

COOK STRAIT WHALE SURVEY REPORT ON FIELD RESULTS 2013



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INTRODUCTION

This report presents preliminary results from the latest Cook Strait whale survey undertaken in June and July 2013. This was the 10th year that the survey has operated.

BACKGROUND

History

New Zealanders have a special connection with whales, stemming from a history of active commercial exploitation to now being vocal advocates for the protection and conservation of whales both nationally and internationally.

In the Southern Hemisphere, commercial whaling during the 19th and 20th century brought many species close to extinction. Whales were once so abundant in New Zealand waters that the early English whalers were able to anchor their vessels in numerous bays on the east coast of North and South Islands, and await the arrival of southern right whales. 'Bay whaling' was largely responsible for the near extinction of southern right whales in NZ waters, especially between 1837 and 1842, when the population that had numbered around 15,000 animals only a few decades earlier, was hunted to the brink of extinction. Even today, despite eighty years of full protection, the surviving population is only about 1,000 whales.

Between 1937 and 1954, the Antarctic feeding grounds to the south of Polynesia were internationally recognised as a sanctuary. Because that sanctuary status was only lifted in 1954, the great whales of the South Pacific were the last populations to be heavily exploited by industrial whaling fleets under International Whaling Commission authorised whaling; and have had the least time to recover. Additionally, during the 1950s and 1960s, an illegal whaling operation by the former Soviet Union killed over 45,000 humpback whales and many thousands of whales of other species in Antarctic waters. It is estimated that the total biomass of baleen (filter-feeding) whale populations in the Southern Hemisphere has been reduced to between 4 and 8 percent of that in 1900. For some species, such as blue whales, the current population is thought to be less than 2% of the numbers in 1900.

New Zealand ceased whaling in 1964, with the closure of the last whaling station in Tory Channel at the northern tip of the South Island. The stocks had been so diminished that humpback whales were no longer migrating through Cook Strait and commercial whaling was no longer viable. Since this time New Zealand has become a vocal advocate of whale protection and conservation. Although New Zealand has a prominent role in the protection of whales in the South Pacific and the world, there is very little information available about whales in New Zealand waters, except for that collected from strandings. There are no abundance estimates available for any species except Southern right whales and little is known about the present distribution and biology of many whale species.

The Cook Strait whale survey is centred on collecting information about northern migrating humpback whales to understand the extent of their recovery from commercial whaling.

Ecology

The humpback whale, *Megaptera novaeangliae*, is a migratory species of baleen whale and has a cosmopolitan distribution throughout the oceans of the North Atlantic, North Pacific and Southern Hemisphere. Humpbacks are a relatively common coastal species and are popular for

whale-watching operations worldwide including Alaska, Hawaii, Tonga, New Caledonia and Australia.

The humpback whale can grow up to 16m in length and weigh between 30 and 40 tonnes and has a variable colour pattern but is generally black with white patches especially on the flippers and tail flukes. Adult humpbacks can be recognised by their small dorsal fin, the knobby protuberances on the head, tip of lower jaw and leading edge of flippers, and by long pectoral flippers, which are up to one third of the body length. Calves are lighter coloured and are less than one-third the length of their mother. Known causes of natural mortality include strandings and killer whale (*Orcinus orca*) predation, and human induced mortality including ship strikes, incidental entrapment, entanglement and whaling.

Southern Hemisphere humpbacks feed in the circumpolar waters of the Antarctic during summer and then migrate north to breeding grounds in sub-tropical or tropical waters in the winter. While in Antarctic waters, humpback whales are segregated into six relatively separate groups that show significant genetic divisions from each other. Of these six groups, the whales found in the Ross Sea area (130°E, 170°W), known as “Group V”, comprise the humpbacks that are seen along the coast of New Zealand while migrating between feeding and breeding grounds.

The breeding grounds destinations of humpbacks that migrate along the New Zealand coast have not been clearly identified. However, mark-recapture studies using discovery tags between 1950 to 1960 has demonstrated connections between New Zealand and Norfolk Island, east Australia and Fiji (Chittleborough 1959, Dawbin 1964). More recently it has been suggested there are also connections with Tonga (Donoghue 1994).

Work by Dawbin (1956) suggests that northern migrating humpbacks in New Zealand waters pass along the east coast of the South Island and then divide into two groups, with one continuing up the east side of the North Island and the other passing through Cook Strait and up the west side of the North Island. Smaller numbers pass the western side of Stewart Island and around the south west corner of the South Island before moving offshore. The bulk of southern migrating humpbacks pass along the west coast of both the North and South Islands and form a large aggregation near the south west corner of the South Island before moving further south. Others follow the east coast of the North Island as far south as East Cape before moving offshore, with a few occurring along the eastern coastlines

The northern migration spans late May to early August, and the southern from mid September to early December. Both the northern and southern migrations follow the same pattern of a gradual increase in the numbers of whales passing through New Zealand waters with a peak near the middle of the season. The peak is in late June to mid July for the northern and late October to late November for the southern migration, and is followed by a slow decline in numbers until the end of the season.

Segregation by age and sex is evident during the northern migration. Lactating females and yearlings are seen early in the season, followed by immature whales, then mature males and females and late in the season by pregnant females. A similar relationship has also been seen during the southern migration but with more mixing between age and sex classes. Mature females and immature whales pass through first, followed by mature males, and finally females in early lactation with calves.

Conservation and Management

While our Exclusive Economic Zone provides 100% protection from directed killing, there are still regular reports of whales incidentally killed from anthropogenic sources (e.g. entanglement,

ship strike). The impact of this mortality is not known and needs to be carefully investigated and managed.

Specifically related to this is the large amount of marine development, exploration and mining that is occurring around our coastlines. While it has been identified that whales have the potential to be entangled in marine fishing or other lines or ropes, this has been impossible to quantify without specific knowledge of the number of whales in the area and the likelihood of entanglement. This project will be able to provide estimates of both these critical pieces of information by documenting the migratory and small scale movement patterns of whales in Cook Strait and assessing trends in abundance.

At the International Whaling Commission meeting in June 2005, Japan presented details of their new JARPA II scientific whaling programme which alongside over 900 minke there was also 50 fin, and 50 humpback whales to be taken in the Ross Sea each year starting in 2007. The humpbacks killed by Japan are likely to include the whales migrating past New Zealand and through Cook Strait. Fortunately Japan has not officially reported any humpback whale catches from the Ross Sea to date. The International Court of Justice recently decided (12 votes to 4) that Japan's JARPA II scientific Antarctic whaling program was not consistent with the Convention of the International Whaling Commission. Japan has publicly stated that they will respect the decision of the court and have cancelled their Antarctic whaling this year (2014) but it is not clear what their actions will be in the future and what this will mean for our humpback whales.

COOK STRAIT WHALE PROJECT

During the operation of the Tory Channel whaling station detailed records were kept of whales seen and killed. Much of this work has been reported and published by Dr. William Dawbin. Prior to 2004, there had been no systematic survey for humpback whales migrating through New Zealand waters since the closure of the whaling station. In 2000, Gibbs & Childerhouse (2001) compiled all the recent anecdotal sightings and reports of humpbacks in New Zealand and found that there were steadily increasing numbers of humpbacks seen in New Zealand, and that over 50 humpback whales had been seen moving through Cook Strait in the winter of 2000. Based on this information, a pilot study to investigate the feasibility of a dedicated annual survey to study the migratory behaviour of humpback whales through Cook Strait was undertaken in 2004. Over 40 humpbacks were seen in a two week period in 2004, and thus the survey was repeated on an annual basis since. The annual survey will allow us to make an assessment about the present status and the level of recovery of humpbacks and provide a baseline for future comparisons. In addition this project will shed light on the migratory pathways and destinations of whales. This will involve collaboration with the South Pacific Whale Research Consortium and the International Whaling Commission, and will be used to further the protection of whales in the South Pacific.

In 2008, OMV NZ Ltd, an Austrian Oil and Gas company, signed up to a partnership with the Department of Conservation and committed to providing financial support to the project for three years. This has ensured that the project will continue to operate annually and for a longer season (extended from 2 to 4 weeks). OMV renewed its partnership with the department again in 2011 enabling the survey to continue for another three years and then again in 2013 for another two years. This survey would not be possible without this highly valuable and collaborative partnership.

Transact Management Ltd, a commercial transaction company, has provided logistical support which has contributed to the smooth operation of this project and some major logistical hurdles being overcome.

The University of Auckland, Molecular Ecology group has provided support by processing the skin samples.

Dolphin Watch Ecotours was another significant supporter of the project during the first five years and provided a research vessel and experienced skipper for the survey period.

The Cook Strait project is led by Nadine Bott (DOC) with key involvement from Joe and Heather Heberley, other DOC offices and numerous volunteers including ex-whalers.

OBJECTIVES

The main objectives of the study are to:

- Estimate the number of humpback whales passing through Cook Strait during the peak of northward migration;
- Estimate the proportion of humpback whales passing through Cook Strait in comparison to historic records;
- Investigate the timing and pathways of migrating humpback whales; and
- Investigate the relationship and migratory links of New Zealand with known humpback breeding grounds in the South Pacific.

METHODOLOGY

The survey is operated by a team of up to 8 people per week. The survey day starts at 7.30am when the sun is just coming up to provide enough light to see; and ends about 4.30pm.



Land-based station

The purpose of the land based site is to undertake visual surveys for whales moving through the Cook Strait. The team will be based at a site on land, and will comprise ~8 spotters (includes ~4 ex-whalers) scanning Cook Strait using naked eyes, and normal and high power (x20) binoculars. The location for the land based team is on a DOC reserve on the ridge above East Head of Arapawa Island. It is the eastern side of the Tory Channel entrance. This allows for an excellent view of Cook Strait. It is a different location to that used historically by the whalers as a lookout and is considerably higher (~127 m above sea level) and more accessible.

Boat-based team

When a whale is spotted about 4 people will go out on the research boat and will be directed (by VHF radio) to any whales seen by the land based team. The boat team, once reaching the whale, will confirm species identification and collect photographs and skin samples for individual identification.

GENERAL RESULTS 2013

A total of 217 hours of visual searching from the lookout on the east head of Tory Channel was undertaken in 2013. Weather conditions were difficult with three full days and two partial days lost to bad weather where no visual searching was possible. In addition, visual searching was impaired on a number of other days this season due to poor visibility and rough sea conditions. Lower numbers of whales than anticipated were observed, particularly during weeks 1 and 2 of the survey, due to inclement weather and probably a late migration.



Over the survey period, 39 pods of humpback whales were spotted by the research team, comprising a total of 59 individuals.

Most of the whales seen on the survey were humpback whales (*Megaptera novaeangliae*), but blue (*Balaenoptera musculus*) and sperm whales (*Physeter macrocephalus*) were also seen. As well, several dolphin species including Orca (*Orcinus orca*), Hector's (*Cephalorhynchus hectori*), bottlenose (*Tursiops truncatus*) and dusky dolphins (*Lagenorhynchus obscurus*) were encountered.

The vessel based team collected 17 photo identification and 23 genetic samples from humpbacks.

The photo ID samples will be inputted into Fluke Matcher (a computer fluke matcher program for humpback whales: <http://scu.edu.au/research/whales/fluke-matcher/index.php/3>) to determine if any of the whales have been seen in Cook Strait or elsewhere in the South Pacific.

The genetic samples have been sent to Auckland University to be processed and will be compared with approximately 1200 genetic samples also held by members of the SPWRC to look at gender and relatedness to other whales in the South Pacific when there is a student available.



HOW ARE WE TRACKING?

The main objectives of the study are identified below with a brief discussion on how we are tracking in achieving these objectives.

1. Estimate the number of humpbacks in Cook Strait during the peak of northward migration.
2. Estimate the proportion of humpbacks in Cook Strait in comparison to historic records.

Comment: These two objectives were to be achieved through the mark-recapture method using photo ID or a full migration season survey. However, initial analysis in 2013 has indicated that these methods are no longer useful given the population characteristics of these whales. Instead it is proposed to continue with the survey in its current form for another two years to determine if the population trend is stable, increasing or decreasing. Prior to 2012, direct counts of humpbacks in Cook Strait had been very low (2 whales per 9 hours) when they dramatically increased to 5 whales per 9 hours in 2012. The increase in whales observed in 2012 could suggest an increasing trend in the population. Unfortunately with a combination of the inclement weather and the late migration in 2013 we did not see many whales or capture all of the peak migration period. Reports of reasonable numbers of humpbacks still migrating after the survey finished suggests the count could have been much higher this year if we were surveying for a another week. A further two years of survey effort would help clarify the population trend status.

3. Investigate the timing and pathways of migrating whales.

Comment: Results to date (from the survey and anecdotal reports) provide confirmation that the timing and pathways of migration appears to be similar to historical reports, with considerable temporal variation still being demonstrated. 2013 was a good example of the temporal variation with the peak number of animals only coming through in the last week of the survey with further reports of reasonable numbers of whales moving through on completion of the survey.

4. Investigate the relationship and migratory links of New Zealand with known humpback whale breeding grounds in the South Pacific.

Comment: The collaborative relationship between the Cook Strait project and the SPWRC is making great progress in clarifying this objective. The collection of comparable data (e.g., photo ID and skin samples) by researchers throughout Oceania provides the ability to match individual whales and determine their pathways and destinations. This enables significant scientific outcomes including deriving a population estimate for the Oceania population of humpback

whales which then feed into critical management outcomes such as International Union for the Conservation of Nature (IUCN) upgrading the Oceania population status from vulnerable to Endangered.

IN SUMMARY

The survey has confirmed the presence of humpback whales migrating northward through Cook Strait in winter and provides the first systematic evidence that indicates some recovery from commercial whaling.

The peak timing of migration appears broadly consistent with historical reports pre-1960's with considerable temporal variation from year to year.

Long term surveys (e.g. 12 weeks long) in Australia suggest that 'pulses' of whales (e.g., large numbers migrating through an area over a few days) move through an area which is frequently preceded and followed by periods with low numbers of whales. Given the Cook Strait survey only covers a short four week period of a 12 week migratory period, the increase in numbers of whales in the last few years may indicate the timing of the survey has better coincided with a 'pulse' of whales moving through Cook Strait. Whereas in 2013 the survey only captured part of the 'pulse' of whales. It is still possible, despite the lower number of whales counted this year, that the population is showing a slow recovery after almost 50 years of protection. Further survey work would help clarify this trend.