

**Mangawhai Historic Wharf Resource Consent Application  
Appendix 10:**

**Overview of the Environmental Effects of proposed  
Mangawhai Wharf Restoration**



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# **Overview of the Environmental Effects of Proposed Mangawhai Wharf Restoration**

## **Key Points**

- Effects on benthic fauna and flora are minimal and certainly less than minor.
- There may be short-term effects on birds in the immediate vicinity of the proposed wharf but short and longer-term effects are less than minor.
- Construction should occur outside the courting and breeding season of the critically endangered New Zealand fairy tern. This period of construction should be between March and early September.
- Negative effects on birds of the constructed wharf will be less than minor and there may be some positive effects for a few species.
- The use of the wharf to provide additional conservation information to people is a long-term positive effect of the proposed wharf.

## **Introduction**

This report has been prepared for the Mangawhai Historic Wharf Trust (MHWT). The Trust was established in 2018 to promote, re-establish and operate a public wharf based on the design of the original historic wharf at Moir Street, Mangawhai for the benefit of the public and, in particular, the Mangawhai Community.

The report has been prepared by Dr John Craig ONZM, a former Professor of Environmental Management at Auckland University and an environmental consultant with over 50 years' experience and recipient of national and international honours for his work in conservation. It addresses the environmental issues raised by the prospect of the wharf rebuild, providing an overview based on earlier expert evidence commissioned by the Trust and by the Mangawhai Harbour Preservation Society and on the author's own experience and expertise.

## **Overview**

The Assessment of Environmental Effects – Minor Coastal Activity (Appendix 8 - La Bonté Consultants) provides an appropriate description of the area, the structure, and assesses all environmental effects as less than minor. The supporting documentation on the benthic surveys support the likely minimal effects on benthic fauna. The La Bonté report records questioning by members of the public on the potential effects on the New Zealand fairy tern. These are assessed as being less than minor but little supporting evidence is provided.

The present report specifically addresses the issues relating to the rare birds and especially the NZ fairy tern.

## **Bird Use of the Wharf Area**

Bioresearches<sup>1</sup> have undertaken a number of bird counts in the area of the proposed wharf. These show as expected that the exposed mudflats are used by a range of birds that both roost and feed in the area. A number of the species have a Threat status which requires comment. The construction of the wharf will have a high potential to disturb bird use of the immediate area and the restored wharf will also have a potential to influence bird behaviour. These can be managed.

The report by Bioresearches (Appendix 9) records a thin layer of sediment over base rock and both low diversity and abundance of invertebrates. This means the area is of little importance for bird feeding in the intertidal. Birds will roost and fly through but such activities can be undertaken in other areas. Bird roosting is often an issue of convenience and roosts are free to move to most areas that have the required characteristics including shelter and safety from predators and to a lesser extent disturbance.

The construction of the wharf will disturb birds but this will be temporary and certainly have little long-term effect. Also, most birds habituate to ongoing activities while some, especially gulls, may be attracted to areas of disturbance. Given the immediately adjacent boat launching ramp and stairs for walker access to the foreshore, a level of disturbance already occurs near the site of the proposed wharf. Unrestrained dogs with walkers are probably a greater threat and it is important that construction staff are not allowed to have accompanying unrestrained dogs while the construction happens.

The area is part of the feeding area of NZ fairy terns and Bioresearches do record both feeding and roosting by these birds in the vicinity of the proposed wharf. The effect of disturbance of feeding NZ fairy terns is less well understood but can be avoided if construction occurs outside the breeding season as recommended by Bioresearches.

Despite the presence of a range of Threatened and At Risk bird species, apart from the potential for disturbance in the immediate area of construction activities, few short term and no longer term effects are expected. Given the very small population size of the NZ fairy tern and the importance of the harbour for feeding during the courting and breeding season, I will address this species in more detail.

## **Potential Long-term Effects on Birds**

Some birds will make use of the wharf structure once it is in place. Gulls, including the At Risk – Declining red-billed gull will roost on the structure. Shags, especially the little shag and the little black shag (At Risk – Naturally Uncommon), and kingfishers will use the structure above the channel for roosting and for spotting food items. The other birds recorded by Bioresearches are intertidal feeders who roost in groups on the ground so they are unlikely to use the wharf. They are likely to continue to feed near and under the wharf but, as pointed out by Poynter and Associates as well as Bioresearches, the low diversity and abundance of invertebrates in the intertidal muds near the wharf suggest that this will be limited.

Lighting on the wharf has the potential to alter activity patterns of some birds, especially gulls. Navigation lights are directional and will have little effect. Other lighting should be downward pointing and preferably should not light the adjacent mudflats or water. Such lighting would have minimal effect.

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<sup>1</sup>

## New Zealand fairy tern

This bird is a species found in Western and eastern Australia, New Caledonia and New Zealand. Each region is currently split into a separate sub-species although the genetic research on the differences is extremely limited<sup>23</sup> and is being revisited. Regardless of the outcome, the New Zealand population is isolated and a remnant of a much larger population. It requires to be managed as a distinct population.

Early records include sightings in both the North and South Islands although by the 1950s it was confined to the North Island from Levin north. For the past 50 years, it has survived as a small population in a restricted part of Northland. The largest breeding grouping is on the Mangawhai Wildlife Refuge although a few birds also breed at Waipu, Pakiri and Papakowai. Most birds appear to winter in the Kaipara Harbour.

Fairy terns are classified as Threatened – Nationally Critical CD,RR,St. This is the highest threat category in the New Zealand system and reflects the extremely small size of the population. **CD** records that it is Conservation Dependent which describes that this bird is dependent on human management of its environment to survive. **RR** is Regionally Restricted and reflects the small area that is used by the bird. (see Figure 1 from the Fairy Tern Trust evidence<sup>4</sup>). **St** records that its numbers are stable at their current small size.

Two versions of the Recovery Plan for NZ fairy terns<sup>56</sup> have been written to guide improving management and an upgrade is currently in progress<sup>7</sup>. The primary focus of these has been on reducing the current known threats which solely relate to breeding birds and nesting areas. No mention is made of threats to foraging areas. Despite this, it is argued that current breeding areas reflect the availability of nearby feeding areas. Brooks et al. 2011<sup>8</sup> suggested that in addition to human disturbance and predators, food availability may be important. They offered no recommendations for future action in relation to this, however.

Lay evidence by New Zealand Fairy Tern Trust of March 2012 (see 4 below) argued that the presence of five foraging territories on the Mangawhai Harbour showed the importance of this area adjacent to the largest breeding area for this species. They argued that dredging of the harbour would reduce the value of the Upper Harbour for foraging whereas now it was the most important area for courting and breeding pairs. They argue that the most important time for foraging by breeding birds was between mid and low tide. This was when there were tidal pools and shallow waters for the birds to catch fish. The report by Bioresarches also reports NZ fairy terns only feeding along the channel edge in the vicinity of the proposed wharf near low tide. They did not record presence of NZ fairy tern at high tide. The feeding territories reported in the Trust evidence

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<sup>2</sup> Chambers, GK & Coddington, SJ. 1998 Molecular systematics of New Zealand fairy tern (*Sterna nereis davisae*) based on mitochondrial DNA sequences. Conservation Advisory Science Notes 182. DOC Wellington.

<sup>3</sup> Brunton, D & Baling, M, 2005. Conservation genetics of the New Zealand fairy tern (*Sterna nereis davisae*). Unpl, University of Auckland.

<sup>4</sup> Statement of Evidence of NZ Fairy Tern Trust (c/- Elizabeth Rogan) in Appeal against the decision of NRC ENV-2011-AKL-000110 March 2012.

<sup>5</sup> K Hansen, 2006. New Zealand fairy tern (*Sterna nereis davisae*) recovery plan, 2005 - 2015

<sup>6</sup> Parrish, GR & Honnor, L. 1997. New Zealand fairy tern (Tara iti) *Sterna nereis davisae* recovery plan. DOC Wellington.

<sup>7</sup> Peter Wilson, Te Arai Shorebird Trust, pers. comm. February 2020

<sup>8</sup> Brooks, J.; Davis, A.; Baird, K.; & Bellingham, M. 2011. Issues and options for the conservation and recovery of the critically endangered New Zealand fairy tern. Unpubl. report Forest & Bird Protection Society of NZ.

appear to coincide with the areas of greatest feeding reported by Ismar et al. 2013<sup>9</sup>. The latter authors observed feeding for two hours either side of low tide. They assumed that this was the most important feeding time based on observations by wardens at nest sites.

The reliability of this evidence as a guide for the current situation is debatable. At that time the lagoons on the spit immediately adjacent to some of the nests was the area of greatest foraging followed by areas in the upper harbour. While there were many records of foraging on the edges of the channel in the lower harbour, the pairs reported in the Evidence of the NZFTT that nested closest to the former lagoons, now use the lower harbour. The NZFTT takes the observation that these birds nest weeks later than those feeding in the upper harbour as evidence that it is a poorer area for foraging. They offer no comment on breeding success even though this is a better measure of quality. Ismar et al. recorded that the fish species used by fairy terns were slightly larger in the lower reaches of the harbour.

Parish and Pullam (1995)<sup>10</sup> record highly variable feeding rates per hour but offer no comment on tidal cycle. They do record at least one hour-interval when no food was delivered to chicks but food was delivered in all other hours albeit very unevenly. This suggests that the birds do feed at all tides but may undertake more at mid to low tide. Jeffries et al. 2016<sup>11</sup> record up to 1% of foraging occurs at Te Arai Stream and the adjacent ocean but observed a large number of fly overs suggesting birds were foraging at the nearby Slipper and Spectacle Lakes. Again, there was no comment on tidal cycle.

Birds that have lost their nest appear to move to the Kaipara Harbour to forage before sometimes returning to rebreed<sup>12</sup>. Post breeding birds, both adults and juveniles, roost at Te Arai or at Mangawhai but eventually most birds overwinter on the eastern parts of the Kaipara<sup>13</sup>. The population is increasing slowly but few birds are seen outside the current restricted range. It is interesting to note that one NZ fairy tern was seen at Pataua North in the winter of 2019 suggesting that some birds are exploring further.

Clearly the Mangawhai harbour is an important part of the foraging area for many of the birds nesting at the nearby refuge. As a result, disturbance of the harbour between the months of September – February should be avoided.

One of the concerns raised by the NZFTT in its 2012 evidence (ref 4) was the potential of further dredging of the channel to extend the area of the harbour available to larger boats at low tide. It is noted that the proposed construction of the wharf specifically states that no dredging of the channel is planned or required and that the depth of the water in the channel at low tide is similar to that when the wharf was in use historically.

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<sup>9</sup> Ismar, SMH; Trnski, T; Beauchamp, T; Bury, SJ; Wilson, D; Kannemyer, R; Bellingham, M & Baird, K. 2013. Foraging ecology and choice of feeding habitat in the New Zealand fairy tern *Sternula nereis davisae*. Bird Conservation International 24: 1-16

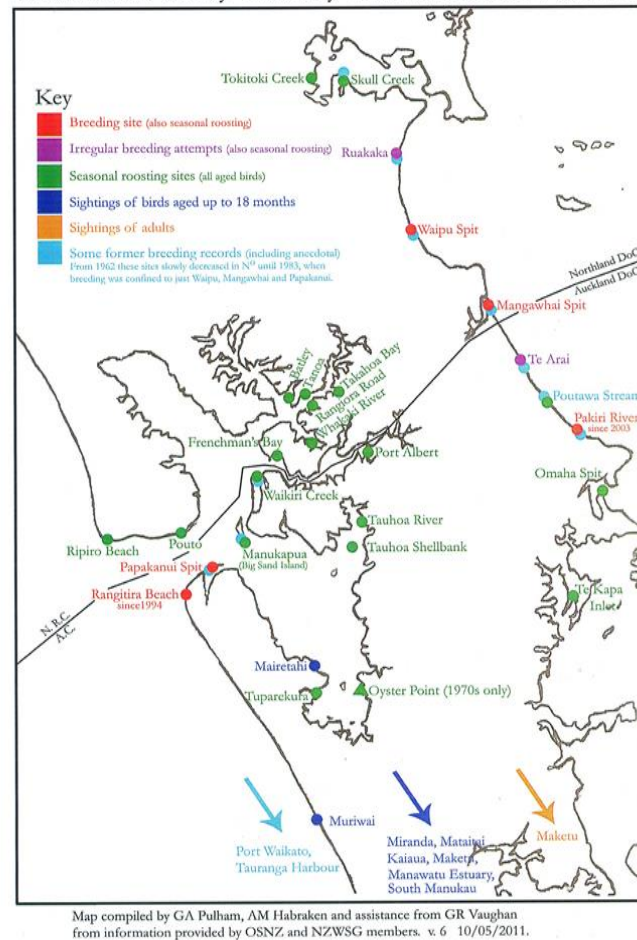
<sup>10</sup> Parrish, GR & Pulham, GA. 1995. Observations on the breeding of the New Zealand fairy tern. Tane 35: 161-173.

<sup>11</sup> Jeffries, DS; Bull, L; Lagnaz, EG; Pulham, GA; Wilson, DS; Wilson, P & Zimmerman, RL 2016. New Zealand fairy tern (*Sternula nereis davisae*) foraging behaviour at Te Arai stream. Notornis 63: 42-45.

<sup>12</sup> Baird, K; Ismar, SMH; Wilson, D; Plowman, S; Zimmerman, R & Bellingham, M. 2013. Sightings of New Zealand fairy tern (*Sternula nereis davisae*) in the Kaipara Harbour following nest failure. Notornis 60: 183 – 185.

<sup>13</sup>

Recorded Site Use by NZ Fairy Terns between 1991 and 2011



**Figure 1** Current and recently past records of NZ fairy tern (from evidence of NZFTT)

### Will the restored wharf negatively affect the foraging of fairy terns?

The Evidence of the Fairy Terns Trust and the results of Ismar et al. suggest that the majority of feeding in the upper harbour is in small channels and pools rather than the main channel. Ismar et al. record use of channel edges in the lower harbour and Bioresarches record one feeding episode by a NZ fairy tern at the main channel edge in the vicinity of the proposed wharf.

When the reconstructed wharf is not in use, all birds will habituate to its presence and will continue to feed as if it was not there. When in use, birds may be disturbed by boating activity and not feed in the immediate vicinity. The intertidal area immediately adjacent to the proposed wharf has no tidal pools and is used for launching boats. It is not a preferred feeding area for NZ fairy tern.

Harbour restrictions do not allow boats to travel faster than 5 knots in the vicinity of the proposed wharf and this will help minimise negative effects. The presence of a ski lane and use by jet-skis in that area in the lower harbour are a much greater threat to foraging NZ fairy terns than the proposed wharf.

## **Can the restored wharf benefit biodiversity?**

The restoration plan specifically states that the wharf will be used to help educate people about the local history and biodiversity. Informing people of the local biodiversity, especially the rarer species, can greatly assist in reducing the threats to these species. Currently boats are launched from the area of the proposed wharf but there is no signage mentioning appropriate behaviour in the harbour or for people who are crossing to walk to the ocean beach. Correcting these omissions is a key positive.

Nation wide there is increasing interest and activity in biodiversity conservation. The fact that NZ fairy tern, NZ dotterel, variable oystercatcher and Caspian tern all have Threat qualifiers of CD – Conservation Dependent points to the importance of actions by local people in enhancing and protecting these species. NZ fairy tern are a very special part of the Mangawhai area and increasing the level of information available to local people and visitors can only assist their future. Coordinating messaging with Northland Regional Council, Department of Conservation and the New Zealand Fairy Tern Trust will ensure maximum buy-in.

Any effects of the wharf on endangered birds including the FT will be temporary and relate only to feeding in what is a relatively low producing area, some distance from the FT breeding and main roosting sites. The effects can be considered no more than minor. Perhaps more importantly, they are likely to be more than offset by enhanced interpretation and instruction, a major benefit given the prospect of significant an ongoing increase in harbour use as Mangawhai continues to grow.

## **Recommendations:**

1. Construction is confined to the months of March to early September.
2. Lighting on the wharf is constrained to downlighting that illuminates the decking but not surrounding water or mudflats.
3. NRC needs to ensure that the channels are clearly marked and that the speed limits of watercraft are strictly enforced. This should reduce disturbance for the NZ fairy terns.
4. Biodiversity information is clearly displayed and wording is determined in conjunction with NRC, DOC and NZFTT.

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