

Antarctic Humpback Whale Program

Large-scale movement and distribution patterns of humpback whales in waters of the Western Antarctica Peninsula

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“To understand the seasonal movement patterns, distribution and habitat requirements of humpback whales, *Megaptera novaeangliae*, in the Southern Ocean in order to identify, manage and protect critical areas of habitat utilized by these animals.”

AHWP Mission Statement

Background and Rationale

2007-08 marks the International Polar Year (IPY) with worldwide efforts underway to increase our understanding, appreciation, and conservation of our planet’s polar regions and their wildlife communities. The poles are climatic indicators, illustrating some of the most dramatic examples of global climate change on the planet. Determining the status of large cetaceans in Antarctica is vital to our ecological understanding of the delicate marine food web dominant in this region. Implemented by CWRP, the Antarctic Humpback Whale Program (AHWP) is a multi-national assemblage of scientists working together to further our knowledge of humpback whales in the waters surrounding the Western Antarctic Peninsula. This knowledge is crucial in order to develop effective conservation strategies for these animals in this fragile environment. While we know that humpback whales are common in Antarctic waters, information on their foraging patterns, seasonal distribution, habitat selection and migratory behaviour is extremely limited. We will use satellite technology and specific research techniques developed for baleen whale studies in other parts of the world to learn more about humpback whales residing along the Antarctic Peninsula.

Why study humpback whales in Antarctica?

Humpback whales were a targeted species during the commercial whale era of the early 20th century, effectively reducing their worldwide population size to an estimated 10 percent of their original numbers. The International Whaling Commission (IWC) ended commercial whaling for humpbacks in all six management areas in Antarctic waters in 1963-1964 because the species was deemed commercially extinct; i.e., no longer profitable to hunt because population sizes were too low. Unfortunately, illegal hunting in Antarctica still occurred both prior to and after the IWC moratorium was installed and still occurs today (recent genetic evidence has revealed humpback whale meat present in Asian fish markets, confirming that illegal hunting still exists). Humpback whales are now listed as endangered under the Endangered Species Act of the United States and listed as vulnerable by the International Union on the Conservation of Nature (IUCN). Although legally protected by the U.S. Marine Mammal Protection Act, they have yet to recover from near extirpation. Several new threats to these animals have also surfaced in the last few decades. The destabilization of marine food webs in the Southern Ocean (as a result of human activity) threatens the availability of food resources upon which humpback whales are dependant. Many humpbacks die each year from entanglement in fishing gear. Climate change and pollution are threatening critical habitat areas utilized by these animals. Now, more than ever, it is imperative to learn more on the status of this animal in Antarctic waters, the role they play in the Antarctic food web and the level to which they are currently affected by human activities. By increasing our understanding of these animals, we can better identify, manage and conserve habitats for these animals in the Southern Ocean.

CWRF Humpback Whale Research 2007 Season:

The Antarctic Humpback Whale Program (AHWP) is a scientific collaboration between CWRF and several other North American academic institutions. We will be conducting a six-week research expedition in waters off the Western Antarctic Peninsula between Jan 27 and March 05 2007. During this time, satellite tags will be applied on humpback whales and biopsy samples will be collected in order to gain information on:

1. Critical foraging locations in Antarctic waters during the late austral summer;
2. Seasonal distribution patterns;
3. Migratory routes and timing of northbound migration;
4. Final breeding ground destination
5. Identification of individuals; and
6. DNA typing and toxin levels

OUTLINE OF RESEARCH PROGRAM

Identifying individuals from natural markings

Humpback whales can be individually identified from photographs taken of the underside of their flukes (tails); each bearing its own unique markings, scars and coloring patterns. This technique, widely known as photo-identification, allows us to study several aspects of humpback whale life history, including group composition, associations between individuals and, on the longer term, population parameters such as abundance, birth, and death rates. By comparing photographs taken in different encounters, it also allows us to identify short to long-range movements of individuals among areas, their fidelity to specific regions, and their home ranges. We will use digital SLR cameras to photo-identify humpback whales in the area primarily to study group composition and behavioural preferences, distribution, movement patterns and site fidelity. Photographs of individuals will be compared to humpback whale catalogues from other research groups working in the Antarctic and other parts of the world for the same purposes.



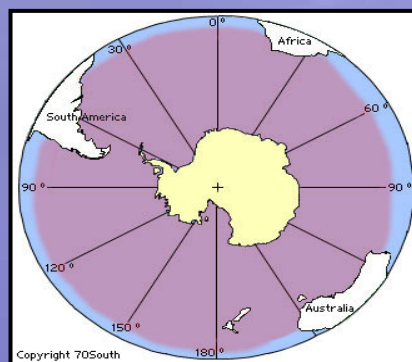
Photograph of humpback whale fluke showing unique markings

Collecting biopsy samples from humpback whales for genetic and toxicological analyses

Small skin and blubber samples (biopsies) can yield extensive information about whale DNA and genetic stocks, toxicology and population dynamics. DNA samples collected from humpback whales in the Antarctic Peninsula will help determine the breeding areas from which these animals originate, as well as help determine potential family lineages between individuals. DNA comparisons will also help establish the degree of integration between humpbacks migrating to different regions of Antarctica during the austral summer, the genetic relationship between Southern Ocean humpback whales and other humpback whales in the world, as well as provide an estimate on the overall population size of the species. DNA also helps us confirm the gender of individual whales when this is otherwise impossible, and helps estimate the age of a live whale by examining a chromosomal structure (telomere) within the DNA itself. Finally, blubber samples will also help us determine if humpback whales carry harmful toxins within their blubber layer, in an effort to assess the overall health of the species and to help us identify the type and origin of these chemicals.

Studying movement patterns and migratory behaviour of humpback whales in Antarctic waters

Humpback whales migrate seasonally from their winter breeding grounds in the tropics to their summer feeding grounds near the poles where they spend the majority of their time feeding on krill (small shrimp like crustaceans). To date, seven humpback whale breeding populations and six IWC management areas are recognized for the Southern Hemisphere. Few studies have examined the movement patterns of humpback whales off the Western Antarctic Peninsula, although it is suspected that a proportion of the population feeding in this region during summer migrates north to the coasts of Ecuador and Columbia for the winter breeding season. The feeding destination of the humpback whale population known to winter in northeastern Brazil has yet to be discovered. Now, with recent technologies in satellite tracking techniques, we are able to literally “hitch a ride” on the back of these majestic creatures in order to gain a better understanding on the finer scale movement patterns of these elusive animals. Satellite tracking is an especially useful tool when following these animals when they cannot be readily observed, such as at night or during the winter. It also provides us with an increased resolution on they are doing during this time. For instance, it can tell us when and where animals are foraging and help identify their migratory routes. This has tremendous ecological value, as humpback whales play a very key role in the Antarctic food web as top-level predators. Knowing their distribution in Antarctica and understanding their movement patterns are the first steps in initiating effective conservation efforts, such as designing and designating specially protected areas aimed at conserving this species.



Distribution of humpback whales in the Southern Ocean

What is a satellite tag?

Most large whales of the world use immense expanses of ocean to meet their habitat requirements. It has always been a huge difficulty to track whales across ocean basins for this reason. For some species, we are not even sure where the majority of their lives are spent. Thankfully, due to advances in satellite technology, we now have the ability to track whales for months at a time using satellite linked locations. This provides us with a real time look at where whales venture off to at different times of the year. Because satellite tags must stay on whales for extended periods of time, they are actually implanted in the blubber layer of the whale. This keeps the tag secure and gives us better long-term insight regarding the whales' movement patterns, distribution and habitat requirements. Over time, the tag is expelled from the body of the whale, similar to what a human body does with a sliver. With this information, researchers can discover migratory routes, critical feeding, breeding and calving grounds. Using this information we can better protect whales, many of which are endangered or threatened, by understanding where they are at specific times of the year. Satellite tags have already had great success in yielding important distributional and habitat information on many marine species including seals, sea lions, blue whales, right whales, gray whales and fin whales.

How you can help

This study offers a unique opportunity to study an animal that remains very poorly understood in this part of the world. CWRWF and its collaborators have designed a research program capable of addressing many of the long-standing questions associated with humpback whales in their Antarctic environment. However, carrying out research in remote regions like Antarctica can be very expensive. In order to achieve success in this scientific endeavor, we need your help. Join our effort to increase awareness, knowledge, and appreciation for remote Polar Regions by providing financial or logistic support to our expedition. Together we can collect very important information for this IPY 2007-08 and increase global knowledge, awareness and understanding of this magnificent species, the humpback whale.

For further information, or if you are interested in supporting this research by making a contribution either by mail or on-line, please visit our website at www.coastalwildlife.com

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