



**Australian Government**

**Department of the Environment,  
Water, Heritage and the Arts**

# NON-LETHAL RESEARCH TECHNIQUES FOR STUDYING WHALES

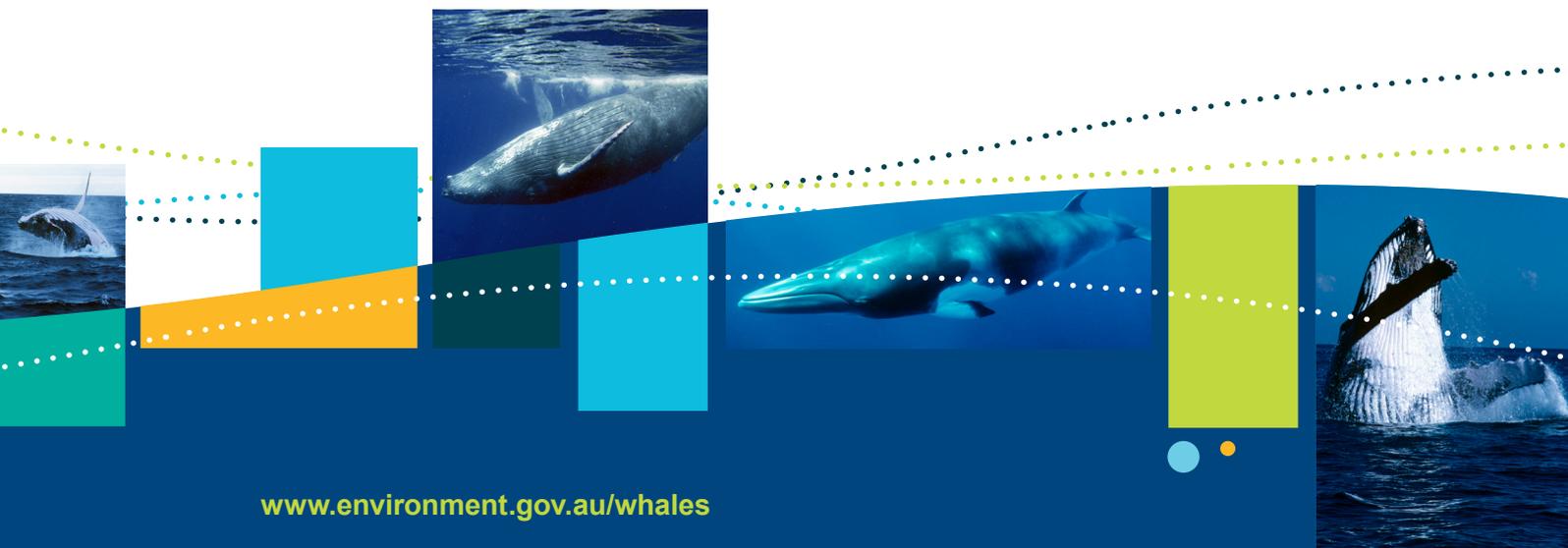
The Australian Government is resolutely opposed to commercial whaling, including so-called 'scientific' whaling, and strongly supports the global moratorium on commercial whaling.

Australia believes it is not enough to simply criticise lethal, so-called 'scientific', whaling without providing a credible alternative. The Australian Government has provided an alternative through its \$32 million, six-year International Whaling and Marine Mammal Conservation Initiatives Program. Key features of this program include the Australian-led Southern Ocean Research Partnership and the setting up of the Australian Marine Mammal Centre (AMMC). This initiative will deliver valuable, non-lethal research on a national and international scale demonstrating that whales do not need to be killed in the name of science.

Modern research techniques do not require killing a whale to learn about its biology and behaviour. All information required for the conservation and management of whale populations can be obtained from non-lethal research methods. Some of the non-lethal research techniques are detailed below.

## Acoustic research methods

Research on cetacean acoustics (e.g. sounds produced by whales and dolphins) is particularly well-suited to overcome many of the difficulties of working in harsh environments such as the Southern Ocean, and has enormous potential to help understand the role of cetaceans in ecosystems. Many cetaceans are highly vocal and produce species-specific and sometimes population-specific sounds (e.g. calls, songs). Underwater sound travels large distances with whale calls often detected at ranges of tens, or even hundreds, of kilometres. Acoustic surveys of cetacean habitats are therefore a powerful means of identifying the species present, locating and tracking individuals, identifying populations from regional dialects, and determining patterns of seasonal distribution and relative abundance.



## Molecular methods

Molecular methods can provide information about important aspects of cetacean biology such as age, population size and structure, and population demographics. The collection of this information (especially age) is often used as a justification to kill whales but modern advances allow for the collection of this information from live whales. Two different non-lethal ageing methods have been researched extensively. These are: the analyses of lipids (which are naturally-occurring molecules which includes fats, waxes, sterols and fat-soluble vitamins) and of nucleic acids (DNA and RNA) in either skin or blubber sampled by biopsy darts from live whales. Development of these techniques is continuing and progress on accurately ageing whales is well-advanced.

The food consumed by any animal is a key aspect of its ecology. The AMMC has pioneered the use of DNA-based analysis of whale faeces to identify prey consumed by whales. DNA identification of prey has been used to investigate the diet of blue whales, fin whales and Bryde's whales.

## Genetics

Genetic analyses of biopsy samples collected off the east and west coasts of Australia and from Antarctica are used to understand the migration patterns of humpback whales between the two recognised Australian breeding populations. Biopsy samples are also used to investigate the distribution of these populations on their summer Antarctic feeding ground, where they were killed in large numbers by commercial whaling operations through the 20th century.

Genetic analysis can be used to identify and sex individuals, trace relationships among individuals, and determine population boundaries and structure. Genetic analyses are also an important component of any monitoring and compliance regime in the regulation of whaling if the moratorium on commercial whaling is ever lifted. Genetic analysis can also be used to trace whale meat sold from commercial, scientific or illegal whaling sources back to the individual, population or species of origin, and thus aid in the detection of illegal trade in whale products.

## Observations

The AMMC is undertaking an aerial survey program to study minke whales in the Antarctic pack ice, their use of various pack ice habitats and to better estimate their true abundance. In 2007-08, aerial surveys in Antarctica were tested for the first time and found to be successful in assessing whale abundance within the pack ice. During the last two years (2008-09 and 2009-10), full surveys have been conducted over Vincennes Bay near Casey station (66° 17' S 110° 32' E) and also in the Davis Sea/Shackleton Ice Shelf (65° 30' S 94° 0' E) in 2009–10. During these surveys many cetaceans were seen by the observers and also recorded by high definition video cameras that provide a permanent record of the survey. Additional survey research is undertaken on many other Australian cetaceans including humpback, blue and southern right whales, plus many small cetaceans.

Visual surveys of migrating whales are also undertaken from land, sea and air platforms around Australia and in the Antarctic. In addition, photographs of individual whale flukes (i.e. tails) that are unique to each individual are catalogued to investigate questions such as migration patterns and population size. This information assists in determining recovery rates from past over-exploitation, identifying whale migration routes and individual fidelity to breeding and feeding sites.

## Satellite tagging

Understanding migration behaviour, population structure and recovery from exploitation of Australia's whale populations is important for the conservation and management of these marine mammals. This important information is principally collected through the use of satellite tracking.

The AMMC has developed a custom-made satellite tag for the tracking of whales. These tags transmit their location to satellites orbiting the Earth that provide daily positions and have enough battery power to provide tracking information for up to 170 days. The tracking data will help with the management of human-whale interactions and threatening processes, and particularly to the economically significant whale watching and oil and gas industries.

As some whale species begin to recover from past over-exploitation, interactions with shipping and industrial activities will also increase, and movement information will assist in reducing these potential impacts. Satellite tags have been deployed on humpback, blue and southern right whales. The use of photo-identification of natural marks on whales and biopsy sampling can also be used to learn about the movements of individually recognised whales.

## Advantages of non-lethal techniques

The Australian Government is undertaking important scientific research into cetaceans utilising the most powerful non-lethal techniques. With recent technological advances, the claim that it is necessary to kill whales to understand them no longer has scientific merit. Using non-lethal techniques provides the opportunity for long term, coordinated and comprehensive cetacean research within Australia and with our international partners. In many cases, non-lethal research can address critical research questions quicker, cheaper and more accurately than traditional methods that require the killing of whales.

The utility of non-lethal scientific research underpins Australia's argument against 'scientific' whaling in the International Whaling Commission. It also strongly supports our cetacean conservation activities and establishes Australia as the Southern Hemisphere's leader in marine mammal science.

### Disclaimer

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