

Watershed Profile:

South Sound

The Place and the People

For the purposes of recovery planning for threatened Chinook, “South Sound” is defined as that area of Puget Sound south of the Tacoma Narrows that includes the marine, nearshore, estuaries, and freshwater environments. Geographically, the South Sound lies within the Puget Lowland physiographic province — a broad, low-lying region situated between the Cascade Range to the east and the Olympic Mountains to the west.

The dominant landform features of this area are the glacial plains cut by numerous streams and dissected by the inlets of Puget Sound. These shallow inlets divide the South Sound and cause poor circulation of seawater. As a result, water does not mix or dilute nutrient inputs to the same degree as in deeper areas. Many of the bays and inlets are more productive than the rest of Puget Sound. The highly productive intertidal zones provide habitat for many animal and fish species, and the flat, sandy areas of the nearshore are home to flounder, shrimp and other animals. Nisqually Chinook, White River early run Chinook, and Puyallup Chinook are among the creatures that use these nearshore waters.

The Nisqually is the primary river system that empties into the southern part of Puget Sound. The region is also home to the Deschutes and the Kennedy-Goldsborough, as well as smaller, independent tributaries which flow from lowlands in the area and help create South Sound’s distinctive and irregular coastline of small, shallow inlets including Hammersely, Little Skookum and Totten as well as portions of Eld and Case Inlets. Eld Inlet boasts a salt marsh, forested shorelines and a local stream, supporting salmon in every part of their life cycle. Hammersely is the skinniest of major Puget Sound inlets and a popular kayaking destination.



Photo courtesy the Squaxin Island Tribe.

Residential neighborhoods, bordered by second-growth forest, are found along Totten and Little Skookum inlets. In 1993 citizens took a bold step, creating the state's first clean water district which provides the financial resources to improve water quality and protect public health.

The South Puget Sound Salmon Recovery Group (SPSSRG) is a local planning group comprised of representatives from tribes, state agencies, local governments, and salmon recovery organizations with interest in the South Puget Sound nearshore. The SPSSRG is working to coordinate protection and restoration efforts around South Sound.

The South Sound Salmon

Chinook

Recovery planning in the South Sound primarily supports the larger Nisqually Chinook Recovery Plan because this is the major river system that empties into the South Sound; however, it also benefits other recovery efforts throughout Puget Sound.

Studies by tribal biologists have revealed that juvenile Chinook and bull trout from other natal watersheds rely heavily on South Sound as a "nursery" for extended periods.

Chinook use the South Sound habitats for feeding and growth, refuge from predation and extreme events, physiological transition between fresh and salt water, and migration. From this context, the South Sound strategy is focused on the nearshore environments. There are, however, Chinook in the South Sound that spawn in McAllister Creek, Deschutes River, Percival Creek and other independent tributaries such as Woodland Creek, Mill Creek, Goldsborough Creek, Case Inlet streams, Carr Inlet streams, and East Kitsap streams.

Historically, South Sound tributaries probably did not possess sustainable populations of Chinook. The marine/nearshore areas, however, are currently utilized by Puyallup River Chinook, White River early run Chinook, which is the sole remaining early run stock in South Puget Sound, and the Nisqually Chinook, a summer/fall stock.

Key Facts:

The Deschutes watershed is located in Thurston County, with a small portion in Lewis County; major cities in the watershed include Olympia, Tumwater and Lacey. Kennedy-Goldsborough is located 85% in Mason County and 15% in Thurston County; the major city is Shelton.



Land use in Kennedy-Goldsborough is primarily forest (71%) with urban and agricultural use accounting for 4% each. Land use in the Deschutes is 54% forested, 39% non-forested vegetation, 16% agricultural and 5% urban.



Projected population growth is 51% for Thurston County and 41% for Mason County.



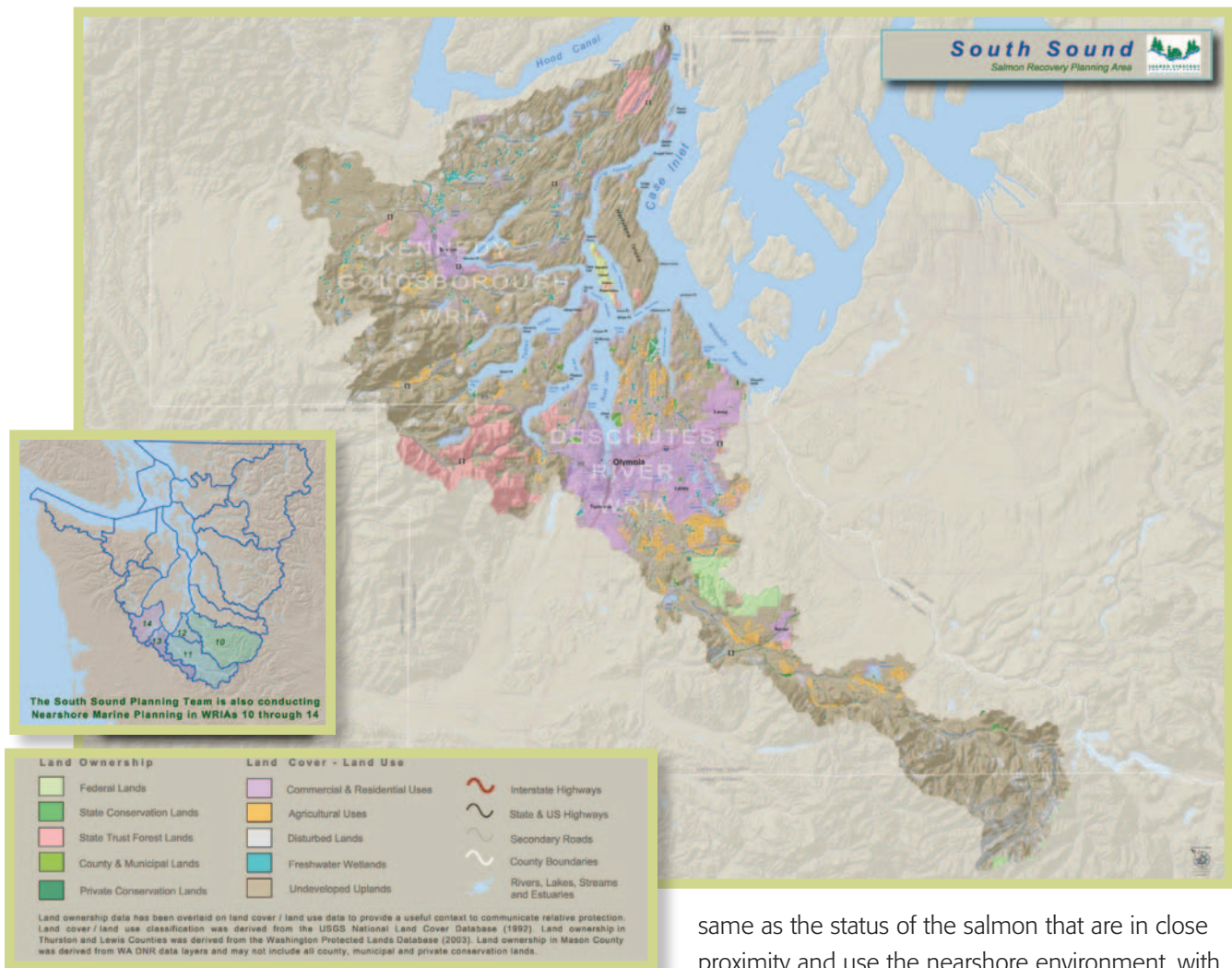
The Nisqually watershed is an important river system in this area and has its own profile.



The planning area for the South Sound is under the state Watershed Management Act are Watershed Resource Inventory Areas 13 and 14. The nearshore of the Nisqually is in WRIA 11. Portions of WRIA 12 (Pierce Co.) and WRIA 15 (Kitsap County) are also included in the nearshore area covered by the South Puget Sound Salmon Recovery Group.

Bull Trout

While there are very few reports of bull trout in the South Sound region, the US Fish and Wildlife Service identifies the South Sound marine and nearshore as a potential area of importance for foraging, migrating and over-wintering habitat for bull trout.



Recovery Goals

The goal of the South Puget Sound Salmon Recovery Group is to restore Chinook, Coho and other salmon species in the South Sound to a sustainable, harvestable level by ensuring that there are properly functioning nearshore habitats that serve their rearing, refuge, feeding, physiological transition, and migratory needs. The South Puget Sound Salmon Recovery Group also accepts the Nisqually Chinook spawner abundance planning targets, and harvest and hatchery goals.

What is the current status of the threatened salmon populations?

For the purposes of this planning effort, the status of the salmon in the South Sound is considered the

same as the status of the salmon that are in close proximity and use the nearshore environment, with the Nisqually salmon considered the primary users. In general, all independent populations of Chinook salmon in the South Sound ESU sub-region are at a high risk of extinction.

What are the key factors contributing to the current status of the populations?

The key factors that contribute to the status of the populations in the Nisqually and Chambers-Clover Creek basin are also considered key factors contributing to the status of these populations in the South Sound (see Nisqually and Puyallup/White Recovery Plans). The SPSSRG also identified the following additional human-induced stressors to key nearshore and freshwater tributary environments.

Shoreline armoring and other built structures

Shoreline armoring impacts nearshore erosion and sediment transport processes. This alters the size and type of beach sediment and can decrease the amount of sediment that is transported. Armoring also increases the energy of waves and reduces the water quality by altering the natural flow of water and accumulation of drift material. Shallow nearshore environments, which are crucial habitat areas for many species, are often lost as a result of armoring. Overwater structures and ramps have similar effects on salmon. Overwater structures especially can limit the sunlight that is needed by many of the chemical and biological components that comprise a functioning nearshore system.

Loss of riparian areas

Loss of riparian areas due to development has resulted in less shade and prey for salmon as well as increased water temperatures.

Modified wetlands and estuaries

Wetlands and estuaries have been modified which impacts tidal exchange, erosion and sediment transport. This can lead to a loss of habitat connectivity, and increase beach scouring.

Input of toxic compounds

Industrial and agricultural development has resulted in the release of toxic compounds in the marine and nearshore waters. Toxics can impair the development, growth, reproduction, and sensory functions of salmon.

Boat traffic

The wakes from boats and other water vessels can disrupt natural flows and are often more forceful than would be naturally found in the environment. This can increase erosion which can lead to a loss of habitat, a loss of habitat connectivity, and can disrupt natural sediment transport processes.

Invasive Species

The introduction of species that are not native to the South Sound has a variety of negative impacts on salmon, including increased competition for food and habitat, as well as increased predation.

Shellfish Aquaculture

Cultivating shellfish in the South Sound results in the loss of shallow nearshore habitat and habitat diversity that is important to salmon. These impacts can be potentially positive or negative depending on the type of aquaculture practice.



Photo courtesy the Squaxin Island Tribe.

Growth

In the future, population growth and development are likely to be key threats for salmon in the South Sound. This will not only decrease the size of available habitat, but will also result in an increase in impervious surfaces which causes an increase in storm runoff which in turn decreases water quality.

Overall Approach to Recovery

The South Sound Recovery Plan takes an ecosystem approach. For the short term, this plan addresses threatened Chinook salmon and bull trout. However, in the long term, the conceptual model and recovery strategies and actions will be broadened to address factors limiting Coho and other salmon species. SPSSRG also recognizes that while recovery efforts in the South Sound will benefit the Nisqually Chinook population specifically, populations throughout the Puget Sound will gain from improved nearshore and marine environments.

The SPSSRG additionally recognizes that salmon recovery depends not only on addressing habitat, harvest, and hatchery issues, but also on a shift in community attitudes. To bring about social change, the SPSSRG advocates that education and marketing strategies will need to be employed, and people in local businesses, social groups and religious organizations will need to be engaged in the recovery effort.

The SPSSRG also believes that salmon recovery in the South Sound will not be possible without cooperative leadership from all levels of government. To meet their recovery objectives, the SPSSRG will use cooperative planning, including the formation of a South Sound Advisory Science Team and a regional inter-jurisdictional forum for recovery planning, addressing the effectiveness of regulations and enforcement activities, and developing a plan for land acquisition and habitat restoration activities.

The South Sound Recovery Plan has identified the following action objectives to address the human-induced stressors that are contributing to the status of the salmon.

Key strategies and actions supporting the overall approach to recovery

Shoreline Armoring

The SPSSRG suggests and encourages the removal of armor from publicly owned sites; identification and removal of bulkheads that are not essential; when feasible, use of soft shore protection measures to protect shorelines; placing moratoria on new armoring through local ordinances; and removal or modification of shoreline armoring that blocks the passage of material from feeder bluffs.

Overwater Structures and Ramps

Designing overwater structures that allow light through would allow sub-tidal and intertidal vegetation to survive. The SPSSRG will seek funding for the removal of old homes, floats, debris, old piling anchors and derelict vessels. The plan also suggests minimizing the number of docks and ramps and encourages community facilities. Where possible and with landowner agreement, boat ramps that impede sediment transport processes will also be identified and removed.

Stormwater and wastewater

Several strategies address stormwater and wastewater. The plan encourages retrofitting stormwater systems and treatment plants to improve water retention and treatment. The plan also promotes land use practices that prevent stormwater flows, monitoring and wastewater reuse, and a street-sweeping program.

Riparian Loss

To address the loss of riparian areas along the nearshore, the plan calls for re-establishment and maintenance of riparian buffers. It is widely accepted that riparian buffers are important for salmon and trout in freshwater systems. Buffers along the marine nearshore serve a similar purpose. The plan encourages several other actions to address riparian loss including: building setbacks, native plantings along the shoreline, increasing public ownership, and retaining undeveloped shorelines in open space areas.



Photo courtesy the Squaxin Island Tribe.

Wetland and Estuarine Modification

Past diking and hydrologic isolation of the wetlands caused substantial loss of estuarine and tidally influenced wetlands. This occurred primarily to support agricultural purposes. The plan recommends the use of incentives and buy-back programs at the state and federal level to remove dikes and put restrictions on agricultural use of estuarine wetlands. This would help restore estuarine functions. Many of the recommended programs already exist and are supported by the planning group.

Toxic Components

The SPSSRG's objective is to support public education efforts that focus on using Best Management Practices (BMPs) for preventing the entry of toxic contaminants into nearshore and marine waters. They also support the study of the use and effect of PBDEs (a chemical found in flame-retardants) on salmon health. The group also identifies existing and future toxic sediment clean-up projects and pesticide education programs as key to addressing toxic impacts on the nearshore-marine environment.

Boat Traffic

The plan identifies the need for programs to reduce the speed of boats and re-direct boating routes to reduce erosion from the wake these vehicles can cause.

Invasive Species

The plan supports the requirement that ballast water in commercial ships be exchanged or treated before release in South Sound to combat the introduction of nonnative species.

Shellfish Aquaculture

Another set of actions in the plan concerns identifying shellfish aquaculture impacts and improving the management practices for the production and harvest of shellfish.

Results

The watershed plan for the South Sound was reviewed by the Puget Sound Technical Recovery Team (TRT: a group of seven scientists) and an interagency committee facilitated by the Shared Strategy staff. The TRT reviewed the plan to determine the degree of certainty that the plan can achieve recovery goals. The conclusions of this analysis are below. For the most part, the issues identified below by the analysis are discussed in the watershed plan to some extent, but the reviewers felt they merited particular attention or additional effort to increase the certainty of achieving plan outcomes. Where the analysis identified key uncertainties, proposals are included for consideration. If implemented along with the watershed plan's other actions, these proposals would increase the certainty of results and achieve the requirements for a recovery plan under the Endangered Species Act.

This plan has a well laid out conceptual model that identifies stressors linked to the landscape and the fish needs (VSP parameters). The plan includes local habitat assessments for each region, which while not linked to the effects of impaired processes to VSP, are linked to changes in habitat conditions.

There is a good guidance framework with maps to identify priority protection and restoration locations providing a good scientific basis for these priorities. The plan did a good job in designing assessments to determine what the actions should be; the assessments provide a good foundation for the needed next step of identifying more specific actions. It will also be important to assess the results for fish from the protection tools on which the plan relies.



Photo courtesy the Squaxin Island Tribe.

The SPSSRG came up with an interesting and different way of looking at the problem and identifying who does what, when for implementation. This approach may be useful in other watersheds.

The certainty of achieving plan outcomes is increased by the fact that Thurston County has agreed to use the plan as Best Available Science. The reviewers also understand that the Puget Sound Action Team (PSAT), the authors of the regional nearshore chapter, agreed to do some additional work, so the plan has more longevity than is apparent in the document.

The certainty of achieving this plan's outcomes and the resulting contribution to overall ESU recovery will increase if the following issues receive focused attention as described below.

One of the key uncertainties of this plan is that it is not clear how the stated habitat strategy relates to the hatchery and harvest management strategies for recovery of the populations and the objectives for harvest in southern Puget Sound.

It will be important to the success of this plan to analyze how hatchery fish use the South Sound habitats (e.g. issues of competition and predation, implications of hatchery production, etc.) and estimate the capacity of the South Sound nearshore to

support hatchery-origin and natural-origin Chinook and other salmon using those waters.

How the food web of Puget Sound (including hatchery salmonids, any competitors, prey species or predators) will affect salmon recovery, and what strategies could be used to address these problems are not included in the plan and should be addressed in the adaptive management and monitoring program (expected to be completed later this year).

Water quality in shallow bays is a significant concern. It will be important to assess the magnitude of impact, reduce contamination where necessary, and ensure protection of processes that maintain water quality sufficient for salmon recovery and other objectives the Puget Sound ecosystem is expected to support.

The planned strategies and actions will need to be linked to results for fish, the Viable Salmonid Parameters (VSP; abundance, productivity, spatial distribution, diversity) to describe the expected outcomes from plan implementation. Once the linkage between the ecosystem principles, stressors, and geographic priorities are linked to VSP, then these four parameters can be used as a measure for monitoring.

The review process also identified a number of issues and uncertainties that are common to many Puget Sound watersheds. Strategies to address these issues that are contained in this local watershed chapter are a good approach, based on the current state of scientific understanding. Nevertheless, because (1) these issues are very important to the success of watershed approaches to recovery and (2) the effects of some of these strategies on salmon populations at watershed scales are relatively untested, these issues deserve particular attention. Reducing the uncertainties in the issues below could come through local and/or regional inclusion in adaptive management and monitoring programs, regional or local pilot studies to explicitly test their effects, or through additional implementation actions. The complexities associated with these issues are discussed in the regional strategy section of this document or in the regional adaptive management and monitoring program. The “cross-watershed” issues identified are:

- The importance of habitat protection strategies and the need to assess the results for fish from the combination of protection tools available,
- The need to develop H-Integration strategies or, where they are included, to move them further along the integration continuum over time,
- The need to reconcile local nearshore strategies and actions with the regional nearshore chapter,
- The need to address water resources, both water quality and water quantity,

- The need to better link the effects of land use to habitat-forming processes and to habitat conditions. In turn, the effects of these changes in habitat, processes and landscapes on salmon populations need to be estimated,
- The need to develop or complete a robust adaptive management and monitoring program.

If the above uncertainties are addressed, the South Sound will support salmon populations using its nearshore and marine waters and provide an important contribution to overall ESU recovery.



Photo courtesy the Squaxin Island Tribe.