

MONITORING OF NESTING BRAIDED RIVER BIRDS IN THE LOWER REACHES OF THE RANGITĀTĀ RIVER DURING THE 2022-2023 BREEDING SEASON



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Black-billed gull colony north of the Rangitātā River mouth. 22 December 2022.

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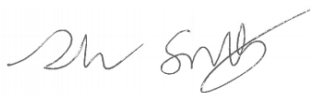
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CONTENTS

1.	INTRODUCTION	1
2.	PROJECT SCOPE AND BRIEF	1
3.	METHODS	2
4.	RESULTS	5
4.1	Tarāpuka/black-billed gulls	2
4.2	Tarapirohe/black-fronted terns	2
4.3	Ngutu pare/wrybill	3
4.4	Pohowera/banded dotterel	4
4.5	Black-fronted dotterel	4
4.6	Other species	5
5.	DISCUSSION	5
5.1	Primary species	5
5.2	Karoro/black-backed gulls s	6
5.3	Other species	7
5.4	Comparison to 2021/2022 breeding season	7
	ACKNOWLEDGMENTS	8
	REFERENCES	8
	APPENDIX 1	9
	Site photographs	9

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1. INTRODUCTION

Braided rivers in Aotearoa New Zealand are considered internationally important due to the high endemism of indigenous plants and fauna that rely on these environments and provide critical breeding habitat for indigenous shorebird species (Gray and Harding 2007). Most species of these shorebirds are classified as either Threatened or At Risk according to the New Zealand Threat Classification System (Robertson *et al.* 2021), including kakī/black stilt (*Himantopus novaezelandiae*; Threatened-Nationally Critical), tarapirohe/black-fronted tern (*Chlidonias albobristatus*; Threatened-Nationally Endangered), ngutu pare/wrybill (*Anarhynchus frontalis*; Threatened-Nationally Increasing), pohowera/banded dotterel (*Charadrius bicinctus*; At Risk-Declining), tarāpuka/black-billed gull (*Larus bulleri*; At Risk-Declining), tōrea/South Island pied oystercatcher (*Haematopus finschi*; At Risk-Declining), and black-fronted dotterel (*Elseyaornis melanops*; At Risk-Naturally Uncommon). Braided river bird surveys have recorded populations of these species on the Rangitātā River, Canterbury. The Rangitātā River has been identified as an important bird area (IBA) (Forest and Bird 2016). Currently, there is limited knowledge of the breeding populations of indigenous birds in the lower Rangitātā River, between the pylons four kilometres upstream of the State Highway 1 Bridge to the river mouth. This report summarises monitoring undertaken during the 2022-2023 breeding season in the lower Rangitātā River and provides baseline data for future monitoring and conservation actions. Site and nesting photographs are provided in Appendix 1.

2. PROJECT SCOPE AND BRIEF

Environment Canterbury provided the following brief:

- The section of river to be monitored runs from the Pylons approximately 4km upstream of the SH1 Bridge, downstream to the river mouth.
- The primary species for monitoring are:
 - Black-billed gull
 - Black-fronted tern
 - Wrybill
 - Banded dotterel
 - Black-fronted dotterel
- Specifications were provided for the time spent undertaking the survey, requirements for the key species listed above, and for other species encountered during the survey (see below).
- The surveys were to also identify accessible karoro/southern black-backed gulls (*Larus dominicanus dominicanus*; Not Threatened) colonies that could potentially be subject to a separate mahinga kai egg harvesting study.
- Requirements for inclusion in the final report:
 - The geographic spread of birds observed throughout the river (including any notable “hotspots”).
 - Methods and approach for survey.
 - A summary of data collected.

- Breeding outcomes for those species being monitored (as outlined above).
- Reasons, or suspected reasons, for nest failure or colony collapse if applicable.
- Comparison of the 2022/2023 and 2021/2022 results including summary information.
- Any other information that is relevant to the future understanding and management of braided river birds in this stretch of river.

3. METHODS

Transect counts were undertaken to identify the locations and numbers of braided river bird species, focusing on tarāpuka/black-billed gull, tarapirohe/black-fronted tern, ngutu pare/wrybill, pohowera/banded dotterel, and black-fronted dotterel. Of these species, tarāpuka/black-billed gulls were the main priority. Additionally, the locations of nests of other indigenous braided river birds, such as pīhoihoi/New Zealand pipit (*Anthus novaeseelandiae novaeseelandiae*; At Risk-Declining) and tōrea/South Island pied oystercatcher, and significant colonies of black-backed gulls were also recorded. Different sections of the river were walked each site visit to cover all areas and to revisit sites on a regular basis.

All bird observations were recorded on eBird (<https://ebird.org/home>). Bird surveys were undertaken between 2 November 2022 and 21 February 2023. The survey area was visited once a week, with each visit consisting of approximately six hours of actual monitoring time in the riverbed and approximately three hours of travel time.

The monitoring area encompassed approximately 23 kilometres of riverbed from the powerlines, approximately five kilometres upstream of the State Highway One Bridge, to the river mouth (Figure 1).

Several access points were used to access the riverbed (Figure 1):

- An access track at the intersection of Withells and Jones Roads on the true left of the river, across private property owned by Rob Wilson.
- The ends of Old Main South Road on both sides of the river.
- From Dip and Badham Roads on the true right of the river.
- At Rangitātā Huts on the true right at the river mouth.
- An access track off Wrens Road, before the Rangitātā Huts area on the true left of the river mouth.

Each monitoring survey consisted of walking slowly, noting the number of species, location, and breeding status, and recording GPS coordinates when applicable. For large tarāpuka/black-billed gull colonies, a subsample was observed to represent the whole population. The ratio of fledging juveniles to adults within the subsection was multiplied to estimate the breeding success for the colony. The raw data was collated in a spreadsheet and provided to Environment Canterbury to supplement this report. The data collected was in a more standardised format than the previous season to allow for repeatability and comparison with future monitoring seasons. The date, location, species and count were all recorded in the same way as they were in the 2021/2022 breeding season (Wildlands 2022), but the number of nests – including eggs and chicks – were added as data columns rather than being recorded in the notes section. Most of

the riverbed length was surveyed at least once, although some areas could not be accessed due to water levels and channel positions. Areas of potential breeding habitat for the target species were visited repeatedly.



4. RESULTS

Breeding bird observations were within one kilometre of the SH1 Bridge, adjacent to Old Main South Road, approximately 2.5 kilometres upstream from Badham Road and within one kilometre of the Rangitātā River mouth (Table 1, Figures 2 and 3).

Table 1: Location and success of breeding attempts by primary monitoring target species in the Rangitātā River during the 2022/2023 breeding season.

Breeding event	Location in River	Number of Juveniles Fledged
Black-billed gull colony	-44.18937, 171.50822	-
Black-billed gull colony	-44.183167, 171.51834	~700
Black-fronted tern nest	-44.091447, 171.45589	-
Black-fronted tern colony	-44.062197, 171.42526	-
Black-fronted tern nest	-44.18279, 171.50185	-
Black-fronted tern juvenile	-44.18279, 171.50185	1
Wrybill nest	-44.19021, 171.50388	-
Wrybill chicks	-44.061672, 171.42496	-
Banded dotterel nest	-44.05342, 171.40829	-
Banded dotterel nest	-44.054425, 171.41408	-
Banded dotterel juveniles	-44.062579, 171.42614	2
Banded dotterel juveniles	-44.052553, 171.40754	29





4.1 Tarāpuka/black-billed gulls

Tarāpuka/black-billed gulls were first observed breeding on 14 November 2023, with close to 10 nesting birds at the river mouth on the true right (-44.18937, 171.50822; Figure 2). However, no nests were observed in the same place on 23 November 2022, as the area where these nests were had been washed away (Table 1). On 29 November 2022, 500+ tarāpuka/black-billed gulls were roosting around the river delta, but no sign of a second nesting attempt. In a similar place to last season, a second colony was seen on 12 December 2022 behind the gravel bar on the true right of the river mouth (-44.183167, 171.51834; Figure 2). This second colony was approximately 200 metres long and 35 metres across at its widest point, on a gravel island separated from the main gravel bar by a small channel and contained well over 1000 individuals.

Due to time constraints, this colony was unable to be properly checked until 22 December 2022. Counting birds in this colony was difficult due to its large size and the fact that adult birds constantly arrived and departed. However, a sample section near the colony's edge was picked to represent the whole colony and was closely monitored to avoid disturbing the breeding birds. This second/tarāpuka black-billed gull colony had an estimated 2500+ individuals, and roughly 30% of the colony was made up of juveniles with the vast majority of these being unfledged chicks (only a few were near/recently fledged). The sample section of the colony contained 48 birds, consisting of 43 adults and five chicks. As many as 25 adults were sitting on the ground and appeared on nests, but some may only have been roosting. The colony appeared in good health on 9 January 2023, with an estimated 1900+ individuals present, including copulating adults. The sample section contained 27 birds, made up of 20 adults (four on nests), three fledged juveniles and four unfledged chicks. On 9 January 2023, a lone adult was also observed roosting in the river south of the SH1 Bridge. On 18 January 2023, the colony had an estimated 1300+ individuals with many fledged juveniles around the edges. The sample section contained 15 birds: six adults (two on nests), four fledged juveniles and five unfledged chicks. Seven dead juveniles were seen around the colony, but healthy-looking live juveniles vastly outnumbered these.

The colony continued to reduce as only 850+ individuals were seen on 24 January 2023. Lots of fledged juveniles were still present but only one unfledged. The sample section contained six birds (none on nests), three adults and three fledged juveniles. The number of individuals at the colony continued to drop over subsequent visits (480 on 1 February 2023 and 89 on 8 February 2023), but fledged juveniles consistently made up approximately 30% of the birds present. On 21 February 2023, the colony was completely abandoned, with the remains of 120 dead juveniles in various states of decomposition around the colony. This rate of gradual drop in overall numbers and the consistent presence of juveniles indicates a successful breeding colony, with an estimated 600 juveniles successfully fledging (excluding the dead birds) (Table 1).

4.2 Tarapirohe/black-fronted terns

Tarapirohe/black-fronted terns were observed flying above the river at multiple locations throughout the entire surveyed area on most survey days. The first breeding attempt observed was on 2 November 2022, when a nest was located upstream of Dip Road (-44.091447, 171.45589; Figure 3). The nest was on the far side of the main channel, and it could not be determined how many eggs were present. This nest was not

observed on any subsequent visits and was likely washed away by high water levels around the time (Table 1).

On 29 November, a tarapirohe/black-fronted tern colony was located upstream of the Old Main South end (-44.062197, 171.42526; Figure 3). Six nests were on the true right of the main channel, with other nests appearing on the channel's true left. Of the six nests on the true right, one was empty (it was guarded by an adult, but eggs were yet to be laid), two had one egg, two had two eggs, and one had a freshly smashed egg. A karoro/black-backed gull was seen eating the eggs from multiple tarapirohe/black-fronted tern nests on the far side of the channel, despite the attempted nest defence by approximately 40 tarapirohe/black-fronted terns. This gull had likely recently preyed on the nest with the smashed egg. On 5 December 2022, no black-fronted terns were seen near the colony. The nests were investigated on 12 December 2022, when all were abandoned (Table 1). Two showed signs of having been washed out by high water levels, and one showed signs of predation with a smashed egg (the other two nests were likely also preyed on as there were no signs of flooding near them).

On 18 January 2023, a roosting flock of 51 tarapirohe/black-fronted terns was observed at the river delta (-44.18279, 171.50185). The flock was mostly adults (most moulting into non-breeding plumage) but included one fledged juvenile begging and being fed by an adult, indicating successful breeding nearby. A nest with one egg was found on the edge of the roosting flock (Figure 2). This nest had failed by 24 January 2023 when the egg was gone. However, the roosting flock contained five fledged juveniles and 33 adults, at least one juvenile was being fed by an adult (Table 1). Two adults were seen engaging in courtship feeding a few hundred metres downstream (-44.187361, 171.5061) on 29 November 2022, but subsequent visits found no further signs of breeding until 18 January 2023.

A group of 34 roosting and feeding adults was seen on 9 January 2023, downstream of the SH1 Bridge (-44.053266, 171.41007). A group of 30 birds was also seen roosting on 8 February 2023 at Badham Road end (-44.116016, 171.48346). Neither of these groups showed any breeding behaviour.

4.3 Ngutu pare/wrybill

On 14 November 2023, two adult ngutu pare/wrybill were seen guarding two chicks on the true right of the river mouth, near the landward base of the gravel bar (-44.19021, 171.50388; Figure 2). However, these individuals were not seen on any subsequent visits, and the chicks likely succumbed to predation (Table 1). Water levels were high around this time, but the chicks would have been able to move up the gravel bar to avoid high water.

Three ngutu pare/wrybill were observed flying upstream of the Old Main South Road end on 29 November 2022, and an adult was found sitting on a nest with two eggs in the same location (-44.061672, 171.42496) on 12 December 2022 (Figure 3). This nest still contained two eggs being incubated on 22 December 2022, before one chick was seen in the nest on 9 January 2023. On 18 January 2023, two chicks being guarded by an adult were observed in the same location, meaning one of the chicks was present but missed by the observer on 9 January 2023. Only one guarded chick was seen on 24 January 2023, after which there were no further sighting of chicks or juveniles at this

location (Table 1). Both chicks likely succumbed to predation as water levels were not high over this period.

Adult ngutu pare/wrybill not exhibiting breeding behaviour were also observed on 12 December 2022 behind the gravel bar on the true right of the river mouth (-44.189095, 171.506473), on 18 and 24 January 2023 feeding and roosting in the river delta (-44.183772, 171.50272), and on 1 February 2023 at the failed nest site upstream of the Old Main South Road end.

4.4 Pohowera/banded dotterel

A pohowera/banded dotterel nest with one egg was observed on 5 December 2022 downstream of the SH1 Bridge (-44.05342, 171.40829; Figure 3). This nest was not found on subsequent visits and was possibly washed away by high water levels (Table 1). A second pohowera/banded dotterel nest was found on 12 December 2022 downstream of the first (-44.054425, 171.41408; Figure 3). It could not be determined how many eggs the adult was sitting on, but an adult sitting on the same nest was observed again on 22 December 2022. On 9 January 2023, a fledged juvenile was observed near the site of the second nest, but the juvenile is unlikely to be from this nest, given the fledging time of this species (Table 1). There was no other breeding activity around the site of this nest.

During the survey, other fledged juvenile pohowera/banded dotterel were observed in multiple places and occasions. One was seen feeding with two adults on 29 November 2022 behind the gravel bar on the true right of the river mouth (-44.189784, 171.50481). Two were seen being guarded by adults at the end of Old Main South Road (-44.062579, 171.42614; Figure 3) on 12 and 22 December 2022 (Table 1). Six juveniles, one being guarded by an adult, were seen between the SH1 Bridge and the end of Old Main South Road on 22 December 2022, while 29 were in the same area (-44.052553, 171.40754) on 9 January 2023 and eight on 18 January 2023 (Table 1). No banded dotterel was seen in this area after 18 January 2023. At least four juveniles were seen at the river delta on 18 and 24 January 2023, possibly some of the individuals previously seen between the SH1 Bridge and the end of Old Main South Road that had moved downstream.

Non-breeding adults were also seen inside the gravel bar on the true right of the river mouth (-44.189784, 171.50481) on 14 and 23 November and 12 December 2022, and in the river delta (-44.186393, 171.50566) on 21 February 2023.

4.5 Black-fronted dotterel

Black-fronted dotterel were observed in four different places during the surveys. These locations were the area behind the gravel bar on the true right of the river mouth (-44.189972, 171.503879), behind the gravel bar on the true left of the river mouth (-44.182122, 171.52001), immediately north of the SH1 Bridge (-44.051811, 171.40308) and at Old Main South Road end (-44.062579, 171.42614). Between one and three individuals were seen on five occasions in the area behind the gravel bar on the true right of the river mouth, but there was no evidence of breeding. No breeding behaviour was noted during any of the other observations.

4.6 Other species

Karoro/black-backed gulls were the most common species in the Rangitātā River during the 2022/2023 breeding season, breeding in a near continuous colony throughout the entire survey area. One particularly large and accessible breeding colony was just south of the Old Main South Road end (-44.067422, 171.4319). None of the primary species for monitoring made breeding attempts near concentrated karoro/black-backed gull breeding areas.

A pair of pīhoihoi/New Zealand pipit were observed carrying food to a possible nest site in the riverbed (-44.092723, 171.45854) on 2 November 2022. However, the nest could not be located and was likely washed away by high water before it could be checked again.

Two tōrea/South Island pied oystercatcher nests were observed on 5 December 2022 between the SH1 Bridge and the Old Main South Road end (-44.05823, 171.42291 and -44.05561, 171.41845). One of these nests contained an egg, and the other could not be checked due to water levels, but neither nests could be found on subsequent visits to the area and were likely washed away by high water.

A pair of tōrea pango/variable oystercatcher (*Haematopus unicolor*; At Risk-Recovering) were observed copulating on the gravel bar on the true right of the river mouth (-44.19063, 171.50337) on the 9 and 14 November 2022. No further breeding behaviour was observed on later visits to the area.

Between two and six poaka/pied stilt (*Himantopus himantopus leucocephalus*; Not Threatened) were observed on every visit to the true right of the river mouth. They were faithful to the area of the gravel bar and the muddy area behind it, often exhibiting agitated and predator distraction display behaviour. Copulation was observed on 14 November 2022, and a chick on 21 February 2023 (-44.190490, 171.502930), confirming successful breeding in this area. A pied stilt chick was also seen on 8 February 2023, being guarded by two adults at Badham Road end (-44.116016, 171.48346).

Tara/white-fronted tern (*Sterna striata*) bred in the river delta, with up to 700 birds seen at one time. These nests were not monitored as this species was not a priority, and the colony was relatively inaccessible. Still, their breeding was at least partly successful, with multiple-fledged juveniles seen begging for food later in the season.

5. DISCUSSION

5.1 Primary species

The 2022/2023 breeding season provided mixed results for indigenous birds breeding in the lower Rangitātā River. Tarāpuka/black-billed gulls were the most successful of the primary monitored species. Despite the failure of the first attempted colony, the second seems to have been very successful and produced approximately 600 juveniles. The location of the second colony was on a small island on the landward side of the gravel bar on the true left of the river mouth, out of the way of people using the bar for

access to the river mouth. One fisherman who was spoken to on a site visit said that the locals were “looking after” the colony, which remained undisturbed even without signage informing the public to keep clear.

Conversely, tarapirohe/black-fronted tern had an extremely poor 2022/2023 breeding season. Nine nests were located, all of which were either predated or washed out by high water levels. This high rate of nest failure is reflected in the very low proportion of juveniles seen in black-fronted tern flocks in the survey area, and the wider region. One fledged juvenile was seen being fed at the river delta, which probably indicates at least one nest was successful in the lower Rangitātā River. There is a chance this juvenile could have come from outside the survey area, as juvenile tarapirohe/black-fronted terns are fed by their parents for at least two weeks after fledging and becoming mobile (Bell, 2013). A karoro/black-backed gull was seen preying on multiple tarapirohe/black-fronted tern nests during a site visit. Karoro/black-backed gulls could be the reason why the terns (and other indigenous birds) do not nest in the majority of the lower Rangitātā where the karoro/black-backed gulls are abundant.

Ngutu pare/wrybill also had an extremely poor 2022/2023 breeding season. Two separate nests produced two chicks each, but none of these chicks survived to fledging age. In both cases, predation was the likely cause of chick death. One clutch had high ground to move to in flooding events, while the other did not have to contend with high water levels (the lower water levels would have increased the accessibility of the area the chicks were in to mammalian predators).

Pohowera/banded dotterel appeared to have a moderately successful breeding season. Two nests were located, but both failed (one washed out by high water, the other unknown), and no unfledged chicks were found. However, 29 juveniles were seen together on between the SH1 Bridge and Old Main South Road end. This indicates breeding success somewhere in the survey area, although all the juveniles seen were fledged and could have come from elsewhere. Two juveniles being guarded by adults were seen over two consecutive visits in a very localised section of the river, suggesting they had fledged in the area.

Black-fronted dotterel had an extremely poor 2022/2023 breeding season, with no breeding attempts detected. The nests of this species are very difficult to find. Due to the small population, small physical size, and nervous disposition of nesting adults, breeding attempts by black-fronted dotterel may have been overlooked. Black-fronted dotterel are present in consistently low numbers in the lower Rangitātā River, so they may well be breeding in or near the area.

5.2 Karoro/black-backed gulls

Karoro/black-backed gulls bred throughout the survey area and were seen at every access point on every visit to the Rangitātā River. The abundance of these birds seems to be a major factor in the lack of breeding success in several of the monitored primary species. Karoro/black-backed gulls are known to prey on the nests of other braided river birds and can exclude them from whole sections of river (O'Donnell and Moore 1983; Wildland Consultants 2020). This seems to be the case in the lower Rangitātā, where the primary species nested in river sections with the fewest karoro/black-backed gulls. Predation by these gulls was observed on a tarapirohe/black-fronted tern colony, which

appeared to cause the whole colony to fail. Tarāpuka/black-billed gulls were the one monitored species that seemed able to cope with the presence of karoro/black-backed gulls, potentially because of their larger physical size (McClellan and Habraken 2013) and their much larger/higher density breeding colony.

5.3 Other species

Pīhoihoi/New Zealand pipit, tōrea/South Island pied oystercatcher and tōrea pango/variable oystercatcher were all observed in various breeding stages, but none were confirmed to have successfully bred in the survey area. Pīhoihoi/New Zealand pipit and tōrea/South Island pied oystercatcher had nests which were likely washed out by high water levels. Tōrea pango/variable oystercatcher is a coastal species and likely bred on the coastline outside the survey area. Poaka/pied stilt and tara/white-fronted tern successfully fledged chicks within the survey area.

5.4 Comparison to 2021/2022 breeding season

During the 2022/2023 breeding season, the overall state of the lower Rangitātā River was very similar to the 2021/2022 breeding season. In both seasons, tarāpuka/black-billed gulls were the most successful species, with a productive colony in a similar place on the true left of the river mouth (Wildland Consultants 2022). Less than half the number of fledged juvenile pohowera/banded dotterel were seen in the 2022/2023 breeding season compared to the previous season. However, these numbers may be influenced by juveniles arriving in the area from further upstream. Tarapirohe/black-fronted tern fledged one chick in the survey area with a fledged juvenile seen being fed by an adult (no juveniles were fledged during the 2021/2022 breeding season). However, the 2022/2023 breeding season would still be classified as extremely poor. Ngutu pare/wrybill and black-fronted dotterel were not observed to fledge any juveniles in either breeding season.

Karoro/black-baked gull numbers were very similar to the 2021/2022 breeding season, and were seen breeding throughout the survey area except from the Old Main South Road end to the SH1 Bridge and around the ends of Dip and Badham Roads. Tōrea/South Island pied oystercatcher failed to produce any chicks in the 2022/2023 breeding season but did during 2021/2022. The opposite is true for poaka/pied stilts, who produced chicks in the 2022/2023 breeding season but none in 2021/2022.

Access to the riverbed was more difficult in 2022/2023, with water levels and the position of channels preventing access to several areas of the river. Despite this, a good representative picture of the state of the river was obtained, including breeding attempts by all but one of the targeted species. Knowing the geographic hotspots of breeding attempts from the 2021/2022 season helped to locate breeding attempts during the 2022/2023 season, and subsequently, more breeding attempts overall were recorded in 2022/2023 (5 in 2021/2022, 12 in 2022/2023). The locations for breeding attempts were the same between 2021/2022 and 2022/2023 for all species, with Old Main South Road end to the SH1 Bridge, Dip and Badham Road ends. and the river mouth being the hotspots.

Tree lupin (*Lupinus arboreus*) was the dominant weed species present in the survey area in 2022/2023. However, it was less prominent than in the 2021/2022 breeding

season. Karoro/black-backed gulls appeared to be the major factor inhibiting indigenous braided river bird breeding in the lower Rangitātā River during the 2022/2023 breeding season. This is the same as in 2021/2022. Therefore, recommendations for future management are That substantial Karoro/black-backed gull control needs to occur focusing on colonies near the SH1 Bridge, Old Main South Road end, Dip and Badham Road ends, and the river mouth. There is a large and accessible karoro/black-backed gull colony downstream of the Old Main South Road end that could be used in mahinga kai egg harvesting studies.

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APPENDIX 1

SITE PHOTOGRAPHS



Plate 1: Rangitātā riverbed upstream of Dip Road end.
2 November 2022.



Plate 2: Rangitātā riverbed at Badham Road end. Rubbish that appeared to have
been dumped visible in left of photo. 2 November 2022.



Plate 3: Black-fronted tern nest, upstream of Old Main South Road end.
29 November 22.



Plate 4: Recently preyed on black-fronted tern nest, upstream of Old Main South
Road end. 29 November 2022.



Plate 5: Remains of black-fronted tern nest filled by sediment after high water levels, upstream of Old Main South Road end. 12 December 2022.



Plate 6: Wrybill nest, upstream of Old Main South Road end. 12 December 2022.



Plate 7: Wrybill adult and chick on the true right of the Rangitātā River mouth, 9 November 2022.



Plate 8: Banded dotterel adult downstream of the SH1 Bridge. 23 November 2022.



Plate 9: Black-fronted dotterel on the true right of the Rangitātā River mouth.
23 November 2022.



Plate 10: Black-billed gull colony north of the Rangitātā river mouth.
22 December 2022.

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