Kimiākau/ Lower Shotover River Braided River Bird Survey-2024 and 2025

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COVER PHOTO: BONNIE WILKINS

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Executive Summary

The Lower Kimiākau/ Shotover River traverses through landscape that offers both protection and pressure on the habitat of migratory braided river birds.

Braided rivers are dynamic environments, they are classified as globally rare, and naturally uncommon ecosystems in New Zealand that are threatened (endangered) because of weed infestations that impact more than 80 percent of their existing extent.

Five species are known to nest on the Lower Kimiākau/ Shotover River ("the River") and Delta: black-fronted tern, banded dotterel, black-billed gull, South Island pied oystercatcher (SIPO), and pied stilt.

Many of the threats impacting on local braided river birds are common to braided river habitats throughout Otago and Canterbury. These are discussed in Sections 4, 6, and 7.

Nesting habitat along the River and Delta is limited by the number of beaches high enough to stay above seasonal high river flows and the availability of terraces and short spring, turfy grasslands that are open and relatively free of weeds. Section 3, 4 and 6 discuss the dynamic nature of the river environment, the wildlife present, and the impacts (both positive and negative) on the available habitats.

Three braided river bird surveys were undertaken in early December 2021, 2024, and 2025 to determine the location of breeding tern and gull colonies and obtain a count of dotterels, oystercatchers and stilts.

The Tucker Beach Wildlife Management Reserve (TBWMR) recorded the highest counts for braided river species during the 3rd December 2024 and 4th December 2025 surveys. The Wakatipu High School site was added to the 2025 survey as it has been used as a post-breeding, pre-migration staging site by SIPO for the past few years.

The results of the surveys suggest that local populations are stable or increasing. The count of black-fronted terns increased 89 % from 38 in 2021 to 72 2025; black-billed gulls increased 216 % from 240 in 2021 to 759 in 2025 and banded dotterel increased nearly 83% from 35 in 2021 to 64 in 2025 despite a dip to 24 in the 2024 count. Results are discussed in Sections 5 and 6. Tables 1A to 1C and Charts in Appendices 1 and 3 contain detailed results for all river sections and land-based count stations.

The surveys represent a snapshot count undertaken by volunteers with varying levels of experience. Counts may have been influenced by recent weather events, ground and river conditions as well as land management and river or land-based activities.

Recommendations for continuing management of braided river bird habitat are provided in Section 8.

The Tucker Beach Wildlife Trust (TBWT) would like to acknowledge the support of many organisations and volunteers, and we refer you to Section 9 to gain an understanding of the level of collaboration and support for the goals of the TBWT and their partners. We would like to thank Shotover Jet and Real NZ/ Queenstown Rafting for providing safe transport down the river for these surveys.

1 Introduction

Three braided river bird surveys were undertaken on the Kimiākau/ Lower Shotover River on 2 December 2021, 3 December 2024 and 4 December 2025.

A report summarizing the results of the 2021 survey was prepared[1], this report incorporates the results of that survey with the results of both the 2024 and 2025 surveys for a more comprehensive updating report on the migratory braided river birds of the Kimiākau/ Lower Shotover River.

The first known survey occurred in 1968, another survey was undertaken in 1993 with 44 banded dotterels recorded in the first and just 10 recorded in the second survey. No details for other birds were available[2].

Braided rivers are globally rare, and threatened, naturally uncommon ecosystems in New Zealand; they are classified as endangered due to severe decline throughout greater than 80 percent of their existing location and extent. The driver of this threat is non-native plants which account for between 50 and 80 percent of the vegetation cover across more than 80 percent of their distribution; this threat meets the criteria of “severe decline”, (Holdaway, et.al., 2012).

Five species of braided river birds are known to breed on the Kimiākau /Lower Shotover River. These are:

Nationally and regionally threatened – endangered[3]:

- Tarapiroe/ Black-fronted tern (*Chlidonias albostriatus*)

Nationally at-risk - declining and regionally threatened – vulnerable:

- Tutriwhatu/ Banded dotterel (*Charadrius bicinctus*),
- Black-billed gull | Tarāpuka (*Chroicocephalus bulleri*) and the
- South Island pied oystercatcher (SIPO) | Tōrea (*Haematopus finschi*)

Not Threatened

- Poaka/ Pied stilt (*Himantopus h. leucocephalus)*

Threats identified within the Kimiākau/ Lower Shotover River include weed infestations which encroach into nesting habitat; disturbance by public walking, off lead dogs, and browsing rabbits, vehicle, 4WD and motorbike activity, gravel extraction, and seasonal flooding, including high or extreme flow events, predation by

[1] Lower Shotover Braided River Bird Survey Report - Dec 2021
[2] pers comm L Thurlow, Department of Conservation, 21 Dec 2021
[3] The Regional and National Conservation Status of birds are per Jarvie, et.al. (2025), Robertson et.al. (2021).

avian and mammalian predators. Many of these are experienced within braided river environments elsewhere.

This report has been prepared as part of an ongoing community-led monitoring scheme. The report is intended to update the Tucker Beach Wildlife Trust (TBWT) and other conservation groups working along the river on the outcomes of survey so efforts to protect, restore, expand and manage available habitat along the Kimiākau/ Lower Shotover River can address the conservation needs of the braided river species.

This monitoring report focuses on braided river birds and describes their presence, distribution and year-to-year variations in the Lower Shotover River.

It is hoped that with continuing protection and restoration efforts, these populations will be secure in the Whakatipu Basin's comparatively small braided river ecosystem and that their reliance on the surrounding habitat will be better understood and supported where possible.

2 Survey Method

Prior to the commencement of the survey, safety briefings were provided by the author and hazards discussed with all participants; further briefings were given by the staff of the jet boat and rafting companies that transported the volunteers. Access to the river was coordinated with the commercial jet boats operating on the River and the Harbour Master. Radio and mobile phone communication was established between all parties.

The volunteers were provided with training in species recognition in the Tucker Beach Wildlife Management Reserve where the most abundant concentrations of birds were likely to be found. Volunteers experienced in identification were paired with less experienced observers. The survey focused on braided river birds but white-faced herons/ matuku moana, New Zealand kingfisher/ kōtare, little shags/ kawaupaka (*nationally at-risk – relict*[4]*, regionally threatened – vulnerable*[5]), black shags/ kōau (*nationally at-risk – relict, regionally endangered*) and New Zealand eastern falcon/ Kārearea (*nationally and regionally threatened – vulnerable*) were also recorded. Other species were not recorded.

The survey covered 10.9 km of river between Big Beach and the Shotover Delta confluence with the Kawarau River. Approximately 2.3 km is confined within the steep, rocky margins of the Shotover Gorge so the effective length of the survey was 8.6 km.

The survey was undertaken primarily on foot with team members evenly spaced across each beach while progressing down river at an even and steady pace. Observations occurred from the raft starting at the bottom of section 6 (refer Map 1) due to river conditions. Binoculars were used to scan the beaches with frequent stops to allow

[4] Robertson et.al. (2021)
[5] Jarvie, et.al. (2025)

thorough searches of the Delta habitat in Sections 7 to 9. This method was used for all the surveys.

Each team member had a notebook with reference pictures of the birds in the back and a pre-labelled field sheet for each kilometre surveyed.

Each bird was counted when passed or if it transited over the survey team flying upriver. A tally of birds flying back down river was kept, no bird was knowingly double counted.

At the end of each kilometre surveyed, the team reconciled their results and agreed on the counts for each species seen in that section.

Observers were asked to look for banded birds, but none were seen.

Chicks and juveniles were counted where detected. In 2025, some observers expressed uncertainty about distinguishing between tern and gull chicks, the 2025 chick counts for these species are therefore given as estimate only (refer Tables 1A to 1C in Appendix 1) and should be treated with caution.

Use of the term "juvenile" indicates the bird was feathered, mostly feathered or fledged young of the year. "Immature" would also describe these birds, however, birds described as juvenile may or may not be fully fledged, to assist consistent recording by volunteers the decision was made to adopt the term juvenile.

Use of the term "chick" indicates the bird was downy or mostly downy.

The on-river survey was synchronised with teams surveying off-river sites in Queenstown Bay, at Frankton Beach, Events Centre, the rubbish transfer station on Glenda Drive and the Shotover Wastewater Treatment ponds and disposal field with all teams arriving at the Shotover River Delta confluence with the Kawarau Rivers together. In 2025, a new site at the Wakatipu High School was added as this site's irrigated grounds have been used by the post-breeding SIPO/ Tōrea flock as a pre-migration staging area[6].

While some birds may have been foraging on farm paddocks throughout the Whakatipu Basin, the method used provides a good count of the local populations of braided river birds and is the method used in 2021 and 2024.

In 2025, a slip prevented the jetboat from navigating through the entire Shotover Gorge. The survey team was therefore dropped off at the Hugo Tunnel where they walked for about an hour to the Tucker Beach Recreation Reserve crossing the river on the new Kimiākau Suspension bridge recently opened by Queenstown Trails at the bottom of the gorge.

The 2025 survey commenced at Big Beach at 8:35am and was completed at the Delta by 16:00 pm. The Queenstown Bay count commenced at 10:05 am, with the River Team starting at the Tucker Beach Recreation Reserve ("Frisbee Golf Reserve") at 10:34 am.

[6] https://ebird.org/checklist/S205043459

This was comparable to previous years which occurred between 8:10 am and 14:00 pm in 2024, and 8:38 am and 14:25pm in 2021. Time required to walk from the Hugo Tunnel to the Tucker Beach Recreation Reserve and waiting to coordinate safe navigation with jet boat traffic upstream of the Tucker Beach Wildlife Management Reserve accounted for the additional survey time in 2025.

3 Summary of the Kimiākau/ Lower Shotover Environment

3.1 THE RIVER

The headwaters of the Shotover River flow through a braided river ecosystem high in the catchment before channelling through the Shotover Canyon, a landscape that characterises most of the Kimiākau/ Shotover River's length. The section of River between the Morningstar Reserve and the Tucker Beach Recreation Reserve is known as the Shotover Gorge (refer Map 3). Within the Shotover Gorge, the river flows around a large oxbow where gravel deposits form a large beach, this feature is named "Big Beach".

Below the confines of the Shotover Gorge a beach on the true left within the Tucker Beach Recreation Reserve (TBRR) pushes the river to the right where it is eroding a low river terrace.

Rock outcrops pinch the river where it transitions from the Recreation Reserve into the Tucker Beach Wildlife Management Reserve (TBWMR). Here, the Shotover River expands again into a braided system as it rounds another wide bend flanked by steep escarpments. The terrace and escarpments are comprised of glacial till and fan deposits (Barrell, et.al., 1994); access tracks have been constructed within gullies connecting the terrace above to the river. Downstream of the TBWMR, the river flows through a reach confined by rock cliffs on the west and a flight of open terraces to the east, before passing under the restored historic and State Highway 6 bridges. From there it spreads widely over the Shotover Delta to its confluence with the Kawarau River.

The Kawarau River is a tributary of the Clutha River; it is the only outlet for Lake Whakatipu.

The nesting seasons of black-billed gulls and black-fronted terns have been impacted by several high flow events over the past few years. Chart 1 in Appendix 2 shows the peak monthly flows from September 2018 to 15 December 2025.

Table 2 in Appendix 2 at the back of this report provides the peak monthly flow during the breeding season from 2021/22 to 2025/26. Figures 2 and 3 illustrate the changes in the TBWMR between 2020 and 2026[7] as the force of the flow and bedload continuously reshape this dynamic habitat.

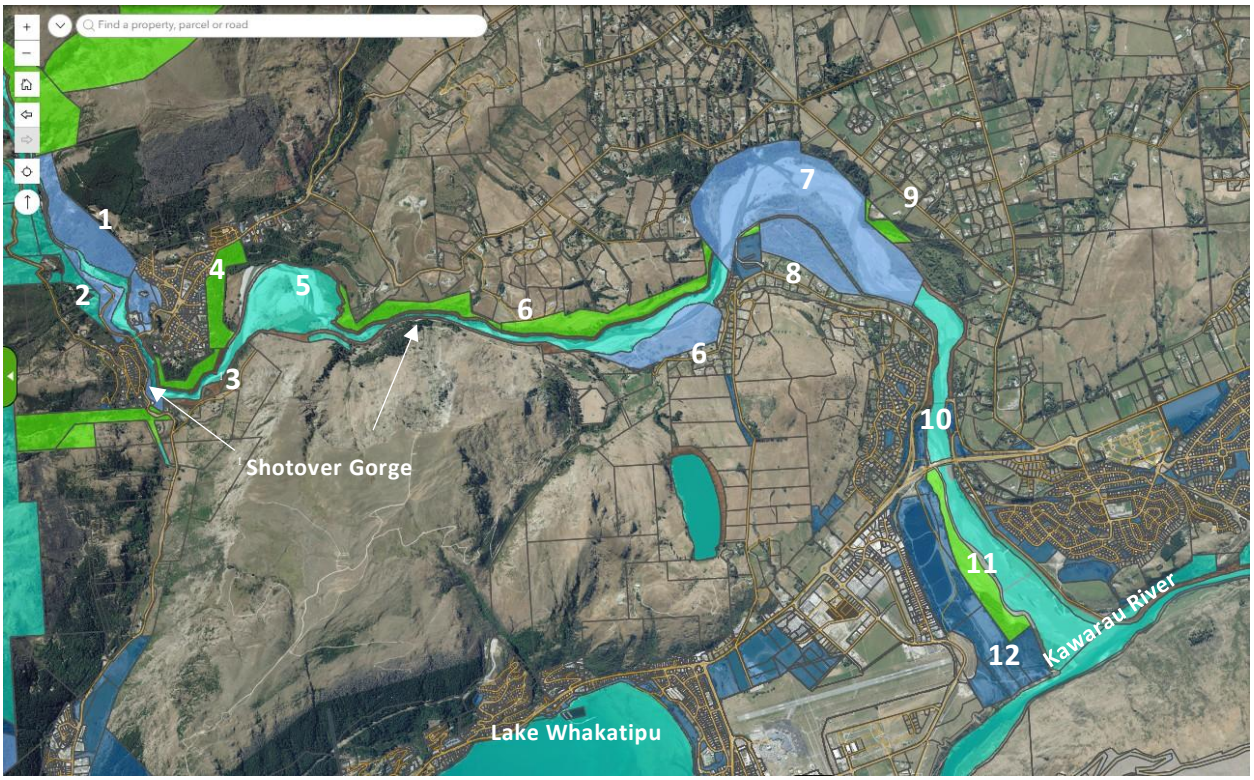
[7] The most recently available imagery on Google Earth

Flows of 300m^3/s noticeably change the beaches, and potentially river margins and terraces sometimes realigning minor channels and braids. This is the nature of the ecosystem, and the braided river birds respond to the changes as they return each season and within each season when flow subsides by moving to alternative or higher beaches along the Kimiākau.

Map 1: The starting mark of transects surveyed on the Kimiākau/ Lower Shotover River in 2021, 2024 and 2025. River survey sections shown on Map 1 are:

1 km	Big Beach
2 km	Tucker Beach Recreation Reserve (TBRR)
3, 4, 5 km	Tucker Beach Wildlife Management Reserve (TBWMR)
6, 7 km	Historic Bridge
8, 9 km	Delta

Map 2: Location of off-river survey sites included in the survey results, Wakatipu High School was added to the 2025 survey; the Queenstown Bay survey site is not shown.



Map 3: Distribution of public conservation land administered by the Department of Conservation and QLDC in the Lower Shotover catchment. 1] Morningstar Reserve, 2] Oxenbridge Tunnel Recreation Reserve (RR), 3] Marginal Strip – Shotover River (brown), 4] Conservation Area (CA) – Big Beach/ Shotover River, 5] Riverbed - Crown land - LINZ, 6] CA – Lower Shotover, 6] Tuckers Beach RR, 7] Tuckers Beach Wildlife Management Reserve, 8] CA - Tuckers Beach, 9] CA – Tuckers Beach Wildlife Management, 10] Riverbed Crown land - LINZ, 11] CA – Shotover River Sewage Treatment, 12] QLDC Shotover Wastewater Treatment designation area.

Source: QLDC map Navigator, LINZ, DOC, Creative Commons Attribution 4.0 International License. https://gis-qldc.hub.arcgis.com/ accessed 14 June 2026

16 Mar 2020 ©2025 CNES/Airbus

6 Jan 2022 ©2025 CNES/Airbus

3 Apr 2023©2025Airbus

9 Jun 2024 ©2025Airbus

Figure 1: Recent changes in the braided river environment in the Tucker Beach Wildlife Management Reserve. The river flow changed in 2025 to the true right. Source: Google Earth accessed 18/3/2026

Figure 2: Most recent changes in the river within the TBWMR 2025/26; Google Earth ©Airbus 18/1/2026; accessed 24/7/2026

3.2 THE VEGETATION

River terraces along the River including those of the TBWMR are variously vegetated by short pasture grass dominated by brown top (*Agrostis capillaris*) and sweet vernal (*Anthoxanthum odoratum*), with invasive weeds such as Russell lupins (*Lupinus polyphyllus),* broom (*Cytisus scoparius),* buddleia (*Buddleja davidii),* white melilot or white sweet clover (*Melilotus albus),* sweet briar (*Rosa rubiginosa*), woolly and moth muellin (*Verbascum thapsus*, and *V. virgatum*), St Johns wort (*Hypericum perforatum*), and Stonecrop (*Sedum acre*). The steeper escarpments, gullies and higher terraces are dominated in places by willows (*Salix fragilis*), sycamore (*Acer pseudoplatanus*), and conifers. Conifers include radiata and contorta pine (*Pinus radiata*, *P. contorta*), Douglas fir (*Pseudotsuga menziesii*) and larch (*Larix decidua*). Pines and larch have been reduced by recent control but remain prominent on some steep sites. Elder (*Sambucus nigra),* hawthorn (*Crataegus monogyna*), Lombardy poplar (*Populus nigra),* and cottonwood (*Populus deltoids* x) are scattered along the river corridor.

Old Man's beard (*Clematis vitalba*), a regional plant pest (requiring progressive containment) is present near the Delta and along the Kawarau River escarpment. Convolvulus (*Convolvulus arvensis*) – an organism of interest under the Regional Pest Management Plan is present near the Hugo Tunnel and in the TBWMR.

Native plants include an occasional matagouri (*Discaria toumatou),* mikimiki (*Coprosma propinqua)*, koromiko (Veronica salicifolia), porcupine shrub (*Melicytus alpinus),* tutu (*Coriaria sarmentosa)* and fern species such as prickly shield fern (*Polystichum vestitum).* Lianes/ vines bush lawyer *(Rubus schmidelioides*) and pōhuehue (*Muehlenbeckia australis*) which climb over native and introduced trees and shrubs.

Ground cover species include creeping pōhuehue (*Muehlenbeckia axillaris*), common mat daisy/ scabweed (*Raoulia australis*) – nationally[8] and regionally at-risk – declining[9], and *Raoulia hookeri* – nationally at-risk – declining, regionally not threatened*;* and willow herbs (*Epilobium* spp.). Mosses, woolly fringe-moss (*Racomitrium pruinosum*) and juniper haircap moss (*Polytrichum juniperinum*) are present on open terraces and tailings where Raoulia and creeping pōhuehue are also present, including the area within and adjacent to the Nohoanga area in the TBWMR, on Big Beach and in the TBRR.

3.3 RESTORATION

Restoration efforts have focused on the removal of invasive weeds, and the reinstatement of indigenous diversity on the open terraces and escarpments. To date, over 40 hectares of the 55 hectares on the true right side of the TBWMR has been cleared of weeds. Follow up of this control work is ongoing and is reliant on community conservation funding.

[8] de Lange, et.al., (2023)
[9] Jarvie, et.al., (2026);

Planting (5 ha) has occurred within rabbit fenced enclosures in the TBWMR undertaken by the TBWT starting in the spring of 2020.

Restoration in the TBWMR also aims to support the native communities described above by removing invasive weeds and reinstating a mixture of open native tussocks and porcupine shrub, a species associated with dryland lizard habitats. These communities have been planted on the river terraces and rocky tailings along with clusters of drought and frost tolerant grey shrubland dominated by *Coprosmas, Olearia*, matagouri, the native bee pollinated desert broom (*Carmichaelia petriei*), kowhai and mountain ribbonwood. Broadleaf shrubland/ small trees could be introduced into areas on the escarpment and other areas with more developed, organic, free draining soil.

Plants establishing well include:

Scientific Name	**Common Name**	**Threat Classification**
Anthosachne solandri	blue wheat grass	Not threatened
Austroderia richardii	toetoe	Not threatened
Carmichaelia petriei	desert broom	nationally and regionally at-risk - declining
Coprosma acerosa	sand Coprosma	nationally at-risk – declining and regionally threatened – endangered
Coprosma crassifolia		Not threatened
Coprosma dumosa		Not threatened
Coprosma propinqua	Mikimiki	Not threatened
Coprosma rugosa		Not threatened
Coprosma virescens		nationally at-risk – declining; regionally threatened – vulnerable
Corokia cotoneaster	korokia	Not threatened
Festuca novae-zelandiae	hard tussock	Not threatened
Melicytus alpinus	porcupine shrub	Not threatened
Olearia fimbriata		nationally and regionally threatened - vulnerable
Olearia hectorii	Hector's tree daisy	nationally and regionally threatened - endangered
Olearia lineata		nationally and regionally at-risk - declining
Olearia odorata	scented tree daisy	nationally and regionally at-risk - declining
Plagianthus regius	Mountain ribbonwood	Not threatened
Poa cita	silver tussock	Not threatened
Poa colensoi	blue tussock	Not threatened
*Sophora microphylla**	Kowhai	Not threatened

4 Wildlife

4.1 BIRDS

This report does not provide a detailed list of all the birds present in the TBWMR and surrounding River corridor. The focus of this report is on the five species of braided river birds that are known to breed on the Kimiākau /Lower Shotover River and the environment and terrestrial species that support them. These are listed again here:

- Tarapiroe/ Black-fronted tern (*Chlidonias albostriatus*)
- Tutriwhatu/ Banded dotterel (*Anarhynchus b. bicinctus*)
- Tarāpuka/ Black-billed gull (*Chroicocephalus bulleri*)
- Tōrea/ South Island pied oystercatcher (*Haematopus finschi*)
- Poaka/ Pied stilt (*Himantopus h. leucocephalus*)

These birds migrate to inland braided river ecosystems, wetlands and farmland to breed lead by Tōrea/ (SIPO) in early to mid-July, then Banded dotterel, Black-fronted tern, Black-billed gull and Pied stilt by mid-July to mid-August. Tōrea/ SIPO migrate back to coastal habitats, in December followed by Banded dotterels in December-January, terns and stilts in February and gulls in March.

Terns and gulls nest in colonies within the active open braided river channel on the highest beaches; males and females share incubation (Keedwell, 2002).

Black-fronted terns forage along the river and lake margins, streams, wetlands and farm pastures. Foraging patterns vary with time of day, season, weather, nesting and chick rearing phases. Black-fronted terns can form a nest within a few days of arriving at a nesting site and lay eggs within a week (O'Donnell and Moore 1983). They have been observed to lay a replacement nest 6 days after losing chicks (Keedwell, 2002). Both gulls and terns rely on a colony defence of nests.

Black-billed gulls forage on farm pasture invertebrates and will also feed at the river's edge or take insects on the wing or over the river. They feed mainly on invertebrates and may also feed on fish (McClellan and Habraken, 2013).

Banded dotterels nest as territorial solitary pairs on the open gravel river terraces of the Shotover River and will attempt to nest on more consolidated open gravel habitats, and open short spring turfs, cushion plants and matt forming species. Banded dotterels have also nested on the gravel pond margins within the Shotover Wastewater Treatment Plant (WWTP) and in the disposal field. Females do most of the incubation during daylight hours and males through the night, (Bomford, 1988).

Banded dotterels have a varied diet including spiders, beetles, insect larvae, adults and subadults of many aquatic insects, e.g. mayflies, stoneflies and caddisflies, as well as terrestrial flies. They may also eat the berries of creeping pōhuehue. Banded dotterels can successfully fledge two clutches per season as young become independent after fledging at 5-7 weeks (Keedwell, 2002).

Tōrea/ SIPO also nest as solitary territorial pairs on farmland with open short spring pastures, and gravel beaches with some vegetation. They feed on earthworms and beetle larvae (Sagar, 2013 [updated 2023]). Both males and females share incubation.

Pied stilts prefer wetland margins including the Shotover WWTP and lake margin habitats in the Whakatipu Basin, they may form nesting colonies (Sagar, 2013, [updated 2023]).

It is common for high flow events to occur during the breeding season and braided river birds have evolved strategies to cope with these and other disturbance events e.g. black-billed gulls minimize time spent at colonies, they can lay eggs within a few days of settling at a colony and chicks are mobile a few days after hatching (Mischler, 2018; Beer, 1966).

4.2 LIZARDS

A lizard survey was undertaken after the survey within the TBWMR in December 2025 by Lizard Expert NZ. The survey was funded by the Otago Regional Council EcoFund and focused on habitat units E2 and E3 (refer Figure 3, a copy of Figure 1 from the Lizard Expert NZ report). These areas are comprised of extensive historical gold-tailing deposits formed as consolidated, lichen-encrusted river-cobble piles. Woody weeds have recently been removed by hand cut and paste methods and pulled into piles across the site. Supplemental survey effort was also allocated to the beach flats near the river, the Forum, and habitat unit E1.

McCann's skink (*Oligosoma maccanni*) was the only species found; it was common throughout the site. This species is classified nationally and regionally as Not Threatened (Hitchmough, et.al., 2025; Jarvie et.al., 2025). Suitable habitat for southern grass skink (*O. chionochloescens*) was determined to be present, but if the species occurs, it is likely at very low abundance. Mountain beech gecko (*Woodworthia* "south-western") may also occur, although no sign of the species was recorded. Both southern grass skink and Mountain beech gecko are classified as At Risk – Declining.

Lizard populations present on the terraces of the Lower Shotover River provide a potential food source for foraging black-fronted terns, and kōtare/ sacred kingfisher. Lizards and small fish become important prey for black-fronted tern during chick rearing (Lalas, 1977, O'Donnell and Hoare, 2009). These prey items are available along the river, surrounding grassy farmland, and lakes. Observations of chick feeding confirm this.

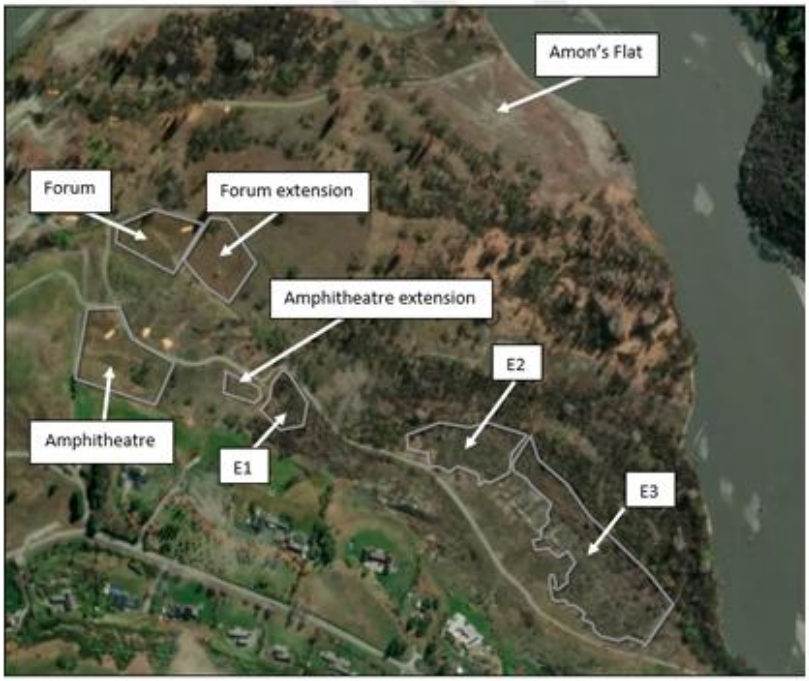


Figure 1: Focal areas of the Tucker Beach Wildlife Management Reserve that were assessed for lizards, December 2025.

Figure 3: Focal areas of the lizard survey, December 2025; copied from Tocher (2026): Tucker Beach Wildlife Management Reserve – Lizard Assessment, Lizard Expert NZ. Dunedin, New Zealand.

4.3 PREDATOR & PEST CONTROL

Predator control is undertaken by several groups along the Kimiākau/ Lower Shotover with the support of the Whakatipu Wildlife Trust. Starting from the upper reach of the surveyed river, groups include:

- KAPOW, an Arthurs Point community group with about 233 traps extending from the Arthur's Point area to the Tucker Beach Recreation and Wildlife Management Reserves on the river's true right;
- TBWMR Trapping Group has 139 traps including traps extending towards Lake Johnson, along both sides of the Shotover River through the Tucker Beach Wildlife Management Reserve (TBWMR) and along the true right side of the Shotover River to the confluence with the Kawarau River.
- Predator Free Puahuru - Shotover Country/Lake Hayes Estate have 20 of their 98 traps positioned along the lower, true left side Shotover River downstream of the Historic Bridge at Spence Road.

A full predator guild is present. Camera monitoring in the TBWMR has detected dogs off lead, cats, hedgehogs, possums, stoats, and harriers. Rats are the most frequently trapped predator in the TBWMR.

Southern black-backed gulls/ karoro (*Larus dominicanus)* also predate eggs and chicks of terns, gulls and potentially banded dotterel (Bell, M. and Harborne, P. 2018). Swamp Harriers/ Kāhu (*Circus approximans)* and New Zealand falcon | Kārearea *(Falco*

novaeseelandiae) also predate braided river birds and waterfowl. Falcon take live prey which they capture in flight or pluck from the ground. Harriers feed on carrion and will also take live birds from the water or ground.

TBWT undertook a pindone rabbit control operation in conjunction with QLDC and some neighbours on the true right side of the River in the TBWMR in August 2024. Follow up control relies on Magtoxin treatment of burrows.

Camera monitoring on one banded dotterel nest during the 2025/26 breeding season recorded rabbits as a frequent cause of disturbance with the nesting bird seen defending the nest from rabbits approaching too close during the night. Rabbits therefore continue to pose a threat to establishing plants and are a nuisance to nesting birds.

Figure 4: View of Big Beach in April 2026 illustrating the extent of weed encroachment impacting this braided river habitat. Human disturbance is low at this site where terns, dotterel and SIPO have historically nested. Photo ref: D Palmer 20260410_IMG_0044

Figure 5: An opening within the Big Beach Reserve near where banded dotterel have been counted by the survey. Photo ref: D Palmer 20251204_084417

Figure 6: Tucker Beach Recreation Reserve, view of the true left beach where banded dotterels have nested over the past few years; it is being invaded by buddleia and lupins. As the beach expands it pushes the river into the terrace on the right. Photo ref: D Palmer 20251204_105518

Figure 7: Tucker Beach Wildlife Management Reserve view southwest from true left below the lower sand escarpment. The survey team made their way through the co-located black-fronted tern and black-billed gull colonies. A high count of banded dotterels was also recorded in this area. Photo ref: Bonnie Wilkins IMG-20251205-WA0005

Figure 8: View towards the upper escarpment "Sand cliff Terrace" on 3rd December 2025 the day before the survey. Buddleia was later cut from an upstream portion of the terrace on 25 January 2026 to try and recover this historical dotterel nesting habitat. Photo ref: D Palmer 20251203_170203

Figure 9: Cleared buddleia on the true left of the TBWMR on the "Sand cliff Terrace" 25/1/2026; a historical nesting site for banded dotterel is being recovered. Photo ref: D Palmer 20260125_121303

Figure 10: Lower Shotover River and Shotover Wastewater Treatment (WWTP) area and disposal field on 3rd December 2025, the day before the survey. This image illustrates the flood prone nature of the delta area in a flow of just 64.1m^3/s recorded EM215 NIWA Shotover at Bowen Peak at 11:00am, 10 minutes prior to this photo. Following high flows (refer Table 2 in Appendix 2), the river tends to flow high over the new gravel beaches deposited by the bedload until the flow can incise braids into them. Photo ref: D Palmer 20251203_111059

5 Results

The TBWMR recorded the highest counts for all braided river species during the survey on 4th December 2025.

Tables 1A to 1C in Appendix 1 at the back of this report provide a detailed summary of birds recorded in all river sections and land-based count stations (refer to Maps 1 and 2 in Section 3.1 above). The Wakatipu High School site was added to the 2025 survey as it has been used as a post-breeding, pre-migration staging site by SIPO for at least the past few years.

Count results for other species can be found in the Tables provided in Appendix 1 and Charts 2 to 10 in Appendix 3.

The Tables and Charts in Appendices 1 and 3 contain results for the three surveys undertaken in December of 2021, 2024 and 2025. For details regarding the 2021 survey, refer to the report produced for that survey.

The surveys represent a snapshot count that may be influenced by recent weather events, ground and river conditions as well as land management and river or land-based activities.

Black-fronted terns (BFT)

The three counts in 2021, 2024 and 2025 illustrate the response of tern and gull colonies to changing river conditions with the black-fronted tern colony moving from the Shotover Delta to the Tucker Beach Wildlife Management Reserve (TBWMR) between seasons.


BFT – Steve Couper

The total 2025 adult count was 75 with 67 counted at the colony in TBWMR; 3 were recorded foraging at Big Beach with another in the Tucker Beach Recreation Reserve.

Throughout the breeding season, terns are seen foraging along the river, across the Frankton Flats, over the farmland in the Whakatipu Basin, at Lake Hayes, Lake Johnson and farmland south of the Kawarau River. Terns were observed making short flights carrying food on their return to their chicks in the colony on 7 December 2025 following the survey[10].


BBG – Rebecca Bowater

The count of chicks in the TBWMR colony in 2025 was impacted by observer confidence in distinguishing between black-bill gull and black-fronted tern chicks. There were at least 102 chicks counted at the gull and tern colonies. Both tern and gull chicks are mobile around the respective colony sites and tern nests and chicks were present on the beach surrounding the two gull colonies, refer Figure 7. Observers

[10] https://ebird.org/checklist/S287740672 ; https://ebird.org/checklist/S287740246

estimated there were about 17 black-fronted tern chicks in the TBWMR but due to the expressed lack of observer confidence, this count should be treated with caution[11].

The 2025 tern count is higher than the 2024 count which recorded 46 in the TBWMR with 3 more recorded foraging along the river at Big Beach (1), Tucker Beach Recreation Reserve (1) and the third at the Delta. No chicks were recorded in 2024.

In 2021, at total of 38 black-fronted tern adults were counted in the lower river with 34 at the Delta colony[12] and 4 foraging upriver near the historic bridge. There were 11 chicks counted in the Delta tern colony located on the lower mid-true right of the Delta, at the boundary of Transects 8 and 9 (refer to Map 1); southeast of the Disposal Field in the Shotover Wastewater Treatment Plant (WWTP).

Banded Dotterels (BD)

The total banded dotterel count was 64 adults in 2025 with the count in the TBWMR the highest of the three surveys undertaken to date with 47 adults and 10 downy chicks. The disposal field recorded 13 adults and 3 chicks, with 2 adults counted on both Big Beach and the Tucker Beach Recreation Reserve (4 adults). A high river flow in the days preceding the 2025 survey may have resulted in banded dotterels concentrating in the TBWMR and disposal field.

In 2024, 24 adult banded dotterel were counted, 18 in the TBWMR, with 3 on Big Beach, and 2 in the Tucker Beach Recreation Reserve. A single adult was also recorded in the disposal field. Seven (7) chicks were recorded with 4 at TBWMR and 3 on Big Beach. This count followed a very wet spring with several high river flows (refer to Chart 1, Table 2 in Appendix 2). However, the river flows during the 2025/26 breeding season exceeded those of the 2024/25 season and resulted in the highest count to date. Observations of dotterel, some recorded on the citizen science app, eBird.org, confirm they are foraging on short turfy paddocks within the Whakatipu Basin and may have been missed by the survey on 3 December 2024. One adult and two juveniles were recorded in the Shotover Wastewater Treatment area disposal field in 2024.

In 2023, a sustained high flow of more than 600m3/s occurred in September at the beginning of the dotterel inland nesting season. This flow eroded traditional dotterel nesting terraces resulting in dotterel being redistributed along the river. This coinci ded with an increase in dotterel observations in the Tucker Beach Recreation Reserve and records of breeding in the Disposal Field downstream[13] in the 2023/24 breeding season.

In 2021, 35 adults were recorded with birds spread reasonably evenly along the river and a higher number of juveniles/ immature birds than in subsequent seasons (17), also well distributed along the river. Big Beach recorded the highest number of adults (13), and 4 juveniles. The Tucker Beach Recreation Reserve recorded 9 adults with 1 juvenile,

[11] Images sourced from Steve Couper (BFT) and Rebecca Bowater www.floraandfauna.co.nz with the image copied from Birds On Line https://www.nzbirdsonline.org.nz/species/black-billed-gull 4/7/2026
[12] https://ebird.org/atlasnz/checklist/S99147584
[13] https://ebird.org/atlasnz/checklist/S154880304

while the TBWMR had 6 adults and 11 juveniles. One adult with 1 chick were recorded near the historic bridge and 6 adults with 1 juvenile were recorded on the central Delta.

Black-billed gulls (BBG)

As noted above, the black-billed gull colony has moved between the lower Delta and the TBWMR between the three surveys. The colony settled in the lower Delta in 2021 and moved upriver to the TBWMR in 2024[14] and 2025[15]. In October of 2024 both terns and gulls established a colony on the mid-lower Delta east of the Queenstown Airport's eastern runway approach in October, however, flooding later in the month (refer Table 2 in Appendix 2) resulted in the colonies abandoning the Delta site and relocating upstream to the TBWMR.

Black-billed gulls breed on the active braided river beaches, but they make use of a range of habitats during the breeding season. For this reason, the surveys have included synchronized counts at Queenstown Bay, Frankton Beach, the Events Centre and Transfer Station where gulls are known roost away from the breeding colony. Tables 1A, 1B and 1C show the counts for each of these sites.

The December survey in 2021 recorded a colony of 80 in the Delta whereas the total count was 240. As the river birds were being counted, 156 gulls were counted at land-based sites with 74 in Queenstown Bay, 33 at Frankton Beach and 45 roosting at the transfer station on Glenda Drive.

In 2024, a total count of 388 were counted with 180 in the TBWMR, 49 on the Delta, 101 in Queenstown Bay, 26 on Frankton Beach, 22 at the transfer station with smaller numbers scattered between the other sites, refer to Charts 2, 5 and 8 in Appendix 3.

The count in 2025 was substantially higher than previous years with 759 adults. The colony established in the TBWMR with 500 adults[16], and despite several high flows (refer Chart 1 and Table 2) which impacted the main colony, the colony split and re-established at two sites within the Reserve. Black-fronted terns were also present in the upstream site. At the time of the survey in December, 553 adults were counted in the TBWMR with an estimated 85 chicks (see notes above regarding confidence in chick identification). Black-billed gulls counted at land-based sites recorded Queenstown Bay (133), Frankton Beach (7), and at the Transfer Station (30) with 25 on the Delta.

Tōrea / South Island pied oystercatchers (SIPO) gather into staging flocks by mid-December as they prepare to migrate back to their coastal non-breeding habitats. In 2021, 8 were recorded, 5 were in the TBWMR, 2 were on Big Beach and 1 in the WTTP disposal field. In 2024 just two adults and 1 juvenile were recorded on Big Beach during the survey but by 11 December 2024 the pre-migration flock on the Wakatipu High

[14] https://ebird.org/checklist/S280979848
[15] https://ebird.org/checklist/S281838505
[16] https://ebird.org/checklist/S281838505

School (WHS) grounds had grown to 106[17]. For this reason, the WHS was included in the braided river bird survey sites in 2025. This resulted in a total count of 111 in 2025, with 73 on the WHS grounds, and 38 adults on the river; 25 of these were on the Delta and 8 were in the TBWMR with the remaining birds spread between Big Beach, and the other river transects.

Pied stilt (PS) numbers have been increasing and have benefited from the availability of habitat in the disposal field and the decommissioning of pond 1 in the WWTP (September 2024).

In 2021 seven pied stilts were recorded, 2 were in the TBWMR, the rest were recorded at the WWTP oxidation ponds (1), disposal field (2 Ad, 1 Ch) and Delta downstream of the flood wall (2 Ad, 1 Ch). In 2024, 17 adults and 2 chicks were recorded, with 15 adults and 2 chicks in the disposal field and 2 adults on the Delta. By 2025, the count had increased slightly to 22 adults and 6 chicks, with 16 adults in the drained disposal field, and 6 adults with 6 chicks in the drying sludge of the decommissioned Pond 1 in the WWTP area.

Southern black-backed gulls (SBBG) roost on the river but nesting, if occurring, has not been recorded. They are often seen roosting near black-billed gull and tern colonies and as previously noted, are known to predate chicks and eggs of both (Bell, M. and Harborne, P. 2018). At total of 29 were counted in 2021, 17 of those in the TBWMR; 26 were counted in 2024, with 12 in the TBWMR and in 2025, 31 were counted with 20 on the Delta, 3 in TBWMR and 3 in Queenstown Bay.

Spur-winged plovers (SWP/ plovers) can be a problematic species for Queenstown Airport; this is the case for many airports in New Zealand (CAA, 2025). In 2021, 58 plovers were recorded on all the river sections surveyed (refer to Table 1A); 18 were counted in both the TBWMR and Delta with 13 counted in the Tucker Beach Recreation Reserve. In 2024, 42 were recorded, 25 were in the Delta and 10 were at the WWTP oxidation ponds with 5 in the TBWMR. In 2025, 125 were counted, with 81 on the Delta and 39 in the TBWMR.

The results show that the braided river birds are mobile within the limitations of the Kimiākau/ Lower Shotover braided river habitats and the braided river birds respond to changes and reconfigurations of the gravel beaches and terrace habitats.

[17] https://ebird.org/checklist/S205043459

6 Discussion

6.1 CONTEXT FOR ENVIRONMENTAL CHANGE

The Lower Kimiākau/ Shotover River traverses through landscapes that offer both protection and pressure on the habitat relied upon by migratory braided river species.

The maximum longevity (lifespan) of black-fronted terns and banded dotterel are 11 and 12 years whereas black-billed gulls and Tōrea/ SIPO is about 29 years[18]. During the life of these species there has been rapid change in the local habitat, and the Threat Classification System (TCS) has been developed; the first was published in 2002[19]. As an understanding of threats developed, the first revision of the TCS followed in 2008[20]. A link to the New Zealand Threat Classification System is provided in the Reference section of this report.

The conservation status of the braided river species has both declined and improved over the years; however, the black-fronted terns remained Nationally and Regionally threatened – endangered since 2005.

Despite much of the river margin being held as public conservation land (refer Map 3), including the riverbed where it passes through the TBWMR, activities such as gravel extraction and stockpiling occurred within the TBWMR up until about 2007 after the Queenstown Landfill closed in January 1999. Gravel extraction is essential to the growing Queenstown Community, and the activity continues below the State Highway 6 Bridge. Extraction above the State Highway Bridge ceased around 2008.

Gravel extraction and stockpiling generally occurs in the non-breeding season. When extraction is required within the breeding season, surveys must be conducted to confirm whether nesting braided river birds will be impacted and appropriate buffers around any affected birds established. Black-billed gulls and southern black-backed gulls have a traditional roost site on the Lower Shotover, east of the gravel stockpile areas and upstream of scattered and eroding willow islands. They transit from this roost to the waste transfer station on Glenda Drive and Queenstown Bay or Frankton Beach beyond.

The eastern approach to Queenstown Airport crosses the lowest and widest portion of the Delta above its confluence with the Kawarau River. The Delta environment has changed substantially over the past twenty years.

In about 2008, following the 1999 flood in Queenstown, Queenstown Lakes District Council and the Otago Regional Council in collaboration with the Queenstown Airport

[18] Bell, M. 2013 [updated 2023]- terns; Pierce, R.J. 2013 [updated 2024]-dotterels; McClellan, R.K.; Habraken, A. 2013 [updated 2023] gulls; Sagar, P.M. 2013 [updated 2023]-SIPO

[19] Molloy, J.; Bell, B.; Clout, M.; de Lange, P.; Gibbs, G.; Given, D.; Norton, D.; Smith, N.; Stephens, T. 2002: Classifying species according to threat of extinction. A system for New Zealand. Threatened species occasional publication 22. Department of Conservation, Wellington. 26p.

[20] Townsend, A.J.; de Lange, P.J.; Duffy, C.A.J.; Miskelly, C.M.; Molloy, J.; Norton, D.A. 2007: New Zealand Threat Classification System manual. Department of Conservation, Wellington. 35p

Corporation undertook three major initiatives. The construction of the Runway Extension Safety Area, the flood retention wall, a portion of which now carries the Queenstown Trail, and an ambitious undertaking to alter the contour of the Shotover Delta to train the river's primary flow towards the true left side of the Delta and confluence. This required the removal of large willow islands in around 2009-2012.

In 2016 large scale excavations along the true left side of the Delta occurred with extracted gravel used to increase the ground height of the lower elevation areas of the Shotover Country subdivision to the east.

The result of these works was to open the wider Delta making it available for braided river bird nesting habitat, refer to Figure 12 in Appendix 4.

The establishment of nesting tern and gull colonies on this portion of the river may increase the risk of those species being involved in strike or near strike incidents at Queenstown Airport. Ongoing extraction in this area also renders the gravel beaches prone to inundation and less suitable for nesting.

The true right side of the Shotover Delta is within an area designated for Wastewater Treatment (WWTP); treated wastewater was discharged into the river up until 2019, and this activity was resumed on 31 March 2025.

The dynamic river conditions are also impacted by variations in seasonal rainfall; it has been observed that following a high flow of about 300m^3/s or higher, the river can erode terraces, braids can be reconfigured and incised channels filled by the sediment bedload. The river flows over the new deposits and washes over lower beaches requiring nesting braided river birds to search for higher beaches. This is a regime that these species are adapted to. However, the increasing frequency of high flow events could be disruptive over the long term. It is for this reason that the qualifier Climate Impact (CI) was added to the New Zealand Threat Classification System in 2021. This qualifier reflects new pressures from changing environments and acknowledges that some taxa are or will be adversely affected by long-term climate trends and / or extreme events (Robertson, et.al. 2021).

All these factors increasingly contribute to degrading changes in the value of the Lower Shotover below the State Highway 6 Bridge as nesting habitat for black-billed gulls, black-fronted tern, banded dotterel, and South Island pied oystercatchers. Despite this, these species are still found attempting to nest on the highest beaches and terraces of the of Delta, including the oxidation pond margins and on the Disposal Field. Both man-made habitats are undergoing a decommissioning process.

Habitats above the State Highway 6 Bridge are less prone to disturbance (excavation) and it is in these areas that Community Groups like the Tucker Beach Wildlife Trust have focused their efforts to protect and enhance the braided river habitats.

6.2 IMPACTS OF COMMUNITY-LED CONSERVATION AND RECREATION

Conservation Groups

KAPOW - The Arthur's Point community group undertakes some predator control, and willow control has been undertaken by LINZ on Big Beach. Access to Big Beach is constrained by the need to travel through Queenstown Hill Station with safe access managed closely by the landowner. Big Beach is a large and relatively isolated area and as such it represents an important area of breeding habitat on the Lower Shotover River that is under threat. Ongoing control of woody weeds (broom, gorse, willows, buddleia) and lupins is required or this historically important breeding habitat (18ha) will be lost.

KAPOW are also actively planting in the Morningstar Reserve and other Reserves above the Shotover Gorge.

DOC has removed wilding conifers from the Lower Shotover corridor as part of a broader control program. Conifers have been felled on the true left of the river around Arthur's Point and on the steep sand cliffs in the TBWMR.

TBRR RESIDENTS - The residents near the Tucker Beach Recreation Reserve are active in weed control within that Reserve and have ongoing plans for ecological enhancement. The new Kimiākau Suspension Bridge facilitates better connection between the efforts of the residents on the true right and those of the true left along Littles Road and the Fitzpatrick Basin areas, some of whom are active in local predator control efforts.

The presence of a Frisbee Golf Course introduces an ongoing source of disturbance to banded dotterels with traditional nest sites on the true right river terrace. This is exacerbated by erosion which has narrowed the terrace following recent high flows.

Vehicle access to the river and terrace has been restricted by the construction of a car parking area and fence; this may reduce risk to banded dotterels on the river terrace. Banded dotterels also nest on the expanding beach on the true left; however, weeds are spreading across that consolidating habitat.

TBWT - The Tucker Beach Wildlife Trust has a program of active weed clearance focused initially on the true right side of the river with over 40 hectares in the 150 ha Reserve cleared of broom, buddleia, lupins and other invasive weeds. The active channel of the river is estimated to occupy about 58 ha of the TBWMR. As weed clearance work in this area progresses, the historical banded dotterel breeding terraces on the true left side of the river in the TBWMR will be recovered. An initial volunteer day held in January 2026 cleared a large area of buddleia, refer to Figures 8 and 9. Downstream in the TBWMR residents and natural bio-control agents have resulted in the reduction of a large area of broom on another historical banded dotterel breeding terrace on the true left.

From time to time, the Otago Regional Council commissions work to remove navigational and structure hazards from the river. Large logs and river debris can help with the aggradation of gravel, allowing potential breeding beaches to withstand and even be improved by high flow events. Where hazards must be removed, consideration

of their subsequent placement could include their value in maintaining breeding beaches.

Bridges & Access

In 2004 the Queenstown Rotary Club commenced the restoration of the Historic Shotover Bridge. The crossing established safe access for pedestrians and cyclists across the Shotover River. The Queenstown Trail has with the opening of the Kimiākau Suspension Bridge at the bottom of the Shotover Gorge created a 12 km loop trail. This loop trail provides access (visual and physical) to this naturally uncommon, globally rare and nationally endangered braided river habitat. This improved access has the potential to bring more people into contact with nesting braided river birds, and this could have both positive (improved awareness and understanding) and adverse effects (disturbance). Signage identifying nesting areas are placed along the river during the breeding season and removed when birds migrate back to coastal non-breeding habitats.

Dogs

The Lower Delta area is one of the Queenstown Lakes District Council's designated dog exercise areas where dogs are frequently exercised off lead. The beaches under the State Highway 6 Bridge, Queenstown Trail, TBWMR and the Recreation Reserve upstream are also popular areas for this activity, although dogs must be on lead in the latter two areas. Advocacy efforts have targeted off-lead dogs to educate Reserve users about the nesting birds.

Vehicles

The Delta area is also popular for motorbikes and four-wheel drivers, including families and learner drivers and the confluence area with the Kawarau River is popular for fishing and private, recreational jetboat launching.

Jet boat activity traversing the river does not seem to disturb the birds who have grown accustomed to the activity and barely acknowledge the passing of boats. However, the intensive use of the Delta Confluence area south of the flood retention wall has rendered this habitat less suitable for nesting and no nesting has been confirmed in this area for several years.

6.3 POPULATION TRENDS

Despite the variability of river flows seen during the breeding seasons of the past few years (refer to Chart 1 and Table 2 in Appendix 2), the local braided river bird populations appear to be increasing.

River conditions appear to have concentrated the breeding birds onto the highest available breeding beaches located in the Tucker Beach Wildlife Management Reserve. Research into whether fledged birds are returning to the colony sites and nesting territories has not been undertaken.

Three surveys are insufficient to determine long-term population trends, but the positive results are encouraging. This section will focus on survey results for terns, dotterels and black-billed gulls.

Black-fronted terns

The count of black-fronted terns on the Lower Shotover has increased 89 % from 38 in 2021 to 72 in 2025. This is good progress amid concerns regarding the unexplored impact of rapidly expanding residential development on foraging opportunities for black-fronted terns within the Whakatipu Basin. Terns may be travelling large distances outside the Basin to forage or roost (Gurney, 2022; Gray, 2024) but require closer foraging success to support chicks through to fledging and protect them from predation (Lalas, 1977).

Black-fronted terns in the MacKenzie Basin's Ohau, Cass (Gurney, 2022) and Tekapo Rivers and the Irishman Creek populations have been found to use roost sites tens of kilometres away from breeding colonies (Gray, 2024). Research into the relationship between the breeding colonies of black-fronted terns in the Lower and Upper Shotover and those of the Matukituki, Rees and Dart Rivers, is therefore warranted. This would enable a more comprehensive understanding of the broader population dynamics and the vulnerability and/or resilience of the tern populations in the Queenstown Lakes District, particularly the Lower Shotover population with a suite of threats concentrated into a comparatively small area of braided river habitat.

Black-billed gulls

The increase in the black-billed gull colony is impressive with the local colony increasing from 240 in the 2021/22 breeding season to 759 in the 2025/26 breeding season, a 216% increase.

The breeding season of 2022/23 produced at least 130 fledglings from the black-billed gull colony on the Shotover River (TBWMR). The drivers of the colony increase may be both breeding success and immigration. The age at first breeding is typically 3 years but may occur at 2 years (McClellan, R.K.; Habraken, A. 2013 [updated 2023]).

In the 2023/24 season, the colony normally seen on the Lower Shotover River in August was not recorded until early December when 200 gulls arrived. The colony established quickly, with 223 adults laying at least 58 nests producing 30 chicks; 17 fledged young were recorded by 20th January 2024. A high flow of 607m^3/s occurred on 21 September 2023, this flow was sustained over about 2 hours and resulted in the reconfiguration of beaches, and the erosion terraces; this may have displaced the prospecting colony, however the return of birds later in the season enabled some breeding to occur.

Elsewhere also in December of the 2023/24breeding season, a large colony of black-billed gulls (450) unusually nested on the farm paddocks near Omakau.[21] The flock has not returned. This illustrates the mobility and resilience of the migratory braided river birds and alerts us to gaps in our understanding of their broader ecological needs.

[21] https://ebird.org/atlasnz/checklist/S156230451

Banded dotterels

As noted in Section 5 above, very high rainfall in September, October and November 2024 may have resulted in the reduced count of 24 adult banded dotterels seen in 2024. Banded dotterel may also have been foraging in surrounding areas e.g. farm flats and river terraces not included in the survey. However, the nearly 83% increase in the count from 35 in 2021 to 64 in 2025 is encouraging and supports the importance of continuing the work of weed clearance from river terraces and ensuring predator and rabbit control pressure is at least maintained and preferably increased.

This species is a small, cryptic, and territorial wader, they are easily overlooked and render nests on river terraces or near tracks vulnerable to disturbance or destruction.

7 Threats & Risks

The ongoing pressure on the Lower Kimiākau/ Shotover Delta habitat below the State Highway Bridge make the protection and restoration of the braided upstream reaches more important if we are to continue to sustain and support the local braided river bird populations.

Braided rivers are dynamic environments and the Lower Kimiākau/ Shotover River and Delta are high use areas with many elements impacting the habitat both on and off river. This includes the ongoing and rapid expansion of residential developments which may diminish off-river foraging, roosting and nesting opportunities.

The results of the surveys undertaken in early December 2021, 2024, and 2025 suggest that local populations are stable or increasing. This supports the importance of continuing threat reduction measures.

The Kimiākau/ Lower Shotover is a reasonably small reach of river (about 10.9 km long) and the distribution of nesting habitat is limited by the changing height and availability of beaches, and terraces that are open and free of weeds. Beaches can be reconfigured and terraces eroded by high flows within or between seasons, or over several years.

The removal of large areas of willow above the confluence with the Kawarau River has opened a large portion of the Lower Delta. However, gravel extraction renders these areas vulnerable to inundation and the substrates of the central confluence can be very sandy and mobile.

The presence and distribution of returning birds can also be influenced by land management off-river, availability of food resources on / off river, nesting phase, weather and river conditions preceding the survey.

These populations are also subject to pressures in their non-breeding habitats, including the recently confirmed arrival and likely spread of H5N1 avian influenza which may spread inland through the seasonal migrations.

Continuing threats requiring management include:

- Weed invasion and encroachment into nesting and foraging habitats,

- High river flows during the breeding season which require the availability of alternative weed free habitats where predator control is occurring.
- Erosion of beaches by unusually high river flows (Extreme weather events and Climate Change trends), see notes above regarding availability of alternative habitats.
- People walking through breeding areas with or without dogs
- Motorbikes/ off-road vehicles
- Rabbits which disturb nesting birds and provide a prey base for the local predator populations
- Predators (mammalian and avian), including feral, stray and pet cats,
- Off-lead dogs
- Gravel extraction that interferes with breeding and foraging habitat, and/ or the reduction of available alternative breeding sites prior to the breeding.
- The Tucker Beach Trail (Queenstown Trail) users; as noted in Section 6.2, this trail has the potential to bring more people into the vicinity of nesting sites and territories during the nesting season. Ongoing positive advocacy and social messaging helps mitigates this potential risk.
- As noted in Section 6.1, if a large colony of black-billed gulls were to establish in the Shotover Delta, the risk to aircraft and safe aviation at the Queenstown Airport would increase. This again, reinforces the need to ensure that the upstream beaches are kept free of weeds and that natural processes of upstream aggradation are not unduly interfered with.

8 Conclusions and Recommendations

The results of the surveys indicate that the braided river birds of the Kimiākau/ Lower Shotover River are stable or increasing.

Changes in the distribution of breeding colonies and banded dotterel nesting territories illustrate their adaptive mobility in relation to changes and the reconfigurations of the gravel beaches and terrace habitats in this relatively confined braided river ecosystem.

This indicates that measures to protect and restore the habitat combined with survival in non-breeding habitats may be combining to sustain local breeding populations.

Pressure on the river environment below the State Highway 6 bridge reinforces the importance of managing the habitats upstream to protect this small example of endangered braided river habitat.

The braided Kimiākau/ Lower Shotover River provides an excellent advocacy and educational site to introduce people to this endangered ecosystem, the species that rely on it and threats that must be managed across this ecosystem throughout Otago and Canterbury.

Restoration and protection efforts of the TBWT and other conservation groups working along the river and within the surrounding catchments should focus on measures that can support the nesting habitats and colonies of braided river birds in the Lower Kimiākau/ Shotover River. These include:

1. Clearance of buddleia, broom, gorse, and other invasive weeds from the terraces to expand and maintain nesting habitat for banded dotterels and foraging habitat for terns and SIPO. This also creates and sustains alternative sites for nesting if the river erodes an area of traditional nesting habitat. This includes the control of willow spread.
2. Predator control along the river corridor and into the landscape beyond to improve the buffer between the river and the surrounding areas. Control should target hedgehogs, rats, mustelids, possums and cats if only through advocacy, education and raised threat awareness for the latter.
3. Follow up rabbit control to reduce the abundance of this nuisance pest species.
4. Planting vegetation communities appropriate to braided river margins to improve habitats for lizards and invertebrates which in turn support braided river birds and kōtare/ kngfisher.
5. Implementation of measures to ensure freshwater habitats in the Whakatipu Basin that support fish, eels, terrestrial and aquatic invertebrates are maintained, enhanced and protected to the fullest extent possible.
6. Advocacy for nesting braided river birds and the reduction of human interference during the nesting season, including from unaccompanied pets (cats and dogs).
7. Advocacy for the protection of available high beaches and terraces as nesting and foraging habitats within the Lower Kimiākau/ Shotover River and the retention of open green spaces along the Kawarau and Shotover Rivers to enable foraging closer to colonies and nest sites.
8. Exploration of opportunities for collaborative research into the ecology of black-fronted tern and banded dotterel populations including the relationship between the breeding colonies of black-fronted terns in the Lower and Upper Shotover and those of the Matukituki, Rees and Dart Rivers.

9 Acknowledgements

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The effort involved in producing this report required a team of 10-13 volunteers in each year surveyed, time for planning the survey, analysing the data and reporting the results. This report represents a significant and valuable body of volunteer work which the Tucker Beach Wildlife Trust and our partners Whakatipu Wildlife Trust are pleased to share in support of informing ongoing conservation management and restoration efforts in the Kimiākau/ Lower Shotover River and the braided river birds that rely on this and the surrounding habitat.

The Tucker Beach Wildlife Trustees acknowledge the support it has received from a variety of funding sources for the ongoing clearance of weeds from braided river habitats. This threat is substantial and is the reason that braided river habitats are classified as endangered (Holdaway,et.al, 2012).

Engagement with communities involved with trapping, volunteer weeding and planting have been instrumental in achieving the improvement of habitat in the Tucker Beach Wildlife Management Reserve.

Additionally, the Tucker Beach Wildlife Trust acknowledges those organisations and community volunteers who have provided funding support and resources (e.g. time) for weed clearance, rabbit control, lizard surveys, planting and plant maintenance; all are critical for maintaining the gains and pushing forward towards the TBWT restoration goals.

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If you have found this report to be helpful, please consider donating to the Tucker Beach Wildlife Trust to support the restoration of the Tucker Beach Wildlife Management Reserve.

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Citation: Palmer, D. (2026): Kimiākau/ Lower Shotover River Braided River Bird Survey - 2024 and 2025. Prepared on behalf of the Tucker Beach Wildlife Trust. July 2026

Appendix 1 Summary of Counts 2021 - 2025

Table 1A Summary Counts from the December 2021 Braided River Bird Count of the Kimiākau /Lower Shotover River

Species	Year	Big Beach	TBRR	TBWMR	Hist Brdge	Delta	QT Bay	Frankton Beach	Events Centre	Transfer Station	WWTP-Ponds	Disposal Field	Total	River	QT Bay_ F/Flats_Disposal Field
BBG-Ad	2021				4	80	74	33		45		4	**240**	84	156
BBG-Ch	2021												**0**	0	0
BD-Ad	2021	13	9	6	1	6							**35**	35	0
BD-Ch	2021				1								**1**	1	0
BD-Juv	2021	4	1	11		1							**17**	17	0
BD-N	2021												**0**	0	0
BFT-Ad	2021				4	34							**38**	28	0
BFT-Ch	2021					11							**11**	11	0
BFT-Juv	2021					3							**3**	3	0
BFT-N	2021					6							**6**	6	0
BS-Ad	2021			4									**4**	4	0
LS-Ad	2021												**0**	0	0
Falcon	2021												**0**	0	0
PS-Ad	2021			2		2					1	2	**7**	4	3
PS-Ch	2021					1						1	**2**	1	1
SBBG-Ad	2021		3	17			1	3		2	3		**29**	37	9
SIPO-Ad	2021	2		5								1	**8**	7	1
SIPO-Juv	2021	2		1									**3**	3	0
SWP-Ad	2021	8	13	18	1	18							**58**	58	0
SWP-Juv	2021												**0**	0	0

Appendix 1 Summary of Counts 2021 - 2025

Table 1B Summary Counts from the December 2024 Braided River Bird Count of the Kimiākau /Lower Shotover River

Species	Year	Big Beach	TBRR	TBWMR	Hist Bridge	Delta	QT Bay	Frankton Beach	Events Centre	Transfer Station	WWTP-Ponds	Disposal Field	Total	River	QT Bay_ F/Flats_Disposal Field
BBG-Ad	2024		1	180		49	101	26	1	22	8		**388**	230	158
BBG-Ch	2024												**0**	0	0
BD-Ad	2024	3	2	18								1	**24**	23	1
BD-Ch	2024	3		4									**7**	7	0
BD-Juv	2024											2	**2**	0	2
BD-N	2024												**0**	0	0
BFT-Ad	2024	1	1	46		1							**49**	49	0
BFT-Ch	2024												**0**	0	0
BFT-Juv	2024												**0**	0	0
BFT-N	2024												**0**	0	0
BS-Ad	2024		1	1									**2**	2	0
LS-Ad	2024												**0**	0	0
Falcon	2024												**0**	0	0
PS-Ad	2024					2						15	**17**	2	15
PS-Ch	2024											2	**2**	0	2
SBBG-Ad	2024			12	2	7	1		1	3			**26**	21	5
SIPO-Ad	2024	2											**2**	2	0
SIPO-Juv	2024	1											**1**	1	0
SWP-Ad	2024		2	5		25					10		**42**	32	10
SWP-Juv	2024										3		**3**	0	3

Appendix 1 Summary of Counts 2021 - 2025

Table 1C Summary Counts from the December 2025 Braided River Bird Count of the Kimiākau /Lower Shotover River

Species	Year	Big Beach	TBRR	TBWMR	Hist Bridge	Delta	QT Bay	Frankton Beach	Events Centre	Wakatipu High School	Transfer Station	WWTP-Ponds	Disposal Field	Total	River	QT Bay_ F/Flats_Disposal Field
BBG-Ad	2025		3	553		25	133	7	2		30	5		**759**	581	178
BBG-Ch	2025			85										**85**	85	0
BD-Ad	2025	2	2	47									13	**64**	51	13
BD-Ch	2025			10									3	**13**	10	3
BD-Juv	2025												1	**1**	0	1
BD-N	2025													**0**	0	0
BFT-Ad	2025	3	1	67					2	2				**75**	71	4
BFT-Ch	2025			17										**17**	17	0
BFT-Juv	2025													**0**	0	0
BFT-N	2025													**0**	0	0
BS-Ad	2025	1		1				1						**3**	2	1
LS-Ad	2025					1	1	1						**3**	1	2
Falcon	2025												1	**1**	0	1
PS-Ad	2025											6	16	**22**	0	22
PS-Ch	2025											6		**6**	0	6
SBBG-Ad	2025		1	3		20	3			2	2			**31**	24	7
SIPO-Ad	2025	2	1	8	2	25				73				**111**	38	73
SIPO-Juv	2025													**0**	0	0
SWP-Ad	2025			39	1	81			2	2		2		**125**	121	4
SWP-Juv	2025													**0**	0	0

Appendix 2: Peak Monthly River Flows – Breeding Season

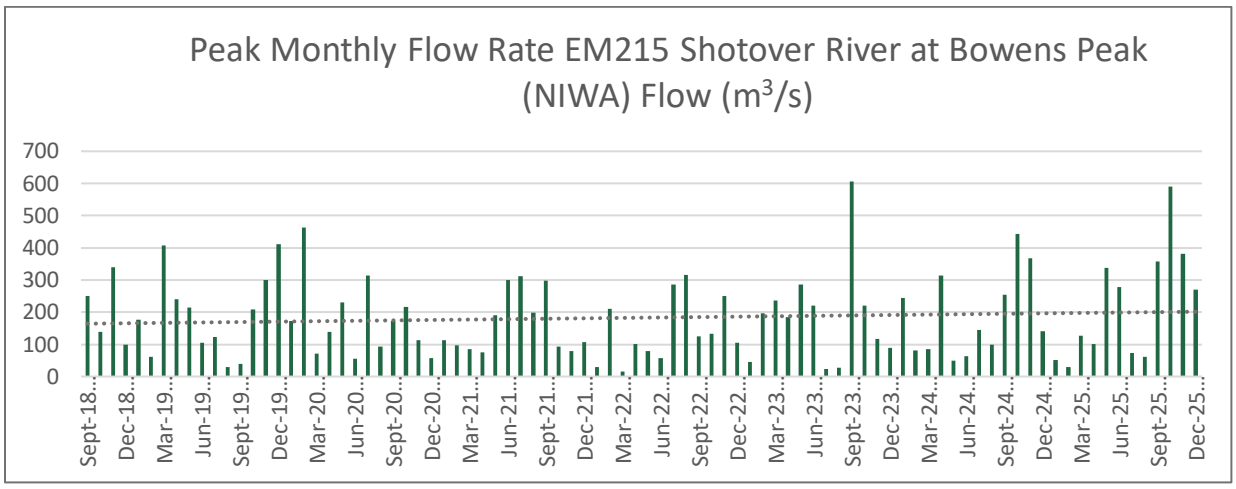


Chart 1: Peak monthly river flows (m^3/s) from September 2018 to 15 December 2025 (11 days after the survey). Source: https://envdata.orc.govt.nz; data from NIWA Station EM215 at Bowen Peak

Table 2: Peak Monthly Shotover River flows – Measured from Bowen Peak NIWA Station EM215

Date	Month/Yr	Breeding Season	Flow m^3/s
13/09/2021	Sept-21	2021/22	297
18/10/2021	Oct-21	2021/22	93.2
12/11/2021	Nov-21	2021/22	79.9
20/12/2021	Dec-21	2021/22	107
2/01/2022	Jan-22	2021/22	29.5
2/09/2022	Sept-22	2022/23	124
30/10/2022	Oct-22	2022/23	132
3/11/2022	Nov-22	2022/23	251
10/12/2022	Dec-22	2022/23	105
27/01/2023	Jan-23	2022/23	44.4
21/9/2023	Sept-23	2023/24	607
26/10/2023	Oct-23	2023/24	220
13/11/2023	Nov-23	2023/24	116
3/12/2023	Dec-23	2023/24	88.3
20/01/2024	Jan-24	2023/24	244
3/9/2024	Sept-24	2024/25	255
24/10/2024	Oct-24	2024/25	444
9/11/2024	Nov-24	2024/25	368
5/12/2024	Dec-24	2024/25	140
29/01/2025	Jan-25	2024/25	51
17/09/2025	Sept-25	2025/26	357
23/10/2025	Oct-25	2025/26	590
27/11/2025	Nov-25	2025/26	382
15/12/2025	Dec-25	2025/26	270
11/01/2026	Jan-26	2025/26	356

Source:
https://envdata.orc.govt.nz/AQWebPortal/Data/Location/Dashboard/422/Location/EM215/Interval/Latest

Appendix 3: Charts Summarising the Survey Results for 2021, 2024 and 2025

The following charts summarise the results of monitoring included in Tables 1A, 1B and 1C of Appendix 1.

The results are displayed in sets of 3, one set for each survey year. They show the distribution of the five braided river birds along the river; banded dotterel (BD), black-fronted tern (BFT), pied stilt (PS), South Island pied oystercatcher (SIPO), and black-billed gull (BBG). Southern black-backed gull and spur-winged plover results are also included as these species are predators and nuisance birds in relation to the Queenstown Airport respectively.

The black-billed gulls have been charted separately as they are generally much more abundant, and increasingly so, than the other species. They are also regularly found in and transiting between the river and off-river, land-based sites, refer to Map 2.

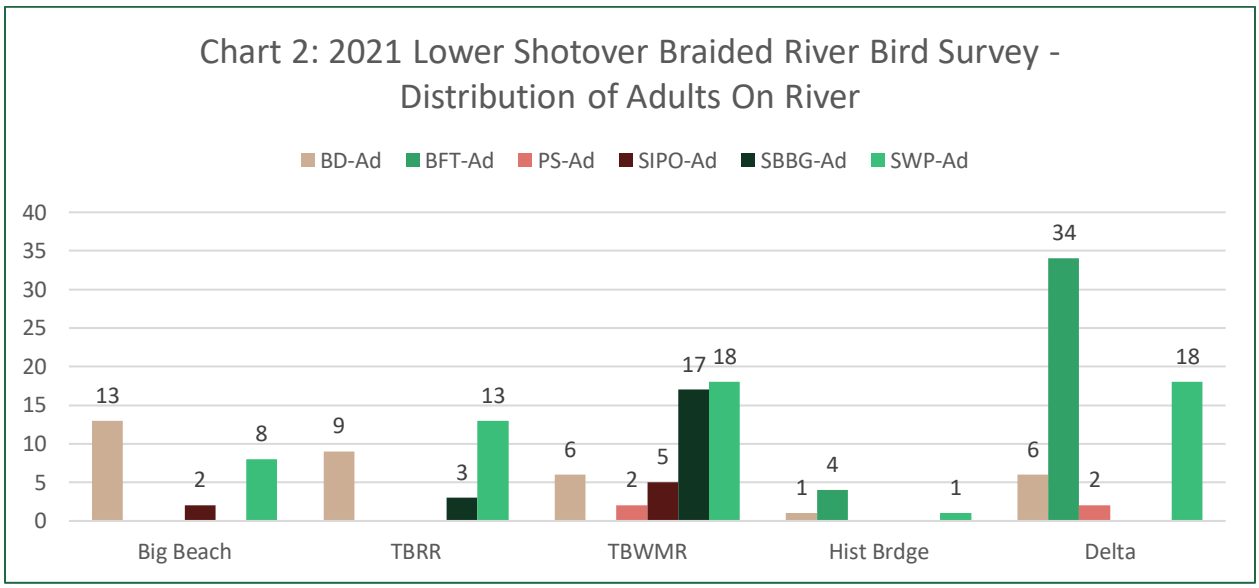
The third chart in each series, identifies the distribution of braided river birds at the off-river land-based sites. Noting that the annual surveys provide a snapshot count that is influenced by recent weather events, ground and river conditions as well as land management or land-based activities.

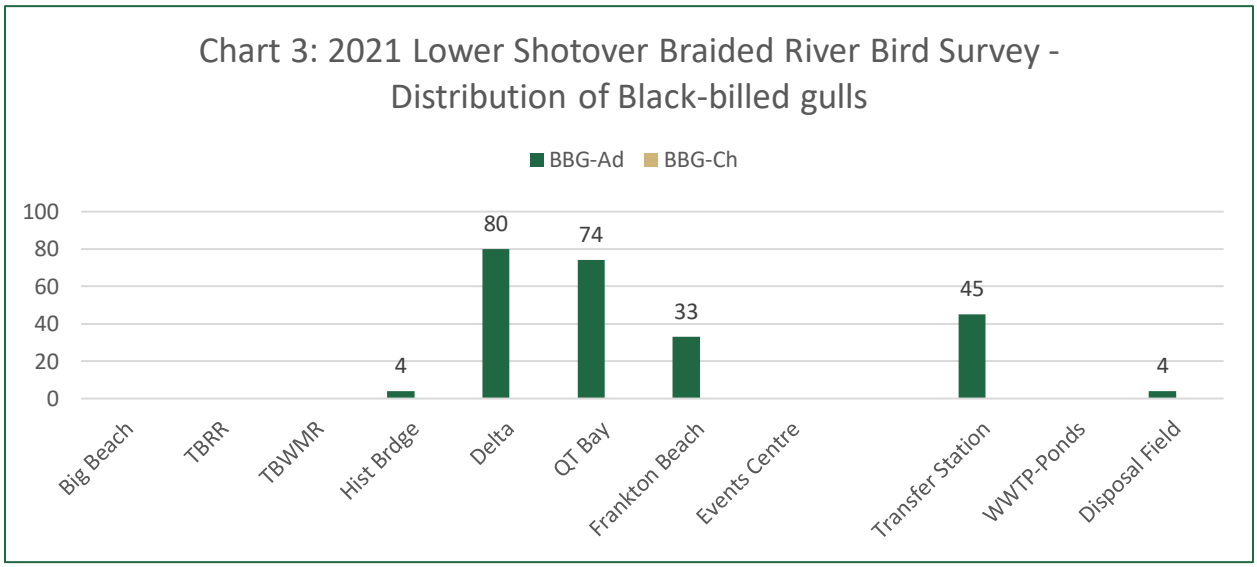
The Wakatipu High School site was added to the 2025 survey as it has been used as a post-breeding, pre-migration staging site by SIPO for at least the past few years.

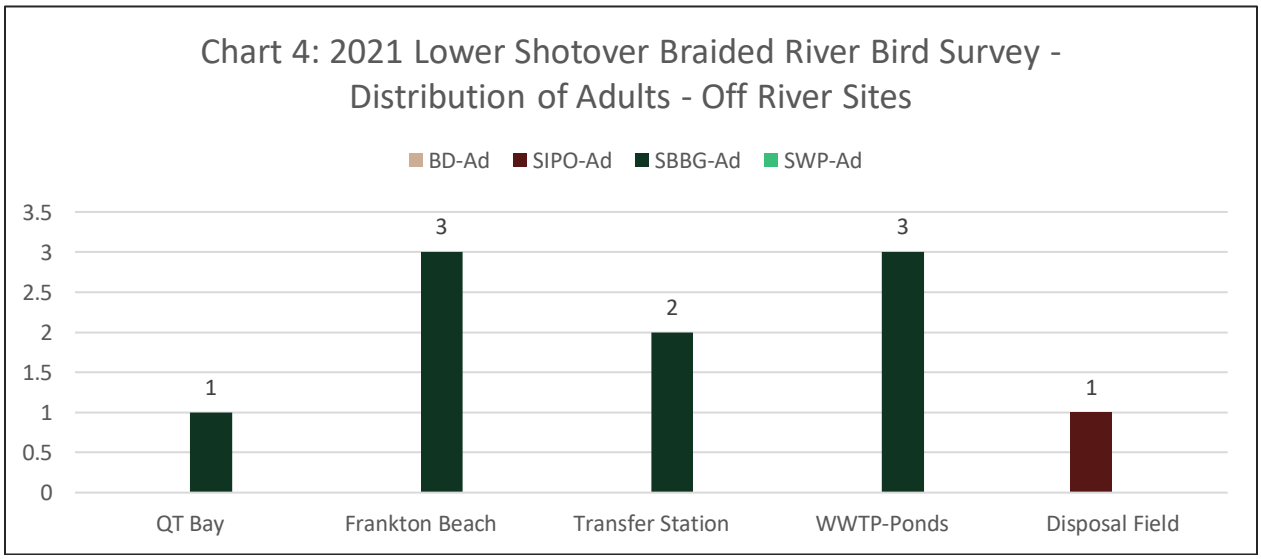
River survey sections shown on Map 1 are:

1 km	Big Beach
2 km	Tucker Beach Recreation Reserve (TBRR)
3, 4, 5 km	Tucker Beach Wildlife Management Reserve (TBWMR)
6, 7 km	Historic Bridge
8, 9 km	Delta

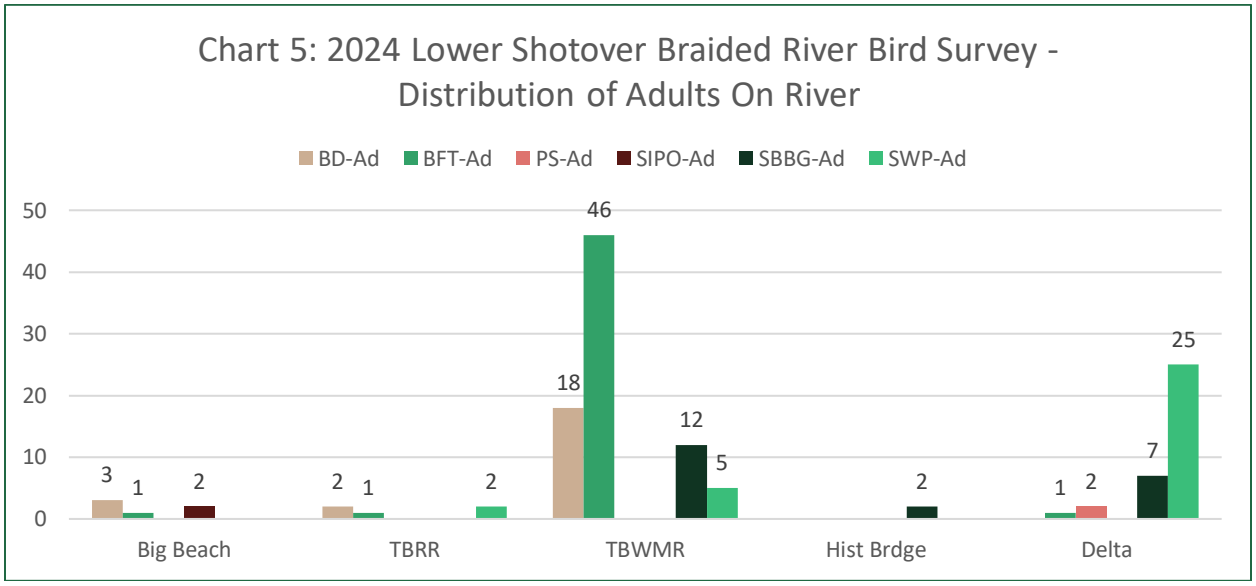
Appendix 3: Charts Summarising the Survey Results for 2021, 2024 and 2025

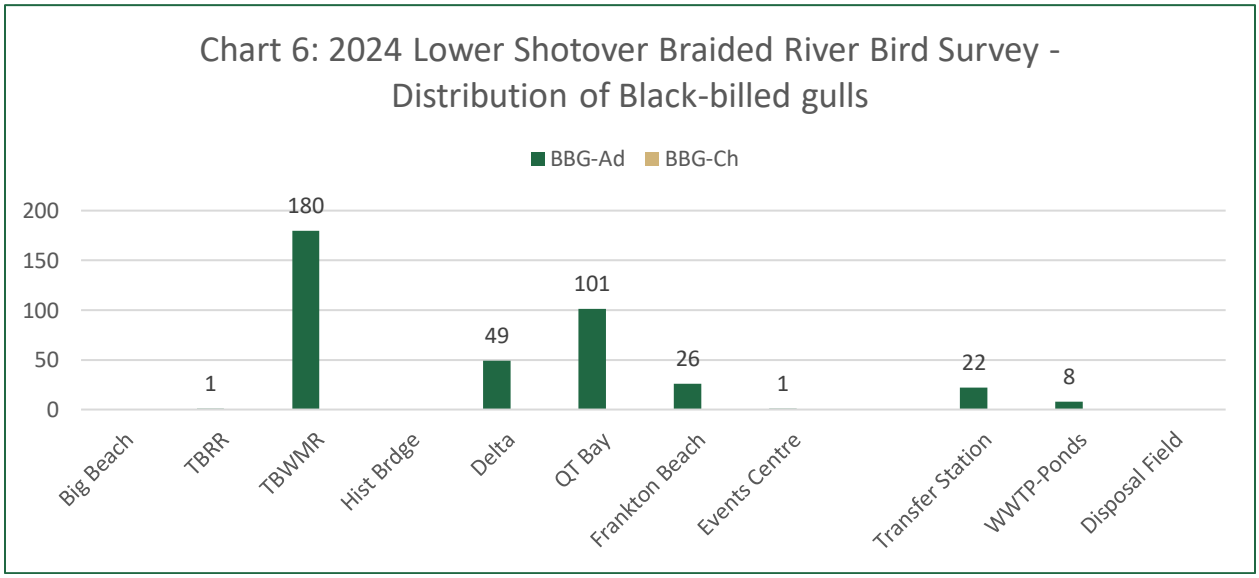


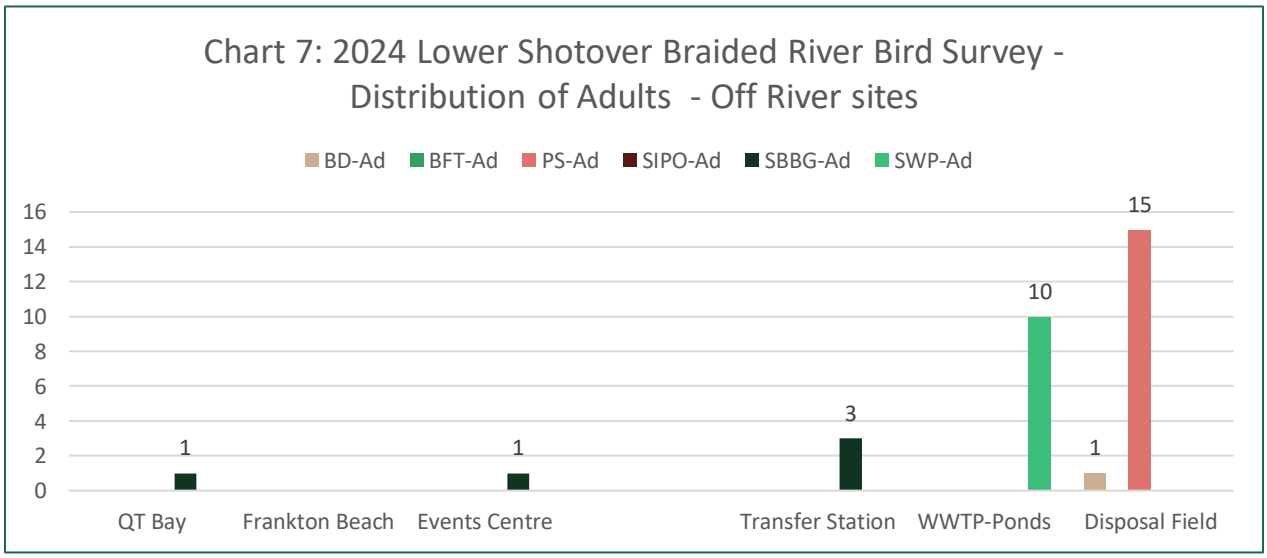




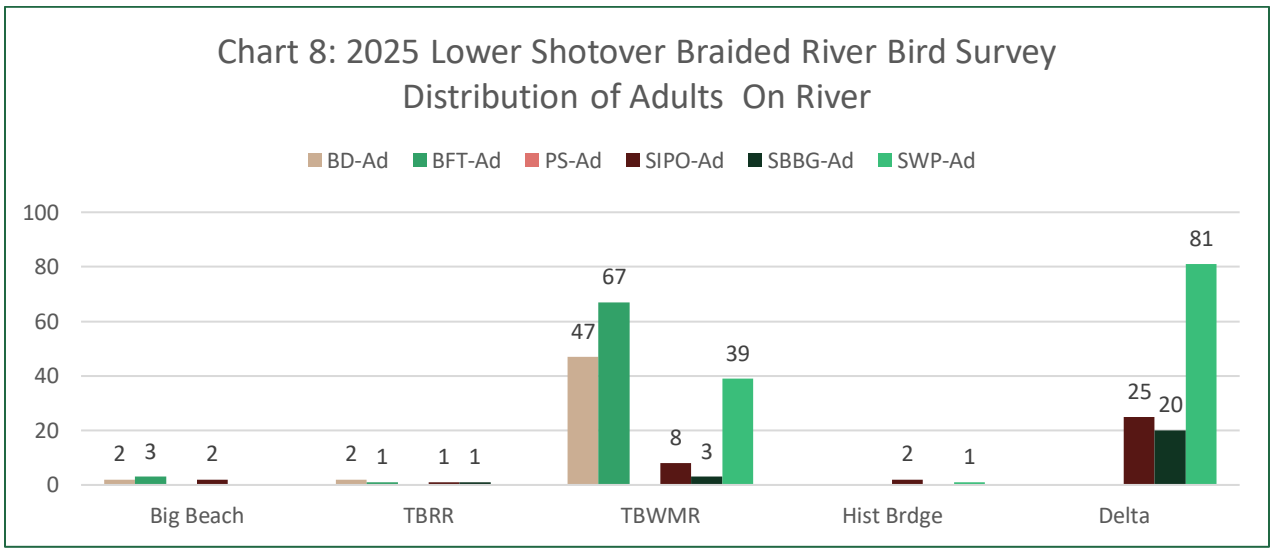
Appendix 3: Charts Summarising the Survey Results for 2021, 2024 and 2025

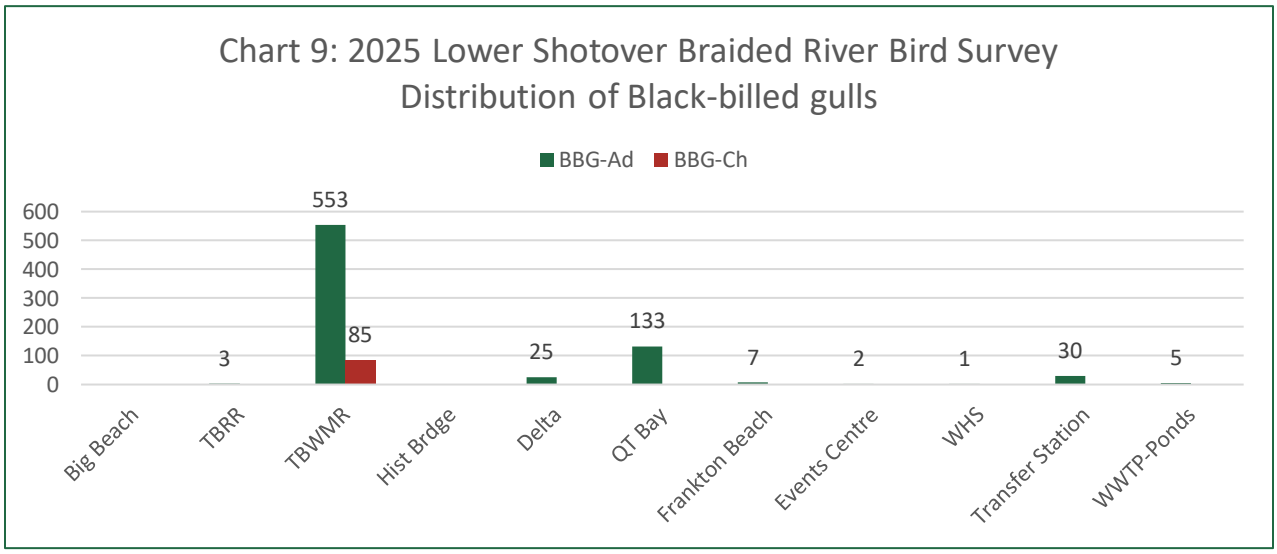


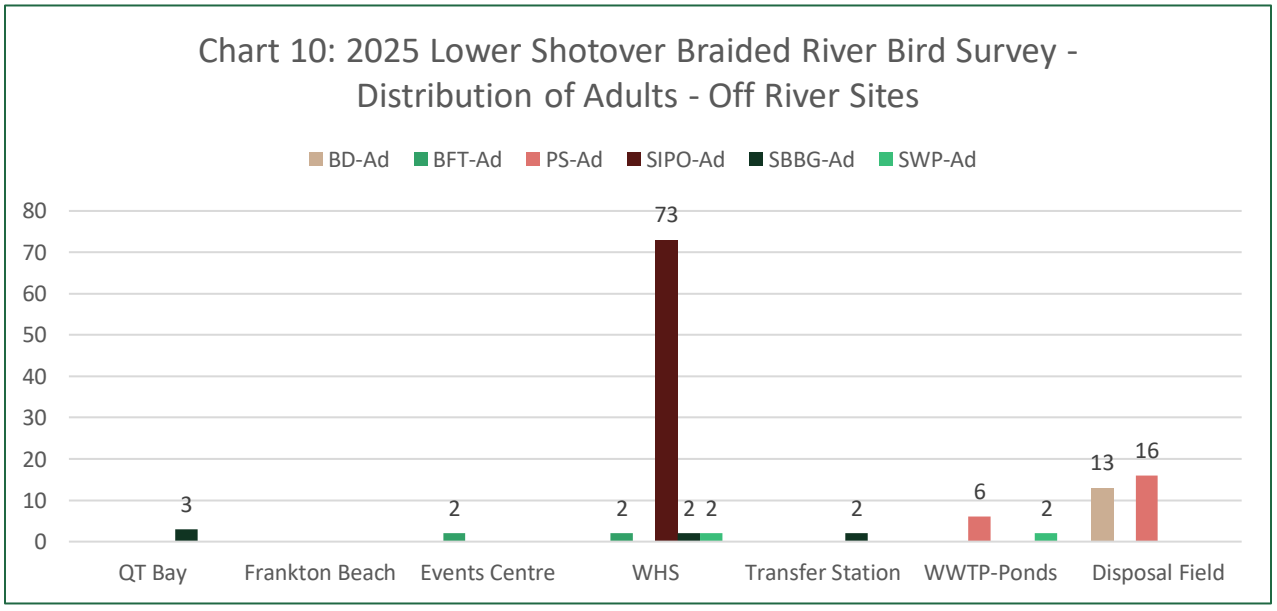




Appendix 3: Charts Summarising the Survey Results for 2021, 2024 and 2025







Appendix 4: Historical Photos – Changing River Environment

Figure 11: View of lower Kimiākau/ Shotover River Delta with willow islands as gravel extraction and stockpiling for the RESA earthworks were commencing. Photo ref: D Palmer_P1294251_20070130

Figure 12: A flooded Delta at around 400m^3/s following a peak of over 500m^3/s after the construction of the RESA and Flood Retention Wall and the clearance of willows from the Delta islands. The gravel removed to build up the ground level of the Shotover Country subdivision is indicated.

Photo ref: D Palmer_P1040401_20130110_Flooded delta D Palmer. Flow Data from the ORC website; accessed 13/1/2013.

Appendix 4: Historical Photos – Changing River Environment

Figure 13: Tucker Beach Wildlife Management Reserve with Faulks Gravel Stockpiles fenced off from the river. Gravel extracted from the Reserve was stockpiled on the area now called "Amon's Flat" where weeds are being removed to encourage the return of nesting banded dotterel present on this site in 2005/6.

Photo ref: D Palmer_PB273563_20061127

Figure 14: View southwest into the Tucker Beach Wildlife Management Reserve. High flows reconfigured gravel beaches. The Amon's Flat terrace is visible on the downstream true right margin of view. Photo ref: D Palmer_20251011_132441