

## 12.0 GLOSSARY

303(d) list: A list of stream segments that do not meet Federal/State water quality standards. The list is named after Section 303(d) of the Federal Clean Water Act, which requires states to maintain such a list.

Acre-feet (ac-ft): The volume of water necessary to cover one acre of area with one foot of water. One ac-ft is equal to twelve acre-inches (ac-in).

Alluvial fan: Loose sediment and material deposited via stream flow and/or debris flows at the base of a mountain front, escarpment or valley side, which has the shape of a fan, either fully or partially extended.

Anadromous: Referring to species of fish that are hatched in freshwater, migrate to the ocean to mature, and return to their natal streams to spawn. Salmon and steelhead are some examples.

Anchor ice: Ice that forms along the stream channel bottom via the accumulation of frazil ice on the rough surfaces of bottom sediments and on the lee sides of pebble, cobbles, and boulders.

Aquatic: Of or in the water; living or growing in or on the water.

Bankfull discharge: Water fills a stream channel to the top of its banks just to the point where water begins to overflow onto the adjacent floodplain. Bankfull discharge occurs about once every year or two, and its flows transport the greatest quantity of sediment and bedload over time.

Bank armoring: The process of placing large rocks, vegetation, or engineering materials along stream banks to protect them from flowing water, especially erosion of channel banks or bottoms during runoff events.

Beneficial use: Beneficial uses of water bodies are protected by Washington State statute. (Chapter 173-201 WAC), and include: fish and shellfish rearing; spawning and harvesting; swimming; boating; navigation; irrigation; wildlife habitat; and domestic, industrial, and agricultural water supply.

Board feet: A volume measurement for timber. MBF = 1,000 board feet = Unit of measurement equal to 1,000 feet of wood having a thickness of 1 inch. MMBF = 1,000,000 board feet.

Channelization: Straightening the meanders/bends of a river and simplifying the habitat; often accompanied by bank armoring to stabilize the system.

Confinement: Fixing a channel in its location, restricting and/or removing its ability to migrate.

Cubic foot per second: (ft<sup>3</sup>/s; also CFS) The rate of discharge representing a volume of 1 cubic foot passing a given point during 1 second, equivalent to 7.48 gallons per second or 448.8 gallons per minute or 0.02832 cubic meter per second. One cfs flowing for one day is equivalent to 1.9835 acre-feet.

Deciduous: Referring to trees that annually shed their leaves before the cold or dry season, and then regrow them.

Depressed stock: A fish stock whose production is below expected levels based on available habitat and natural variations in survival levels, but above the level where permanent damage to the stock is likely.

Dichloro-Diphenyl-Trichloroethane (DDT): Pesticide used to control mosquitoes, lice, flies, aphids, etc. Speculated to have adverse effects on both human and wildlife populations.

Discharge: The volume of water (or more broadly, volume of fluid plus suspended sediment) that passes a given point within a given period of time.

Dissolved Oxygen (DO): The concentration of free molecular oxygen (a gas) dissolved in water, usually expressed in milligrams per liter, parts per million, or percent of saturation. DO concentration measurements are an indicator of water quality and a water body's ability to support fish and other aquatic life.

Ecosystem: A geographically defined area that encompasses unique physical and biological characteristics. It is the sum of the plant community, animal community (including humans), and environment in a particular region or habitat.

Ecosystem Diagnosis and Treatment (EDT): A methodology designed by Moberg and Biometrics, Inc. to provide a practical, science-based approach for developing and implementing watershed plans. Information is organized in a way that describes a watershed ecosystem so that scientific principles can be applied to better understand that ecosystem; an analytical model is used to analyze environmental information and draw conclusions about the ecosystem; and a step-by-step procedure is used to explain how to apply the conceptual and analytical model to develop plans that achieve goals. The conceptual framework for the EDT method was developed with an aim toward utility for salmon management but also with the important goal of maintaining consistency with an ecosystem approach.

Entiat Experimental Forest (EEF): An area in the subbasin on National Forest System lands allocated to forest research activities.

Endangered species: Any species of animal or plant considered to be in danger of extinction throughout all or a significant portion of its range. Endangered species are designated in the Federal Register, and provided the most stringent protection under the Endangered Species Act of 1973.

Endangered Species Act: A 1973 Act of Congress that mandated the protection and restoration of endangered and threatened species of fish, wildlife and plants.

Erosion: The wearing away of land surfaces by running water, wind, ice, rain, etc.

Escapement: The portion of adult salmon that survive all fisheries to return to spawning grounds or a hatchery.

Fecal Coliform: A group of bacteria passed through the excrement of wildlife, livestock and humans that can enter aquatic environments through the waste from mammals and birds, agricultural and storm runoff, and from untreated human sewage that may enter streams through leaking septic systems or storm water overflows. Fecal coliform by themselves are usually not pathogenic; they are indicator organisms, which means they may indicate the presence of other pathogenic bacteria that can cause infection or disease in humans.

Fine sediment: Sediment with a diameter less than 1mm in diameter, usually reported as a percentage, i.e. percent fines, of total substrate size composition. Fine sediment plays an important role in determining spawning gravel suitability and salmonid egg survival.

Fish screen: Woven, welded or perforated durable material installed at the intake of surface water diversions, e.g. irrigation ditches, hydropower facilities, pumps, in order to protect juvenile fish. Screens must meet certain engineering and design criteria in order to be effective.

Fish passage: An important consideration for the migration of fish species within a river or stream system. Culverts under roads must be engineered such that juvenile salmonids (50 – 120mm) and/or trout 6 inches in length are provided suitable velocity and depth of flow conditions for movement. A range of flow regimes and different fish species and life stage requirements (adult v. juvenile) must all be considered.

Floodplain: Lowland and relatively flat areas adjacent to stream channels susceptible to a one percent or greater chance of inundation/flooding by stream derived waters in any given year.

Flow rate: The rate at which water moves by a given point. In US rivers, it is usually measured in cubic feet per second (cfs).

Forward Looking Infrared (FLIR): Technology available for monitoring and evaluating stream surface temperatures using infrared sensors that detect in the 8-12 micron range of the spectrum.

Frazil ice: Stream ice with the consistency of slush, formed when small ice crystals develop in super-cooled stream water as air temperatures drop below freezing. These ice crystals join and are pressed together by newer crystals as they form.

Fry: Young salmon that have emerged from the redd, absorbed their yolk-sac, and are capable of actively searching for food.

Gaging station: A particular site on a stream, canal, lake, or reservoir where systematic observations of hydrologic data are obtained. Stations in the Entiat are either continuous recording gages or staff gages.

Geographic Information System (GIS): A computer system which allows the input and manipulation of geographic data to allow manipulation, analysis and display of data in tabular as well as map format.

Geomorphology: Geologic study of the configuration and evolution of surface features of the Earth. Geomorphology deals with the general configuration of the earth surface and the changes that take place as landforms develop (history).

Glaciation: Effects on landforms produced by the presence and movement of a glacier.

Gradient: The rate of inclination; change in elevation per unit length of slope.

Gravel scour: The scrubbing or flushing of gravel from a streambed due to increases in stream flow. Especially a concern in salmonid spawning areas, as gravel scour can damage eggs or sweep them downstream.

Groundwater: All water beneath the earth's surface that can be collected with wells, tunnels, or drainage galleries, or that flows naturally to the surface via seeps or springs.

Hatchery: Facility where salmon eggs are hatched and reared..

Hydrology: Natural science related to the waters of the earth, their occurrence, circulation and distribution, their chemical and physical properties, and their reaction with the environment, including their relation to living things.

Infiltration rate: The measure of a soil's ability to absorb and transmit water in a given time, which reveals the likely behavior of the soil under precipitation or flooding. This is important information for irrigation management or flood prevention planning.

Instream flow: The quantity of water maintained in a stream in order to sustain multiple non-consumptive uses, such as: fisheries and wildlife, channel stability and maintenance, riparian habitat maintenance, navigation, recreation, and aesthetics.

Instream Flow Incremental Methodology (IFIM): A methodology developed by the USFWS in the late 1970s, which involves putting site-specific stream flow, and micro- and macrohabitat data, into a group of models collectively called PHABSIM (physical habitat simulation) in order to determine the relationship between flows and fish habitat over space and time. In addition to the PHABSIM models, IFIM may include reviewing water quality, sediment, channel stability, temperature, and other variables that affect fish production. An IFIM approach can be applied to other instream values as well, such as recreation.

Landform: Surface features, the origin of which can be attributed to particular geological processes or structures. A type of land surface that exists as a result of geological activity, such as a plateau, plain, basin, or mountain.

Land Type Association (LTA): One of the most basic ecological units for Forest-wide planning; describes areas of common ecosystem characteristics and generally (but not always) numbering in the thousands of acres. LTA's are defined by similarities in general topography, geomorphic process, geology, soil and potential plant community patterns.

Large Woody Debris (LWD): Any large piece of relatively stable woody material having a diameter greater than 10 cm and a length greater than 3 meters. LWD is an important part of the structural diversity of streams. The nature and abundance of LWD in a stream channel reflects past and present recruitment rates, which are largely determined by the age and composition of past and present adjacent riparian stands.

Moraine: Dirt, rock and debris transported via the advance of a glacier, and then left behind once the glacier recedes. A terminal moraine marks the farthest glacial advance.

Nitrate: One of the forms of nitrogen found in aquatic ecosystems. Elevated nitrate levels can cause changes in the types of plants and animals living in a stream, may lead to low dissolved oxygen, and may cause temperature increases.

Non-point source pollution: Diffuse pollution; not discharged from a pipe. Non-point source pollution can result from land uses such as agriculture and timber harvest, or contamination from septic tanks, etc.

Noxious weed: Undesirable plant that is harmful to agriculture as well as native plant species. Washington State law (17.10 RCW) defines a noxious weed as: "...any plant which, when established, is highly destructive, competitive, or difficult to control by cultural or chemical practices."

Optimum: The best or most advantageous condition, degree, or amount [Webster's Dictionary].

Organic: Containing carbon atoms and carbon-carbon bonds.

Orographic: Related to the physical geography of mountains and mountain ranges.

Parr: Young trout or salmon actively feeding in fresh water, often with large dark spots or bars on their sides for camouflage. Salmon parr usually live in freshwater for 1 to 2 years; usually refers to young anadromous salmonids before they migrate to the sea.

pH or pH scale: A measure of the concentration of hydrogen ions in a substance. A pH scale is used to determine the alkaline or acidic nature of a substance. The scale ranges from 1-14 with 1 being the most acidic and 14 the most basic. Pure water is neutral with a pH of 7. Water pH determines the amount of nutrients that can be dissolved in the water and utilized by aquatic life.

Percolation rate: The rate at which a soil will accept water.

Phosphorous: A nutrient essential for plant and animal growth. It may be dissolved or suspended in water. Slight increases may cause numerous undesirable effects, such as accelerated plant growth, algae blooms, low dissolved oxygen, and the death of certain aquatic organisms.

Pinnate: Having a shape like that of a feather.

Polychlorinated biphenyls (PCBs): Mixtures of up to 209 individual chlorinated chemical compounds used as coolants/lubricants in transformers and other electrical equipment until 1977, when the manufacture of PCBs was stopped due to concerns about their harmful environmental and health effects. PCBs do not readily break down in the environment and thus may remain there for very long periods of time. In water, PCBs are taken up by and accumulated in fish and marine mammals, reaching levels that may be many thousands of times higher than in water.

Pool: Portion of a stream with reduced current velocity, often with deeper water and a smooth surface. Essential habitat for young salmonid rearing and adult salmon resting.

Radio telemetry: The process of tracking the movement and location of animals that have been implanted or collared with a radio transmitter. An animal's unique radio signal/frequency is detected using a special antenna, which can be hand held or mounted to a vehicle or airplane.

Reach: A homogenous section of stream or river characterized by uniform channel pattern, gradient, substrate and channel confinement.

Rearing habitat: Areas required for the successful survival to adulthood by young animals.

Redd: A gravel nest dug out of streambed by the adult salmon female, into which eggs are laid and then covered.

Riffle: Stream habitat having a broken or choppy surface (white water), moderate or swift current, and shallow depth.

Riparian vegetation: Vegetation that grows beside rivers, streams and other freshwater bodies and depends on these water sources for soil moisture greater than would otherwise be available from local precipitation.

Riparian zone: The land area and associated vegetation adjacent to a stream or river, identified by soil characteristics and distinctive vegetation. It includes wetlands and those portions of floodplains that support riparian vegetation.

Runoff: Rainfall not absorbed by soil or vegetation.

SaSI (Salmonid Stock Inventory): A list of Washington's naturally reproducing salmonid stocks and their origin, production type, and status. Developed in 1998 as an appendix to SASSI to include bull trout and Dolly Varden; formerly named SASSI.

SASSI (Salmon and Steelhead Stock Inventory): A list of Washington's naturally reproducing salmon and steelhead stocks and their origin, production type, and status; developed in 1992.

Salmonid: Of or belonging to the family Salmonidae, which includes the salmon, trout chars, bull trout, and whitefishes.

Salmon: Common name for species of the family Salmonidae

Sedimentation: The removal, transport, and deposition of detached soil particles by flowing water (or wind). Accumulation of organic and inorganic matter on the stream bottom; usually the result of the reduction in water velocity below the point at which material can be transported in suspended form.

Silviculture: Cultivation, care, and management of forest trees.

Smolt: Young anadromous fish, 1 or more years old, migrating downstream from freshwater to saltwater and undergoing physiological changes that will allow it to change from life in freshwater to life in the sea. The transformation from parr to smolt often involves the loss of spots and change to a silvery color.

Spawning habitat: Areas with specific micro- and macrohabitat parameters (water depth and velocity, substrate, temperature) required for successful redd creation by adult salmonids.

Streamflow: The discharge that occurs in a natural channel.

Subbasin: A subdivision of the largest regional hydrologic unit [basin], i.e. the Columbia River Basin. Examples within Chelan County include the Wenatchee, Entiat and Lake Chelan subbasins.

Substrate: Mineral and organic material forming the bottom of stream or waterbody.

Suspended solids: Items such as soil, algal cells, and plant particles, which can be separated from the water by filtration via a filter with openings of 0.45 microns in diameter. Total suspended solids levels are monitored/regulated to protect water quality.

Thalweg: The path of maximum depth in a river or stream.

Thinning: The process of removing trees to decrease population density and competition between trees in a stand

Threatened species: Any species of animal or plant considered likely to become endangered in the foreseeable future. Threatened species are protected by somewhat less restrictive regulations than endangered species.

Topography: The shape of a portion of the earth's surface, including its elevations and the position of physical and cultural features

Total Maximum Daily Load (TMDL): A calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards, and an allocation of that amount to the pollutant's sources.

Tributary: A river or stream that flows into a larger river or stream.

Water Resource Inventory Area (WRIA): Washington State is divided into 62 WRIs for water and aquatic-resource management planning, e.g. planning done under Chapter 90.82 RCW, the Watershed Planning Act. A Water Resource Inventory Area may include more than one watershed, although the terms "WRIA", "watershed" and "subbasin" are frequently used interchangeably. WRIA 46 comprises Entiat and Mad River watersheds, along with some minor Columbia River tributaries.

Water year: A 12-month period, October 1 through September 30. The water year is designated by the calendar year in which it ends and which includes 9 of the 12 months. Thus, the year ending September 30, 1992 is called the "1992 water year" [USGS].

Watershed: The entire land area that contributes water to a river, river system, or body of water; also a subdivision of the subbasin. The Entiat and Mad River watersheds collectively form the Entiat subbasin.

Wetland: Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas [RCW 90.58.030].

Width-to-Depth ratio: The ratio of the bankfull surface width to the average depth of the bankfull channel. The width-to-depth ratio is important in understanding a stream's adjustments to the water's energy in its channel, and the ability of various discharges within the channel to move sediment.

Wild and Scenic River: Rivers that receive special protection under the Wild and Scenic Rivers Act.

Wilderness: Undeveloped Federal land retaining its primeval character and influence without permanent improvements or human habitation. Wilderness areas are designated by congressional action under the 1964 Wilderness Act.