

## Glossary of Terms – Whale Communications FAQ

This glossary defines and provides additional details on terms used in the Whale Communications FAQ document.

**Annual stranding rate** – The number of strandings reported per year. It is important to note that the number reported may not accurately reflect the true number of strandings occurring each year.

**Anthropogenic** – Anthropogenic effects, processes, objects, or materials are those that are derived from human activities.

**Authorization** – permit or approval from the federal government to conduct a specified action, which includes strict limits and requirements that must be complied with when conducting the action. For example, the NOAA Fisheries Office of Protected Resources issues [Incidental Take Authorizations \(ITAs\)](#) to U.S.-based entities under the Marine Mammal Protection Act for actions that unintentionally affect marine mammals (assuming the effect is on a small number of animals and leads to negligible impacts to the species or stock). The ITA includes requirements for how the entity is expected to ensure the least practicable impact, as well as monitoring and reporting requirements.

**Bias** – Statistical bias is the difference between an estimate of a parameter (e.g., estimated population size from survey data) and the true underlying value of the parameter (e.g., true population size). Statistical bias can arise during data collection, analysis, or interpretation. For example, if a boat-based survey is unable to collect observational data in a portion of a study area, the resulting abundance estimate could be statistically biased if appropriate analytical methods were not used to account for the unequal survey coverage.

**Cetacean** – The scientific name for the taxonomic subset of mammals that includes whales, dolphins, and porpoises. See “Marine Mammals” below.

**Construction and Operations Plans (COPs)** – Plan that an offshore wind energy developer submits to BOEM for approval to request a permit to build an offshore wind project. Includes substantial detail on project components and specifications, baseline survey efforts, and other data to inform BOEM’s permitting decision.

**Demography** – statistical study of populations. At the population level, demographic parameters may include characteristics such as a population’s growth rate or age structure. Demographic parameters for individual animals include characteristics such as its age and sex.

**Distribution** – A species’ distribution refers to its arrangement in 3-dimensional space (e.g., latitude, longitude, and depth) within a particular time frame.

**Dynamic Management Areas (DMAs)** – A type of “slow zone” defined by NOAA Fisheries to help protect North Atlantic right whales from collisions. Mariners are encouraged to avoid these areas if possible, or to reduce speeds to 10 knots or less while transiting through these areas. NOAA Fisheries establishes DMAs based on visual sightings of three or more right whales within an area of 75 square nautical miles. Recently, NOAA has also identified “slow zones” based on passive acoustic detections of North Atlantic right whales; similar voluntary vessel speed slowdowns are encouraged in these areas, though these zones are not technically designated as DMAs.

**Federal waters** – water controlled by the U.S federal government. Typically, this area extends from the boundary of state waters (3 nautical miles from the shoreline in the Atlantic Ocean) to about 200 nautical miles from shore (or to the boundary of other countries’ waters).

**Foraging** – spending time searching for food or eating.

**Geophysical surveys** – Surveys conducted during offshore wind site assessment in which vessels collect information on the ocean floor, including its geologic makeup and the features (shape and conditions) of the seafloor. Geophysical survey data inform planning of offshore wind farms, including plans for cable routes, pile driving, and anchor/mooring plans. Surveys can include a variety of different tools, such as high-resolution multi-beam or towed side-scan sonars, dual magnetometers, and high-resolution/shallow-penetration subbottom profilers, among others. Geophysical surveys are sometimes called “non-intrusive” because they do not involve physical sampling of the seabed, unlike geotechnical surveys (see below).

**Geotechnical surveys** – Surveys that physically sample or test characteristics of the seabed to inform the placement of offshore wind farm turbines, substations, and cables. Generally conducted after geophysical surveys, these physical samples and in-situ measurements of the seabed help create a geological model of the seabed to inform the engineering plans for an offshore wind farm.

**Habitat** – A species' habitat is the manifestation of its ecological niche. Habitat comprises the physical, biological, chemical, and acoustical parameters that support the specific needs for a species' survival and reproduction. The values of habitat parameters may be constant or variable across space and time. For example, humpback whales undergo seasonal migrations from foraging grounds in the North Atlantic during spring through fall, to winter breeding grounds in equatorial waters. During these different stages, the properties of their habitat varies, as it is supporting different stages of the life cycle of the species.

**Harassment** – Type of incidental take under the U.S. Marine Mammal Protection Act (MMPA) that is authorized by the National Marine Fisheries Service either through a Letter of Authorization (LOA) or an Incidental Harassment Authorization (IHA). Harassment authorizations are required for many types of anthropogenic marine activities, including aspects of offshore wind energy development. Also see “take,” below.

- **Level A harassment** – Any act of pursuit, torment, or annoyance that 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 that has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, feeding, or sheltering. Changes in behavior that disrupt biologically significant behaviors or activities for the affected animal are indicative of take by Level B harassment under the MMPA.

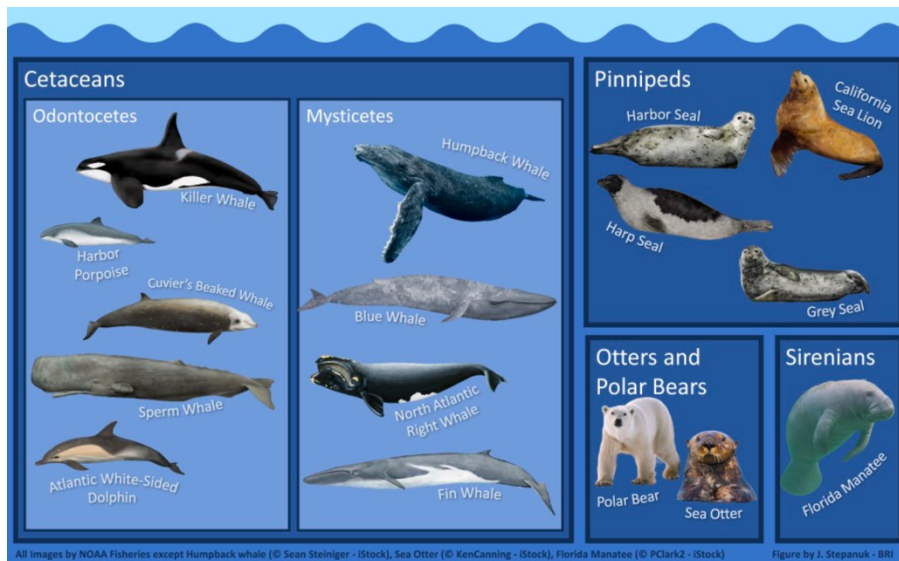
**Human interaction evaluation** – Process conducted during necropsies to assess and evaluate stranded animals for signs of human interaction, such as rope, gear, or debris on the animal, or sharp lacerations indicative of interaction with a vessel propeller. The process is documented in the “Handbook for Recognizing, Evaluating, and Documenting Human Interaction in Stranded Cetaceans and Pinnipeds” (Barco & Touhey 2006).

**Marine mammals** – Marine mammals retain all of the characteristics of mammals (they breathe air through lungs, are warm blooded, have hair for at least part of their life, and produce milk to nurse their offspring). However, they are unique from other mammals because they live most or all of their lives in or near the ocean. Marine mammals comprise four taxonomic groups:

- **Cetaceans:** Whales, dolphins, and porpoises. Cetaceans are carnivores who spend their entire lives in aquatic environments. They have streamlined bodies designed for swimming

and diving, with appendages designed for aquatic environments. Cetaceans are comprised of two subgroups, odontocetes and mysticetes. Odontocetes are cetaceans with teeth, including all dolphins and porpoise, as well as killer whales, beaked whales, and pilot whales, for example. These species are typically fast-swimming animals who pursue one or a few prey items at a time, such as fish or squid. Mysticetes are cetaceans with no teeth. Mysticetes have vertical plates called baleen (made of keratin, the same material that comprises human hair and fingernails) that hang from the upper gum line of the mouth, used for filter-feeding of small prey. Mysticetes feed by either skimming the sea surface or by gulping huge amounts of prey and water, and then filtering the water out of the mouth. Species in this taxonomic group include the largest whale species, such as blue and fin whales, as well as species such as the bowhead and North Atlantic right whale.

- **Pinnipeds:** Seals, sea lions, and walrus. Pinnipeds are carnivores who have modified flippers to move on both land and in water. Though pinnipeds primarily forage and migrate in the water, they return to land or ice to breed, rest, and molt.
- **Sirenians:** Manatees and dugongs. Sirenians spend their entire life in the water and are herbivores. Though the fossil record suggests that there were once many species of sirenians, only four species exist today.
- **Marine fissipeds:** Polar bears and sea otters. Polar bears and sea otters are also considered marine mammals, though they are more closely related to terrestrial carnivores like weasels. They lack the types of adaptations seen in the other marine mammal taxonomic groups, but portions of their lives are associated and reliant on the marine environment. Therefore, they are considered marine mammals under U.S. laws.



**Marine Mammal Health and Stranding Response Program** – Program within the National Oceanic and Atmospheric Administration (NOAA) that was established under the U.S. Marine Mammal Protection Act to coordinate emergency responses to sick, injured, out of habitat, or entangled marine mammals. This coordination is achieved through collaborations with federal and state, local, and tribal governmental agencies as well as an extensive network of regional stranding responders involving academic institutions, zoos and aquariums, museums, and non-governmental organizations.

**Mitigation** – Efforts to avoid, minimize, restore, or offset environmental impacts caused by a human activity. Mitigation of offshore wind energy-related effects to marine mammals could involve a wide range of approaches. Common mitigation methods for whales in relation to offshore wind energy development include vessel speed restrictions, observers on vessels, and noise reduction approaches such as bubble curtains.

**Monitoring** – Repeated, systematic observations of marine mammals or their habitat and ecosystems. Monitoring can be conducted for several purposes, including as part of scientific research, management, or to inform and enact mitigation measures (see “mitigation,” above).

**Morphology** – the physical characteristics and structure of an animal. Morphological measurements may include body length, weight, or other information.

**Mysticetes** – cetaceans with baleen instead of teeth, including large whale species such as fin, humpback, and blue whales. Also see “Marine Mammals” above.

**Necropsy** – The examination of an animal after death (essentially an autopsy on an animal), usually to determine the cause of death. A necropsy can involve observation, dissection, or sample processing. Resulting data may be used as a basis for interpreting and documenting cause of death. For marine mammals, necropsies provide opportunities to learn about the physiology, biology, and threats (e.g., disease, toxins) to individuals and populations, since many marine mammal species inhabit regions far from human activity and may be rarely seen when alive and healthy.

**Noise abatement systems** – Technologies implemented during pile-driving activities intended to reduce the distance and duration that sound travels through the water, and thus to minimize potential acoustic impacts to wildlife. Examples include bubble curtains and acoustic resonators that are deployed underwater around pile-driving activities to absorb sound.

**Odontocetes** – Cetaceans with teeth, including all dolphins and porpoise, as well as killer whales, beaked whales, and pilot whales. Also see “Marine Mammals” above.

**Passive Acoustic Monitoring (PAM)** – Study or monitoring method in which equipment is deployed in the ocean to record underwater sounds. The device is considered “passive” because it does not produce any sounds itself, but rather listens and records sounds. These sounds can be classified by source (e.g., are sounds generated by animals, waves, weather, vessels, etc.), and in the case of animal sounds, identified to species. PAM is an important method for studying cetaceans because it can be deployed for long periods of time (e.g., years), and can be used at night, during poor weather, underwater, and in other cases where direct visual observation is not possible or ineffective.

**Pile driving** – The process of installing structural columns into the seabed via a large hammer located on a barge. This process is used across a range of industries including for the installation of some types of offshore wind turbine foundations. These monopile foundations (in which a single steel tube comprises a large part of the turbine foundation) are the most common type of offshore wind turbine foundation globally, since they are relatively inexpensive and easy to install in shallow waters. However, there are multiple turbine foundation types that do not involve monopiles (e.g., jacket foundations, floating foundations), and several newer pile-driving technologies that do not involve the use of a hammer (to reduce noise generation during turbine construction).

**Pinniped** – Seals, sea lions, and walruses. Also see “Marine Mammals” above.

**Population** – A marine mammal "population stock" or "stock" is the fundamental unit of conservation under the U.S. Marine Mammal Protection Act (MMPA). The MMPA uses the terms "population stock" and "stock" interchangeably to mean “a group of marine mammals of the same species or smaller taxa in a common spatial arrangement that interbreed when mature.” The term “population” is also sometimes used to mean a smaller geographic subset of a species that is being separately considered for research, management, or mitigation purposes.

**Protected Species Observer (PSO)** – trained professional biologists who monitor aquatic animals that are federally protected under the US Endangered Species Act (ESA) or Marine Mammal Protection Act (MMPA). This monitoring occurs during anthropogenic activities to help a wide range of industries comply with federal regulations.

**Seasonal Management Areas (SMAs)** – A type of “slow zone” defined by NOAA Fisheries to reduce vessel collision risk to endangered North Atlantic right whales (per the Vessel Speed Restriction Rule of 2008; 50 CFR 224.105). SMAs occur in defined locations at specific times of year based on expected species presence or behavior. During these periods, vessels of 65 feet or greater in length are required to travel at a speed of 10 knots or less in these areas.

**Seismic airguns** – A technology that blasts the seabed with sound to find and explore offshore oil and gas reserves. The reflected waves or “echoes” from the airgun extend into the seabed and can be used to form a scan of the subsurface to locate fossil fuel reserves. Because the sounds must penetrate far below the surface of the seabed, airguns are substantially louder than the geophysical surveys used for offshore wind energy development (which do not need deep subsurface data).

**Slow zone** – Areas defined by NOAA fisheries to help protect North Atlantic right whales from collisions via avoidance and vessel speed restrictions. Types of slow zones include dynamic management areas (see definition), seasonal management areas (see definition), and slow zones similar to dynamic management areas but defined based on passive acoustic detections of North Atlantic right whales (as opposed to visual sightings).

**Sonar** – The use of sound propagation to understand the positioning and characteristics of underwater objects. Passive sonar involves only “listening”, where underwater sounds are heard and characterized (for example, some listening devices in military applications measure and characterize the frequency and vibrations of nearby vessels to determine nationality). For marine mammals, passive recordings of sounds produced by animals can be identified to species in many instances (see “Passive Acoustic Monitoring”). Active sonar involves sound that is purposefully emitted from a source, which is then reflected or returned by measured objects. Active sonar can be used to obtain a variety of information on objects underwater, including distance from the sound source, density of the object (which can assist with object identification), and object speed. For example, echosounding emits a sound beam from a vessel directly downward to the seafloor, and the depth of the sea floor (e.g., water depth) can be estimated based on the amount of time it takes for the sound to return to the surface. Fishfinders are used to characterize the location (e.g., depth) of schooling fish, which work because the swim bladders of fish are of different density than water, which reflects sound in a unique way. For scientific purposes, more advanced versions of this technology rely on multiple frequencies of emitted sound and can be used to identify species or taxa, school size, and density of schooling animals including fish, shrimp, and zooplankton. Passive sonar does not contribute noise to the marine environment, as it just requires listening devices. Active sonar does add sound to the marine environment, which can vary in volume, pitch (i.e., acoustic

frequency), and regularity (e.g., regular pulses vs. random noise introduction), depending on the intended application of the sonar technique.

**Sound** – Mechanical vibrations transmitted through an elastic medium (e.g., air, water). The ability of an animal to detect a sound depends on characteristics of the sound (e.g., frequency, intensity, duration), the proximity of the animal to the sound, and their hearing capabilities.

**State waters** – waters controlled by a U.S. state. Atlantic coast states control areas within three nautical miles of the nearest ocean shoreline (including shorelines of islands). Beyond this boundary, waters are controlled by the federal government, though states may maintain some degree of authority via their NOAA-approved state Coastal Zone Management Plans.

**Stock** – See “Population”.

**Stranding** – Marine mammals are considered stranded when found dead, either on land or floating in the water, or alive on land but unable to return to the water or in need of medical attention. Strandings can be caused by many factors, including disease, injury (such as from vessel strikes or entanglement with fishing gear), or other factors.

**Take** – As defined in the U.S. Marine Mammal Protection Act, to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal. Take can be lethal or nonlethal, and can be intentional (e.g., whaling) or incidental (e.g., unintentionally occurring as a result of some other activity, such as energy development, fishing, military exercises, etc.).

**Unusual Mortality Event (UME)** – Defined under the Marine Mammal Protection Act as a stranding event that is unexpected, involves a significant die-off of any marine mammal population, and demands immediate response. A working group of scientific experts use specific criteria to determine when a UME is occurring or has ended. Common causes of UMEs include infectious diseases, biotoxins, and human interactions.

**Vessel speed restrictions** – NOAA has implemented several management approaches to help protect endangered North Atlantic right whales from vessel collisions. These include designating locations where vessel speeds are restricted to reduce the risk of lethal collisions. Some restrictions on vessel speed are required (e.g., mandatory) in the same geographic locations and time periods every year (see “Seasonal Management Areas (SMAs),” above). Others are suggested (e.g., voluntary) and are designated based on known presence of animals in an area (see “Dynamic Management Areas (DMAs),” above). The 2008 vessel speed restriction rule requires vessels >65 feet to reduce speeds to 10 knots in SMAs and suggests voluntary speed reduction in DMAs. In 2022, NOAA proposed an amendment to the current vessel speed restriction rule, which would 1) modify current SMAs, 2) apply speed restrictions to most vessels 35 feet or longer, and 3) create a new framework for implementing mandatory speed restrictions outside of active SMAs.

**Vessel strike** – when a vessel collides with marine animals such as whales.