

## **New Zealand's own dolphins: What more needs to be done to protect them?**

Associate Professor Liz Slooten  
Zoology Department, Otago University  
Dunedin

Presentation at Environmental Defense Society conference "Reform in Paradise: Threat or Opportunity?" Auckland, 8-9 June 2009

Hector's dolphin is one of four species commonly seen in New Zealand waters. The other three are common, dusky and bottlenose dolphins. Hector's dolphin is the only endemic species and is endangered (IUCN 2009). Population surveys carried out by Otago University during 1997-2004 followed international best practice methods, using line-transect survey design and the programme Distance (Buckland et al. 1993) for data analysis. Hector's dolphin is one of only two dolphin species in the world for which a total population estimate is available, with 7,270 (CV 0.16; Dawson et al. 2004; Slooten et al. 2004) off the South Island and 111 (CV 0.44; Slooten et al. 2006) off the North Island west coast. The North Island population is a separate subspecies, also known as Maui's dolphin, and is listed as critically endangered (IUCN 2009).

Hector's dolphins have a very small home range of about 50km of coastline (Rayment et al. 2009). Individuals are photographically identified on the basis of nicks out of their dorsal fins and obvious scars or body colouration. This makes it possible to gather data not only on movements but also on survival, reproductive rates and who is seen with whom. Females start breeding at age 7-9, give birth every 2-3 years and live to 20-25 years old (Slooten & Lad 1991). This adds up to a maximum population growth rate of about 2% per year (e.g. Slooten 2007). In other words, a population of 100 dolphins (e.g. Maui's dolphin) could grow by at most 2 individuals per year. Their behaviour includes a range of social and sexual behaviours. Aggression is rare but dolphins are from time to time seen chasing and biting each other. Like other dolphin species, Hector's dolphins like to play with seaweed, sticks and other flotsam in their environment. Surface feeding is occasionally seen, but most feeding occurs too far below the water surface to be seen. The diet of Hector's dolphins includes squid and a range of fish including yellow-eyed mullet, ahuru, red cod, flatfish, stargazer and other species.

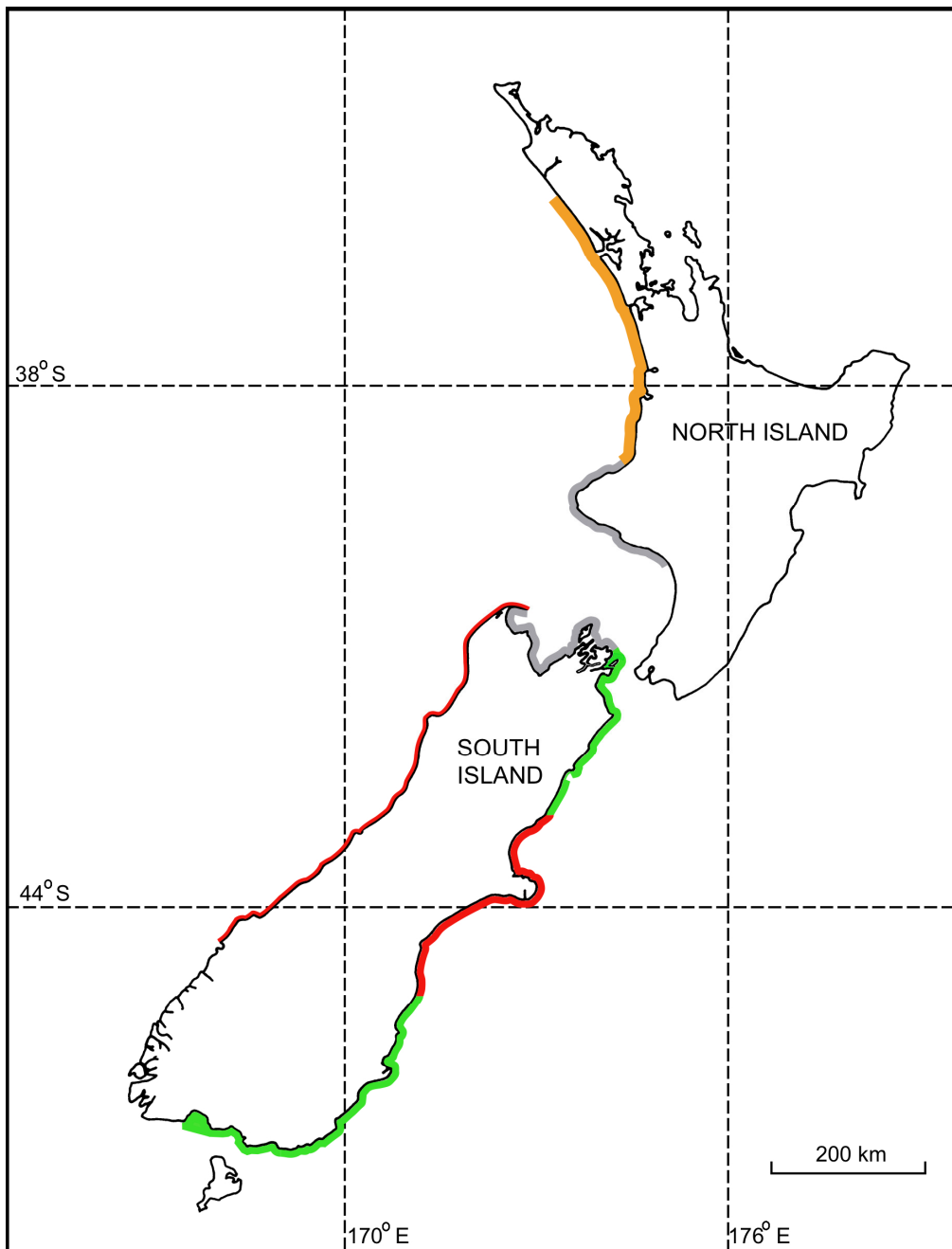
Conservation threats include fishing, pollution, habitat degradation, marine mining and occasionally invasive research methods. Dolphin deaths in fishing nets, in particular gillnets but also in trawling, have been identified as the most serious threat in the Hector's and Maui's dolphin Threat Management Plan (DOC & Mfish 2007). A study by NIWA and the fishing industry estimated that 110-150 Hector's dolphins were caught each year during 2000-2006 (Davies et al. 2008).





New protection measures introduced by Hon. Jim Anderton (then Minister of Fisheries) in 2008 are a major improvement on past management, providing at least some protection for most of the range of the species (Slooten & Dawson 2008). These protection measures are expected to be effective for most of the east and south coast of the South Island (Figure 1). Dolphin populations are expected to

slowly recover in Otago and Southland for example. Maui's dolphin is expected to be held at the current, seriously depleted level (less than 10% of original population size), because the harbours are not included in the protected area and there is no protection in the southern part of the range (Taranaki). Hector's dolphin populations around Banks Peninsula and off the west coast of the South Island are expected to continue declining (see Figure 1). Protection extends only about a third as far offshore as the dolphins' range in these areas. And in some areas there is no protection (e.g. Tasman Bay, Golden Bay and Taranaki).

Overall, these new protection measures are expected to slow the decline but not to result in any meaningful population recovery (Slooten & Dawson 2008). For example, past management would have resulted in the loss of just over 2,400 Hector's dolphins by the year 2050. By comparison, the new protection measures are expected to result in a much smaller loss, of just over 700 individuals. By contrast, without fisheries mortality the population would be expected to recover to 15,411 individuals by 2050, an increase of just over 7,500 individuals (Slooten & Dawson 2008).

Figure 1.



 Protected area	In these areas, Hector's dolphin populations are expected to slowly recover
 Harbours not included	Populations expected to be held at their current, depleted levels
 Less than 1/3 of offshore distribution protected	Continued population declines
 No protection	Continued population declines

## References:

- Buckland ST, Anderson DR, Burnham KP, Laake JL. 1993. Distance sampling: estimating abundance of biological populations, 446 p. New York: Chapman and Hall.
- Davies NM, Bian R, Starr P, Lallemand P, Gilbert D, McKenzie J. 2008. Risk analysis for Hector's dolphin and Maui's dolphin subpopulations to commercial set net fishing using a temporal-spatial age-structured model. Ministry of Fisheries, Wellington, New Zealand, [www.fish.govt.nz/NR/rdonlyres/B034115D-247A-42E5-B08F-F5D267046C59/0/HectorNIWAriskanalysis.pdf](http://www.fish.govt.nz/NR/rdonlyres/B034115D-247A-42E5-B08F-F5D267046C59/0/HectorNIWAriskanalysis.pdf)
- Dawson SM, Slooten E, DuFresne S, Wade P, Clement D. 2004. Small-boat surveys for coastal dolphins: Line-transect surveys for Hector's dolphins (*Cephalorhynchus hectori*). *Fishery Bulletin* 201: 441-451.
- DOC, MFish. 2007. Department of Conservation and Ministry of Fisheries. Hector's and Maui's dolphin Threat Management Plan, 29 August 2007. Available at [www.fish.govt.nz/en-nz/Environmental](http://www.fish.govt.nz/en-nz/Environmental).
- Rayment W, Dawson SM, Slooten E, Bräger S, DuFresne S, Webster T. 2009. Kernel density estimates of alongshore home range of Hector's dolphins (*Cephalorhynchus hectori*) at Banks Peninsula. *Marine Mammal Science* (In Press in hard-copy Journal; Published online 6 Feb 2009, DOI: 10.1111/j.1748-7692.2008.00271.x)
- Slooten E. 2007. Conservation management in the face of uncertainty: Effectiveness of four options for managing Hector's dolphin bycatch. *Endangered Species Research* 3:169-179.
- Slooten E, Dawson SM. 2008. Effectiveness of new protection measures for Hector's dolphin. Paper SC/60/SM12, presented at the Scientific Committee of the International Whaling Commission.
- Slooten E, Dawson SM, Rayment WJ. 2004. Aerial surveys for coastal dolphins: Abundance of Hector's dolphins off the South Island west coast, New Zealand. *Marine Mammal Science* 20: 117-130.
- Slooten E, Dawson SM, Rayment WJ, Childerhouse SJ. 2006. A new abundance estimate for Maui's dolphin: What does it mean for managing this critically endangered species? *Biological Conservation* 128: 576-581.
- Slooten E, Dawson SM, Rayment WJ, Childerhouse SJ. 2005. Distribution of Maui's dolphin, *Cephalorhynchus hectori maui*. *New Zealand Fisheries Assessment Report* 2005/28, 21p. Published by Ministry of Fisheries, Wellington.
- Slooten E, Lad F. 1991. Population biology and conservation of Hector's dolphin. *Canadian Journal of Zoology* 69: 1701-1707.