

## 7.0 GLOSSARY

**95% Exposure Range:** The horizontal range that includes 95 percent of animat (simulated animal) closest points of approach (CPAs) that exceed a given impact threshold.

**Abiotic:** Non-living part of the ecosystem such as air, water, and substrates.

**Accuracy:** The degree to which measurements or models reflect the actual value or condition of the subject being measured or characterized.

**Acoustic Impedance:** Ratio of sound pressure to sound volume.

**Action Area:** The geographic location where the NOS Proposed Action would occur. It includes rivers, states' offshore waters, the U.S. territorial sea, the contiguous zone, U.S. portions of the Great Lakes, the U.S. Exclusive Economic Zone, and coastal and riparian lands.

**Active Sonar:** A type of Sound Navigation and Ranging (sonar) that detects objects by creating a sound pulse that is transmitted through the water, reflects off a target object, and returns in the form of an echo to be detected.

**Additive Cumulative Effect:** An impact on a resource which is the sum of the individual impacts on that resource.

**Adverse Impacts:** Effects which are negative and harmful for the analyzed resource; and cause a change that moves the resource away from a desired condition or detracts from its appearance or condition.

**Algal Flat:** An assemblage of cyanobacteria (i.e., blue-green algae) or other photosynthetic microorganisms forming a dense flat mass, especially on or within the surface layer of an aquatic sediment.

**Alkali Flat:** Dried-out lake beds adjacent to coasts containing high salt concentrations.

**Alkali lake:** A saline water body containing large amounts of sodium and potassium carbonates in solution as well as sodium chloride, commonly found in arid regions.

**Amphipod:** An order of crustaceans, resembling shrimp, with no carapace (i.e., hard upper shell) and ranging from 1 to 340 mm in length, comprising both marine and freshwater forms. Amphipods are detritivores (i.e., feed on dead organic material) or scavengers.

**Amplitude:** Magnitude of the largest departure from its equilibrium value of an acoustic variable. High amplitude corresponds to high intensity.

**Anadromous:** A general category of fish, such as the salmon, which hatch in fresh water, spend most of their lives in the salt water of the ocean, and then return to fresh water to spawn.

**Angling:** Recreational fishing with hook and line.

**Animat:** Computer simulated animals used in behavioral research and modeling.

**Annelid:** Macroinvertebrate phylum consisting of segmented worms, including polychaetes (e.g., bristle worms).

**Aquaculture:** The artificial breeding, rearing, and harvesting of fish, shellfish, plants, algae, and other organisms in all types of water environments.

**Aquatic Macroinvertebrate:** Small organisms that have no internal skeletal system and live part or all of their lives in water; they are visible without the aid of a microscope.

**Archipelago:** Area that contains a chain or group of islands scattered in lakes, rivers, or the ocean.

**Area of Potential Effect (APE):** The geographic location within which a physical undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The APE is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking.

**Arribada:** The synchronized, large-scale nesting on sandy beaches of some species of sea turtle (e.g., Kemp's ridley and olive ridley).

**Arthropod:** Phylum consisting of macroinvertebrate animals with exoskeletons, including (in marine habitats) crustaceans such as lobsters, crabs, shrimp, as well as amphipods, barnacles, and copepods.

**Astrolabe:** A historic scientific instrument used for reckoning time and for observational purposes.

**Atoll:** A ring-shaped coral reef, island, or series of islets.

**Audiogram:** A chart that shows the results of a hearing test.

**Auditory Masking:** The reduction in an animal's ability to perceive, recognize, or decode biologically relevant sounds because of interfering sounds.

**Automatic Identification System (AIS):** A shipboard broadcast system that acts like a transponder and uniquely identifies ships and vessels, using radio or satellite transceivers.

**A-weighting Function:** A mathematical curve that takes into account the average sensitivity of the human ear to sound frequency. A-weighting is used to convert a physical quantity of acoustic pressure (in dB) to a value that better quantifies how loud a noise is perceived by humans. Corresponds to M-weighting functions for marine mammals.

**Back-reef Habitat:** Shallow lagoon between a barrier reef and the shoreline, often including small patches of corals, sand plains, and seagrass beds; waters in this habitat are typically warmer than outside the reef because of shallow depth, reduced water circulation, and shelter from wave action. Salinity may fluctuate because of variable freshwater inflow.

**Backscatter:** The scattering of particles or radiation, such as sound waves, by the atoms of the medium through which they pass, in the backward direction.

**Bait Cup (also known as grinding hole):** Small depressions ground into bedrock.

**Baleen:** The apparatus inside the mouths of toothless whales, upon which they rely to filter food from the sea.

**Ballast Water:** Fresh or salt water, sometimes containing sediments, held in tanks and cargo holds of ships to increase stability and maneuverability during transit.

**Bank Reef:** Reef that is built upward from the seafloor by non-photosynthetic coral.

**Barotrauma:** Injury from excessive water pressure.

**Barrier Reef:** A coral reef roughly parallel to a shore and separated from it by a lagoon or channel of deep water.

**Bathymetry:** The depths and shapes of underwater terrain, or submarine topography.

**Bathypelagic:** Zone of the open ocean that extends from a depth of 1,000 to 4,000 meters beneath the surface, with little or no sunlight present in the ecosystem. Above lies the mesopelagic zone; below the abyssopelagic zone.

**Beach Nourishment:** Process by which sediment, usually sand, lost through longshore drift or erosion is artificially replaced with sediment from other sources.

**Beneficial Impacts:** Effects which are positive and supportive for the analyzed resource. A beneficial impact constitutes a positive change in the condition or appearance of the resource or a change that moves the resource toward a desired condition.

**Benthic:** Relating to or occurring at the bottom of a body of water or in the depths of the ocean.

**Benthos:** The flora and fauna found on the bottom, or in the bottom sediments, of a sea, lake, or other body of water.

**Best Management Practice (BMP):** An action or a combination of actions, that is determined to be an effective and practicable means of preventing or reducing adverse impacts to a resource.

**Bicarbonate:** A salt of carbonic acid containing the ion  $\text{HCO}_3^-$ .

**Bilge:** Area on the outer surface of a ship's hull where the bottom curves to meet the vertical sides. The bilge of a ship or boat is the part of the hull that would rest on the ground if the vessel were unsupported by water.

**Bilge Water:** Water that is generated by various activities involved in keeping a ship running while at sea. It collects in the hull of a vessel and contains industrial fluids from machinery spaces, internal drainage systems, sludge tanks, and various other sources.

**Bioaccumulation:** Over time, the buildup of ingested substances, typically heavy metals, pesticides, or toxins, in the tissues of a living organism. This occurs when an organism absorbs a substance at a rate faster than that at which the substance is lost or eliminated.

**Biodiversity:** The variety and variability of life on Earth. Biodiversity is typically a measure of variation at the genetic, species, and ecosystem level. Terrestrial biodiversity is usually greater near the equator, which is the result of the warm climate and high primary productivity, and lower in polar regions.

**Biologically Important Area (BIA):** Spatially defined locations where aggregations of individuals of cetaceans display biologically important behaviors which are region-, species-, and time-specific.

**Bioluminescence:** Light produced by a chemical reaction within a living organism; occurs widely in marine vertebrates and invertebrates.

**Biosphere:** Layer of the Earth where life exists.

**Biotic:** Relating to or resulting from living things, especially in their ecological relations.

**Bivalve:** Aquatic mollusk with two hinged shells, such as oysters, clams, mussels, and scallops.

**Bleaching (of coral):** Under conditions of thermal stress, the process of expelling the algae (zooxanthellae) living in the tissues of coral polyps, causing the corals to turn completely white; bleaching for an extended period of time can lead to mortality of the coral polyps and hence the coral reef.

**Blubber:** The thick layer of fat under the skin of marine mammals, such as seals, whales, and walrus.

**Bluff:** Steep shoreline slope formed in sediment (i.e., loose material such as clay, sand, and gravel) that has three feet or more of vertical elevation just above the high tide line.

**Brachiopod:** Phylum consisting of marine macroinvertebrates with hard "valves" or shells on their upper and lower surfaces.

**Brackish:** Water with salinity levels higher than fresh water but lower than sea water (salt water).

**Breaching (for whales):** Leaping above the water.

**Broadband:** Data transmission using a wide range of frequencies.

**Broadband Sound:** Vibrations with a combination of many frequencies distributed over a wide section of the audible range; as opposed to narrowband sound.

**Bryozoan:** Macroinvertebrate phylum consisting of moss animals or sea mats.

**Bycatch:** Fish or shellfish caught unintentionally or inadvertently while pursuing other target species.

**Capital:** Human-created assets that can enhance one's power to perform economically useful work.

**Carbon Geosequestration:** Depositing and storing carbon in a reservoir beneath the Earth's surface.

**Catadromous:** A general category describing fish, such as eels, that live in fresh water and migrate to salt water to spawn.

**Cavitation:** A phenomenon in which rapid changes of pressure in a liquid lead to the formation of small vapor-filled cavities (i.e., bubbles) in places where the pressure is relatively low.

**Cephalopod:** Active predatory mollusk of the large class Cephalopoda, such as an octopus or squid.

**Cetacean:** Completely aquatic marine mammals such as whales, dolphins, and porpoises; they feed, mate, calve, and suckle their young in the water.

**Chartered Vessel:** Vessels that are owned and/or operated by a private firm and are operating under an NOS contract.

**Cilia:** Microscopic hair-like structures on the surface of certain cells that either cause currents in the surrounding fluid, or, in some protozoans and other small organisms, provide propulsion.

**Closest Point of Approach (CPA):** Term used in modeling the level of sound exposure of marine mammals to an underwater sound source; refers to the closest horizontal distance of animals from a sound source.

**Cnidaria:** Phylum of macroinvertebrate marine fauna including jellyfish, sea anemones, and corals.

**Coastal Birds:** Birds which occupy coastal habitats, such as shorebirds, pelicans, terns, gulls, and some waterfowl and wading birds.

**Community:** Group or association of populations of two or more different species occupying the same ecosystem.

**Conservative Estimate:** Use of assumptions in analysis methodologies that result in larger impacts on the environment.

**Conspecific:** Animals or plants belonging to the same species.

**Consumer Surplus:** The value of goods in excess of the costs of acquisition.

**Contiguous Zone:** A band of water extending farther from the outer edge of the territorial sea to up to 24 nautical miles (44.4 km) from the baseline. The zone established by the United States under Article 24 of the Convention on the Territorial Sea and the Contiguous Zone, as published in the June 1, 1972 issue of the *Federal Register*.

**Continental Shelf:** The area of sea bed around a large landmass where the sea is relatively shallow compared with the open ocean.

**Continental Slope:** The deepening sea floor out from the continental shelf (see definition above) edge to the upper limit of the continental rise, or the point where there is a general decrease in steepness.

**Continuous Sound:** Vibration that is present at all times in a relevant time window.

**Copepod:** Small aquatic crustaceans that are one of the most numerous macroinvertebrates in aquatic communities. They inhabit a wide range of salinities, from fresh water to hypersaline conditions.

**Coral Polyps:** Sessile macroinvertebrates of the class Anthozoa that typically form and live in large colonies known as coral reefs, which constitute some of the most biodiverse communities on Earth.

**Corallite:** Skeleton of an individual coral polyp.

**Core:** Samples that preserve surface and subsurface sediment layers.

**Countervailing Cumulative Effect:** Where the net adverse impact is less than the sum of the individual impacts.

**Critical Habitat:** Specific geographic area, as formally designated by the U.S. Fish and Wildlife Service or National Marine Fisheries Service under the Endangered Species Act (ESA), that contains features essential to the conservation of an endangered or threatened species and that may require special management and protection. May also include areas that are not currently occupied by the species but will be needed for its recovery.

**Cryopelagic:** Relating to the underside of an oceanic ice layer or the water immediately below the ice surface.

**Cultural Landscape:** A geographic area, including both cultural and natural resources and the wildlife or domestic animals therein, associated with a historic event, activity, or person, or exhibiting other cultural or aesthetic values.

**Cumulative Actions:** Past, present, and reasonably foreseeable future activities that are addressed in the cumulative effects analysis because their environmental effects may combine or interact with the effects of the Proposed Action.

**Cumulative Impacts:** Effects on the environment from the incremental effect of the Proposed Action when added to other past, present, and reasonably foreseeable future actions.

**Cumulative Sound Exposure Level (SEL):** A measure of energy that takes into account both received level and duration of exposure; total combined sound energy to which an animal has been exposed over time.

**Datum:** A coordinate system and a set of reference points used for locating places on the Earth. Datums are used in navigation and surveying by cartographers, surveyors, and navigation systems to translate positions indicated on maps to their real position on Earth.

**De minimis:** Referring to environmental impacts so minimal as to merit disregard.

**De-ballast:** Exchange of ballast water (see definition above) in open ocean waters (for vessels that have ballast tanks).

**Decidecade Band:** A logarithmic frequency interval equal to one tenth of a decade (i.e., a unit for measuring ratios on a logarithmic scale, with one decade corresponding to a ratio of 10 between two numbers); it is approximately equal to one third of an octave.

**Delphinid:** Oceanic dolphin belonging to the family Delphinidae.

**Demand:** The desire of purchasers, consumers, clients, employers, etc., for a particular commodity, service, or other item.

**Demersal:** Relating to or near the ocean bottom, typically in reference to fish species such as cod, haddock, and flatfish (e.g., halibut) that live on or near the sea floor.

**Deoxygenation:** A decrease in dissolved oxygen concentration in fresh or saltwater habitats.

**Depleted (under the MMPA):** Status of a species under the MMPA when its population falls below the optimum sustainable population level.

**Depredation:** The act of preying upon, such as the killing of adult birds and offspring by natural predators.

**Designed Cultural Landscape:** A setting that includes purposefully planned views or vistas.

**Detritus:** In aquatic ecosystems, refers to dead particulate organic material, as opposed to dissolved organic material. It usually includes the remains or fragments of dead organisms as well as fecal material, and often hosts communities of microorganisms that both colonize and decompose it.

**Diadromous:** A general category describing fish that spend portions of their life cycles partially in fresh water and partially in salt water, including both anadromous and catadromous fish.

**Direct effect:** Impact caused by an action that occurs at the same time and place.

**Distinct Population Segment (DPS):** A vertebrate population (i.e., a group of potentially interbreeding organisms in the same species in a given locality) or group of populations that is discrete from other populations of the species and significant in relation to the entire species.

**Doppler Shift:** Relative change in the frequency of sounds emitted by approaching or receding sound sources.

**Downwelling:** A process where surface water is forced downwards, where it may deliver oxygen to deeper waters, increasing dissolved oxygen concentrations in the depths.

**Dredge:** Remove sediment from the sea bed, lake bed, river bed, or the bottom of artificial waterways, typically done to increase or restore water depth for the transit of vessels or to restore the volume of water in lakes filling in with sediments.

**Duty Cycle:** The fraction or percentage of time that a source is 'on' in a relevant time window (e.g., a source transmitting for two hours per day has a duty cycle of  $2/24 = 0.08 = 8$  percent).

**Echinoderm:** Member of a phylum of marine macroinvertebrates; the adults are recognizable by their radial symmetry, including sea stars, sea urchins, sea cucumbers, sand dollars, and crinoids.

**Echolocation:** The use of sound waves and echoes to determine where objects are in space, used both in air (by bats) and water (by marine mammals).

**Economic Sector:** Components of the economy which are distinct from each other.

**Ecosystem:** A system of biotic (i.e., living) and abiotic (i.e., non-living) components that interact with each other and function together as a unit.

**Effects Determination:** Process employed under the Endangered Species Act to formally conclude whether actions may affect listed species or designated critical habitat.

**Electric Load Planning:** The process of forecasting the demand for electricity of a community and adjusting the generation and transmission of electricity accordingly.

**Electrophysiological Studies:** Investigations which stimulate the flow of ions into tissue in order to deduce the functional capabilities of anatomical structures.

**Endangered:** A species is considered endangered under the Endangered Species Act if it is in danger of extinction throughout all or a significant portion of its range.

**Endemic:** Native and restricted to a certain place, often referring to a species confined to a given locale.

**Energy Source Level:** In acoustics, defined as the intensity of the radiated sound at a distance of 1 meter from the source, where intensity is the amount of sound power transmitted through a unit area in a specified direction. Source level is given as a relative intensity measured in decibels (dB).

**Ensonify:** To fill with sound, for example, a given volume of water of a given shape and configuration.

**Environmental Justice:** A condition under which no population bears a disproportionate share of negative environmental consequences resulting from industrial, municipal, and commercial operations or from the execution of federal, state, and local services, laws, regulations, and policies.

**Epipelagic:** The part of the ocean where there is enough sunlight for algae to utilize photosynthesis; this zone reaches from the sea surface down to approximately 200 m (650 feet).

**Episodic Erosion:** The shore and backshore adjustment that results from short-duration, high-intensity meteorologic and oceanic storm events. This type of event response results in shore adjustment and occurs during a single storm or during a series of closely spaced storm events within a storm season.

**Escarpment:** An area of ground surface at which elevation changes suddenly. It usually refers to a cliff, precipice, or steep slope.

**Essential Fish Habitat:** Those waters and substrate necessary for fish for spawning, breeding, feeding, or growth to maturity, as designated by the National Marine Fisheries Service.

**Eutrophication:** Excessive richness of nutrients (e.g., nitrates and phosphates) in a lake or other body of water, frequently due to runoff from the land, which causes a dense growth of plant life (e.g., algal blooms) and death of aquatic animal life from lack of oxygen when the algae die en masse and decompose.

**Evolutionarily Significant Unit (ESU):** A population of organisms considered distinct for the purposes of conservation action; may be a species, subspecies, race, population, or stock, such as a stock of salmon associated with a particular river.

**Exclusive Economic Zone (EEZ):** Area of the sea where the U.S. and other coastal nations have jurisdiction over natural resources. The U.S. EEZ extends no more than 200 nautical miles from the territorial sea baseline and is adjacent to the 12 nautical mile territorial sea of the U.S., including the Commonwealth of Puerto Rico, Guam, American Samoa, the U.S. Virgin Islands, the Commonwealth of the Northern Mariana Islands, and any other territory or possession over which the United States exercises sovereignty.

**Exoskeleton:** A rigid, external supportive covering of an animal, such as an arthropod.

**Federal Subsistence Priority:** Subsistence (see definition below) uses by rural residents of Alaska are accorded priority by the federal government over non-subsistence uses, commercial or sport.

**Feeding Area:** Areas and months within which a particular species or population selectively eats. These may either be found consistently in space and time, or may be associated with ephemeral features that are less predictable but can be delineated and are generally located within a larger identifiable area.

**Filter Feeder:** Animals that eat by moving water through a structure that acts as a sieve, straining suspended matter and food particles or prey from the water.

**Fissiped:** Members of the taxonomic order Carnivora, having toes separated to the base, including sea otters and polar bears.

**Fishery Management Councils (FMC):** Eight regional bodies composed of knowledgeable people with a stake in fishery management, established under the Magnuson-Stevens Fishery Conservation and Management Act, to develop regional Fishery Management Plans and responsibly manage fish and shellfish species in waters within the U.S. EEZ.

**Fishing Community:** A social or economic group whose members reside in a specific location and share a common dependency on commercial, recreational, or subsistence fishing or on directly related fisheries dependent services and industries (e.g., boatyards, ice suppliers, tackle shops).

**Fishing Lure:** Artificial fishing bait designed to attract a fish's attention and instigate a bite so as to impale the fish on a hook; one or more hooks are often hidden within the lure.

**Fjord:** A long, deep, narrow body of water that reaches far inland and is bordered by steep mountains; in the continental United States, they are found only in Alaska.

**Fledging Period:** The stage in a flying animal's life between hatching or birth and becoming capable of flight.

**Fledgling:** A young bird which has developed wing feathers that are large and strong enough for flight.

**Floe:** A layer of floating ice on the surface of a water body; distinct from icebergs, which have calved from tidewater glaciers and have more vertical structure.

**Flume:** A narrow channel conveying water.

**Fore Reef:** The outside part of a reef (see definition below) seaward of the reef edge facing the open sea.

**Fourier Transform:** Algorithm that decomposes functions depending on space or time into functions depending on spatial or temporal frequency. Used to compute the spectral (frequency) content of a signal.

**Frequency:** Rate of oscillation of a sound wave as the number of cycles per second:  $f$  [unit is Hz: Hertz];  $1 \text{ Hz} = 1/s$  [second]; higher-frequency sounds are perceived as higher-pitched to the observer. Animal species are able to perceive sounds within given frequency ranges that vary from species to species. Sounds below or above that frequency range cannot be heard or detected by that species.

**Fringing Reef:** One of the three main types of coral reef (see definition below). It is distinguished from the other main types, barrier reefs and atolls, in that it has either an entirely shallow backreef zone (i.e., lagoon) or none at all. Grows seaward directly from the shore and forms a border along the shoreline and surrounding islands.

**Frontal Zone:** The transition area, sometimes amounting to a discontinuity, that separates adjacent air masses.

**Fusiform:** Tapering at both ends; spindle-shaped.

**Gastropod:** Mollusks of the class Gastropoda, having a head with eyes and feelers and a muscular foot on the underside of its body with which it moves. Most gastropods are aquatic in both fresh and salt water, but some have evolved to live on land, such as some snails and slugs; may have a univalve shell or none.

**Geological and Geophysical (G&G) Surveys:** Conducted to obtain data for oil and gas exploration and production; uses high-intensity active acoustic sources that penetrate the surface of the sea floor.

**Gill Net:** A fishing mesh which is hung vertically so that fish get trapped in it by their gills (i.e., the respiratory organs of fish).

**Gross Domestic Product (GDP):** The total value of goods produced and services provided in a country during one year.

**Ground Truthing:** To directly confirm, or validate by direct observation, information or data that was derived indirectly.

**Gyre:** A large system of rotating ocean currents.

**Habitat:** The natural environment of an organism; a place possessing the features and resources needed to promote the life and growth of an organism or a species.

**Habitat Areas of Particular Concern (HAPC):** A designation that encompasses discrete subsets of Essential Fish Habitat; high-priority locales for conservation, management, or research because they are rare, sensitive, stressed by development, or important to ecosystem function.

**Habitat Occupancy:** The presence of a given species within a habitat area.

**Hard Bottom:** Refers to exposed rock underneath a waterbody but includes other substrata such as coral and artificial structures.

**Hatchling:** A young bird that has recently emerged from its egg and is typically still nest-bound.

**Haul Out:** To come out of the water to spend time on land; practiced in particular by certain pinnipeds.

**Head-of-tide:** The inland limit of water affected by the rise and fall of sea levels.

**Headwaters:** The inland source from which a river originates within a basin or watershed; often refers to adjacent lands as well as waters within the upper reaches of a river basin.

**Hearing Threshold:** The minimum sound level, measured in decibels (dB) that an animal can hear within a specified frequency band.

**Hearing Threshold Shifts:** Changes in the hearing range of an organism due to exposure to high intensity sounds.

**Highly Migratory Species (HMS):** Fish that travel long distances and often cross domestic and international boundaries. These pelagic fish live in the open ocean, although they may spend part of their life cycle in nearshore waters.

**High Resolution Geophysical (HRG) Survey:** A type of geological and geophysical (G&G) survey that uses sound waves that are reflected off submerged structures to collect data on conditions both at the sea floor and the shallow subsurface.

**High Tide Line:** The intersection of the land with the water's surface at the maximum height reached by a rising tide.

**Historic Property:** Any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties and also includes properties of traditional religious and cultural importance to an Indian tribe or Hawaiian organization and that meet the National Register criteria.

**Homing Propensity:** Tendency to return to the locations where a species originated.

**Hydrocarbon:** A compound of hydrogen and carbon, such as any of those which are the chief components of coal, petroleum, and natural gas (i.e., the fossil fuels).

**Hydrography:** The measurement and description of the physical features of oceans, seas, coastal areas, lakes, and rivers, as well as the prediction of their change over time, for the primary purpose of safety of navigation and in support of all other marine activities.

**Hypoxia:** Refers to low or depleted dissolved oxygen in a body of water.

**Ice Seals:** Four species of seals found in the Arctic – bearded, ringed, spotted, and ribbon – which are collectively called ice seals because of their association with sea ice for feeding, resting, and pupping.

**Illegal, Unreported, and Unregulated (IUU) Fishing:** Fishing activities that violate both national and international fishing regulations.

**Immunocompetency or Immunocompetence:** The ability of the body or of an organism to respond to illness.

**Impulsive Sound:** Sounds that are typically transient, brief (less than 1 second), broadband, and consist of high peak sound pressure (i.e., the decibel level of the maximum instantaneous acoustic pressure in a stated frequency band) with rapid rise time and rapid decay.

**Indirect Effect:** Environmental impact that is caused by the action and occurs later in time or is farther removed in distance but is still reasonably foreseeable. Indirect effects also include “induced changes” in the human and natural environments.

**Insolation:** Sunlight or incoming solar radiation.

**Intermittent Sound:** A sound that is periodically present, in contrast to one that is constant or continuous.

**Intertidal Zone:** Area where the ocean meets the land between high and low tides.

**Inverse Fourier Transform:** A mathematical algorithm that converts a space or time signal to a signal of the frequency domain; converting spatial or temporal data into the frequency domain data. It computes the time-domain signal,  $h(t)$ , from the spectral components  $H(t)$ .

**Invertebrate:** Animal lacking a backbone.

**Irretrievable Impact:** Losses to or effects on natural resources that are lost for a period of time, but not permanently.

**Irreversible Impact:** Losses to or effects on natural resources from use or depletion of nonrenewable resources, such as fossil fuels or cultural resources, or to factors such as soil productivity that are renewable only over long periods of time.

**Isopleth:** Lines or curves on a map of equal values; contour lines on a topographic map depicting ground surfaces of the same elevation are an example of isopleths.

**Karigi:** Special houses used for performing ritual ceremonies by Alaska Natives.

**Knot (unit):** A unit of speed equal to one nautical mile per hour, exactly 1.852 km/h (approximately 1.15078 mph or 0.514 m/s).

**Krill:** Small, planktonic, shrimp-like crustaceans of the open oceans that are eaten by a number of marine animals, notably the baleen whales; they have been described as “essentially the fuel that runs the engine of the Earth’s marine ecosystems.”

**Lagoon:** A shallow body of water that may have an opening to a larger body of water but is also protected from it by a sandbar or coral reef; often brackish when near the sea.

**Launch:** A small boat that is deployed into the water directly from a ship.

**Lentic:** Inhabiting or situated in still fresh water, such as the waters of a lake.

**Level A Harassment:** Any act of pursuit, torment, or annoyance which has the potential to injure a marine mammal or marine mammal stock in the wild.

**Level B Harassment:** Any act of pursuit, torment or annoyance which has the potential to disturb a marine mammal or marine mammal stock in the wild by causing a disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering but which does not have the potential to injure a marine mammal or marine mammal stock in the wild.

**Lidar:** Acronym for Light Detection And Ranging. A remote sensing technology that uses light in the form of a pulsed laser to measure ranges (i.e., distances) to a target.

**Liquefied Natural Gas (LNG):** A form of natural gas (i.e., a naturally occurring hydrocarbon gas mixture consisting primarily of methane) that has been cooled down so that it has a reduced volume and behaves as a liquid.

**Lithic:** Of the nature of or relating to stone; in archaeology, it refers to any stone that has been used or beat on by humans.

**Lombard Effect:** A phenomenon in which speakers increase their vocal production to communicate in noisy environments.

**Low-income Population:** Group of individuals living in geographic proximity to one another, or a geographically dispersed or transient (i.e., migrant) group of individuals that have household incomes at or below the designated "low-income" threshold or the designated federal poverty level.

**Macroalgae:** Large marine algae, often living attached in dense beds, such as kelp and seaweed.

**Macrohabitat:** An extensive habitat presenting considerable variation of the environment, containing a variety of ecological niches, and supporting a large number and variety of complex flora and fauna.

**Macroinvertebrate:** An animal lacking a backbone that can be seen without the aid of a microscope and captured by a 500- $\mu\text{m}$  net or sieve. This includes arthropods (e.g., insects, mites, scuds and crayfish), mollusks (e.g., snails, limpets, mussels and clams), annelids (e.g., segmented worms), nematodes (e.g., roundworms), and platyhelminthes (e.g., flatworms).

**Mangrove:** A tree or shrub that grows in chiefly tropical coastal swamps that are flooded at high tide, typically with numerous tangled roots above ground and forming dense thickets.

**Markov Chain:** A mathematical system that transitions from one state to another according to certain probabilistic rules. Its defining characteristic is that no matter how the process reached its present state, the possible future states are fixed. They are used to model randomness in biological and economic systems.

**Marine Hydrokinetic Technologies (MHK):** The use of movement or temperature gradients of water to generate electricity in the ocean.

**Marine Seismic Survey:** A type of geological and geophysical (G&G) survey that uses a variety of acoustic sources to image sediment and rock deep below the sea floor.

**Maritime Heritage:** The study of our past, both recent and ancient, in the context of the marine environment; study of the history of vessels, trade, transport, seaports, migration, navies, and sea battles, among other topics.

**Marsh:** A type of wetland which is dominated by grasses and other herbaceous plants; may be freshwater, brackish, or saltwater, and may be located inland or along the coast.

**Masking:** The effect of an acoustic source interfering with the reception and detection of an acoustic signal of biological importance to a receiver.

**Mechanical Wave:** A wave, such as sound, that is not capable of transmitting its energy through a vacuum. They require a medium in order to propagate their energy from one location to another.

**Melon (as in Odontocetes):** A globular fatty organ in certain whale species that gives shape to the domed forehead, focuses and modulates the animal's vocalizations, and acts as a sound lens; it is a key organ involved in communication and echolocation.

**Merchantman:** A merchant or trading ship that transports cargo or carries passengers for hire.

**Mesopelagic:** Also known as the middle open ocean, this zone stretches from the bottom of the epipelagic down to the point where sunlight cannot reach. The deep end of this zone is approximately 1000 m (3300 feet) deep.

**Metapopulation:** Consists of a group of spatially separated populations of the same species which interact at some level. Among certain marine fish species, for example, populations may be spatially separated and independent, but spatial overlap occurs during breeding periods, allowing for gene flow between the distinct populations.

**Midden:** An old dump for domestic waste which may consist of animal bone, human excrement, botanical material, mollusk shells, sherds, lithics, and other artifacts and ecofacts associated with past human occupation.

**Midwater:** Mesopelagic and bathypelagic (see definitions above) zones of the open ocean.

**Migratory Corridor:** Areas and seasons within which a substantial portion of a species or population is known to migrate; for aquatic species the corridor is typically delimited on one or both sides by land or ice.

**Minimum Population Estimate:** An estimate of the number of animals in a stock that:

(A) is based on the best available scientific information on abundance, incorporating the precision and variability associated with such information; and

(B) provides reasonable assurance that the stock size is equal to or greater than the estimate.

**Minority Population:** A population in which the percentage of minorities exceeds 50 percent or is substantially higher than the percentage of minorities in the general population or other appropriate unit of geographic analysis.

**Mollusk:** Phylum of macroinvertebrates including gastropods (e.g., sea snails, whelks, limpets, abalone), bivalves (e.g., clams, mussels, oysters, scallops), cephalopods (e.g., squid, octopus), and chitins.

**Molt:** The process of shedding feathers, fur, or skin that will be replaced by a new growth.

**Motile:** Capable of self-powered motion.

**Muktuk/maktak:** Fried whale blubber.

**M-weighting Function:** Sound frequency weighting function for marine mammals based on a literature review of their physiological and behavioral responses to anthropogenic sound. Applied in a similar way as A-weighting for noise level assessments for humans (see definition for A-weighting function).

**Mysticete:** A taxonomic suborder of cetaceans; whales that have two blowholes and baleen plates instead of teeth.

**Nacelle:** Housing for the generator, gearbox, and other parts of a wind turbine.

**National Register of Historic Places (NRHP):** The official list of the nation's historic places worthy of preservation. Authorized by the National Historic Preservation Act of 1966, the National Park Service's NRHP is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect America's historic and archeological resources.

**National Wildlife Refuge:** A designation for protected areas that are managed by the U.S. Fish and Wildlife Service. These public lands and waters are set aside to conserve America's wild animals and plants.

**Neritic:** Relating to or denoting the shallow part of the sea near a coast and overlying the continental shelf.

**Nesting:** The process of building or occupying a nest (i.e., a structure built by certain animals to hold eggs, offspring, and, oftentimes, the animal itself).

**Noise:** An undesirable sound, one that interferes with communication, is intense enough to damage hearing, or is otherwise intrusive or objectionable to certain living organisms, including humans.

**Non-impulsive Sound:** Sounds that can be broadband, narrowband or tonal, brief or prolonged, continuous or intermittent, and typically do not have a high peak sound pressure with rapid rise/decay time as impulsive sounds do.

**Nursery Area:** A location, usually offering plentiful food and some level of protection from predation, in which the juveniles of a marine species undergo growth and development.

**Nutrient Cycling:** Movement of organic and inorganic materials through different components of a cell, community, or ecosystem, which can be cycled and reutilized by some of these components.

**Ocean Acidification:** The process in which the acidity, a measure of hydrogen ion concentration (pH), of seawater increases as a result of absorbing carbon dioxide (CO<sub>2</sub>).

**Ocean Economy:** Economic activity which indirectly or directly uses the ocean (or Great Lakes) as an input. It consists of six sectors: marine construction; living resources; offshore mineral extraction; ship and boat building; tourism and recreation; and marine transportation.

**Ocean Thermal Energy Conversion (OTEC):** A process or technology to power a turbine to produce electricity by harnessing the temperature differences (i.e., thermal gradients) between ocean surface waters and deep ocean waters.

**Octave:** A series of eight notes occupying the interval between, and including, two notes, one having twice or half the frequency of vibration of the other.

**Odobenid:** Organisms belonging to the family Odobenidae. The only living species is the walrus.

**Odontocete:** A taxonomic suborder of cetaceans; whales that have teeth (e.g., the orca) and one opening at their blowhole.

**Offshore Waters:** Marine waters outside the territorial boundaries of a state.

**Ordnance:** Military supplies including weapons, ammunition, combat vehicles, and maintenance tools and equipment.

**Ostracod:** A class of crustaceans that has several pairs of legs and a body made up of sections that are covered in a hard outer shell.

**Otariid:** Eared seals. This family includes sea lions and fur seals.

**Otolith:** Also known as “earstones”, they are hard, calcium carbonate structures located directly behind the brain of bony fishes; involved in sensing gravity and movement. Alternating bands develop over time that can be read like tree rings to determine a specimen’s age, which is important information in managing the sustainable harvest of fish stocks.

**Overwintering:** The process of organisms adapting to and surviving winter conditions, such as freezing temperatures, ice, snow, and less available food.

**Pack Ice:** Any area of detached sea ice (i.e., ice formed by freezing of sea water) that is not land fast; it is mobile by virtue of not being attached to the shoreline or something else.

**Palustrine:** Relating to a system of inland freshwater wetlands, such as marshes, swamps, and lake shores, and characterized by the presence of trees, shrubs, or emergent vegetation.

**Passband:** Frequency bands obtained by splitting a spectrum into 1 Hz wide bands.

**Passive Sonar:** A method for detecting acoustic signals in an underwater environment, usually the ocean. The difference between passive and active sonar is that a passive sonar system emits no signals; instead, its purpose is to detect the acoustic signals emanating from external sources.

**Patch Reef:** Small, isolated reefs (see definition below) that grow up from the open bottom of the island platform or continental shelf. They usually occur between fringing reefs and barrier reefs.

**Peak Pressure:** The maximum value reached by sound pressure (see definition below); referred to as the  $L_{peak}$  or sometimes  $L_{pk}$ .

**Peak-to-peak Sound Pressure:** The difference between the maximum and minimum instantaneous sound pressure (see definition below), possibly filtered in a stated frequency band, attained by an impulsive sound,  $p(t)$ .

**Pelagic:** Relating to, living in, or found on the open sea, away from land, where water is deep; oceanic.

**Permanent Threshold Shift (PTS):** Permanent elevation in hearing threshold with physical damage to the sound receptors in the ear lasting indefinitely; in some cases, there can be total or partial deafness, whereas in other cases the animal has an impaired ability to hear sounds in specific frequency ranges.

**Period (as related to sound):** Duration of 1 cycle:  $T = 1/f$  [s], where  $T$  = time period to complete one cycle of an oscillation,  $f$  = frequency, and  $s$  = second. It is related to wavelength by  $T = \lambda/v$ , where,  $\lambda$  = wavelength (lambda), and  $v$  = velocity.

**Petroglyphs:** Prehistoric rock carvings.

**Phocid:** Earless seals or “true seals” that can be identified by their lack of external ear flaps.

**Photic Zone:** Part of a body of water where enough light penetrates for photosynthesis to occur in phytoplankton.

**Photosynthesis:** Process by which green plants, algae, diatoms, and certain forms of bacteria (e.g., cyanobacteria) manufacture the carbohydrate glucose ( $C_6H_{12}O_6$ ) from carbon dioxide and water, using energy captured from sunlight by chlorophyll, and releasing excess oxygen as a byproduct.

**Phylum (p. phyla):** Major taxonomic category that ranks just above class and just below kingdom (as in plant, animal, and fungus kingdoms) in the taxonomic hierarchy; it classifies organisms by their fundamental body plan.

**Physiology:** The normal functions of living organisms and their anatomical structures.

**Phytoplankton:** Microscopic organisms that live in both saltwater and freshwater aquatic environments; like all green plants, they contain the pigment chlorophyll to convert sunlight via the process of photosynthesis into carbohydrates (i.e., food, organic matter, and chemical energy); phytoplankton are critically important in aquatic ecosystems and form the base of the aquatic food web or pyramid.

**Pillbox:** Small concrete forts used by armies as outposts or guard posts.

**Pinger:** Underwater signaling device or locator beacon; they have short-duration chirp signals in the 10s of kHz range at moderate source levels (160-180 dB re: 1  $\mu$ Pa @ 1m).

**Pinniped:** Marine mammals that include the true seals, eared seals, sea lions, and walruses.

**Piscivorous:** Referring to organisms that primarily eat fish.

**Planktivorous:** Referring to organisms that primarily consume small invertebrates (e.g., plankton such as krill, zooplankton).

**Plankton:** Organisms, including both plants and animals (i.e., autotrophs and heterotrophs), that drift in water in the oceans, seas, rivers, and lakes.

**Plunge Diving:** A seabird foraging technique that involves rapidly diving into deep waters while in flight in order to hunt for prey; practiced by gannets and boobies, among other species.

**Pod:** A social group of whales.

**Population:** Group of individual organisms of the same plant, animal, or microorganism species capable of interbreeding and occupying the same geographic area or ecosystem; or, the size (i.e., number of individuals) in any given population; members of a given population are typically more closely related to one another genetically than to individuals of other populations within the same species.

**Potential Biological Removal (PBR) Level:** Defined by the Marine Mammal Protection Act as the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population.

**Porifera:** Macroinvertebrate animal phylum composed of sponges.

**Precision:** The degree to which separate measurements or models of the same subject are close in value.

**Precocial:** Offspring requiring lower levels of parental care.

**Primary Constituent Element (PCE):** The physical and biological features of a habitat that a species needs to survive and reproduce. Used in definitions of designated critical habitat.

**Producer Surplus:** The value of a good or service in excess of the costs of production.

**Programmatic:** Describes any broad or high-level National Environmental Policy Act (NEPA) review; it is not limited to a NEPA review for a particular project. Programmatic NEPA reviews assess the general environmental impacts of proposed policies, plans, programs, or suites of projects for which subsequent actions will be implemented either based on the Programmatic Environmental Assessment or Programmatic Environmental Impact Statement, or based on subsequent NEPA reviews tiered from the programmatic review (e.g., a site- or project- specific document).

**Project Cargo:** Large, heavy, high value or critical pieces of equipment for a project.

**Propagation Loss:** Reduction in sound pressure level (SPL) between two designated locations in a sound transmission system, one location often being at a reference location from the source. Also known as propagation transmission loss.

**Propagules:** Any material that functions in growing an organism to the next stage in its life cycle, such as by dispersal. The propagule is usually distinct in form from the parent organism.

**Propeller Singing:** The resonance between the local natural frequency of the propeller blade tip and the vortex shedding frequency at trailing edge of the blade. Propeller singing creates very intensive levels of radiated noise.

**Protected Species:** An animal or plant which it is forbidden by federal law to harm or destroy, e.g., endangered species.

**Pseudofeces:** Mucous-coated grit expelled by filter-feeding gastropod mollusks, distinct from actual feces.

**Pulse (as related to sound):** A single segment of a periodic signal that consists of (potentially) repeating segments with defined beginning and end points and is, typically, short in duration. Pulses are not necessarily impulsive.

**Pulse Length:** For impulsive (pulsed) sound (e.g., airguns, pile driving), the pulse length is often taken as the 90 percent pulse energy duration T90%, which is the time between the 5 percent and 95 percent points on the cumulative energy curve.

**P-wave:** Also called primary waves, these are mechanical waves that are longitudinal in nature.

**Received Level:** Amount of sound energy actually reaching a receiver such as a modeled animal; the greater the transmission loss, the lower the received sound level at any given location.

**Red Tide:** A common term used for harmful algal blooms, which can be dangerous to people and deadly for fish due to potent neurotoxins released by the dinoflagellate *Karenia brevis*.

**Reef:** A ridge of jagged rock, coral, or sand just above or below the surface of the sea.

**Reef Crest:** The highest (i.e., most shallow) part of the reef which lies between the shoreward, protected back reef zone and the outer fore reef zone (see definitions above).

**Reef Flat:** Occupies the inshore side of the bank reef (see definition above). This consists of broken coral skeletons and coralline algae and excludes most other organisms due to the inhospitable, heavy surf that often characterizes this area.

**Reef Slope:** Area of high coral cover and moderate to low wave energy on the fringing reef.

**Reproductive Area:** Locations and seasons within which a particular species or population selectively mates, gives birth, or is found with neonates or other sensitive age classes.

**Reserved Right:** The doctrine that holds that Native Americans retain all rights not explicitly revoked in treaties or other legislation.

**Rise Time:** The amount of time it takes for a signal to change from static pressure to high pressure.

**Rookery:** Large, clustered nesting colony, generally of gregarious seabirds, wading birds, and pinnipeds.

**Salp:** Semi-transparent barrel-shaped marine animals that move through the water by contracting bands of muscles which ring the body. They belong to the subphylum Tunicata, a group of marine macroinvertebrates also known as sea squirts.

**Salt Marsh:** Coastal wetlands that are flooded and drained by salt water moved by the tides; the soil may be composed of deep mud and peat.

**Sandbar:** Along the seashore, a ridge of sand or coarse sediment connected to the shoreline or resting offshore that is submerged or partially exposed; generally narrow and straight and formed by the breaking of waves moving material from the shoreline.

**Sandflat:** A flat, marshy, or barren tract of land that is alternately covered and uncovered by the tide and consisting of unconsolidated sediment mostly of mud and sand.

**Sea floor:** The solid surface underlying a sea or ocean.

**Seabirds:** Birds which spend much of their lives at sea foraging over pelagic habitat (i.e., open sea), often thousands of kilometers from their nesting grounds.

**Seamount:** Undersea mountains formed by volcanic activity.

**Sediment:** A naturally occurring material that is broken down by processes of weathering and erosion and subsequently transported by the action of wind, water, or ice or by the force of gravity.

**Seine Net:** A large mesh with sinkers on one edge and floats on the other that hangs vertically in the water and is used to enclose and catch fish when its ends are pulled together or are drawn ashore.

**Semelparous:** Organisms that die after spawning only once, such as Pacific salmonids.

**Sessile:** Non-mobile, or attached, organisms such as adult coral polyps

**Shelf Break:** The point of the first major change in gradient at the outermost edge of the continental shelf (see definition above); its depth, distance from shore, and configuration are highly variable.

**Shoal:** A shallow place in a river, sea, or other body of water caused by a submerged bank or bar of sand or other unconsolidated material deposited on the substrate

**Shorebirds:** A distinct taxonomic subset of coastal birds, such as sandpipers, plovers, sanderlings, and godwits which forage on sandy shores at the water's edge.

**Sirenian:** An order of fully aquatic, herbivorous mammals that inhabit swamps, rivers, estuaries, marine wetlands, and coastal marine waters. Sirenians currently comprise the families Dugongidae (e.g., the dugong) and Trichechidae (e.g., manatees) with a total of four species.

**Social Surplus:** The value of a good or service in excess of the costs of acquisition or production.

**Sonar:** A technique that uses sound propagation to navigate (e.g., submarines), communicate with, or detect objects on or under the surface of the water, such as other vessels.

**Sound:** Vibrations that travel through the air or water and can be heard when they reach a person's or animal's ear.

**Sound Exposure Level (SEL):** The time-integral of the squared acoustic pressure over a duration ( $T$ ).

**Sound Pressure Level (SPL):** The root-mean-square (rms) pressure level in a stated frequency band over a specified time window ( $T$ ;  $s$ ).

**Source Level:** Amount of sound radiated by a sound source, defined as the intensity of the radiated sound at a distance of 1 meter from the source, where intensity is the amount of sound power transmitted through a unit area in a specified direction. Source level is stated as a relative intensity in decibels (dB). In underwater sound, decibels are referenced to a pressure of 1 microPascal ( $\mu\text{Pa}$ ); thus, sound level is reported in units of dB re 1  $\mu\text{Pa}$  @ 1 m.

**South Pacific Gyre:** A distinct area of the Earth's system of rotating ocean currents bounded by the equator to the north, Australia to the west, the Antarctic Circumpolar Current to the south, and South America to the east.

**Spawn:** The mass of eggs deposited by fishes, amphibians, mollusks, crustaceans, etc.; the release or deposit of eggs.

**Species:** The most basic unit in the hierarchical system of taxonomy, a group of organisms that can and do reproduce with one another in nature and produce offspring that are fertile.

**Spectral Density:** The distribution of a sound's power with frequency is described by the sound's spectrum. The sound spectrum can be split into a series of adjacent frequency bands with a width of 1 Hz (called passbands), which yields the power spectral density of the sound.

**Speed:** The distance travelled per unit time  $c = \lambda/T = \lambda \times f$  where  $c$  = the speed of sound [m/s],  $f$  = frequency (Hz),  $\lambda$  = wavelength (m), and  $T$  = time (s).

**Spermaceti:** The solid wax found in the head cavity of the sperm whale.

**Spherical Spreading Loss:** With regard to spherical sound waves emitted by a point source, refers to that portion of the transmission loss due to the divergence, that is, spreading, of sound waves in accordance with a system's configuration. Also known as divergence loss.

**Spur and Groove:** Geomorphic feature of many coral reefs, consisting of ridges or "spurs" of coral separated by channels or "grooves"; grooves are often characterized by sediments such as sand or rubble.

**State Historic Preservation Office/Officer (SHPO):** Entities within each state and U.S. territory that administer the state historic preservation program, a state and National Register of Historic Places Program, a Historic Preservation Fund grant program, a data management program, review and compliance, and other programs. The latter term refers to the individual who directs that office and oversees management of each of its programs.

**Statocysts:** Sac-like organs with sensory cilia.

**Stock:** In fisheries, it refers to a particular fish population of a given species that is more or less genetically isolated from other stocks of the same species, such as those associated with a particular river or tributary. For marine mammals, it is a group of individuals of the same species or smaller taxa in a common spatial arrangement that interbreed when mature.

**Stranding:** The term may refer to any of the following:

- A marine mammal that is on the shore and unable to return to the water under its own power;
- A marine mammal that is on the shore and, although able to return to the water, is in need of apparent medical attention;
- A marine mammal in the water that cannot return to its natural habitat without assistance; or
- A dead marine mammal on the beach or in the water.

**Strategic Stock (under the MMPA):** Defined by the Marine Mammal Protection Act (MMPA) as a marine mammal stock:

- For which the level of direct human-caused mortality exceeds the potential biological removal level (see definition above);

- Which, based on the best available scientific information, is declining and is likely to be listed as a threatened species under the Endangered Species Act (ESA) within the foreseeable future; or
- Which is listed as a threatened or endangered species under the ESA, or is designated as depleted under the MMPA.

**Strike Quota:** Under international agreement, refers to the limitation on the number of bowhead whales that may be struck by subsistence hunters, and is the sum total of the whales that are successfully and unsuccessfully landed.

**Submarine Canyon:** Narrow, steep-sided valleys that cut into continental slopes and continental rises of the oceans. They originate either within continental slopes or on a continental shelf.

**Submerged Cultural and Historic resources:** Objects found on the sea floor, lake, or river beds with historic, pre-historic, or culturally significant values.

**Subsistence:** Subsistence uses of wild resources are defined as “noncommercial, customary and traditional uses” for a variety of purposes. These include: Direct personal or family consumption as food, shelter, fuel, clothing, tools, or transportation; for the making and selling of handicraft articles out of nonedible by-products of fish and wildlife resources taken for personal family consumption; and for the customary trade, barter, or sharing for personal or family consumption.

**Substrate:** Surface or material on or from which an organism lives, grows, or obtains its nourishment; also, the material or sediments that rest at the bottom of a stream, lake, or ocean.

**Subtidal Zone:** On a coastline, the area that lies below the intertidal zone (see definition above) and is almost continuously submerged.

**Suspension Feeder:** Animals that eat particles of organic matter that are suspended in water.

**S-wave:** Also called secondary waves, these are mechanical waves that are transverse in nature.

**Swim Bladder:** In fish, gas-filled internal cavity near the ears that deforms with the pressure wave and allows fish to sense the pressure impact of sound.

**Taxon (pl. taxa):** Units used in the science of biological classification, or taxonomy. A taxonomic group of any rank, such as a species, family, or class.

**Taxonomy:** Science of naming, describing and classifying organisms, including all plants, animals and microorganisms in the biosphere.

**Temporary Threshold Shift (TTS):** The mildest form of hearing impairment; exposure to loud sound resulting in a non-permanent (i.e., reversible) elevation in hearing threshold, making it more difficult to hear sounds; TTS can last from minutes or hours to days; the magnitude of the TTS depends on the level and duration of the sound exposure, among other considerations.

**Territorial Sea:** Defined as a belt of coastal waters extending 12-nautical miles from the baseline, usually the low-water line, along the coast.

**Tidal Flat:** Intertidal, non-vegetated, soft sediment habitats, found between mean high-water and mean low-water spring tide datums and generally located in estuaries and other low energy marine environments.

**Thermal Refugium (pl. refugia):** A place that serves as a shelter for organisms from adverse temperatures (e.g., in a stream).

**Thermocline:** Transition layer between warmer mixed water at the ocean's surface and cooler deep water below.

**Thicket:** Dense groups of corals.

**Threatened:** A species is considered threatened if it is likely to become an endangered species under the Endangered Species Act within the foreseeable future.

**Tonal Sound:** Sounds with discrete frequencies, such as music notes.

**Traditional Cultural Places:** Also referred to as "Traditional Cultural Properties", TCPs are historic properties that derive their cultural significance from the role the property plays or played in a community's historically rooted beliefs, customs, and practices.

**Transducer:** Any device that converts one form of energy into a readable signal.

**Transmission Loss:** A measure, in decibels, of the decrease in sound level between a source and a receiver some distance away. Geometric spreading of acoustic waves is the predominant way by which transmission loss occurs. Transmission loss also happens when the sound is absorbed and scattered by the seawater, and reflected at the water surface and within the seabed. Transmission loss depends on the acoustic properties of the ocean and seabed; its value changes with frequency.

**Treaty Tribe:** Federally recognized tribe that has retained its right to hunt, fish, and gather under a treaty signed with the federal government.

**Tribal Sovereignty:** The right of American Indians and Alaska Natives to govern themselves. The U.S. Constitution recognizes Indian tribes as distinct governments and they have, with a few exceptions, the same powers as federal and state governments to regulate their internal affairs.

**Trophic Level:** The position an organism occupies in a food chain. A food chain is a succession of organisms that eat other organisms and may, in turn, be eaten themselves. The trophic level of an organism is the number of steps it is from the start of the chain.

**Tunicate:** Macroinvertebrate animal phylum including sea squirts or sea pork.

**Tympanum:** Membrane, or eardrum, in certain animals.

**Umiak:** Seal skin boat.

**Unavoidable Adverse Impact:** Effects on the human environment that would remain even after mitigation measures and best management practices (BMPs) have been applied.

**Undertaking:** A project, activity, or program funded in whole or in part by a federal agency, including those carried out by or on behalf of a federal agency; those carried out with federal assistance; those requiring a federal permit, license, or approval; and those subject to state or local regulation administered pursuant to a delegation or approval by a federal agency.

**Unregulated Fishing:** Occurs in areas or for fish stocks for which there are no applicable conservation or management measures and where such fishing activities are conducted in a manner inconsistent with the responsibilities of nation-states for the conservation of living marine resources under international law. Unregulated fishing occurs in marine regions outside the EEZs of nation-states.

**Unreported Fishing:** Fishing activities that are not reported or are misreported to relevant authorities in contravention of national laws and regulations or reporting procedures of a relevant regional fisheries management organization.

**Upwelling:** A process in which deep, cold water rises toward the surface. It occurs in the open ocean and along coastlines.

**Usual and Accustomed (U&A) Places:** Lands adjacent to streams, rivers, or shorelines to which a tribe usually travels or is accustomed to travel for the purpose of taking fish.

**Vessel Wake:** Waves created by the hull of a ship as it moves through the water. Depending on hull design, speed, vessel weight, and power supply, the wake of a vessel can produce anywhere from a minimal flow of water and rippling chop to swelling waves of significant size.

**Vestibular Apparatus:** In vertebrates, the structure of the inner ear involved in balance.

**Viewshed:** A subset of a landscape unit that consists of all the surface areas visible from an observer's viewpoint.

**Viscosity:** Quantity that describes a fluid's resistance to flow.

**Viviparous:** Animals that give birth to developed, live young, instead of producing eggs.

**Water Column:** Conceptual vertical area of water extending from the surface of the ocean, river, or lake to the bottom substrate or sediment. Many physical, chemical, and biological aquatic phenomena are characterized by their relative and/or absolute positions in the water column.

**Waterfowl:** Birds which spend much of their lives on the water's surface in both freshwater and saltwater environments. Specifically refers to ducks, geese, and swans.

**Watershed:** An area of land that drains or "sheds" water into a specific watercourse (i.e., a river or stream), such as the Missouri River watershed or the Ohio River watershed.

**Wavelength:** Spatial distance between two successive 'peaks' in a propagating wave:  $\lambda$  [m]. It is related to sound speed  $c$  and frequency  $f$  by  $\lambda = c/f$ .

**Weighting Function:** In acoustical analysis, a weighting function is used to correlate objective sound level meter measurements with subjective responses to sound in the subject organisms (such as marine mammals) under study.

**Whelping:** The process of a mammal giving birth, such as female polar bears birthing their cubs.

**Willingness to Pay:** The amount users are hypothetically willing to pay for goods, services, or information. Commonly used to monetize goods, services, or information without clear market values.

**Zero-to-peak Sound Pressure/Peak Sound Pressure:** Decibel level of the maximum instantaneous acoustic pressure in a stated frequency band attained by an acoustic pressure signal,  $p(t)$ .

**Zooplankton:** A type of heterotrophic (i.e., non-photosynthesizing) plankton that ranges from microscopic organisms to macroinvertebrates such as jellyfish; zooplankton drift or float with marine currents. Zooplankton are heterotrophs (i.e., they cannot produce their own food via photosynthesis) and must obtain their energy by consuming other organisms.

**Zooxanthellae:** Unicellular, golden-brown algae (e.g., dinoflagellates) that live either in the water column as plankton or symbiotically inside the tissue of other organisms, such as coral polyps.