

High Level Indicators for Salmon and Ecosystem Health Report on Current Indicators

Prepared by PNAMP for the NWEIS Executive Summit
September 29, 2008

NWEIS Task #5 Vision: *A core set of high-level indicators on salmon and ecosystem health are established and used across the Pacific Northwest. Data collection and management to inform the indicators are efficiently coordinated and communicated to allow comparisons within and among regions. Goals and unique mandates of partners are respected.*

In May 2008, participants in the Northwest Environmental Information Sharing (NWEIS) executive summit agreed to initiate the task of identifying high-level indicators (HLI) currently in use across the Pacific Northwest (PNW), with the understanding that this would inform the long term goal of achieving a core set of indicators that could be used to communicate salmon status and ecosystem health to Congress, legislatures, governors, and the public. The Pacific Northwest Aquatic Monitoring Partnership (PNAMP) was invited to provide information in support of this task, including: (1) high level indicators currently in use in the PNW; (2) who is using the indicator; and to the extent possible, (3) metrics being used to support the indicator. This document summarized PNAMP's approach, initial findings, and recommendations for executive consideration.

Methods

Building from a foundation of existing PNAMP work, several entities that report HLIs were surveyed for updated information in September of this year. The Columbia Basin Fish and Wildlife Authority (CBFWA) assisted by providing information on behalf of entities responsible for reporting indicators related to fish in the Columbia River basin. Information from numerous reports (Appendix 1) was incorporated into a summary table (Appendix 2). A compilation of findings is found in Appendix 3.

Observations

- There are a significant number of HLIs currently being used in the Pacific Northwest. In reviewing information from 14 reports a total of 169 HLIs were identified. Although there are additional reports that should be included in the future (e.g., Puget Sound Partnership), this represents the most comprehensive examination of HLI information to date in this region.
- There are a range of scales reported as “high level” indicators in the documents that were reviewed. Some of the HLIs identified may be considered “mid level” indicators when examined further.
- Each indicator fell into one of three broad categories: biological, physical, and implementation indicators. There is significant variation within the categories, but common themes tended to form around the following:

- Biological
 - Fish (including abundance, harvest, hatcheries)
- Physical
 - Water quality
 - Habitats
- Implementation
 - Projects
 - Funding

A further breakout of these categories is found in Appendix 2.

- Although similar HLI terminology is used among the reports examined, more analysis is necessary to ascertain the extent to which indicators represent the same things. For example, an indicator that appears to be reported similarly may rely on different metrics in each report.

Recommendations

Based on our work to date, we offer the following recommendations.

1. Refine the executive direction on this task. What are the highest NWEIS priorities for further review, refinement, and/or development of new HLIs? For example, we could
 - a. Focus on the common HLIs identified here to increase efficiency and consistency of reporting and make the most of current data collection efforts, and/or
 - b. Focus on environmental measures where the need for HLIs has been identified but where they are lacking (e.g., habitat or watershed condition indicator or index).
2. Examine definitions of indicators and metrics to explore opportunities to enhance consistency in reporting and data collection.
3. Continue to gather information from NWEIS participants in order to ensure this compilation is comprehensive, including adding other sources (reports) and refining the information presented here.
4. Continue HLI efforts by piloting a coordinated approach that examines NWEIS Tasks 2 and 3 in order to more thoroughly work through the process of identifying opportunities and limitations.

Appendix 1 – Sources (reports) examined for reporting of high level indicators and person responsible for providing this information.

Report	Contact
Proposed Northwest Power and Conservation Council Annual ME Report	Nancy Leonard
Columbia Basin Fish and Wildlife Authority. Status of Fish and Wildlife Resources in the Columbia River Basin. Proposed July, 2008 www.cbfwa.org/sotr	Ken MacDonald
ESA Biennial report to Congress on ESA Recovery Actions NOAA	Scott Rumsey
Federal Columbia River Power System BiOp Annual and Comprehensive (3 yr) Progress Reports	Jim Geiselman
Northwest Forest Plan – the first 10 years (1994-2003): preliminary assessment of the condition of watersheds; Gallo, K.; Lanigan, S.H.; Eldred P.; Gordon S.N.; and Moyer C. 2005. Gen. Tech. Rep. PNW-GTR-647. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station 133 p.	Kirsten Gallo/ Steve Lanigan
Oregon Department of Environmental Quality Air Quality Index	Greg Sieglitz
Oregon Department of Environmental Quality Water Quality Index	Greg Sieglitz
Oregon Plan Biennial Report	Greg Sieglitz
Oregon Watershed Enhancement Board Key Performance Measure Report	Greg Sieglitz
PACFISH INFISH Biological Opinion Effectiveness Monitoring Program, 2001-2007 Annual Summary Reports. USDA Forest Service, Fish and Aquatic Ecology Unit Staff.	Eric Archer
Pacific Coastal Salmon Recovery Fund Report to Congress (NOAA)	Scott Rumsey
State of the Sound 2007 (Puget Sound Action Team Publ No 07-01)	Ken Dzinbal
Washington State of Salmon in Watersheds (2008)	Steve Leider

Appendix 2 – Summary of the number and percent of high level indicators (HLI) referenced in the reports surveyed, summarized by coarse category (biological, physical, and implementation) and common subcategories.

	Number of HLI reported by category (percentage of total in parentheses)	Number of reports citing HLI category
Biological	72 (43%)	
Fish Population/Survival	25 (15%)	6
Harvest	9 (5%)	3
Hatchery	10 (6%)	4
Status/Trend (population)	28 (16%)	6
Physical	32 (19%)	
Water Quality	20 (12%)	4
Habitat Quality	12 (8%)	6
Implementation	65 (38%)	
Project Tracking	54 (32%)	9
Funding	11 (6%)	4

Appendix 3 - Complete presentation of all high level indicators received to date, from all reports listed in Appendix 2, and including all types of information. Please note this table is formatted to print on legal size paper.

Category for Summary Tab (see other tab)	Report Citation (where High Level Indicator is reported)	Indicator Category	High Level Indicator (generically)	High Level Indicator (as specifically described in report)	Management (or High Level) Question (as cited in report)	Assessment Question or Performance Measure	Metrics	Scale(s)	Reporting Frequency
Fish Population	Washington State of Salmon in Watersheds (2008)	Biological	Abundance	Adult abundance	Are salmon populations abundant and productive?	Recovery plan spawner goal, or spawner target range (i.e., Puget Sound)	For listed species, average 5-years pre-listing and average X-years post-listing: total wild run size, showing wild spawner abundance and wild harvest components	By listed ESU/DPS, and MPG (portions in WA); and selected focus watersheds	Annual data in SOSiW reports that occur biennially (at end of even numbered years)
Fish Population	Washington State of Salmon in Watersheds (2008)	Biological	Productivity	Juvenile production achieved	Are salmon populations abundant and productive?	Post-listing percentage change from baseline mean; smolt (juvenile) production resulting from spawners from pre-listing fisheries management and habitat conditions, if available	Juvenile migrant abundance	Where available: MPGs, focus watersheds	Annual data in SOSiW reports that occur biennially (at end of even numbered years)

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Project Tracking	Washington State of Salmon in Watersheds (2008)	Implementation and management	Accomplishment	Salmon recovery plan implementation status	Are we using government resources cost-effectively?		In prep	Statewide	SOSiW reports occur biennially (at end of even numbered years)
Project Tracking	Washington State of Salmon in Watersheds (2008)	Physical	Fish Passage Barriers	Fish passage barriers corrected and stream miles opened (reports by year the number of barriers corrected and miles of stream estimated to be opened as a result of barrier removal)	Are freshwater and estuarine habitats healthy and accessible?	Are streams accessible to wild salmon?	Number of barriers corrected and estimated stream miles opened	Statewide	Annual data in SOSiW reports that occur biennially (at end of even numbered years)
Project Tracking	Washington State of Salmon in Watersheds (2008)	Physical	Fish Passage Barriers	Fish passage barriers corrected and stream miles inaccessible	Are freshwater and estuarine habitats healthy and accessible?	Are streams accessible to wild salmon?	Number of complete and partial barriers; miles of anadromous waters inaccessible	Selected focus watersheds	Annual data in SOSiW reports that occur biennially (at end of even numbered years)

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Funding	Washington State of Salmon in Watersheds (2008)	Implementation and management	Funding	Salmon Recovery Funding Board (SRFB) grants	Are we using government resources cost-effectively?		Percentage of funding by project category (restoration, acquisition, combined, assessments, planning, monitoring, other)	Statewide	Annual data in SOSiW reports that occur biennially (at end of even numbered years)
Project Tracking	Washington State of Salmon in Watersheds (2008)	Implementation and management	Implementation	Acres acquired for salmon restoration	Are we using government resources cost-effectively?		Number of acres acquired and approved but pending, for salmon restoration	Statewide	Annual data in SOSiW reports that occur biennially (at end of even numbered years)
Project Tracking	Washington State of Salmon in Watersheds (2008)	Physical	Implementation	Acre-feet of water restored to streams	Do rivers and streams have flows that support wild salmon?		Acre-feet of water from purchases, donations, leases, and irrigation efficiencies	Statewide	Annual data in SOSiW reports that occur biennially (at end of even numbered years)

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Water Quality	Washington State of Salmon in Watersheds (2008)	Physical	Water Quality	Stream flows during low flow periods critical to fish	Do rivers and streams have flows that support wild salmon?	Are instream flow rules set?	Percent of time flow is met during low flow periods critical to fish (August 1 to September 30), pre- and post-listing where available	Selected focus watersheds	Annual (water year) data in SOSiW reports that occur biennially (at end of even numbered years)
Harvest	Washington State of Salmon in Watersheds (2008)	Biological	Harvest	ESA compliant harvest goals	Does harvest management protect wild salmon?	Fisheries met NOAA-approved goals, exceeded by up to 15%, exceeded by less than 5%	Percent of wild fish harvested	Statewide	Annual data in SOSiW reports that occur biennially (at end of even numbered years)
Harvest	Washington State of Salmon in Watersheds (2008)	Biological	Harvest	Wild salmon harvested	Does harvest management protect wild salmon?	Track toward recovery plan spawner goal, or spawner target range (i.e., Puget Sound)	Number of wild salmon harvested (e.g., total, WA, WA/OR, AK/BC, in-river, ocean)	By listed ESU/DPS, and MPG (portions in WA)	Annual data in SOSiW reports that occur biennially (at end of even numbered years)

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Harvest	Washington State of Salmon in Watersheds (2008)	Biological	Harvest	Wild salmon harvested	Does harvest management protect wild salmon?	Track toward recovery plan spawner goal, or spawner target range (i.e., Puget Sound)	For listed species, average wild harvest 5-years pre-listing and average X-years post-listing	Selected focus watersheds	Annual data in SOSiW reports that occur biennially (at end of even numbered years)
Harvest	Washington State of Salmon in Watersheds (2008)	Implementation and management	Harvest	Average compliance rate for salmon and steelhead fishers	Does harvest management protect wild salmon?		Average compliance percentage by year; Number of violators, arrests, written warnings, contacts	Statewide	Annual data in SOSiW reports that occur biennially (at end of even numbered years)
Hatchery	Washington State of Salmon in Watersheds (2008)	Implementation and management	Hatchery	Hatcheries meeting Hatchery Scientific Review Group (HSRG) standards	Do hatchery practices meet the needs of wild salmon?		Percentage of hatcheries meeting HSRG standards	Statewide, selected focus watersheds	SOSiW reports occur biennially (at end of even numbered years)

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Status and Trend Population	Washington State of Salmon in Watersheds (2008)	Biological	Status	Fish status (all listed and unlisted species and stocks)	Are salmon populations abundant and productive?		Number of unlisted healthy, depressed, critical, unknown, extinct stock status as reported in WDFW's Salmonid Stock Inventory (SaSI); ESA-listed species	Statewide, Salmon Recovery Region	SOSiW reports occur biennially (at end of even numbered years)
Status and Trend Population	Washington State of Salmon in Watersheds (2008)	Biological	Status/Trend	Trends in wild juvenile salmon production	Are salmon populations abundant and productive?		For composite of sites monitored, percent of juvenile migrant abundance increasing, decreasing, no change, unknown	Statewide	Annual data in SOSiW reports that occur biennially (at end of even numbered years)
Fish Survival	Washington State of Salmon in Watersheds (2008)	Implementation and management	Hydro	Salmon friendliness of hydroelectric projects	Are hydroelectric facilities operating in a 'fish friendly' manner?		Percentage of FERC/Columbia projects meeting juvenile and adult passage obligations	Statewide, selected focus watersheds	SOSiW reports occur biennially (at end of even numbered years)

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Project Tracking	Washington State of Salmon in Watersheds (2008)	Implementation and management	Volunteer	Volunteers in watershed and salmon recovery activities	Are we reaching out to citizens?		Volunteer hours in watershed and salmon recovery activities	Statewide	Annual data in SOSiW reports that occur biennially (at end of even numbered years)
Water Quality	Washington State of Salmon in Watersheds (2008)	Physical	Water Quality	Water quality in watersheds	Is water clean and cool enough to support wild salmon?	Does water quality meet expectations?	Number of water cleanup plans (TMDL) underway, completed, and needed	ESU/DPS, watershed	Annual data in SOSiW reports that occur biennially (at end of even numbered years)
Water Quality	Washington State of Salmon in Watersheds (2008)	Physical	Water Quality	Water quality in watersheds	Is water clean and cool enough to support wild salmon?	Does water quality meet expectations?	Water quality index (WQI) aggregates temperature, pH, fecal coliform bacteria, dissolved oxygen, nutrients and sediment	Statewide	Annual data in SOSiW reports that occur biennially (at end of even numbered years)

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Water Quality	Washington State of Salmon in Watersheds (2008)	Physical	Water Quality	Water quality in watersheds	Is water clean and cool enough to support wild salmon?	Does water quality meet expectations?	Number of stream segments meeting and not meeting standard for WQI parameters (fecal coliform, dissolved oxygen, pH, temperature)	Selected focus watersheds	Annual data in SOSiW reports that occur biennially (at end of even numbered years)
Habitat	State of the Sound 2007 (Puget Sound Action Team Publ No 07-01)	Physical	Aquatic Nuisance Species	Distribution of tunicates and spartina	Are invasive species negatively impacting Puget Sound?				
Habitat	State of the Sound 2007 (Puget Sound Action Team Publ No 07-01)	Physical	Forest Loss	Square miles of forest land lost in the lowland Puget Sound.	What is the rate of forest land conversion in the Puget Sound lowlands?				
Habitat	State of the Sound 2007 (Puget Sound Action Team Publ No 07-01)	Physical	Nearshore health	Eelgrass extent and distribution	Is the extent of eelgrass cover changing over time?				

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Habitat	State of the Sound 2007 (Puget Sound Action Team Publ No 07-01)	Physical	Climate Change	Sea Level Rise	How will Puget Sound's shorelines and nearshore habitats be impacted by rising sea levels? Is climate change resulting in warming of Puget Sound waters?				
Habitat	State of the Sound 2007 (Puget Sound Action Team Publ No 07-01)	Physical	Climate Change	Stream Flow	Is climate change altering stream flows?				
Habitat	State of the Sound 2007 (Puget Sound Action Team Publ No 07-01)	Physical	Climate Change	Snow pack depth	How will melting glaciers and reduced snow pack impact stream flows?				
Status and Trend Population	State of the Sound 2007 (Puget Sound Action Team Publ No 07-01)	Biological	Status/trend	Groundfish - Groundfish stock conditions 2002-2006; good, poor, unknown (also displayed on a scale negative to positive)	Are current management practices protecting and/or restoring groundfish numbers?				

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Status and Trend Population	State of the Sound 2007 (Puget Sound Action Team Publ No 07-01)	Biological	Status/trend	Trends in spawning biomass of 19 designated herring populations; Estimated spawning biomass (tons) of Puget Sound herring by region (North, Straits, South/central) (also displayed on a scale negative to positive)	Are management actions to protect and restore herring numbers working?				
Status and Trend Population	State of the Sound 2007 (Puget Sound Action Team Publ No 07-01)	Biological	Status/trend	Population counts of 30 common marine bird species; Densities of marine birds in north Puget Sound 1997-2006; #birds by species/sq.km also displayed on a scale negative to positive)	Is the number and variety of marine birds using Puget Sound changing over time?				

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Status and Trend Population	State of the Sound 2007 (Puget Sound Action Team Publ No 07-01)	Biological	Status/trend	Population size of resident Orca whales; Trends in southern resident orca population; number of whales by year (also displayed on a scale negative to positive)	Are the numbers of this top food-chain predator changing over time?				
Status and Trend Population	State of the Sound 2007 (Puget Sound Action Team Publ No 07-01)	Biological	Status/trend	Abalone abundance at 10 sites in San Juan County; Pinto Abalone - Pinto abalone abundance in the San Juan Archipelago 1992-2005 (also displayed on a scale negative to positive)					

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Status and Trend Population	State of the Sound 2007 (Puget Sound Action Team Publ No 07-01)	Biological	Status/trend	Salmon - Number and % of stocks healthy, depressed, critical, extinct, not rated and unknown (also displayed on a scale negative to positive (not sure if steelhead and bull trout are included))	Are management actions protecting and/or restoring vulnerable salmon runs?				
Water Quality	State of the Sound 2007 (Puget Sound Action Team Publ No 07-01)	Physical/Chemical	Toxic Contamination	Sediment Triad Indicator	What is the extent and severity of sediment contamination?				
Water Quality	State of the Sound 2007 (Puget Sound Action Team Publ No 07-01)	Physical/Chemical	Toxic Contamination	Concentrations of PCB's and PBDE's in Chinook and coho salmon	Are PCB and PBDE levels changing over time in salmon? Are these fish safe to eat?				
Water Quality	State of the Sound 2007 (Puget Sound Action Team Publ No 07-01)	Physical/Chemical	Toxic Contamination	Toxics in mussels	Is toxic contamination in marine waters changing over time, as indicated by these filter				

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					feeders?				
Water Quality	State of the Sound 2007 (Puget Sound Action Team Publ No 07-01)	Physical/Chemical	Toxic Contamination	Toxics in harbor seals	Is toxic contamination in the food web changing over time, as indicated by harbor seals?				
Water Quality	State of the Sound 2007 (Puget Sound Action Team Publ No 07-01)	Physical/Chemical	Toxic Contamination	Liver disease in English Sole	Is toxic contamination changing over time, or are symptoms of contamination changing, as indicated by these bottom-dwelling fish?				

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Water Quality	State of the Sound 2007 (Puget Sound Action Team Publ No 07-01)	Physical/Chemical	Toxic Contamination	Number and size of oil spills	Are current industry and safety practices effectively guarding against a potentially catastrophic oil spill?				
Water Quality	State of the Sound 2007 (Puget Sound Action Team Publ No 07-01)	Physical	Climate Change	Trends in water temperature over time	Is climate change resulting in warming of Puget Sound waters?				
Water Quality	State of the Sound 2007 (Puget Sound Action Team Publ No 07-01)	Physical/Chemical	Marine and Freshwater Quality	The number of water bodies not meeting standards.	Where are water bodies impaired?				
Water Quality	State of the Sound 2007 (Puget Sound Action Team Publ No 07-01)	Physical/Chemical	Marine WQ Index	An index combining fecal coliform, nitrogen, ammonium, dissolved oxygen, and stratification	Where are marine waters of concern?				
Water Quality	State of the Sound 2007 (Puget Sound Action Team Publ No 07-01)	Physical/Chemical	Water Quality / Stormwater Runoff	Changes in amount of impervious surfaces	Is the rate of land conversion to impervious surfaces changing over time?				

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Water Quality	State of the Sound 2007 (Puget Sound Action Team Publ No 07-01)	Physical/Chemical	Water Quality / Stormwater Runoff	The number of local jurisdictions with adequate stormwater management programs in place.	Is stormwater being adequately managed?				
Water Quality	State of the Sound 2007 (Puget Sound Action Team Publ No 07-01)	Physical/Chemical	Water Quality/ Pollution from human and animal waste	Violations of fecal coliform bacteria samples at public swimming beaches.	Are swimming beaches safe? Are management actions reducing bacterial loading to beaches?				
Water Quality	State of the Sound 2007 (Puget Sound Action Team Publ No 07-01)	Physical	Commercial shellfish growing areas	Acres of commercial shellfish growing areas restricted from harvest.	Are management actions effective in mitigating water quality problems leading to commercial shellfish harvest restrictions?				
Project Tracking	Pacific Coastal Salmon Recovery Fund Report to Congress (NOAA)	Physical	Fish Passage Barriers	Barriers		Cumulative and annual increment in the number of barriers removed for fish passage projects	Barriers treated per project	West Coast	Annual

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Project Tracking	Pacific Coastal Salmon Recovery Fund Report to Congress (NOAA)	Physical	Fish Passage Barriers	Fish Screens		Cumulative and annual increment in fish screens installed for fish passage projects	Screens installed per project	West Coast	Annual
Funding	Pacific Coastal Salmon Recovery Fund Report to Congress (NOAA)	Implementation and Management	Funding	Appropriation		Reports the total Congressional appropriation to PCSRF by fiscal year	Dollars	West Coast	Annual
Funding	Pacific Coastal Salmon Recovery Fund Report to Congress (NOAA)	Implementation and Management	Funding	Allocation		The annual and cumulative allocation of PCSRF funds to states and tribes	Dollars per project, by grantee	West Coast	Annual
Funding	Pacific Coastal Salmon Recovery Fund Report to Congress (NOAA)	Implementation and Management	Funding	Matching		The average percentage of state matching funds for PCSRF funded projects	PCSRF dollars and state matching dollars per project by grantee	West Coast	Annual

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Funding	Pacific Coastal Salmon Recovery Fund Report to Congress (NOAA)	Implementation and Management	Funding	Matching		The total {i.e. 2000 to present} amount of PCSRF and state matching funds committed for RME and Education, Habitat Protection and Restoration and Watershed/species Assessment and Sub-basin Planning project categories respectively	PCSRF dollars and state matching dollars per project by grantee	West Coast	Annual

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Project Tracking	Pacific Coastal Salmon Recovery Fund Report to Congress (NOAA)	Implementation and Management	Habitat	Miles		Reports the cumulative {i.e., 2000-present} and annual increment in stream miles treated/acquired/protected/opened/monitored for the following project types: instream habitat, land acquisition, riparian habitat, fish passage, and research, monitoring and evaluation projects.	Miles per project	West Coast	Annual

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Project Tracking	Pacific Coastal Salmon Recovery Fund Report to Congress (NOAA)	Implementation and Management	Habitat	Acres		The cumulative (i.e., 2000-present) and annual increment in acres created/treated/acquired/protected/for the following project types: wetland habitat, estuarine habitat, land acquisition, riparian habitat, and upland habitat projects.	Acres per project	West Coast	Annual
Hatchery	Pacific Coastal Salmon Recovery Fund Report to Congress (NOAA)	Biological	Hatchery - marking	Marking		Cumulative and annual increment in the number of fish marked for management strategies for hatchery fish enhancement projects	No. of juveniles marked per project/facility	West Coast	Annual
Project Tracking	Pacific Coastal Salmon Recovery Fund Report to Congress (NOAA)	Implementation and Management	Location	Project Location		A map of all PCSRF funded project locations in CA, OR, WA, ID and AK	Lat. & Long.	West Coast	Annual

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Project Tracking	Pacific Coastal Salmon Recovery Fund Report to Congress (NOAA)	Implementation and Management	Planning	Assessments		The cumulative number of ESA-listed ESUs with identified limiting factors as part of Watershed Planning and Assessment projects)	No. of ESUs/DPSs	West Coast	Annual
Project Tracking	Pacific Coastal Salmon Recovery Fund Report to Congress (NOAA)	Implementation and Management	Planning	Assessments		The cumulative and annual increment in the number of assessments completed for RM&E projects	No. of Plans	West Coast	Annual
Status and Trend Population	Pacific Coastal Salmon Recovery Fund Report to Congress (NOAA)	Biological	Status/Trend	ESU Abundance,		Index of aggregate ESU abundance representing the sum of available population abundance data. Represents hatchery +natural abundance with a rough estimate of hatchery fraction	Redd counts; Direct counts (e.g., weir or dam counts)	ESU	Annual

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Status and Trend Population	Pacific Coastal Salmon Recovery Fund Report to Congress (NOAA)	Biological	Status/trend	ESU trend -		Most recent 5-year geometric mean ESU level abundance estimate by ESU A trend of decreasing, stable, increasing is reported for each ESU for which there is sufficient data. Also the total number of ESUs demonstrating stable or increasing trend	Redd counts; Direct counts (e.g., weir or dam counts)	ESU	Annual

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Project Tracking	PACFISH INFISH Biological Opinion Effectiveness Monitoring Program, 2001-2007 Annual Summary Report. USDA Forest Service, Fish and Aquatic Ecology Unit Staff.	Implementation and Management	Riparian and Instream Habitat	multiple inchannel and riparian vegetation	Status and Trend		S&T of stream reaches are evaluated at multiple spatial scales within the UCRB. • Status of streams and riparian areas - evaluated on 1150 stream reaches, sampled 2001-2005. • Trend in condition- evaluated on a five-year rotation, starting in 2006 and for each subsequent year. • S&T in watershed condition for all 6th-field watersheds - examined using in-channel and vegetation data collected at 1/3 (1150) of the 3600 watersheds, with data on roads, and other watershed-level characteristics	Federal (Forest Service and BLM) land in the upper Columbia River basin (eastern Oregon, eastern Washington, Idaho, Montana, and northern Nevada)	

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Habitat	PACFISH INFISH Biological Opinion Effectiveness Monitoring Program, 2001-2007 Annual Summary Report. USDA Forest Service, Fish and Aquatic Ecology Unit Staff.	Physical	Stream morphology	all of the normal attributes collected as part of stream surveys		Are the physical processes that contribute to fish habitat intact?	Channel morphology, floodplain connectedness, slope stability, pool development, bathymetry.	Regional, basin, watershed, reach	
Project Tracking	PACFISH INFISH Biological Opinion Effectiveness Monitoring Program, 2001-2007 Annual Summary Report. USDA Forest Service, Fish and Aquatic Ecology Unit Staff.	Biological	Benthic macro-invertebrate assemblages	12 metrics computed for inverts.	What is the productivity of the watershed?	What is the productivity of the watershed?	Invertebrate diversity, biomass	Reach to watershed	

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Water Quality	PACFISH INFISH Biological Opinion Effectiveness Monitoring Program, 2001-2007 Annual Summary Report. USDA Forest Service, Fish and Aquatic Ecology Unit Staff.	Physical	Water Temperature	Days exceeding 15.5 C	Are maximum stream temperatures exceeded?	Does the temperature in the reach exceed 16 degrees Celsius?	Water temperature	Reach to watershed	Annual
Water Quality	PACFISH INFISH Biological Opinion Effectiveness Monitoring Program, 2001-2007 Annual Summary Report. USDA Forest Service, Fish and Aquatic Ecology Unit Staff.	Physical	Water Temperature	Exceed of each state standard	Status and Trend	Does the temperature in the reach exceed the state water quality criteria?	Water temperature	Reach	Daily

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Fish Population	Oregon Watershed Enhancement Board Key Performance Measure Report	Biological	Abundance of native fish	Percentage of native fish(roll-up) that exhibit increase or stable levels of abundance; trends and targets	Are the majority of monitored fish increasing or stable or not? Which species are measured for abundance and which are not?		Trend in monitored native fish populations in key OWEB investment areas; % of listed areas where monitoring is adequate; % of federal ESA species de-listed in last year; % of OR ESA listed species de-listed last year	State-wide	Annual
Project Tracking	Oregon Watershed Enhancement Board Key Performance Measure Report	Physical	Fish Passage Barriers	The trend and total miles opened (some attempt at establishing overall need); targets included	How many miles of stream were made accessible to salmon? Are the state's programs making a difference?	What is the extent of river length that is inaccessible to salmon due to impassable barriers to fish movement?	Number of impassible road crossings, culverts. Miles of stream inaccessible.	State-wide	Annual
Project Tracking	Oregon Watershed Enhancement Board Key Performance Measure Report	Implementation and Management	Riparian and Instream Habitat	Improved riparian areas (trend, status, targets)	Are things getting better in riparian areas? How much of the landscape is treated annually and in composite? Are investments strategic?		Trend in native riparian communities in OWEB investment areas	State-wide	Annual

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Habitat	Oregon Watershed Enhancement Board Key Performance Measure Report	Physical	Salmon Habitat	Trend in quality of habitat (overall)	Is salmon habitat quality increasing, decreasing or staying the same? Are programs designed to maintain or increase salmon habitat quality effective?		in development	state-wide	annual
Project Tracking	Oregon Watershed Enhancement Board Key Performance Measure Report	Biological	Adequate Monitoring (multiple parameters)	Percentage of native fish that have adequate monitoring conducted	To what extent is fish monitoring conducted relative to the defined need? What species and percentage of species are monitored, or not, on an annual basis? What is the trend of monitoring effort, collectively and by species?		Percentage of native fish, where monitoring has been quantified, and are monitored to the extent that it is considered adequate under the Oregon Plan for Salmon and Watersheds and the state's Native Fish Status Review		Annual

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Project Tracking	Oregon Plan Biennial Report	Implementation and Management	Habitat on agricultural lands	Federal Investments - Natural Resources Conservation Service and Partner Land treatment Accomplishments , July 2004-June 2006 (Acres treated by 10 categories)	How do federal investments stack up to state investments? Are there divergent areas of focus?		acres treated by treatment type	Statewide	Biennial
Project Tracking	Oregon Plan Biennial Report	Physical	Fish Passage Barriers	Fish passage: stream crossings improved by year	To what extent is fish passage improved each year? How does this compare to previous years?		barrier type and number of each	Statewide	Biennial
Project Tracking	Oregon Plan Biennial Report	Physical	Fish Passage Barriers	Fish passage: miles made accessible to fish due to stream crossing improvements by year	To what extent is fish passage improved each year? How does this compare to previous years?		stream miles	Statewide	Biennial

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Project Tracking	Oregon Plan Biennial Report	Physical	Fish Passage Barriers	Fish passage: push-up dams retired by year	To what extent is fish passage improved each year? How does this compare to previous years?		number of dams	Statewide	Biennial
Project Tracking	Oregon Plan Biennial Report	Physical	Fish Passage Barriers	Fish Screens: Irrigation diversions with screens installed	To what extent are unscreened diversions screened each year? How does this compare to previous years?		number of irrigation diversions with screens	Statewide	Biennial
Project Tracking	Oregon Plan Biennial Report	Implementation and Management	Funding	Funding for Completed and Reported Restoration by Year (total funding regardless of source?)	How much funding has been provided to what restoration project types? In what part of the state? How does this compare to previous biennia?		dollars, restoration project types, geographic location	Statewide and by Oregon Plan Reporting Basin	Biennial

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Project Tracking	Oregon Plan Biennial Report	Implementation and Management	Funding	Federal Investments (NRCS funding by basin and category {inventory, assessment, restoration& protection} BPA investment by basin and category {coordination, harvest, acquisition, monitoring, research and evaluation, hatchery production, habitat restoration}	What basin, which project types, and how much money has been provided by BPA and NRCS in Oregon?		dollars provided by basin, \$ provided by investment category	Statewide by basin	Biennial
Project Tracking	Oregon Plan Biennial Report	Implementation and Management	Riparian Habitat - protection and restoration	Acres enrolled in CREP program	How large is the CREP program? How does this compare to previous periods?		# acres enrolled	Statewide	Biennial

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Project Tracking	Oregon Plan Biennial Report	Implementation and Management	Habitat - riparian	Riparian miles treated by year	How many miles of riparian area have been treated the past two years? How does this compare to previous periods?		# of stream miles where riparian areas treated	Statewide	Biennial
Project Tracking	Oregon Plan Biennial Report	Implementation and Management	Habitat - roads	Miles of road closures and decommissionings by year	How many miles of road have been closed or decommissioned in the past two years? How does this compare to previous periods?		miles of road	Statewide	Biennial
Project Tracking	Oregon Plan Biennial Report	Implementation and Management	Habitat - roads	Miles of road improvements by year	How many miles of road have been improved in the past two years? How does this compare to previous periods?		miles of road	Statewide	Biennial

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Project Tracking	Oregon Plan Biennial Report	Implementation and Management	Habitat	Numerous	What are the priority investment areas over the past two years? What amount of progress has been made in restoring Oregon watersheds?		<ul style="list-style-type: none"> Numbers of acres protected, restored or enhanced Cubic feet of water conserved Diversion screens restored Miles of riparian habitat protected, or enhanced in pilot watersheds 	State-wide and by Oregon Plan reporting basin	biennially
Project Tracking	Oregon Plan Biennial Report	Implementation and Management	Effectiveness Monitoring	Monitoring Effort	What are the current priorities for monitoring? What monitoring is occurring?		various related to restoration project objectives	State-wide	Biennial
Project Tracking	Oregon Plan Biennial Report	Implementation and Management	Project Implementation	Numerous restoration projects	How many projects of what type occurred where? Are they focused on the present needs? How do the projects and locations compare to previous years?		o Number/Types of projects	State-wide and Oregon Plan Reporting basin	Biennial

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Project Tracking	Oregon Plan Biennial Report	Implementation and Management	Recovery Planning	Conservation and Recovery Planning (narrative status of recovery plans)	How many and which plans have been completed in the past two years? What is the schedule for completion of draft plans?		plan names, number of them, status	Statewide	Biennial
Water Quality	Oregon Department of Environmental Quality Water Quality Index	Physical/Chemical	Habitat	Water Quality Index	What is the status and trend of water quality in the Oregon river basins? How does it compare to previous years and targets?		Water quality parameters: Continuous or daily water temperature in degrees; Daily Concentrations of Nitrate and Phosphate, Daily concentrations of dissolved oxygen, Daily Concentrations of Coliform bacteria, etc.	Site	Annual
Habitat	Oregon Department of Environmental Quality Air Quality Index	Physical	Watershed Condition	Air Quality Index	What us the air quality in the metro areas of the state? How does this compare to targets and EPA		Particulate, Ozone, Carbon monoxide	Cities	Hourly, Daily

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					standards?				
Fish Population	Northwest Power and Conservation Council annual ME (tentatively proposed to be reported)	Biological	Adult Returns	Total Abundance		Total adult salmon, and steelhead (perhaps also include lamprey) returns to the Columbia	Number passing Bonneville Dam (1938-present)		
Fish Population	Northwest Power and Conservation Council annual ME (tentatively proposed to be reported)	Biological	Abundance	Total Abundance		Abundance of adult fish in the Council's program	Number of salmon, steelhead, lamprey, resident fish, ...		

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Fish Population	Northwest Power and Conservation Council annual ME (tentatively proposed to be reported)	Biological	Productivity	Habitat		Productivity of wild fish in select watersheds targeted by Council program.	Juveniles/spawner for anadromous and resident fish. Alternatives for consideration: number of wild spawners or juvenile growth rates.		
Project Tracking	Northwest Power and Conservation Council annual ME (tentatively proposed to be reported)	Implementation (NPCC category) / physical?	Fish Passage Barriers	Passage Barriers		Instream passage improvement. Additional habitat made accessible	# of miles of habitat accessed, number of barriers removed. (PISCES: Install Fish Passage Structure, Remove/Install Diversion, Remove/Modify Dam,...)		
Project Tracking	Northwest Power and Conservation Council annual ME (tentatively proposed to be reported)	Implementation (NPCC category) / Physical?	Water Quantity	Water		Water conservation and irrigation practices and water transactions. Additional water available for fish, anadromous and resident	Acre-feet/yr., # of miles of primary stream reach improvement. (PISCES: Acquire Water Instream, Install Well, Install Pipeline, Install Sprinkler...)		

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Project Tracking	Northwest Power and Conservation Council annual ME (tentatively proposed to be reported)	Implementation (NPCC category) /Implementation and Management	Riparian and instream habitat	Land		Land acquisition/conservation easement. Additional land acquired or leased for fish habitat	# of riparian miles protected, # of acres. (PISCES: Lease land, ...)		
Project Tracking	Northwest Power and Conservation Council annual ME (tentatively proposed to be reported)	Implementation (NPCC category) / Implementation and Management	Riparian and instream habitat	Improvement		Riparian habitat improved	Miles, acres. (PISCES: Increase Instream Habitat Complexity, Realign, Connect, and/or Create Channel, Create, Restore, and/or Enhance Wetland, Enhance Floodplain, Install Fence, Plant Vegetation, Practice No-till & Conservation Tillage Systems, Upland Erosion & Sedimentation Control...)		

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Habitat	Northwest Power and Conservation Council annual ME (tentatively proposed to be reported)	Physical	Riparian and instream habitat / Wildlife Habitat?	Wildlife		Wildlife habitat units by dam: lost and acquired	Measured in habitat units.		
Harvest	Northwest Power and Conservation Council annual ME (tentatively proposed to be reported)	Biological	Harvest and Hatcheries/ harvest rates	Harvest and Hatcheries		Harvest of hatchery fish in the Council's Program	Number by species and by hatchery		
Hatchery	Northwest Power and Conservation Council annual ME (tentatively proposed to be reported)	Biological	Hatchery releases and returns	Harvest and Hatcheries		Harvest number and rate	Totals for all spring, summer, fall Chinook, sockeye, steelhead, lower river sturgeon and for each listed ESU and by fishing type as well as hatchery and natural		

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Hatchery	Northwest Power and Conservation Council annual ME (tentatively proposed to be reported)	Biological	Hatchery releases and returns rates	Harvest and Hatcheries		Relative fitness of supplemented stocks from hatcheries in the Council's Program	Possible measures may include relative reproductive success (RSS), percent natural influence (PNI), or natural origin spawners compared to control stream		
Project Tracking	Northwest Power and Conservation Council annual ME (tentatively proposed to be reported)	Implementation (NPCC category) / Implementation and Management	project implementation / Hydrosystem performance ?	Screens		Installed fish screens	Quantity of water protected in acre-feet		
Fish Survival	Northwest Power and Conservation Council annual ME (tentatively proposed to be reported)	Implementation (NPCC category) /Implementation and Management	predation	Predators		Number of juvenile salmon saved from all predators	Consider pikeminnow, avian predators, sea lions...		

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Status and Trend Population	Northwest Power and Conservation Council annual ME (tentatively proposed to be reported)	Biological	Status/Trend	ESU		Fish population status and trends for each ESU, especially listed ESUs	Based on NOAA definitions and USFWS (Bull trout and sturgeon)		
Fish Survival	Northwest Power and Conservation Council annual ME (tentatively proposed to be reported)	Biological	Fish survival / Adult returns	Life-cycle mortality		Life stage survival estimates for representative populations of Chinook and steelhead	Mortality rates at each life stage: egg to smolt, freshwater passage (reservoirs, dams), estuary, ocean, harvest, freshwater return. Include SARs.		
Fish Survival	Northwest Power and Conservation Council annual ME (tentatively proposed to be reported)	Biological	Hydrosystem performance	Hydro survival		Survival rates through the hydrosystem for adult and juvenile fish passing in-river and barged	From Lower Granite to Bonneville and McNary to Bonneville, total system survival and individual hydroelectric facility		

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Project Tracking	Northwest Power and Conservation Council annual ME (tentatively proposed to be reported)	Implementation (NPCC category) /Implementation and Management	watershed condition index	Watershed Health Indicator		Number and percentage of targeted watersheds that provide adequate fish habitat	Watershed Health Indicator for fish (need to be developed)		
Fish Population	Federal Columbia River Power System BiOp Comprehensive (3 yr) Progress Reports	Biological	Population Abundance	Adult Population Abundance Trends for each population within an ESA Listed Salmon/Steelhead ESU or DPS	What are the population-level trends in adult abundance?	Do more than 30 percent of the populations within an ESU or DPS have a negative trend in abundance?	spawner, redd, weir and hatchery return counts		
Fish Survival	Federal Columbia River Power System BiOp Comprehensive (3 yr) Progress Reports	Biological	Life stage Survival	Increase in Juvenile Hydrosystem life stage survival for each ESU or DPS	What is the increase in juvenile survival rate, relative to base case conditions, through the FCRPS for ESA listed salmon and steelhead?	Are juvenile salmon and steelhead meeting hydrosystem passage survival targets - by ESU?	COMPASS model results based on dam bypass, spill, turbine and reservoir passage rates, transportation rates, flows, temperatures, and fish migration timing/survival measurements		

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Fish Survival	Federal Columbia River Power System BiOp Comprehensive (3 yr) Progress Reports	Biological	Life stage Survival	Increase in Tributary Habitat life stage survival for each population within an ESA Listed Salmon/Steelhead ESU or DPS	What is the relative increase in tributary habitat fish survival associated with implemented or planned habitat actions?	Will targeted percent habitat quality improvements be achieved through implemented or planned actions – by population for actions implemented or planned from 2007 through 2017?	habitat condition metrics and juvenile and adult abundance and/or fish condition		
Fish Survival	Federal Columbia River Power System BiOp Comprehensive (3 yr) Progress Reports	Biological	Life stage Survival	Increase in Estuary Habitat life stage survival for each population within an ESA Listed Salmon/Steelhead ESU or DPS	What is the relative increase in estuary habitat fish survival associated with implemented or planned habitat actions?	Will targeted percent function improvements be achieved through implemented or planned actions for Stream Type and Ocean Type Chinook ESUs and steelhead DPSs for actions through 2007 and through 2017?	estuary habitat condition metrics and juvenile and adult abundance and/or fish condition		

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Fish Survival	Federal Columbia River Power System BiOp Comprehensive (3 yr) Progress Reports	Biological	Life stage Survival	Increase in life cycle survival associated with hatchery actions per targeted salmon and steelhead fish populations	What is the relative increase in life cycle survival (low, medium or high) associated with implemented or planned hatchery actions?	Will targeted Low, Medium or High benefits relative to objectives be achieved through implemented or planned actions – by target population?	hatchery fish performance metrics		
Fish Survival	Federal Columbia River Power System BiOp Comprehensive (3 yr) Progress Reports	Biological	Life stage Survival	Increase in juvenile salmon and steelhead life stage survivals associated with reduced numbers of piscivorous and avian predators	What is the relative increase in juvenile life stage survival associated with reduced numbers of piscivorous and avian predators?	Will targeted increases in juvenile survival rates be achieved though the 2007 to 2017 implemented and planned predation actions (3.1 percent for Chinook salmon, 4.4 percent for steelhead, and 1.7 percent for fall Chinook salmon)?	predator abundance and exploitation rates		

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Fish Survival	Federal Columbia River Power System BiOp Annual and Comprehensive (3 yr) Progress Reports	Physical	Hydrosystem Performance	River flow, gas levels, and temperature levels (adjusted to reflect annual and seasonal water conditions)	What are the juvenile and adult hydrosystem environmental and physical conditions at each mainstem dam on the FCRPS?	Are Juvenile and Adult Hydrosystem Environmental and Physical Configuration Standards being met at each mainstem fish passage dam in the FCRPS?	Flow rates, gas levels, and water temperatures		
Project Tracking	Federal Columbia River Power System BiOp Annual and Comprehensive (3 yr) Progress Reports	Implementation and Management	Project Implementation	Number of projects being successfully implemented for each Strategy of the Reasonable and Prudent Alternative(RPA)	Are projects committed to under the RPA being successfully implemented?	What proportion of projects identified in the RPA and subsequent Implementation Plans are being successfully implemented?	Project implementation metrics		

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Fish Survival	Federal Columbia River Power System BiOp Annual and Comprehensive (3 yr) Progress Reports	Biological	Hydrosystem Performance	Juvenile Dam Passage Survival for each ESU or DPS	What is the juvenile dam passage survival rate at mainstem dams within the FCRPS for ESA listed salmon and steelhead?	Are juvenile salmon and steelhead meeting Juvenile Dam Passage Survival Standards (96 percent average for spring migrants and 93 percent average for summer migrants)?	PIT-tag and acoustic tag detection monitoring		
Fish Survival	Federal Columbia River Power System BiOp Annual and Comprehensive (3 yr) Progress Reports	Biological	Hydrosystem Performance	Adult Hydrosystem Survival for each ESU or DPS	What is the adult survival rate through the FCRPS for ESA listed salmon and steelhead?	Are adult salmon and steelhead meeting hydrosystem passage standards specified in the BiOp (no significant decrease from current average survival levels)?	Pit-tag detections at dams, stray rates, tributary turn-off, and harvest rates		

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Project Tracking	ESA Biennial report to Congress on ESA Recovery Actions NOAA	Implementation and Management	Habitat	Miles Critical Habitat		The cumulative number of lake, riverine and estuarine habitat miles designated as critical habitat in the last biennium. The cumulative number of nearshore marine habitat miles designated as critical habitat in the last biennium	Miles	West Coast	Biennial
Project Tracking	ESA Biennial report to Congress on ESA Recovery Actions NOAA	Implementation and Management	Protection	ESA Section 7 Consultations		ESA Section 7 Consultations (Number of ESA section 7 formal & informal consultations conducted by Northwest and Southwest Regions per Fiscal year.)	No. of consultations	Region	Fiscal Year

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Project Tracking	ESA Biennial report to Congress on ESA Recovery Actions NOAA	Implementation and Management	Protection	ESA Habitat Conservation Plans		Number of habitat conservation plans approved or implemented by the Northwest and Southwest Regions under ESA Section 10	No. of HCPs	Region	Fiscal Year
Project Tracking	ESA Biennial report to Congress on ESA Recovery Actions NOAA	Implementation and Management	Protection	ESA Section 10 Permits		Number of new and modified permits by the Northwest and Southwest regions for scientific research and enhancement activities)	No. of permits	Region	Fiscal Year
Status and Trend Population	ESA Biennial report to Congress on ESA Recovery Actions NOAA	Biological	Status	ESU historical Abundance -		Estimated range of historical abundance by ESU	Historical redd counts Historical direct counts (e.g., weir or dam counts)	ESU	Biennial

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Status and Trend Population	ESA Biennial report to Congress on ESA Recovery Actions NOAA	Biological	Status	ESU Trend		Most recent 5-year geometric mean ESU level abundance estimate by ESU A trend of decreasing, stable, increasing is reported for each ESU for which there is sufficient data	Redd counts Direct counts (e.g., weir or dam counts)	ESU	Biennial
Status and Trend Population	ESA Biennial report to Congress on ESA Recovery Actions NOAA	Biological	Status	ESA Listing Status		The number name and extinction risk (threatened, endangered) for listed salmonids	Listing Status	West coast	Biennial
Status and Trend Population	ESA Biennial report to Congress on ESA Recovery Actions NOAA	Biological	Status	ESU Abundance		Index of aggregate ESU abundance representing the sum of available population data. Represents hatchery+natural abundance with a rough estimate of hatchery fraction	Redd counts Direct counts (e.g., weir or dam counts)	ESU	Biennial

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Status and Trend Population	ESA Biennial report to Congress on ESA Recovery Actions NOAA	Biological	Status - Limiting factor	Limiting Factors		By ESU the top five factors and threats limiting recovery	Population-level threats and limiting factors	ESU	Biennial
Fish Population	Columbia Basin Fish and Wildlife Authority. Status of Fish and Wildlife Resources in the Columbia River Basin. Proposed July, 2008 www.cbfgwa.org/sotr	Biological	Abundance	Bull trout population abundance			Bull trout population abundance by recovery unit	Recovery Unit in the Columbia Basin	Annual
Fish Population	Columbia Basin Fish and Wildlife Authority. Status of Fish and Wildlife Resources in the Columbia River Basin. Proposed July, 2008 www.cbfgwa.org/sotr	Biological	Adult Returns	Adult salmon and steelhead counts at Bonneville Dam			Bonneville dam counts of adult salmon and steelhead by species/race, hatchery and natural (1938-present)	Columbia Basin	Annual
Fish Population	Columbia Basin Fish and Wildlife Authority. Status of Fish and Wildlife Resources in the Columbia River Basin. Proposed July, 2008 www.cbfgwa.org/sotr	Biological	Adult Returns	Adult salmon and steelhead returns to the mouth of the Columbia			Estimated salmon and steelhead returns to the mouth of the Columbia by species/race, hatchery and natural	Columbia Basin	Annual

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Project Tracking	Columbia Basin Fish and Wildlife Authority. Status of Fish and Wildlife Resources in the Columbia River Basin. Proposed July, 2008 www.cbfgwa.org/sotr	Implementation and Management	Accomplishment	Accomplishments Pacific lamprey			Narrative summary of BPA funded Pacific lamprey project accomplishments	Columbia Basin	Annual
Project Tracking	Columbia Basin Fish and Wildlife Authority. Status of Fish and Wildlife Resources in the Columbia River Basin. Proposed July, 2008 www.cbfgwa.org/sotr	Physical	Fish Passage Barriers	Fish passage projects -			BPA Funded number of barriers removed, miles of stream accessed, number of fish screens installed, reported for anadromous and resident fish	Columbia Basin	Annual
Funding	Columbia Basin Fish and Wildlife Authority. Status of Fish and Wildlife Resources in the Columbia River Basin. Proposed July, 2008 www.cbfgwa.org/sotr	Implementation and Management	Funding	BPA Funding For Anadromous Fish Habitat Restoration Projects (also reported for resident fish)			Total funding by year (\$ millions)	Columbia Basin	Annual

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Funding	Columbia Basin Fish and Wildlife Authority. Status of Fish and Wildlife Resources in the Columbia River Basin. Proposed July, 2008 www.cbfgwa.org/sotr	Implementation and Management	Funding	BPA Funding For Anadromous Fish Habitat Restoration Projects (also reported for resident fish)			Funding for Habitat Restoration by Activity Type (by year) (also reported for resident fish)	Columbia Basin	Annual
Funding	Columbia Basin Fish and Wildlife Authority. Status of Fish and Wildlife Resources in the Columbia River Basin. Proposed July, 2008 www.cbfgwa.org/sotr	Implementation and Management	Funding	Hatchery production of salmon and steelhead in the Columbia basin			Hatchery Funding by Entity (Total funding by BPA and non-BPA)	Columbia Basin	Annual
Funding	Columbia Basin Fish and Wildlife Authority. Status of Fish and Wildlife Resources in the Columbia River Basin. Proposed July, 2008 www.cbfgwa.org/sotr	Implementation and Management	Funding	Hatchery Funding for Resident Fish Substitution			Funding per Entity {State, Tribal} and Funding Per Blocked Area {Columbia, Snake}		

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Project Tracking	Columbia Basin Fish and Wildlife Authority. Status of Fish and Wildlife Resources in the Columbia River Basin. Proposed July, 2008 www.cbfgwa.org/sotr	Implementation and Management	Habitat	BPA (Year) Anadromous Fish Habitat project Accomplishments (also reported for resident fish) - Instream Habitat projects			Instream habitat projects, miles treated by anadromous and resident fish	Columbia Basin	Annual
Project Tracking	Columbia Basin Fish and Wildlife Authority. Status of Fish and Wildlife Resources in the Columbia River Basin. Proposed July, 2008 www.cbfgwa.org/sotr	Implementation and Management	Habitat	BPA (Year) Anadromous Fish Habitat project Accomplishments (also reported for resident fish) - Wetland projects			Wetland habitat acres created, acres treated by anadromous and resident fish	Columbia Basin	Annual
Project Tracking	Columbia Basin Fish and Wildlife Authority. Status of Fish and Wildlife Resources in the Columbia River Basin. Proposed July, 2008 www.cbfgwa.org/sotr	Implementation and Management	Habitat	BPA (Year) Anadromous Fish Habitat project Accomplishments - estuarine projects			Estuarine habitat projects -acres created, acres treated	Columbia Basin	Annual

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Project Tracking	Columbia Basin Fish and Wildlife Authority. Status of Fish and Wildlife Resources in the Columbia River Basin. Proposed July, 2008 www.cbfgwa.org/sotr	Implementation and Management	Habitat - protection	BPA (Year) Anadromous Fish Habitat project Accomplishments (also reported for resident fish) - land acquisition projects			Land Acquisition Projects - acres acquired/protected and miles streambank acquired/protected reported for anadromous and resident fish	Columbia Basin	Annual
Project Tracking	Columbia Basin Fish and Wildlife Authority. Status of Fish and Wildlife Resources in the Columbia River Basin. Proposed July, 2008 www.cbfgwa.org/sotr	Implementation and Management	Habitat - riparian	BPA (Year) Anadromous Fish Habitat project Accomplishments (also reported for resident fish) - riparian habitat projects			Stream miles treated, acres treated, reported for anadromous and resident fish	Columbia Basin	Annual
Project Tracking	Columbia Basin Fish and Wildlife Authority. Status of Fish and Wildlife Resources in the Columbia River Basin. Proposed July, 2008 www.cbfgwa.org/sotr	Implementation and Management	Habitat - roads	BPA (Year) Anadromous Fish Habitat project Accomplishments (also reported for resident fish) - Road projects			Road Projects - Miles corrected, reported for anadromous and resident fish	Columbia Basin	Annual

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Project Tracking	Columbia Basin Fish and Wildlife Authority. Status of Fish and Wildlife Resources in the Columbia River Basin. Proposed July, 2008 www.cbfgwa.org/sotr	Implementation and Management	Habitat - Upland	BPA (Year) Anadromous Fish Habitat Project Accomplishments (also reported for resident fish) - Upland Habitat Projects			Upland habitat projects- acres treated/reported for anadromous and resident fish	Columbia Basin	Annual
Project Tracking	Columbia Basin Fish and Wildlife Authority. Status of Fish and Wildlife Resources in the Columbia River Basin. Proposed July, 2008 www.cbfgwa.org/sotr	Implementation and Management	Habitat - Water acquisition	BPA (Year) Anadromous Fish Habitat Project Accomplishments (also reported for resident fish) - Water Acquisition Projects			Water Acquisition projects - acre feet of water restored to streams, reported for anadromous and resident fish	Columbia Basin	Annual
Harvest	Columbia Basin Fish and Wildlife Authority. Status of Fish and Wildlife Resources in the Columbia River Basin. Proposed July, 2008 www.cbfgwa.org/sotr	Biological	Harvest	Columbia River basin Salmon and Steelhead Harvest			Columbia River basin Salmon and Steelhead Harvest; by species/race, ocean, mainstem, tributary NPCC program fish and non-program fish	Columbia Basin	Annual

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Harvest	Columbia Basin Fish and Wildlife Authority. Status of Fish and Wildlife Resources in the Columbia River Basin. Proposed July, 2008 www.cbfgwa.org/sotr	Biological	Harvest	Columbia River Basin Resident Fish Substitution Harvest			Numbers of resident fish substitution fish harvested, Snake and Columbia Rivers	Columbia Basin, Snake River, Columbia River	Annual
Harvest	Columbia Basin Fish and Wildlife Authority. Status of Fish and Wildlife Resources in the Columbia River Basin. Proposed July, 2008 www.cbfgwa.org/sotr	Biological	Harvest	White sturgeon harvest,			Total harvest, % of harvested fish 42-60 inches (sport), % of harvested fish 45-60 inches (commercial)	Population	Annual
Harvest	Columbia Basin Fish and Wildlife Authority. Status of Fish and Wildlife Resources in the Columbia River Basin. Proposed July, 2008 www.cbfgwa.org/sotr	Biological	Harvest	Columbia River basin Salmon and Steelhead Harvest;			Total harvest by tributary sport, mainstem commercial, mainstem sport, ocean commercial, ocean sport, tribal, total	Columbia Basin	Annual

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Hatchery	Columbia Basin Fish and Wildlife Authority. Status of Fish and Wildlife Resources in the Columbia River Basin. Proposed July, 2008 www.cbfgwa.org/sotr	Biological	Hatchery releases (implementation Indicator?)	Hatchery production of resident fish for substitution;			Total releases by species	Columbia Basin	Annual
Hatchery	Columbia Basin Fish and Wildlife Authority. Status of Fish and Wildlife Resources in the Columbia River Basin. Proposed July, 2008 www.cbfgwa.org/sotr	Biological	Hatchery releases (implementation Indicator?)	Hatchery production of resident fish for substitution;			Hatchery releases by entity (state, Tribe)	Columbia Basin	Annual
Hatchery	Columbia Basin Fish and Wildlife Authority. Status of Fish and Wildlife Resources in the Columbia River Basin. Proposed July, 2008 www.cbfgwa.org/sotr	Biological	Hatchery returns (implementation Indicator)	Hatchery Production of Salmon and Steelhead in the Columbia River Basin			Total salmon and steelhead returns to hatcheries by species	Columbia Basin	Annual

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Hatchery	Columbia Basin Fish and Wildlife Authority. Status of Fish and Wildlife Resources in the Columbia River Basin. Proposed July, 2008 www.cbfgwa.org/sotr	Biological	Hatchery Releases (implementation Indicator)	Hatchery Production of Salmon and Steelhead in the Columbia River Basin			Total salmon and steelhead hatchery releases by species/race	Columbia Basin	Annual
Hatchery	Columbia Basin Fish and Wildlife Authority. Status of Fish and Wildlife Resources in the Columbia River Basin. Proposed July, 2008 www.cbfgwa.org/sotr	Biological	Hatchery Releases (implementation Indicator)	Hatchery Production of Salmon and Steelhead in the Columbia River Basin			Total salmon and steelhead hatchery releases by entity (BPA-funded, non-BPA funded)	Columbia Basin	Annual
Hatchery	Columbia Basin Fish and Wildlife Authority. Status of Fish and Wildlife Resources in the Columbia River Basin. Proposed July, 2008 www.cbfgwa.org/sotr	Biological	Hatchery Releases (implementation Indicator)	Hatchery Production of Salmon and Steelhead in the Columbia River Basin			Total salmon and steelhead hatchery releases by production type; supplementation, harvest	Columbia Basin	Annual

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Project Tracking	Columbia Basin Fish and Wildlife Authority. Status of Fish and Wildlife Resources in the Columbia River Basin. Proposed July, 2008 www.cbfgwa.org/sotr	Implementation and Management	Location	BPA-Funded Anadromous Fish Habitat projects (also resident fish and wildlife)			3 Maps 1) Location BPA Funded Anadromous Fish Habitat Improvement Projects, 2) BPA Funded Resident Fish Habitat Projects, 3) Wildlife Acquisitions	Columbia Basin	Annual
Project Tracking	Columbia Basin Fish and Wildlife Authority. Status of Fish and Wildlife Resources in the Columbia River Basin. Proposed July, 2008 www.cbfgwa.org/sotr	Implementation and Management	Planning	BPA (Year) Anadromous Fish Habitat Project Accomplishments (also reported for resident fish) - Watershed Planning and Assessment Projects			Watershed planning and assessment projects, reported for anadromous and resident fish	Columbia Basin	Annual

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Fish Survival	Columbia Basin Fish and Wildlife Authority. Status of Fish and Wildlife Resources in the Columbia River Basin. Proposed July, 2008 www.cbfgwa.org/sotr	Biological	Predation	Abundance of Colonial Birds on East Sand Island and consumption of juvenile salmon			2001-Present: Caspian tern breeding pairs, cormorant breeding pairs, tern consumption (millions), cormorant consumption (millions)	Columbia Basin	Annual
Fish Survival	Columbia Basin Fish and Wildlife Authority. Status of Fish and Wildlife Resources in the Columbia River Basin. Proposed July, 2008 www.cbfgwa.org/sotr	Biological	Predation	Northern Pikeminnow catch and index of predation on juvenile salmonids			1990-present catch (thousands) and predation index (%)	Columbia Basin	Annual
Status and Trend Population	Columbia Basin Fish and Wildlife Authority. Status of Fish and Wildlife Resources in the Columbia River Basin. Proposed July, 2008 www.cbfgwa.org/sotr	Biological	Status/Trend	Pacific lamprey counts at Columbia and Snake dams			By facility adult lamprey counts, average counts and risk level	Columbia Basin by hydro facility	Annual

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Status and Trend Population	Columbia Basin Fish and Wildlife Authority. Status of Fish and Wildlife Resources in the Columbia River Basin. Proposed July, 2008 www.cbfgwa.org/sotr	Biological	Status/Trend	Status of Pacific lamprey populations;			% of populations increasing, decreasing no change, unknown	Columbia Basin and by hydroelectric facility	Annual
Status and Trend Population	Columbia Basin Fish and Wildlife Authority. Status of Fish and Wildlife Resources in the Columbia River Basin. Proposed July, 2008 www.cbfgwa.org/sotr	Biological	Status/Trend	Risk level of Pacific lamprey;			% populations high, medium, low risk	Columbia Basin and by hydroelectric facility	Annual
Status and Trend Population	Columbia Basin Fish and Wildlife Authority. Status of Fish and Wildlife Resources in the Columbia River Basin. Proposed July, 2008 www.cbfgwa.org/sotr	Biological	Status/Trend	Status and Trends of salmon and steelhead in the Columbia River basin federal designation			%/# Salmon and steelhead ESU/DPS Listed (NOAA definition)	Columbia Basin, Recovery Domain, ESU/DPS	Annual

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Status and Trend Population	Columbia Basin Fish and Wildlife Authority. Status of Fish and Wildlife Resources in the Columbia River Basin. Proposed July, 2008 www.cbfgwa.org/sotr	Biological	Status/Trend	Status and Trends of salmon and steelhead in the Columbia River Basin - Status of Salmon and Steelhead			%/# Salmon and steelhead ESU/DPS increasing, stable decreasing (NOAA definition)	Columbia Basin, Recovery Domain, ESU/DPS	Annual
Status and Trend Population	Columbia Basin Fish and Wildlife Authority. Status of Fish and Wildlife Resources in the Columbia River Basin. Proposed July, 2008 www.cbfgwa.org/sotr	Biological	Status/Trend	Status and Trends of salmon and steelhead in the Columbia River Basin - risk level of Salmon and Steelhead			%/# Salmon and steelhead ESU/DPS in very low, low, moderate and high risk categories (NOAA definition)	Columbia Basin, Recovery Domain, ESU/DPS	Annual
Status and Trend Population	Columbia Basin Fish and Wildlife Authority. Status of Fish and Wildlife Resources in the Columbia River Basin. Proposed July, 2008 www.cbfgwa.org/sotr	Biological	Status/Trend	Status of ESA-Listed Bull trout Core Areas in the Columbia River Basin - Bull Trout Core Area Threats;			% core areas where threats are substantial (imminent), moderate (imminent), moderate (non-imminent) localized (substantial), widespread (low severity), slightly threatened	Columbia Basin	Annual

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Status and Trend Population	Columbia Basin Fish and Wildlife Authority. Status of Fish and Wildlife Resources in the Columbia River Basin. Proposed July, 2008 www.cbfgwa.org/sotr	Biological	Status/Trend	Status of ESA-Listed Bull trout Core Areas in the Columbia River Basin - Bull trout Core Area Trends;			% core areas where population trends are severely declining, very rapidly declining, rapidly declining, declining, stable, increasing, unknown	Columbia Basin	Annual
Status and Trend Population	Columbia Basin Fish and Wildlife Authority. Status of Fish and Wildlife Resources in the Columbia River Basin. Proposed July, 2008 www.cbfgwa.org/sotr	Biological	Status/Trend	Status of ESA-Listed Bull trout Core Areas in the Columbia River Basin - Bull trout Core Area Risks;			% core areas where population risks are high, at, potential. Low, unknown	Columbia Basin	Annual
Status and Trend Population	Columbia Basin Fish and Wildlife Authority. Status of Fish and Wildlife Resources in the Columbia River Basin. Proposed July, 2008 www.cbfgwa.org/sotr	Biological	Abundance	White sturgeon broodstock abundance			White sturgeon broodstock abundance by Columbia Basin population	Population	Annual

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Status and Trend Population	Columbia Basin Fish and Wildlife Authority. Status of Fish and Wildlife Resources in the Columbia River Basin. Proposed July, 2008 www.cbfgwa.org/sotr	Biological	Status/Trend	Status of white sturgeon populations; % increasing, decreasing no change, unknown			% Columbia Basin populations increasing, decreasing no change, unknown	Columbia Basin, population	Annual
Status and Trend Population	Columbia Basin Fish and Wildlife Authority. Status of Fish and Wildlife Resources in the Columbia River Basin. Proposed July, 2008 www.cbfgwa.org/sotr	Biological	Status/Trend	Risk Level of White sturgeon; % populations high medium low risk			% of Columbia Basin populations at high, medium, low risk	Columbia Basin, population	Annual
Fish Survival	Columbia Basin Fish and Wildlife Authority. Status of Fish and Wildlife Resources in the Columbia River Basin. Proposed July, 2008 www.cbfgwa.org/sotr	Biological	Hydrosystem performance	Juvenile and Adult salmon steelhead survival (TBD)				By salmon ESU, steelhead DPS where BiOp standard	Annual

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Habitat	Aquatic and Riparian Effectiveness Monitoring Program	Physical	Stream morphology			Are the physical processes that contribute to fish habitat intact?	Channel morphology, floodplain connectedness, slope stability, pool development, bathymetry.	Regional, basin, watershed, reach	Annual reports and 5-year summary reports
Habitat	Aquatic and Riparian Effectiveness Monitoring Program	Physical	Watershed Condition Index				This assessment consisted of aggregating road, vegetation, and in-channel data to assess the condition of 6th-field watersheds in an effort to describe the distribution of the condition of watersheds in the Northwest Forest Plan area	Coastal WA, OR, and CA	Annual reports and 5-year summary reports