# Ashburton River/Hakatere shorebird habitat management plan

August 2016

WMIL | Wildlife Management International

Ashburton River/Hakatere shorebird habitat management plan

Nikki McArthur and Mike Bell

Wildlife Management International Ltd
PO Box 607
Blenheim 7240
New Zealand
www.wmil.co.nz

This report was prepared by Wildlife Management International Limited for Environment Canterbury as fulfilment of the Contract of Services No. 490-16/17 dated 1st June 2016.

31st August 2016

**Citation:**

This report should be cited as:

McArthur, N. and Bell, M. 2016. Ashburton River/Hakatere shorebird habitat management plan. Client report prepared for Environment Canterbury. Wildlife Management International Ltd, Blenheim.



Cover image: Black-billed gull (*Larus bulleri*) sitting on a nest. Image courtesy of Steve Attwood, Auldwood Photography, www.flickr.com/photos/stevex2/.

# EXECUTIVE SUMMARY

The Ashburton River/Hakatere is considered to be one of the most important braided rivers in Canterbury for birdlife, supporting nationally-significant populations of a number of Nationally Threatened or 'At Risk' shorebird species.

A number of groups and agencies, including Environment Canterbury, the Department of Conservation, Forest & Bird and Braid have implemented local-scale management actions to improve the state of the river and its bird values. These efforts have met with local success, including raising greater awareness of the value of the large black-billed gull colony near the SH1 bridge, and reducing the impacts of woody weeds and mammalian predators on a particularly high-value reach of the river near Hakatere.

These stakeholders have agreed to a need to create an overarching management plan for the Ashburton River/Hakatere, to better prioritise and coordinate these management actions, and to identify additional threats that need to be addressed with management.

An analysis of shorebird count data collected annually since 1981 has led to the identification of three reaches of the Ashburton River/Hakatere that support particularly high numbers of shorebirds during the breeding season (August – February). Furthermore, the Ashburton River mouth has emerged as a significant year-round habitat for the highest diversity of birds recorded anywhere in the Ashburton District.

This management plan proposes a series of management actions focussed on reducing the impacts of a range of the threats operating on these key reaches of river. These actions include a combination of management work currently underway, and new initiatives for which additional funding and resources will need to be found.

A common message received from all of the stakeholders that provided input into this plan was that the current high rates of water abstraction from the Ashburton River/Hakatere is likely to be directly causing, or exacerbating the negative impacts that woody weeds, pest animals and people are having on the river's shorebird values. For this reason, it is hoped that the preparation of this management plan does not take any urgency away from the need to increase the minimum environmental flow limits set out for the Ashburton River/Hakatere in the Canterbury Land and Water Regional Plan.

This plan has a seven-year operational lifespan, and it is recommended that it be reviewed and updated in July 2023 following the implementation of the first increased environmental minimum flow limit.

# 1. INTRODUCTION

## 1.1 Purpose and scope of this plan

This Ashburton River/ Hakatere river bird management plan has been prepared as an outcome of discussions held between Environment Canterbury, the Department of Conservation and the Ashburton Branch of Forest & Bird.

The purpose of the plan is to facilitate the coordination of management activities aimed at improving habitat quality for the shorebirds of the Ashburton River/Hakatere; to guide the prioritisation of management actions and existing funding; and to support applications for further funding to resource management actions. As such, all of the management and monitoring actions outlined in this plan should be considered as recommendations. Prior to the implementation of any of these actions, all relevant or affected stakeholders shall be consulted and be given the opportunity to have input into the planning and implementation of these actions.

It is proposed that an Ashburton River/Hakatere Management Group be established to oversee the implementation and review of this management plan. This management group shall include representatives from key stakeholder groups, including but not restricted to: Environment Canterbury, Ashburton District Council, the Department of Conservation, Forest & Bird, Fish & Game, Arowhenua Rūnanga and the Mid-Canterbury Four Wheel Drive Club. Environment Canterbury has been nominated as the agency responsible for convening the Ashburton River/Hakatere Management Group and coordinating the implementation of this management plan.

This plan has an initial seven year operational lifespan from October 2016 to July 2023, and is due to be reviewed and renewed in 2023 following the implementation of the 6000 L/sec minimum environmental flow limit set in the Canterbury Land and Water Regional Plan (ECan, 2015).

The geographic extent of the management plan is the bed of the Ashburton River/Hakatere from the Coastal Marine Area (therefore including the Ashburton River mouth), to the base of the Arrowsmith Range on the Ashburton River/Hakatere South Branch and the Pudding Hill Stream confluence on the Ashburton River/Hakatere North Branch (see Figure 1.1).

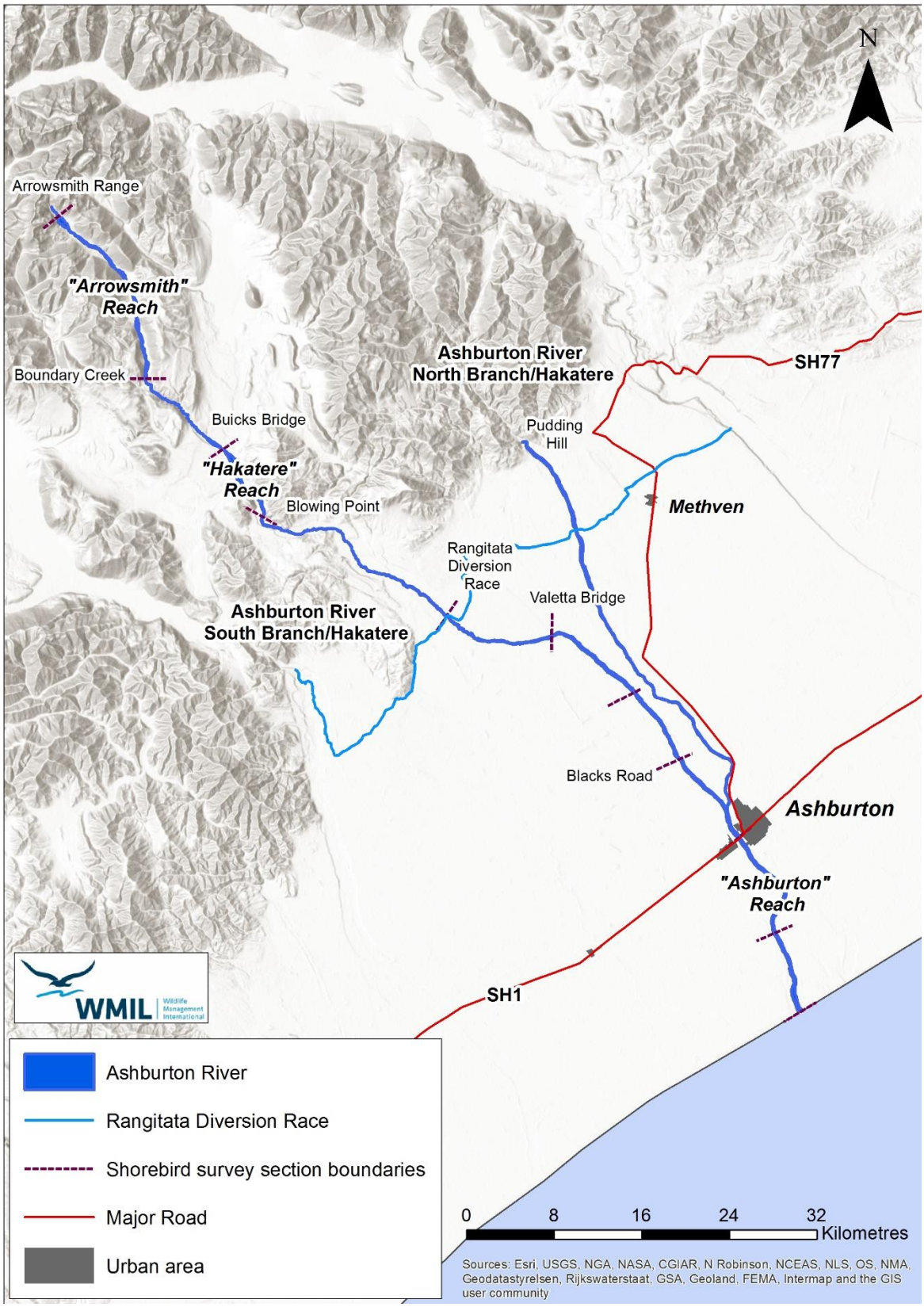


**Figure 1.1: Map of the Ashburton River/Hakatere, showing the geographic scope of this management plan.**

## 1.2 Shorebird values of the Ashburton River/Hakatere

The Ashburton River/Hakatere is considered to be one of the most important braided rivers in the Canterbury region for birdlife, supporting nationally- and regionally-significant populations of black-fronted terns (*Chlidonias albostriatus*), black-billed gulls (*Larus bulleri*), banded dotterels (*Charadrius bicinctus*), black-fronted dotterels (*Elseyornis melanops*), wrybill (*Anarhynchus frontalis*), South Island pied oystercatchers (*Haematopus finschi*), pied stilts (*Himantopus himantopus*) and black-backed gulls (*Larus dominicanus*; O'Donnell, 1992). A total of 75 bird species have been recorded on the Ashburton River/Hakatere since 1981, 31% of which (23 species) are ranked as Nationally Threatened or 'At Risk' under the New Zealand Threat Classification System (Appendix 1).

The Ashburton River/Hakatere has been identified as an Important Bird Area (IBA) by Birdlife International and Forest & Bird. This is based on the presence of five indigenous bird species with local population sizes that trigger IBA criteria, including black-billed gull, black-fronted tern, wrybill, Australasian bittern (*Botaurus poiciloptilus*) and spotted shag (*Sticticarbo punctatus*; Forest & Bird, 2016).

The Ashburton River/Hakatere and its associated lakes and wetlands have long been an important landscape and food basket for Ngāi Tahu. For Ngāi Tahu, water is a taonga left by the ancestors to provide and sustain life. All the waterways, their associated tributaries, wetlands and springs are considered significant resources, of cultural, spiritual and historical importance to Ngāi Tahu (ECan, 2011). Three Rūnanga consider the zone part of their takiwā, namely Arowhenua Rūnanga, Taumutu Rūnanga and Ngāi Tūāhuriri Rūnanga (Ashburton Zone Committee, 2015). In earlier times, the eggs of karoro (black-backed gulls), tarāpuka (black-billed gulls) and kakīānau (black swans) were harvested for food, as were moulting pārera (grey ducks). Native fish species including īnanga (*Galaxias maculatus*), kanakana (lamprey; *Geotria australis*) and tuna (freshwater eels; *Anguilla* spp.) were also important food resources, and continue to be harvested by members of the local Rūnanga and the wider local community (John Henry, *personal communication*).

The South Branch of the Ashburton River/Hakatere supports much larger numbers of shorebirds than the North Branch of the river (O'Donnell, 1992). On the South Branch, three reaches of river support a particularly high diversity and/or density of shorebirds. The 17 km "Arrowsmith Reach", from the base of the Arrowsmith Range downstream to the Boundary Creek confluence supports relatively high numbers of banded dotterels, black-fronted terns and New Zealand pipits (*Anthus novaeseelandiae*; O'Donnell, unpublished data). Further downstream, the 9 km "Hakatere Reach" also supports relatively high numbers of banded dotterels, black-fronted terns and New Zealand pipits, together with a small number of wrybill (Grove, 2005; Cochrane, 2015; O'Donnell, unpublished data). Downstream from the "Hakatere Reach" the river becomes much more channelised and shorebirds become either rare or absent. Shorebird numbers begin to increase again downstream from the Rangitata Diversion Race, with particularly high densities of banded dotterels, pied stilts, SI pied oystercatchers and black-fronted terns found on the 27 km "Ashburton Reach" between Blacks Road and the coast. The 18 km section of this reach between the SH1 Bridge and the coast also provides habitat for the majority of the black-fronted dotterels found on the Ashburton River/Hakatere (Figure 1.2; O'Donnell, unpublished data).

An outstanding feature of the "Ashburton Reach" of the river is the large number of Nationally Critical black-billed gulls that typically use this reach as breeding habitat during the summer

months (Figure 1.3). Historically, the Ashburton River/Hakatere South Branch has had some of the highest counts of black-billed gulls of any braided river surveyed, with just under 11,000 birds recorded in 1986 and counts of over 10,000 birds recorded in 1982, 1984 and 1987 (O'Donnell, 1992). Gull numbers have declined in more recent years, however breeding colonies of several thousand birds still typically establish each summer, usually either immediately upstream, or downstream of the SH1 Bridge (Schmechel, 2008; McClellan, 2015; Mischler & Bell, 2016a; O'Donnell, unpublished data). During the 2014/15 breeding season, a colony of 9,545 black-billed gulls was recorded on the lower Ashburton/Hakatere River, the largest colony recorded in the Canterbury region that year (McClellan, 2015). During the 2015/16 breeding season, two much smaller colonies comprised of 1,198 and 203 birds were situated near the SH1 Bridge and at the Ashburton River mouth respectively (Mischler & Bell, 2016a). This sudden drop in gull numbers between 2014/15 and 2015/16 is thought to be due to a large number of gulls relocating from the Ashburton River/Hakatere to the Rangitata River mouth during the second year, possibly in response to extensive woody weed growth in the bed of the lower Ashburton River/Hakatere (Mischler & Bell, 2016a).

The Ashburton River mouth provides important year-round habitat for a large number of shorebird and waterfowl species, with more bird species having been recorded at this site than at any other location in the Ashburton District (Andrew Crossland, unpublished data). An outstanding feature of the river mouth is the very large concentrations of spotted shags that roost on the shingle spit at the mouth of the river during autumn and winter. Flocks of up to 6000 spotted shags have been observed roosting at the river mouth (Crossland, 2016), most likely comprised of juvenile and post-breeding adult birds from the nearby Banks Peninsula population (Doherty & Bräger, 1997). The river mouth and shingle spit also provides important breeding habitat for black-billed gulls (Mischler, 2016) and banded dotterels during summer months. During autumn and winter, the river mouth and shingle spit also provides foraging and roosting habitat for a range of coastal and freshwater bird species, including black shags (*Phalacrocorax carbo*), SI pied oystercatchers, variable oystercatchers (*Haematopus unicolor*), red-billed gulls (*Larus novaehollandiae*), white-fronted terns (*Sterna striata*), black-fronted terns and Caspian terns (*Hydroprogne caspia*; eBird, 2002).

Between 1981 and 2015 there have been significant declines in the numbers of black-fronted terns, black-billed gulls, banded dotterels, SI pied oystercatchers and pied stilts counted each summer on the Ashburton River/Hakatere South Branch (O'Donnell, 1992; O'Donnell, unpublished data). These declines are likely to have occurred due to a combination of ongoing habitat loss and loss of habitat quality resulting from declining mean low flows, the encroachment of woody weeds into open gravel habitats and depredation by mammalian predators (O'Donnell, 1992). In more recent years, these declines have been at least partially offset by the local recovery of banded dotterels, black-fronted terns and wrybill in the "Hakatere Reach" of the Ashburton River/Hakatere South Branch, likely a consequence of the intensive pest animal and weed control work that has been carried out by Environment Canterbury and the Department of Conservation along this stretch of river and in the surrounding landscape since 2003 (Cochrane, 2015; O'Donnell, unpublished data).

In contrast to the ongoing declines being observed in a number of these locally-breeding shorebird species, annual counts of black-fronted dotterels have steadily increased since 1981. Black-fronted dotterels are a recent coloniser to New Zealand having first been recorded in Hawkes Bay in 1954 (Brathwaite, 1956). This increase in the number of black-fronted dotterels observed on the Ashburton River/Hakatere is likely a consequence of the ongoing range expansion of this species in New Zealand in recent decades (Robertson et al, 2007). At present, black-fronted dotterels are mainly restricted to the "Ashburton Reach" of

the Ashburton River/Hakatere South Branch, but are steadily expanding their distribution up river, having now been recorded as far upstream as the Valetta Bridge (O'Donnell, unpublished data).

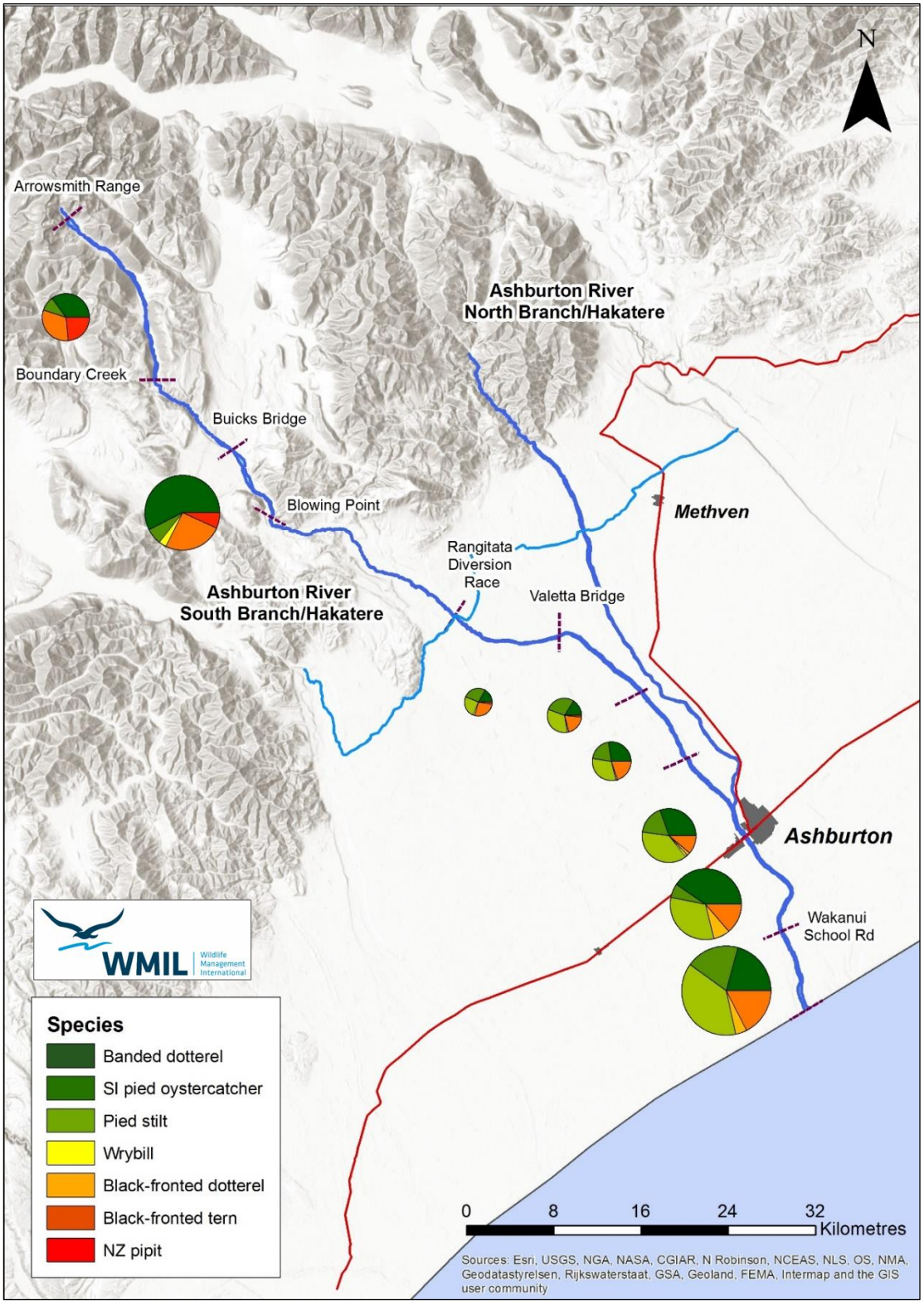


**Figure 1.2: Mean relative abundance of shorebirds (excluding gulls) along the Ashburton River/Hakatere South Branch between 2006 and 2015 Source: Colin O'Donnell, unpublished data.**

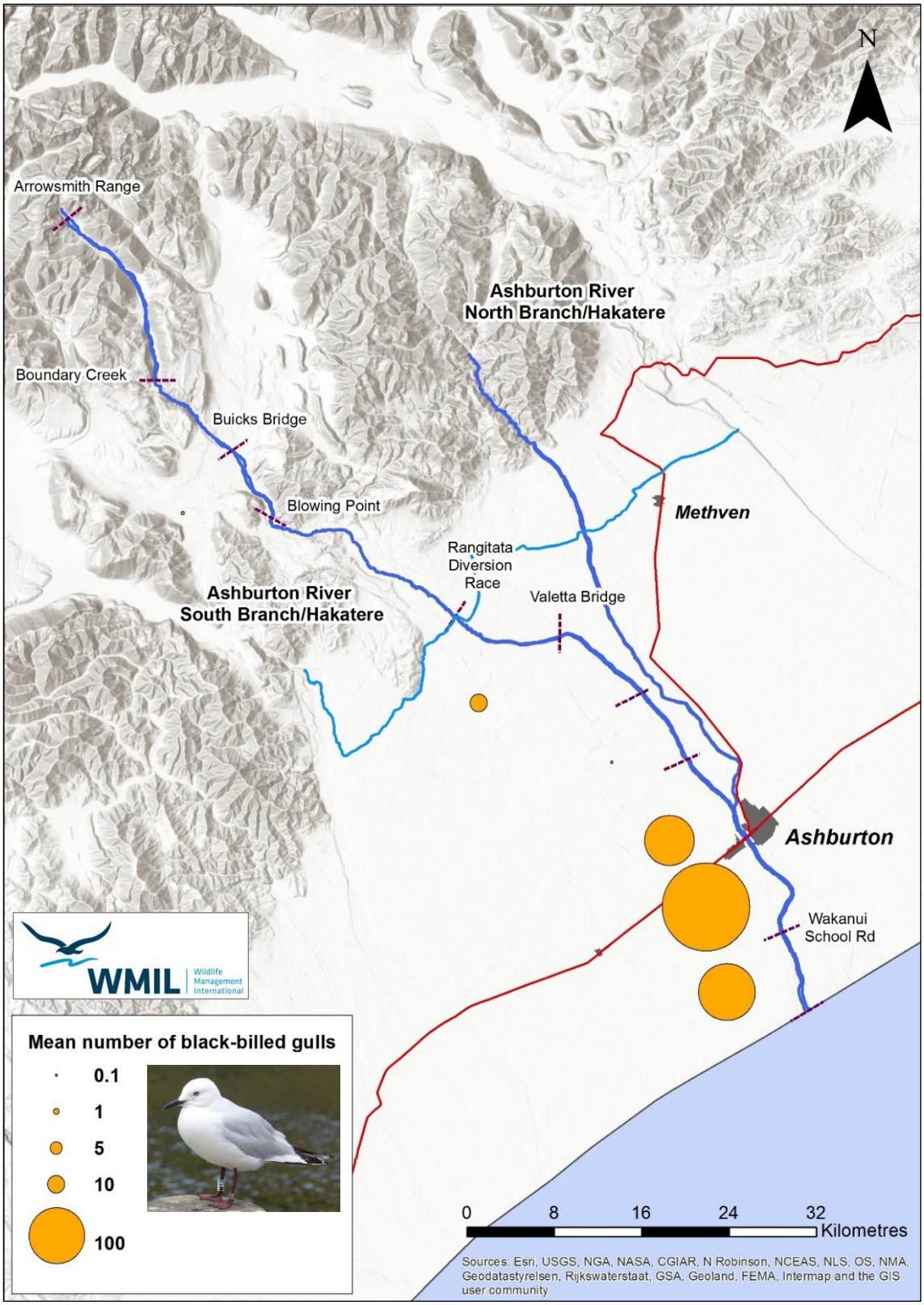


**Figure 1.3: Mean annual counts of black-billed gulls along the Ashburton River/Hakatere South Branch between 2006 and 2015. Source: Colin O'Donnell, unpublished data.**

## 1.3 Threats to the shorebird values of the Ashburton River/Hakatere

### Water abstraction

The maintenance of natural flow regimes on braided rivers has long been recognised as being essential for maintaining high quality feeding and breeding habitat for shorebirds (Hughey, 1985, 1997, 1998; Hughey et al, 1987). A high diversity of microhabitats, including both shallow and deep water, runs and riffles of intermediate depth and dry gravel beaches and islands of different heights is needed to maintain the full diversity of riverbed-nesting birds on braided rivers (Hughey, 1985; Hughey et al, 1989, Rebergen, 2011 and 2012).

Abstraction of water from rivers and the consequent reduction in mean and peak flows reduces the size and number of small channels and gravel islands in rivers and reduces the total area of aquatic feeding habitat for birds (Bowden et al, 1982; Robertson et al, 1983; Hughey, 1987). Furthermore, braided rivers are naturally unstable habitats, and it's this feature that naturally limits the establishment of woody vegetation and allows the maintenance of the large areas of open gravel habitats required by riverbed-nesting shorebirds. The lower and less variable flows resulting from water abstraction can reduce the natural erosion and scouring of the riverbed, leading to dramatic increases in woody weed growth such as that seen on the lower Ashburton River/Hakatere within the last 30 years (Miall, 1977; O'Donnell 1992). In extreme situations, if flows are reduced to the extent that channels dry up (as can occur in the lower reaches of the Ashburton River/Hakatere North Branch) there will be an almost total loss of local shorebird populations (e.g. Maloney 1999).

The Ashburton Zone Implementation Programme clearly identifies that the authorised takes from the Ashburton River/Hakatere are so great that the river is being placed under severe pressure (ECan, 2011). It states that "there is widespread recognition…of the pressure the river is under from reduced flows due to significant consumptive use and the impacts of changing land use…" According to the ZIP, both summer and winter flows in the Ashburton River/Hakatere are over-allocated. Summer allocations currently represent 191% of the Seven Day Mean Annual Low Flow (7DMALF) and winter allocations represent 133% of the 7DMALF (ECan, 2011).

These high rates of water abstraction are likely to be exacerbating the impacts of other threats to shorebird values mentioned below. For instance, O'Donnell (2000) states that "river flows and [woody] weed problems appear to be closely linked", due to the fact that lower flows create more stable gravel habitats into which woody weeds can invade more easily. Similarly, lower river flows can reduce the number and area of gravel islands that provide comparatively safe nesting habitat for shorebirds due to being less accessible to mammalian predators (Bell & McArthur, 2016).

### Flood protection management activities

A number of the activities carried out by local authorities to manage the risk of flooding can have detrimental impacts on shorebirds and their habitats. Disturbance of dry gravel habitats during woody weed removal, gravel extraction, gravel ripping or contouring activities carried out during the breeding season can lead to the local destruction of nests and chicks, reducing the productivity of shorebird populations (Cameron, 2013 & 2015; McArthur et al, 2015). The construction of stopbanks, rock groynes, willow planting, gravel island removal and channel straightening can increase river channelisation and reduce habitat quality for shorebirds (O'Donnell, 2000; Rebergen 2011 & 2012).

Conversely, some of these activities can have positive impacts on locally-breeding shorebirds provided that local losses of nests, eggs and chicks are minimised. In the absence of large, regular floods, the mechanical disturbance of dry gravels during gravel extraction, gravel ripping or contouring activities can help reduce woody weed encroachment and maintain open habitats for shorebirds. On the Ruamahanga River and its tributaries, these activities appear to have helped to maintain stable or increasing populations of banded dotterels, black-fronted dotterels and black-billed gulls over the past 30 years, during which time shorebird populations on nearby rivers not subject to flood protection activities have declined (Rebergen, 2011; 2012; McArthur et al, 2015).

Environment Canterbury and Ashburton District Council have statutory responsibilities under the Resource Management Act (1991) for the management of flood risks from the Ashburton River/Hakatere. Measures taken to manage flood risks posed by the river include the construction of stopbanks, the planting of willows to protect and stabilise river banks and gravel extraction, woody weed control and channel straightening to streamline flows and to maintain the flood-bearing capacity of the active riverbed (Boyle, 2012).

## Recreational use of the riverbed

Unintentional disturbance by people and vehicles can cause localised losses of eggs, chicks and adult birds during the breeding season (O'Donnell & Moore, 1983; Robertson et al, 1983), Similarly, the prolonged or repeated disturbance of roosting birds can cause them to abandon traditional habitats, increasing competition for remaining disturbance-free habitats (Woodley, 2012). The effects of prolonged or repeated disturbance of birds is difficult to quantify, however by increasing energy expenditure and/or reducing time spent roosting and foraging, higher rates of disturbance may reduce the survival and productivity of affected birds, potentially contributing to population declines (Pfister et al, 1992; Lord et al, 1997).

On the Ashburton River/Hakatere, disturbance impacts are likely to occur mainly during the shorebird breeding season (August – February), as the majority of the shorebirds that breed on the Ashburton River/Hakatere migrate to coastal sites elsewhere during the non-breeding season (Heather & Robertson, 2015). Disturbance impacts are likely to be highest closer to urban centres and in the vicinity of river access points, so the "Ashburton Reach", with its proximity to Ashburton Township and multiple legal access points to the river is particularly at risk to disturbance impacts (Figure 1.4).

The Ashburton River mouth, and particularly the shingle spit is at risk from disturbance caused by 4WDs, fishers and other recreational users all year round. The shingle spit provides important breeding and roosting habitat for a large variety of shorebird species year-round, and is a particularly important roosting sites for large numbers of spotted shags.

**Figure 1.4: Convoy of 4WD vehicles driving through a black-fronted tern colony the lower Ashburton River/Hakatere, October 2015. Adult black-fronted terns can be seen flying around the rear (right hand) vehicle. In this case the disturbance was unintentional, the occupants of the vehicles believed that the birds were nesting in the lupins, so drove on the open shingle in an attempt to avoid damaging nests. Source: Forest & Bird.**

## Vandalism and illegal hunting

Vandalism and the illegal hunting of shorebirds can cause catastrophic losses of adult birds, eggs and chicks, leading to sudden and drastic local population declines. Most of New Zealand's shorebird species are relatively long-lived with comparatively low reproductive rates (Dowding & Murphy, 2001; Heather & Robertson, 2015). Due to these life history traits it can take many years, or decades for shorebird populations to recover from sudden, catastrophic mortality events.

Some species are particularly vulnerable to vandalism and hunting due to negative public perception and a history of persecution (Woodley, 2012). Gulls are particularly at risk, due to their ubiquitous distribution and scavenging behaviours. An added complication is that relatively few people can reliably distinguish between black-billed gulls (Nationally Critical, and absolutely protected under the Wildlife Act, 1953) and black-backed gulls (Not Threatened, and one of our few native species that is not legally protected). Shags are another group of birds that have a history of illegal persecution, due to an erroneous assumption that they compete with fishers for commercial, recreational and sport fish (Dickinson, 1951).

On the lower Ashburton River/Hakatere, two shorebird species are particularly at risk of vandalism or illegal hunting. The large black-billed gull colony that typically establishes each summer in the vicinity of the SH1 Bridge is a very large and conspicuous feature and has attracted the attention of vandals in the past. In November 2008, a vehicle was intentionally

driven through this colony, causing the deaths of 110 adults and destroying an unknown number of eggs and chicks. (Schmechel, 2008). Following a similar incident in November 2012, a man was prosecuted and sentenced to two months' imprisonment for driving his vehicle into the colony, destroying an unknown number of nests and eggs (Ashburton Guardian, 2013).

The very large concentrations of spotted shags that roost on the shingle spit at the Ashburton River mouth is similarly at risk. Despite the fact that spotted shags feed almost exclusively at sea and forage up to 15km offshore (Heather & Robertson, 2015), some members of the local community are calling for the spotted shags at the Ashburton River mouth to be culled, due to a belief that they're competing with recreational fishers for freshwater fish and mahinga kai species (John Henry, *personal communication*). In January 2016, over 50 birds including 16 black-billed gulls, four white fronted terns, one SI pied oystercatcher and one spotted shag were illegally shot at the Ashburton River mouth (Edith Smith, *personal communication*).

## Woody weeds

Introduced weeds such as broom (*Cytisus scoparius*), gorse (*Ulex europaeus*), Russell lupin (*Lupinus polyphyllus*), sweet briar (*Rosa rubiginosa*) and willow (*Salix spp.*) are particularly invasive in braided river habitats and pose a significant threat to shorebird populations (O'Donnell & Moore 1983; Brown 1999). Woody weeds reduce the total area of open gravel habitats available to shorebirds and are also likely to increase the channelisation of the river, leading to the loss of minor braids and gravel islands which provide particularly high quality shorebird foraging and nesting habitat. Furthermore, dense stands of woody weeds provide shelter and cover for mammalian predators, so likely contribute to higher depredation rates on breeding shorebirds (O'Donnell & Moore, 1983; Robertson et al, 1983; O'Donnell 1992; Hughey & Warren 1997 and Rebergen et al, 1998).

The two upper reaches of the Ashburton River/Hakatere South Branch that currently support high numbers of shorebirds (the "Arrowsmith" and "Hakatere" reaches described above) are both relatively weed-free at present, however the Hakatere Reach is now being encroached upon by broom, sweet briar, Russell lupin, yellow tree lupin, false tamarisk (*Myricaria germanica*) and grey willow (*Salix cinerea*; Figure 1.5).

On the lower reaches of the Ashburton River/Hakatere, particularly the "Ashburton Reach" described above, weed encroachment has been steadily worsening since the early 1980s. O'Donnell (1992) observed that there had been a "considerable increase in the extent and encroachment of introduced shrubs, particularly broom, gorse and…willows" on the river between 1981 and 1990. He also noted that there was a strong relationship between the extent of woody weed encroachment observed and the total abundance of shorebirds counted along the river. Since the early 1980s, shorebird numbers have steadily declined as weed encroachment has worsened, although shorebird numbers temporarily bounced back following major flood events that cleared woody vegetation from large areas of riverbed. Such events only provided temporary improvement in habitat quality however, as woody weeds typically re-colonised these clear areas of riverbed within 3-4 seasons following a major flood event. Based on these observations, O'Donnell (1992) concluded that "if the wildlife values are to be maintained [on the Ashburton River/Hakatere], then weed control is essential."

Woody weed growth within Ashburton Reach has been particularly severe over the past 2-3 years, with the majority of gravel beaches and islands now covered in dense thickets of broom and yellow tree lupin (*L. arboreus*) (Figure 1.6). This weed growth has led to rapid, local declines in several shorebird species, and likely caused a large number of black-billed gulls to

abandon their traditional nesting site near the SH1 Bridge last summer, in favour of nesting at the Rangitata River mouth (O'Donnell, unpublished data; Mischler & Bell, 2016a).

**Figure 1.5: Broom and Russell lupin infestation on the true left bank of the "Hakatere Reach" of the Ashburton River/Hakatere South Branch. Source: Cochrane (2015).**

**Figure 1.6: Extensive tree lupin infestation and prospecting black-billed gulls on the Ashburton River/Hakatere near the SH1 Bridge in late September 2015. Source: Edith Smith/Forest & Bird.**

## Mammalian predators

There is now a very large body of evidence demonstrating that introduced mammalian predators including feral cats (*Felis catus*), ferrets (*Mustela furo*), stoats (*M. erminea*) and hedgehogs (*Erinaceus europaeus*) have a major impact on the survival and productivity of riverbed-nesting shorebirds and are contributing to ongoing population declines of several species. Species such as wrybill, banded dotterels and black-fronted terns are particularly vulnerable to predation (e.g. Rebergen et al, 1998; Dowding & Murphy, 2001; Sanders & Maloney, 2002; Bell & McArthur, 2016; Figure 1.7).

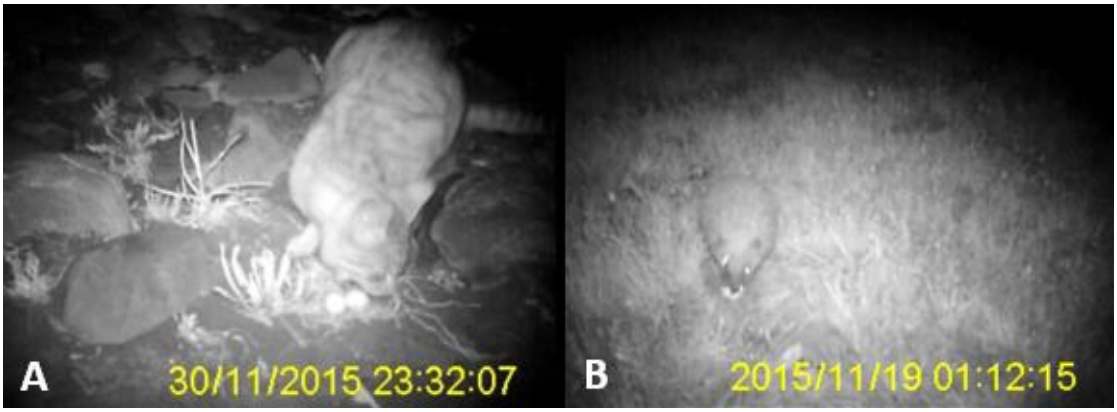


**Figure 1.7: A feral cat (A) and a hedgehog (B) preying on black-fronted tern nests on the Upper Clarence River, November 2015. Source: Bell & McArthur, (2016).**

All of these predator species are present and widespread on the Ashburton River/Hakatere, and a regularly trapped in predator control operations underway in both the Hakatere and Ashburton Reaches of the river (Cochrane, 2015). Local increases in the abundance of shorebirds in the Hakatere Reach since 2003 indicates that the trapping programme on this part of the river is succeeding in reducing depredation rates by mammalian predators (O'Donnell, unpublished data). However, predators are likely to be contributing to the ongoing declines in shorebird numbers being observed from the Valetta Bridge downstream to the sea.

## Black-backed gulls

There is a growing body of evidence demonstrating that black-backed gulls can be significant predators of other shorebird species, including black-billed gulls and black-fronted terns. Impacts are likely to be highest when large numbers of black-backed gulls are co-existing with these more vulnerable species, and particularly when nesting colonies are situated in close proximity (Mischler & Bell, 2016b). Although black-backed gulls are a native species, they have benefited substantially from the human settlement of New Zealand, and their numbers are now substantially higher than at any time in the past (Heather & Robertson, 2015). As a result, black-backed gulls are one of the few native bird species not afforded any level of protection under the Wildlife Act (Miskelly, 2013).

The Ashburton River/Hakatere South Branch supports a very large breeding population of black-backed gulls. Numbers are relatively low in both the Arrowsmith and Hakatere Reaches, the latter being a consequence of culling operations carried out by Environment Canterbury (Grove, 2005). Black-backed gull numbers continue to be very high on the lower reaches of the Ashburton River/Hakatere from the Rangitata Diversion Race downstream, particularly

the reaches between Valetta Bridge and Shearers Road and the “Ashburton Reach” between Blacks Road and the sea (Figure 1.8). During summer months, breeding colonies comprising up to 2500 birds have been recorded on these lower reaches of the river (O’Donnell, unpublished data).

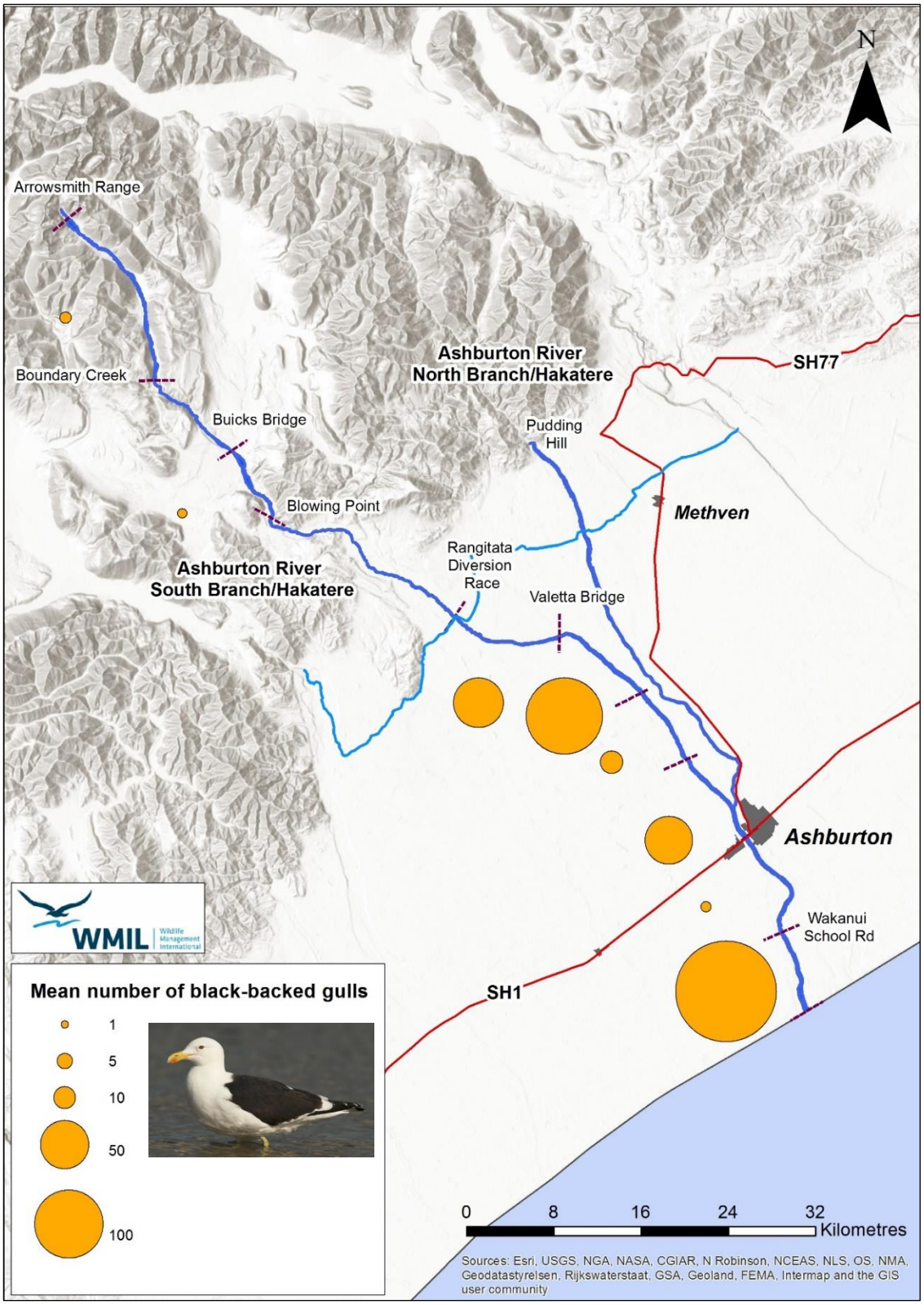


**Figure 1.8: Mean annual counts of black-backed gulls along the Ashburton River/Hakatere South Branch between 2006 and 2015. Source: Colin O'Donnell, unpublished data.**

Table 1.1 below summarises the key threats impacting the bird values of the Ashburton River/Hakatere that are described above, and identifies which reaches of river are being affected by each threat. The codes alongside each threat correspond to the management objectives listed in Table 2.1, which in turn correspond to the management activities listed in the Operational Plan (Table 3.1). These codes are used to ensure that each management action taken is targeted at reducing or eliminating one or more specific threats that have been identified.

Many of the threats identified here can, and do interact with each other. For example, higher rates of water abstraction can increase the rate of woody weed encroachment into the open gravel habitats required by nesting shorebirds. Furthermore, the effects of these threats on local shorebird populations can be both direct (e.g. vandalism of black-billed gull colonies causing local losses of adults, eggs and chicks) and indirect (e.g. woody weeds providing improved habitat for mammalian predators and leading to an increase in depredation rates on shorebirds). Figure 1.9 below summarises the interactions between the various threats summarised in Table 1.1, and how each threat directly or indirectly impacts local shorebird populations.

**Table 1.1: Key threats to river bird values on the Ashburton River/Hakatere (SB = Ashburton River/Hakatere South Branch; NB = Ashburton River/Hakatere North Branch)**

| Threat code | Threat and impact on river bird values | Affected area(s) |
|---|---|---|
| **Human activities** | | |
| **HA-1*** | High levels of water abstraction is reducing mean water flows in the river, likely increasing the rate of woody weed encroachment in open gravel habitats and improving predators' ability to access and depredate shorebird eggs, chicks and adult birds. Low water flows are also likely to be improving 4WD and foot access in the riverbed, leading to higher rates of human disturbance of nesting shorebirds. | SB: From the Inverary Bridge to the sea;<br>NB: From Pudding Hill to the NB/SB confluence |
| **HA-2*** | ECan flood protection management activities, including aerial spraying and mechanical removal of weeds, gravel extraction, stopbank and rock groyne construction and willow planting has the potential to disturb nesting shorebirds when activities are carried out during the breeding season. The cumulative effects of these activities may also lead to greater channelization of the riverbed over time, reducing the overall extent and quality of shorebird habitat on the river. | SB: From the Inverary Bridge to the sea.<br>NB: From Pudding Hill to the NB/SB confluence. |
| **HA-3** | Recreational users, including 4WDs, fishers, dog-walkers and bird-watchers have the potential to disturb shorebirds, resulting in localised losses of eggs and chicks and lower annual productivity. | Entire river. |
| **HA-4** | Intentional vandalism and illegal hunting or culling of local bird populations can result in catastrophic losses of adults, chicks and eggs. Species at particular risk include black-billed gulls and spotted shags. | From SH1 road bridge to river mouth. |
| **Pest plants** | | |
| **PP-1** | Woody weeds (primarily broom, gorse, lupin and willow spp.) are encroaching on the riverbed and reducing the area of open gravel habitats used by locally-breeding shorebirds. Woody weeds also provide improved habitat and cover for mammalian predators. | SB: From Buicks Bridge to the sea<br>NB: From Pudding Hill to the NB/SB confluence. |
| **Pest animals** | | |
| **PA-1** | Introduced mammalian predators (principally possums, mustelids, cats and hedgehogs) are reducing the survival and productivity of locally-breeding shorebirds by preying on eggs, chicks and adult birds. | Entire river |
| **PA-2** | Native black-backed gulls are likely to be reducing the productivity of other (threatened) shorebird species by preying on eggs and chicks. The presence of large black-backed gull colonies on the river may also the area of habitat available to these more threatened shorebird species due to competitive exclusion and predator avoidance behaviours. | SB: From the Valetta Bridge to the sea. |

* Any threats marked with an asterisk are not addressed by actions in this management plan. In the case of HA-1 above, this threat is being addressed in other planning documents, namely the Canterbury Water Management Strategy, Ashburton Zone Implementation Programme and Canterbury Land and Water Regional Plan which together provide a framework for addressing water abstraction issues in the Ashburton River/Hakatere catchment (CWMS, 2010; ECan 2011; ECan, 2015). In the case of HA-2, this threat is being addressed in the Code of Practice documents governing activities carried out by ECan for the purposes of flood management (ECan 2015b; 2015c). However, in order to effectively manage the shorebirds of the Ashburton River/Hakatere, it is important to be aware of all existing threats to the bird values of the river, hence the inclusion of these threats in the table above.

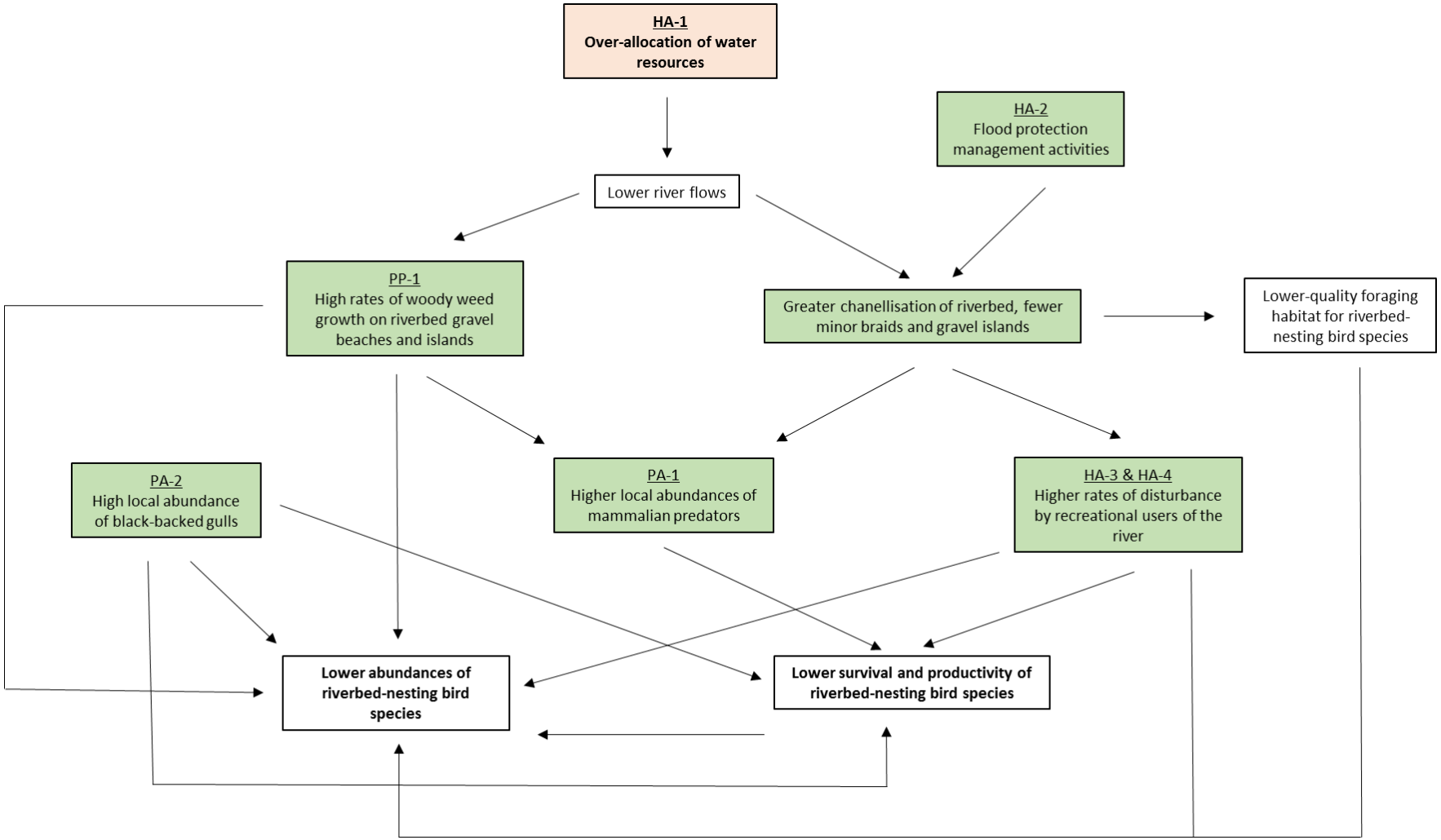


**Figure 1.9: Interactions and effects of key threats to the shorebird values of the Ashburton River/Hakatere.**

## 1.4 Landowners and stakeholders

### Environment Canterbury Regional Council

The roles and functions of Environment Canterbury Regional Council (ECan) are set out by the Local Government Act (2002). Among these functions, ECan is responsible for managing the effects of using freshwater, land, air and coastal waters, by developing regional policy statements and through the issuing of consents under the Resource Management Act (1991). ECan is also charged with managing rivers in the Canterbury region in order to mitigate soil erosion and for flood control under the Soil Conservation and Rivers Control Act (1941).

Regional Councils have a statutory requirement to take into account a range of natural and cultural values under the Resource Management Act. These include recognising and providing for the protection of significant habitats of indigenous fauna from inappropriate subdivision, use and development (Section 6c) and recognising the relationship of Māori and their culture with taonga (Section 6e). There is also a requirement to have a particular regard to the intrinsic values of ecosystems (Section 7d).

The broad policy direction for ECan is described in the Canterbury Regional Policy Statement (ECan, 2013), and includes:

- Chapter 8, Objective 3, Policy 4: Areas of indigenous vegetation and habitats of indigenous fauna…should be protected from adverse effects
- Chapter 9, Objective 1, Policy 1: Flow regimes and water levels should be set to protect basic instream values including ecological values
- Chapter 10, Objective 1, Policy 1: Land use activities should avoid causing significant adverse effects on the significant habitats of indigenous flora and fauna within the beds of rivers and lakes and their margins.

Environment Canterbury is responsible for flood management activities on the lower reaches of the Ashburton River/Hakatere, including woody weed control, the construction and maintenance of stopbanks and groynes, riparian willow planting and gravel extraction. ECan's Flood Protection staff have indicated a willingness to assist with some of the management actions listed in this plan, including providing technical support regarding the creation and maintenance of gravel islands to provide safe nesting habitat for shorebirds.

Environment Canterbury staff have also provided technical advice and carried out advocacy work to support the efforts of local Forest & Bird members to protect the SH1 black-billed gull colony.

Since 2003, Environment Canterbury have funded intensive pest animal and weed control work in the Hakatere Reach of the Ashburton River/Hakatere to improve the breeding success of locally-breeding shorebirds. ECan similarly funds pest control work in the lower Ashburton River/Hakatere, between the SH1 Bridge and the sea.

Environment Canterbury also jointly operates the Ashburton Zone Committee, which is charged with implementing the Canterbury Water Management strategy in the Ashburton Zone.

### Ashburton District Council

The Ashburton River/Hakatere catchment falls within the Ashburton District, for which the Ashburton District Council is the territorial authority. The roles and functions of the Ashburton District Council are largely set out by the Local Government Act (2002). Among these functions, the Ashburton District Council is responsible for the provision of local infrastructure including water, sewerage, stormwater and roads; and controlling the effects of land use, and the effects of activities on the surface of lakes and rivers.

In 2010 the Ashburton District Council established the Biodiversity Working Group, a team of people from across the Ashburton District with an interest in the district's natural environment. A key purpose of the Biodiversity Working Group is to prepare and implement a Biodiversity Action Plan, the purpose of which is to provide a clear set of objectives to coordinate biodiversity protection work in the Ashburton District (ADC, 2011).

Ashburton District Council also jointly operates the Ashburton Zone Committee, which is charged with implementing the Canterbury Water Management strategy in the Ashburton Zone.

### Ashburton Zone Committee

The Ashburton Zone Committee is one of 10 water zone committees in the Canterbury Region established as part of the Canterbury Water Management Strategy 2009 (ECan, 2011). The Ashburton Zone Committee operates as a joint committee of Ashburton District Council and Environment Canterbury, but includes representatives from the wider community.

The purpose and function of the committee is to facilitate community involvement in the development, implementation, review and updating of a Zone Implementation Programme that gives effect to the Canterbury Water Management Strategy in the Ashburton Zone. The Ashburton Zone Implementation Programme was published in November 2011 and subsequent to this the Ashburton Zone Committee has led the development of a new minimum flow regime for the Ashburton River/Hakatere which has now been incorporated into the Canterbury Land and Water Regional Plan (Ashburton Zone Committee, 2015; ECan, 2015). In addition to this planning work, the Ashburton Zone Committee has been driving on-the-ground actions to improve the state of freshwater resources, including the distribution of almost $500,000 to 33 community-led biodiversity projects (Ashburton Zone Committee, 2015).

### Land Information New Zealand (LINZ)

Land Information New Zealand (LINZ) is a central government agency responsible for managing land titles, geodetic and cadastral survey systems, topographic and hydrographic information and managing Crown property. The active beds of most braided rivers are crown land administered by the Commissioner of Crown Lands, and are managed by LINZ on behalf of the commissioner. Among other roles, LINZ undertakes weed and animal pest control on crown land including on braided rivers (O'Donnell et al, undated).

LINZ currently funds gorse and broom control on the upper reaches of the Ashburton River/Hakatere South Branch, upstream of Hakatere (http://www.linz.govt.nz/crown-property/using-crown-property/biosecurity/control-programmes; accessed 29/9/2016).

### Department of Conservation

The Department of Conservation (DoC) is the central government agency charged with conserving New Zealand's natural and historic heritage. The Conservation Act (1987) sets out the majority of DoC's responsibilities and roles, which includes administering and enforcing another 25 Acts of Parliament, including the Wildlife Act (1953) and the Reserves Act (1977).

On the Ashburton River/Hakatere, DoC has worked in the past to enforce the Wildlife Act by investigating a number of cases of intentional vandalism and illegal hunting of absolutely protected bird species (e.g. Schmechel, 2008; Ashburton Guardian, 2013). DoC staff have also provided support and technical advice regarding the management of the SH1 black-billed gull colony and have been supporting the management of braided river habitat management in the Hakatere Reach by monitoring the nesting success of several shorebird species and by leading weed control efforts within the Hakatere Conservation Park.

### Arowhenua Rūnanga

The Arowhenua Rūnanga is one of 18 regional Papatipu Rūnanga that exist to uphold the mana of the Ngāi Tahu people over the land, the sea and the natural resources in their respective takiwā. The Arowhenua Rūnanga therefore provides representation of Ngāi Tahu interests at the local level, by engaging with local government agencies and the wider community (Te Rūnanga o Ngāi Tahu, 1996).

The Arowhenua Rūnanga, along with Tuahuriri and Taumutu Rūnanga have representatives on the Ashburton Zone Committee to represent the interests and views of their respective Rūnanga regarding water management issues in the Ashburton Zone.

### Forest & Bird

Forest & Bird is New Zealand's leading independent conservation organisation working to protect and restore New Zealand's wildlife and wild places.

The Ashburton Branch of Forest & Bird has a particular focus on protecting and managing the biodiversity values of braided rivers in the area, including the Ashburton River/Hakatere. Branch members have been instrumental in lobbying for the preparation of this management plan, and have advocated for improvements in the management of the Ashburton River/Hakatere for many years. Branch members have also provided invaluable assistance in carrying out annual shorebird counts along up to 124 km of the Ashburton River/Hakatere since the early 1980s, creating a 35-year dataset describing the state and trends in shorebird populations on the river (O'Donnell, 1992; Don Geddes, personal communication). This dataset has now been used both to identify high priority reaches of the river for biodiversity management (Grove, 2005) and to demonstrate that the Ashburton River/Hakatere met Birdlife International's criteria to be designated an Important Bird Area (Forest & Bird, 2016).

Ashburton Branch members have also been involved in the monitoring and management of the SH1 black-billed gull colony, and the installation and maintenance of signage at river access points upstream and downstream of the colony. Branch members have also been assisting the Department of Conservation to carry out wilding conifer control in the Hakatere Conservation Park over a number of years.

### BRaid

BRaid is an Incorporated Society formed in 2006 by individuals from across the South Island who shared a concern about the declining state of New Zealand's braided river species and ecosystems. BRaid functions as an umbrella group, working to protect, enhance and restore braided river ecosystems through cooperation and partnership with iwi, individuals, schools, community groups and government departments (http://braid.org.nz/about-braid/; accessed 29/09/2016).

In the past, BRaid has worked with the Ashburton branch of Forest & Bird to raise community awareness of the bird values and threats to the Ashburton River/Hakatere, with a particular emphasis on the SH1 black-billed gull colony.

### Birds New Zealand

Birds New Zealand (the Ornithological Society of New Zealand, Inc.) is an incorporated society dedicated to the study of birds in New Zealand. A key aim of the society is to assist the conservation and management of birds by providing information from which sound management decisions can be derived (OSNZ, 2006).

Members from the Canterbury Region of Birds New Zealand have been involved in the shorebird surveys that have been carried out on the Ashburton River/Hakatere since 1981, and have assisted with raising awareness of the shorebird values of the Ashburton River/Hakatere among the general public. Canterbury Region members have also carried out regular bird counts and surveys at the Ashburton River mouth, and some of these counts are publicly accessible on the New Zealand eBird database, an online open-access bird observation database jointly administered by Birds NZ and the Cornell Lab of Ornithology.

### Mid-Canterbury Four Wheel Drive Club, Inc.

The Mid-Canterbury Four Wheel Drive Club is an Incorporated Society affiliated to the New Zealand Four Wheel Drive Association catering for 4WD enthusiasts based in the mid-Canterbury area. The club holds monthly meetings and regular trips as well as off-road training for its members. The Ashburton River/Hakatere is one venue for club trips, however the club has a long-standing policy not to run trips in the river during the shorebird nesting season, between September and December.

The Club believes that the majority of the off-road vehicles disturbing nesting shorebirds on the Ashburton River/Hakatere are being operated by non-Club affiliated 4WD owners who view the Ashburton River/Hakatere as a convenient and accessible location to use their vehicles. Unfortunately, many of these 4WD enthusiasts appear to be oblivious of the damage that their activities are doing to nesting shorebirds.

### Fish & Game

Fish & Game New Zealand manages, maintains and enhances sports fish and game birds and their habitats in the best long-term interests of present and future generations of anglers and hunters. Fish & Game is a "user pays, user says" non-profit organisation that receives no government or taxpayer money (http://www.fishandgame.org.nz/about-fish-game; accessed 29/9/2016).

The Ashburton River/Hakatere is popular with local salmon and trout anglers, particularly early in the season, when there is the possibility of catching sea run brown trout (*Salmo*

*trutta*). The Hakatere Huts on the north bank of the river mouth is a popular access point to the river mouth for anglers, and good fishing water is found in the Ashburton River/Hakatere North Branch, upstream of SH72 and in the Ashburton River/Hakatere South Branch upstream from the junction of Taylors Stream at Valetta.

### Hakatere Hut Owners

The Hakatere Hut owners maintain houses and bachs at a small settlement on the northern bank of the Ashburton River mouth. In the past these owners have had input into shorebird management work on the Ashburton River/Hakatere through a group called the Ashburton River mouth Action Committee (ARMAC). This group have organised signage to be erected at the Ashburton River mouth providing visitors with information on the birds of the area. The Hakatere Hut Owners are also some of the main users of the Ashburton River mouth area, often gaining access to the river mouth via the Croys Road gate.

# 2. Objectives, management actions and performance monitoring

## 2.1 Objectives & performance measures

Objectives and performance measures help to ensure that the management activities being carried out are creating a measurable improvement to the shorebird values of the Ashburton River/Hakatere. Table 2.1 below provides a list of objectives and performance measures to guide the management activities included in this plan.

**Table 2.1: Management objectives and performance measures for the Ashburton River/Hakatere shorebird management plan.**

| Objective No. | Objective | Threat(s) to be addressed | Performance measure |
|---|---|---|---|
| 1. | There is a large and productive black-billed gull colony present on the "Ashburton Reach" of the river during most years | HA3, HA-4, PP-1, PA-1, PA-2 | 1a. Numbers of black-billed gulls breeding on the "Ashburton Reach" are stable or increasing.<br>1b. In flood-free years, an average of 0.8 chicks fledge per nest<br>1c. No adult mortality is being caused by local human-induced factors such as vandalism or disturbance. |
| 2. | There are stable, or increasing populations of banded dotterels, black-fronted dotterels, SI pied oystercatchers, wrybill and black-fronted terns on the Arrowsmith, Hakatere and Ashburton reaches of the river. | HA3, HA-4, PP-1, PA-1, PA-2 | 2a. Annual shorebird counts show that shorebird numbers are stable or increasing on the Arrowsmith, Hakatere and Ashburton reaches. |
| 3. | Disturbance of shorebirds and waterfowl at the Ashburton River mouth by people and vehicles is minimised year-round, and the river mouth continues to support a high diversity and abundance of shorebirds and waterfowl. | HA3, HA-4, PP-1, PA-1, PA-2 | 3a. Monthly bird counts show that the diversity and abundance of shorebirds and waterfowl is stable or increasing over time.<br>3b. No adult mortality is being caused by local human-induced factors such as disturbance or illegal hunting. |

## 2.2 Management actions

Management actions are targeted to work towards the objectives above by responding to the threats outlined in Table 1.1. Each management action is described briefly below, and specific actions with timeframes and estimated costs are set out in the Operational Plan in Table 3.1 below. Management actions are listed in priority order.

### Convene the Ashburton River/Hakatere Management Group

It is proposed that an Ashburton River/Hakatere Management Group be convened to coordinate and oversee the implementation of the management actions outlined in this management plan, to report on the outcomes of these management actions and to review the management plan when required.

The Management Group will be composed of representatives from key stakeholder groups, including but not restricted to: Environment Canterbury, Ashburton District Council, the Department of Conservation, Forest & Bird, Fish & Game, Arowhenua Rūnanga and the Mid-Canterbury Four Wheel Drive Club.

Each year, Environment Canterbury will oversee the preparation of an annual report summarising management outcomes and monitoring results for the Ashburton River/Hakatere, to be circulated to the management group by April each year. It is proposed that the Management Group meets at least twice a year, once in April to review the previous year's annual report, and once in June to plan the upcoming year's work programme.

### Island maintenance at SH1 black-billed gull colony

It is proposed that one or more islands be created and modified just downstream from the SH1 Bridge, to provide safer breeding habitat for black-billed gulls prior to the 2017/18 breeding season. Shorebirds typically have higher nesting success on gravel islands, rather than gravel beaches, due to the greater difficulty that mammalian predators have in reaching islands. For this reason, island creation is increasingly being used as a management tool to improve the productively of riverbed-nesting shorebirds (Figure 2.1; Bell & McArthur, 2015).

Key modifications that need to be made to the islands are to deepen the channels separating the islands from the banks of the river, and to use any excavated material to build up the height of each island to reduce the likelihood that they will be overtopped during a flood event. If the islands are covered in woody vegetation, this will need to be either scraped off or buried in order to create the open habitats required by black-billed gulls for nesting.

This work will need to be carried out using heavy machinery such as a digger or bulldozer, operated by a suitably-experienced driver. Environment Canterbury's Flood Protection staff have offered to assist with the design and planning of the works and with locating a suitable contractor to carry out the works. Depending on how robust these modifications are, and the timing and intensity of subsequent floods, there may be a need to repeat these works in subsequent years to maintain these islands on an ongoing basis.

These works will require the issuing of a Resource Consent under the Resource Management Act (1991), however it may be possible to carry out these works under the Resource Consent granted to ECan's Flood Protection department.

**Figure 2.1: An example of island engineering works carried out to improve nesting habitat quality for black-fronted terns on the upper Clarence River. The channel to the right of the bulldozer has been deepened, and the excavated material spread across the top of the island on the left-hand side of the photo, both to raise the height of the island and to bury the woody vegetation growing on its surface. Source: Bell & McArthur, 2016).**

## Woody weed control at SH1 black-billed gull colony

It is proposed that woody weeds be mechanically cleared from an eight hectare area of the bed of the Ashburton River/Hakatere immediately downstream of the SH1 Bridge prior to the 2017/18 breeding season, to provide open gravel nesting habitat for black-billed gulls and other shorebird species (see Figure 2.2).

Mechanical clearance is recommended over chemical control (herbicide application) for the initial clearance of woody weed infestations, for two reasons. Firstly, representatives of the Arowhenua Rūnanga have expressed strong concerns regarding herbicide use in the bed of the Ashburton River/Hakatere, in particular the potential effects of herbicide use on aquatic invertebrates and freshwater fish. Secondly, spraying dense infestations of woody weeds will be unlikely to confer an immediate benefit to local shorebird populations, because dead standing woody vegetation is almost as problematic for shorebirds as live woody vegetation. Clearing this woody vegetation using herbicide would either need to include the added cost of subsequent mechanical crushing or clearance, or be reliant on a relatively large flood event to scour away the dead, standing material. At present, floods of the magnitude required to scour out this vegetation occur on a frequency of 3-5 years or longer, so it's highly likely that controlling woody weeds by spraying won't have measurable beneficial impact on shorebird populations for a number of years following a control operation, if at all.

Weed control should be carried out annually, however cost savings may be able to be achieved depending on the degree and speed of re-growth. Following major floods, woody weeds can

take up to 2-3 years to re-colonise areas of riverbed (O'Donnell, 1992), so whole-scale mechanical clearance may only be required to be carried once every 2-3 years. In the intervening years, hand-pulling of weeds by volunteers, or localised spot-spraying using a knapsack sprayer (subject to the support of the Arowhenua Rūnanga) may be sufficient to prevent or slow the recolonization of woody weeds, reducing the frequency at which mechanical control would need to be carried out.

This mechanical clearance of weeds will require the issuing of a Resource Consent under the Resource Management Act (1991), however it may be possible to carry out these works under the Resource Consent granted to ECan's Flood Protection department.

**Figure 2.2: An island in the upper Clarence River before (left) and after (right) the mechanical removal of a dense broom infestation. This island had been favoured as a nesting site by black-fronted terns in three of the four preceding breeding seasons, however the terns had largely abandoned the site during the previous breeding season following the establishment of broom on the island. Source: Bell & McArthur, 2016).**

## Mammalian predator trapping at SH1 black-billed gull colony

It is recommended that the pre-existing pest animal control work being carried out on the lower Ashburton River/Hakatere be re-deployed to provide continuous mammalian predator control in the vicinity of the black-billed gull colony during the gulls' breeding season each year.

Rather than the existing regime of a rolling deployment of traps progressively trapping areas further and further downstream, permanent traps will be established at 100m spacings up to 2km upstream and downstream of the engineered islands & weed-controlled area established for black-billed gulls immediately downstream of the SH1 Bridge. Trapping efforts will continue to target the full suite of shorebird nest predators, namely feral cats, mustelids, hedgehogs, rats and possums and ideally will use a similar trap layout to that used at DoC's Ohau River black-fronted tern colony, and DoC/ECan's Clarence River black-fronted tern colonies. Namely, an alternating layout of DOC150 and DOC250 traps, with Sentinal/Timms traps deployed at every second trap site.

Traps will be baited with fresh rabbit meat, and checked once every two weeks between July and February, inclusive.

### Investigation of a total vehicle and foot access ban at the SH1 black-billed colony

It is proposed that between October and January each year (inclusive), a total ban on private vehicle and foot access to the Ashburton River/Hakatere within 200m of the SH1 black-billed gull colony be implemented, to reduce the risk of intentional, or unintentional disturbance of the colony. This ban does not apply to vehicles or machinery required to access the area for the purposes of river management or emergency response.

Signage will be installed at river access points 500m upstream and downstream of the colony, and on the riverbed itself both upstream and downstream of the colony. If feasible, temporary fencing will be erected around the colony to identify its location to river users. If the colony is within sight of the SH1 Bridge, signage on the bridge requesting people to report any disturbance events to DoC, or local police, could be installed.

Environment Canterbury and Ashburton District Council will carry out a review of legal access points to the Ashburton River/Hakatere, and investigate options for permanent or temporary closure of any access points in the close vicinity of the black-billed gull colony.

### Community education and advocacy

Building on pre-existing advocacy work, an education and advocacy programme will be designed to raise awareness in the Ashburton community of the shorebird values of the Ashburton River/Hakatere, the threats they face, and the measures they can take to avoid unintentionally disturbing birds while recreating on the river. Such a programme could include regular press releases and social media posts, particularly in the lead-up to each breeding season and to inform the public on any river access restrictions being put in place. An annual 'open day' held for recreational 4WD users on the river may provide an additional mechanism for raising awareness of the river's shorebird values, notify local users of temporary access restrictions and to suggest alternative locations for 4WD activities.

Black-billed gulls and spotted shags should be a particular focus of education and advocacy efforts, given the history of vandalism and persecution directed at these two species in particular. Finding ways to engage with local schools in order to educate younger members of the community should also be a focus, such as the competition run at Ashburton Borough School last year to produce artwork for warning signage on the river.


**Figure 2.2: Emma Moodie from Ashburton Borough School standing beside a warning sign featuring her artwork. Source: Forest & Bird.**

### Woody weed surveillance in the "Arrowsmith Reach"

The Arrowsmith Reach is currently free of the introduced weed species present on the lower reaches of the river. It is recommended that ground surveys be carried out once every two years to check for new weed infestations, including willow, broom, sweet briar, gorse, Russell lupins and false tamarisk. Any new infestations found will be delimited with the use of handheld GPS units, and a plan created to control or eradicate these new infestations as soon as possible.

### Mammalian predator trapping in the "Hakatere Reach"

The pre-existing pest animal control work being carried out on the Hakatere Reach of the Ashburton River/Hakatere will continue as planned on an ongoing, annual basis. This pest animal control work is being carried out on one of the three reaches of river identified as supporting particularly high densities of shorebirds (Figure 1.2), and has been successful at creating local increases in shorebird numbers since 2003 (Cochrane, 2015; O'Donnell, unpublished data).

### Woody weed control in the "Hakatere Reach"

The weed control work currently scheduled for the 2016/17 season will proceed as planned. From the 2017/18 season onwards, additional funds could be sourced to continue maintenance weed control in the areas treated during the preceding three years, as well as

incrementally expanding the area of weed control downstream towards Blowing Point Bridge. Target species will include broom, Russell lupin, grey willow, gorse, sweet briar, poppies and false tamarisk.

### Progressive extension of woody weed control downstream of SH1 Bridge

It is proposed that woody weeds be progressively cleared from 30ha bank-to-bank blocks of the bed of the Ashburton River/Hakatere, immediately downstream of the weed-controlled area at the SH1 black-billed gull colony, each year from the 2018/19 breeding season onwards. Assuming it will take up to 2-3 years for woody weeds to re-establish in these mechanically-cleared sections of river, this should be sufficient to maintain a minimum of 90 ha of clean gravel habitats as high-quality breeding habitat for the relatively high numbers of banded dotterels, black-fronted dotterels, pied stilts and black-fronted terns that typically occur along this section of the river (O'Donnell, unpublished data).

Mechanical clearance is recommended over chemical control (herbicide application) for the reasons already mentioned above. A minimum of 30ha should be cleared of weeds annually, with each 30ha treated on a ca. 3-year rotation. However >90ha of weed-free habitat may be able to be maintained depending on the degree and speed of weed regrowth, the strategic use of hand-pulling or spot-spraying to slow re-infestation rates, and the occurrence of large flood events which will assist to maintain these open gravel areas. Any use of herbicides to control woody weed re-growth should only be carried out after consultation with the Arowhenua Rūnanga, and herbicide use should be kept to a minimum.

This mechanical clearance of weeds will require the issuing of a Resource Consent under the Resource Management Act (1991), however it may be possible to carry out these works under the Resource Consent granted to ECan's Flood Protection department.

### Progressive extension of mammalian predator control downstream of SH1 Bridge

It is recommended that from the 2018/19 breeding season, pest animal trapping be increased incrementally along 5km river sections, downstream of the black-billed gull colony trap network for the next three seasons. By the 2020/21 breeding season, this trapping layout, together with the adjacent trap layout upstream and downstream of the black-billed gull colony will ensure that the entire lower 19km of the Ashburton River/Hakatere will be receiving mammalian pest control.

As with the black-billed gull trapping layout, this progressive downstream extension will consist of traps spaced 100m apart, with an alternating arrangement of DOC150 and DOC250 traps, with Sentinel/Timms Traps placed at every second trap site. Traps should be arranged in one line on either side of the river and situated high enough above the riverbed to be at low risk of being washed away by floods.

Traps will be baited with fresh rabbit meat, and checked once every two weeks between July and February, inclusive.

### Black-backed gull control on the lower Ashburton River/Hakatere

Black-backed gulls nesting in colonies between the Valetta Bridge and the sea could be controlled via a combination of egg-pricking and poisoning from the 2017/18 breeding season onwards. Poisoning of all adult birds using Alphachloralose paste is recommended. This is an

effective way to remove gulls, and has been used in a number of places around New Zealand (Mischler & Bell, 2016b).

This method would first involve surveying the lower Ashburton River/Hakatere South Branch, from the Valetta Bridge to the sea to locate active black-backed gull colonies. Once located, the number of gull nests in each colony will be counted, and the location of each nest recorded using a hand-held GPS unit. Any eggs laid at this time will be pricked, to prevent them from hatching prior to the black-backed gull control operation. Approximately 5-7 days prior to the expected hatching date, adult gulls in the colony will be pre-fed on bread by quickly scattering small pieces of bread around each nest. Deploying the bread baits around then nest in this fashion minimises the risk of any non-target bird species eating it. This pre-feeding helps get the birds "keyed into" this new food source, improving the effectiveness of the subsequent control operation. This pre-feeding work will take place at dusk, as this is the time of day when the toxic bread baits will need to be deployed. This is because this is the time of day when the maximum number of adult birds should be at the colony, and the Alphachloralose (a narcotic-based substance which anesthetises the birds) will be faster-acting during cooler night-time temperatures. After 5-7 days of pre-feeding, the Alphachloralose powder will be mixed with butter and spread on the bread, then deployed around each nest in the colony. Scattering of the poison bait at every nest must be done very quickly – the poison is fast acting, and any odd behaviour by birds having consumed the bait will deter other birds from eating it. Anesthetised birds will then be humanely euthanised, and dead birds along with any remaining baits will be removed from the site and disposed of safely.

This initial control operation should result in the destruction of the majority of the adults in each breeding colony. However, smaller operations will likely need to be carried out during the following 3-4 seasons, to remove any birds that happened to be absent from the colony during the first control operation, or were immature non-breeders at the time.

### Investigating measures to reduce levels off-road vehicle disturbance at the Ashburton river mouth

It is recommended that measures be investigated to reduce levels of disturbance caused to shorebirds and waterfowl by off-road vehicles accessing the Ashburton River mouth at any time of the year. Measures to be considered include:

- The installation of conspicuous and well-designed signage at key access points, clearly describing the bird values of the river mouth and steps that local users can take to minimise their potential for disturbing nesting or roosting birds
- The design and implementation of a local community education and advocacy campaign targeting river users and designed to give them the knowledge and advice they need to enable them to minimise the risk of inadvertently disturbing nesting shorebirds
- Building relationships with special interest groups, including the Mid-Canterbury Four Wheel Drive Club and Fish & Game to empower their members and licence-holders to minimise their own risk of inadvertently disturbing shorebirds, and to inform other river-users.
- Local authorities carrying out a review of legal access points to the Ashburton River/Hakatere, and investigating options for the permanent or temporary closure of access points in the vicinity of the river mouth.
- Developing the 4WD area at the end of Ocean View Road by installing infrastructure such as signage, bollards or other temporary fencing to minimise the risk of 4WDs

accessing the shingle spit and river mouth from this popular recreational area. In the long term, Environment Canterbury and the Ashburton District Council should investigate retiring this area from 4WD use, in exchange for setting up a similar area either off-river, or adjacent to another stretch of the river that doesn't have such high shorebird values.

### Investigating measures to reduce levels off-road vehicle disturbance downstream of SH1 Bridge during the shorebird breeding season

It is proposed that measures be investigated to reduce levels of disturbance caused to nesting shorebirds by off-road vehicles using the Ashburton River/Hakatere between the SH1 Bridge and the sea between August and February inclusive. Measures to be considered include:

- The installation of conspicuous and well-designed signage at key river access points, clearly describing local river bird values and steps that river-users can take to minimise their potential for disturbing nesting birds
- The design and implementation of a local community education and advocacy campaign targeting river users and designed to give them the knowledge and advice they need to enable them to minimise the risk of inadvertently disturbing nesting shorebirds
- Building relationships with special interest groups, including the Mid-Canterbury Four Wheel Drive Club and Fish & Game to empower their members and licence-holders to minimise their own risk of inadvertently disturbing shorebirds, and to inform other river-users.
- Local authorities carrying out a review of legal access points to the Ashburton River/Hakatere, and investigating options for the permanent or temporary closure of access points between the SH1 Bridge and the river mouth.

### Feasibility assessment of reserve status for the Ashburton river mouth

The Reserves Act (1977) was established to acquire, preserve and manage areas for their conservation values or public recreational and educational values, and as such has three main functions:

- To provide for the preservation and management, for the benefit and enjoyment of the public, areas possessing some special feature or values such as recreational use, wildlife, landscape, amenity or scenic value.
- To ensure, as far as practicable, the preservation of representative natural ecosystems or landscapes and the survival of indigenous species of flora and fauna, both rare and commonplace.
- To ensure, as far as practicable, the preservation of access for the public to the coastline, islands, lakeshore and riverbanks and to encourage the protection and preservation of the natural character of these areas.

The Ashburton River mouth appears to meet the abovementioned criteria for reserve status, particularly the pressing need to balance the high recreational values of the site with its outstanding value as year-round habitat for a large number and diversity of shorebirds and waterfowl.

In recognition of these values, it is recommended that the Department of Conservation investigates the feasibility of gazetting the Ashburton river mouth as a reserve. Of the eight

categories of reserve allowed for under the Act, a Scenic Reserve would appear to strike the most equitable balance between the site's recreational and biodiversity values.

## 2.3 Performance monitoring

Performance monitoring is designed to create the ability to report on whether or not the performance measures for each objective has been met. Performance measures are necessary to ensure that the time and resources being spent on specific management activities is achieving the objectives of the management plan. Objectives and performance measures for this plan can be found in Table 2.1. Each performance monitoring action is described briefly below, and is listed with timeframes and estimated costs in the Operational Plan in Table 3.1 below.

### SH1 black-billed gull colony monitoring

It is recommended that the size and productivity of the SH1 black-billed gull colony be monitored each year from the 2017/18 breeding season to determine whether the management actions aimed at improving the health of this colony (Objective 1; Table 2.1) have been successful. Monitoring will involve regular checks of the colony site from October onwards to record the laying and hatching dates of eggs, to count the maximum number of occupied nest and attendant adult birds (both measures of colony size), to count the number of chicks present just prior to fledging and to check for evidence of disturbance or vandalism. Trail or security cameras will be set up at the colony for the duration of the incubation and nestling periods to record disturbance and depredation events.

It is recommended that this work be coordinated and run by a suitably-experienced ornithologist, with logistical support from local Environment Canterbury staff and assistance from local volunteers from the Ashburton Branch of Forest & Bird, and the Canterbury Region of Birds New Zealand.

### Annual shorebird counts along the Ashburton River/Hakatere South Branch

It is recommended that annual counts of all shorebird species along selected reaches of the Ashburton River/Hakatere South Branch will continue to be carried out to determine whether management actions being taken to stabilise or improve shorebird populations on the river have been successful (Objective 2; Table 2.1). These counts will represent a continuation of the shorebird counts that have been organised by Colin O'Donnell, Don Geddes and others each year between the end of October and the beginning of December since 1981. At a minimum, counts will be carried out along the following reaches of river each year:

- The 17km Arrowsmith Reach, between the base of the Arrowsmith Range and the Boundary Creek confluence.
- The 9km Hakatere Reach, between Buicks Bridge and Blowing Point.
- 54km of the lower reaches of the Ashburton River/Hakatere South Branch, from the Rangitata Diversion Race to the sea.

It is recommended that these surveys be carried out according to the methodology described in O'Donnell, 1992, but with the following additions and modifications (these are described in more detail in McArthur et al, 2015):

- Bird counts are recorded separately for each 1km section of the reaches being surveyed, to allow spatial patterns in the relative abundance of shorebirds to be mapped in greater detail.
- Start and finish times for each 1km survey section, and the number of observers used to survey each section is recorded, so that the search effort for each section can be quantified.

It is recommended that funding be sourced to cover the travel costs of survey participants. Members of the Mid-Canterbury Four Wheel Drive Club have also offered their assistance to provide surveyors with vehicle transport.

### Monthly shorebird counts at the Ashburton River mouth

Monthly counts of all shorebird and waterfowl species using the Ashburton River mouth and shingle spit will be carried out from the 2016/17 breeding season to determine whether management actions being taken to maintain the diversity and abundance of shorebirds using the river mouth have been successful (Objective 3; Table 2.1). Monthly counts are considered necessary, in addition to the annual surveys mentioned above, due to the very large seasonal changes in bird abundance and habitat use that occurs at this site. Andrew Crossland (Birds New Zealand) has been carrying out regular counts of birds at the Ashburton River mouth for the past 15 years, so we recommend that these counts be formalised into a regular monthly sampling regime. We suggest that these counts could continue to be carried out by members of the Canterbury Region of Birds New Zealand, with travel costs covered by Birds New Zealand's Projects Assistance Fund.

# 3. Operational plan

The operational plan shows the actions suggested to achieve the stated objectives for the Ashburton River/Hakatere river bird management plan and their timing and cost. The budgets in the table below should be considered indicative only and will be subject to change as each management action is planned out in more detail. Costs denoted by an asterix (*) represent existing funding already being invested by the relevant agency.

**Table 3.1: Seven-year operational plan for the Ashburton River/Hakatere**

| Management action | Objective | Priority | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | 2022/23 | Total cost | Lead agency | Proposed Funding source |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Convene and administer the Ashburton River/Hakatere Management Group | 1, 2, 3 | High | $1000 | $1000 | $1000 | $1000 | $1000 | $1000 | $1000 | **$7000** | ECan | ECan |
| Island maintenance at SH1 black-billed gull colony | 1 | High | $3500 | $2000 | $2000 | $2000 | $2000 | $2000 | $2000 | **$15500** | ECan | Canterbury Water Immediate Steps Fund |
| Woody weed control at SH1 black-billed gull colony | 1, 2 | High | $5600 | $5660 | $5660 | $5660 | $5660 | $5660 | $5660 | **$39200** | ECan | Canterbury Water Immediate Steps Fund |
| Mammalian predator trapping at SH1 black-billed gull colony | 1, 2 | High | | $22000 | $22000 | $22000 | $22000 | $22000 | $22000 | **$132000*** | ECan | ECan |

| Management action | Objective | Priority | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | 2022/23 | Total cost | Lead agency | Proposed Funding source |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Investigation of a total vehicle/foot access ban at SH1 black-billed gull colony | 1, 2 | High | $3000 | $1000 | $1000 | $1000 | $1000 | $1000 | $1000 | **$9000** | ECan | Canterbury Water Immediate Steps Fund |
| Community education and advocacy | 1, 2 | High | $3000 | $3000 | $3000 | $3000 | $3000 | $3000 | $3000 | **$21000** | ECan; BRaid | Braid; Lottery Environment and Heritage Fund; DoC Community Fund |
| Weed surveillance in the "Arrowsmith" reach | 2 | High | | $960 | | $960 | | $960 | | **$2880** | ECan | ECan |
| Mammalian predator trapping in the "Hakatere" reach | 2 | High | $44000 | $44000 | $44000 | $44000 | $44000 | $44000 | $44000 | **$308000*** | ECan | ECan |
| Woody weed control in the "Hakatere" reach | 2 | High | $600 | $3000 | $3000 | $3000 | $3000 | $3000 | $3000 | **$18600*** | ECan | ECan |

| Management action | Objective | Priority | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | 2022/23 | Total cost | Lead agency | Proposed Funding source |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Progressive extension of woody weed control downstream of SH1 | 2 | Medium | | | $20350 | $20350 | $20350 | $20350 | $20350 | **$101750** | ECan | Canterbury Water Immediate Steps Fund; Lottery Environment and Heritage Fund; DoC Community Fund |
| Progressive extension of mammalian predator trapping downstream of SH1 | 2 | Medium | | | $25500 | $29700 | $34000 | $18300 | $18300 | **$95200** | ECan | Canterbury Water Immediate Steps Fund; Lottery Environment and Heritage Fund; DoC Community Fund |
| Black-backed gull control on the lower Ashburton River/Hakatere | 1, 2, 3 | Medium | | $4870 | $4870 | $4870 | $4870 | | | **$19480** | ECan | ECan |

| Management action | Objective | Priority | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | 2022/23 | Total cost | Lead agency | Proposed Funding source |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Investigating measures to reduce vehicle disturbance at the Ashburton River mouth | 3 | Medium | $3000 | $1000 | $1000 | $1000 | $1000 | $1000 | $1000 | **$8000** | ECan | ECan |
| Investigating measures to reduce levels of vehicle disturbance downstream of SH1 bridge | 2 | Low | | $4000 | $2000 | $2000 | $2000 | $2000 | $2000 | **$14000** | ECan | ECan, Forest & Bird, BRaid |
| Feasibility investigation of reserve status for Ashburton River mouth | 3 | Low | DoC staff time only? | DoC staff time only? | | | | | | | DoC | DoC |
| **Total annual cost** | | | **$53600** | **$61830** | **$104720** | **$109880** | **$113220** | **$93610** | **$92650** | **$629510** | | |

| Performance monitoring action | Performance measure | Priority | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | 2022/23 | Total cost | Lead agency | Proposed Funding source |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SH1 black-billed gull colony monitoring | 1a, 1b, 1c | High | | $3300 | $3300 | $3300 | $3300 | $3300 | $3300 | **$19800** | ECan | Canterbury Water Immediate Steps Fund; Lottery Environment and Heritage Fund; DoC Community Fund; Birds NZ Projects Assistance Fund |
| Annual shorebird counts along the Ashburton River/Hakatere South Branch | 2a | High | $500 | $500 | $500 | $500 | $500 | $500 | $500 | **$3500** | Forest & Bird | ECan; Birds NZ Projects Assistance Fund |
| Monthly shorebird counts at Ashburton River mouth | 3a, 3b | High | $480 | $480 | $480 | $480 | $480 | $480 | $480 | **$3360** | Birds New Zealand | Birds NZ Projects Assistance Fund |
| **Total annual cost** | | | **$980** | **$4280** | **$4280** | **$4280** | **$4280** | **$4280** | **$4280** | **$26660** | | |

# 4. Plan review and future issues

This management plan needs to be considered in the context of the current over-allocation of the water resources of the Ashburton River/Hakatere, and the lack of minimum environmental flow limits being enforced at the current time. As described in Section 1.3 and Figure 1.9 above, artificially low flows in the Ashburton River/Hakatere are likely to be causing or exacerbating a number of the threats being addressed by management actions in this plan, including the extent of woody weed infestations, impacts of mammalian predators and rates of human disturbance.

The management required to address the impacts of weeds, pest animals and human impacts is likely to be much more costly, and much less effective in the long-term if water flows in the Ashburton River/Hakatere remain artificially low. Many of the stakeholders consulted during the preparation of this plan, including representatives from Environment Canterbury, the Department of Conservation, the Ashburton Zone Committee, Forest & Bird and the Arowhenua Rūnanga have clearly communicated that they consider the current, very low environmental flow limit in the Ashburton River/Hakatere as the single most important and urgent threat to the long-term health of the river and its shorebird and mahinga kai values.

For these reasons, it is important that the adoption and implementation of this management plan does not take any urgency away from the need to work towards implementing the minimum environmental flow limits outlined in the Canterbury Land and Water Regional Plan. Namely, that the minimum flow of the Ashburton River/Hakatere at SH1 will be increased from the current limit of 3000 L/sec to 6000 L/sec by the 1st July 2023, and to 10,000 L/Sec by the 1st July, 2033 (ECan, 2015).

Given that that the establishment of these minimum flows could well have an impact on the threats and management actions described in this management plan, it is recommended that this plan be reviewed when each of these minimum flow limits have been achieved. Based on the goals outlined in the Canterbury Land and Water Regional Plan, we therefore recommend that this management plan be considered operational from 1st October 2016 to 1st July 2023. We recommend that this plan then be reviewed and updated in the context of the new environmental flow limit, with the aim of publishing an updated management plan to be operational from the 1st October 2023 to 1st July 2033.

# 5. ACKNOWLEDGMENTS

This management plan would not have been prepared had it not been for many hundreds of hours of hard work spent by Edith Smith, Don Geddes and other members of the Ashburton Branch of Forest and Bird, lobbying and advocating for the improved management of the Ashburton River/Hakatere and its bird values over a number of years.

The preparation of this management plan has been funded by Environment Canterbury, with technical and logistical support from the Department of Conservation and the Ashburton Zone Committee.

We'd like to thank both Donna Lill and Donna Field (Environment Canterbury) for their excellent support managing the logistics of this project, arranging meetings with key stakeholders and responding to requests for information.

Colin O'Donnell (Department of Conservation), Frances Schmechel (Environment Canterbury), Andrew Crossland, Jan Walker and Nick Allen (Birds New Zealand), Edith Smith and Don Geddes (Forest & Bird) provided invaluable assistance by providing or sourcing information regarding the bird values of the Ashburton River/Hakatere.

Brad Edwards (Department of Conservation) and Jean Jack (Environment Canterbury) provided useful information regarding the pest animal and pest plant control work being carried out on the upper and lower reaches of the Ashburton River/Hakatere.

John Henry (Arowhenua Rūnanga) provided valuable insights into the bird and mahinga kai values of particular importance to local members of Ngāi Tahu, and explained the concerns shared by his Rūnanga regarding current condition of the Ashburton River/Hakatere and its management.

We also thanks members of the Mid-Canterbury Four Wheel Drive Club for their advice on the impacts of recreational off-road vehicle use on the Ashburton River/Hakatere, and for the proactive approach they're taking to ensure that club activities don't have an adverse impact on locally-breeding shorebirds.

Donna Field, Donna Lill, Jean Jack, Frances Schmechel, Verity Kerstein (Environment Canterbury), Brad Edwards, Richard Maloney (Department of Conservation), Edith Smith, Don Geddes (Forest & Bird), Marcus Ewart (Mid-Canterbury Four Wheel Drive Club) all provided useful comments and corrections to previous drafts of this management plan.

Lastly, thank you to Steve Attwood (Auldwood Photography) for kindly allowing us to use his photograph of a nesting black-billed gull as the image on the front cover of this report.

# 6. REFERENCES

Ashburton District Council, 2011. *Ashburton District Biodiversity Action Plan 2011-2016.* Unpublished report prepared by Ashburton District Council, Ashburton, New Zealand.

Ashburton Guardian, 2013. *Man jailed for driving into endangered black-billed gulls.* http://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=10881987; retrieved 19/08/2016.

Ashburton Zone Committee, 2015. *Annual report for the community 2015.* http://ecan.govt.nz/publications/Council/azc-annualreport-2016.pdf; accessed 19/08/2016.

Bell, M. and McArthur, N. 2016. *Clarence River black-fronted tern restoration project – 2015/2016 operational report.* Client report prepared for the Department of Conservation. Wildlife Management International Ltd, Blenheim, New Zealand.

Bowden, M.J.; Ayrey, R.B.; Duffield, D.M.; Glennie, J.M.; Harrison, N.; Hurd, S.B.; Mason, C.R.; Talbot, J.D. and Weeber, J.H. 1982. *The water resources of the Ashley catchment.* North Canterbury Catchment Board and Regional Water Board, Christchurch, New Zealand.

Boyle, T. 2012. *Ashburton River (Hakatere) flood hazard management strategy.* Publication No. R12/47. Environment Canterbury Regional Council, Christchurch, New Zealand.

Brathwaite, D.H. 1956. Notes on some rare birds recently recorded in Hawke's Bay. *Notornis* 7: 56-58.

Brown, K.P. 1999. *Project River Recovery weed control plan 1999-2004.* Unpublished Project River Recovery Report No. 99/19, Department of Conservation, Twizel, New Zealand.

Cameron, D. 2013. *Effects of flood protection activities on aquatic and riparian Ecology in the Ōtaki River.* Report prepared for Greater Wellington Regional Council (Flood Protection), MWH, Wellington, New Zealand.

Cameron, D. 2015. *Effects of flood protection activities on aquatic and riparian ecology in rivers of the Wairarapa valley.* Report prepared for Greater Wellington Regional Council (Flood Protection), MWH, Wellington, New Zealand.

Canterbury Water, 2010. *Canterbury Water Management Strategy Strategic Framework.* Published by Canterbury Water, on behalf of the Canterbury Mayoral Forum, Christchurch, New Zealand. http://ecan.govt.nz/publications/Plans/cw-canterbury-water-wanagement-strategy-05-11-09.pdf; accessed 19/08/2016.

Cochrane, P. 2015. *Hakatere Pest Management 2013-2015.* Draft report, Environment Canterbury Regional Council, Christchurch, New Zealand.

Crossland, A. 2016. eBird Checklist: http://ebird.org/ebird/newzealand/view/checklist/S29714934. eBird: An online database of bird distribution and abundance [web application]. eBird, Ithaca, New York. Available: http://ebird.org/content/newzealand/; accessed 19/08/2016.

Dickinson, P. 1951. Stomach contents of New Zealand inland shags. *Australian Journal of Marine and Freshwater Research.* 2: 245-253.

Doherty, J.L. and Bräger, S. 1997. The breeding population of spotted shags (*Stictocarbo punctatus punctatus*) on Banks Peninsula: 36 years later. *Notornis* 44: 49-56.

Dowding, J.E. and Murphy, E.C. The impact of predation by introduced mammals on endemic shorebirds in New Zealand: a conservation perspective. *Biological Conservation* 99: 47-64.

eBird, 2012. eBird: An online database of bird distribution and abundance [web application]. eBird, Cornell Lab of Ornithology, Ithaca, New York. Available: http://ebird.org/content/newzealand/; accessed 19/08/2016.

Environment Canterbury, 2011. *Ashburton Zone Implementation Programme.* Publication No. R11/77, Environment Canterbury Regional Council, Christchurch, New Zealand.

Environment Canterbury, 2013. *Canterbury Regional Policy Statement 2013.* Publication No. R14/22, Environment Canterbury Regional Council, Christchurch, New Zealand.

Environment Canterbury, 2015. *Canterbury Land and Water Regional Plan.* Publication No. R15/146, Environment Canterbury Regional Council, Christchurch, New Zealand.

Environment Canterbury, 2015b. *Canterbury Regional Council code of practice for defences against water and drainage schemes.* Unpublished report prepared by Environment Canterbury Regional Council, Christchurch, New Zealand.

Environment Canterbury, 2015c. *Canterbury regional river gravel extraction code of practice.* Publication No. R15/67, Environment Canterbury Regional Council, Christchurch, New Zealand.

Forest & Bird, 2016. *New Zealand Seabirds: Sites on land, rivers, estuaries, coastal lagoons and harbours.* The Royal Forest and Bird Protection Society of New Zealand, Wellington, New Zealand.

Gill, B.J. (Convener); Bell, B.D.; Chambers, G.K.; Medway, D.G.; Palma, R.L.; Scofield, R.P.; Tennyson, A.J.D. and Worthy, T.H. 2010. *Checklist of the birds of New Zealand, Norfolk and Macquarie Islands, and the Ross Dependency, Antarctica.* Te Papa Press, Wellington, New Zealand.

Grove, P. 2005. *Monitoring the effects of biodiversity pest control in high value environmental areas.* R05/29, Environment Canterbury Regional Council, Christchurch, New Zealand.

Heather, B.D. and Robertson, H.A. *The field guide to the birds of New Zealand.* Penguin Random House New Zealand.

Hughey, K.F.D. 1985. *Hydrological factors influencing the ecology of riverbed breeding birds on the plan's reaches of Canterbury's braided rivers.* Unpublished PhD thesis, Lincoln College, University of Canterbury, Christchurch, New Zealand.

Hughey, K.F.D. 1987. Wetland Birds. Pp 264-275 In: Henriques, P.R. (ed.) *Aquatic biology and hydroelectric power development in New Zealand.* Oxford University Press, Auckland, New Zealand.

Hughey, K.F.D. 1997. The diet of the wrybill (*Anarhynchus frontalis*) and the banded dotterel (*Charadrius bicinctus*) on two braided rivers in Canterbury, New Zealand. *Notornis* 44: 185-193.

Hughey, K.F.D. 1998. Nesting home range sizes of wrybill (*Anarhynchus frontalis*) and banded dotterel (*Charadrius bicinctus*) in relation to braided riverbed characteristics. *Notornis* 45: 103-111.

Hughey, K.F.D.; Fraser, B. and Hudson, L.G. 1989. *Aquatic invertebrates in two Canterbury rivers – related to bird feeding and water development impacts.* Science and Research Series No. 12, Department of Conservation, Wellington, New Zealand.

Hughey, K.F.D. and Warren, A. 1997. Habitat restoration for wildlife nesting on degraded braided riverbeds in New Zealand. In: Hale, P. and Lamb, D. (eds.) *Conservation outside nature reserves.* Centre for Conservation Biology, University of Queensland, Brisbane, Australia.

Lord, A., Waas, J.R. and Innes, J. 1997. Effects of human activity on the behaviour of northern New Zealand dotterel *Charadrius obscurus aquilonius* chicks. *Biological Conservation* 82: 15-20.

Maloney, R.F. 1999. Bird populations in nine braided rivers of the Upper Waitaki Basin, South Island, New Zealand: changes after 30 years. *Notornis* 46: 243-256.

McArthur, N. Small, D. and Govella, S. 2015. *Baseline monitoring of the birds of the Ōtaki. Waikanae and Hutt Rivers, 2012-2015.* Greater Wellington Regional Council, Publication No. GW/ESCI-T-15/42, Wellington, New Zealand.

McClellan, R.K. 2015. *Aerial surveys of black-billed gulls in Canterbury 2014-2015.* Contract report No. 3666, prepared for Environment Canterbury Regional Council, Christchurch.

Medway, D.G. 2002. Rare birds committee – 6 monthly report. *Southern Bird* 12: 6-7.

Miall, A.D. 1977. A review of the braided river depositional environment. *Earth Science Review* 13: 1-62.

Mischler, C.P. and Bell, M.D. 2016a. *Canterbury black-billed gull (*Larus bulleri*) aerial survey 2015-16.* Unpublished technical report prepared for Environment Canterbury Regional Council. Wildlife Management International Ltd, Blenheim, New Zealand.

Mischler, C.P. and Bell, M.D. 2016b. *Clarence River black-billed gull management.* Unpublished technical report prepared for Environment Canterbury Regional Council. Wildlife Management International Ltd, Blenheim, New Zealand.

Miskelly, C.M. 2013. Southern black-backed gull. In: Miskelly, C.M. (ed.) *New Zealand Birds Online.* www.nzbirdsonline.org.nz; accessed 19/08/2016.

Miskelly, C.M.; Crossland, A.C.; Sagar, P.M.; Saville, I.; Tennyson, A.J.D. and Bell, E.A. 2013. Vagrant and extra-limital bird records accepted by the OSNZ Records Appraisal Committee 2011-2012. *Notornis* 60: 296-306.

O'Donnell, C.J.F. 1992. *Birdlife of the Ashburton River, Canterbury, New Zealand.* Canterbury Conservancy Technical Report Series 1, Department of Conservation, Christchurch, New Zealand.

O'Donnell, C.J.F. 2000. *The significance of river and open water habitats for indigenous birds in Canterbury, New Zealand.* Unpublished report No. U00/37, Prepared for Environment Canterbury, Christchurch, New Zealand.

O'Donnell, C.J.F. & Moore, S.M. 1983. *The wildlife and conservation of braided river systems in Canterbury.* Fauna Survey Unit Report No. 33. New Zealand Wildlife Service, Wellington, New Zealand.

O'Donnell, C.J.F., Sanders, M. and Woolmore, C. Undated. *Conservation strategy for New Zealand braided rivers: biodiversity values, issues and priority actions.* Unpublished report, Department of Conservation, Christchurch, New Zealand.

OSNZ, 2006. *Constitution of the Ornithological Society of New Zealand Incorporated.* Unpublished document prepared by the Ornithological Society of New Zealand. http://www.osnz.org.nz/sites/osnz.org.nz/files/01-01%20Constitution_1.pdf; accessed 19/08/2016.

Pfister, C., Harrington, B.A. and Lavine, M. 1992. The impact of human disturbance on shorebirds at a migration staging area. *Biological Conservation* 60: 115-126.

Rebergen, A. 2011. *River bird numbers on Ruamahanga, Waingawa, Waiohine and Tauherenikau Rivers, Wairarapa, in spring 2010.* Unpublished report prepared by Forest & Bird, Wellington, New Zealand.

Rebergen, A. 2012. *Birds on Wairarapa rivers and coast in 2011-2012 breeding season.* Unpublished report prepared for Greater Wellington Regional Council. Forest & Bird, Wellington, New Zealand.

Rebergen, A.; Keedwell, R.; Moller, H. and Maloney, R. 1998. Breeding success and predation at nests of banded dotterel (*Charadrius bicinctus*) on braided river beds in the central South Island, New Zealand. *New Zealand Journal of Ecology* 22: 33-41.

Robertson, C.J.R.; Hyvōnen, P.; Fraser, M.J. and Pickard, C.R. 2007. *Atlas of bird distribution in New Zealand 1999-2004.* The Ornithological Society of New Zealand, Inc., Wellington, New Zealand.

Robertson, C.J.R.; Law, E.; de Hamel, R.J.B; Wakelin, D.J. and Courtney, S.P. 1984. *Habitat requirements of wetland birds in the lower Waitaki River catchment, New Zealand.* New Zealand Wildlife Service Occasional Publication No. 3. Department of Internal Affairs, Wellington, New Zealand.

Robertson, H.A.; Dowding, J.E.; Elliot, G.P.; Hitchmough, R.A.; Miskelly, C.M.; O'Donnell, C.J.F.; Powlesland, R.G.; Sagar, P.M.; Scofield, R.P. and Taylor, G.A. 2013. *Conservation status of New Zealand birds, 2012.* New Zealand Threat Classification Series 4, Department of Conservation, Wellington, New Zealand.

Sanders, M.D. and Maloney, R. 2002. Causes of mortality at nests of ground-nesting birds in the Upper Waitaki Basin, South Island, New Zealand: a 5-year video study. *Biological Conservation* 106: 225-236.

Schmechel, F. 2008. *Ashburton River 2007/8 black-billed gull colony.* Publication No. R08/89, Environment Canterbury Regional Council, Christchurch, New Zealand.

Te Rūnanga o Ngāi Tahu, 1996. Papatipu Rūnanga. In: Te Runanga o Ngāi Tahu. http://ngaitahu.iwi.nz/; accessed 19/08/2016.

Woodley, K. 2012. *Shorebirds of New Zealand, sharing the margins.* Penguin Books, Auckland, New Zealand.

# 7. Appendices

## Appendix 1: Bird species recorded on the Ashburton River/Hakatere 1981-2016

This appendix contains a list of all of the bird species encountered on the Ashburton River/Hakatere between 1981 and 2016. Species names and taxonomic order are as per Gill et al (2010). Threat classification rankings are as per Robertson et al (2013).

| Scientific name | Māori name | European name | Threat status | Local status | Source |
|---|---|---|---|---|---|
| *Callipepla californica* | Koera | California quail | Introduced and Naturalised | Resident | O'Donnell (1992) |
| *Cygnus olor* | Wāna | Mute swan | Introduced and naturalised | Irregular Visitor | O'Donnell (1992) |
| *C. atratus* | Kakīānau | Black swan | Not Threatened | Irregular Visitor | O'Donnell (1992) |
| *Branta canadensis* | Kuihi | Canada goose | Introduced and Naturalised | Resident | O'Donnell (1992) |
| *Tadorna variegata* | Pūtangitangi | Paradise shelduck | Not Threatened | Resident | O'Donnell (1992) |
| *Anas gracilis* | Tētē moroiti | Grey teal | Not Threatened | Resident | O'Donnell (1992) |
| *A. platyrhynchos* | Rakiraki | Mallard | Introduced and Naturalised | Resident | O'Donnell (1992) |
| *A. superciliosa* | Pārera | Grey duck | Nationally Critical | Locally extinct | O'Donnell (1992) |
| *A. rhynchotis* | Kuruwhengi | Australasian shoveler | Not Threatened | Regular Visitor | O'Donnell (1992) |
| *Aythya novaeseelandiae* | Pāpango | New Zealand scaup | Not Threatened | Irregular Visitor | O'Donnell, unpublished data |
| *Phalacrocorax melanoleucos* | Kawau paka | Little shag | Not Threatened | Resident | O'Donnell (1992) |

| Scientific name | Māori name | European name | Threat status | Local status | Source |
|---|---|---|---|---|---|
| *Phalacrocorax carbo* | Kawau | Black shag | At Risk, Naturally Uncommon | Resident | O'Donnell (1992) |
| *P. varius* | Kāruhiruhi | Pied shag | Nationally Vulnerable | Irregular visitor | O'Donnell (1992) |
| *P. sulcirostris* | Kawau tūī | Little black shag | At Risk, Naturally Uncommon | Irregular Visitor | O'Donnell (1992) |
| *Stictocarbo punctatus* | Kawau tikitiki | Spotted shag | Not Threatened | Regular Visitor | O'Donnell (1992) |
| *Ardea modesta* | Kōtuku | White heron | Nationally Critical | Irregular Visitor | New Zealand eBird database |
| *Egretta novaehollandiae* | Matuku moana | White-faced heron | Not Threatened | Resident | O'Donnell (1992) |
| *Botaurus poiciloptilus* | Matuku hūrepo | Australasian bittern | Nationally Endangered | Resident | O'Donnell (1992) |
| *Platalea regia* | Kōtuku ngutupapa | Royal spoonbill | At Risk, Naturally Uncommon | Irregular Visitor | O'Donnell (1992) |
| *Circus approximans* | Kāhu | Swamp harrier | Not Threatened | Resident | O'Donnell (1992) |
| *Falco novaeseelandiae* | Kārearea | New Zealand falcon | At Risk, Recovering | Irregular Visitor | Forest & Bird, 2016 |
| *Gallinula ventralis* | | Black-tailed native hen | Vagrant | Irregular Visitor | Miskelly et al, (2013); Medway, (2002) |
| *Porphyrio melanotus* | Pūkeko | Pukeko | Not Threatened | Resident | O'Donnell (1992) |
| *Calidris canutus* | Huahou | Red knot | Nationally Vulnerable | Irregular Visitor | O'Donnell (1992) |
| *Calidris acuminata* | | Sharp-tailed sandpiper | Migrant | Irregular Visitor | O'Donnell, unpublished data |

| Scientific name | Māori name | European name | Threat status | Local status | Source |
|---|---|---|---|---|---|
| *C. melanotos* | | Pectoral sandpiper | Vagrant | Irregular Visitor | O'Donnell (1992) |
| *C. ruficolis* | | Red-necked stint | Migrant | Irregular Visitor | Andrew Crossland, unpublished data. |
| *Numenius madagascariensis* | | Eastern curlew | Migrant | Irregular Visitor | O'Donnell (1992) |
| *Limosa lapponica* | Kuaka | Bar-tailed godwit | At Risk, Declining | Irregular Visitor | O'Donnell (1992) |
| *Tringa nebularia* | | Greenshank | Vagrant | Irregular Visitor | Don Geddes *pers. comm.* |
| *Tringa brevipes* | | Grey-tailed tattler | Vagrant | Irregular Visitor | O'Donnell (1992) |
| *T. hypoleucos* | | Common sandpiper | Vagrant | Irregular Visitor | Andrew Crossland unpublished data. |
| *Arenaria interpres* | | Ruddy turnstone | Migrant | Irregular Visitor | O'Donnell (1992) |
| *Haematopus unicolor* | Tōrea pango | Variable oystercatcher | At Risk, Recovering | Regular Visitor | O'Donnell, unpublished data |
| *H. finschi* | Tōrea | South Island pied oystercatcher | At Risk, Declining | Resident | O'Donnell (1992) |
| *Himantopus himantopus* | Poaka | Pied stilt | At Risk, Declining | Resident | O'Donnell (1992) |
| *H. novaezelandiae* | Kakī | Black stilt | Nationally Critical | Irregular Visitor | O'Donnell (1992) |
| *Pluvialis fulva* | | Pacific golden plover | Migrant | Irregular Visitor | O'Donnell (1992) |
| *Charadrius bicinctus* | Pohowera | Banded dotterel | Nationally Vulnerable | Resident | O'Donnell (1992) |

| Scientific name | Māori name | European name | Threat status | Local status | Source |
|---|---|---|---|---|---|
| *Anarhynchus frontalis* | Ngutu pare | Wrybill | Nationally Vulnerable | Resident | O'Donnell (1992) |
| *Elseyornis melanops* | | Black-fronted dotterel | Coloniser | Resident | O'Donnell (1992) |
| *Vanellus miles* | | Spur-winged plover | Not Threatened | Resident | O'Donnell (1992) |
| *Stercorarius parasiticus* | | Arctic skua | Migrant | Irregular Visitor | Andrew Crossland unpublished data. |
| *Larus dominicanus* | Karoro | Southern black-backed gull | Not Threatened | Resident | O'Donnell (1992) |
| *L. novaehollandiae* | Tarāpunga | Red-billed gull | Nationally Vulnerable | Resident | O'Donnell (1992) |
| *L. bulleri* | Tarāpuka | Black-billed gull | Nationally Critical | Resident | O'Donnell (1992) |
| *Hydroprogne caspia* | Taranui | Caspian tern | Nationally Vulnerable | Regular Visitor | O'Donnell (1992) |
| *Chlidonias leucopterus* | | White-winged black tern | Vagrant | Irregular Visitor | O'Donnell, unpublished data |
| *C. albostriatus* | Tarapirohe | Black-fronted tern | Nationally Endangered | Resident | O'Donnell (1992) |
| *Sterna striata* | Tara | White-fronted tern | At Risk, Declining | Regular Visitor | O'Donnell (1992) |
| *S. hirundo* | | Common tern | Vagrant | Irregular Visitor | Miskelly et al, (2013) |
| *Columba livia* | | Rock pigeon | Introduced and Naturalised | Resident | O'Donnell (1992) |
| *Chrysococcyx lucidus* | Pīpīwharauroa | Shining cuckoo | Not Threatened | Regular Visitor | O'Donnell (1992) |
| *Ninox novaeseelandiae* | Ruru | Morepork | Not Threatened | Irregular Visitor | O'Donnell (1992) |

| Scientific name | Māori name | European name | Threat status | Local status | Source |
|---|---|---|---|---|---|
| *Athene noctua* | | Little owl | Introduced and Naturalised | Resident | O'Donnell (1992) |
| *Todiramphus sanctus* | Kōtare | New Zealand kingfisher | Not Threatened | Resident | O'Donnell (1992) |
| *Acanthisitta chloris* | Tītitipounamu | Rifleman | At Risk, Declining | Resident | O'Donnell (1992) |
| *Gerygone igata* | Riroriro | Grey warbler | Not Threatened | Resident | O'Donnell (1992) |
| *Anthornis melanura* | Korimako | Bellbird | Not Threatened | Resident | O'Donnell (1992) |
| *Gymnorhina tibicen* | Makipai | Australian magpie | Introduced and Naturalised | Resident | O'Donnell (1992) |
| *Rhipidura fuliginosa* | Pīwakawaka | New Zealand fantail | Not Threatened | Resident | O'Donnell (1992) |
| *Corvus frugilegus* | | Rook | Introduced and Naturalised | Resident | O'Donnell (1992) |
| *Zosterops lateralis* | Tauhou | Silvereye | Not Threatened | Resident | O'Donnell (1992) |
| *Hirundo neoxena* | Warou | Welcome swallow | Not Threatened | Resident | O'Donnell (1992) |
| *Alauda arvensis* | | Skylark | Introduced and Naturalised | Resident | O'Donnell (1992) |
| *Turdus merula* | Manu pango | Blackbird | Introduced and Naturalised | Resident | O'Donnell (1992) |
| *T. philomelos* | | Song thrush | Introduced and Naturalised | Resident | O'Donnell (1992) |
| *Sturnus vulgaris* | Tāringi | Common starling | Introduced and Naturalised | Resident | O'Donnell (1992) |

| Scientific name | Māori name | European name | Threat status | Local status | Source |
|---|---|---|---|---|---|
| *Passer domesticus* | Tiu | House sparrow | Introduced and Naturalised | Resident | O'Donnell (1992) |
| *Anthus novaeseelandiae* | Pīhoihoi | New Zealand pipit | At Risk, Declining | Resident | O'Donnell (1992) |
| *Prunella modularis* | | Dunnock | Introduced and Naturalised | Resident | O'Donnell (1992) |
| *Fringilla coelebs* | Pahirini | Chaffinch | Introduced and Naturalised | Resident | O'Donnell (1992) |
| *Carduelis chloris* | | European Greenfinch | Introduced and Naturalised | Resident | O'Donnell (1992) |
| *C. carduelis* | | European goldfinch | Introduced and Naturalised | Resident | O'Donnell (1992) |
| *C. flammea* | | Common redpoll | Introduced and Naturalised | Resident | O'Donnell (1992) |
| *Emberiza citrinella* | | Yellowhammer | Introduced and Naturalised | Resident | O'Donnell (1992) |

## Appendix 2: Consultation timeline during the preparation of this plan

| Date | Consultation action |
|---|---|
| 13th June, 2016 | Initial meeting with Donna Field (ECan), Donna Lill (ECan), Edith Smith (F&B) and Don Geddes (F&B), Nikki McArthur (WMIL) and Mike Bell (WMIL) to discuss the scope of the management plan and share thoughts on key bird values, threats and management actions required. |
| 14th June, 2016 | Meeting with Donna Field (ECan), Frances Schmechel (ECan), Jean Jack (ECan), Brad Edwards (DoC), Nikki McArthur (WMIL) and Mike Bell (WMIL) to share knowledge on river bird values, threats and both existing and future management actions. |
| 15th June, 2016 | Meeting with Donna Field (ECan), Verity Kerstein (ECan), Ryan Dynes (ECan), Nikki McArthur (WMIL) and Mike Bell (WMIL) to discuss ECan's Flood Protection activities on the Ashburton River/Hakatere and implications for bird values and their management. |
| 15th June, 2016 | Meeting with Donna Field (ECan), Nikki McArthur (WMIL), Mike Bell (WMIL) and representatives from the Mid-Canterbury Four Wheel Drive Club to discuss the Club's use of the Ashburton River and measures being taken to minimise disturbance to shorebirds, particularly during the breeding season. |
| 16th June, 2016 | Meeting with Donna Field (ECan), John Henry (Arowhenua Rūnanga), Nikki McArthur (WMIL) and Mike Bell (WMIL) to discuss Arowhenua Rūnanga's views on the natural values of the Ashburton River/Hakatere, the threats to those values and how they are, and should be managed. |
| 17th June, 2016 | Meeting with Colin O'Donnell (DoC), Nikki McArthur (WMIL) and Mike Bell (WMIL) to discuss the bird values of the Ashburton River, the ongoing shorebird counts being managed by Colin, and his views on the threats and appropriate management actions for the river. |
| 13th July, 2016 | Email correspondence with Verity Kerstein (ECan) seeking additional information regarding ECan's Flood Protection weed control activities. |
| 14th July, 2016 | Email correspondence with Colin O'Donnell (DoC) to seek additional information regarding the annual shorebird monitoring carried out on the Ashburton River/Hakatere. |
| 19th August, 2016 | Phone call and letter to John Henry (Arowhenua Rūnanga) to seek feedback on aspects of the draft management plan. |
| 19th August, 2016 | Email correspondence with Jan Walker, Nick Allen and Andrew Crossland (Birds New Zealand), seeking additional information regarding the bird values of the Ashburton River/Hakatere. |

| | |
|---|---|
| 22nd August, 2016 | Email correspondence with Andrew Crossland (Birds New Zealand) regarding monthly shorebird counts he'd been carrying out at the Ashburton River mouth. |
| 25th August, 2016 | Email correspondence with Colin O'Donnell regarding proposed management actions being considered for inclusion in the draft management plan. |
| 25th August, 2016 | Email correspondence with Verity Kerstein (ECan) seeking additional information regarding measures taken by ECan's Flood Protection Department to minimise adverse impacts on nesting shorebirds. |
| **30th August, 2016** | **Draft Ashburton River/Hakatere shorebird habitat management plan delivered to Environment Canterbury** |
| 9th September, 2016 | Meeting with stakeholders to discuss draft Ashburton River shorebird habitat management plan (Environment Canterbury, Ashburton Depot).<br>Attendees: Donna Field (ECan), Frances Schmechel (ECan), Jean Jack (ECan), Verity Kerstein (ECan), Ryan Dynes (ECan), Bert Hofmans (ADC), Don Geddes (F&B), Edith Smith (F&B), Fish & Game, Marcus Eward (Mid-Canterbury Four Wheel Drive Club, Inc), Nikki McArthur (WMIL), Mike Bell (WMIL).<br>Absent: Department of Conservation, Arowhenua Rūnanga. |
| 10th September – 16th September, 2016 | Additional comments and feedback received regarding the draft Ashburton River shorebird habitat management plan, from the following individuals: Donna Field (ECan), Donna Lill (ECan), Frances Schmechel (ECan), Jean Jack (ECan), Edith Smith (F&B), Brad Edwards (DoC), Richard Maloney (DoC) and Bert Hofman (ADC). |
| **30th September, 2016** | **Final Ashburton River/Hakatere shorebird habitat management plan delivered to Environment Canterbury** |