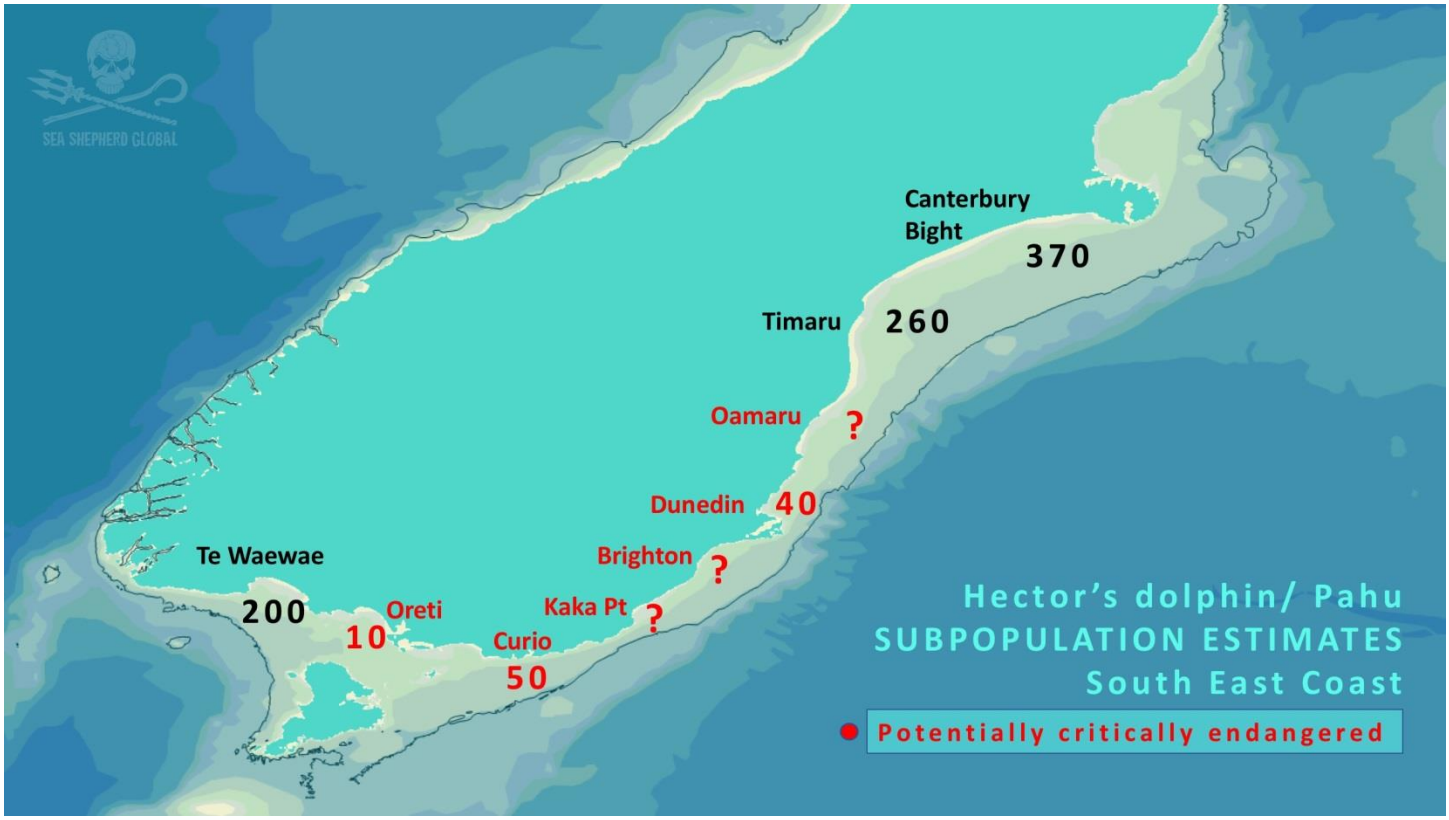
South East Subpopulation Estimates for Hector's Dolphins



Hector's dolphins don't stray far from home, with movements over 100km very rare. Their alongshore range is around just 50km[1]. Only some individuals are adventurous, traveling to visit other pods.

The species is made up of a series of distinct subpopulations like a necklace around the South Island. Genetic studies and lack of Photo-ID matches all support this. Each subpopulation is important, for adjacent genetic exchange, of which there is a stepping-stone pattern along coasts, and each is a critical link for the species as a whole[2].

There used to be more than 50,000[3] Hector's dolphins around Aotearoa. Now they are only abundant off the middle coastal parts of the South Island. In other areas, most subpopulations are becoming increasingly fragmented. The exception is Banks Peninsula, this subpopulation is slowly increasing[4]. Many are just as critically endangered as Māui dolphins.

[1] Rayment et al. 2009.
[2] Hamner et al. 2012.
[3] Slooten & Dawson, 2016.
[4] Gormley et al. 2012.

"…Hector's dolphin populations have been substantially depleted... Without fisheries mortality, populations would recover fairly rapidly."

Slooten & Dawson, 2010 p. 344

The following segments explain the reasoning behind each subpopulation estimate:

Te Waewae Bay ~ 200

The most recent population survey in 2009 for the whole of the South Coast - Te Waewae and Porpoise bays – estimated a population of 628 dolphins[5]. This result has since been reanalysed and revised down to an estimate of 238 Hector's for the whole South Coast[6]. The difference was largely due to a mistake in estimating the length of time a dolphin group remains in the field of view of an observer[7]. Without the Catlins subpopulation (40-50) we get a current estimate of around 200 dolphins for Te Waewae.

There would have been about 500 dolphins in Te Waewae bay in the 1970s. Hector's are regularly seen around Colac Bay and Riverton. From the history of estimates, it's clear this population has recently declined.

There's lots of anecdotal evidence from this area pointing to high levels of dolphin bycatch – 10 years ago there was about one Hector's caught for every four to six tonnes of rig.[8] One ex-fishermen (Riverton) was working on a vessel that caught five Hector's in one day. Six months later, they caught another ten in the same location[9].

Oreti Beach ~ 10

Small numbers of Hector's are regularly sighted off Oreti Beach by the public. Surfers have seen the same individuals repeatedly hanging out with them in the waves. Grant Meikle (Sea Shepherd) believes there are about 10. This population remains unstudied by scientists. Hector's are also seen in Bluff Harbour and between Dog and Ruapuke Islands. It is unknown to what extent any mixing with adjacent populations (Te Waewae and Catlins) occurs.
One ex-fisherman has said he knew of 20 Hector's dolphins being caught by a trawler out of Bluff in one week[10]

[5] (CV 0.39; 95% CI 301-1311); Clement et al. 2011.
[6] (CV 0.40; 95% CI 113–503); McKenzie & Clement, 2016a.
[7] McKenzie & Clement, 2016b.
[8] Te Waewae Bay fishermen, (requested anonymity), personal communication, 2008.
[9] Hay & Fagan, 2012.
[10] Grant Meikle, personal communication, 2017.

Curio Bay ~ 50

The latest population study for Porpoise Bay was commissioned by DOC in 2008[11], resulting in an estimate of 49 dolphins. This is very similar to earlier findings: 1997/1998 surveys estimated 48 individuals and 2002/03 fieldwork indicated 43 dolphins present in Porpoise Bay in summer. These estimates indicate there is no population trend, as in increasing or decreasing. However, the latest estimate is over 10 years old and is outdated; this population is likely to be more threatened than Māui dolphin.

Kaka Point ~ ?

Hector's were once abundant off Kaka Point, just like Porpoise Bay. Many older generations used to swim with them there. Today there are only occasionally sighted.
In winter, the dolphins from Porpoise Bay head closer to Bluff, to Toetoes Bay. Māori oral history indicates that in winter there used to be a lot of dolphins at Owaka[12] . These may have been the Kaka Point dolphins, now largely gone today.

Brighton ~ ?

During Turek's surveys in 2011[13], there were no Hector's south of Taiaroa Head to Taieri Mouth. We know they are occasionally sighted off Brighton by the public, where they used to be historically abundant[14].

Dunedin ~ 40

Turek estimated the population between Taiaroa Head to Karitane at 37 - 42 individuals. Interestingly the Dunedin Hector's do not seem to go north past Waikouaiti. This has also been found in earlier studies[15]. And so far, there are no photo-ID matches between the Dunedin and Moeraki/Oamaru groups.

In 1970 there used to be around 215 dolphins in this area[16]. This population can only afford one death from fishing every 37 years[17]. The dolphins here are critically endangered.

Oamaru ~ ?

There are no official estimates for the Moeraki/ Oamaru area. When Turek's more recent findings are compared with the study in the mid 1990s, there are about 75% less dolphin sightings. Brager found consistent sightings between Moeraki and Oamaru, but Turek saw

[11] Conducted by Webster & Rayment, (2008; 95%CI 44-55).
[12] Huata Holmes, personal communication, 2017.
[13] Turek, 2011; Turek et al. 2013; (CV 0.42; 95%CI 25-75); (CV 0.41; 95%CI 19-92).
[14] Diver, 1866.
[15] Brager, 2008.
[16] (CV 0.49; Slooten et al. 2011).
[17] Slooten & Dawson, 2008.

them around Moeraki and only slightly north. There has been pronounced population decline, and a contraction in distribution off Oamaru.
Interviews with fishermen from this area have revealed that "it is wide practice that dolphins are caught as bycatch by rig and elephant fisheries that occur in summer, and inshore waters".

There used to be around 300 dolphins in this area in the 1970s. There may be as few as 20 individuals. This area really needs some urgent fieldwork.

Timaru ~ 260

Based on line-transect boat and aerial surveys from the late 1990s to 2009[18], there could be about 260 dolphins in the Timaru to Rakaia area. Hector's have been observed much further offshore in this area, 19 nautical miles (nm)[7].

In 2012, MPI (Operation Achilles) trialled video surveillance on six boats out of Timaru, recorded the capture of two Hector's dolphins. Both were released from the net, dead. Only one of the two incidents was reported and there was no prosecution. There is a lot of bycatch occurring in this area.

Based on actual recent sightings and bycatch rates this estimate may still be too high. In 2002, Pichler observed that the Timaru population was on a par with Māui in terms of recent population decline. New small-scale research is urgently needed in this area.

A local scientist and kayaker goes out frequently looking for Hector's. He doesn't see them every time and often paddles far offshore. He believes there are only about 30 off Timaru. They are seen often by the local sailing club in Caroline Bay.

Canterbury Bight ~ 370

Based on line-transect boat and aerial surveys from the late 1990s to 2009[18], there could be about 370 dolphins in the Rakaia to Birdlings Flat area. Based on sightings and bycatch rates, this figure may still be too high. Hector's have been observed 19nm off this area also[7].

A much larger amount of habitat remains unprotected in this area with high fishing effort. This population continues to slowly decline[4].

New small-scale research is urgently needed in this area to update the subpopulation estimate.

At least 46 Hector's dolphins are caught by trawlers, per year, off East Coast South Island alone.

Slooten & Dawson, 2017

[18] Will Rayment, personal communication, 2016; Dawson et al. 2004; Rayment et al. 2006; Rayment et al. 2009.

Figure 1: Hector's dolphin, Te Waewae Bay, July 2017. Photo: Katharina Rehberg.

The latest estimate of 15,000 dolphins

Research from the Cawthron Institute in 2016 estimated the total South Island population at almost 15,000[19]. The West Coast has declined by around 1000 dolphins and the South Coast by about 100 individuals. The estimates for the East Coast of the South Island range to a maximum of 7 billion dolphins. Blow outs like these are not a good indication of accuracy.

Sure signs there are issues come from Golden Bay, where there weren't any dolphin sightings in summer. There was only one sighting of 3 dolphins in winter. From that one sighting, over 200 dolphins are estimated in only part of Golden Bay. This certainly does not fit with long- term sighting rates which are very low. Off Otago, there were no dolphins sighted at all. Otago has an estimate of zero, yet we know there are about 40 Hector's there. Likewise, McKenzie and Clement's estimates are 4 to 6 times higher than other population estimates for Cloudy Bay[20]. Bearing this in mind, we have divided their latest estimates by 4 for the Canterbury Bight and Timaru subpopulation estimates[21].
It is obvious this methodology does not fit the patchy distribution of Hector's dolphins, especially for the smaller subpopulations. It would be unwise to use these estimates for conservation management until the issues are resolved.

McKenzie and Clement's estimates have been peer-reviewed by scientists from the International Whaling Commission Scientific Committee and other scientists contracted by DOC and MPI who have given recommendations to improve the analysis[22]. The NZ

[19] McKenzie & Clement, 2016a.
[20] Boat line transect, 162 dolphins, Dawson et al. 2004; Genetic recapture, 230 dolphins, Hamner et al. 2017; Photo-ID recapture, 269 dolphins (CV 0.12), Hamner et al. 2017; and Aerial line transect, 953 dolphins, McKenzie & Clement, 2016.
[21] Figures taken from Table 24 in McKenzie & Clement, 2016b.
[22] Palka et al. 2016.

government is having a scientific workshop to resolve issues, during the Hector's Dolphin Threat Management Plan review process in 2018.

The survey did confirm dolphins are found further offshore, particularly off the East Coast, in unprotected areas, revealing a greater overlap of dolphin distribution with commercial fishing.

Current protection measures

Here is the link to the South Island South East Coast Closures Map.
For these areas:

- Set netting is generally banned out to 4nm.
- Recreational set netting is still allowed in some harbours, estuaries and inlets.
- Trawling is banned out to 2nm except trawling within 2nm is allowed for targeting flatfish (gear must have low headline height). There is no evidence that this reduces the number of dolphins caught.

Some marine mammal sanctuaries have been established. These sanctuaries offer no additional restrictions on fishing except for Te Waewae Bay, where set netting is banned out to 9nm. Instead they limit mining and acoustic surveys used in seismic prospecting.

Most of these regulations are very poorly monitored in most areas.
You can see how much Hector's and Māui habitat (red) remains unprotected in the map below:

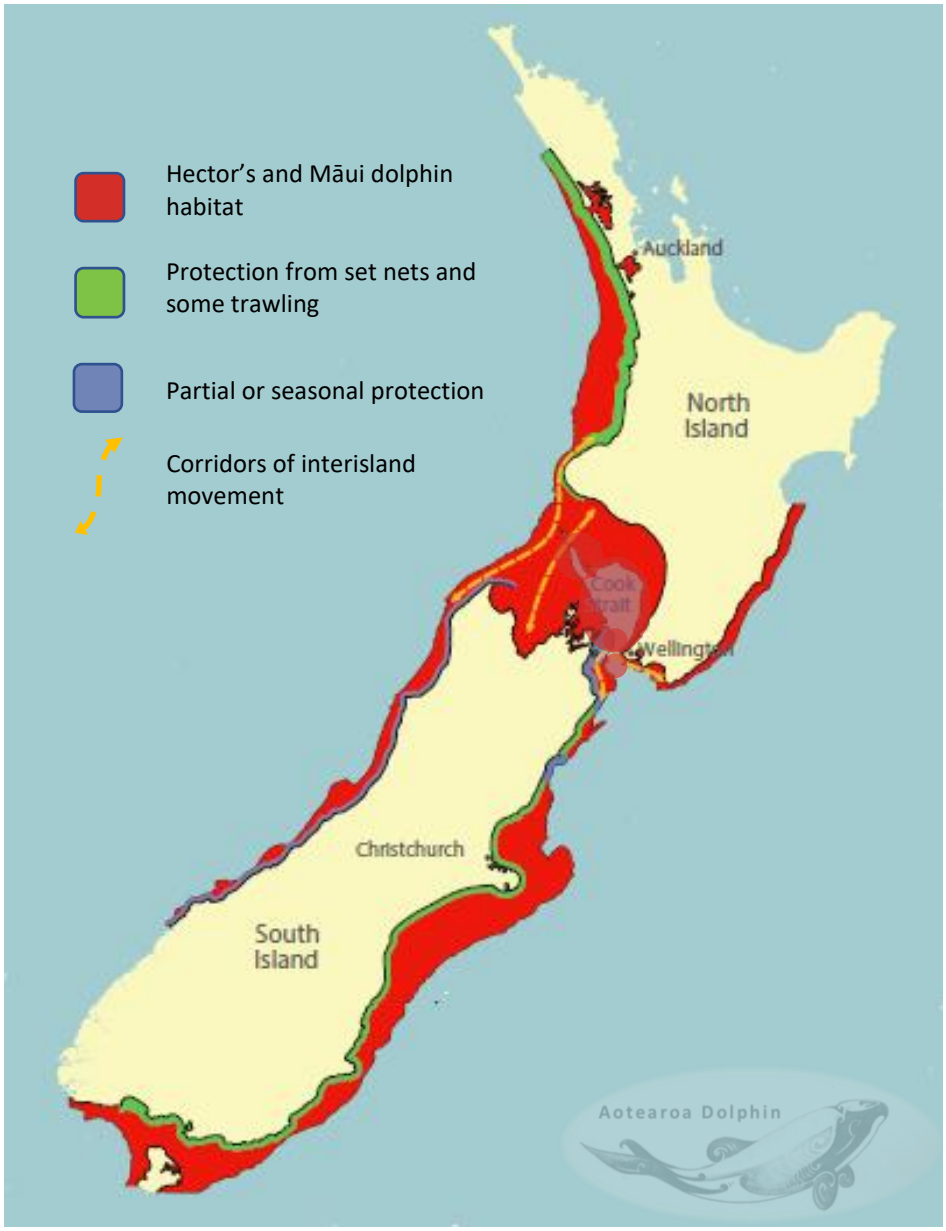


Figure 2: Overview of existing protection measures for Hector's and Māui dolphins compared with dolphin distribution.

CVs and CIs?

Some of the estimates referred to have more details in the footnotes. The Coefficient of Variation (CV) and Confidence Interval (CI) are statistical terms that indicate how precise an estimate is. A small Confidence Interval is better than a large one. For example, in Clement et al.'s, 2011 estimates for Te Waewae Bay, the true estimate is thought to be somewhere between 301 and 1311 individual dolphins.

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