

THE SWAG PROJECT

Ships, Whales & Acoustics in Gitga'at territory (SWAG)

The marine environment that surrounds the Great Bear Rainforest contains the quietest ocean along the coastline of BC and some of the world's richest cold-water seas. The Gitga'at First Nation's waters within this region are home to the highest density of humpback and fin whales along BC's coast and the continued high occurrence of two orca populations. Resident orcas live here year-round in tightly-knit family pods. Orca are the emblem for one of Gitga'at's three main Clans – the Gispwuwada or Blackfish – and as a result, the Gitga'at hold a strong cultural reverence for the species. The second-largest animal on the planet—the elusive fin whale—visits to feed in these nutrient-rich seas. Humpback whales display the dramatic bubble net feeding strategy for food and try to perfect what are thought to be mating songs in the deep fjords of the Great Bear region. Pacific white-sided dolphins, Dall's porpoises, sea lions, seals and a wealth of other marine species are also part of this thriving and complex ocean ecosystem.

In 2014, the founding partners of the project, North Coast Cetacean Society, Gitga'at First Nation and WWF-Canada acquired and installed a state-of-the-art hydrophone network to monitor the underwater soundscape. Many species of whales and dolphins depend on sound for communicating and use echolocation to sense food and avoid danger. The hydrophone network consists of an array of 4 hydrophones, in the Gitga'at waters of Squally Channel (Figure 1). The array acoustically monitors over 200 km² of underwater habitat in an area that is the nexus of important whale habitat and increasing shipping traffic. The area has been identified as critical habitat and potential critical habitats for the whales using the area; all of which are considered at-risk under Canada's Species at Risk Act. It is also the core shipping route for

many proposals to increase industrial shipping to export energy products such as liquefied natural gas (LNG) and refined petroleum products.

Ships, Whales & Acoustics in Gitga'at Territory (SWAG) initiative is a collaboration between the Gitga'at First Nation, the North Coast Cetacean Society (NCCS) and WWF-Canada to advance leading-edge research to develop real time tracking tools for whales and ships, and collaboratively develop mitigation measures to reduce the impact of commercial shipping on four populations of at-risk whales in one of the region's most important whale areas. The work advanced through SWAG will be an important contribution to managing the balance between high ecological and cultural values with increasing industrial use.

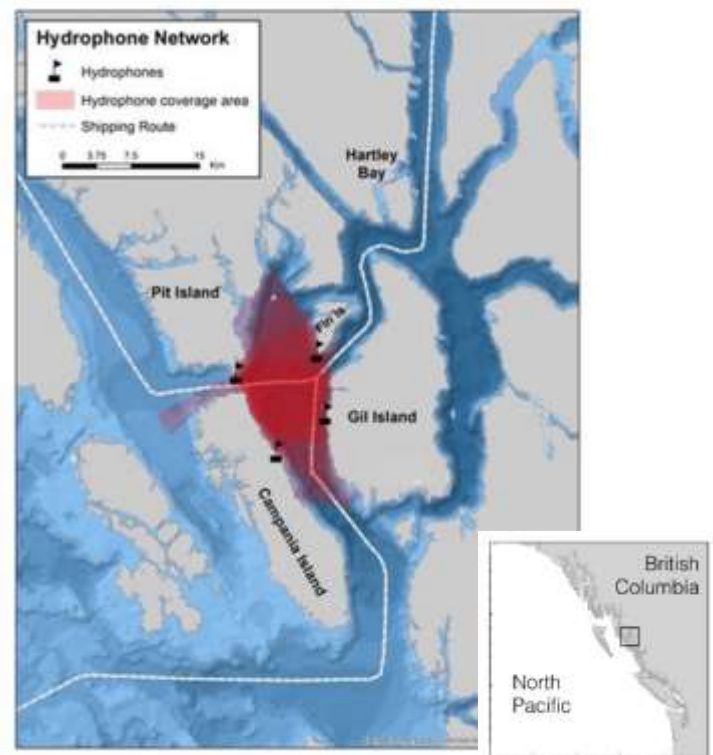


Figure 1: SWAG Project Area in Gitga'at Territory

SWAG PROJECT GOALS:

The overall goal of the SWAG project is to reduce the impacts of shipping traffic on whales and their habitats by enabling the Gitga'at to effectively monitor and make decisions about shipping traffic within their territory. This partnership project uses data from the hydrophones to detect, identify and track whales and ships in order to understand how whales respond to the acoustic and physical disturbances created by shipping traffic. The acoustic recordings from the hydrophone array also monitor the background noise levels in Squally Channel, as well as the additional noise introduced by ship traffic. The project seeks to understand the threshold levels of noise that may interfere with the communication, feeding and socialization of whales in the area, and allow the study of other acoustically sensitive marine species. The project will generate key information that will enable the management of the area and facilitate research on habitat use of cetaceans and their interactions with marine vessels.

The project is also developing tools to visualize the presence of both marine vessels and whales in real time, to enable local managers to reduce the risk of ship strikes and other negative impacts on whales from shipping. The project also generates a unique educational opportunity for the Gitga'at to learn and use this state-of-the-art technology and increase their capacity to combine contemporary science with their traditional knowledge to pursue their conservation interests and exert their rights to monitor and manage their traditional territory from the impacts of marine traffic.

The project team consist of staff drawn from the partner organizations who co-lead the implementation of the project. It also includes a sensor and systems design engineer, two PhD project scientists and researchers pursuing

post-graduate studies. The project gets field support from the Gitga'at Guardian Program and a Gitga'at community engagement and outreach officer. Two Gitga'at technical project officer also support the programs field implementation and community engagement work. The project team is drawing technical support from a science advisory committee of external experts on the specification, design and development of the project to reach its research outcomes. A field team oversees the smooth running of the hydrophone system in the water from the Fin Island research station managed by NCCS. The project has successfully collected three seasons of acoustic and visual observation data, continuously optimizing the configuration and upkeep of the hydrophone infrastructure and associated field power and transmission requirements.

Researchers on the project are successfully developing tools to detect, localize and track vocalizing whales of different species. Visual surveys of whales are being integrated with acoustic detection and tracking tools as well as data on the presence of marine vessels to understand the interactions between whales and marine vessels as well as any possible behavioral responses. Metrics to quantify the interactions between the whales and ships are a desired outcome, as is the development of a strike risk analysis. The project is in early implementation and over the next 5 years deliver tools to visualize the presence of whales and marine vessels, advance research to understand whales and the risks they face from shipping as well as engage with industry and government to develop mitigation measures and real time capacity to manage the impacts of ships on whales.

For more information on the project or please contact the project co-leads listed below;

[Chris Picard](#) (co-lead Gitga'at)

[Janie Wray](#) (co-lead NCCS)

[Hussein Alidina](#) (co-lead WWF-Canada)