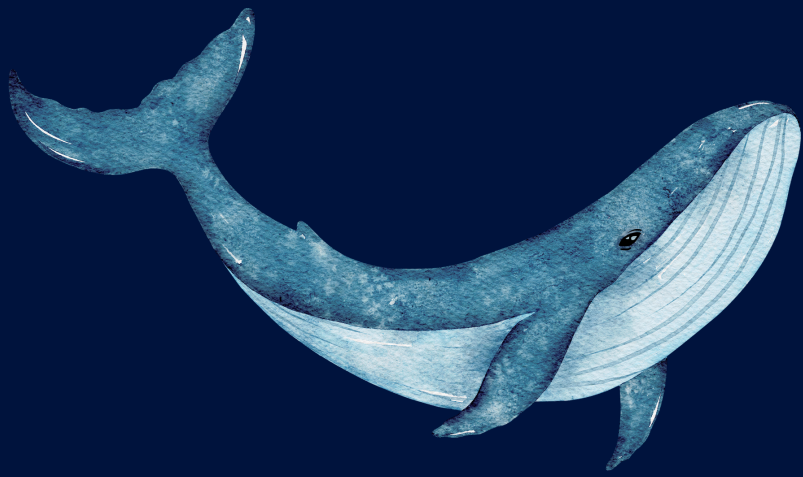


IMPACTS OF UNDERWATER NOISE ON MARINE MAMMALS



Sound travels more than 4 times faster in the water than in the air.

Acoustical Factors

Marine mammals are impacted by underwater noise. Port activities that create underwater noise include marine construction (pile driving, underwater drilling, etc.) and vessel noise. It is not easy for a marine mammals to detect the presence of moving ships, despite the noise that they make. Because one of the main sources of noise on a ship comes from the propeller, which is located at the rear of the vessel, its noise can be less pronounced when the animal is in front of the ship. The hull acts as a physical barrier that keeps the noise made by the propeller from reaching the front of the ship, where the danger of collision is actually the greatest. Marine mammals that are regularly exposed to ship noise and have not had any negative encounters may learn to tolerate the noise and stop trying to avoid the vessels. Both problems can be compounded in areas with a high density of marine traffic.

Acoustic Masking

The phenomenon of acoustic masking is described as the presence of an external noise that keeps an animal from noticing another sound. In such cases, the loud noise masks the sound of interest to the animals (such as social communication calls from another individual), which causes partial or total loss of information. Acoustic masking makes it difficult for marine mammals to hear one another, impacting their ability to communicate about food, danger, and other important topics like finding a mate, which further exacerbates the challenges faced by marine mammal species at risk.



A whale's listening space under natural ambient sound conditions. Oncoming vessels, prey, and other whales inside this space can be heard by the whale.



A whale's listening space is reduced by vessel noise. The acoustic detection of oncoming vessels, prey, and other whales may no longer be possible as it falls outside the listening space. The extent to which masking occurs depends on the vessel (including its sound frequencies, speed, size, weight, and fouling) and the marine mammal (including its age, sex, and species-specific behaviour).