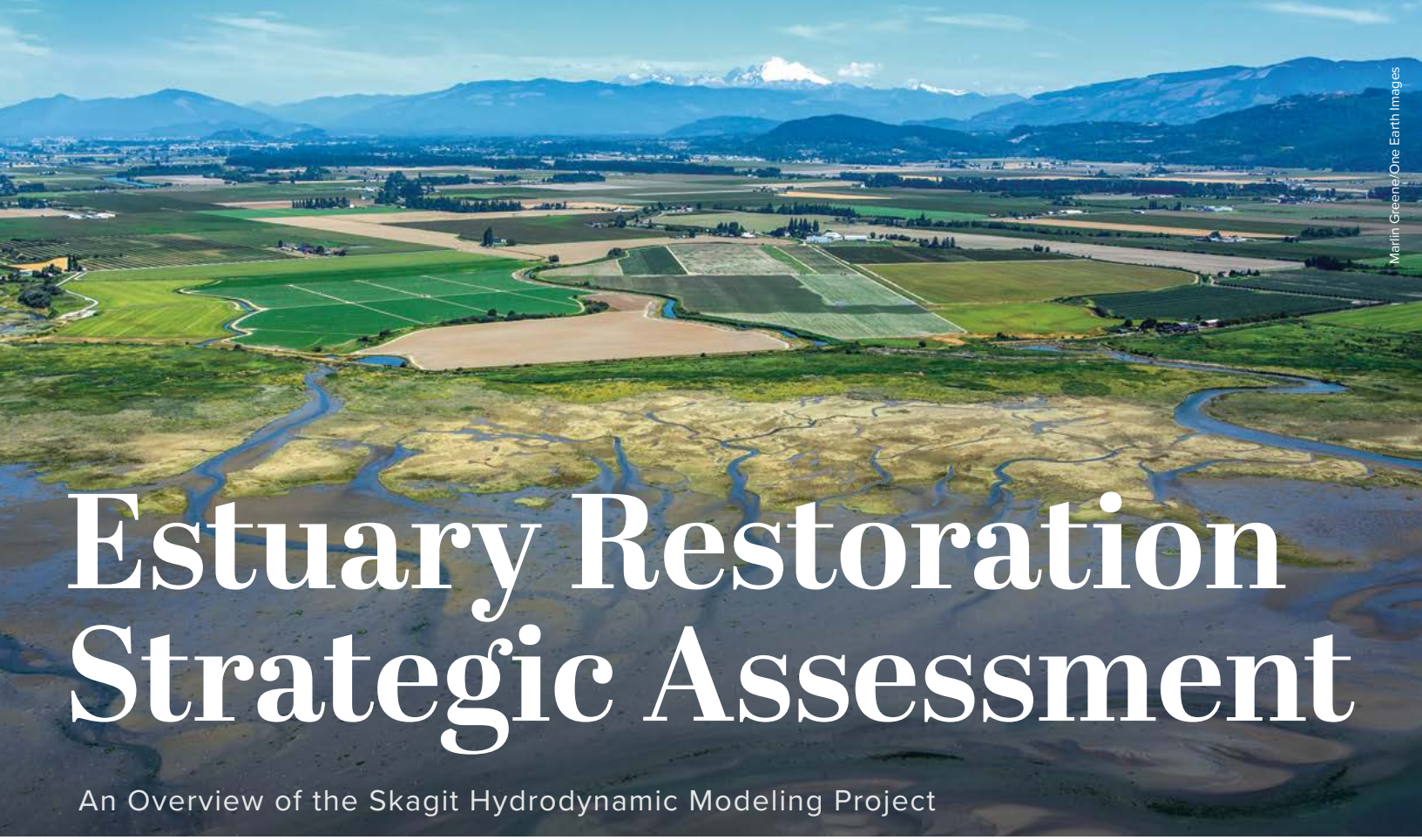


Estuary Restoration Strategic Assessment

An Overview of the Skagit Hydrodynamic Modeling Project

Balancing the needs of **FISH, FARMERS,** and **FLOOD RISK REDUCTION** on the Skagit delta.

Chinook salmon are a cornerstone of the Skagit River's tribal culture, economy, and ecosystem. As with many watersheds in Puget Sound, a majority of the Skagit's tidal wetlands were diked and drained over a hundred years ago to make way for farms and towns. Young salmon, or smolts, find food and shelter in estuarine waters as they prepare to go to sea; loss of estuary habitat is one of several factors that contributed to the decline of this important species.

To recover 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 habitats.

Local communities and businesses also rely on the delta. Farmers grow crops in the rich soils, producing valuable food, flower bulbs, and seeds, and driving the local economy. Thousands of people live, work, and recreate there, with the number rising every year. Aging flood and drainage infrastructure combined with a changing climate are increasing flood risk.

Under the umbrella of the Skagit Farm, Fish, and Flood Initiative, individuals from salmon recovery, flood risk reduction, and agricultural groups collaborated to develop the Estuary Restoration Strategic Assessment (ERSA), which combines best available science, local knowledge, and community values to prioritize actions.

The goal was to identify estuary restoration actions that will increase habitat for salmon while providing benefits and minimizing negative impacts for farms and flood risk reduction. This work resulted in a strategic approach for prioritizing restoration project concepts for implementation.

STUDY AREA: SKAGIT DELTA

ERSA focused on the tidally influenced areas of the Skagit River watershed, including Skagit Bay, Swinomish Channel, and southern Padilla Bay. Drawing on past studies and incorporating new ideas, the project team identified twenty-three individual project concepts and three combined project concepts for estuary restoration.

DIVERSE PARTICIPANTS REPRESENTING FARM, FISH, AND FLOOD INTERESTS

Individuals from fourteen organizations actively participated as members of the project team, engaging with the broader community to gain further input. The diversity of perspectives was critical to ensure that the final results were meaningful and well supported. The team strived for a collaborative, thoughtful, and transparent process.

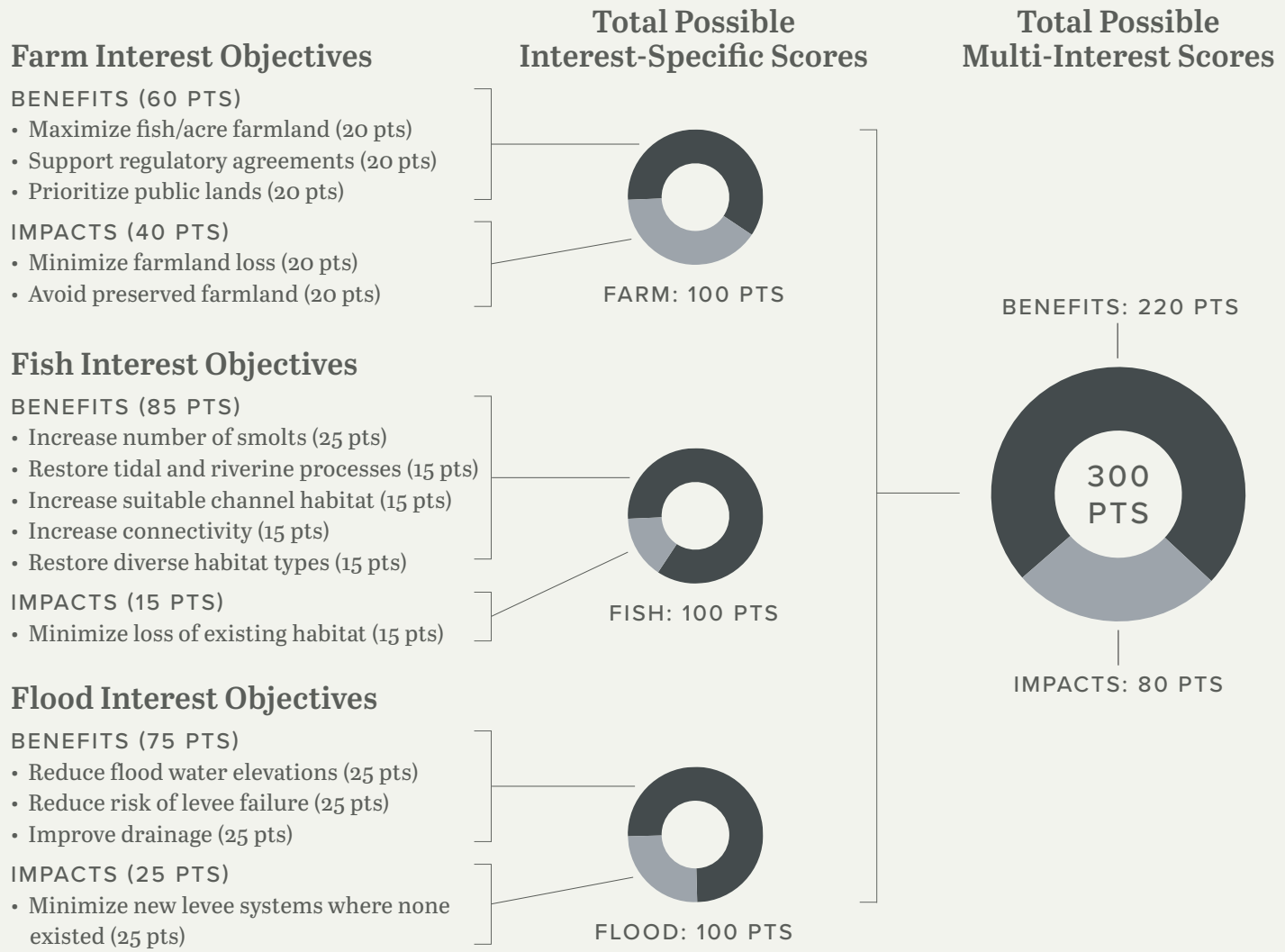
DETERMINING BENEFITS AND IMPACTS

The project team set out to analyze the benefits and impacts that could result from each of the project concepts. Groups of representatives from the three interests—farm, fish, and flood—chose the objectives for their interest. The objectives encompassed both benefits to be maximized and impacts to be minimized from estuarine restoration. The groups developed indicators to measure how much each project concept would contribute toward each of the objectives.

EQUAL WEIGHT TO FISH, FARMS, AND FLOODS

Each interest group had one hundred points to allocate among their objectives, allowing weighting of high-priority objectives. By allocating a hundred points for each of the three interests, the analysis placed equal weight on fish, farms, and flood risk reduction, when calculating multi-interest scores.

OBJECTIVES AND SCORING SYSTEM FOR RESTORATION PROJECT CONCEPTS



BEST AVAILABLE SCIENCE

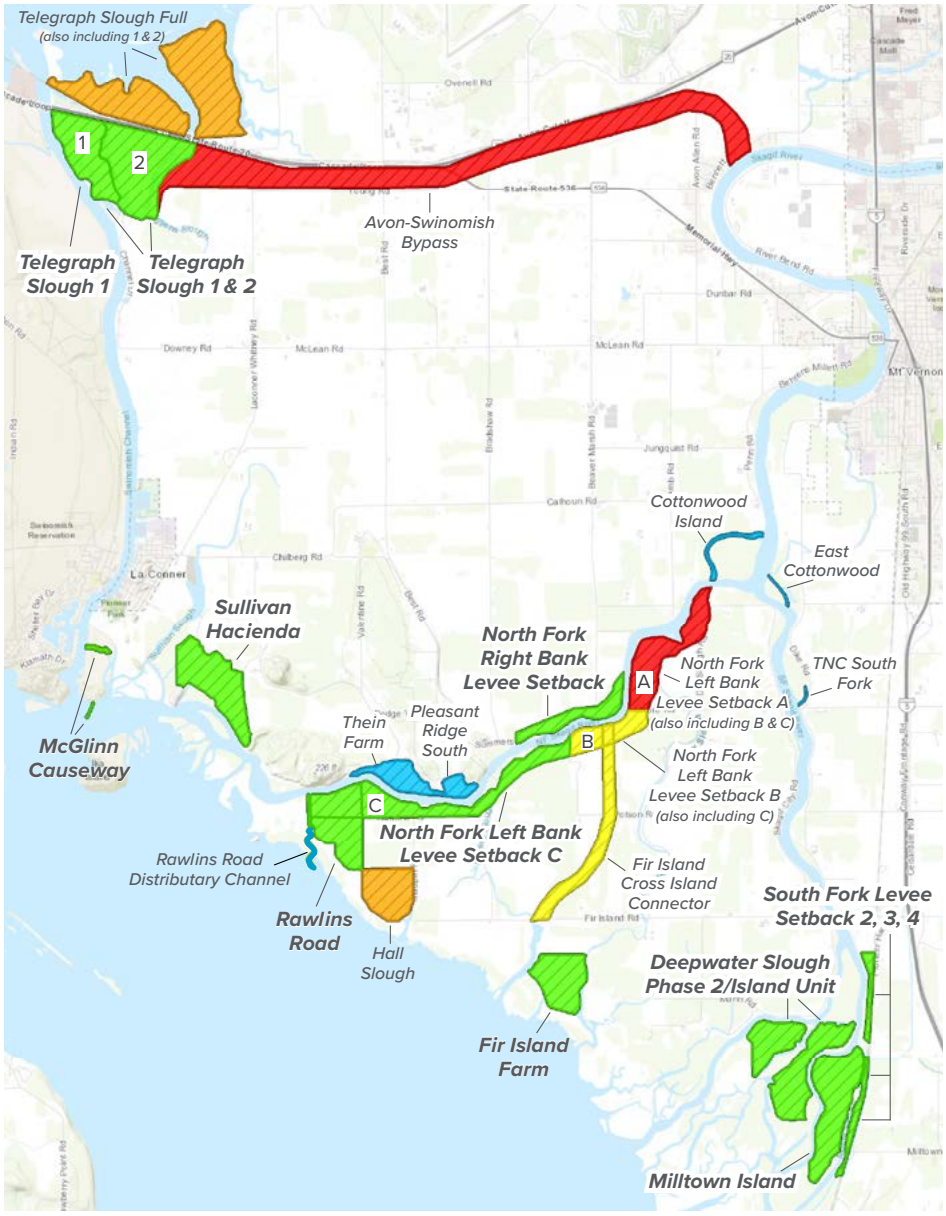
Scientists and technical experts worked with the project team to quantify the indicators for each project concept using best available science, including updated models and analytical methods. An enhanced model of tidal channel formation on restored sites, new geographic information system (GIS) analyses, models of sedimentation patterns, an updated three-dimensional hydrodynamic model of tidal and river flows, and vegetation community predictions informed calculations of indicators. This work was an iterative process between the experts and members of the interest groups, helping to ensure that the models and indicators reflected real-world conditions.

VISUALIZING TRADEOFFS

To visualize how the project concepts compared in their benefits and impacts, the project team plotted the multi-interest scores for all project concepts, as shown on the graph below. Each diamond on the graph represents a project concept, with its multi-interest benefit score (vertical axis) plotted against its multi-interest impact score (horizontal axis).

DEFINING MANAGEMENT GROUPS

Based on the benefit and impact scores, the project team categorized the multi-interest scores as high, medium, or low. This placed the project concepts into five distinct groups for planning and management purposes. Colors on the graph indicate management categories based on relative benefits and impacts.



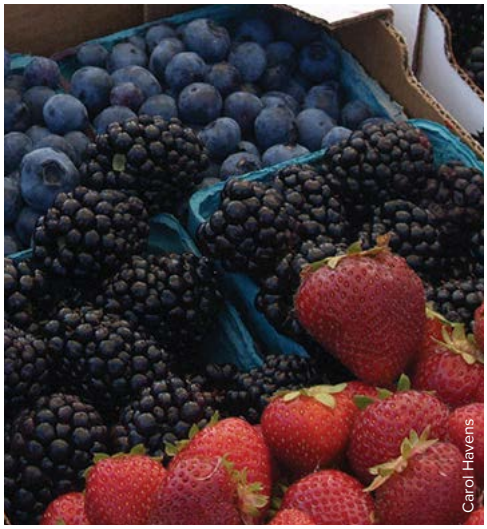
***Left*: Graph of the multi-interest scores of all project concepts based on scientific analysis. Colors indicate the management groups identified by the ERSA project team. The green management group has moderate benefits and low impacts; this group was prioritized for implementation.**

***Above*: Map of project concept locations, with colors corresponding to the management groups.**

PRIORITIES FOR IMPLEMENTATION

The green management group has projects with moderate benefits and low impacts. The ERSA project team recommends this group as the highest priority for collaborative implementation. The yellow and orange groups are lower priority due to the likelihood of higher impacts. Blue project concepts may be advanced as single-interest actions. The red group should not be advanced at this time.


Julie Morse/TNC


Carol Havens


Marlin Greene/One Earth Images

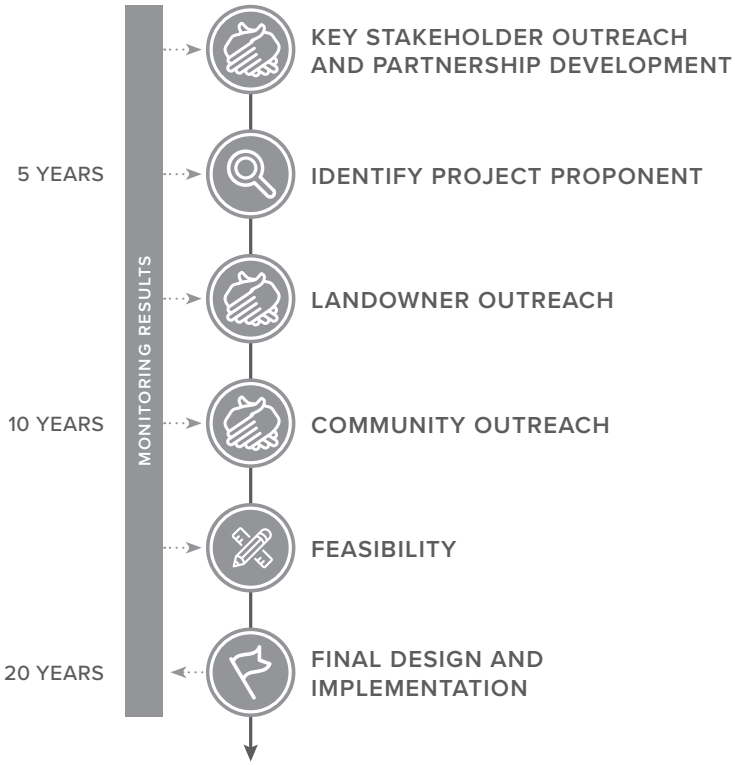
Editorial & Design: Waterview Consulting

MOVING FORWARD

Strong collaboration of fish, farm, and flood interest groups and monitoring of project outcomes are essential for successful estuary restoration.

- The ERSA project team recommends that the focus in the next five years should be on engaging key stakeholder groups and developing multi-interest partnerships to advance project concepts in the green group.
- The project team anticipates these collaborative efforts may focus on a few, well-supported projects at any one time; therefore, individual project timelines will be staggered.
- Monitoring is critical to understand how completed restoration projects are achieving, or not achieving, the goals of each interest and to help improve the design and approaches used for future project concepts.

ERSA provides a strategic approach for achieving salmon recovery, while increasing benefits and decreasing impacts to agriculture and flood risk reduction.



Project implementation pathway showing phases to advance a restoration project, including a general timeframe for projects in the prioritized green management group.

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 District Partnership
Skagit Watershed Council
Skagitonians to Preserve Farmland
Western Washington Agricultural Association
Upper Skagit Tribe
U.S. Geological Survey

SKAGIT FARMS, FISH AND FLOOD INITIATIVE

NOAA Restoration Center, Skagit County Dike District #17/Dike District Partnership, Skagitonians to Preserve Farmland, Washington Department of Agriculture, Washington Department of Fish and Wildlife, Western Washington Agricultural Association

SCIENTIFIC AND TECHNICAL EXPERTS

Pacific Northwest National Labs, U.S. Geological Survey, Skagit River System Cooperative, The Nature Conservancy

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