

# An update of management and increased protection for bottlenose dolphins of the Doubtful Sound Complex, Fiordland, New Zealand

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## ABSTRACT

In the 2007 Report of the IWC Scientific Committee, the New Zealand delegation undertook to report to this year's Whale Watching subcommittee on actions taken to increase the protection of the bottlenose dolphin (*Tursiops truncatus*) population of the Doubtful Sound Complex in Fiordland, New Zealand. Recent abundance estimates indicate that there were 44 adult and sub-adult bottlenose dolphins in the Doubtful Sound Complex population in the summer of 2006/2007. A decline of 34-39% has been reported over the past 12 years (Currey *et al.* 2007). In New Zealand, marine mammals are protected under the Marine Mammals Protection Act 1978. The Department of Conservation (DOC) administers this Act and is the Government agency responsible for marine mammal welfare in New Zealand. In early 2007, DOC commenced a public process in order to circulate the current scientific information available regarding this population. The public discussion paper released also sought comments and suggestions on possible options to increase the protection of this population. In January 2008, a management strategy was implemented, based on the feedback received from this process.

KEYWORDS: BOTTLENOSE DOLPHINS, *TURSIOPS TRUNCATUS*, NEW ZEALAND

## Introduction

In the 2007 Report of the IWC Scientific Committee, the New Zealand delegation undertook to report to this year's Whale Watching subcommittee on actions taken to increase the protection of the bottlenose dolphin (*Tursiops truncatus*) population of the Doubtful Sound Complex in Fiordland, New Zealand.

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## Background on Doubtful Sound

The Doubtful Sound Complex is isolated due to its remote location and the fact that it is inaccessible directly by road. Typically, the fiord is reached via vessel across Lake Manapouri, followed by a vehicle trip over the Wilmot Pass to the head of the Doubtful Sound Complex at Deep Cove. This trip takes approximately 2.5 hours one way. The Wilmot Pass road is part of Fiordland National Park and is managed by DOC. All vehicles require a permit to use the road and there are limits on the number of vehicles that may operate. The Doubtful Sound complex is also accessible from the sea, although due to the length of the trip from the nearest port<sup>1</sup> and the frequently rough sea conditions, this method is not often used (although cruise ships do occasionally pass through the fiord).

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<sup>1</sup> Approximately 110km from Milford Sound and 230km from Riverton.

## Background on the bottlenose dolphin population of the Doubtful Sound Complex

The bottlenose dolphin population within the Doubtful Sound Complex (which includes Doubtful Sound / Patea, Hall Arm, Crooked Arm, First Arm, Thompson Sound, Bradshaw Sound and Gaer Arm), (**FIG. 1**) is one of three largely isolated bottlenose dolphin populations that have been identified in Fiordland, on the south west coast of New Zealand's South Island (44°30', 168°E). These three groups are reportedly the southernmost populations of resident bottlenose dolphins in the world (Bräger and Schneider 1998).

Aside from being at the southernmost limits of their range, the Doubtful Sound Complex population is also interesting for several other reasons: 1) Compared to calving in warmer waters, calving in the Doubtful Sound Complex shows strong seasonality, with a peak between December and April (Schneider 1999; Haase and Schneider 2001); 2) the population has been reported as having distinct social and cultural characteristics (Lusseau *et al.* 2003); and 3) every adult can be individually identified using markings on the dorsal fin, meaning that a complete census of the resident adult population of dolphins is possible (Currey *et al.* 2007).

Previously there has been some discussion on the robustness of the abundance estimates as figures quoted in the past have been taken from different data sets that treated sub-adults and calves differently. A recent assessment of trends in abundance over time that controlled for this factor (Currey *et al.* 2007), indicates that the number of adults and sub-adults decreased from 69 (95% CI: 68-70) in the summer of 1994/1995 to 44 (95% CI: 43-45) in the summer of 2006/2007. This represents a decline of 34-39% over 12 years. While the population of adults and subadults was reported in 2007 to be 44, the total population including calves (aged 0-3) was reported as 56 (Currey *et al.* 2007).

## Possible factors in the decline of the population

Although there have been rare sightings of individual dolphins from the Doubtful Sound Complex in other fiords, this population as a whole remains within the Complex year round, rarely leaving the fiord for more than a few hours (Schneider 1999; Lusseau *et al.* 2002). There is also no evidence of immigration from neighbouring populations (Currey *et al.* 2007), although more research on this is warranted. At this stage, immigration and emigration are not thought to be factors in the decline of this population, but further research on this variable is also warranted.

Recent research indicates that a possible underlying cause for the decline of adult/sub-adult population is the low recruitment rate into the breeding population. In the absence of any significant migration into the fiord, a decline in calf survivorship has been flagged as a key factor influencing total abundance (Currey *et al.* 2007).

The main source of boating activity in the Doubtful Sound Complex is tourism, making up 87% of all dolphin-boat interactions. Private and fishing charter vessels comprise 8% and 5% of interactions respectively (Lusseau 2003a).

The New Zealand Marine Mammal Regulations 1992 (MMPR) require that vessels advertising to take passengers to view marine mammals must obtain a permit from DOC, and may be subject to a number of conditions, regarding frequency of trips, seasonality of operation, etc.

Section 18 of the MMPR stipulates a generic code of behaviour around marine mammals (e.g. approach distance, maximum number of vessels in attendance, vessel handling when approaching, interacting with, and leaving a group of marine mammals) that applies to all vessels, whether or not the owner holds a permit issued under the MMPR.

While vessels operating scenic cruises (i.e. not targeting marine mammals as the primary focus of the trip), are still bound by Section 18 of the MMPR, DOC has no direct control over the licensing of such vessels, which is a function of the Regional Council, under the provisions of the Resource Management Act 1991 (RMA). In the case of the Doubtful Sound Complex, this is Environment Southland. DOC does retain enforcement powers from section 18 of the MMPR.

Scenic cruises take place year round but are more frequent in the summer months when there are 8 tour vessels operating regularly offering commercial day trips and overnight trips. Because of its isolation, private recreational vessels are rarely seen in most parts of the fiord complex, although at some times

of year groups / organisations travel to the area in larger numbers. In addition, cruise ships pass through Thompson Sound and the outer parts of the Doubtful Sound Complex during a limited summer cruising season.

Boat interactions with bottlenose dolphins in the Doubtful Sound Complex have been shown to change the behavioural budget of the dolphins. Resting dolphins are more adversely affected by interactions with boats than socialising dolphins (Lusseau *et al.* 2003).

Another anthropogenic factor in the Doubtful Sound Complex ecosystem is the input of freshwater from the Manapouri hydro-electric power station into Deep Cove which commenced operation in 1969 and was increased in 2002.<sup>2</sup> This increased freshwater input, combined with naturally high rainfall that flows in from the steep walls of the fiord creates a low salinity layer on the surface of the fiord complex and lowers water temperatures, and these may have an adverse effect on the dolphin population. The freshwater input from the power station discharges two to three times more water than rainfall each year.<sup>3</sup> Research indicates that there are fewer bivalve species and lower abundance of these key organisms in the inner Doubtful Sound Complex, where the low salinity layer ranges between 2m and 12m (Rutger and Wing, 2006). Impacts, if any, of this increase in freshwater input on the dolphin population are not yet understood.

Ecosystem changes due to historical commercial fishing inside the fiord complex, current commercial fishing practices outside the fiord complex, recreational fishing and climate variability, as well as disease or genetic features, are all factors that also have the potential to affect the bottlenose dolphin population's viability.

The New Zealand Government recognises that a precautionary management approach is warranted to increase the protection available to this dolphin population. It also recognises that due to the isolation of the fiord and the range of stakeholders involved that buy-in from the broader community is important to the success of any management strategy.

### **The Consultation Process**

Sixty responses were received to the discussion paper that was notified in July 2007. Three independent experts (Dr. Helene Marsh, Dr. Tim Markowitz and Dr. Karsten Schneider) reviewed the existing information on the dolphin population as well as the responses received to the discussion paper<sup>4</sup>. The experts agreed that a causal link between boats and the decline of Doubtful Sound Complex bottlenose dolphins was not as yet definitively established; however all three agreed that an increased level of protection for this population is warranted.

This opinion was provided to a panel convened by DOC that then gave recommendations on the implementation of management actions to provide increased protection.

This panel consisted of representatives from:

- Fiordland Marine Guardians<sup>5</sup>
- Regional Council
- Iwi<sup>6</sup>
- Department of Conservation

In addition to the opinion of the experts, the panel considered information presented in responses to the public discussion document.

<sup>2</sup> The increased discharge from 460m<sup>3</sup>/sec to 485m<sup>3</sup>/sec plus or minus 25m<sup>3</sup>/sec started in mid 2002.

<sup>3</sup> Chris Cornelisen, Meridian Technical Consultant, pers. comm., 2 May 2008.

<sup>4</sup> Dr. Helene Marsh – Ph.D, Dean, Graduate Research Studies, James Cook University, Townsville, Australia. Areas of expertise: Ecology and population biology of marine and terrestrial wildlife, coastal zone management; Dr. Tim Markowitz – Ph.D, Adjunct Faculty in Zoology, University of Canterbury, Principal Investigator, Dusky Dolphin Tourism Research Project, Kaikoura, NZ; Dr. Karsten Schneider – Ph.D, Doubtful Sound bottlenose dolphins, more field days in Doubtful Sound than any other researcher.

<sup>5</sup> This group was formed in response to concerns about escalating pressures on the Fiordland area resulting from increasing use, the need for improved and integrated management of the area and a desire that the community be more involved in the management of Fiordland's marine environment. The strategy the Guardians developed was entrenched in the Fiordland (Te Moana o Atawhenua) Management Act 2005.

<sup>6</sup> Fiordland is within the takiwa (area) of the iwi authority Te Rūnanga o Ngai Tahu.

Further consultation in an open public forum was undertaken in November 2007 prior to a final decision on the strategy being released in January 2008.

## **The Strategy**

The strategy adopts a number of the elements suggested by respondents to the discussion paper. The elements contained in this strategy were implemented in January 2008. They are to be reviewed in the first quarter of 2009 and the strategy amended if necessary. This review will be based on information collected on biological parameters, in particular abundance and calf survival rates, as well as compliance with the strategy by vessel operators. The strategy is made up of the following elements, which are inter-linked, with the intention of delivering the best possible degree of protection for the dolphin population:

1. Voluntary Code of Management ('COM')
2. Research and Monitoring of Dolphin Population
3. Education/Public Awareness
4. Compliance and Monitoring of Voluntary Measures
5. Resource Management Act 1991 Advocacy
6. Regulatory Measures

### 1. Voluntary Code of Management ('COM')<sup>7</sup>

This voluntary code applies to the behaviour of all vessels around the bottlenose dolphins in the Doubtful Sound Complex. It expands on the previous Code of Practice which was only applicable to tourism operators.

The Code of Management implements a 200m Dolphin Protection Zone (DPZ) which means that boats are not permitted to enter the DPZ if dolphins are present (FIG.1). Additionally, the COM provides that encounters with dolphins are to be left to chance for all vessels. By signing on to the COM, the commercial tour operators with Marine Mammal Viewing Permits (MMVP) have relinquished the right to seek encounters with marine mammals as is allowed by the permit in other areas around NZ. Eight such permits have been issued by DOC, or are in the renewal process for operations that focus on the Doubtful Sound complex. If a scenic cruise operator does not have viewing marine mammals as a publicly-advertised purpose of the trip, they are not required to have a MMVP. Any opportunistic interactions they may have with marine mammals must comply with the Marine Mammal Protection Regulations 1992. Additionally, the COM prescribes distances and speed restrictions around the dolphin population.

To date, all the eight regular tourist operators have signed on to the COM. Research vessels are also required to comply with the COM, except in situations that have been specifically provided for in their research permit.

Due to the large size and isolation of the Doubtful Sound Complex, the assistance and cooperation of the local community in adhering to and helping to enforce the COM is essential and will lead to better protection for the dolphins than would be possible from regulations with limited capacity for enforcement and no buy-in from the local community.

### 2. Research and Monitoring of Dolphin Population

The guiding document for research into the population and ecology of bottlenose dolphins in Fiordland is the 'Commercial Marine Mammal Viewing Research Strategy for Fiordland'. The focus of the strategy has in the past been solely to investigate the effects of vessels on the marine mammals with the main objectives being to define management needs in relation to commercial marine mammal viewing in Fiordland, and to develop a long-term research strategy for the Fiordland area.

Several extra research initiatives have been implemented as a result of the discussion paper process. The scope of the strategy has been expanded to include other research relevant to the dolphins and their habitat.

The current research mandate can be summarised into 7 broad groups of research;

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<sup>7</sup> The full text of the Code of Management and map of Doubtful Sound / Patea is located at <http://www.doc.govt.nz/templates/page.aspx?id=44339> or [www.doc.govt.nz](http://www.doc.govt.nz).

- Underwater noise and acoustics;
- Short-term effects of interactions with vessels;
- Long-term effects of interactions with vessels;
- General Population studies;
- Spatial studies (Geographical Information System);
- Management; and
- Habitat and ecological.

Research within these groups has been prioritised with the highest priority research focus generally being on population parameters (abundance and calf survivorship); distribution; and ecological interactions (habitat and food webs).

Research was carried out on the abundance of the Dusky Sound population of bottlenose dolphins during December 2007 and February 2008. This will allow comparisons between the two populations which will assist in determining the causes of the reported decline of the Doubtful Sound Complex population. Also, each operator with an existing marine mammal permit is now required to fill out a marine mammal sighting logbook. These logbooks now include a further set of questions that are specific to the COM which may help to guide future management decisions.

### 3. Education/Public Awareness

This aspect of the strategy includes educating boaters in the Doubtful Sound Complex of appropriate behaviour around dolphins, as well as keeping all stakeholders abreast of new information about the dolphin population.

One-on-one sessions with skippers of the commercial tour vessels have been held to explain how the Code of Management works, answer any questions that they have about the COM and to provide them with information to increase their knowledge of the dolphin population. Recreational users are being educated by DOC rangers through seminars to boating clubs and booths at boating shows. Both groups have received maps of the fiord complex that indicate the Dolphin Protection Zone as well as copies of the Code of Management.

### 4. Compliance and Monitoring of Voluntary Measures

Monitoring compliance with the Code of Management is occurring in three ways: 1) via surveillance by a DOC vessel; 2) compliance visits by uniformed DOC rangers on commercial tours; and 3) through observers sent *incognito* on commercial tours.<sup>8</sup> Because the Code of Management is voluntary, the goal of these efforts is to assess compliance by users of the fiord. The results of these monitoring activities will be fed into the review process in 2009 as one of the factors to be considered in deciding whether it will be necessary to introduce further regulatory measures, such as a marine mammal sanctuary.

### 5. Resource Management Act (RMA) 1991 Advocacy

The purpose of the RMA is to promote sustainable management of natural and physical resources including safeguarding the life supporting capacity of air, water, soil and ecosystems, and to avoid, remedy or mitigate any adverse effects of activities on the environment. Preservation of the natural character of the coastal environment and protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna are also matters of national importance under the RMA.

A publicly notified resource consent issued by the Regional Council (Environment Southland (ES) is required for commercial surface water activities<sup>9</sup>, and research activities<sup>10</sup> undertaken within the

<sup>8</sup> Surveillance by the DOC vessel is occurring whenever it is in the Doubtful Sound complex with full days being dedicated to compliance at least once a month. Each of the regular commercial tour vessels are being visited by a uniformed DOC ranger once a month. There is a minimum of two *incognito* observers a month being sent on commercial tours in the summer, one in the winter months.

<sup>9</sup> The Regional Coastal Plan for Southland (the purpose of which is to assist Environment Southland, in conjunction with the Minister of Conservation, to achieve the purposes of the Resource Management Act 1991 in relation to the coastal marine area of the Southland region) defines of a Commercial Surface Water Activities as including any activities that involve the use of any ship of less than 1000 gross registered tons where that ship has been offered for hire and reward...but does not include any activity for which a reasonable charge is made towards recovery of reasonable expenses, or any commercial fishing vessel when undertaking catching quota and non-quota fish and ancillary services.

coastal waters adjacent to Fiordland National Park. DOC has no statutory responsibility under the RMA for management of these activities.

The no boat-zone has been accepted by the activity operators who have voluntarily chosen not to enter such no-boat zones. However, this new position is not reflected within the current version of ES's Regional Coastal Plan for Southland, which predates the concerns around the dolphin habitat. While allocation limits are established for commercial surface water activities within the Doubtful Sound Complex, (which is currently fully allocated), there is no prohibition on additional activities. Additional commercial surface water activities may therefore be granted, which may result in cumulative adverse effects on the dolphin population. However, resource consent applications for those activities over and above the allocation limits are subjected to rigorous scrutiny, (as a non-complying activity), through the processes of the Resource Management Act, and a decision in favour of an application is not guaranteed.

Separately, the Department of Conservation has a statutory role for the protection of marine mammals under the Marine Mammal Protection Act 1978. An overlap in roles therefore exists between ES and DOC for the protection of marine mammals.

In order to provide for protection of the Doubtful Sound Complex bottlenose dolphins, the Department of Conservation has advocated for no-boat zones, based on research including that of Lusseau (2003).

DOC will continue to advocate to Environment Southland that resource consent conditions should include prohibiting access to areas sensitive to the dolphin population as presented by Lusseau (2003) etc., unless and until research indicates otherwise.

Additionally, DOC will advocate for conditions such as the Code of Management to be included as a mandatory part of any resource consent conditions.

#### 6. Regulatory Measures

The Marine Mammal Protection Regulations 1992 ('MMPR') prepared under the MMPA and enforced by DOC currently provides the regulatory framework for behaviour around marine mammals in New Zealand internal waters. The conditions in the MMPR apply to all marine mammals in New Zealand. Any strengthening of regulatory measures is contingent on the results of monitoring calf survival rates, abundance estimates, immigration or emigration and compliance with the voluntary Code of Management. The review of the measures will occur in May 2009.

#### **Conclusion**

New Zealand is appreciative of the consideration that has been afforded to the bottlenose dolphin population of Doubtful Sound by the IWC Scientific Committee, in particular the Whale Watching Subcommittee. The concerns that have been expressed by the Committee in recent years are being addressed through a suite of research and management initiatives, supported by a comprehensive programme of advocacy, education and public participation. Continued monitoring will be undertaken and a review of the measures will occur in May 2009.

Discussions with stakeholders have made it clear that a Marine Mammal Sanctuary under the Marine Mammals Protection Act 1978 may be considered in the future if voluntary management measures prove to be unsuccessful. The remoteness of the area, however, means that it is important that cooperation with stakeholders continue in order to achieve the best possible protection for the Doubtful Sound Complex bottlenose dolphins.

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<sup>10</sup> Where research is not relating to a consented activity.





FIG. 1

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