Management and monitoring of shorebirds in the Ashley River during the 2004/05 season

Ashley/Rakahuri Rivercare Group

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Prepared for:
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April 2005

Cover photo: Wrybill chick, Ashley River © JE Dowding 2004

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Summary

Dowding, J.E.; Ledgard, N.J. 2005. *Management and monitoring of shorebirds in the Ashley River during the 2004/05 season*. Unpublished report, Ashley/Rakahuri Rivercare Group, Rangiora. 20 pp.

The braided rivers of the South Island provide vital breeding habitat for a number of threatened shorebird species. The Ashley River, North Canterbury, has breeding populations of four of these, namely the banded dotterel, the wrybill, the black-billed gull and the black-fronted tern. All are endemic and with the exception of the banded dotterel, all are braided-river specialists.

Shorebirds in the Ashley River face a number of threats. These include loss and degradation of habitat, disturbance during breeding, predation by introduced mammals, and flooding. The Ashley/Rakahuri Rivercare Group is a community group formed in 1999, with the main goal of protecting and enhancing shorebird habitat in the lower reaches of the river. The group aims to involve a range of riverbed users and to promote its activities to the wider public. In 2004, the ARRG received two grants to assist it in carrying out these objectives.

The main activities undertaken by the group in 2004/05 were:

- Clearance of weeds to create nesting habitat for shorebirds
- Advocacy and liaison with other groups of riverbed users
- Control of mammalian predators in areas with concentrations of nesting birds
- Enhancement of public facilities in parts of the river not used by shorebirds
- A survey of all shorebird species in the lower river in November
- Monitoring of shorebird breeding success in response to management

Management and monitoring were focussed on the three most threatened species in the river (wrybill, black-billed gull and black-fronted tern).

Three areas (totalling about 4.5 ha) were cleared of weeds. All three areas were used by a range of shorebird species for breeding, and this aspect of the programme was clearly successful.

Advocacy and liaison undoubtedly raised public awareness of shorebirds in the river and of the group's activities, but there was still disturbance is some areas. Further publicity is required.

Predator trapping was considered a success, with 61 mammals of 5 species caught in about 4000 trap-nights. Hedgehogs were by far the most common species trapped.

Public facilities in parts of the river not used by shorebirds were enhanced by maintenance of a 4WD track, construction of a walkway, plantings, and installation of an information plaque.

Counts from the November survey suggested that while numbers of some species appear stable (pied oystercatcher, pied stilt, banded dotterel, wrybill), others are probably in decline (black-billed gull, black-fronted tern).

Monitoring of the three key threatened species revealed mixed results. Six pairs of wrybills nested and produced a total of four fledged young. A colony of 200 black-billed gulls established in the study area, but deserted shortly before laying, probably because of excessive disturbance. Thirteen pairs of black-fronted terns nested, but all failed; two pairs may have lost nests to predators, while the remaining 11 pairs deserted, again probably because of disturbance.

Recommendations for future management include:

- Continue management; without it, the key species will probably not persist in the Ashley
- Preferentially enhance and manage habitat away from areas heavily used by people
- Increase advocacy
- Continue monitoring activities

1 Introduction

The braided rivers of the eastern South Island provide important breeding habitat for a number of threatened shorebird species. Several of these species are highly specialised and breed largely or entirely in these riverbeds. The wildlife values of braided rivers are increasingly under threat from a number of human activities, including hydro-electric development, water abstraction for irrigation, and a wide range of recreational activities. Riverbed habitat is also seriously degraded by extensive growth of weeds (mainly willow, lupin, gorse and broom) and by the presence of introduced mammalian predators (particularly cats, mustelids, hedgehogs and rodents).

Between 1974 and 1981, the New Zealand Wildlife Service conducted wildlife surveys in 14 Canterbury rivers, including the Ashley River. Following these surveys, the wildlife and conservation value of each river was ranked, using a set of standard criteria. The Ashley was one of five rivers given the highest possible ranking of 'Outstanding' (O'Donnell & Moore 1983). The North Canterbury Catchment Board & Regional Water Board (1982) described the estuary as "one of the most important bird habitats on the east coast of the South Island because of the diversity of species". More recently, the Ashley River and estuary were included in a list of 73 wetland sites of international importance in New Zealand (Cromarty & Scott 1996).

The Ashley/Rakahuri Rivercare Group (ARRG) is a community group set up in 1999. It was formed to assist with the management of the lower reaches of the river for a wide range of end-users, but with a prime focus on protecting and enhancing shorebird habitat in the riverbed and promoting those activities to the wider public. It specifically aims to involve a wide spectrum of the community, including the District and Regional Councils and special-interest groups of riverbed users, in an attempt to reduce impacts on breeding birds. In 2004, the ARRG received two grants to assist it in carrying out these objectives.

Particular emphasis was placed on management of three species: the wrybill (*Anarhynchus frontalis*), the black-billed gull (*Larus bulleri*), and the black-fronted tern (*Sterna albostriata*). All are braided river specialists to varying degrees, all are threatened with extinction, and all are endemic, i.e. found only in New Zealand.

The wrybill is a small plover, and the most highly specialised of the three species. It breeds exclusively on braided rivers of the South Island east coast and is well adapted to the greywacke shingle environment of those riverbeds—eggs and chicks are highly cryptic, and incubating adults are well-camouflaged. The wrybill is unique among birds in having a laterally-curved bill, which is used to probe under stones for insects. Wrybills breed as isolated pairs, which defend individual territories. The population currently numbers 4500-5000 individuals (Riegen & Dowding 2003). Under the Department of Conservation's national threat classification system (Molloy *et al*. 2002), the species is considered Acutely Threatened, with a ranking of 3 Nationally Vulnerable (Hitchmough & Bull 2004). The breeding range of the wrybill has contracted during the past century, and all current breeding occurs in Canterbury and a few rivers in northern Otago. The Ashley is now the northern-most breeding site of the species. After breeding, wrybills migrate northwards and most spend the winter on the large harbours around Auckland, particularly the Manukau Harbour and Firth of Thames.

The black-billed gull nests in colonies. The majority of the population breeds on South Island braided rivers, but there are colonies on sand-spits and beaches in the South Island, and on lakes, rivers, shell-banks and beaches in the North Island. South Island breeding sites can be well inland, but in winter the species is largely coastal. There is no accurate estimate of the size of the population, but numbers are almost certainly falling and the species is considered Chronically Threatened, with a ranking of 4 Serious Decline (Hitchmough & Bull 2004).

Black-fronted terns may breed as isolated pairs, sometimes in loose groups, or in larger colonies. Almost the entire population breeds on the braided rivers of the South Island east coast. In winter, black-fronted terns move to the coast where they form flocks and feed out to sea; some birds disperse as far as Northland and Stewart Island. Declines are apparent in many areas and the population probably now numbers 5000 birds or less. The species has a threat ranking of 2 Nationally Endangered (Hitchmough & Bull 2004), with the qualifier Human Induced, indicating that the present restricted distribution is a result of human activity.

Both the black-fronted tern and the black-billed gull are particularly susceptible to disturbance during breeding, and pairs or whole colonies will desert nests and abandon breeding attempts if disturbed repeatedly.

Other shorebird species breeding in the Ashley River (with their threat categories) include:
Pied oystercatcher (*Haematopus finschi*) (Not Threatened)
Pied stilt (*Himantopus himantopus*) (Not Threatened)
Banded dotterel (*Charadrius bicinctus*) (5 Gradual Decline)
Spur-winged plover (*Vanellus miles*) (Not Threatened)
Black-backed gull (*Larus dominicanus*) (Not Threatened)
Caspian tern (*Sterna caspia*) (3 Nationally Vulnerable).

Wrybills, black-billed gulls and black-fronted terns attempting to breed in the Ashley River face three main threats.

1 All three species require a largely bare substrate for nesting, with little or no vegetation. Weed growth in the riverbed therefore results in loss of breeding habitat for them.
2 All are ground-nesting, and are susceptible to introduced mammalian predators.
3 Disturbance by people, their dogs, and vehicles in the riverbed can reduce breeding success.

For these reasons, shorebird management in the Ashley River has focussed primarily on
(a) clearing weeds from potential nesting habitat,
(b) controlling predators during the breeding season, and
(c) attempting to reduce disturbance.

At the start of the 2004/05 season, the ARRG received grants from the Pacific Development and Conservation Trust and the New Zealand National Parks and Conservation Foundation to assist with its riverbed management. This report mainly documents the direct management and monitoring of birds that was undertaken, and on which over 90% of the funds were spent. It also provides recommendations for future management of shorebirds in the Ashley River.

2 Study area and methods

2.1 Study area

The Ashley River is located in North Canterbury, with its upper tributaries draining the Puketeraki Range and Lees Valley. From the Ashley Gorge, the river flows east and joins the sea about 25 km north of Christchurch. Saltwater Creek joins the river at the estuary, which has extensive mud-flats and saline swampland behind a sand dune barrier. The study area consisted of a *c*. 18 km stretch of the lower river, from its confluence with the Okuku River (43°16'S 172°28'E) to the State Highway 1 bridge (43°17'S 172°41'E), about 2 km upstream of the estuary. The town of Rangiora lies on the southern side of the river, roughly mid-way between these two points. A sketch map of the study area is shown in Figure 1.

2.2 Island creation/weed clearance

In late June 2004, three sites in the riverbed were bulldozed by Taggart Earthmoving Ltd to remove vegetation and create the bare gravel substrate required for nesting by the three target shorebird species. A number of criteria were used to select these sites, including:

(a) a history of previous use, particularly by wrybills and black-fronted terns,
(b) the presence of a water barrier on both sides of the site under normal flow conditions; birds breeding on islands in the river should be less affected by some mammalian predators and should suffer less disturbance, and
(c) the height of the gravel bank; birds nesting on higher sites are likely to lose fewer nests to flooding.

The areas cleared were at the Aerodrome site (*c* 1.9 ha), at Groyne 1 (not measured), and at the Railway site (*c* 1.4 ha); these locations are shown in Figure 1. At all three sites, yellow tree lupin (*Lupinus arboreus*) was the dominant weed species. Some hand-pulling of weeds was also undertaken in these areas.

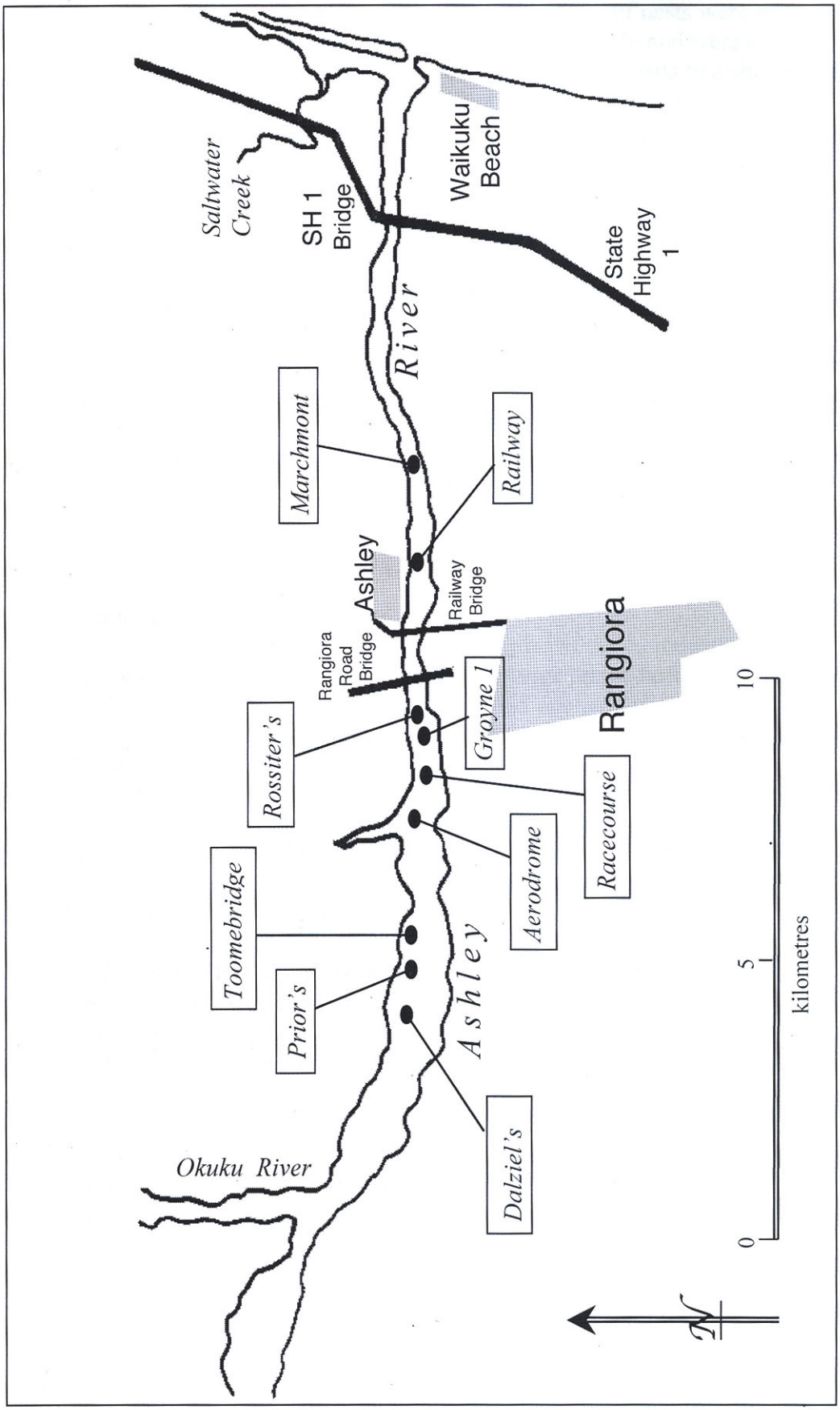
2.3 Walkway creation

One aim of the walkway was to provide an attractive and inviting riverside track, which will reduce the numbers of people causing disturbance elsewhere in the riverbed. The section receiving most attention runs between the railway bridge and the Rangiora–Ashley bridge picnic area, which already serves as a focal point for local people and visitors. In recent years, this stretch of the river has not been used for breeding by any of the three key shorebird species. During summer, a swimming hole created beside the walkway attracted many users. Over the past year, the track has been rerouted and surfaced, with bollards placed at both ends to prevent motorised access. More native plants are to be established and maintained. The signage associated with the walkway and picnic area also provided good opportunities for advocacy.

2.4 Predator control

A variety of kill-traps was used to target the larger mammalian predators (cats, mustelids and hedgehogs); traps included 18 Bushby traps, 16 Timms traps and 8 DOC 200 traps set in pairs inside wooden tunnels Traps were initially set (from 15 August 2004) at sites with a history of use by wrybills. Later, as all three target species occupied territories elsewhere, traps were added at those sites. Traps were baited with a range of baits, including eggs, a specially prepared, extruded, long-life bait (supplied by DOC), and fresh meat (mainly rabbit), and checked once or twice a week. Many shorebirds are most vulnerable during nesting and when small chicks are present. Later in the season, as second nesting attempts were made, traps were therefore moved between sites as appropriate to provide the greatest degree of cover possible for pairs at those stages of the breeding cycle. The last traps were removed on 05 February 2005. One Timms trap at the Aerodrome territory was vandalised in mid-September 2004.

Figure 1 Sketch map of the study area in the lower Ashley River, showing locations mentioned in the text. Names of wrybill territories are boxed and shown in italics.



2.5 Monitoring

Wrybills and black-fronted terns were initially located by searching suitable habitat in the riverbed on foot. Surveys began on 20 August 2004, when birds were starting to return and occupy territories. When pairs showed defensive behaviour their nests were located by watching from a distance until a bird returned to the nest. Exact locations of nests were recorded by GPS. Pairs with known nests or chicks could be monitored more quickly and were checked less frequently, both of which reduced disturbance. The frequency of visits to a site was increased when a nest was due to hatch, when chicks were due to fledge, or when a re-nest was expected. Breeding success (productivity) was recorded as the average number of chicks fledged per pair in the study area.

For banding, wrybills were caught on noose-mats; each bird was fitted with a numbered metal band on the left tibia and a unique combination of four colour bands, two on each tarsus. In a few cases, birds were fitted with a metal band on one tarsus and three colour bands on the other. Birds were banded under permit 0368, issued by the New Zealand National Banding Scheme.

The spring survey of shorebirds in the study area was carried out on 20 November 2004. The river between the Okuku confluence and the SH1 bridge was divided into three sections, each surveyed by a group of four people. Members of each group spread out in a line across the river and walked downstream, recording the species seen and the numbers of each encountered.

3 Results

3.1 Habitat enhancement

All three areas cleared of weeds were used by shorebirds. At the Aerodrome site, the resident pair of wrybills moved from their site of the past two years on the north bank, to nest on the cleared island. At least six pairs of banded dotterels and one pair of pied oystercatchers also nested on this area. At the Groyne 1 cleared area, a pair of wrybills were found prospecting in September but they eventually nested downstream in the Rossiter's territory. At least four pairs of banded dotterels, two pairs of black-fronted terns, two pairs of spur-winged plovers, four pairs of pied stilts, one pair of pied oystercatchers and one pair of Caspian terns nested on the area. A colony of black-billed gulls established on the area, but deserted just before laying (see below). At the Railway site, one pair of wrybills, one pair of pied oystercatchers, one (possibly two) pairs of pied stilts and two pairs of banded dotterels nested on the cleared area.

Life-sized decoys of black-billed gulls and black-fronted terns were installed on the cleared area at the Aerodrome site on 20 August in an attempt to attract those species and encourage nesting there, away from the areas most used by people around Rangiora. Up to 35 black-fronted terns were present at the site early in the season, but none nested. Only the occasional black-billed gull was seen in the area and none nested there.

3.2 Predator control

In total, 61 potential predators were trapped in 4092 trap-nights. Predators trapped consisted of 46 hedgehogs, 6 weasels, 4 stoats, 4 cats, and 1 rat. A summary of trapping periods, trap-nights and captures at each site is shown in Table 1.

Table 1 Summary of predator trapping in the Ashley River, 2004/05 season. Locations are shown in Figure 1. Trap-nights are not corrected for sprung/occupied traps.

Location	Trapping period	Trap-nights	Captures				
			Cat	Stoat	Weasel	Hedgehog	Rat
Prior's	04/12/04 - 15/01/05	147	0	0	0	2	0
Toomebridge	04/12/04 - 15/01/05	98	0	0	0	0	0
Aerodrome							
north bank	29/08/04 - 05/02/05	924	0	1	1	24	1
island/south bank	15/08/04 - 05/02/05	1356	3	0	1	12	0
Racecourse	11/11/04 - 05/02/05	165	0	2	2	1	0
Groyne 1							
north bank	10/10/04 - 23/12/04	370	0	1	1	0	0
island	19/09/04 - 28/12/04	500	0	0	0	0	0
south bank	02/10/04 - 09/11/04	228	0	0	1	0	0
Railway							
island	07/11/04 - 28/12/04	204	1	0	0	7	0
south bank	11/11/04 - 30/12/04	100	0	0	0	0	0
Totals		**4092**	**4**	**4**	**6**	**46**	**1**

3.3 Advocacy

Articles about the ARRG's activities appeared in the *Christchurch Press* on 21 June 2004 and in the Environment Canterbury newspaper *Living Here*.

Four articles appeared in the *Northern Outlook* during the season:
'Preparing for rare bird arrival' (July 2004);
'Pressure grows on Ashley river users' (September 2004),
'Bird progress on the Ashley River' (November 2004),
'Mixed success in the Ashley River' (March 2005).

There was a display in a shop window in the High Street, Rangiora, in July 2004. The display included photographs, stuffed predators and texts about the Group's activities.

There were displays at the Rangiora A&P Show (October 2004) and at the Kaiapoi Carnival Day (November 2004). These displays featured photographs, stuffed predators, texts about the Group's activities, plus the presence of Group members to field inquiries.

An information plaque was installed at the main Ashley River picnic area near the Rangiora road bridge. This 1.4 x 0.8 m plaque is mounted on a riverbed stone base, and describes the rare bird situation on the Ashley River. It also describes how the public can assist in improving the breeding success of riverbed birds.

Ten custom-made Corflute signs (see Plate 2) were installed at strategic sites in the riverbed to inform people of nesting bird and trap presence. Information on these was updated as necessary. About half the signs were vandalised at some time.

Work was initiated on an updated information pamphlet about riverbed birds and what the public can do to help them.

Plate 1 Habitat enhancement at the Railway site, Ashley River. The upper picture shows the site in May 2004, before clearing; the lower picture shows the site in October 2004, after clearance of about 1.4 ha in late June.

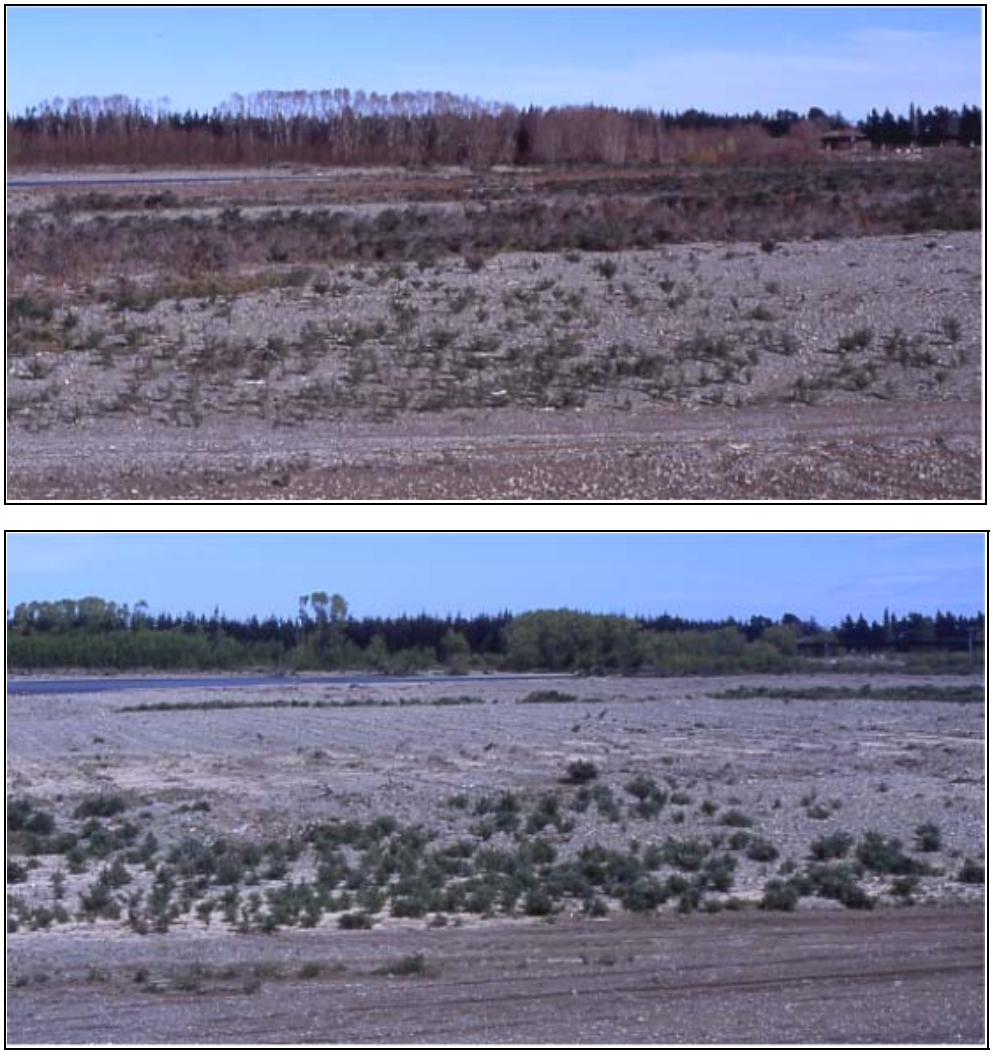


Plate 2 Interpretation sign installed between the Groyne 1 and Rossiter sites, Ashley River.

3.4 Spring bird survey

Results of the spring counts collected between 2000 and 2004 were collated by Eric Spurr and are shown in Table 2.

Table 2 Spring bird counts undertaken in the Ashley River, 2000-2004. No count was undertaken in 2002. nr = not recorded. Counts of some species from Moore (1980) (from the same stretch of river) are also shown for comparison.

Species	2004	2003	2001	2000	1980
Black shag	7	8	3	18	
Little shag	7	4	6	3	
Pied oystercatcher	37	22	22	25	28
Variable oystercatcher	2	0	0	0	
Pied stilt	140	138	82	229	178
Black stilt	2	0	0	0	
Banded dotterel	213	169	130	199	253
Wrybill	9	16	7	17	7
Spur-winged plover	27	13	nr	18	28
Southern black-backed gull	27	10	nr	26	
Black-billed gull	10	0	3	314	*c* 1000
Black-fronted tern	28	102	44	74	55
Caspian tern	0	4	0	0	

3.5 Shorebird breeding

Most of the time available for monitoring was spent on wrybills, black-billed gulls and black-fronted terns, but incidental observations were made on other species, particularly pied oystercatchers and banded dotterels.

Wrybill pairs

Locations of wrybill territories are shown in Figure 1. Where applicable, birds are identified by their colour-band combinations, bands are recorded left leg first and top to bottom (possible colours are: O=orange, R=red, B=blue, Y=yellow, G=green and W=white). M=metal, UB=unbanded.

Male: OW-RW
Female: YGO-M
This pair bred at Dalziel's in 2003/04, and both birds were seen there on 14 September 2004. After that date, neither was seen anywhere in the river, in spite of repeated searches. Both birds survived the season, as they were seen on their wintering grounds at Miranda, Firth of Thames, on 13 February 2005; it is assumed that they bred outside the Ashley study area in 2004/05.

Male: GO-WO
Female: UB
The first sightings of this pair for the season were in the Prior's territory in late August and early September. They abandoned that area in mid-September, and their first breeding attempt was in

the Marchmont territory, about 2 km below the Ashley railway bridge. No nest was found, but the pair were seen there with a small chick on 28 and 30 October. The chick had disappeared by 04 November. The pair then returned to the Prior's territory (a distance of about 8.5 km upstream), where they were found with a nest on 20 November. One egg from this nest hatched on or about 12 December but the chick apparently died within a day. The second egg hatched on 14 December and the chick was seen on 20 December. It had disappeared by 07 January 2005, and the adults had left the area by 11 January.
Result: No chicks fledged.

Male: UB
Female: UB
This pair of unbanded birds were first found in the Toomebridge territory on 27 October. The male was making nest scrapes on that date, but subsequent checks showed that the pair were not consistently present. A one-egg nest was found on 05 November, but it had gone by 10 November. The male continued preparing scrapes and the pair were seen at the site occasionally until mid-December. The late start to nesting, the erratic occupation of the territory, and the apparent lack of a second nesting attempt suggest this was a new pair of first-time breeders.
Result: No chicks fledged.

Male: OG-YR
Female: YO-WB
This pair (previously -M male and M-M female) have occupied the Aerodrome territory for at least the past three seasons. The female was originally banded as a juvenile in January 1996, and is therefore nine years old; the male was first banded as an adult in 2002 and is at least four years old. Both were captured this season and colour banded to aid monitoring. Their first breeding attempt was on the island that had been cleared at this site. A two-egg nest was found on 11 October; it was empty by 26 October, and eggshell fragments in the nest suggested predation rather than a hatch. On 11 December, a second nest was found on the north bank. Although relatively low-lying, this nest just survived a 56-cumec flood on 16 December and hatched on or about 27 December. Two chicks were seen until 03 January, but only one fledged about 30-31 January. The chick was banded OR-OR on 28 January.
Result: One chick fledged.

Male: WO-RW
Female: BO-YO
This pair occupied the Racecourse territory in 2003/04 and returned to it for the 2004/05 season. They may have made an early unsuccessful nesting attempt, but if so, this was not detected. They must have nested (or re-nested) in mid-October, and were found with a small chick 2-3 days old on 23 November. This chick was banded WO-OB on 21 December and fledged about a week later.
Result: One chick fledged.

Male: OR-BO
Female: YO-OG
These two birds were unbanded at the beginning of the season; they could have been the two birds that were seen in this part of the river late in the 2003/04 season, or they could have been a new pair. They first occupied a territory on the cleared island at Groyne 1, but were later found with a two-egg nest about 750 m downstream in the Rossiter's territory. This nest was first found on 04 November, about a week before it hatched. The chicks were first seen on 12 November; they were banded RO-M and OW-M on 08 December and both were flying by 17 December.
Result: Two chicks fledged.

Male: OG-YW
Female: UB
These birds were unbanded at the beginning of the season and were thought to be a new pair. They were seen in the Railway territory periodically until mid-October. On 26 October, a two-egg nest was found on the area that had been cleared; the male was incubating, normally an indication that laying has just been completed. The eggs were present on 10 November, but had disappeared by 22 November. There was no evidence that they had hatched, and the nesting area was covered in vehicle tracks. The male was seen foraging upstream (usually near Groyne 1) on several occasions in December, but there was no sign of a second nesting attempt. It is possible that the female did not survive the season
Result: No chicks fledged.

Overall, six pairs of wrybills attempted to breed in the study area during the 2004/05 season. Between them they fledged four chicks, for average productivity of 0.67 fledglings per pair.

Black-fronted terns
On 12 October, 14 terns were seen on the ground at the downstream end of the Prior's territory. Five birds and two nests were found there on 27 October. Both nests were still present on 04 November but had disappeared by 22 November, when no adults were seen at the site. The area suffers relatively little human disturbance and there were no floods between 04 and 22 November (see Appendix A), so it seems likely that these nests failed because of predation of eggs or small chicks.

No terns nested at the Aerodrome site in 2004/05, although 4-8 pairs have nested there in previous seasons. Up to 16 birds were seen at the site in August, but by mid-September only three birds were occasionally present and most terns in the area were concentrated in the vicinity of Groyne 1.

On 16 September, 55 terns were counted around the Groyne 1 area. By mid-October, 20-25 were routinely present. Nests were found on 26 October, with one on the cleared area, and 8 on the low island immediately downstream. Some of these nests contained only one egg (the normal clutch is two), suggesting that laying was not yet complete. Nests (including two new ones) were still present on 28 October, but on 04 November all nests were empty and only three terns were present.

On 30 October, 16 terns (with about 6 nests) were present immediately upstream of the SH1 bridge. None of these nests survived to hatching, and by 22 November only three terns were present at the site.

On 04 and 05 November, 15 and 12 birds respectively were seen prospecting in the Marchmont territory, but did not nest there.

Result: No black-fronted tern chicks fledged in the study area.

Black-billed gulls
On 16 September, three black-billed gulls were seen on a shingle mound in the cleared area at Groyne 1. By late September, a colony of 190-200 birds had occupied the mound. and nest-building had begun. The colony was still present on 13 October, but had deserted by 17 October, with only 11 gulls seen in the area on that date. A search of the mound on 26 October revealed at least 74 nests in various stages of preparation, but no eggs or egg remains. However, the length of time the birds had been present and the number of nests prepared both suggest that laying was close.

No other breeding attempts by black-billed gulls were detected within the study area. However, a colony with 178 nests (and a few newly-hatched chicks) was found on the sand barrier island at

the estuary on 13 November (S. Petch, pers. comm.). The incubation period of black-billed gulls is 20-24 days (Heather & Robertson 1996), suggesting that eggs were laid there from about 20-24 October, a week after the Groyne 1 colony deserted. It therefore seems probable that many of the Groyne 1 birds were part of the later estuary colony.

Result: No black-billed gull chicks fledged in the study area.

Pied oystercatchers
Pairs of oystercatchers were thinly spread throughout the study area, but only the 5 pairs that nested between Dalziel's and Groyne 1 were monitored closely. They fledged 6 chicks, for productivity of 1.20 chicks fledged per pair.

Banded dotterels
Banded dotterels nested throughout the study area. Many nests were found during searches for wrybills and terns, but fledging success was only recorded for those breeding in or near the wrybill territories that were being monitored regularly. In these areas, 13 pairs fledged at least 10 chicks, for minimum productivity of 0.77 chicks fledged per pair.

Caspian terns
One pair of Caspian terns nested in the study area near Groyne 1. They fledged one chick.

4 Discussion

4.1 Habitat enhancement

The clearance of weeds from potential nesting areas by bulldozing appeared to be very successful, and all three enhanced sites attracted breeding shorebirds. After clearance, these areas consisted of a series of parallel flat strips (each the width of the bulldozer blade), separated by low ridges (formed by spillage of material from each end of the blade). Most natural nesting areas used by riverbed shorebirds are relatively flat, and do not have these low ridges. However, there was no indication that this topography made the areas unattractive to shorebirds. In fact, breeding banded dotterels, wrybills and oystercatchers were seen using the ridges as look-outs, and it is possible that they also provided some shelter for nesting birds during windy conditions.

4.2 Predator control

Of the 61 pest animals trapped, no fewer than 46 (75.4%) were hedgehogs. Studies in the Mackenzie Basin have shown that these are a very common predator of the eggs of ground-nesting birds in braided river systems (Sanders & Maloney 1999). In the Ashley River, cats and mustelids are almost certainly present at lower densities than hedgehogs (which partly accounts for the lower catch rates of those species), but pose a much greater threat than hedgehogs to other life stages, namely chicks and adults.

4.3 Advocacy

Publicity from newspaper articles, signs in the riverbed, and various displays has undoubtedly raised public awareness in the Rangiora area of the threatened shorebirds breeding in the Ashley River, and of the group's activities. Disturbance caused by human recreational use of the river probably had a major impact on two threatened species nesting in the Groyne 1 area near Rangiora in 2004/05. It should be possible to raise public awareness of this issue further, but there will always be some disturbance at this and other sites close to built-up areas. The installation of a dedicated 4WD track along the northern berm has been well-publicised and has probably reduced the number of vehicles in the riverbed itself. However, there are still trail-bikes and 4WDs using many parts of the river.

4.4 Spring bird counts

The November bird counts shown in Table 2 cover four of the past five years and are, as yet, a relatively short dataset. There are fluctuations in numbers of shorebird species, but no clear trends so far. However, some earlier counts are available for longer-term comparisons.

A survey from the Ashley Gorge to the SH1 bridge in late October 1963 recorded no wrybills, 1986 black-billed gulls, and 254 black-fronted terns (Davies 1964). Because single counts for the whole survey area were presented, it is not possible to determine how many of each species were counted below the Okuku confluence, i.e. the area surveyed in recent years. However, the lack of wrybills in 1963 is puzzling, given that they are recorded as breeding in the river by Oliver (1955) and have been recorded (albeit in low numbers) in all surveys after 1963.

Counts from Moore (1980) shown in Table 2 suggest that numbers of most shorebird species in the lower Ashley River have changed relatively little in the past 24 years. The notable exception is the black-billed gull; Moore recorded a colony estimated at about 1000 birds in the lower reaches of the river (between the Ashley rail bridge and the SH1 bridge), but no more than 200 were seen in 2004.

Shorebird breeding success in part of the Ashley River was monitored in 1983 by Hughey (1985). His study area extended 4 km upstream from a point 1.5 km above the Ashley road bridge; this covers the area from the Dalziel's territory down to the Racecourse territory (see Figure 1). In 1983/84, that area contained 5 pairs of wrybills, and in 2004/05 it had 4 pairs. In 1983/84, 11 pairs of black-fronted terns nested within Hughey's study area but all nests were "either destroyed or abandoned as a result of human interference associated with gravel extraction" (Hughey 1985). In 2004/05, 2 pairs nested in the same area. Hughey also recorded 7 pairs of pied stilts, 5 pairs of pied oystercatchers, and a black-billed gull colony (size not stated) in the area. In 2004/05, the same area contained at least 9 pairs of stilts, 4 pairs of oystercatchers and no black-billed gulls.

Overall, the number of wrybills appears to have fluctuated relatively little in the past 30-40 years, with probably fewer than 10 pairs breeding in the river each season. Black-fronted terns appear to have declined over the same time; 28 were recorded in the November 2004 survey (Table 2) and the season's maximum count was 55, seen on 16 September around Groyne 1. These figures compare with counts of 254 in 1963 (Davies 1964), 55 in the lower river in 1980 (Moore 1980) and more than 139 in the upper river in 1981 (Overmars & O'Donnell 1981), and about 90 in 4 km of the river in 1994 (Spurr, in prep.). The most obvious decline has been that of black-billed gulls. No more than 200 were seen in the lower river in 2004, compared to about 1000 in the same area in 1980 (Moore 1980), and almost 2000 between the gorge and SH1 in 1963 (Davies 1964).

While both black-billed gulls and black-fronted terns have almost certainly declined, it should be noted that both species are highly mobile, and may nest many kilometres from the previous season's site. Both species are known to have nested between the Okuku confluence and the Ashley Gorge (Davies 1964, Overmars & O'Donnell 1981), and there appears to have been no survey of that section of the river since 1981. A survey of that stretch is now clearly desirable to confirm the apparent declines in black-billed gull and black-fronted tern numbers in the Ashley River.

4.5 Shorebird breeding

The successful fledging of four wrybill chicks is significant. The limited data available suggest that wrybills show high natal-site fidelity, i.e. most birds raised in a river will return to that river

to breed (Riegen & Dowding 2003). It is therefore essential that chicks continue to fledge in the Ashley if the species is to survive there in the long term. As the Ashley is the northern-most breeding river for this species, its extirpation would result in a further contraction of the breeding range. Banding the chicks that do fledge in the river will provide further information on dispersal and site fidelity. Age and/or experience of some of the wrybills may have been a factor in the 2004/05 season, with two or three of the six pairs thought to be breeding for the first time. As these new pairs become more established and experienced, their breeding success may increase.

The black-billed gull colony that established at Groyne 1 deserted in mid-October, apparently just before egg-laying. This species may desert either because of excessive disturbance, or because the food supply near a colony falls at a critical time (Heather & Robertson 1996). In this case there is no reason to believe that food supply was a problem, because (a) a range of other species (banded dotterel, pied oystercatcher, pied stilt, and Caspian tern) bred successfully in the same area, and (b) the shallows immediately adjacent to the gull colony were a favoured feeding area for many species throughout the season, with wrybills from other territories and many stilts seen foraging there regularly. Disturbance appears to be the most likely cause of the desertion. The area on the south bank adjacent to where the gulls built nests is frequently used by walkers during the day, and by young people at night. A combination of low river flows and easy access for 4WDs at Groyne 1 in October also resulted in vehicles being able to drive to (and past) the colony; a number of vehicles were seen doing this.

All the black-fronted terns that attempted to breed in the study area also failed. As noted above, the failure of the two pairs at Prior's may have been caused by predation. Ten of the 11 pairs that nested in the Groyne 1 area were on an island about 100 m downstream from the failed gull colony and nearer the northern bank. Predation seems a less likely cause at this site, as banded dotterels, pied oystercatchers and pied stilts all had nests or chicks on the same island at the same time as the terns, and most of these survived. The simultaneous disappearance of all the tern pairs at this site suggests desertion after disturbance.

4.6 Threat management

Flooding

The main natural threat to birds breeding in South Island riverbeds is flooding, which destroys low-lying nests. Relatively little can be done to manage flooding, except to ensure that clear areas of gravel on higher islands and gravel banks are available for birds to nest on. Flow rates for the river (measured at Ashley Gorge) between August 2004 and January 2005 are shown in Appendix 1. During the main nesting period from mid-September to mid-December, there were no significant floods and no known losses of nests to flooding. As noted above, a relatively low-lying wrybill nest at the Aerodrome site survived a 56-cumec flood in December.

Weed clearance

The enhancement of breeding habitat by clearance of weeds was considered successful. The next challenge will be to keep these areas as free of weeds as possible in the longer term by reducing re-growth. The cleared area at the Aerodrome territory was sprayed with glyphosate (by helicopter) on 12 March 2005. It is hoped that repeated clearance over several years at selected sites will reduce the seed bank locally and result in gravel areas that can be kept relatively free of weeds with minimal effort. A combination of bulldozing, hand-pulling, and occasional spraying will probably be required. Clearance of about 3.8 ha in the Dalziel's-Prior's area before the 2005/06 season has been proposed.

The fact that virtually all the shorebirds breeding in the Ashley migrate to the North Island or move to the coast for the winter is helpful – intrusive management such as bulldozing can be undertaken between March and August without risk of disturbance.

Predators
The number of predators caught, and the productivity of wrybills, banded dotterels and pied oystercatchers seen (see section 3.5 above) suggests that trapping was effective in increasing survival of eggs and chicks. Within limits, the more traps that can be deployed the better, but quality of trapping (particularly siting and setting of traps) is also very important. Some training, experience, or natural 'feel' for trapping is required, and suitable volunteers may be few.

Disturbance
Some progress was made with public awareness of this issue, but disturbance by people, vehicles and dogs was still a major problem in the heavily-used areas close to Rangiora (Groyne 1 and Rossiter's) and Ashley township (Railway). Further publicity would undoubtedly help, but even if the majority of the public were aware of the problem and prepared to stay out of parts of the riverbed, there would still be substantial numbers of people in these areas unaware of (or unsympathetic to) the plight of the shorebirds in the river.

5 Conclusions

Wrybills, black-billed gulls and black-fronted terns face a wide array of potential threats in the Ashley River, including loss and degradation of habitat through weed growth and water abstraction, predation by introduced mammals, disturbance from human recreational use and gravel extraction, and flooding. It seems very likely that management will be required if these threatened species are to persist in the Ashley River. Management aims may not be the same for all three species.

Gulls and terns are particularly susceptible to disturbance. They are also colonial or semi-colonial nesters, which often results in an 'all-or-nothing' outcome. Suitable habitat in low-disturbance areas is required, and some fencing and/or policing of these sites at critical times may be needed. The short-term goal for both gulls and terns must be to maintain colonies of both species in the river and to maximise their breeding success.

Wrybills are more tolerant of disturbance than gulls or terns but are highly susceptible to mammalian predators. While wrybill numbers have apparently been roughly stable for some years, the absolute number of birds in the Ashley is small. The goal for wrybills must therefore be to increase the number of pairs breeding in the river. Natal site fidelity in this species appears to be high (Riegen & Dowding 2003), suggesting that in the event of local extirpation re-colonisation from other rivers is unlikely. With six pairs remaining, it is therefore vital to fledge as many chicks as possible in the short term, to ensure sufficient recruitment in future.

Results from the 2004/05 season suggest that in the longer term, management in the Ashley should probably concentrate on trying to encourage threatened shorebirds to breed away from the built-up areas around Rangiora and Ashley. This may be achieved by (a) enhancing and managing habitat upstream of Rangiora, and (b) by *not* clearing weeds in areas of high human recreational use. There is some evidence that the 4-5 km of riverbed upstream of the Racecourse territory has routinely attracted all three threatened shorebird species in recent decades. Managing this single, discrete area more intensively may be easier from a public relations point of view, and may provide better outcomes. Advocacy material could emphasise that the birds only require a small proportion of the riverbed, and that this site is away from the areas of highest recreational use.

6 Recommendations

1 Continue weed control, predator control and monitoring in the study area

Justification: Similar shorebird protection programmes in North Island coastal areas show that many benefits only accrue after several years of management. Weed and predator control become more effective, and public awareness and cooperation increase. Accumulation of management experience and of monitoring data allows more informed decisions and more effective management. The creation of bare shingle areas was highly successful – all three areas were used by shorebirds for nesting – and this form of habitat enhancement should continue..

2 Preferentially enhance habitat away from heavily-used areas (i.e. those near Rangiora)

Justification: Disturbance, particularly in the Groyne 1 area, may have resulted in desertion by the black-billed gull colony and breeding failure by black-fronted terns there. Suitable habitat exists upstream (where there is less disturbance), particularly at the Aerodrome site and in the Dalziel's-Prior's-Toomebridge area. Future island creation and weed clearance should consider these as high-priority areas.

3 Increase predator control as resources allow

Justification: Introduced predators are the main cause of breeding failure among native shorebirds (Dowding & Murphy 2001). On average, the more traps that are present at each site, the higher breeding success is likely to be. Note however that quality of trapping is important.

4 Continue banding wrybills

Justification: Banding assists greatly with monitoring each season and will provide information on survival of the adult birds in the river. Sightings of banded birds elsewhere also provide information on migration and other movements, and add to our general knowledge of the species. By making birds recognisable as individuals, banding also potentially enhances interest in the project by members of the ARRG and others in the community. Consider marking other species.

5 Expand monitoring to include the Ashley estuary

Justification: It seems likely that during the 2004/05 season, at least some of the black-billed gulls (and possibly black-fronted terns) that abandoned sites within the study area nested later at the estuary. Occasional monitoring of the estuary would require a small increase in time, but should improve our understanding of movement patterns and breeding areas used by these two species.

6 Maintain and increase education and publicity

Justification: Many of the public are likely to be sympathetic to the Group's aim of improving the breeding success of shorebirds in the river, and would not disturb breeding birds if they knew when, where, and how to help. Further newspaper articles are required, and PowerPoint presentations should be available for use by local schools and special interest groups.

7 Acknowledgements

We are particularly grateful to the funding agencies that supported the ARRG in 2004/05:

- **Pacific Development and Conservation Trust**
- **New Zealand National Parks and Conservation Foundation**

The activities recorded in this report would not have been possible without their generous grants.

Thanks to Taggart Earthmoving Ltd for weed clearance and island creation, the Department of Conservation for traps, and Environment Canterbury and Waimakariri District Council for support throughout the season.

This project relied heavily on people donating considerable amounts of their time. Thanks to all the members of the ARRG for help with fieldwork, ideas, useful discussions and attendance at meetings; they and others helped with weed-pulling, predator-trapping, monitoring, advocacy and the November survey. For construction of the plinth at the picnic area, we are grateful to Ron Mackie and various local businesses. Thanks to Eric Spurr, who collated results from the annual November surveys, and made available a copy of his draft manuscript. A special mention must be made of volunteer trappers, who spent many hours out on the riverbed – notably Chris and Jim Martin, Lyn Andrews, Terry Calvert, Doug Tait and Geoff Swailes.

8 References

Cromarty, P. & Scott, D.A. 1996. *A Directory of Wetlands in New Zealand*. Department of Conservation, Wellington.

Davies, M.M. 1964. Field study week-end, Canterbury 25th - 28th October, 1963. *Notornis 11:* 61-62.

Dowding, J.E.; Murphy, E.C. 2001. The impact of predation by introduced mammals on endemic shorebirds in New Zealand: a conservation perspective. *Biological Conservation 99*: 47-64.

Heather, B.D.; Robertson, H.A. 1996. *The Field Guide to the Birds of New Zealand*. Viking, Auckland.

Hitchmough, R.; Bull, L. 2004. Draft New Zealand Threat Classification Systems lists 2004. Biodiversity Recovery Unit, Department of Conservation, Wellington.

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

Molloy, J; Bell, B.D.; Clout, M.N; De Lange, P.; Gibbs, G.; Given, D.; Norton, D.; Smith, N.; Stephens, T. 2002. Classifying species according to threat of extinction: a system for New Zealand. *Threatened Species Occasional Publication 22*. Department of Conservation, Wellington.

Moore, S.G.M. 1980. Wildlife Survey of the Ashley River. Unpublished report, NZ Wildlife Service, Christchurch.

North Canterbury Catchment Board & Regional Water Board. 1982. The water resources of the Ashley Catchment. North Canterbury Catchment Board & Regional Water Board, Christchurch.

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

Oliver, W.R.B. 1955. *New Zealand Birds, 2nd edn*. A.H. & A.W. Reed, Wellington.

Overmars, F.; O'Donnell, C. 1981. Wildlife Survey of Upper Ashley River. Unpublished report, NZ Wildlife Service, Christchurch.

Riegen, A.C.; Dowding, J.E. 2003. The Wrybill *Anarhynchus frontalis*: a brief review of status, threats and work in progress. *Wader Study Group Bulletin 100*: 20-24.

Sanders, M.D.; Maloney, R. F., 1999. Video monitoring of nesting banded dotterels, black stilts, and black-fronted terns in braided rivers of the upper Waitaki Basin. *Project River Recovery Report 99/07*. Department of Conservation, Twizel, New Zealand.

Spurr, E.B. *In prep*. Bird population trends in the Ashley River (Rakahuri). Manuscript to be submitted to *Notornis*.

Appendix A

Flow at the Ashley Gorge during the shorebird breeding season, August 2004 – January 2005. Source: http://www.ecan.govt.nz/Our+Environment/Water/Rivers/RiverFlows/