



Glossary, Acronyms, and Index



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GLOSSARY

Abiotic Factors — The nonliving physical and chemical aspects of an organism's environment. Abiotic refers to such factors as light, temperature, and topography.

Adaptive Management — A principle that incorporates monitoring and research into conservation actions. Specifically, it is the integration of planning, management, and monitoring to test assumptions in order to adapt and learn.

Adsorbed — The accumulation of gases, liquids, or solutes on the surface of a solid or liquid.

Algae — One-celled (phytoplankton) or multi-cellular plants either suspended in water (plankton) or attached to rocks and other substrates (periphyton). Algae are an essential part of the lake ecosystem and provide the food base for most lake organisms, including fish. Phytoplankton populations vary widely from day to day because life cycles are short.

Alkalinity — A measure of the amount of carbonates, bicarbonates, and hydroxide present in water. Low alkalinity is the main indicator of susceptibility to acid rain; increased alkalinity is often related to increased algae productivity.

Alleles — Forms of a gene. One of two or more alternative forms of a gene, occupying the same position on paired chromosomes and controlling the same inherited characteristic.

Ammonia — The first form of nitrogen released when organic matter decays. It can be used by most aquatic plants and is, therefore, an important nutrient.

Amphipod — A small crustacean of the order Amphipoda, such as the sand flea, having a laterally compressed body with no carapace.

Anadromous — Migrating up rivers from the sea to spawn (reproduce) in fresh water.

Angler — A person who fishes with a rod and reel.

Anthropocentric — Those engaged in wilderness management have found it useful to characterize impacts to wilderness values according to two alternative philosophical perspectives on wilderness: anthropocentric and biocentric. The *anthropocentric* perspective emphasizes human use and enjoyment of wilderness.

Aquatic invertebrates — Aquatic animals without an internal skeletal structure such as insects, mollusks, and crayfish.

Bathymetry — The measurement of water depth at various places in a water body. The physical characteristics including depth, contour, and shape of the bottom of a body of water.

Benthic — Relating to or characteristic of the bottom of a sea, lake, or deep river. The benthic community is composed of a wide range of plants, animals, and bacteria from all levels of the food web.

Benthic Macroinvertebrate — Macroinvertebrates are large, generally soft-bodied organisms that lack backbones. Benthic macroinvertebrates live in or on the bottom sediment in aquatic environments.

Benthos — A group of organisms, most often invertebrates, that live in or on the bottom in aquatic habitats (such as clams that live in the sediments) which are typically immotile or of limited motility or range.

Bioaccumulation — The accumulation of a harmful substance, such as a heavy metal or an organochlorine, in a biological organism, especially one that forms part of the food chain.

Bioassay — A simple biological test that uses an indicator organism to measure the potency of a given substance in a biological system. An example of a bioassay would be a test that measures algal growth in response to different nutrient concentrations.

Biocentric — Those engaged in wilderness management have found it useful to characterize impacts to wilderness values according to two alternative philosophical perspectives on wilderness: anthropocentric and biocentric. The *biocentric* perspective emphasizes protection and maintenance of natural processes and conditions.

Biological Diversity — The variety of life on Earth. It generally refers to the variety of species within an ecosystem or community. The greater the diversity or variety there is in a system, the greater the strength and stability the system has over the long run; diversity strengthens the potential of a population to cope with, or respond to, changes in the environment.

Biological Integrity — Biological integrity refers to the capability of supporting and maintaining a balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of the natural habitat of the region.

Biomass — The total amount of living organisms (plants and animals) in a lake. Measured as organisms per cubic meter, biomass indicates the degree of a lake system's productivity.

Biota — The combined plant and animal life of a particular region.

Blue-Green Algae — Algae that are often associated with problem blooms in lakes. Some produce chemicals toxic to other organisms, including humans.

Broodstock — Animals or fish with a common origin that are kept for breeding; for example, the pool of captured adult salmon a hatchery has available for artificial spawning. This pool can be made up of wild and/or returning hatchery salmon.

Cilia — A microscopic hair-like process extending from the surface of a cell or one-celled organism.

Cyprinids — Freshwater fish of the family that includes carp and minnows, typically with rounded scales, soft fins, and toothless jaws.

Copepod — A type of crustacean zooplankton that exhibits a wide variety of feeding preferences, even consuming other zooplankton. The larger copepods are an important component of the food base for larger vertebrate organisms such as larval amphibians and fish.

Cirque — A steep bowl-shaped hollow occurring at the upper end of a mountain valley, especially one formed by the erosive activity of a glacier.

Crustacean Zooplankton — The animal form of plankton that has a segmented body, paired, jointed appendages, and a hard outer skeleton; one example is a copepod.



Deciduous — Trees that lose their leaves at the end of the growing season; also called hardwoods.

Desired Future Conditions — In this case, describes what the lake and lake environment should be like after implementation of the management actions contain in this plan/EIS. It summarizes the anticipated physical changes that would result from carrying out planned management actions. It is an expression of resource goals that have been set for a lake and lake environment and describes the lake as it would appear when the goals set for it have been achieved. It includes a description of physical and biological processes, the environmental setting, and the human experience.

Diaptomid copepod — A family of free-living largely planktonic copepods with very long first antennae.

Diatom — Any of various microscopic one-celled or colonial algae (planktonic) of the class Bacillariophyceae, having cell walls of silica consisting of two interlocking symmetrical valves.

Ecology — The study of the interrelationships between organisms and their environments.

Ecosystem — A community of living organisms interacting with one another and with their physical environment, such as a forest, pond, or estuary.

Ecotone — A zone of transition between two different ecosystems.

Endemic — Native to or confined to a certain region.

Endorheic Lakes — Lakes whose surface waters do not flow to the ocean. They are also called terminal or sink lakes. Their watersheds are often contained within a mountain range or other natural geologic feature that has severed their direct hydrologic connection to the ocean. Because their inflowing waters subsequently flow into dry watercourses or are evaporated, minerals and other inflow erosion products concentrate within these water bodies. With a continuing mineral input, some water bodies typically become saline compared to water bodies that drain to the oceans. Because evaporation plus seepage are the major water outflow pathway, endorheic water-bodies also tend to be more sensitive to pollutant inputs than water bodies that drain to the oceans.

EIS – Environmental Impact Statement — The *National Environmental Policy Act of 1969* requires that an environmental impact statement be prepared to evaluate the potential environmental effects of major federal actions. An EIS identifies and analyzes activities that might affect the human and natural environment.

Ephemeral — Short-lived; existing or continuing for a short time only.

Escapement Goal — The number of adult fish desired to return to their spawning habitat in a lake, river, or stream in order to meet management objectives.

Eutrophic Lakes — Lakes that are high in nutrients and support a large biomass (all the plants and animals living in a lake). They are usually either weedy or subject to frequent algae blooms, or both. Eutrophic lakes often support large fish populations but are also susceptible to oxygen depletion.

Eutrophication — The process by which lakes and streams are enriched by nutrients and the resulting increase in plant and algae. The extent to which this process has occurred is reflected in a lake's trophic classification:

Oligotrophic – nutrient poor

Mesotrophic – moderately productive
 Eutrophic – very productive and fertile

Evolutionarily Significant Unit (ESU) — A set of populations that is morphologically and genetically distinct from other similar populations and with a distinct evolutionary history. Recognized for purposes of Endangered Species Act protection.

Extirpated Species — A species that is no longer present in an area where it once lived. This could be the result of several environmental factors, including human activities.

Flocculent Bottom — The joining of small colloids (a particle-size range of less than 0.00024 millimeters) into a small group of soil particles and the deposition or settling out of the water of these small colloids onto the bottom of a lake.

Floodplain — Land adjacent to a river that is periodically subject to flooding.

Food Web — The hierarchy of organisms in a community according to the order of predation from one to another; usually, the lower members are the food source for members higher on the food web.

Fragmentation — The breaking up of large and continuous ecosystems, communities, and habitats into small, discontinuous areas that are surrounded by altered or disturbed lands or aquatic features.

Fyke Net — A fish trap shaped like a bag, cylinder, or cone mounted on rings, with funnels that direct fish into successive compartments; also called a wing net.

Genotype — The genetic makeup of an organism as opposed to its physical characteristics.

Geographic Connectivity — The concept that one location is close enough in proximity and without obstacles to allow genetic interchange by target organisms in that location with organisms in another location.

Goal — A concise statement that describes intended results or desired conditions and that are normally expressed in broad, general terms without a specific time frame for achievement. Goals are reached by attaining specific objectives, although not all goals have quantifiable objectives.

Gradient — Pertains to the upward or downward slope (the steepness) of such features as river or stream banks.

Graminoid — Grass-like plants, including grasses, sedges, rushes, reeds, and cattails.

Habitat — The location and the combination of biotic and abiotic surroundings that a particular kind or type of plant or animal occupies for part of its life cycle. It typically includes the substrate (soil, rocks, water), other nonliving features, vegetation, and often, other organisms.

Haplotype — A set of closely linked genes inherited as a unit. A contraction of the phrase "haploid genotype" (genotype is the genetic makeup of an organism). "Haplo" comes from the Greek word for "single."

Headwater Lakes or Streams — The water from which a river or lake originates; the source.

Historic Range — Those geographic areas a species was known or believed to occupy in the past.



Hybridization — Interbreeding that results in combining the genes of two different species or other taxa in the resulting generation of organisms (hybrids).

Indicator taxa; indicator species — A species capable of showing early signs of change if ecological conditions change. In the case of this plan/EIS, changes would occur to the ecology of mountain lakes in the study area.

Igneous — Rock formed by the cooling and consolidation of magma.

Indigenous — Living or occurring naturally in an area.

Interbreeding — The mating of related individuals; see also, hybridization.

Intermittent Streams or Lakes — Streams and lakes that only contain water seasonally, or at certain times of the year.

Introgressed — The incorporation of genes from one species into the gene pool of another species as a result of hybridization (crossbreeding).

Juvenile — Any organism that is not adult, for example, the life stage of salmon living in fresh water before entering the ocean, the life stage of a salamander or aquatic insect living in a lake.

Lateral Moraine — A pile of materials carried or pushed by a glacier and deposited along the side of a valley glacier.

Listed Species — A species, subspecies, or distinct vertebrate population segment that has been added to the federal lists of endangered and threatened wildlife and plants as they appear in section 17 of Title 50 of the Code of Federal Regulations (50 CFR 17.11 and 17.12)

Macrobenthos — A term that includes all invertebrates larger than one millimeter that are found in or on the floor of a body of water. This community of organisms is used extensively for environmental monitoring because benthos provide an essential link to fish and birds.

Macroinvertebrates — Aquatic invertebrate organisms that can be seen clearly with the naked eye.

Macrophytes — A macroscopic (large enough to be perceived or examined by the unaided eye) plant.

Meristically — Using physical characteristics to determine the degree of differentiation between two populations.

Metamorphosis — A change in the form and often habits of an animal during normal development after the embryonic stage. Metamorphosis typically includes transformation from one life form to another, such as from a maggot into an adult fly, a caterpillar into a butterfly, or a tadpole into a frog.

Metamorphosed (crystalline rocks) — Rock whose original minerals or textures, or both, have been transformed to new minerals and new textures by reactions in the solid state as a result of high temperature, high pressure, or both.

Metapopulation — Geographically separate populations of the same species that are connected by infrequent, but critical, interbreeding and genetic exchange with nearby populations.

Mitigation — Activities that can prevent, reduce, or compensate for adverse environmental impacts.

Moraine — Landforms composed of unsorted materials deposited by glaciers. They can cover broad geographic areas of millions of acres. Topography can vary from nearly level “till” plains to rough end moraine landscapes composed of steep dry ridges interspersed with deep kettle holes. These glacial “kettles” are frequent locations for lakes and wetlands.

Morphology — The three-dimensional characteristics or form of a feature such as a river channel or of an organism.

Native — A term used to describe an organism that occurs naturally in a specific area or habitat. No species of fish are native to the mountain lakes in the North Cascades Complex, though they may be native to the surrounding basin (for example, the Ross Lake strain of rainbow trout stocked in Ridley Lake).

Natural Variation — The changes that occur naturally in an ecosystem (includes physical characteristics, plants, and animals) over time without human disturbance.

Neotenic Phase — Retention of juvenile characteristics in the adults of a species, as among certain amphibians; the attainment of sexual maturity by an organism still in its larval stage.

Nonmarket Value — Values associated with goods or services over and above their selling price.

Objective — A concise, time-specific statement of measurable planned results that respond to pre-established goals. An objective forms the basis for further planning to define the precise steps to be taken and the resources to be used in achieving identified goals.

Oligotrophic Lakes — Lakes that are generally clear, deep, and free of weeds or large algae blooms. Though beautiful, they are low in nutrients and do not support large fish populations. However, oligotrophic lakes often develop a food web capable of sustaining a very desirable fishery of large game fish.

Omnivores — Eating both animal and plant foods.

Oxidize — To combine with oxygen, or to change (a compound) by increasing the proportion of the electronegative part or change (an element or ion) from a lower to a higher positive valence: remove one or more electrons from (an atom, ion, or molecule).

Paleolimnological — The study of the organic and chemical history of lakes through analysis of bottom sediments. The study of conditions and processes in ancient lakes; interpretation of the conditions and accumulated sediments and the geomorphology and geologic history of ancient lake basins.

Pelagic — Open water.

Phenotype — The visible characteristic of an organism resulting from the interaction between its genetic makeup and the environment.

pH — The measure of the acidity or alkalinity of a solution (such as vinegar) or a damp substance (such as soil). The pH of pure water is 7, with lower numbers indicating acidity and higher numbers indicating alkalinity.

Phytoplankton — Photosynthetic plants that live in water. The phytoplankton community consists of a rich array of microscopic and submicroscopic organisms that include diatoms, blue-green algae, green algae, and photosynthetic flagellates.



Piscivorous — Mammals and birds that feed frequently or mainly on fish.

Piscicide — A chemical that is used to kill fish in a lake.

Plankton — A collective term for a variety of freshwater (and marine) organisms that live within the lighted zone or near the surface of the water. The density of plankton varies, depending on the availability of nutrients and the stability of the water. A liter of lake water may contain more than 500 million planktonic organisms.

Plate Tectonics — The theory of global tectonics that deals with the processes by which the lithosphere (outer 100 kilometers of the solid Earth) is moved laterally over the asthenosphere (the region of the earth that lies 100 to 350 kilometers below the surface where the rocks have little strength and are easily deformed).

Pleistocene Epoch — The period of geologic time between approximately 1.8 million years ago and 11.5 thousand years ago.

Potassium permanganate — A dark purple salt (KMnO₄) used as an oxidizer and disinfectant.

Prehistoric Conditions — Composition, structure, and functioning of ecosystems resulting from natural processes that, based on sound professional judgment, are believed to have been present prior to substantial human-related changes to the landscape.

Query — An inquiry or question.

Rainshadow Effect — A region of relatively low rainfall that occurs downwind of a mountain or mountain range. A rain shadow occurs when wind encounters a mountain and the air is forced upward; this rising air expands and cools. If it cools enough, clouds will form on the upwind side of the mountain and rain or snow will fall. In contrast, as the air descends the downwind side of the mountain, it is warmed by compression, and the clouds dissipate. This reoccurring dissipation causes the downwind side of the mountain to receive relatively less rainfall than the upwind side, and hence, forms a rain shadow.

Range — The geographic area a species is known or believed to occupy.

Reaches (Stream) — The stretch of water visible between bends in a river or channel.

Refugia — An area of relatively unaltered climate that is inhabited by plants and animals during a period of continental climatic change (as a glaciation) and remains as a center of relict forms from which a new dispersion and speciation may take place after climatic readjustment.

Riparian Vegetation — Vegetation found along waterways and shorelines that is adapted to moist growing conditions and occasional flooding.

Risk — The degree of vulnerability to factors detrimental to survival.

Rotifers — Tiny animalian microbes whose Latin name literally means “wheel bearer.” The two wheels on the rotifers are made of cilia that beat and create a current that draws water-born food into their gut.

Salmonid — Fish within the family Salmonidae; includes salmon, trout, char, and whitefish.

Scoping Process — Early and open activities used to determine the scope and significance of a proposed action, what level of analysis is required, what data is needed, and what level of public participation is appropriate. Scoping focuses on the issues surrounding the proposed action and the range of actions, alternatives, and impacts to be considered in an environmental assessment or an EIS.

Sedimentation — Accumulated organic and inorganic matter on the lake bottom. Sediment includes decaying algae and weeds, marl (mixture of clay and lime), and solid and organic matter eroded from the lake's watershed.

Self-sustaining — For this plan/EIS, refers to reproducing fish that are able to maintain populations over time without further stocking.

Smolt — A young anadromous salmonid migrating downstream that has undergone the physiological changes necessary to survive in salt water.

Spawn — The deposition and fertilization of eggs by organisms such as salmon and trout.

Species — A group of individual plants or animals (including subspecies and populations) that have common characteristics and interbreed among themselves and not with other similar groups.

Species of Concern — Refers to those species that might be in need of concentrated conservation actions, which can vary depending on the health of the populations and degree and types of threats. At one extreme, there may only need to be periodic monitoring of populations and threats to the species and its habitat. At the other extreme, a species may need to be listed as a federal threatened or endangered species. Species of concern receive no legal protection, and the use of the term does not necessarily mean that the species will eventually be proposed for listing as a threatened or endangered species.

Substrate — The nonliving material or base upon which plants or animals live or grow.

Synergy/Synergistic — The combined effect or effort is greater than parts; the working together of two or more elements, especially when the result is greater than the sum of their individual effects.

Talus — A sloping mass of rock debris at the base of a cliff.

Tarn — A small mountain lake, especially one formed by the action of glaciers.

Taxon (plural taxa) — Category of organisms. Any of the groups to which organisms are assigned according to the principles of taxonomy, including species, genus, family, order, class, and phylum.

Tectonic — The branch of geology relating to the continuing structural evolution of the earth's crust (for example, the formation of mountains and valleys).

Tectonic Uplift — The geological conditions produced by movements in the earth's crust that elevate rocks, forming mountains.

Total Kjeldahl Nitrogen — A combined measurement of ammonia and organic nitrogen. It can be considered a surrogate measure of overall lake productivity.

Trophic Levels — The various positions of a food web that are occupied by specific organisms (see "Food Web" above).



Turbid/Turbidity — Visible undissolved solid material suspended in water. Increasing the turbidity of the water decreases the amount of light that can penetrate.

Ubiquitous — Being or seeming to be everywhere at the same time; omnipresent.

Untrammeled — Not limited or restricted by human activities.

Unmetamorphosed Sedimentary Rocks — Sedimentary rocks that have not yet undergone metamorphic conditions.

Watershed — The area drained by a river system. It includes the whole region or extent of country that contributes to the supply of a river or lake; the natural boundary of a basin.

Wetland — Areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, wet meadows, and similar areas.

Zooplankton — Microscopic or barely visible animals that eat algae (the animal form of plankton). Freshwater zooplankton found in high mountain lakes would include microscopic animals such as protozoans, rotifers, copepods, and cladocerans. Zooplankton are an important component of the lake food web and ecosystem. For many fish, they are the primary food source.

ACRONYMS AND ABBREVIATIONS

BMI	benthic macroinvertebrate
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CUA	Commercial Use Authorization
EIS	environmental impact statement
EPA	U.S. Environmental Protection Agency
ESU	Evolutionarily Significant Unit
DDE	dichlorodiphenyldichloroethylene
DDT	dichlorodiphenyltrichloroethane
DM	Department Manual
GIS	Geographic Information System
GPS	Global Positioning System
IOC	Index of Connectivity
km	kilogram
mg	milligram
ml	milliliter
MOU	memorandum of understanding
NEPA	<i>National Environmental Policy Act</i>
NHPA	<i>National Historic Preservation Act</i>
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
NRA	national recreation area
OSU	Oregon State University
PCB	polychlorinated biphenyl



pH	potential of hydrogen
PL	Public Law
POP	persistent organic pollutants
SEPA	State Environmental Policy Act
SHPO	State Historic Preservation Office or Officer
SR	State Route
TAC	Technical Advisory Committee
TCP	Tradition Cultural Property
TKN	total Kjeldahl nitrogen
USFWS	United States Fish and Wildlife Service
USC	United States Code
USGS	United States Geological Survey
UTM	Universal Transverse Mercator
WDFW	Washington Department of Fish and Wildlife
WPPA	<i>Washington Park Wilderness Act of 1988</i>

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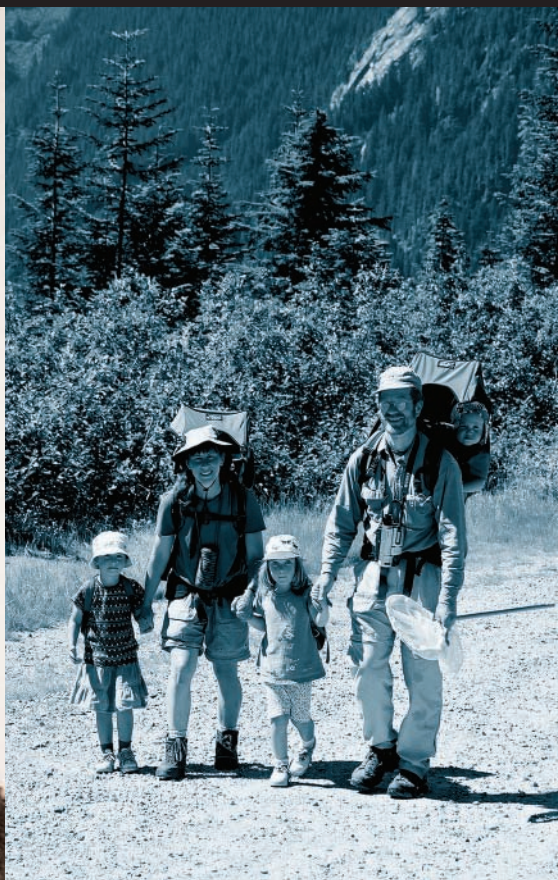
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