

Appendix H: Existing Indicator Matrix

This appendix compiles existing indicators in use by other programs. Where available, all relevant information about the parent indicator program and the specific indicator was included in this summary. Each indicator was classified into the landscape classes established for the Coos Watershed Indicators Program: Freshwater Aquatic, Terrestrial, Estuarine Aquatic, and Nearshore Marine. “NA” indicates where data were not available.

Indicator	Native anadromous fish abundance, distribution, and life histories
Appropriate Indicator Class*	Aquatic and Riparian
Indicator Measure Description	NA (not available)
Location	Oregon
Organization	Oregon Plan for Salmon and Watersheds: OWEB
Indicator Program in Use?	yes
Framework	Pressure-Condition-Impact-Response
Available Data	Coastal streams since 1998--ODF&W started in early 1990s using stratified random sampling at 4th field HUC.
Threshold or Target	Not defined
Limitations and Challenges	NA
Use by additional programs	Oregon Progress Board; Pacific/Infish Biological Opinion Monitoring Team (PIBO), PNAMP; EPA; Oregon Dept. of Forestry; Upper Columbia Basin Oregon Plan Monitoring Strategy; Mobrand Biometrics, Inc.--EDTs; Pacific Coast Salmon Recovery Fund Workshop; ODF Montreal Process; Willamette Initiative--OWEB; Aquatic and Riparian Effectiveness Monitoring Program; Oregon State of the Environment Report; Pacific Northwest Salmon Habitat Work Group
Personal Contact (if available)	NA
Website	http://www.oregon-plan.org/
Notes	NA

Indicator	Coldwater Index of Biotic Integrity for fish and macroinvertebrates
Appropriate Indicator Class*	Aquatic and Riparian
Indicator Measure Description	IBI
Location	Oregon
Organization	Oregon Plan for Salmon and Watersheds: OWEB
Indicator Program in Use?	yes
Framework	Pressure-Condition-Impact-Response
Available Data	Coastal streams since 1998; 3rd field HUC.
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	PIBO; PNAMP; EPA; Upper Columbia Basin Oregon Plan Monitoring Strategy; Mobrand Biometrics, Inc.--EDTs; ODF Montreal Process; State of the Nation's Ecosystems-Heinz Center; Pacific Coast Salmon Recovery Fund Workshop; Institute for Natural Resources; Willamette Initiative--OWEB; Aquatic and Riparian Effectiveness Monitoring Program; Oregon State of the Environment Report;
Personal Contact (if available)	NA
Website	http://www.oregon-plan.org/
Notes	NA

Indicator	Water Quality Index
Appropriate Indicator Class*	Aquatic and Riparian
Indicator Measure Description	miles or % of streams with rating of poor, fair, or good WQI
Location	Oregon
Organization	Oregon Plan for Salmon and Watersheds
Indicator Program in Use?	yes
Framework	Pressure-Condition-Impact-Response
Available Data	Coastal streams since 1998; random sites statewide since 1960. Data at 3rd field HUC and subwatersheds for random data
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	Oregon Progress Board; Pacific/Infish Biological Opinion Monitoring Team (PIBO); EPA; Oregon Dept. of Forestry; Upper Columbia Basin Oregon Plan Monitoring Strategy; Mobrand Biometrics, Inc.--EDTs; Pacific Coast Salmon Recovery Fund Workshop; ODF Montreal Process; Environment and Sustainable Development Indicators for Canada; Institute for Environmental Research and Education; State of the Nation's Ecosystems-Heinz Center; Willamette Initiative--OWEB; Aquatic and Riparian Effectiveness Monitoring Program; Oregon State of the Environment Report; Pacific Northwest Salmon Habitat Work Group--Green Mountain Institute for Environmental Democracy; Institute for Natural Resources; National Research Council
Personal Contact (if available)	NA
Website	http://www.oregon-plan.org/
Notes	NA

Indicator	Area, distribution, and types of riparian and wetland vegetation
Appropriate Indicator Class*	Aquatic and Riparian
Indicator Measure Description	NA
Location	Oregon
Organization	Oregon Plan for Salmon and Watersheds
Indicator Program in Use?	yes
Framework	Pressure-Condition-Impact-Response
Available Data	FIA plots, statewide; AREMP; DOA remote low level photos; DEQ-TMDL data satellite; CLAMS; EPA, USF&WS, DSL and OWEB change in wetland acreage below 100 m from 1984 to 1999. Data at variety of scales.
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	http://www.oregon-plan.org/
Notes	NA

Indicator	Riparian function based on vegetation and site capability and wetland function based on HGM typing
Appropriate Indicator Class*	Aquatic and Riparian
Indicator Measure Description	Riparian function site capability is exemplified by large wood recruitment, shade, and nutrient input. HGM typing is an assessment tool that classifies wetlands into subclasses based on hydrogeomorphic characteristics.
Location	Oregon
Organization	Oregon Plan for Salmon and Watersheds
Indicator Program in Use?	yes
Framework	Pressure-Condition-Impact-Response
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	http://www.oregon-plan.org/
Notes	NA

Indicator	Condition of physical aquatic habitat and estuarine habitat
Appropriate Indicator Class*	Aquatic and Riparian
Indicator Measure Description	NA
Location	Oregon
Organization	Oregon Plan for Salmon and Watersheds
Indicator Program in Use?	yes
Framework	Pressure-Condition-Impact-Response
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	http://www.oregon-plan.org/
Notes	NA

Indicator	Access to freshwater and estuarine habitat
Appropriate Indicator Class*	Aquatic and Riparian
Indicator Measure Description	miles of habitat accessible or limited
Location	Oregon
Organization	Oregon Plan for Salmon and Watersheds
Indicator Program in Use?	yes
Framework	Pressure-Condition-Impact-Response
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	Could be assessed further by habitat type.
Use by additional programs	NA
Personal Contact (if available)	NA
Website	http://www.oregon-plan.org/
Notes	NA

Indicator	Frequency with which instream water rights are being met
Appropriate Indicator Class*	Aquatic and Riparian
Indicator Measure Description	NA
Location	Oregon
Organization	Oregon Plan for Salmon and Watersheds
Indicator Program in Use?	yes
Framework	Pressure-Condition-Impact-Response
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	http://www.oregon-plan.org/
Notes	NA

Indicator	Number of native plant and animal species and distribution over time
Appropriate Indicator Class*	Aquatic and Riparian
Indicator Measure Description	departure from potential
Location	Oregon
Organization	Oregon Plan for Salmon and Watersheds
Indicator Program in Use?	yes
Framework	Pressure-Condition-Impact-Response
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	http://www.oregon-plan.org/
Notes	The Oregon Plan for salmon and watersheds did not identify biodiversity as a priority indicator, however the literature suggests that shifts in biodiversity are important indicators of the impacts of climate change.

Indicator	Percent of nonnative invasive species
Appropriate Indicator Class*	Aquatic and Riparian
Indicator Measure Description	measure of biodiversity
Location	Oregon
Organization	Oregon Plan for Salmon and Watersheds
Indicator Program in Use?	yes
Framework	Pressure-Condition-Impact-Response
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	http://www.oregon-plan.org/
Notes	The Oregon Plan for salmon and watersheds did not identify biodiversity as a priority indicator, however the literature suggests that shifts in biodiversity are important indicators of the impacts of climate change.

Indicator	Change in land use and land cover
Appropriate Indicator Class*	Terrestrial
Indicator Measure Description	Change from farming, forestry or grassland to urban or rural residential and vice versa; also conversion to conservation use and urban sprawl
Location	Oregon
Organization	Oregon Plan for Salmon and Watersheds
Indicator Program in Use?	yes
Framework	Pressure-Condition-Impact-Response
Available Data	Air photos and FIA plot data from ODF and TNC from 1973-2000, statewide.
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	http://www.oregon-plan.org/
Notes	NA

Indicator	Area, distribution, configuration, and types of cover for identified ecological classes
Appropriate Indicator Class*	Terrestrial
Indicator Measure Description	Ecological classes are those identified by the state.
Location	Oregon
Organization	Oregon Plan for Salmon and Watersheds
Indicator Program in Use?	yes
Framework	Pressure-Condition-Impact-Response
Available Data	1990 Statewide USGS National Land Cover data; Statewide FIA plots; Statewide and yearly USFS fire condition and land use boundaries; Statewide, yearly NRCS-NRI soil and vegetation comparison to natural community; TNC statewide, every 10 years by ecoregion
Threshold or Target	NA
Limitations and Challenges	Need agreed upon classification system. Resolution of available data may not be useful at the lower levels of the Coos Watershed
Use by additional programs	NA
Personal Contact (if available)	NA
Website	http://www.oregon-plan.org/
Notes	NA

Indicator	Number of native plant and animal species and distribution over time
Appropriate Indicator Class*	Terrestrial
Indicator Measure Description	measure of biodiversity
Location	Oregon
Organization	Oregon Plan for Salmon and Watersheds
Indicator Program in Use?	yes
Framework	Pressure-Condition-Impact-Response
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	http://www.oregon-plan.org/
Notes	The Oregon Plan for salmon and watersheds did not identify biodiversity as a priority indicator, however the literature suggests that shifts in biodiversity are important indicators of the impacts of climate change.

Indicator	Percent of nonnative invasive species
Appropriate Indicator Class*	Terrestrial
Indicator Measure Description	measure of biodiversity
Location	Oregon
Organization	Oregon Plan for Salmon and Watersheds
Indicator Program in Use?	yes
Framework	Pressure-Condition-Impact-Response
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	http://www.oregon-plan.org/
Notes	The Oregon Plan for salmon and watersheds did not identify biodiversity as a priority indicator, however the literature suggests that shifts in biodiversity are important indicators of the impacts of climate change.

Indicator	Area, distribution, type, and change in area of tidal and submerged wetlands
Appropriate Indicator Class*	Estuarine
Indicator Measure Description	Area, percent cover, and classification of wetlands
Location	Oregon
Organization	Oregon Plan for Salmon and Watersheds
Indicator Program in Use?	yes
Framework	Pressure-Condition-Impact-Response
Available Data	EPA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	http://www.oregon-plan.org/
Notes	NA

Indicator	Index of Biotic Integrity of estuaries
Appropriate Indicator Class*	Estuarine
Indicator Measure Description	measure of biodiversity
Location	Oregon
Organization	Oregon Plan for Salmon and Watersheds
Indicator Program in Use?	yes
Framework	Pressure-Condition-Impact-Response
Available Data	EPA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	http://www.oregon-plan.org/
Notes	NA

Indicator	Percent nonnative, invasive estuarine species
Appropriate Indicator Class*	Estuarine
Indicator Measure Description	measure of biodiversity
Location	Oregon
Organization	Oregon Plan for Salmon and Watersheds
Indicator Program in Use?	yes
Framework	Pressure-Condition-Impact-Response
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	http://www.oregon-plan.org/
Notes	The Oregon Plan for salmon and watersheds did not identify biodiversity as a priority indicator, however the literature suggests that shifts in biodiversity are important indicators of the impacts of climate change.

Indicator	Restoration
Appropriate Indicator Class*	Operational
Indicator Measure Description	The percentage of OWEB watershed restoration investments that address established basin and watershed restoration priorities.
Location	Oregon
Organization	OWEB
Indicator Program in Use?	Performance measures are used to evaluate the program
Framework	NA
Available Data	OWEB yearly data
Threshold or Target	2009 target of 90%
Limitations and Challenges	Lack of limiting factor analyses for basins
Use by additional programs	NA
Personal Contact (if available)	Greg Sieglitz, Monitoring and Reporting Manager, (503) 986-190
Website	www.oregon.gov/OWEB/MONITOR/index.shtml
Notes	NA

Indicator	Fish Populations
Appropriate Indicator Class*	Aquatic and Riparian
Indicator Measure Description	The percentage of monitored native fish species that exhibit increasing or stable levels of abundance.
Location	Oregon
Organization	OWEB
Indicator Program in Use?	Performance measures are used to evaluate the program
Framework	NA
Available Data	NA
Threshold or Target	2009 target of 65%
Limitations and Challenges	Some data sets are not yet robust enough for evaluation; Many native fish species are not monitored by ODFW and the measure is dependent on participation and cooperation between a number of other agencies.
Use by additional programs	NA
Personal Contact (if available)	Greg Sieglitz, Monitoring and Reporting Manager, (503) 986-191
Website	www.oregon.gov/OWEB/MONITOR/index.shtml
Notes	NA

Indicator	Plant Communities
Appropriate Indicator Class*	Aquatic and Riparian
Indicator Measure Description	The percentage of improved riparian stream miles of the total number of stream miles in Oregon.
Location	Oregon
Organization	OWEB
Indicator Program in Use?	Performance measures are used to evaluate the program
Framework	NA
Available Data	OWEB's Oregon Watershed Restoration Inventory (OWRI), federal Interagency Restoration Database (IRDA), Bureau of Land Management, U.S. Forest Services, and Grande Ronde Model Watershed Program restoration databases.
Threshold or Target	2008 target of 1.0%
Limitations and Challenges	LIDAR data available in May 2010.
Use by additional programs	NA
Personal Contact (if available)	Greg Sieglitz, Monitoring and Reporting Manager, (503) 986-192
Website	www.oregon.gov/OWEB/MONITOR/index.shtml
Notes	NA

Indicator	Fish Monitoring
Appropriate Indicator Class*	Aquatic and Riparian
Indicator Measure Description	The percentage of native fish, where monitoring needs have been quantified, that were monitored to a level considered adequate under the Oregon Plan Monitoring Strategy and ODFW's Native Fish Status Review.
Location	Oregon
Organization	OWEB
Indicator Program in Use?	Performance measures are used to evaluate the program
Framework	NA
Available Data	2000-current Oregon Department of Fish and Wildlife (ODFW) staff, ODFW's Natural Resources Information Management Program, Oregon Plan Monitoring Strategy.
Threshold or Target	2009 target of 40%
Limitations and Challenges	Data dependent on cooperation of many agencies, especially ODFW. Some data do not reflect a species entire geographic range. Recovery and monitoring plans are needed for a number of native fish species.
Use by additional programs	NA
Personal Contact (if available)	Greg Sieglitz, Monitoring and Reporting Manager, (503) 986-193
Website	www.oregon.gov/OWEB/MONITOR/index.shtml
Notes	NA

Indicator	Salmon Habitat Quantity
Appropriate Indicator Class*	Aquatic and Riparian
Indicator Measure Description	The percentage of potential aquatic salmon habitat made available to salmon each year.
Location	Oregon
Organization	OWEB
Indicator Program in Use?	Performance measures are used to evaluate the program
Framework	NA
Available Data	OWEB's Oregon Watershed Restoration Inventory (OWRI), federal Interagency Restoration Database (IRDA), Bureau of Land Management, U.S. Forest Services, and Grande Ronde Model Watershed Program restoration databases.
Threshold or Target	2009 target of 0.25%
Limitations and Challenges	Analyses are likely underestimates of the percentage of potential aquatic salmon habitat made available to salmon each year because of a lack of quantitative information about the total miles of potential aquatic salmon habitat in Oregon.
Use by additional programs	NA
Personal Contact (if available)	Greg Sieglitz, Monitoring and Reporting Manager, (503) 986-0194
Website	www.oregon.gov/OWEB/MONITOR/index.shtml
Notes	NA

Indicator	Salmon Habitat Quality
Appropriate Indicator Class*	Aquatic and Riparian
Indicator Measure Description	The trend in quality of aquatic salmon habitat.
Location	Oregon
Organization	OWEB
Indicator Program in Use?	Performance measures are used to evaluate the program
Framework	NA
Available Data	Oregon Department of Fish and Wildlife (ODFW) Aquatic Inventories Project staff, ODFW Natural Resource Inventory Management Program
Threshold or Target	Inconclusive
Limitations and Challenges	Currently ODFW's Aquatics Inventory Project (AIP) does not have a single metric that summarizes the variety of habitat variables (e.g., pools, wood, sediment, channel complexity, etc.) collected during the surveys that serves as a high-level indicator of trends in aquatic habitat quality.
Use by additional programs	NA
Personal Contact (if available)	Greg Sieglitz, Monitoring and Reporting Manager, (503) 986-195
Website	www.oregon.gov/OWEB/MONITOR/index.shtml
Notes	ODFW should now have models that incorporate this data into a comprehensive metric of habitat quality. Comprehensive, statewide data about the quality of aquatic salmon habitat have been collected by the AIP and can be found in reports and spatial datasets available online. Stream habitat data have been collected in 10,000 miles of streams statewide—or approximately 20% of Oregon's perennial stream miles—under the basin survey project and at 1,500 sites in coastal and Lower Columbia River drainages as part of aquatic habitat monitoring under the Oregon Plan for Salmon and Watersheds. However, only in coastal drainages have data been collected in a systematic, annual fashion since 1998; thus, trend for this metric can only be described for coastal watersheds.

Indicator	Trophic State
Appropriate Indicator Class*	Aquatic and Riparian
Indicator Measure Description	The trophic state of lakes is indicative of their biological productivity, that is, the amount of living material supported within them, primarily in the form of algae
Location	US/Canada Great Lakes
Organization	SOLEC (State of the Lakes Ecosystem Conference)
Indicator Program in Use?	Yes
Framework	NA
Available Data	Since 1990 EPA
Threshold or Target	Oligotrophic or Mesotrophic
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	EPA
Website	http://www.epa.gov/solec/
Notes	NA

Indicator	Phosphorous
Appropriate Indicator Class*	Aquatic and Riparian
Indicator Measure Description	Phosphorus is an essential element for all organisms and is found naturally in tributaries and run-off waters. Excessive phosphorus can lead to over-enrichment with algae and aquatic weeds and depletion of dissolved oxygen as the excess plant and animal matter decay.
Location	US/Canada Great Lakes
Organization	SOLEC (State of the Lakes Ecosystem Conference)
Indicator Program in Use?	Yes
Framework	NA
Available Data	Since 1990 EPA
Threshold or Target	10 ug/l
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	EPA
Website	http://www.epa.gov/solec/
Notes	NA

Indicator	Dissolved Oxygen
Appropriate Indicator Class*	Aquatic and Riparian
Indicator Measure Description	Oxygen is essential for all plants and animals to survive, whether they live on the land or in the water. The Central Basin of Lake Erie is susceptible to low dissolved oxygen concentrations
Location	US/Canada Great Lakes
Organization	SOLEC (State of the Lakes Ecosystem Conference)
Indicator Program in Use?	Yes
Framework	NA
Available Data	Since 1990 EPA
Threshold or Target	4 mg/l
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	Dr. Paul Bertram at (312) 353-0153
Website	http://www.epa.gov/solec/
Notes	NA

Indicator	Beach Closings
Appropriate Indicator Class*	Aquatic and Riparian
Indicator Measure Description	When bacteria standards are exceeded, local authorities may close swimming at a beach or issue an advisory that water is unhealthful for swimming.
Location	US/Canada Great Lakes
Organization	SOLEC (State of the Lakes Ecosystem Conference)
Indicator Program in Use?	Yes
Framework	NA
Available Data	Since 1990 EPA
Threshold or Target	Zero
Limitations and Challenges	Trends are difficult to ascertain due to rapidly expanding number of beaches being reported on and changing monitoring methods from year to year.
Use by additional programs	NA
Personal Contact (if available)	EPA
Website	http://www.epa.gov/solec/
Notes	NA

Indicator	Benthic Community Health
Appropriate Indicator Class*	Aquatic and Riparian
Indicator Measure Description	Measure of Diporeia populations
Location	US/Canada Great Lakes
Organization	SOLEC (State of the Lakes Ecosystem Conference)
Indicator Program in Use?	Yes
Framework	NA
Available Data	Since 2000 EPA
Threshold or Target	Depth <100 m 220-320/m ² Depth >100 m 30-160/m ²
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	http://www.epa.gov/solec/
Notes	NA

Indicator	Coastal Zones and Aquatic Habitats
Appropriate Indicator Class*	Aquatic and Riparian
Indicator Measure Description	alteration of coastal, aquatic habitats
Location	US/Canada Great Lakes
Organization	SOLEC (State of the Lakes Ecosystem Conference)
Indicator Program in Use?	Yes
Framework	NA
Available Data	Since 1960 EPA, NOAA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	http://www.epa.gov/solec/
Notes	NA

Indicator	Invasive Species
Appropriate Indicator Class*	Aquatic and Riparian
Indicator Measure Description	number of invasive species
Location	US/Canada Great Lakes
Organization	SOLEC (State of the Lakes Ecosystem Conference)
Indicator Program in Use?	Yes
Framework	NA
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	http://www.epa.gov/solec/
Notes	NA

Indicator	Contamination
Appropriate Indicator Class*	Aquatic and Riparian
Indicator Measure Description	Releases of targeted bioaccumulative toxic chemicals
Location	US/Canada Great Lakes
Organization	SOLEC (State of the Lakes Ecosystem Conference)
Indicator Program in Use?	Yes
Framework	NA
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	http://www.epa.gov/solec/
Notes	NA

Indicator	Biotic Communities
Appropriate Indicator Class*	Aquatic and Riparian
Indicator Measure Description	Food web condition
Location	US/Canada Great Lakes
Organization	SOLEC (State of the Lakes Ecosystem Conference)
Indicator Program in Use?	Yes
Framework	NA
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	http://www.epa.gov/solec/
Notes	NA

Indicator	Land Use Land Cover
Appropriate Indicator Class*	Terrestrial
Indicator Measure Description	Change in land cover and land use patterns.
Location	US/Canada Great Lakes
Organization	SOLEC (State of the Lakes Ecosystem Conference)
Indicator Program in Use?	Yes
Framework	NA
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	http://www.epa.gov/solec/
Notes	NA

Indicator	Climate Change
Appropriate Indicator Class*	NA
Indicator Measure Description	Changes in climate, such as air temperature and weather patterns, as well as lake ice cover
Location	US/Canada Great Lakes
Organization	SOLEC (State of the Lakes Ecosystem Conference)
Indicator Program in Use?	Yes
Framework	NA
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	http://www.epa.gov/solec/
Notes	NA

Indicator	Greenhouse Gas Emissions
Appropriate Indicator Class*	Terrestrial
Indicator Measure Description	NA
Location	CA
Organization	EPIC (California Indicators Program)
Indicator Program in Use?	Yes
Framework	IPCC-DPSIR adaptation
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	Scale of measurement must determined to effectively monitor.
Use by additional programs	NA
Personal Contact (if available)	NA
Website	www.oehha.org/multimedia/epic/pdf/ClimateChangeIndicatorsApril2009.pdf
Notes	NA

Indicator	Atmospheric Carbon Dioxide Concentration
Appropriate Indicator Class*	Terrestrial
Indicator Measure Description	NA
Location	CA
Organization	EPIC (California Indicators Program)
Indicator Program in Use?	NA
Framework	IPCC-DPSIR adaptation
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	www.oehha.org/multimedia/epic/pdf/ClimateChangeIndicatorsApril2009.pdf
Notes	NA

Indicator	Annual Air Temperature--State and Regional
Appropriate Indicator Class*	Terrestrial
Indicator Measure Description	NA
Location	CA
Organization	EPIC (California Indicators Program)
Indicator Program in Use?	NA
Framework	IPCC-DPSIR adaptation
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	www.oehha.org/multimedia/epic/pdf/ClimateChangeIndicatorsApril2009.pdf
Notes	NA

Indicator	Air Temperature by County
Appropriate Indicator Class*	Terrestrial
Indicator Measure Description	NA
Location	CA
Organization	EPIC (California Indicators Program)
Indicator Program in Use?	NA
Framework	IPCC-DPSIR adaptation
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	www.oehha.org/multimedia/epic/pdf/ClimateChangeIndicatorsApril2009.pdf
Notes	NA

Indicator	Extreme Heat Events
Appropriate Indicator Class*	Terrestrial
Indicator Measure Description	Number of events where temperatures exceed record high temperatures for more than a week.
Location	CA
Organization	EPIC (California Indicators Program)
Indicator Program in Use?	NA
Framework	NA
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	www.oehha.org/multimedia/epic/pdf/ClimateChangeIndicatorsApril2009.pdf
Notes	NA

Indicator	Accumulated Winter Chill Hours
Appropriate Indicator Class*	Terrestrial
Indicator Measure Description	NA
Location	CA
Organization	EPIC (California Indicators Program)
Indicator Program in Use?	NA
Framework	NA
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	www.oehha.org/multimedia/epic/pdf/ClimateChangeIndicatorsApril2009.pdf
Notes	NA

Indicator	Annual Precipitation
Appropriate Indicator Class*	Terrestrial
Indicator Measure Description	NA
Location	CA
Organization	EPIC (California Indicators Program)
Indicator Program in Use?	NA
Framework	NA
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	www.oehha.org/multimedia/epic/pdf/ClimateChangeIndicatorsApril2009.pdf
Notes	NA

Indicator	Net Gain or Loss of Freshwater Wetland Acres
Appropriate Indicator Class*	Aquatic and Riparian
Indicator Measure Description	Net gain or loss of freshwater wetland acres in a year.
Location	Oregon
Organization	Oregon Progress Board
Indicator Program in Use?	Yes
Framework	NA
Available Data	U.S. Geological Survey, Oregon Dept. of State Lands
Threshold or Target	Zero net loss
Limitations and Challenges	Permitted wetland losses do not account for all wetland losses.
Use by additional programs	NA
Personal Contact (if available)	Oregon Dept. of Environmental Quality, Laboratory Division
Website	http://benchmarks.oregon.gov/
Notes	NA

Indicator	Net Gain or Loss of Estuarine Wetland Acres
Appropriate Indicator Class*	Aquatic and Riparian
Indicator Measure Description	Net gain or loss of estuarine wetland acres in a year.
Location	Oregon
Organization	Oregon Progress Board
Indicator Program in Use?	Yes
Framework	NA
Available Data	U.S. Geological Survey, Oregon Dept. of State Lands
Threshold or Target	Gain of 250 acres
Limitations and Challenges	Available data is not entirely trusted by officials.
Use by additional programs	NA
Personal Contact (if available)	Oregon Dept. of Environmental Quality, Laboratory Division
Website	http://benchmarks.oregon.gov/
Notes	NA

Indicator	Increasing Stream Water Quality
Appropriate Indicator Class*	Aquatic and Riparian
Indicator Measure Description	Percent of monitored stream sites with significantly increasing water quality over 10 years.
Location	Oregon
Organization	Oregon Progress Board
Indicator Program in Use?	Yes
Framework	NA
Available Data	Oregon Dept. of Environmental Quality
Threshold or Target	75%
Limitations and Challenges	The indicator continues to decline because many of the monitored streams have improved water quality, so fewer streams are experiencing significant increases in water quality, while there remain streams that are very difficult to improve their water quality.
Use by additional programs	NA
Personal Contact (if available)	Oregon Dept. of Environmental Quality, Laboratory Division
Website	http://benchmarks.oregon.gov/
Notes	This indicator seems to be unfit because a decreasing percentage would seem to give a warning signal, but may actually be misleading. When compared with the percent of monitored streams with decreasing water quality, however this indicator suggests a different result.

Indicator	Decreasing Stream Water Quality
Appropriate Indicator Class*	Aquatic and Riparian
Indicator Measure Description	Percent of monitored stream sites with significantly decreasing water quality over 10 years.
Location	Oregon
Organization	Oregon Progress Board
Indicator Program in Use?	Yes
Framework	NA
Available Data	Oregon Dept. of Environmental Quality
Threshold or Target	Zero percent
Limitations and Challenges	The indicator continues to decline because the percentage of monitored streams with declining water quality is increasing. This may be skewed because some streams have improved water quality and are not showing significant increases in water quality.
Use by additional programs	NA
Personal Contact (if available)	Oregon Dept. of Environmental Quality, Laboratory Division
Website	http://benchmarks.oregon.gov/
Notes	The Oregon Water Quality Index (OWQI) analyzes a defined set of water quality parameters and produces a score describing general water quality. The water quality parameters included in the OWQI are: temperature, dissolved oxygen (percent saturation and concentration), biochemical oxygen demand, pH, total solids, ammonia and nitrate nitrogens, total phosphorous, and fecal coliforms. OWQI scores are classified as follows: 10-59 is very poor, 60-79 is poor, 80-84 is fair, 85-89 is good, and 90-100 is excellent. The Department of Environmental Quality laboratory maintains a large network of ambient water quality monitoring sites. Monitoring sites are representative of Oregon rivers and streams, including pristine waters and highly impacted waters. For the benchmark, OWQI results are calculated on all samples at these sites, using ten years of data.

Indicator	Stream Water Quality
Appropriate Indicator Class*	Aquatic and Riparian
Indicator Measure Description	Percent of monitored stream sites with good or excellent water quality
Location	Oregon
Organization	Oregon Progress Board
Indicator Program in Use?	Yes
Framework	NA
Available Data	Oregon Dept. of Environmental Quality
Threshold or Target	45%
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	Oregon Dept. of Environmental Quality, Laboratory Division
Website	http://benchmarks.oregon.gov/
Notes	Benchmark 79(c) represents the percentage of monitoring sites with good to excellent water quality, with respect to the total number of monitoring sites.

Indicator	Water Quantity-Stream Flow Rights
Appropriate Indicator Class*	Aquatic and Riparian
Indicator Measure Description	Percent of key streams meeting minimum water rights nine or more months of the year.
Location	Oregon
Organization	Oregon Progress Board
Indicator Program in Use?	Yes
Framework	NA
Available Data	Oregon Water Resources Dept.
Threshold or Target	65%
Limitations and Challenges	Climatic conditions affect the natural fluctuation of stream flow.
Use by additional programs	NA
Personal Contact (if available)	Oregon Water Resources Dept., Technical Services Division
Website	http://benchmarks.oregon.gov/
Notes	This benchmark measures the extent to which flows in selected rivers and streams meet minimum perennial stream flow levels adopted to support aquatic life. Statistics are based on USGS stream flow data.

Indicator	Forest Land
Appropriate Indicator Class*	Terrestrial
Indicator Measure Description	Percent of Oregon's wildland forest in 1974 still preserved for forest use.
Location	Oregon
Organization	Oregon Progress Board
Indicator Program in Use?	Yes
Framework	NA
Available Data	Oregon Dept. of Forestry
Threshold or Target	97.40%
Limitations and Challenges	The comparator data includes all forest land types.
Use by additional programs	NA
Personal Contact (if available)	Oregon Dept. of Forestry
Website	http://benchmarks.oregon.gov/
Notes	This benchmark measures the extent to which non-federal "wildland forest" land in Oregon is still preserved for "forest use" as compared to the amount classified as "wildland forest" in 1974. For purposes of this benchmark, "wildland forest preserved for forest use" means forested land where the numbers of dwellings do not interfere with the production of timber, watershed, wildlife, recreation or other forest values.

Indicator	Marine Species
Appropriate Indicator Class*	Aquatic and Riparian
Indicator Measure Description	Percent of monitored marine fish species not risk.
Location	Oregon
Organization	Oregon Progress Board
Indicator Program in Use?	Yes
Framework	NA
Available Data	Oregon Dept. of Fish and Wildlife
Threshold or Target	Not established
Limitations and Challenges	Discrepancies regarding classification of endangered versus 'at risk' may influence the benchmarks evaluation. The benchmark will be revised in the near future.
Use by additional programs	NA
Personal Contact (if available)	Oregon Dept. of Fish and Wildlife
Website	http://benchmarks.oregon.gov/
Notes	NA

Indicator	Marine Species Shellfish
Appropriate Indicator Class*	Aquatic and Riparian
Indicator Measure Description	Percent of monitored marine shellfish species not at risk.
Location	Oregon
Organization	Oregon Progress Board
Indicator Program in Use?	Yes
Framework	NA
Available Data	Oregon Dept. of Fish and Wildlife
Threshold or Target	Not established
Limitations and Challenges	Discrepancies regarding classification of endangered versus 'at risk' may influence the benchmarks evaluation. The benchmark will be revised in the near future.
Use by additional programs	NA
Personal Contact (if available)	Oregon Dept. of Fish and Wildlife
Website	http://benchmarks.oregon.gov/
Notes	NA

Indicator	Marine Species Plants and Mammals
Appropriate Indicator Class*	Aquatic and Riparian
Indicator Measure Description	Percent of monitored marine mammal and plant species not at risk.
Location	Oregon
Organization	Oregon Progress Board
Indicator Program in Use?	Yes
Framework	NA
Available Data	Oregon Dept. of Fish and Wildlife
Threshold or Target	Not established
Limitations and Challenges	Only mammal data exists; Plant data is not available. The benchmark is under review.
Use by additional programs	NA
Personal Contact (if available)	Oregon Dept. of Fish and Wildlife
Website	http://benchmarks.oregon.gov/
Notes	NA

Indicator	Terrestrial Vertebrate Species
Appropriate Indicator Class*	Terrestrial
Indicator Measure Description	Percent of monitored terrestrial vertebrate species not at risk.
Location	Oregon
Organization	Oregon Progress Board
Indicator Program in Use?	Yes
Framework	NA
Available Data	Oregon Dept. of Fish and Wildlife
Threshold or Target	Not established
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	Oregon Dept. of Fish and Wildlife
Website	http://benchmarks.oregon.gov/
Notes	This measures the percentage of vertebrates (fish and wildlife) that are currently not considered to be “at risk”. As in benchmarks 86 and 87, “at risk” is defined as federally or state listed, threatened and endangered species only. All vertebrates are sufficiently monitored to address this benchmark.

Indicator	Terrestrial Invertebrate Species
Appropriate Indicator Class*	Terrestrial
Indicator Measure Description	Percent of monitored terrestrial invertebrate species not at risk.
Location	Oregon
Organization	Oregon Progress Board
Indicator Program in Use?	Yes
Framework	NA
Available Data	Oregon Dept. of Fish and Wildlife
Threshold or Target	Not established
Limitations and Challenges	No data exists for terrestrial invertebrate species.
Use by additional programs	NA
Personal Contact (if available)	Oregon Dept. of Fish and Wildlife
Website	http://benchmarks.oregon.gov/
Notes	NA

Indicator	Terrestrial Plant Species
Appropriate Indicator Class*	Terrestrial
Indicator Measure Description	Percent of monitored plant species not at risk.
Location	Oregon
Organization	Oregon Progress Board
Indicator Program in Use?	Yes
Framework	NA
Available Data	Oregon Dept. of Fish and Wildlife
Threshold or Target	Not established
Limitations and Challenges	Plants are sufficiently monitored, but the benchmark is under review.
Use by additional programs	NA
Personal Contact (if available)	Oregon Dept. of Fish and Wildlife
Website	http://benchmarks.oregon.gov/
Notes	NA

Indicator	Natural Habitats Overall
Appropriate Indicator Class*	Terrestrial
Indicator Measure Description	Percent of land in Oregon that is natural habitat.
Location	Oregon
Organization	Oregon Progress Board
Indicator Program in Use?	Yes
Framework	NA
Available Data	Oregon State University, Institute for Natural Resources
Threshold or Target	Not established
Limitations and Challenges	Using satellite imaging and due to the concerted efforts by the Institute of Natural Resources Oregon has its first data point for Natural Habitats. For the early 2000's Oregon rate of natural habitats made up roughly 80 percent of the state. Targets will be established off of this baseline data.
Use by additional programs	NA
Personal Contact (if available)	Oregon State University, Institute for Natural Resources
Website	http://benchmarks.oregon.gov/
Notes	The benchmark measures the amount and distribution of natural habitats in each of Oregon's eight ecoregions, sub-categorized by four major habitat types: forests, shrublands, grasslands, and wetlands and riparian areas. The term `natural habitats' refers to those which are dominated primarily by native plant species and: 1) contain habitat types present at the beginning of European settlement circa 1850; or 2) have habitats created and/or maintained by natural factors; or 3) have natural disturbance events that proceed without major interference or are mimicked through management; or 4) are managed primarily for native ecosystems, plant communities and species. Data are be derived largely from 2001-03 multispectral thematic mapper (TM) satellite imagery collected and distributed by the US Geological Survey (USGS) in the early spring and early and late summer collected over a three-year period.

Indicator	Invasive Species
Appropriate Indicator Class*	NA
Indicator Measure Description	Number of most threatening invasive species not successfully excluded or contained since 2000
Location	Oregon
Organization	Oregon Progress Board
Indicator Program in Use?	Yes
Framework	NA
Available Data	Oregon Invasive Species Council
Threshold or Target	Zero
Limitations and Challenges	Does not include already established invasive species. Data is not robust.
Use by additional programs	NA
Personal Contact (if available)	Oregon Invasive Species Council
Website	http://benchmarks.oregon.gov/
Notes	The list of the 100 most dangerous invasive species threatening the state is updated annually by the Oregon Invasive Species Council. This benchmark does not include invasive species that were in Oregon prior to 2000 such as Scotch broom.

Indicator	Land Cover Change-Urbanization
Appropriate Indicator Class*	Terrestrial
Indicator Measure Description	The composition metrics contained in this indicator include percent of urban and forest land cover.
Location	WA, Canada
Organization	EPA--Puget Sound Georgia Basin
Indicator Program in Use?	Yes
Framework	NA
Available Data	Coastal Change Analysis Project (CCAP); LandSat; 5-7 year assessments
Threshold or Target	Undefined
Limitations and Challenges	Scale of data may produce error in analyses
Use by additional programs	NA
Personal Contact (if available)	EPA-Region 10
Website	http://www.epa.gov/pugetsound/
Notes	Metrics that serve as indicators of landscape patterns aim to measure two major characteristics of the landscape: land cover composition and spatial configuration. Landscape composition refers to the presence and amount of different patch types within the landscape without explicitly describing its relative spatial features.

Indicator	River, Stream and Lake Quality
Appropriate Indicator Class*	Aquatic and Riparian
Indicator Measure Description	This indicator describes the quality of freshwater found in water bodies such as rivers, streams, lakes, creeks and sloughs in 2003. Stream quality is measured by a water quality index (physical and chemical properties) and an index of biological integrity (health of biological organisms at the base of the food chain).
Location	WA, Canada
Organization	EPA--Puget Sound Georgia Basin
Indicator Program in Use?	Yes
Framework	NA
Available Data	(1) Water quality index for sites in the Puget Sound Georgia Basin (2003) and (2) Index of Biological Integrity (IBI) for sites in the Puget Sound Georgia Basin
Threshold or Target	Applicable ratings based on Index scores
Limitations and Challenges	Data may be limited. Monitoring is focused on water bodies of concern. The water quality score received by a water body is dependent on the number of water quality objectives for that resource.
Use by additional programs	NA
Personal Contact (if available)	Dave Hallock, Washington State Department of Ecology (360) 407-6681; Les Swain, Water Quality Network Specialist, BC Ministry of Environment: Phone: (250) 387-4227
Website	http://www.epa.gov/pugetsound/
Notes	NA

Indicator	Shellfish
Appropriate Indicator Class*	Aquatic and Riparian
Indicator Measure Description	Annual net change in commercial shellfish area (combined commercial and recreational areas in British Columbia).
Location	WA, Canada
Organization	EPA--Puget Sound Georgia Basin
Indicator Program in Use?	Yes
Framework	NA
Available Data	1995-present; Indicator data – estimates of reclassified commercial shellfish area calculated by Washington Department of Health and documented in sanitary survey reports for individual shellfish growing areas. In Canada, shellfish growing area classification is performed by the Marine Water Quality Monitoring Unit (MWQM) of Environment Canada (EC).
Threshold or Target	Undefined
Limitations and Challenges	Calculations of total and reclassified shellfish area continue to gain accuracy with improvements in Geographic Information System (GIS) mapping systems.
Use by additional programs	NA
Personal Contact (if available)	Tim Determan, Washington State Department of Health, tim.determan@doh.wa.gov Stuart Glasoe, Puget Sound Action Team, sglasoe@psat.wa.gov and (360) 725-5449 Stewart Yee, Environment Canada, stewart.yee@ec.gc.ca and (604) 666-2037
Website	http://www.epa.gov/pugetsound/
Notes	NA

Indicator	Marine Species at Risk
Appropriate Indicator Class*	Aquatic and Riparian
Indicator Measure Description	The indicator is the count of the newly listed species but the data profile contains the information used to bring about the new or changes to listings by the appropriate agencies.
Location	WA, Canada
Organization	EPA--Puget Sound Georgia Basin
Indicator Program in Use?	Yes
Framework	NA
Available Data	Total population estimates and/or trends of Marine Species at Risk found within the Puget Sound Georgia Basin and listed by any of the following jurisdictions: the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), BC's Conservation Data Centre (BC Ministry of Sustainable Resource Management), US Fish & Wildlife Service, National Oceanic and Atmospheric Administration and the Washington State Fish & Wildlife Commission, between September 2002 and 2004. Total data set is 30 years.
Threshold or Target	Undefined
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	BC: Glen Rasmussen, Department of Fisheries and Oceans Canada: (250) 756-7095 or Rasmusseng@pac.dfo-mpo.gc.ca WA: Joe Gaydos, The SeaDoc Society: (360) 376-3910 or jkgaydos@ucdavis.edu, and Mary Lou Mills, Washington State Department of Fish & Wildlife: (360) 902-2834 or millsmmlm@dfw.wa.gov
Website	http://www.epa.gov/pugetsound/
Notes	The commonality for the indicator is that some members of the population at risk utilize the Puget Sound or Georgia Basin for part of their life. For some species this area is only used for a very short time by a small part of the population at risk and for others like the two salmon species, the Georgia Basin provides key spawning and rearing habitat.

Indicator	Marine Water Quality
Appropriate Indicator Class*	Aquatic and Riparian
Indicator Measure Description	Marine Water Quality – Characterization of Seawater Density Stratification – as an indicator of how mixed is the water column, how resilient it is to mixing, and how likely water quality vertical gradients (e.g., oxygen depletion, concentration of surface pollutants) will be established.
Location	WA, Canada
Organization	EPA--Puget Sound Georgia Basin
Indicator Program in Use?	Yes
Framework	NA
Available Data	1998-2004:Data from Washington are collected monthly and were pooled for 1998-2004. Data from British Columbia are seasonal (4 times a year) and were collected over the period 1999-2004
Threshold or Target	Undefined
Limitations and Challenges	The data are representative of the station where measured; the spatial scale of the station's representativeness is not known and is expected to vary over the study area.
Use by additional programs	NA
Personal Contact (if available)	Contact for raw data for Washington State is Skip Albertson, (360) 407-6676 and salb461@ecy.wa.gov
Website	http://www.epa.gov/pugetsound/
Notes	NA

Indicator	Water Temperature
Appropriate Indicator Class*	Aquatic and Riparian
Indicator Measure Description	Changes in water temperature patterns that affect aquatic life.
Location	Oregon Coast
Organization	Oregon Coastal Watershed Health: OWEB and Coastal Watershed Councils
Indicator Program in Use?	Unknown since 2008
Framework	NA
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	www.oregonwatersheds.net/coast/index.php
Notes	NA

Indicator	Water Quality
Appropriate Indicator Class*	Aquatic and Riparian
Indicator Measure Description	Changes in water quality, both harmful to fish and public health. Evaluated based on the extent to which parameters meet or exceed DEQ standards.
Location	Oregon Coast
Organization	Oregon Coastal Watershed Health: OWEB and Coastal Watershed Councils
Indicator Program in Use?	Unknown since 2008
Framework	NA
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	www.oregonwatersheds.net/coast/index.php
Notes	NA

Indicator	Water Quantity
Appropriate Indicator Class*	Aquatic and Riparian
Indicator Measure Description	Inadequate summer stream flows that limit fish production and increase water temperatures. Elevated winter peak flow magnitudes that increase scour, bank erosion, and/or otherwise degrade channel function and fish habitat.
Location	Oregon Coast
Organization	Oregon Coastal Watershed Health: OWEB and Coastal Watershed Councils
Indicator Program in Use?	Unknown since 2008
Framework	NA
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	www.oregonwatersheds.net/coast/index.php
Notes	NA

Indicator	Spawning Gravel Quantity
Appropriate Indicator Class*	Aquatic and Riparian
Indicator Measure Description	Sufficient spawning gravel available to produce enough fry to seed the rearing habitat given adequate adult escapement, as defined by ODFW habitat benchmarks for percent of riffle area covered with gravel.
Location	Oregon Coast
Organization	Oregon Coastal Watershed Health: OWEB and Coastal Watershed Councils
Indicator Program in Use?	Unknown since 2008
Framework	NA
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	www.oregonwatersheds.net/coast/index.php
Notes	NA

Indicator	Spawning Gravel Quality
Appropriate Indicator Class*	Aquatic and Riparian
Indicator Measure Description	The quality of spawning gravel as measured by the degree of embeddedness in comparison to reference conditions for the stream type and geology, as defined by ODFW benchmarks for percent of riffle area covered with fine sediments.
Location	Oregon Coast
Organization	Oregon Coastal Watershed Health: OWEB and Coastal Watershed Councils
Indicator Program in Use?	Unknown since 2008
Framework	NA
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	www.oregonwatersheds.net/coast/index.php
Notes	NA

Indicator	Stream Complexity: winter rearing habitat
Appropriate Indicator Class*	Aquatic and Riparian
Indicator Measure Description	From Coho Conservation Plan (2006): "Stream complexity and high quality over-winter rearing habitat refer to the same thing." Present only in areas where the stream is fairly low gradient (less than 2%) and there are broad valley areas near the stream. Usually recognizable by one or more of the following features: large wood, pools, connected off-channel alcoves, beaver ponds, lakes, and connected floodplains and wetlands.
Location	Oregon Coast
Organization	Oregon Coastal Watershed Health: OWEB and Coastal Watershed Councils
Indicator Program in Use?	Unknown since 2008
Framework	NA
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	www.oregonwatersheds.net/coast/index.php
Notes	NA

Indicator	Stream Complexity: summer rearing habitat
Appropriate Indicator Class*	Aquatic and Riparian
Indicator Measure Description	Complex summer rearing habitat includes the components above with an emphasis on appropriate water temperatures, accessible areas of cold water refugia, and abundant complex pools with adequate depth, structure, and hiding cover.
Location	Oregon Coast
Organization	Oregon Coastal Watershed Health: OWEB and Coastal Watershed Councils
Indicator Program in Use?	Unknown since 2008
Framework	NA
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	www.oregonwatersheds.net/coast/index.php
Notes	NA

Indicator	Large Wood
Appropriate Indicator Class*	Aquatic and Riparian
Indicator Measure Description	Large in-channel wood (usually conifer) that forms pools and/or provides complex structure and hiding cover, as defined by ODFW benchmarks for number of pieces and/or volume.
Location	Oregon Coast
Organization	Oregon Coastal Watershed Health: OWEB and Coastal Watershed Councils
Indicator Program in Use?	Unknown since 2008
Framework	NA
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	www.oregonwatersheds.net/coast/index.php
Notes	NA

Indicator	Barriers
Appropriate Indicator Class*	Aquatic and Riparian
Indicator Measure Description	Fragmented aquatic habitats that affect the dispersal of aquatic life and reduce access to key habitats. This includes structures blocking fish passage and unscreened water diversions. For example, reduced access to spawning/rearing habitat in tributaries from a culvert that is a barrier to fish passage.
Location	Oregon Coast
Organization	Oregon Coastal Watershed Health: OWEB and Coastal Watershed Councils
Indicator Program in Use?	Unknown since 2008
Framework	NA
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	www.oregonwatersheds.net/coast/index.php
Notes	NA

Indicator	Channel Modification
Appropriate Indicator Class*	Aquatic and Riparian
Indicator Measure Description	A stream channel that is altered from its normal channel movement, particularly providing an abundance of low velocity habitats. Typical channel modifications include gravel extraction, channel straightening, bank armoring and channel relocation. These actions reduce key habitat features such as pools, gravel bars, lateral scour pools, side channels and habitat complexity.
Location	Oregon Coast
Organization	Oregon Coastal Watershed Health: OWEB and Coastal Watershed Councils
Indicator Program in Use?	Unknown since 2008
Framework	NA
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	www.oregonwatersheds.net/coast/index.php
Notes	NA

Indicator	Invasive Species
Appropriate Indicator Class*	Aquatic and Riparian
Indicator Measure Description	Non-native animal and plant species that affect the aquatic environment. Includes exotic fish species that compete with, prey on, or displace native fish species.
Location	Oregon Coast
Organization	Oregon Coastal Watershed Health: OWEB and Coastal Watershed Councils
Indicator Program in Use?	Unknown since 2008
Framework	NA
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	www.oregonwatersheds.net/coast/index.php
Notes	NA

Indicator	Hatchery Impacts
Appropriate Indicator Class*	Aquatic and Riparian
Indicator Measure Description	Impacts to wild anadromous fish populations from improper hatchery management, including the following possible risk factors: genetic (inbreeding, unintentional natural selection, etc), ecological (competition, carrying capacity, etc.), behavioral, diseases, and other factors.
Location	Oregon Coast
Organization	Oregon Coastal Watershed Health: OWEB and Coastal Watershed Councils
Indicator Program in Use?	Unknown since 2008
Framework	NA
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	www.oregonwatersheds.net/coast/index.php
Notes	NA

Indicator	Riparian Stand Condition
Appropriate Indicator Class*	Aquatic and Riparian
Indicator Measure Description	Riparian stand conditions that affect normal succession to native vegetation (for example, blackberry areas) or influence the recruitment of large wood to the aquatic system (for example, an alder stand where there would normally be conifers).
Location	Oregon Coast
Organization	Oregon Coastal Watershed Health: OWEB and Coastal Watershed Councils
Indicator Program in Use?	Unknown since 2008
Framework	NA
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	www.oregonwatersheds.net/coast/index.php
Notes	NA

Indicator	Riparian roads
Appropriate Indicator Class*	Aquatic and Riparian
Indicator Measure Description	Roads prevent establishment of native streamside vegetation, deliver sediment, interrupt ground water flow, and provide a pathway for non-native exotic species.
Location	Oregon Coast
Organization	Oregon Coastal Watershed Health: OWEB and Coastal Watershed Councils
Indicator Program in Use?	Unknown since 2008
Framework	NA
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	www.oregonwatersheds.net/coast/index.php
Notes	NA

Indicator	Riparian invasive species
Appropriate Indicator Class*	Aquatic and Riparian
Indicator Measure Description	Non-native plants and animals that modify riparian habitats and displace native species.
Location	Oregon Coast
Organization	Oregon Coastal Watershed Health: OWEB and Coastal Watershed Councils
Indicator Program in Use?	Unknown since 2008
Framework	NA
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	www.oregonwatersheds.net/coast/index.php
Notes	NA

Indicator	Freshwater wetland habitat loss
Appropriate Indicator Class*	Aquatic and Riparian
Indicator Measure Description	Loss of wetlands due to drainage, dredging, deposition of dredged material, levees, diking, tiling, development, and other means. Loss of wetlands impacts water quality, water storage, flood abatement, and wildlife habitat.
Location	Oregon Coast
Organization	Oregon Coastal Watershed Health: OWEB and Coastal Watershed Councils
Indicator Program in Use?	Unknown since 2008
Framework	NA
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	www.oregonwatersheds.net/coast/index.php
Notes	NA

Indicator	Freshwater wetland habitat function
Appropriate Indicator Class*	Aquatic and Riparian
Indicator Measure Description	Alterations to existing wetlands that reduce wetland functions - water filtering, flood storage, and wildlife habitat. Water quality functions are reduced by grazing or other types of vegetation removal. Flood storage functions are impacted by hydrologic modifications that change the inflow or outflow of the wetland. Flood storage capacity can also be reduced by decreasing the width of wetlands associated with streams. \ Alterations in vegetation, hydrology, plant diversity (usually by invasive species), and development around wetland areas can reduce wetland habitat functions.
Location	Oregon Coast
Organization	Oregon Coastal Watershed Health: OWEB and Coastal Watershed Councils
Indicator Program in Use?	Unknown since 2008
Framework	NA
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	www.oregonwatersheds.net/coast/index.php
Notes	NA

Indicator	Freshwater wetland connectivity
Appropriate Indicator Class*	Aquatic and Riparian
Indicator Measure Description	Loss and/or degradation of the physical connection between surface water sources and wetlands. In the context of this assessment wetland connectivity relates primarily to the loss of access by juvenile salmonids to off-channel wetland habitats.
Location	Oregon Coast
Organization	Oregon Coastal Watershed Health: OWEB and Coastal Watershed Councils
Indicator Program in Use?	Unknown since 2008
Framework	NA
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	www.oregonwatersheds.net/coast/index.php
Notes	NA

Indicator	Hydrology modification
Appropriate Indicator Class*	Terrestrial
Indicator Measure Description	Roads, impervious surfaces, and land uses that affect water runoff timing, magnitude of peak and low flows, and storage. For example, urbanization and improper storm water management that modifies peak flows through stream channels. Land not having tree or shrub coverage is classified as development. Urban, agricultural, and small grassland areas are included in the classification. Human development of roads, housing, agriculture, diversions and some recreational activities can have adverse effects on anadromous fish and landscape functionality.
Location	Oregon Coast
Organization	Oregon Coastal Watershed Health: OWEB and Coastal Watershed Councils
Indicator Program in Use?	Unknown since 2008
Framework	NA
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	www.oregonwatersheds.net/coast/index.php
Notes	NA

Indicator	Fine sediment sources
Appropriate Indicator Class*	Terrestrial
Indicator Measure Description	Increased sediment delivery to the aquatic system from changes in land use patterns and management. For example, road practices or other land use management that increases soil erosion rates and delivery to stream channels.
Location	Oregon Coast
Organization	Oregon Coastal Watershed Health: OWEB and Coastal Watershed Councils
Indicator Program in Use?	Unknown since 2008
Framework	NA
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	www.oregonwatersheds.net/coast/index.php
Notes	NA

Indicator	Invasive Species
Appropriate Indicator Class*	Terrestrial
Indicator Measure Description	Non-native plants and animals that modify terrestrial habitats and displace native species.
Location	Oregon Coast
Organization	Oregon Coastal Watershed Health: OWEB and Coastal Watershed Councils
Indicator Program in Use?	Unknown since 2008
Framework	NA
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	www.oregonwatersheds.net/coast/index.php
Notes	NA

Indicator	Habitat fragmentation
Appropriate Indicator Class*	Terrestrial
Indicator Measure Description	Fragmented terrestrial habitats that affect wildlife/plant dispersal and connectivity across the landscape. Human-caused forest fragmentation is one metric that can be used to evaluate the extent of habitat fragmentation in the Oregon Coast Range.
Location	Oregon Coast
Organization	Oregon Coastal Watershed Health: OWEB and Coastal Watershed Councils
Indicator Program in Use?	Unknown since 2008
Framework	NA
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	www.oregonwatersheds.net/coast/index.php
Notes	NA

Indicator	Upland large wood recruitment
Appropriate Indicator Class*	Terrestrial
Indicator Measure Description	Description is undefined.
Location	Oregon Coast
Organization	Oregon Coastal Watershed Health: OWEB and Coastal Watershed Councils
Indicator Program in Use?	Unknown since 2008
Framework	NA
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	www.oregonwatersheds.net/coast/index.php
Notes	NA

Indicator	Hydrologic modification of tidal wetlands
Appropriate Indicator Class*	Estuarine
Indicator Measure Description	Man-made alterations that restrict tidal flow, hydrologic alterations can reduce or greatly alter nearly all tidal wetland functions, and in some cases completely eliminate those functions. Major types of hydrologic alterations include diking, tide gates, restrictive culverts, fill, excavation, dams, ditching, tiling, and other changes to hydrology (including changes to nontidal flows entering tidal wetlands). Fill includes dredged material disposal, road and railroad crossings, channel armor, etc.
Location	Oregon Coast
Organization	Oregon Coastal Watershed Health: OWEB and Coastal Watershed Councils
Indicator Program in Use?	Unknown since 2008
Framework	NA
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	www.oregonwatersheds.net/coast/index.php
Notes	NA

Indicator	Sediment regime
Appropriate Indicator Class*	Estuarine
Indicator Measure Description	Increased or reduced sediment delivery to the tidal wetlands from changes in land use patterns and management.
Location	Oregon Coast
Organization	Oregon Coastal Watershed Health: OWEB and Coastal Watershed Councils
Indicator Program in Use?	Unknown since 2008
Framework	NA
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	www.oregonwatersheds.net/coast/index.php
Notes	NA

Indicator	Water quality
Appropriate Indicator Class*	Estuarine
Indicator Measure Description	Changes in water quality, both harmful to fish and public health. Evaluated based on the extent to which parameters meet or exceed DEQ standards.
Location	Oregon Coast
Organization	Oregon Coastal Watershed Health: OWEB and Coastal Watershed Councils
Indicator Program in Use?	Unknown since 2008
Framework	NA
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	www.oregonwatersheds.net/coast/index.php
Notes	NA

Indicator	Vegetation modification
Appropriate Indicator Class*	Estuarine
Indicator Measure Description	Change or reduction of wetland vegetation through agricultural or other management practices. Tillage, grazing and logging compact soils, contribute to soil erosion of channel banks, and reduce vegetation diversity and wildlife habitat.
Location	Oregon Coast
Organization	Oregon Coastal Watershed Health: OWEB and Coastal Watershed Councils
Indicator Program in Use?	Unknown since 2008
Framework	NA
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	www.oregonwatersheds.net/coast/index.php
Notes	NA

Indicator	Invasive Species
Appropriate Indicator Class*	Estuarine
Indicator Measure Description	Non-native species that displace native species and alter the tidal wetland ecosystem. These species are characteristically adaptable, aggressive, and have a high reproductive capacity.
Location	Oregon Coast
Organization	Oregon Coastal Watershed Health: OWEB and Coastal Watershed Councils
Indicator Program in Use?	Unknown since 2008
Framework	NA
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	www.oregonwatersheds.net/coast/index.php
Notes	NA

Indicator	Complete wetland loss
Appropriate Indicator Class*	Estuarine
Indicator Measure Description	Wetland loss occurs with complete fill and conversion to developed uses, or other irreversible changes. In contrast to hydro-modification, this refers to historic conversion to cities, developments, etc. with no opportunity for restoration.
Location	Oregon Coast
Organization	Oregon Coastal Watershed Health: OWEB and Coastal Watershed Councils
Indicator Program in Use?	Unknown since 2008
Framework	NA
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	www.oregonwatersheds.net/coast/index.php
Notes	NA

Indicator	Hydrologic modification of tidal flats
Appropriate Indicator Class*	Estuarine
Indicator Measure Description	Man-made alterations that restrict tidal flow. Major types of hydrologic alterations include diking, tide gates, restrictive culverts, fill, excavation, dams, ditching, tiling, and other changes to hydrology (including changes to nontidal flows entering tidal wetlands). Fill includes dredged material disposal, road and railroad crossings, channel armor, etc.
Location	Oregon Coast
Organization	Oregon Coastal Watershed Health: OWEB and Coastal Watershed Councils
Indicator Program in Use?	Unknown since 2008
Framework	NA
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	www.oregonwatersheds.net/coast/index.php
Notes	NA

Indicator	Loss of Tidal Flats
Appropriate Indicator Class*	Estuarine
Indicator Measure Description	Tidal flat loss occurs with complete fill and conversion to developed uses, or other irreversible changes. In contrast to hydro-modification, this refers to historic conversion to cities, developments, etc. with no opportunity for restoration.
Location	Oregon Coast
Organization	Oregon Coastal Watershed Health: OWEB and Coastal Watershed Councils
Indicator Program in Use?	Unknown since 2008
Framework	NA
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	www.oregonwatersheds.net/coast/index.php
Notes	NA

Indicator	Sediment regime of tidal flats
Appropriate Indicator Class*	Estuarine
Indicator Measure Description	Increased or reduced sediment delivery to the tidal flats from changes in land use patterns and management.
Location	Oregon Coast
Organization	Oregon Coastal Watershed Health: OWEB and Coastal Watershed Councils
Indicator Program in Use?	Unknown since 2008
Framework	NA
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	www.oregonwatersheds.net/coast/index.php
Notes	NA

Indicator	Water quality in tidal flats
Appropriate Indicator Class*	Estuarine
Indicator Measure Description	Changes in water quality, both harmful to fish and public health. Evaluated based on the extent to which parameters meet or exceed DEQ standards.
Location	Oregon Coast
Organization	Oregon Coastal Watershed Health: OWEB and Coastal Watershed Councils
Indicator Program in Use?	Unknown since 2008
Framework	NA
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	www.oregonwatersheds.net/coast/index.php
Notes	NA

Indicator	Invasive species in tidal flats
Appropriate Indicator Class*	Estuarine
Indicator Measure Description	Non-native species that displace native species and alter the tidal flat ecosystem. These species are characteristically adaptable, aggressive, and have a high reproductive capacity.
Location	Oregon Coast
Organization	Oregon Coastal Watershed Health: OWEB and Coastal Watershed Councils
Indicator Program in Use?	Unknown since 2008
Framework	NA
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	www.oregonwatersheds.net/coast/index.php
Notes	NA

Indicator	Sub-tidal hydrologic modification
Appropriate Indicator Class*	Estuarine
Indicator Measure Description	Man-made alterations that restrict tidal flow. Major types of hydrologic alterations include diking, tide gates, restrictive culverts, fill, excavation, dams, ditching, tiling, and other changes to hydrology (including changes to nontidal flows entering tidal wetlands). Fill includes dredged material disposal, road and railroad crossings, channel armor, etc.
Location	Oregon Coast
Organization	Oregon Coastal Watershed Health: OWEB and Coastal Watershed Councils
Indicator Program in Use?	Unknown since 2008
Framework	NA
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	www.oregonwatersheds.net/coast/index.php
Notes	NA

Indicator	Sub-tidal sediment regime
Appropriate Indicator Class*	Estuarine
Indicator Measure Description	Increased or reduced sediment delivery to the sub-tidal zone from changes in land use patterns and management.
Location	Oregon Coast
Organization	Oregon Coastal Watershed Health: OWEB and Coastal Watershed Councils
Indicator Program in Use?	Unknown since 2008
Framework	NA
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	www.oregonwatersheds.net/coast/index.php
Notes	NA

Indicator	Sub-tidal water quality
Appropriate Indicator Class*	Estuarine
Indicator Measure Description	Changes in water quality, both harmful to fish and public health. Evaluated based on the extent to which parameters meet or exceed DEQ standards.
Location	Oregon Coast
Organization	Oregon Coastal Watershed Health: OWEB and Coastal Watershed Councils
Indicator Program in Use?	Unknown since 2008
Framework	NA
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	www.oregonwatersheds.net/coast/index.php
Notes	NA

Indicator	Sub-tidal invasive species
Appropriate Indicator Class*	Estuarine
Indicator Measure Description	Non-native species that displace native species and alter the sub-tidal zone ecosystem. These species are characteristically adaptable, aggressive, and have a high reproductive capacity.
Location	Oregon Coast
Organization	Oregon Coastal Watershed Health: OWEB and Coastal Watershed Councils
Indicator Program in Use?	Unknown since 2008
Framework	NA
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	www.oregonwatersheds.net/coast/index.php
Notes	NA

Indicator	Complete sub-tidal zone loss
Appropriate Indicator Class*	Estuarine
Indicator Measure Description	Sub-tidal wetland loss occurs with complete fill and conversion to developed uses, or other irreversible changes. In contrast to hydro-modification, this refers to historic conversion to cities, developments, etc. with no opportunity for restoration.
Location	Oregon Coast
Organization	Oregon Coastal Watershed Health: OWEB and Coastal Watershed Councils
Indicator Program in Use?	Unknown since 2008
Framework	NA
Available Data	NA
Threshold or Target	NA
Limitations and Challenges	NA
Use by additional programs	NA
Personal Contact (if available)	NA
Website	www.oregonwatersheds.net/coast/index.php
Notes	NA