

Saving New Zealand's Vanishing Dolphins

What are Hector's dolphins?

Hector's dolphins (*Cephalorhynchus hectori*) are small, inshore dolphins that are only found in New Zealand waters. They are one of the rarest species of marine dolphin. They typically move in small groups of up to 8 individuals, and stay within a small stretch of coastline (usually around 50km) year-round. They spend most of their time in shallow, inshore waters including harbours and bays (Slooten et al 2006, Scali et al 2008), although they are known to venture up to 9km offshore into waters up to 80m deep (Pichler et al 2003). They feed on a variety of inshore fish species and invertebrates.



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Most live in South Island waters where they are divided into three distinct populations. A small genetically distinct subspecies known as Maui's dolphin (*C. hectori maui*) lives along the north-west coast of the North Island (Baker et al 2002). The movement of individuals between populations is thought to be less than 1% per year (Brager et al 2002).

Hector's dolphin is listed as endangered by the International Union for the Conservation of Nature (IUCN), and as nationally vulnerable by the New Zealand government. The North Island subspecies, Maui's dolphin, is classified as critically endangered by the IUCN, and nationally critical by the New Zealand government. Recent population studies estimate the total South Island Hector's dolphin population at 7270 individuals (Slooten et al 2004), and the North Island Maui's population at just 111 individuals (Slooten et al 2006).

Why are they threatened?

Hector's dolphins are relatively short lived (around 20 years), and don't sexually mature until they are 7-9 years old. A breeding female produces a single calf every 2-3 years. These characteristics make them very vulnerable to external threats, because they are unable to rapidly replace any losses; their maximum population growth rate is only around 2% per year (Davies et al 2008). Their preference for inshore habitats brings them into close proximity to human activities, such as fishing, pollution, and coastal development.

Entanglement in gill net (set net) fisheries is recognised as the single major cause of bycatch for cetaceans worldwide, and as a significant threat to small populations (Read et al 2006). Entangled dolphins cannot get to the surface to breathe; the dolphins therefore hold their breath, and if they don't escape or aren't released they asphyxiate.



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Since the early 1970s, commercial gill netting and trawling have grown considerably around New Zealand's coast. New Zealand is also one of the only countries in the world which allows recreational gill netting. During the period of expansion of these fisheries, total abundance of Hector's dolphins has reduced to less than 30% of its 1970 levels; in the case of the Maui's subspecies, it is estimated that more than 90% have disappeared in the last 40 years (Slooten 2007). In short, fishing-related mortality has resulted in serious declines in abundance, population fragmentation, and reduced genetic diversity within populations (Pichler and Baker 2000, Slooten & Dawson 2008).

The actual levels of fishing-related mortality are difficult to estimate accurately, because of low independent observer coverage, lack of monitoring of recreational fishing activities, and poor incentives for the voluntary reporting of incidents. The Department of Conservation maintains a database of reports received relating to deaths of Hector's and Maui's dolphins. Most of these reports come from public sightings, and are therefore biased towards heavily used coastal areas, and represent an underestimate of total deaths. For the period 1921-2008, some 456 deaths have been recorded on the database. A cause of death was determined for around half (254 animals), of which 35% were entangled in set nets, and a further 7% in trawl nets. Annual reported mortality of Hector's dolphins has increased markedly, from an average of less than 1 per year prior to 1970, to more than 20 per year since 2000. It is no coincidence that the increase in mortality since before 1970 corresponds with the increase in inshore gillnet fishing effort (Slooten and Dawson 2008).

The rate of entanglement of Hector's dolphins for the period 2000-2006 was estimated by Davies et al (2008) as 110-150 per year.

Using current population and bycatch estimates, the rate at which Hector's dolphins are becoming entangled is some 10-35x higher than the rate the populations can sustain. Calculations of the Potential Biological Removal (PBR) level for Maui's dolphins (ie the maximum human-induced mortality level the population can sustain without it causing decline) suggest they can afford no more than 1 human-induced death every 5 years (Slooten and Dawson 2008). So if fisheries-related mortality continues (even at a much reduced level) the numbers of Hector's and Maui's dolphins will continue to decline towards extinction. (Baird and Bradford 2000, Burkhart and Slooten 2003, Pichler and Baker 2000, Pichler et al 2003, Read et al 2006.)

Under management prior to the changes announced by the Minister of Fisheries in July 2008 (see below), populations were predicted to continue to decline (Slooten 2007, Davies et al 2008). New measures announced in July 2008 are predicted at best to hold populations at their current, depleted level (Slooten & Dawson 2008). If fishing impact could be reduced to

zero, populations are predicted to increase, potentially reaching half their 1970 levels within 40 years (Davies et al 2008, Slooten 2007, Slooten & Dawson 2008).

Any overlap between the gillnet and trawl fisheries and the dolphins' range therefore places the future of Hector's and Maui's dolphins at risk. A precautionary approach to the management of fisheries-related mortality of Hector's and Maui's dolphins is therefore essential if these dolphins are to survive.

What responsibility do the New Zealand government have, and what are they doing?

Being endemic to New Zealand, and threatened with extinction, the protection of Hector's and Maui's dolphins is of national and international importance.

The two main New Zealand government agencies with responsibility for protecting Hector's and Maui's dolphins are the Ministry of Fisheries, and the Department of Conservation.

Under the terms of the Marine Mammals Protection Act 1978, the Department of Conservation of the New Zealand Government has an obligation to afford protection to marine mammals listed as critically endangered, endangered, or vulnerable, in order to effect recovery. The Fisheries Act 1996 gives the Minister of Fisheries the power to take necessary steps to "avoid, remedy, or mitigate the effect of fishing-related mortality on any protected species", and specifies that associated or dependent species should be "maintained above a level that ensures their long-term viability". In its advice to the minister regarding the threat management plan, the Ministry of Fisheries suggested that the minister could "restrict utilisation (ie fishing).... if you are confident those measures are necessary to avoid, remedy or mitigate the effect of fishing-related mortality on dolphins".

In its Marine Mammal Action Plan for 2005-2010, New Zealand's Department of Conservation outlined the need to "determine and recommend management measures to reduce fishing-related mortality (of Hector's and Maui's dolphins) to near zero".

Threat management

New Zealand's first Marine Mammal Sanctuary was created around the Bank's Peninsula on the East coast of the South Island, in 1988, specifically to protect Hector's dolphins in the area from entanglement in gill nets during the summer months (November-February) when the dolphins tend to come inshore to breed. This approach was recognised as being insufficient to protect the dolphin population (Cameron et al 1999).

Following two reported net entanglements of Maui's dolphins in 2002, the Minister of Fisheries prohibited set netting along parts of the west coast of the North Island to 4km offshore in 2003, although the ban did not apply within harbours. Research carried out since then indicates that Maui's dolphins do venture outside the area of the ban, and into harbour entrances (Slooten et al 2005, Russell 2008, Scali et al 2008).

In response to national and international calls for increased protection for Hector's and Maui's dolphins, in which Care for the Wild International was instrumental, in 2005 the Ministry of Fisheries and Department of Conservation began development of a draft Threat Management Plan for Hector's dolphins to cover all populations. The plan was developed in consultation with a number of stakeholders, including representatives from the fishing industry and conservation groups, and included three options for the minister of fisheries to consider. Following public consultation and submissions, the minister was provided with the plan in May 2008, and published his proposals for increased protection measures in July 2008. The measures, which came into effect on 1st October 2008, included some increased

regional restrictions on set netting and trawling, and requirements for some commercial fishers to carry government observers on their vessels.

The new measures represent an improvement on previous levels of protection, although they still do not provide complete protection for these endangered animals throughout their known or historic range (Slooten & Dawson 2008). In spite of this, fishing industry objections resulted in a successful application for a judicial review in September 2008. That judicial review is currently ongoing.

Fishing Industry objections

The protection measures announced by the then Minister of Fisheries Jim Anderton, in July 2008, included increased restrictions on commercial and recreational gill netting and trawling, and an announcement of additional money to increase observer coverage on commercial fishing boats, in order to better assess the continuing impact of fishing on the dolphins.

Predictably, the fishing industry has objected to most of the new restrictions, using the legal process to force a judicial review. The industry's objections are complex, but basically they cover three broad areas:

1. They claim there is insufficient information available on which the Minister could base his decisions
2. They emphasize that the observer programme implemented through summer 2008-2009 detected only one Hector's dolphin entanglement (ironically in an unprotected area off Kaikoura), and could have been implemented much earlier
3. They claim that the measures impose restrictions on the gill netting and trawling industries which will cause unacceptable economic loss

1. "Insufficient information"

Hector's and Maui's dolphins are arguably the world's most extensively studied dolphin species. There are more than 100 scientific publications in peer-reviewed New Zealand and international journals, as well as many commissioned reports for government and non-government organisations, covering everything from general biology and behaviour, to population biology and extinction risk analysis. A selection of these publications is listed in the references below. In 2008 the International Union for the Conservation of Nature re-affirmed the endangered and critically endangered status of Hector's and Maui's dolphins respectively, following detailed consultation with specialist groups, and peer review at species workshops and the Species Survival Commission.

Population biology and associated risk analyses are by nature inexact sciences, relying on the calculation of probabilities in the face of a number of variables; however, studies using different recognised methods by different authors come to the same broad conclusions regarding current and past populations of Hector's and Maui's dolphins, and the future impact of the various protection proposals.

As noted by the Cetacean Specialist Group of the IUCN in its submission on the Threat Management Plan, as well as in recent comments from the Society for Marine Mammalogy, the New Zealand government is in a very strong position to take good management decisions based on existing science and precautionary principals.

2. “Lack of observed entanglements”

Members of the fishing industry have consistently objected to having observers on their boats, and indeed a number refused to carry the statutory observers during the recent surveys and are currently facing prosecution (see Fish Information Services articles 2009). As a result, observer coverage during the summer of 2008-09 was less than 5%. At that level, assuming a bycatch mortality of 40 dolphins (the reported annual level for the East coast of the South Island prior to the new protection measures), there is a 60% chance that one or less bycatch event would be recorded by observers. So the fact that only one bycatch mortality was officially observed (quoted as evidence that there is no problem by fisheries representatives) is much as you would expect if the new measures had in fact made no difference at all (Slooten 2009). The National Institute of Water and Atmospheric Research in New Zealand estimates that to get a true indication of bycatch levels, the observer programme would need to cover around 80% of all gillnetting activities.

3. Economic cost

The fishing industry argues that the most stringent protection measures announced in the minister's decision regarding the threat management plan could cost the industry some NZ\$79 million. This figure, if it is true, represents only some 1% of the total value of the fishing. The economic value of protecting Hector's and Maui's dolphins in terms of revenue from tourism, and the cost of not doing so to New Zealand's international reputation, are more difficult to measure, but substantially more significant.

Conclusion

New Zealand's gill netting and trawling industry contributes very little to the country's economy, but is doing huge damage to Hector's and Maui's dolphins. After many years of neglecting the future of these iconic indigenous mammals, the New Zealand government has finally woken up to the fact that something needs to be done. The new measures put in place last year represent a start, but do not go far enough to ensure the survival and recovery of Hector's and Maui's dolphins. In spite of this, the fishing industry objections to the new measures are delaying the issue by forcing it through the courts.

The cost of failing to provide complete protection is likely to be the extinction of Maui's dolphin in the near future, followed by further decline and eventual extinction of other populations of Hector's dolphins. They will follow many other species that have fallen by the wayside in the name of development and commerce, in a country that has spent the last 10 years promoting its green credentials to the world through its “100% Pure New Zealand” marketing campaign.

If the New Zealand government wishes to retain any environmental credibility on the international stage, and does not wish to place its “100% Pure” campaign at risk, it must stop compromising to placate a few fishermen, and take the measures that are needed to fully protect Hector's and Maui's dolphins.



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