



RECOVERY CONTEXT

THE CURRENT STATUS OF PUGET SOUND

Recovery Context: The Current Status of Puget Sound

“Healthy” ecosystems are both functioning and resilient. A functioning ecosystem serves the needs of fish and wildlife and of human populations. When ecosystem conditions are stressed, such as through pollution or resource depletion, it can become more difficult to meet all of these needs. Resilient means that the ecosystem is flexible or adaptable to changes over time that may be caused by humans or natural causes. Having some redundancy of species and habitats in the ecosystem (e.g., species live in multiple locations), as well as a representative sample of the species and habitats that were historically present in the ecosystem, can improve the resiliency of the ecosystem.

So what does this mean for Puget Sound? Based on the statutory goals, a healthy Puget Sound supports our well-being and quality of life, the health of our communities, and a thriving economy in the Northwest, both now and in the future. In a healthy Puget Sound, native species are abundant and diverse, and have the habitat they need to thrive. Moreover, Puget Sound waters are also clean and plentiful enough to fully support drinking water and recreational uses, fish and shellfish harvest, and other activities, without causing health concerns or posing environmental risks for fish or wildlife. While we don’t expect Puget Sound to return to conditions before European settlers first arrived, we do want to derive many of the same benefits offered them, from a healthy, vibrant Puget Sound in the 21st century and beyond.

As described in Part 1 of the Action Agenda, the Partnership has adopted indicators for the statutorily-established goals and recovery targets for 18 of the chosen indicators.

The table below presents the indicators, recovery targets and current status as reported on the Vital Signs (unless otherwise noted). The current status information is helpful in developing the strategies and actions needed to reach 2020 targets and recovery goals.

PRESSURES ON PUGET SOUND

Recovery targets consider both indicators of the statutorily-established Puget Sound goals and the pressures on the Puget Sound ecosystem that may make recovery difficult. Ecosystem pressures identify human activities that may impact the physical, structural, and ecological processes and functions in the ecosystem. Many of these human activities also may provide direct and indirect benefits to the ecosystem and/or may be relatively neutral to the ecosystem but provide benefits in terms of human quality of life. The goal is not to eliminate human pressures on Puget Sound, but to understand and manage them towards ecosystem protection and recovery.

GOAL	INDICATOR	RECOVERY TARGET	CURRENT STATUS
1. Healthy Human population	Safe seafood	A net increase of 10,800 acres of harvestable shellfish beds, of which 7,000 acres must be from beds presently classified as prohibited.	There are an estimated 190,000 acres of classified commercial and recreational shellfish beds. About 36,000 acres – approximately 19 percent – are closed due to pollution sources (primarily fecal bacteria from humans, livestock and pets).
	Swimming beaches	All monitored beaches meet enterococcus (a type of fecal bacteria) standards.	Almost half of routinely monitored beaches (about 70 locations) consistently met the standards between 2004 and 2010; another third met the standard except for one or two years. However, in any given year from 2004 - 2010, 7 to 15 beaches failed to meet standards, resulting in the issuance of health advisories to the public.
	On-site sewage systems	<ul style="list-style-type: none"> By 2020, all on-site sewage systems in marine recovery areas and other areas with equivalent enhanced operation and maintenance programs are inventoried, 95 percent are current with inspections, and all failed systems are fixed Designations of marine recovery areas or designation of other areas with equivalent enhanced operation and maintenance are expanded to 90 percent of marine shorelines not primarily served by sewers. 	Local health jurisdictions and the Department of Health are gathering and mapping data for on-site sewage system inspections. Initial results will be available in 2011 and semi-annually thereafter.
2. Human quality of life	Commercial harvest	A target has not been set at this time.	Data on pounds of all salmon caught in Puget Sound commercial harvest are presented on the Vital Signs
	Recreation	A quality of life index will include address aesthetics, recreation, culture, and the economy. The index and targets are being developed with anticipated adoption in 2012.	
	Working waterfronts	This indicator is under consideration as part of the quality of life index.	
	Rural and resource lands	This indicator is under consideration as part of the quality of life index.	
	Sound behavior index	The Sound Behavior Index will be a measure of two elements: the public's changing behavior to reduce human impacts on Puget Sound, and social capital. Social capital represents the bonds that bring groups of people and organizations together; it can be measured, and correlates to a variety of social indicators including health, civic participation, and educational achievement. The index is under development.	Data will be posted in 2012.
	Recreational fishing permit sales	This indicator is under consideration as part of the quality of life index..	Recreational angling and crabbing permit data are presented on the Vital Signs

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3. Healthy native species and food web	Wild Chinook salmon	By 2020, stop the overall decline and start seeing improvements in wild Chinook abundance in two to four populations in each biogeographic region.	Data to be available in 2012.
	Orcas	By 2020, achieve an end of year census of southern resident killer whales of 95 individuals, which would represent a 1 percent annual average growth rate from 2010 to 2020.	The historic population of Southern Resident Orcas may have numbered around 200 individuals, but by mid-2011, the population totaled fewer than 90 whales. There are currently 17 female orcas capable of bearing young, and orcas generally wait three to five years between pregnancies. About three orcas disappear from the population every year with unknown fates.
	Pacific herring	<ul style="list-style-type: none"> By 2020, achieve increased spawning biomass for each genetic grouping to a minimum of: 5,000 tons for Cherry Point stock. 880 tons for Squaxin Pass stock. 13,500 tons for all other stocks combined. 	Overall, the number of herring in Central and Southern Puget Sound has been relatively stable for the past 40 years. However, the population of one large and important stock of Pacific Herring, the Cherry Point stock in North Puget Sound, has declined by 90 percent since 1973.
	Terrestrial birds	A target has not yet been set.	
4. Protect and restore habitat	Land development	<p>By 2020, the proportion of basin-wide growth occurring within Urban Growth. Areas is at least 86.5% (equivalent to all counties exceeding goal by 3%) and all counties show an increase over their 2000-2010 percentage.</p> <p>By 2020, average annual loss of forested land cover to developed land-cover in non-federal lands does not exceed 1,000 acres per year and 268 miles of riparian vegetation are restored or restoration projects are underway</p>	<p>The rate of forest conversion to developed from 2001-2006 was 2,176 acres/year. For the riparian corridor aspect the footnotes under the target options note that 13,000 riparian acres (equivalent to 268 stream miles) are currently in medium or high density development and 2,100 acres (equivalent to 43.3 stream miles) were converted from vegetated to developed from 1996 to 2006.</p> <p>From p. 11 of the Target Setting Technical Memo (9/30/11)</p>
	Land cover	Basin-wide, by 2020, loss of vegetation cover on indicator land base over a 5-year period does not exceed 0.15% of the 2011 baseline land area.	<p><i>Not yet summarized on the Vital Signs.</i></p> <p>The 2001-2006 rate of change from vegetative to developed was 0.26% of the indicator base lands for a six county area (named in the footnote on p. 15); 83% of the basin-wide new growth from 2000-2010 occurred within UGAs</p> <p>(summarized from pages 14 and 20 of the Target Setting Technical Memo (9/30/11))</p>
	River mouth estuaries	By 2020, all Chinook natal river deltas meet 10-year salmon recovery goals (or 10 percent of restoration need as proxy for river deltas lacking quantitative acreage goals in salmon recovery plans) and 7,380 quality acres are restored basin-wide, which is 20 percent of restoration need.	Data will be available in 2012.

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	Floodplains	By 2020, 15 percent of degraded floodplain areas are restored or floodplain projects to achieve that outcome are underway across Puget Sound and there is no additional loss of floodplain function in any Puget Sound watershed relative to a 2011 baseline.	Data will available in 2012. Based on other studies, the National Oceanic and Atmospheric Administration (NOAA) estimates that almost three quarters of wetlands have been lost in Puget Sound, the vast majority of which occurred in floodplains.
	Shoreline armoring	From 2011 to 2020, the total amount of armoring removed is greater than the total amount of new armoring in Puget Sound (total miles removed > total miles added); feeder bluffs receive strategic attention for removal of existing armoring and avoidance of new armoring; and soft shore techniques are used for all new and replacement armoring unless it is demonstrably infeasible.	
	Eelgrass	Eelgrass extent in 2020 is 120 percent of area measured in the 2000-2008 baseline period (an increase from about 53,100 acres to about 63,700)	Current eelgrass baseline for Puget Sound is 53,100 acres. Though some larger Puget Sound eelgrass beds are stable or possibly increasing in size, many of the smaller more widely dispersed beds are in decline.
5. Enough water for humans and the environment	Summer stream flows	<p>By 2020, meet the following river-specific targets:</p> <ul style="list-style-type: none"> • 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. <p>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.</p>	Ask Ken Dz to help interpret

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6. Sufficient water quality for human and ecosystem health	Insects in small streams	By 2020, 100 percent of Puget Sound lowland stream drainage areas monitored with baseline benthic invertebrate community (B-IBI) scores of 42-46 or better retain these “excellent” scores and mean B-IBI scores of 30 Puget Sound lowland drainage areas improve from “fair” to “good.”	Data for the B-IBI measure are sparse. King County recently reported that, for small Wadeable Lowland Streams, 37 percent of sites ranked “good” or “excellent” and 63 percent ranked “fair or poor.”
	Freshwater quality	<ul style="list-style-type: none"> By 2020, at least 50 percent of all monitoring stations with suitable data have Freshwater Water Quality Index scores of 80 or higher. By 2020, achieve a decrease in the number of impaired waters (303(d) list) in Puget Sound freshwaters. 	<p>In general, fresh water quality index scores for the major rivers in Puget Sound have slowly improved since the index was first established in 1995 and now average in the mid-70's range (a score of 80 or higher is close to the goals). Scores in small urban streams are lower.</p> <p>Washington's most recent complete list (2008) shows 1,272 “listings” on 501 different rivers and streams in Puget Sound (an individual stream may be listed as impaired for more than one pollutant or impaired in more than one location). Since 2008, 54 listings (about 4.2 percent) have been addressed by formal Clean-Up Plans. An additional five listings were removed for other reasons. Since about 1998, a total of 570 listings in Puget Sound have been addressed (about 31 percent) by formal Clean-Up Plans.</p>
	Dissolved oxygen in marine waters	By 2020, human-related contributions of nitrogen do not result in more than 0.2 mg/L reductions in dissolved oxygen levels anywhere in Puget Sound.	<p>Water quality in much of Puget Sound remains poorer than we would like, especially in areas where the circulation of water is restricted (e.g. Hood Canal, South Puget Sound, Sinclair Inlet, and Port Susan). In many areas, water quality appears to be getting even worse. Monitoring stations in South Puget Sound, the central basin (Tacoma to Port Townsend) and in Bellingham Bay all show significant declining trends in water quality.</p> <p>For dissolved oxygen, this target requires a combination of monitoring data, studies on the sources of nitrogen and mathematical models to determine whether human inputs are contributing to a decline in dissolved oxygen. This work is underway and initial results will be available sometime in late 2012.</p>
	Marine sediment quality	By 2020, all Puget Sound regions and bays achieve the following: Chemistry measures reflect “minimum exposure” (i.e., mSQS is <0.1 and the SCI is >93.3), Sediment Quality Triad Index (SQTI) scores reflect “unimpacted” conditions (i.e., SQTI values >83), and no measurements exceed the Sediment Quality Standards chemical criteria set in the Washington State sediment management standards.	Data to be available in 2012.

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	<p>Toxics in fish</p>	<p>By 2020, toxics in fish are below threshold levels. Target is achieved if each of the following conditions is observed in monitoring results from 2019 or 2020:</p> <ul style="list-style-type: none"> • Bioaccumulative toxics – 95 percent of samples meet the following thresholds: <ul style="list-style-type: none"> ○ Concentrations of PCBs and PBDEs in Puget Sound herring, English sole, salmon and steelhead are below adverse effects thresholds (e.g., 2,400 ng PCB/g lipid and 1,400 ng PBDE/g lipid). ○ Concentrations of PCBs and other biocumulative toxics in Puget Sound herring, English sole, salmon, and steelhead are below human-health screening levels (e.g., Department of Health screening levels for recreational or subsistence consumption rates, currently 33 ng PCB/g and 10 ng PCB/g fish tissue, respectively for a non-cancer endpoint). • PAHs and endocrine disrupting compounds – all samples meet the following thresholds: <ul style="list-style-type: none"> ○ English sole in Puget Sound exhibit no PAH-related liver disease. ○ English sole in Puget Sound exhibit no toxics-related reproductive impairment. • PAHs in herring are below an effects threshold. 	<p>Results are mixed. In recent years, four of the five species of salmon were almost always below the threshold. But 15% of adult Chinook salmon that were sampled, and 100% of juvenile Chinook exceeded the threshold. This is most likely because Puget Sound Chinook salmon spend more time in Puget Sound close to PCB sources and are more likely to eat contaminated prey (e.g. herring). The other four species of salmon tend to spend more of their life in the Pacific Ocean where PCB levels are lower.</p> <p>For Pacific herring, from 30-82% of sampled fish exceeded the threshold levels for contamination, with herring from Puget Sound’s most urbanized basin showing the highest levels. Nearly all (95%) of English sole from urban bays exceeded the threshold, compared to only 30% which exceeded the threshold in rural bays (still above the target).</p>