

# Chapter 9

## Glossary

abeyance	A state of temporary suspension.
abutment	Structural element that ties a dam into the existing ground.
acclimation (of fish)	The process of a fish adjusting to change in its environment, allowing it to survive changes in temperature, water and food availability, and other stresses.
acre-foot	The amount of water required to cover 1 acre to a depth of 1 foot. One acre-foot equals 326,851 gallons or 43,560 cubic feet. This volume measurement is used to describe a quantity of storage in a reservoir.
adfluvial	Fish who live in lakes and migrate into rivers or stream to spawn.
adjudication	The final judgment in a legal proceeding; the act of pronouncing judgment based on the evidence presented.
Affirmative Determination	A determination by the Secretary of the Interior under Section 3 of the Klamath Hydroelectric Settlement Agreement that facilities removal should proceed.
alluvial	Deposition of sediment over a long period of time by a river; an alluvial layer; pertaining to the soil deposited by a stream.
ammocoete	Juvenile lamprey.
anadromous	A type of fish that hatch in freshwater, migrate to the ocean, mature there, and return to freshwater to spawn. Salmon and steelhead are examples.
anoxic conditions	Conditions with a deficiency of oxygen.

anthropogenic	Made by people or resulting from human activities.
antidegradation policy	A policy designed to prevent deterioration of existing levels of good water quality.
appropriations	Funds set aside (as by a legislature) for a specific purpose.
attraction flows	Drawing fish to dam fishways or spillways through the use of water flows.
bedload sediment	Particles carried along the bottom of a river or stream, rather than in the current.
beneficial use	The uses of a water resource that are protected by state water quality standards. Beneficial uses include human consumption, aquatic life, recreation, and fish and wildlife habitat.
benthic	The ecological region at the lowest level of a body of water, including the sediment surface and some sub-surface layers. Organisms living in this zone are called benthos or benthic organisms.
berm	A mound or linear embankment of fill material, typically earth fill.
best management practices (BMPs)	Physical, structural or managerial practices that control soil loss and reduce water quality pollution caused by nutrients, animal wastes, toxics, and sediment.
bioaccumulation	The process by which substances accumulate in the tissues of living organisms.
biochemical oxygen demand (BOD)	The amount of oxygen needed by aerobic microorganisms to decompose all the organic matter in a sample of water; it is used as a measure of pollution.
biological opinion	The product of Endangered Species Act consultation, a document stating the opinion of the United State Fish and Wildlife Service or National Marine Fisheries Service on whether or not a federal action is likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat.

blue-green algae	Algae that can cause problems in aquatic environments because some produce chemicals that are toxic to animals, including humans.
bulk bag	A container made from abrasion resistant fabric designed to contain loose material such as seeds, or in this case sand and gravel, and used for work area isolation.
camas	A type of lily used as a food source by Native Americans.
cession (of property)	The assignment of property to another entity.
chlorophyll-a	A photosynthetic pigment that serves as a surrogate measure for abundance of algae.
cofferdam	A temporary enclosure designed to be watertight or minimize water infiltration to isolate work areas for construction.
cohort	A group of fish spawned during a given period, usually within a year.
confluence	The meeting of two or more bodies of water, such as the point where a tributary joins the mainstem.
connected action	The National Environmental Policy Act defines a <u>connected action</u> as an action that (i) automatically triggers other actions that may require environmental impact statements (ii) cannot or will not proceed unless other actions are taken previously or simultaneously (iii) is an interdependent part of a larger action and depends on the larger action for its justification. Connected actions are closely related and therefore should be discussed in the same impact statement (40 CFR Part 1508.25 (a)1).
consolidation (of sediments)	The process by which sediments are compacted together.
contour line	A line connecting points of equal elevation.
Cooperating Agencies	Under the National Environmental Protection Act (NEPA), the agencies having responsibility to assist the lead agency by participating in the NEPA process. The role of the cooperating agencies may

include conducting environmental analyses of resources which the cooperating agency has jurisdiction by law or special expertise.

critical habitat

Areas that are essential to the conservation of a species listed under the federal Endangered Species Act.

cyanobacteria

Photosynthetic bacteria, also known as blue-green algae. Cyanobacteria form extensive and highly visible blooms in the freshwater and marine environment.

Dam Removal Entity

The party with primary responsibility for carrying out the dam removal and other components of the Klamath Hydroelectric Settlement Agreement.

decommissioning

Taking out of use, such as dismantling a dam or destroying an unneeded road.

desiccation

Drying out.

diel

Pertaining to a 24-hour period; daily.

direct effects

Related to socioeconomics, they are one or a series of production changes or expenditures made by producers/consumers as a result of an activity or policy. These initial changes are determined by an analyst to be a result of this activity or policy. Applying these initial changes to the multipliers in an IMPLAN model will then display how the region will respond, economically to these initial changes.

dissolved oxygen

The amount of oxygen in the water available to aquatic organisms measured in mg/L or percent saturation.

diversion

The act of diverting water from the main river course down a water separate conveyance system.

drawdown

Lowering of the water level in a reservoir.

drop structure

A structure, often part of a dam's spillway, to pass water to a lower elevation while controlling the energy and velocity of the water as it passes over.

elutriate	Separation of fine particles into size fractions according to their rate of fall through an upward current of water.
embankment	Earth or stone fill designed to hold back water.
emergent vegetation	Aquatic plants rooted underwater that grow above (emerge from) the surface of the water (e.g., cattails).
employment (jobs)	Employment in IMPLAN is measured in number of jobs. A job is the annual average of monthly jobs in that industry (this is the same definition used by Quarterly Census of Employment Wages, Bureau of Labor Statistics, and Bureau of Economic Analysis nationally). Thus, 1 job lasting 12 months = 2 jobs lasting 6 months each = 3 jobs lasting 4 months each. A job can be either full-time or part-time.
endemic	Native to or confined to a certain region.
entrainment (of fish)	The loss of fish during water diversion due to their movement with the flow of water. Entrainment can result in mortality from direct contact with structures, from steep drops, or from stranding in areas where water does not persist, such as irrigation systems.
environmental water	The quantity and quality of instream water available to support fisheries and other aquatic resources.
epilimnion	The top-most layer in a lake stratified by temperature. It is warmer and typically has a higher pH and dissolved oxygen concentration than the lower layers (the hypolimnion).
erosion	The wearing away of the land surface by wind or water. Erosion occurs naturally from weather or runoff but is often intensified by land-clearing practices.
ESA consultation	In compliance with the Endangered Species Act, the process by which a federal agency presents information to the United States Fisheries and Wildlife Service or National Oceanic and Atmospheric Administration Fisheries Service

regarding actions that may affect listed species or their designated habitat.

escapement (of fish)

That portion of an anadromous fish population that escapes the commercial and recreational fisheries and reaches the freshwater spawning grounds.

escapement floor

The lower bound of an escapement goal, which sets the number of salmonids that are not harvested and return to the river for spawning.

estuary

A partly enclosed coastal body of water with one or more rivers or streams flowing into it, and with a free connection to the open sea.

eutrophic

Waters rich in dissolved nutrients (especially nitrogen and phosphorus); leads to accelerated growth of algae and plants that depletes oxygen levels.

extirpation

Local extinction of a species over a portion of its total range.

ex-vessel value

Gross value of all fish caught within the area of analysis.

final demand

The value of goods & services produced and sold to final users (institutions) during the calendar year. This value is also equivalent to the Direct Effect of the impact.

fine sediment

Sediment with small particle size such as silts and clays.

fish ladder (fishway, fish passageway)

A structure on or around artificial barriers such as dams and locks to allow fish to move around the barrier during migration.

flume

Open-channel water conveyance system.

focal species

Species of ecological and/or human value that is of priority interest for study or management.

forebay

Water conveyance area between reservoir and power generation facilities.

fry

A juvenile salmon or steelhead.

genotype	The genetic identity of an individual.
geomorphic	Relating to surface features of a landscape.
gravel augmentation	The direct placement of spawning-size gravel into the stream channel to increase spawning habitat by increasing the amount of area with suitable substrate.
gravity arch dam	A dam that curves upstream in a narrowing curve that directs most of the water against the canyon rock walls, providing the force to compress the dam.
greenhouse gases	Gases including carbon dioxide, methane, and nitrous oxide, that prevent heat from escaping from the atmosphere, resulting in climate change (also known as global warming).
groundwater recharge	The natural or intentional infiltration of surface water for the replenishment of existing natural underground water supplies.
hatchery	A place where large numbers of fish eggs are artificially fertilized and fry are hatched in an enclosed environment.
headcut	An erosional feature in waterways where an abrupt vertical drop in the stream bed occurs.
herbaceous	Referring to a plant that has leaves and stems that die down at the end of the growing season to the soil level. They have no persistent woody stem above ground.
hibernacula	A place where a hibernating animal shelters for the winter.
humic	Having a high organic carbon content.
Hydroelectric Reach	The portion of the Klamath River that includes the four most downstream dams (J.C. Boyle, Copco 1, Copco 2, and Iron Gate Dams).
hydrophilic	Plants especially suited to thrive in soils that are always wet.

hydroseeding	A planting process which utilizes a slurry of seed and mulch. The slurry is transported in a tank, either truck- or trailer-mounted and sprayed over prepared ground in a uniform layer.
hypereutrophic	Very nutrient-rich lakes characterized by frequent and severe nuisance algal blooms and low transparency.
hypolimnetic anoxia	The absence of oxygen in the lower layers of a lake or reservoir.
hyporheic	Beneath the bed of a stream, where there is mixing of shallow groundwater and surface water.
hypoxia	Oxygen deficiency.
IMPLAN®	IMpact Analysis for PLANning, a regional input-output model that evaluates regional economic effects.
incidental take	The “take” (adverse effect) of a listed species that results from, but is not the purpose of, an activity. Incidental take cannot result in jeopardy to the species and must be specifically authorized in the biological opinion.
indirect effects	Related to socioeconomics, they represent the impact of local industries buying goods and services from other local industries. The cycle of spending works its way backward through the supply chain until all money leaks from the local economy, either through imports or by payments to value added (employee).
induced effects	Related to socioeconomics, they represent the response by an economy to an initial change that occurs through re-spending of income received by a component of value added (employee). The labor income is recirculated through the household spending patterns causing further local economic activity.
in situ	In the original or natural place.
intake structure	Facility designed to divert water from the river or reservoir.

ipos	Roots of the plant <i>Carum oregonum</i> , important to some Native Americans tribes.
isobath	A type of contour line connecting points of equal water depth in a body of water.
J.C. Boyle Bypass Reach	The reach of the Klamath River between J. C. Boyle Dam and J. C. Boyle Powerhouse. A bypass reach is that section of a river from which water is removed to generate hydropower. Water is often diverted from the river at the dam, transported through channels or penstocks downstream, and released back in the river at the powerhouse.
J.C. Boyle Peaking Reach	The reach of the Klamath River between the J. C. Boyle Powerhouse and the mouth of Shovel Creek. A peaking reach is that section of a river that receives the water from the generation of hydroelectric power at the powerhouse.
Keno Impoundment	The water body created by Keno Dam.
Keno Transfer	The transfer ownership and operational responsibility of the Keno facility from PacifiCorp to the United States Department of the Interior as part of Klamath Hydroelectric Settlement Agreement implementation.
Klamath Allottee	A tribal member who owns a beneficial interest in a tract of land within the original (1864) boundaries of the Klamath Indian Reservation.
Klamath Hydroelectric Project	A system of hydroelectric components that includes the dams, powerhouses, and other facilities for generation of hydroelectric power on the Klamath River and developed jointly by Reclamation and the California-Oregon Power Company (COPCO, the predecessor to PacifiCorp).
Klamath River Basin	The portion of land drained by the Klamath River and its tributaries. The Klamath River Basin is divided into the Upper Klamath Basin and the Lower Klamath Basin.
Klamath River Basin Compact	Agreement between the State of California and the State of Oregon and consented by U.S. Congress in 1957 that established the Klamath River Compact

Commission to promote comprehensive development, conservation, and control of the resources of the Klamath River and to foster interstate comity between California and Oregon.

Klamath Tribes

The Tribes of the Klamath Basin include the Karuk Tribe, Yurok Tribe, Klamath Tribes (made up of the Klamaths, the Modocs, and the Yahooskin), Resighini Rancheria, Hoopa Valley Tribe, and Quartz Valley Indian Community.

Lake Ewauna

Also known as Keno Impoundment.

labile

Active, possessing rapid turnover rates.

labor income

All forms of employment income, including Employee Compensation (wages and benefits) and Proprietor Income.

lacustrine

Of or pertaining to lakes.

Lead Agencies

The agencies with the primarily responsibility under the National Environmental Protection Agency (NEPA) and equivalent state environmental policy acts (e.g., California Environmental Quality Act [CEQA]) for carrying out an evaluation of the environmental effects of their decision-making and for preparation of the appropriate environmental document. For the Klamath Facilities Removal Environmental Impact Statement/Environmental Impact Report, the Department of Interior is lead agency under NEPA and the California Department of Fish and Game is lead agency under CEQA.

lease lands

Land located near Tule Lake National Wildlife Refuge or the Lower Klamath National Wildlife Refuge, leased by the Bureau of Reclamation.

lentic

Of, relating to, or living in still waters (lakes, ponds, or swamps).

levee

A natural or artificial slope or wall to regulate water levels. It is usually earthen and often parallel to the course of a river or the coast.

littoral

The zone between high tide and low tide waterlines of a lake or ocean.

liquid limit	The water content at which the behavior of the soil changes from a plastic to a semi-liquid state.
lotic	Of, relating to or living in actively moving waters (streams and rivers).
Lower Klamath Basin	The portion of the Klamath River Basin downstream of Iron Gate Dam.
macroinvertebrate	Aquatic insects, worms, clams, snails, and other animals without backbones that can be seen without the aid of a microscope.
macrophyte	An aquatic plant that grows in or near water and is either emergent, submergent, or floating.
mainstem	The principal river in a basin, as opposed to the tributary streams and smaller rivers that feed into it.
mitigation	The act of alleviating or lessening an adverse condition.
microcystin	A toxin produced by the blue-green algal species <i>Microcystis aeruginosa</i> .
morphological	Related to the form of. Morphology is the study of the forms of things.
Negative Determination	A determination by the Secretary of the Interior under Section 3 of the Klamath Hydroelectric Settlement Agreement that facilities removal should not proceed.
nonpoint source pollution	A term in the Clean Water Act also called “polluted runoff,” water pollution produced by diffuse land-use activities. Occurs when runoff carries fertilizer, animal wastes, and other pollution into rivers, streams, lakes, reservoirs, and other bodies of water.
noxious weed	A plant species that has been designated by state or national agricultural authorities as a plant that is injurious to native plants, agricultural and/or horticultural crops, and/or humans and livestock.
nutrient loading	Discharging of nutrients from the watershed (basin) into a receiving water body (lake, stream, wetland).

off-Project	Not associated with (not receiving water from, in the case of irrigators) Reclamation's Klamath Project.
ogee-type drop structure	A drop structure with a curved shape consisting of two arcs that curve in opposite directions so that their ends are parallel.
on-Project	Associated with (receiving water from, in the case of irrigators) Reclamation's Klamath Project.
output (sales)	Related to socioeconomic, output represents the value of industry production. In IMPLAN these are annual production estimates for the year of the data set and are in producer prices. For manufacturers this would be sales plus/minus change in inventory. For service sectors production = sales. For Retail and wholesale trade, output = gross margin and not gross sales.
PacifiCorp	An electric power company in the northwestern United States that owns and operates the Klamath River dams.
palustrine	Of or pertaining to wetlands or freshwater marsh.
Parties	Signatories to the Klamath Hydroelectric Settlement Agreement.
pelagic	Relating to or occurring, living in, or frequenting the open ocean.
penstock	A pipe or conduit that carries water to a power generation turbine.
periphyton	A complex mixture of algae, bacteria, their secretions, associated detritus, and various species of microinvertebrates attached to submerged surfaces in most aquatic ecosystems.
phytoplankton	Small, photosynthetic aquatic organisms, including diatoms, green algae, and cyanobacteria (blue-green algae).
plasticity	The ability of a soil to transform from a solid state to a liquid state by adding water.

point source pollution	Pollution into bodies of water from specific discharge points such as sewer outfalls or industrial-waste pipes.
polychaete	Aquatic annelid worms belonging to the Class Polychaeta, segmented and have bristles for movement or attachment.
powerhouse	Structure that contains the power generation equipment such as the turbine, may be an enclosed building or an open area with concrete slabs and equipment.
programmatic analysis	For purposes of the California Environmental Quality Act (CEQA), the Klamath Basin Restoration Agreement analysis is programmatic, as described in Section 15168 of the CEQA Guidelines. A program-level document is appropriate when a project consists of a series of smaller projects or phases that may be implemented separately. Under the programmatic Environmental Impact Report approach, future projects or phases may require additional, project-specific environmental analysis.
Project Team	The group of lead, cooperating, and responsible agencies responsible for evaluating the alternatives in the Environmental Impact Statement/Report.
Proposed Action	One of the alternatives evaluated in the Environmental Impact Statement/Report, the Proposed Action (also known as the Full Facilities Removal of Four Dams Alternative) includes the removal of four PacifiCorp Dams (J.C. Boyle, Copco 1, Copco 2, and Iron Gate Dams) during a 20-month period which includes an 8-month period of site preparation and partial drawdown at Copco 1 and a 12-month period for full drawdown and removal of facilities. This alternative would include the complete removal of power generation facilities, water intake structures, canals, pipelines, ancillary buildings, and dam foundations.
protocol-level surveys	Standardized methods approved by the U.S. Fish and Wildlife Service or other resource agency for establishing the presence or absence of special-status species.

radial gate	Tainter gate.
Reclamation's Klamath Project	The system of reservoirs, dams, canals, and pumps built to drain and reclaim lake bed lands of the Lower Klamath and Tule Lakes, to store water of the Klamath and Lost Rivers, to divert irrigation supplies, and to control flooding of the reclaimed lands.
redd	A depression in streambed gravel dug by a female fish for depositing eggs during spawning.
regalia	Especially fine or decorative clothing.
relicensing	The administrative proceeding in which Federal Energy Regulatory Commission (FERC), in consultation with other federal and state agencies, decides whether and on what terms to issue a new license for an existing hydroelectric project at the expiration of the original license.
remediation	To address a problem. Often refers to the removal of pollution or contaminants from environmental media such as soil, groundwater, sediment, or surface water for the general protection of human health and the environment.
riffle	A shallow section of river characterized by numerous small waves on the surface often caused by gravel bars.
Resource Agencies	Government entities that have jurisdictional authority over various natural resources.
Responsible Agencies	Under the California Environmental Quality Act (CEQA), the agencies with discretionary approval authority over a portion of a CEQA project such as required permits.
restoration	The return of a landscape, ecosystem, or other system to a predefined historical state.
riparian	The area adjacent to a river or stream (and sometimes along shorelines of lakes or reservoirs).
riprap	Broken stone, cut stone blocks, or rubble that is placed on slopes to protect them from erosion.

riverine	Of or pertaining to rivers.
river left and right	The designated side of the river when looking downstream in the direction of flow.
river mile	Measure of distance in miles along a river from its mouth. River mile numbers begin at zero and increase further upstream.
river mouth	The place where a river ends by flowing into another body of water such as a lake, ocean, or another river.
run (of salmonids)	A group of fish that is migrating from the ocean to spawn in the rivers or streams where they were born.
salmonid	Of, belonging to, or characteristic of the family Salmonidae, which includes salmon, trout, and whitefish.
scour	The hole left behind when sediment is washed away from the bottom of a river. Although scour may occur at any time, scour action is especially strong during floods. Swiftly flowing water has more energy than calm water to lift and carry sediment down river.
secondary effects	Related to socioeconomics, they are indirect effects plus induced effects.
Secretarial Determination	Decision by the Secretary of the Interior based on a thorough scientific review of existing science, data and other information whether removal of the dams: (1) will advance restoration of the salmonid fisheries of the Klamath Basin; and 2) is in the public interest.
sedimentation	Settling of particulate matter in water related to particle size, water velocity, and water flow.
senescence	In plants, death triggered by an increase in the enzymes that promote the breakdown of plant cells.
smolt	A juvenile salmon or steelhead migrating to the ocean and undergoing physiological changes to adapt its body from a freshwater to a saltwater environment.

spawning	The process by which fish release eggs and sperm and deposit them on the stream substrate.
special-status species	Plant and wildlife species listed as threatened or endangered under the federal or state endangered species acts. Also included are federal candidate species, federal species of concern, state sensitive species, state species of concern, and those given special status by the Bureau of Land Management, the U.S Forest Service, or Indian Tribes.
spillway	Open-channel used to convey water over a dam, typically constructed of concrete to resist scour and erosion.
soil moisture content	The weight of water contained in a sample of soil, typically expressed as a percentage of the dry weight of the soil.
stormwater	Water that is not absorbed into soil and rapidly flows downstream, increasing the level of waterways.
stratification (in lakes)	The formation of layers based on temperature, oxygen levels, salinity, and density that act as barriers to water mixing.
subsistence	The way by which a culture obtains its food.
supersaturation	When oxygen (or other substance) is more highly concentrated in water (or other substance) than is normally possible under normal temperature and pressure.
suspended sediment	Particles that settle slowly enough to be carried in flowing water.
switchyard	The enclosed areas at power stations containing switching facilities and equipment for the purpose of connecting to the transmission network.
Tainter gate	A radial arm water control structure used to control flow into a spillway or overflow area.
tailrace	Open-channel area downstream of power generation turbine for return water to flow back to the river.

talus	A deposit of broken, coarse rock found at the base of a cliff or mountain.
Tidal prism	The volume of water in an estuary or inlet between mean high tide and mean low tide, or the volume of water leaving an estuary at ebb tide.
thalweg	The deepest part of a stream or river channel.
thermal refugia	Cool, well-oxygenated areas of rivers utilized by salmon and other species to avoid thermal stress.
thermocline	A layer within a body of water or air where the temperature changes rapidly with depth.
topographical	Of or relating to the arrangement or accurate representation of the physical features of an area.
total effects	Related to socioeconomics, they are direct effects plus indirect effects plus induced effects.
total maximum daily load (TMDL)	A regulatory term in the Clean Water Act that describes the maximum amount of a pollutant that a body of water can receive while still meeting water quality standards.
total Kjeldahl nitrogen	A measure of organic nitrogen plus ammonia.
toxigenic	Producing or containing toxins.
transformer bushings	A transformer is a device that transfers electrical energy from one circuit to another; a bushing provides insulation for the transformer.
transhumance	The seasonal movement of people with their livestock over relatively short distances, typically to higher pastures in summer and to lower valleys in winter.
tributary	A stream or river that flows into a mainstem river and contributes water to it.
turbidity	A measure of the extent to which light passing through water is reduced owing to suspended materials.
Upper Klamath Basin	The portion of the Klamath River Basin located upstream of Iron Gate Dam. The Upper Klamath

Basin is divided into two sub-basins: the Klamath Hydropower Reach from Iron Gate Dam to J.C. Boyle Dam and the basin upstream of J.C. Boyle Dam.

V-screen

A V-shaped screen over the water intake to prevent fish from swimming through.

volitional fish passage

The movement of migratory fish around a dam via an upstream fish ladder or downstream bypass system as opposed to being trapped and hauled around the dam or attempting to move through hydropower turbines where many would be killed. Volitional fishways allow anadromous fish to migrate when they are physiologically ready.

watershed

All the land drained by a given river and its tributaries. An entire drainage basin including all living and nonliving components of the system.

weir

A low structure built across a stream to raise the upstream water level while allowing water to flow over the top of the structure.

wocas

The nutritious seeds of the yellow pond lily, important to some Native Americans tribes.