

# Bird Monitoring Programme Waiau River (Southland)

Report for Meridian Energy  
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## SURVEY BACKGROUND

The aquatic birds of the mainstem Waiau River, Southland, have been monitored for absence/presence and relative abundance since November 1993 (Sagar 1994). During this time four reaches were surveyed (Figure 1) with surveys originally being undertaken during breeding and post-breeding (November and March) and latterly including the winter season as well (July). The results of these surveys have been written up and are available from Meridian Energy, or the Project Manager for the Waiau River Working Party.

At its May 2000 meeting the Waiau Working Party (which includes Meridian Energy, Department of Conservation, Iwi, Fish and Game Southland, and Environment Southland as members) reviewed the findings of previous monitoring and discussed recommendations from Teri McClelland, Environmental Resources, for changes to the monitoring regime. The Waiau Working Party agreed upon the

recommendations and Meridian Energy then undertook formal notification and approval procedures with Environment Southland. A synopsis of the new monitoring programme for birds on the Waiau River is attached as Appendix 1.

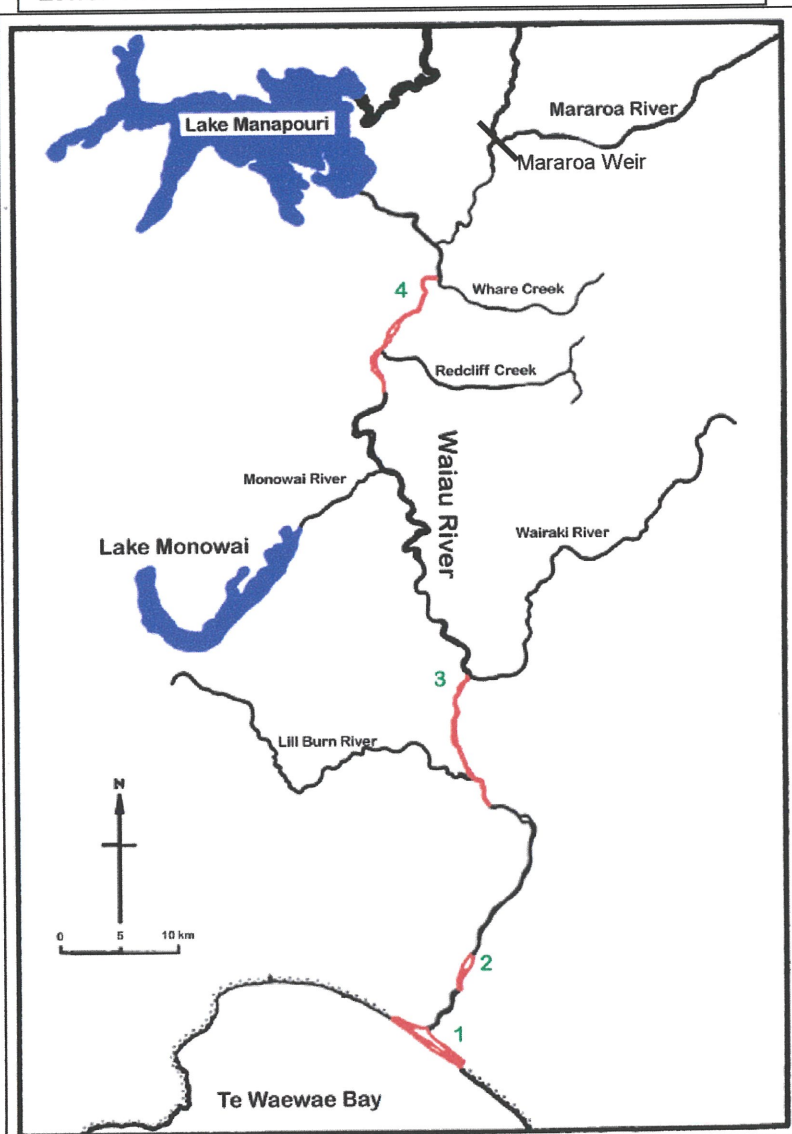
## SPECIES MONITORED

It was decided to focus the Waiau River bird monitoring programme on the rarer and most likely affected species found on the river. These species were identified as:

- Black-fronted terns (*Sterna albostrata*) – a category B threatened species (Molloy and Davis 1992);
- Black-billed gulls (*Larus bullerii*), which although not listed as a threatened species are of concern because of their decreasing numbers.

Although there are other “rare” species which utilise the river,

**Figure 1.** River Reaches Surveyed: 1) Lagoon Reach; 2) Lower River Reach; 3) Clifden/Wairaki Reach; 4) Redcliffs



most notably black-fronted Dotterel (*Charadrius melanops*) which breed on the river, a relevant monitoring programme for these species would be unjustifiably expensive as they are solitary nesters, e.g. the previous monitoring programme which covered in excess of 30km of river bed only ever included one pair of black-fronted dotterel at the Lower River Reach (number 2 on Figure 1).

Two other species of concern were the red-billed gulls (*Larus novaehollandiae*) and white-fronted terns (*Sterna striata*), although not listed as rare, they are recognised as being significantly affected by river levels. Since both of these species are frequently found in the same areas as the 2 primary species it was decided to include them in the monitoring regime.

All the species selected for the new programme are colonial breeders which usually nest on gravel bars and islands and are therefore susceptible to large numbers of nests being wiped out by increased river levels during the breeding season. White-fronted terns and red-billed gulls are both predominantly coastal species and are widespread around the NZ coast, although they can at times be found well inland. These species are often found breeding in close vicinity to each other.

Black-fronted terns and black-billed gulls on the other hand are generally inland species, although the latter frequently breed on the coast e.g. Waiau Bar, as well as on islands further upstream. These birds are both believed to be decreasing in numbers through out Southland. The Southland Branch of the OSNZ has been carrying out regional counts for black-billed gulls, largely using aerial photos. While there is some question over the accuracy of photo monitoring of colonies, i.e. how many birds per nest present, there is no doubt that this species has had a significant decline in past years. Of particular concern was the high number of black-backed gulls that were hit on Southland roads where they were finding some respite from the big freeze that saw most of Southland covered in snow for up to 10 days in July 1996. Other possible reasons for the decline in black-backed gulls include:

- Increased predation
- Nesting attempts being wiped out by high river flows
- Illegal killing
- Loss of habitat/food through competition/pollution and invasive weeds.

Black-fronted terns that feed both over land and water also appear to be declining. The reasons for which are unknown.

It has been an issue for many years that the breeding attempts of entire colonies, sometimes numbering several thousand can be wiped out by high river flows – particularly during September through November. High river flows occurring in the months of October and November are likely to have the greatest impact on these species. These are the initial nesting months and, although the birds will routinely re-nest if their first attempt is destroyed, having to re-nest increases the chances of the chicks not being recruited into the population, i.e. the chicks may fledge but not be prepared to survive the winter.

## **TIMING**

It is planned to carry out the surveys in the middle of each month programmed, as this allows a safety margin in case surveys are delayed due to weather or river conditions. Unlike the previous survey technique, the time of day at which this survey is carried out should have little effect, unless there is to be an attempt to monitor the total number of birds present. Timing of the surveys will generally, for reasons of practicality, be based around the high tides at the lagoon.

## **SITE DESCRIPTIONS**

### **Mararoa Weir**

This site is a triangular gravel spit at the confluence of the Mararoa and Waiau Rivers at NZMS 260 D44 955976. It is approximately 500m upstream from the Manapouri Lake Control Structure (commonly known as the Mararoa Weir, Figure 1) which is operated by Meridian Energy to manage the water level in Lake Manapouri. The point of the spit rises up from the river in several gentle steps to the base that is approximately 3m above the river.

*Access* – this area is easily accessed through a locked gate, controlled by Meridian Energy. Access for the survey is co-ordinated through Colin Sinclair of Meridian Energy.

### **Lillburn**

This site consists of several gravel islands in the Waiau River adjacent to the mouth of the Lillburn Stream at NZMS 260 D45 988534 (Figure 1). None of these islands can be safely reached on foot, even at the current minimum flows, however through access from adjacent farmland; an overview of the islands can be had. Therefore, this site was checked through the use of a spotting scope. If a colony had been observed on the islands, an attempt to access the island by boat would have been made. Black-billed gulls have regularly been recorded congregating/breeding at this site although there are no current exact counts known.

*Access* – is via a farm track/gravel pit accessway and across paddocks owned by Mr Nick Robertson. There is unlikely to be any problem with ongoing access to this site.

### **Lagoon**

The lagoon colony is situated towards the western end of the Waiau bar at NZMS 260 D46 930330 (Figure 1 – Western end of Reach 1). It is approximately 300m South west of the township of Papatotara on the seaward side of the lagoon.

*Access* - the current position of the river mouth, west of the colony, means that the only practical access to this colony is by boat. The best site for launching is at the boat ramp

on the eastern lagoon, which means that access is restricted to a couple of hours either side of high tide in order to get safely through the channel.

## SURVEY RESULTS

### ▪ OCTOBER 2000

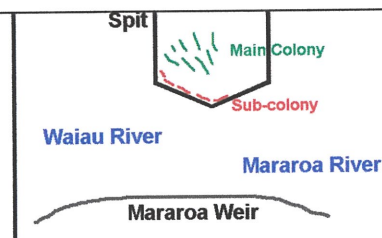
#### Mararoa Weir

It was apparent that black-billed gull nesting at this site is spread over several months as one nest had small chicks present and the eggs in many other nests (<5%) had starred or pipped (chick starting to break out of the shell). While, at the same time, there were a large number of nest scrapes, which are indications of areas to be laid in the near future. Given the incubation period of 20 – 24 days, for this species, this means that eggs laid at this time will not hatch for another 4-5 weeks at least.

There were large numbers of birds roosting around the periphery of the colony – possibly non-nesters or off duty birds.

Earliest nesting attempts were at the lower site nearer to the weir (sub-colony in Figure 2), however later nesting attempts were higher up the spit, above the water level. The location of the main colony in this area is attributed to a rise in lake/river levels early in the nesting season (Colin Sinclair, pers comm).

**Figure 2.** Location of main colony and sub-colony at Mararoa Weir site.



#### Findings:

Number of eggs per nest	Number of nests
0	254
1	409
2	663
3	108
Chicks	1

#### Totals:

Nest with Eggs	1180
Nests with chicks	<u>1</u>
Operational nests	1181

Nests scrapes without eggs	<u>254</u>
Total number of nests	1435



## Lillburn

During this count, no gulls were seen in this area and although five black-fronted terns were seen feeding on one of the smaller branches, there was no evidence of them breeding.

As this colony is the most vulnerable to high river flows, there may be merit in undertaking an earlier survey (i.e. in September) to monitor whether birds have attempted to breed at this site, in order to gauge the effect of any temporary increase in water flows. Given that this site frequently contains a breeding colony, it is possible that nesting attempts were foiled due to high river levels and that birds moved to other sites. On 6 November a visit was paid to a large (>2000 birds) black-billed gull colony on the Whitestone River. Nesting in this colony was obviously spread over a long time and was considerably later than at either of the Waiau colonies with some small chicks present but many birds were still laying. It is possible that at least some of these birds were from a washed out colony at the Lillburn site on the Waiau.

## Lagoon

Like the Mararoa Weir colony, this colony had many more birds present than nests. These "extra birds" are likely to be a mix of non-sitting birds of a breeding pair, pairs of birds that have not laid and non-breeders. There was also a significant group – 100+ of white-fronted terns, but there was no sign of this species breeding at this location at this time. The December survey in previous years had recorded significant numbers of this species breeding near the black-billed gull colony.

Prior to this season, the mouth of the river has been east of the colony, however following very high flows in November 1999, the river burst out at the very western end of the lagoon and has remained there ever since. This does not appear to have had any obvious effect on the colony.

### Findings:

Number of eggs per nests	Number of nests
0	175
1	349
2	1363
3	599
4	3
Chicks 1	3
Chicks 2	11
Chicks 3	1

### Totals:

Nests with Eggs	2314
Nests with chicks	<u>15</u>
Operational nests	2329
Nests scrapes without eggs	<u>175</u>
Total number of nests	2504

## ▪ NOVEMBER 2000

### **Mararoa Weir**

The nests in the weir colony were at a wide range of stages in the breeding cycle. A large number of well-feathered chicks were present in the colony with an estimated 15-20% of birds still on eggs.

### **Lillburn**

As with the October count, the only birds present in this vicinity were approximately six black-fronted terns feeding on a small reach on the true left of the river.

### **Lagoon**

It was not possible to count the number of chicks or birds still on nests due to the detrimental effect that people walking through the black-billed gull colony could have. When disturbed at this stage of the breeding cycle, i.e. with chicks present, the chicks frequently run into the water and can be swept downstream, at the very least risking a lengthy separation from their parents and at worst being swept out to sea.

In order to minimise disturbance, the colony was observed from a boat and from the bar to the west of the colony. This enabled the colony to be observed with only minimal effect, i.e. at times the adults nearest the observers took off briefly but they quickly settled down again with no noticeable effect on the chicks.

While it was not possible to do a count of the chicks/nests, it is estimated that 5-10% of adult birds present were still on nests – presumably still with eggs or small chicks. The chicks in the colony ranged from a couple of days old to a few that had started to feather-out.

A group of 12 red-billed gull nests had been built in the middle of the black-billed gull colony. These appeared to all be on eggs and were the only red-billed gulls in the vicinity.

During this survey a large number of white-fronted terns were found on nests (an accurate count was not possible at this time given the effect on the adjoining gull colony and the indistinctive nests of the terns, making locating a nest without an adult present very difficult). The breeding terns were divided approximately in half on either side of the gulls. A count of the terns was carried out during the December survey, when the impact on breeding gulls was significantly reduced.

## ▪ **AERIAL SURVEY of WAI AU RIVER**

On 13 November an aerial survey of the Waiau was carried out from the lagoon to the weir to check for any additional gull and tern colonies. No additional colonies were located confirming that if there had been a colony at the Lillburn early in the season which had been washed out, the birds had joined other existing colonies either on the Waiau or nearby. This exercise proved invaluable for both confirming the choice of the survey sites and ensuring no at-risk colonies were omitted.

## ▪ **DECEMBER 2000**

### **Mararoa Weir**

The majority of the nests had fledged their chicks and those that remained had congregated towards the head of the spit (close to the weir) close to the river. There were only four nests still active and as they all still had eggs, it is likely that they are re-nesting attempts. There were quite a few dead chicks present in the colony but not sufficient to raise undue alarm when compared with the number of live chicks.

### **Lillburn**

Once again there was no sign of any gull or tern colonies at the Lillburn. As noted above, it appears that, if there was a colony this breeding season, it was washed out early on (e.g. September) and all the birds then moved to other colonies either on the Waiau or nearby rivers.

### **Lagoon**

Black-billed gull nesting at the lagoon appears to spread out over a much greater time than at the other sites. During this survey there were chicks present, ranging from < one week old to fully feathered, along with approximately 1200 nests with eggs - which appeared to be re-nesting attempts, as most of the new nests were not at the same sites as earlier nests.

The red-billed gull nests present in November appeared to have all fledged and there was another nest along with eight adults present at another site.

The white-fronted tern nests that had been present during the November count had fledged chicks that were mostly creching around the outside of the gull colony.

In addition there were another approximately 300 new white-fronted tern nests with eggs, mostly at the west end of the gull colony.

**Observation** – during the surveys no black-fronted tern nesting attempts were observed at any of the survey sites, nor was any colony found during the November aerial survey.



## THREATS

While high river levels can seriously impact upon the Mararoa Weir and Lillburn colonies in particular, during this survey river levels were not seen to adversely impact upon the species monitored. The possible loss of a nesting colony at the Lillburn site and the movement of the Weir colony to a higher point on the spit, may be attributable to high river/lake levels prior to this survey commencing (i.e. September). All three sites do face very real threats from vegetation, predator and human interference. These threats, and possibilities for protecting the colonies from them, are summarised below.

### Mararoa Weir

Meridian Energy cleared most of the vegetation from this site during the previous year, mainly by bulldozing lupins from the spit (Colin Sinclair, pers comm, see Photo 1). This action has certainly benefited the colony as cover such as lupins encourages predators – stoats, ferrets and cats, to live in the area.

**Photo 1.** Lupins at Mararoa Site pre control work (photo taken by Colin Sinclair).



The controlled grazing of the pasture that borders the spit is probably also of benefit as it increases the open buffer around the colony, making it less attractive to predators. However, some planned plantings in this area may be beneficial.

During the November survey there was a noticeable increase in weeds on the spit, however the disturbance to the colony from carrying out a weed control programme while chicks are present in the colony, would far outweigh the benefits of removing the weeds. This is largely due to the fact that birds with chicks are very susceptible to disturbance and abandonment and the scattered nature of the plants gives only limited cover for predators. However, it will be important that a weed control programme is carried out once the colony is no longer active this season (*this has been carried out by Meridian Energy following advice from T. McClelland, Colin Sinclair pers comm*). It would be beneficial if a weed programme could include spraying of the lupins on the edge of the spit.

Predators are a real threat to this colony and a predator control programme on the edge of the colony, especially at the base of the spit, would be of benefit. A suggested control programme is outlined in the Recommendations section below. Assistance/advice for predator control could possibly come from the Southern Institute of Technology's Pest Control (Predator) programme, Environment Southland or the Department of Conservation.

## **Lillburn**

There is a varying amount of vegetation on the "Lillburn Islands" and it would be beneficial to remove this vegetation, ideally by spraying or hand pulling, so as to reduce any cover for predators and make the site more attractive to birds.

## **Lagoon**

This colony is at greatest risk from humans and/or associated dogs, especially during the whitebaiting season (15 August to 30 November) when there can be large numbers of people in the area. The current location of the mouth probably reduces this disturbance as access is now largely restricted to boats which generally go straight past the colony, compared with previously when access from the west end was usually by 4 wheel bike which had to go past/through the colony.

Other than via boat from the lagoon, access to the mouth from the east end is along a reasonably well defined, if temporary, 4 wheel bike track which runs mainly along the crest of the spit. During the November survey a 4-wheel bike drove past the colony on this track – the effect was minimal and only temporary, possibly in part at least due to the bike travelling at a slow speed.

Another possible source of disturbance to the colony is the presence of whitebaiters fishing in the vicinity, especially a temporary (hopefully) hut that has been built within 50 m of the colony. The effect of these whitebaiters appeared to also be minimal as they did not walk through the colony and did not rush around.

An additional, although not obvious, risk is the presence of fishermen fishing in the lagoon, especially in boats. During the November survey a single boat with two lines out was observed catching two gulls on shiny lures, both gulls were released apparently unharmed.

The location of the new river mouth should provide increased protection to the colony from predators as they now have to travel a greater distance from the base of the spit. While there is considerable cover for predators along much of the spit, the colony is distanced from the nearest significant cover.

## **RECOMMENDATIONS**

Based on the 2000/2001 survey, the following recommendations are made:

- River information, similar to that provided to the Guardians of the Lakes – but made available on a monthly, rather than six-monthly basis (as six-monthly does not meet the time requirements of these surveys), would be of benefit when trying to determine whether river flows attribute to nesting attempt losses or locations.

- That an aerial survey be carried out for the length of the Waiau River and ideally up the tributaries, i.e., Whitestone, Mararoa and Eglinton, to identify the breeding colonies early on in the season, i.e., Sept/Oct. This would be particularly useful for locating black-fronted tern breeding sites as none were observed on the main river this season.
- To carry out additional checks on the colonies in:
  - September to check colony locations to see if colonies are lost due to high river levels etc, early in the season and monitor where these birds may re-nest.
  - January to check the final status of late breeding birds, e.g., the lagoon colony this year.
- That all spraying at the weir be carried out before September and then again after December to avoid disturbing nesting birds.
- That the colonies, especially the weir colony, not be entered when chicks are present as they will frequently go into the river and may be lost downstream.
- That the site of the weir colony continues to be subject to an intensive weed control programme – removing all vegetation on the gravel spit so as to remove cover for predators.
- That a trapping programme be put in place at the weir colony to reduce losses to predators/ monitor the potential impact of predators. This would need to be kill traps, i.e. Fenns for mustelids and Conibars for feral cats, so as to minimise the resources required to check them, i.e., kill traps need only be checked weekly while non-lethal traps need to be checked daily.

## **ACKNOWLEDGEMENTS:**

Thanks to Colin Sinclair, Meridian Energy, for access to Mararoa Weir survey site and for his information and comments regarding the weir colony and to Nick Robertson for access to Lillburn survey site, and to the survey team of Pete McClelland and Gary Morgan.

## **REFERENCES:**

Molloy and Davis. 1992. Ranking of New Zealand's Threatened Wildlife. *Department of Conservation*.

Sagar, P.M. 1994. Aquatic Birds of the Waiau River November 1993 and March 1994. Southland Regional Council. *NIWA Christchurch Miscellaneous Report No. 168*. 16p.

## **APPENDIX 1**

### **Synopsis of the New Monitoring Programme for Birds on the Waiau River**

1. Surveys to be held during October, November, December - to cover the time when birds are most vulnerable to changes in waterflow (i.e. breeding) - the post breeding (March) and winter (July) surveys to be discontinued, as the data usefulness is limited to relative presence/absence of species (and there is ample data on this now from previous surveys) and does not incorporate impacts of changes in waterflow (given birds are very mobile at these times).
2. Surveys to focus on high-priority species (in terms of national/regional significance and potential for impact upon breeding success due to changes in waterflow) such as black-billed gulls; white-fronted terns; dotterels (both banded and black-capped); black-fronted terns, rather than low-priority species such as feral geese; paradise shelduck; black-backed gull; etc.
3. Survey sites to be the known nesting sites at: Te Waewae Lagoon (both eastern and western ends); Clifden/Wairaki Reach; and the gravel areas above the Mararoa Weir, as these are the predominant breeding sites for high-priority species.
4. October survey to focus on nesting attempts (e.g. location, density, and number of nests); November survey to focus on nesting pairs (e.g. how many nests being utilised); December survey to focus on nesting success (e.g. presence of chicks).

This refinement will provide Meridian Energy and the Waiau Working Party with more specific, relevant information as to the possible impacts of activities (both natural, such as flooding; and man-induced, such as flow releases, shingle extraction, and weed encroachment and removal) on specific, high-priority avian species.