

Freshwater Protection

The Challenge

Surface water flows and groundwater levels in most watersheds of Puget Sound have been altered as a result of dams and other hydrological modifications, loss and change of vegetative cover, water withdrawals for municipal, domestic, commercial, industrial, and agricultural water supplies, and in some cases, over-allocation of water rights. Climate change will compound these problems by reducing snowpack and groundwater infiltration, increasing stormwater runoff, raising stream temperatures, and concentrating pollutants in water bodies. As a result, Puget Sound aquatic habitats are degraded, native species have declined, and there is an uncertain future water supply for human consumption, especially in rural areas. Low water flows are identified as priority issues for salmon in 14 of the 19 Puget Sound Water Resource Inventory Areas (WRIA).

SALMON RECOVERY

Freshwater – A Salmon Recovery Plan Priority: Adequate water availability is critical for salmon. Water availability for salmon recovery also includes the timing and the type of flow (e.g. peak flows, rain-on-snow events, water levels during summer vs levels during spring). The Recovery Plan calls for resolving technical and policy uncertainties around water availability and flow, and the implementation of protective water quantity measures.

How are these priorities integrated: While the Action Agenda strategies and actions have some actions around in-stream flows and water availability, the Recovery Plan places a higher emphasis on resolving the water availability issues than is highlighted in the Action Agenda. The flow work has not advanced in the region as articulated in 2005. More work is needed to address the concerns around instream flows for salmon recovery.

Puget Sound watersheds require a comprehensive approach to protecting year-round, instream flows for people and instream uses. This is particularly important with increasing human population in the region and concomitant projected increases in water demand. Current approaches to managing stream flows, groundwater, water use, land use, and stormwater management are fragmented and the many programs that address water quantity are not coordinated. A fundamental realignment in policy and regulation is needed at the state level to repair the system, one that ensures the protection of natural hydrologic processes and associated habitats within Puget Sound watersheds. Some of these actions will also help improve water quality.

Relationship to Recovery Targets

Puget Sound has a specific recovery target for summer stream flows that support salmon habitat needs, other ecosystem needs, and provide water for people. This target includes a series of river-specific sub-targets to be achieved by 2020:

- Maintain stable or increasing flows in highly regulated rivers (Nisqually, Cedar, Skokomish, Skagit, Green)
- Monitor low flow in the Elwha River after dam removal
- Maintain stable flows in unregulated rivers that currently are stable (Puyallup, Dungeness, Nooksack)
- Restore low flows to bring the Snohomish River from a weakly decreasing trend to no trend
- Restore low flows to bring the Deschutes River, North Fork Stillaguamish River, and Issaquah Creek from a strongly decreasing trend to a weakly decreasing trend

Protecting and improving stream flows also will help support recovery targets related to insects in small streams, wild Chinook salmon abundance (which in turn supports recovery targets for Puget Sound resident killer whales), and freshwater quality.

A8. Protect and conserve freshwater resources to increase and sustain water availability for instream flows.

The aim of this strategy is to develop coordinated, watershed-based water management approaches, accounting for existing ecosystem goals, water management agreements, projected future climate conditions and water availability, and projections of future instream flow demands. This strategy approaches freshwater protection and conservation from three perspectives:

- Regulation, monitoring, and enforcement
- Water demand and conservation
- Supply, including reuse, rainwater, and stormwater management
- Ground water supplies and recharge

A8.1 Update Puget Sound instream flow rules and to encourage conservation.

A critical tool for protecting and conserving freshwater resources is rule-making for instream flows. Ecology has authority to set instream flows under several statutes—Chapters 90.22, 90.54, and 90.82, of the Revised Code of Washington. The term "instream flow" is used to identify a specific stream flow (typically measured in cubic feet per second, or cfs) at a specific location for a defined time, and typically following seasonal variations. Instream flows are usually defined as the stream flows needed to protect and preserve instream resources and values, such as fish, wildlife, water quality, aesthetics, and recreation. Instream flows are most often described and established in a formal legal document, typically an adopted state rule. Ecology establishes in stream flow rules through the Administrative Procedures Act (RCW 34.05). In areas of the state where watershed planning has occurred, local planning units can make recommendations to Ecology for instream flow rules to be established or, for existing rules, amended. DFW provides technical assistance in the form of instream flow studies, flow

study interpretation and analysis in light of hydrology and species-specific ecology, developing instream flow recommendations based on interpretation of instream flow study results, and explaining instream flow ecology and methods to stakeholders.

Most of the watersheds in Puget Sound's WRIAs 1, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, and 17 are currently covered by instream flow rules. Only four of these rules, however, address permit-exempt groundwater withdrawals that can have a cumulative effect on stream flows, especially in late summer. For example, the instream flow rule for Kennedy–Goldsborough WRIA 14 was codified in 1988 and has not been updated.

An additional challenge to updating instream flow rules is the degree of local support and/or opposition to the rule-making process within any given basin. The degree of support or opposition can greatly influence both the cost and time required to adopt or update a rule, as evidenced by recent rule-making activity in WRIA 17 and WRIA 18. New instream flow rules often limit access to groundwater supplies and this can cause a backlash from home builders, realtors, and property owners. To address this challenge, it will be important to work with local officials, legislators, tribes, and stakeholders to reach agreement on regulatory approaches and solutions to water supply problems. Finding solutions to the growing demand for water can take longer than developing the rule language itself. Education and outreach efforts are also critical for building public understanding and support. Outreach strategies would be tailored for specific basins. Ecology's staffing for instream flow rules has been reduced in recent years due to budget cuts—there are currently only two instream flow rule writers for this work statewide.

Local Strategies

Updating instream flow rules and implementation of instream flow rules is critically important across the Puget Sound. Specifically, the Strait identified implementing Instream Flow Rules for WRIAs 17, 18 East and West, and 19 as a local priority strategy.

Ongoing Programs

Ecology's Watershed Plan Implementation and Flow Achievement Capital Grant Program and Watershed Planning Operating Budget Grants include specific technical approval criteria such as amount of water added to instream flows and improvements to fish habitat.

Performance measures from Ecology's Water Resources Division include: two instream flow rules adopted (Q6, 2009–2011 biennium), number of instream flow rules adopted, zero percent of monitored stream flows below critical flow levels, and 1,250 acre-feet of water saved for instream flow (for each period, 2009–2011 biennium). Additional measures include percentage of Hood Canal summer chum and Puget Sound Chinook stocks with spawner escapement (number of fish returning to a stream or river to spawn) exceeding their 1993–97 pre-ESA listing base period. An increasing number of populations with spawner escapement exceeding the population's pre-ESA base period would indicate progress toward a healthier Puget Sound ecosystem.

Ongoing programs also establish minimum flow regimens on rivers where flows are controlled by dams. In general, these rivers have the most stable or positive trends relative to minimum flows. There are six Puget Sound rivers where flows are highly controlled by dams: the Cedar River, the Elwha River (although this will change in the future as the dams are removed), the Green River, the Nisqually River,

the Skagit River, and the Skokomish River. Two additional Puget Sound rivers, the Deschutes River and the Snohomish River, are slightly regulated by dams.

Key Ongoing Program Activities

- Ecology will continue to support implementation of the recommendations from approved watershed plans prepared under the Watershed Planning Act (RCW 90.82) consistent with the Action Agenda and coordinated with other local restoration and protection efforts. Approved watershed plans in Puget Sound include Nooksack, San Juan, Island, Nisqually, Skokomish-Dosewallips, and Quilicene. Other areas stopped the RCW 90.82 planning process (Kitsap, Kennedy-Goldsborough, Chambers-Clover, Deschutes, Lower Skagit-Samish, Upper Skagit), and still other areas are not expected to participate in RCW 90.82 planning (Stillaguamish, Snohomish, Cedar-Sammamish, Duwamish-Green, Puyallup-White). Work is needed to identify and support flow-protection and enhancement actions in approved watershed plans.
- Over time, as flow agreements are renegotiated and new agreements are put into place, Ecology will review targets to ensure agreements are resulting in adequate flows in stream.

Near-Term Actions

A8.1 NTA 1: Ecology, with support from DFW, will within 6 years set flow rules in the three remaining Puget Sound watersheds (WRIAs 16, 18, and 19) that currently do not have instream flow rules. Two additional watersheds—San Juan (WRIA 2) and Island (WRIA 6) are not near-term candidates for instream flow rules due to naturally limited freshwater habitat. Priority will be given to critical basins or those with known significant problems meeting instream or out-of-stream demands. By 2013 Ecology will have adopted an instream flow rule for the Dungeness River portion of WRIA 18.

Performance measure: Done or not

A8.1 NTA 2: Ecology will develop and implement the comprehensive basin flow protection and enhancement programs called for in the recovery plans for Puget Sound Chinook and Hood Canal/Strait of Juan de Fuca summer Chum by [date]. By 2013 Ecology will [increment of anticipated progress.]

Performance measure: Done or not

A8.1 NTA 3: Ecology will establish local water masters in each Puget Sound watershed to increase water code compliance and enforcement by [date]. By 2013, Ecology will establish at least one water master in a selected high priority watershed to increase water code compliance and enforcement. This will include providing funding for the water master to be a local contact to water users, provide a local compliance presence, protect the resource, reduce water use, and protect senior water rights, including instream flows.

Performance metric: Done or not

Local Action

The Strait also identified adoption and implementation of instream flow rules for WRIAs 17, 18 East, 18 West, and 19 as a high priority action.

A8.2 Decrease the amount of water withdrawn or diverted and per capita water use.

The previous section focused on regulation and monitoring of freshwater resources through implementation of instream flow protection programs; this section considers freshwater resource protection through demand and conservation strategies. Managing demand and promoting conservation will be critical as the human population increases in the Puget Sound region. Population stress on water supply will be further exacerbated by predicted decrease in snow-pack and increased frequency of droughts brought about by climate change. The near-term objectives for water demand and water conservation address four key sectors: municipalities, agriculture, industry, and rural domestic water users. Demand and conservation goals will be met through a combination of implementation/enforcement of rules, voluntary participation in conservation programs, market-based approaches to adjust water usage, and deployment of current and emerging water conservation technologies.

Local Strategies

The North Central area is considering a couple of local strategies to address this issue.*

** See Local Areas Chapters for more detail on local areas that are in the process of completing strategy and action identification and prioritization.*

Ongoing Programs

Key Ongoing Program Activities

- Support municipal water systems' implementation of Washington Department of Health's Water Use Efficiency Rule, including establishing water conservation goals, metering, and reporting from all municipal suppliers by [when?]
- Ecology will support an increase in periodic audits of industrial water users of [how much] by 2013.

Near-Term Actions

A8.2 NTA 1: Building on existing public-private models, public utilities will adopt demand management strategies (such as tiered pricing structures) to discourage inefficient and unnecessary use of municipal water, particularly in flow-limited areas or low flow periods. By 2013, [x] number of utilities will have adopted demand management strategies.

Performance measure: number of demand management strategies adopted; reduction in demand

A8.3 Implement effective management programs for groundwater.

A critical approach to protection and restoration of freshwater resources includes management of groundwater in conjunction with surface water to better account for the interaction between the two.

In addition to the exempt well issue, work on groundwater should emphasize monitoring of groundwater resources (including exempt wells) and use projections, and completion and implementation of groundwater management plans throughout Puget Sound. It will require an emphasis on work in areas without current groundwater management plans that are at high risk of groundwater pollution and/or current or future demand. The Critical Aquifer Recharge Area (CARA) program (under the state's Growth Management Act) is one potential vehicle for coordinating protection of groundwater resources across Puget Sound counties to support instream flows.

Near-Term Actions

A8.3 NTA1: Ecology will work with Tribal Nations, local governments, and other Partners to develop and support a consistent approach to making decisions about exempt wells, and to ensure that both the physical and legal availability of water is considered in decisions this will include workshops on exempt well issues to be complete by [date].

Performance measure: Done or not

Emerging Issues and Future Opportunities

In addition to the specific ongoing program activities and near-term actions described above, there are a number of ideas for future work that might be undertaken to address protection of freshwater flows in Puget Sound. These ideas should be an ongoing part of the regional discussion about freshwater flows, and may inform future funding decisions, programmatic priorities and guidance, and/or may become near-term actions in future Action Agenda cycles. They include:

- The proper balance between establishing new instream flow rules and updating existing rules. Ecology current has no resources to update existing rules. Diverting resources to update existing rules would slow establishment of new instream flows. In general this is a very resource challenged area of the Action Agenda.
- Application of more holistic, watershed and water budget based approaches that would examine all the water needs in a watershed (e.g., growth, industry/agriculture, stream flows) and all the potential water resources (e.g., reclaimed water, stormwater, and rainwater harvesting) and work to best match needs and resources.
- Consideration of a comprehensive "Puget Sound Water Plan", which would integrate all of the water issues in the basin, including water rights, water quality, land use permitting, habitat protection, and watershed management.
- Consideration of new implementation mechanisms for planning, these might include consideration of watershed districts, which would have independent revenue (e.g., taxation authority) and the ability to review all permits for conformity with the plan and to step in where

a proposal has a watershed-wide impact and take the lead for planning, for example for flood control or water supply planning.

Target View: Summer Stream Flows

Summer stream flows support salmon habitat needs, other ecosystem needs, and water for people. The summer (June through October) lowest 30-day average flow is a statistical measure of flow that has been linked to salmon habitat needs.

Summers in the Puget Sound region are often glorious, with comfortable temperatures and little rain. One result of this great weather is that the flow of water from rivers and streams around the Sound also declines, affecting salmon runs, wildlife, and our water supply. There are other man-made reasons for lower summer stream flows, such as new wells that tap ground water and new buildings and development that cover up the ground and decrease seepage – reducing the amount of water that would reach the stream in summer.

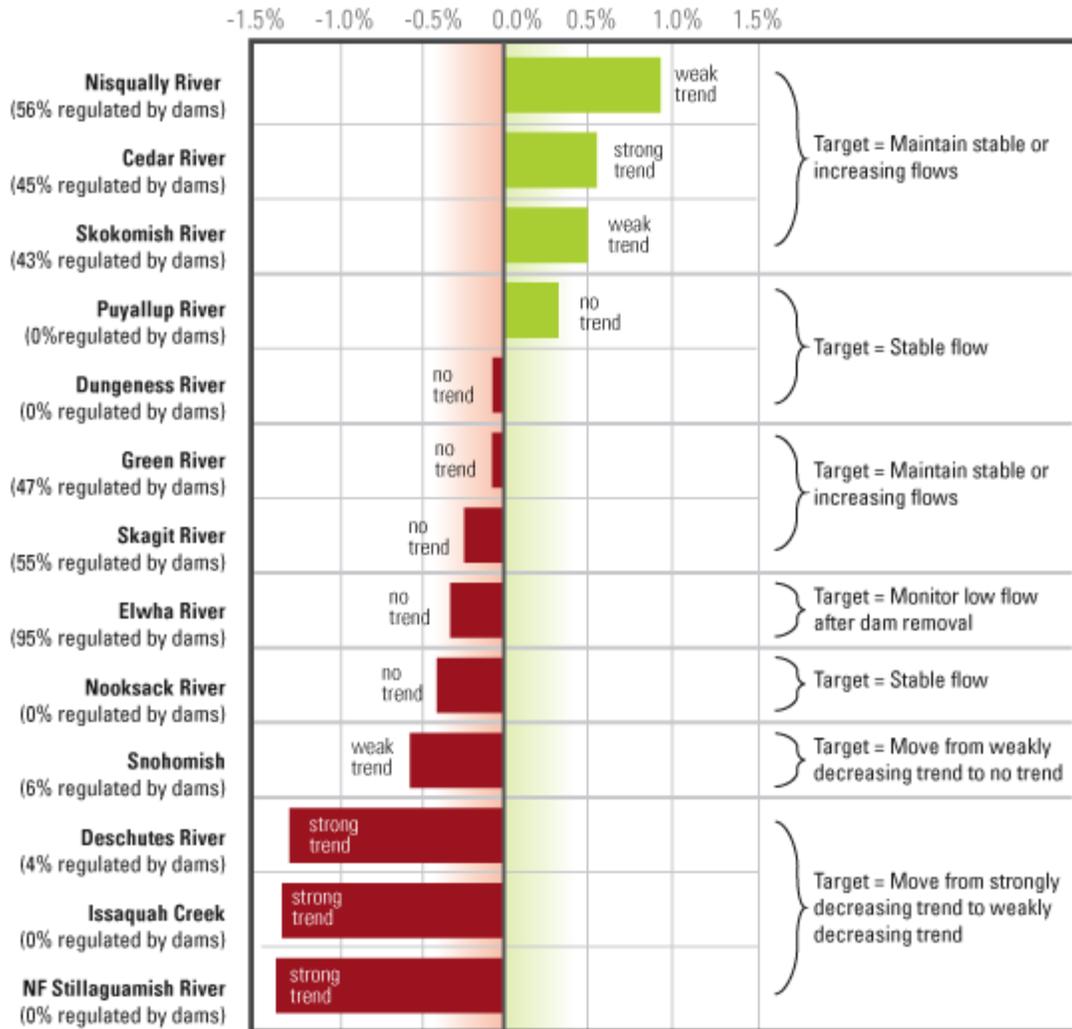
Of course, stream flows vary from year to year. But there are good measurements available for most of the rivers in the Puget Sound basin. The 2020 recovery target for summer stream flows is to meet the following river-specific targets:

- Maintain stable or increasing flows in highly regulated rivers: Nisqually, Cedar, Skokomish, Skagit, and Green.
- Monitor low flow in the Elwha River after dam removal.
- Maintain stable flows in unregulated rivers that currently are stable: Puyallup, Dungeness, and Nooksack.
- Restore low flows to bring the Snohomish River from a weakly decreasing trend to no trend.
- Restore low flows to bring the Deschutes River, North Fork Stillaguamish River, and Issaquah Creek from a strongly decreasing trend to a weakly decreasing trend.

The river-specific targets for stream flow are displayed in the following graph. All flows are from U.S. Geological Service gages. Most gages are near the mouth of the river, except the Deschutes River and Dungeness River gages are higher in the watershed.

In the following results chain, or logic model, yellow polygons identify strategies and actions from the Action Agenda that we believe will contribute significantly towards meeting the target. Arrows to the blue boxes describe the intermediate results the strategies and actions are expected to achieve. The purple boxes show the reduced pressure on the ecosystem that is expected to occur, the green ovals show the areas of the ecosystem where the change will be observed, and the dark green square shows the recovery targets.

Average Change in Low Water Flows in 13 Puget Sound Rivers Percent per year, 30-day average summer low flow, 1975-2010



Source: Washington State Department of Ecology

The three Action Agenda strategies most related to the summer stream flow target are:

- Reform state water laws to be more protective of instream flows and to encourage conservation and implement streamflow protection and enhancement programs (A8.1)
- Decrease the amount of water withdrawn or diverted and per capita water use (A8.2)
- Implement effective management programs for groundwater (A8.3)

Miradi target diagrams are still being developed for the summer stream flow target.