
*Management and monitoring of shorebirds in the
Ashley-Rakahuri River during the 2017/18 season*



Unlucky birds. A wrybill sits on its nest in heavy rain, hours before rising waters swept away the eggs. The pair re-nested nearby, but a 4WD vehicle ran over the nest just as the two eggs were hatching.



Ashley-Rakahuri Rivercare Group, Inc.

Management and monitoring of shorebirds
in the Ashley-Rakahuri River during the 2017/18 season

A report by:

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Prepared for:

Ashley-Rakahuri Rivercare Group, Inc.

(composition of Group given on last page – Appendix 4)

July 2018

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Summary

Ledgard, N.J.; Davey, G. R. *Management and monitoring of shorebirds in the Ashley-Rakahuri River during the 2017/18 season*. Unpublished report, Ashley-Rakahuri Rivercare Group Inc., Rangiora. 48 pp.

The Ashley-Rakahuri Rivercare Group was formed in 1999. Its main goal is to protect key shorebird populations in the lower reaches of the Ashley-Rakahuri River, in the 18km stretch between the Okuku river junction and the SH1 road bridge. This is the 14th annual report from the Group.

The Group is now mostly self-funded, with finances coming from a trap making and selling project, donations and sponsorship via Karikaas Dairy Products Ltd cheese sales, plus grants for special projects (such as weed clearing and video creation) from DOC, ECan and its Waimakariri Zone Committee, and the Rata Foundation

Activities were focussed on management to assist the feeding and breeding of three threatened species in the river, namely the wrybill (ngutupare), black-billed gull (tarapuka) and black-fronted tern (tarapirohe). All riverbed birds require clear, weed-free shingle expanses for successful feeding and breeding. To this end, the main actions undertaken involve habitat management (mainly weed control), monitoring bird populations and breeding success, predator control, restricting nesting season access to the river, and improving awareness by the public and river management decision-makers.

Habitat enhancement. Habitat threats from predators and human disturbance have not altered recently, but weed invasion has changed considerably. After a major weed increase between 2014 and early 2017, large floods over the 2017 winter increased clean shingle areas from around 30ha to over 250ha. In addition, small areas of remnant weeds were cleared using earth-moving machinery. The challenge now is to maintain weed-free sites. Trials are underway to determine the most cost-effective and environmentally friendly means (spray and/or machinery) of doing this. Greater areas of clear shingle appear to be a major cause of improved bird numbers and breeding success.

Bird surveys. Although the bird population trend up to 2014 was a rising one, it reversed (declined) in the following 2 years. However, the survey figures for November 2017 indicated that this decline has stopped and populations could even be rising again. Although wrybill survey numbers (9) were the lowest since 2008, there were at least six pairs nesting on the river at the time of the mid-November survey. There was a 56% increase in pied stilts, and a 17% increase in black-fronted terns, plus the return of a black-billed gull colony (up to 350 pairs) for the first time in 4 years.

Monitoring of breeding birds. After a decline in breeding attempts in 2016-17, there was an increase in the 2017-18 season. At least eight pairs of wrybill took up territories in the study area in 2017-18 – the same number as in the previous season. A minimum of 5 chicks were fledged by six pairs, for a productivity of 0.63 chicks fledged per pair. Such productivity is well above last year's figure (0.38), and similar to the previous year's (0.7) – but below the 14-year average of 0.79. After a poor 2016-17 season, there was a good recovery of black-fronted tern breeding. It is estimated that 70-80 pairs attempted nesting, ending with a total of 40-45 chicks fledged, for a productivity of between 0.5-0.64. This is above the 14-year average of 0.41, but if some of these pairs nested twice then the average probably remains about the same. For the first time in 4 years, a black-billed gull colony returned to the riverbed. If a figure of 350 occupied nests is used from the colony, resulting in 120-140 chicks fledging, then productivity ranged from 0.34 to 0.4. This is close to the long-term riverbed average of 0.32, but considerably down on the exceptional productivity of the 2016-17 off-river farm colony of 1.17 to 1.70. Breeding success or productivity of other species was not recorded, but signs of successful breeding were noted at many sites.

Predator control. The number of trap-nights during the 2017/18 summer breeding season was 24,752 - the highest since regular trapping started in 2004. The reason for this is extra trappers in the volunteer trapping team (now 12-13), additional work by the regular trappers, and an increase in trap numbers from 120 in 2015-16 to 150 currently. The breeding season trap-catch rate of 0.44 predators / 100 nights was the second lowest on record - 29% more than last year (the lowest), but still well below the 14-year long-term average of 0.90. Although this maintains the downward trend over time, individual predator numbers may be increasing. Hedgehogs remain the most trapped predator (second highest ever), followed by the highest ever numbers of weasels, cats, stoats, rats and ferrets. The winter trap-catch rate was 0.57. The increase in predator numbers may be due to increased food sources (rabbits, rats and mice).

Awareness / education. During 2017/18 many opportunities were taken to ensure that the public were kept aware of the Group's activities. Ten articles appeared in local papers. Powerpoint presentations were given to nine primary schools and Rangiora High School, plus interest and service groups, district council committees, and as part of DOC's Conservation Week and Predator Free NZ workshops. During the breeding season, Rangiora cinema featured a

'screen vista' about the Group prior to every film showing. In early 2018 the Group gained its first sponsor. Karikaas Dairy Products Ltd in Loburn now uses our name, plus images of riverbed birds, to promote their premier cheeses. Another new advocacy project during the past season has been work on a documentary video of the Group's activities over a bird breeding season. Filming and interviews were undertaken throughout the season by Tony Benny, a professional film maker from Oxford.

Our website (www.ashleyrivercare.org.nz) was maintained by the District Council's Visit Waimakariri office, while Steve Attwood ran our Facebook page (<https://www.facebook.com/ashleyrivercare>) for its most active year to date. The Group remained closely associated with staff from DOC, the Waimakariri District Council and local Zone Committee, Environment Canterbury (ECan) and the Ashley-Rakahuri Regional Park - plus contributed actively to the running of BRaid Inc, a group which aims to improve the ecological welfare of all braided rivers in Canterbury.

Conclusion. Relative to the future success of rare and endangered shorebird species breeding in the Ashley-Rakahuri river, bird populations and breeding success increased significantly from 2000 - 2014, but then declined through the subsequent 2 years. Over the past year, it was pleasing to note an arrest in this decline, primarily due to major floods in the winter of 2017, which reversed a prior increase in weed-infested areas. The major challenges now involve maintaining weed control and improving bird nesting and feeding habitat, maintaining/improving the control of predators, plus banding more adult birds (particularly wrybills) to determine long-term survival trends. To these challenges and opportunities must be added the ever-present one of maintaining the interest and involvement of the local community and major decision makers in bird management on the Ashley-Rakahuri River.

Recommendations for future management include:

1. Continue annual bird surveys and monitoring of breeding activities - focussing on the three key threatened shorebird species (wrybill, black-billed gull and black-fronted tern).
To date: Surveys and monitoring being maintained adequately
2. Create and maintain improved habitat, particularly extensive weed-free sites, for breeding and feeding. Identify cost-effective and environmentally-friendly means of maintaining weed control.
To date: Significant weed removal by 2017 floods, supported by machine clearance of remnant vegetation, plus follow-up maintenance (by spraying).
3. Improve record keeping / mapping (traps and bird nesting), and band more birds.
To date: Record keeping adequate. Mapping effort has been greatly improved over the past 2 years. Banding over recent years has been minimal – needs improvement.
4. Explore opportunities for increasing trapping effort and using new technologies for predator control. This effort needs to extend to include all the study area.
To date: Trapping adequate and appears to have lowered predator numbers. A good trapping network is now established around the estuary.
5. Continue advocacy initiatives both by members and other agencies such as DOC, making use of the website (including social media such as Facebook), the Powerpoint presentation, video footage and printed material. Particular attention should be paid to schools and field interpretation / awareness signs for the public.
To date: Good advocacy to date, plus video documentary should improve this. However, the almost complete lack of field interpretation signs needs priority attention.
6. Maintain funding via local sponsorship and Group initiatives such as trap-making.
To date: Funding adequate over recent years, and now includes a major sponsor. Our major fund raiser, trap-making and selling, not only adds to funds, but promotes effective predator control elsewhere. Large projects have been supported by outside agencies.
7. Continue full support for BRaid Inc.
To date: Good support of BRaid and its outreach programmes.
8. Maintain and improve collaboration with ECan's Biodiversity Programme, the Waimakariri Zone Committee, the Canterbury Water Management Strategy's Regional Committee, Fish and Game and local iwi/runanga.

To date: Good collaboration, but links with iwi/runanga and F&B need improvement.

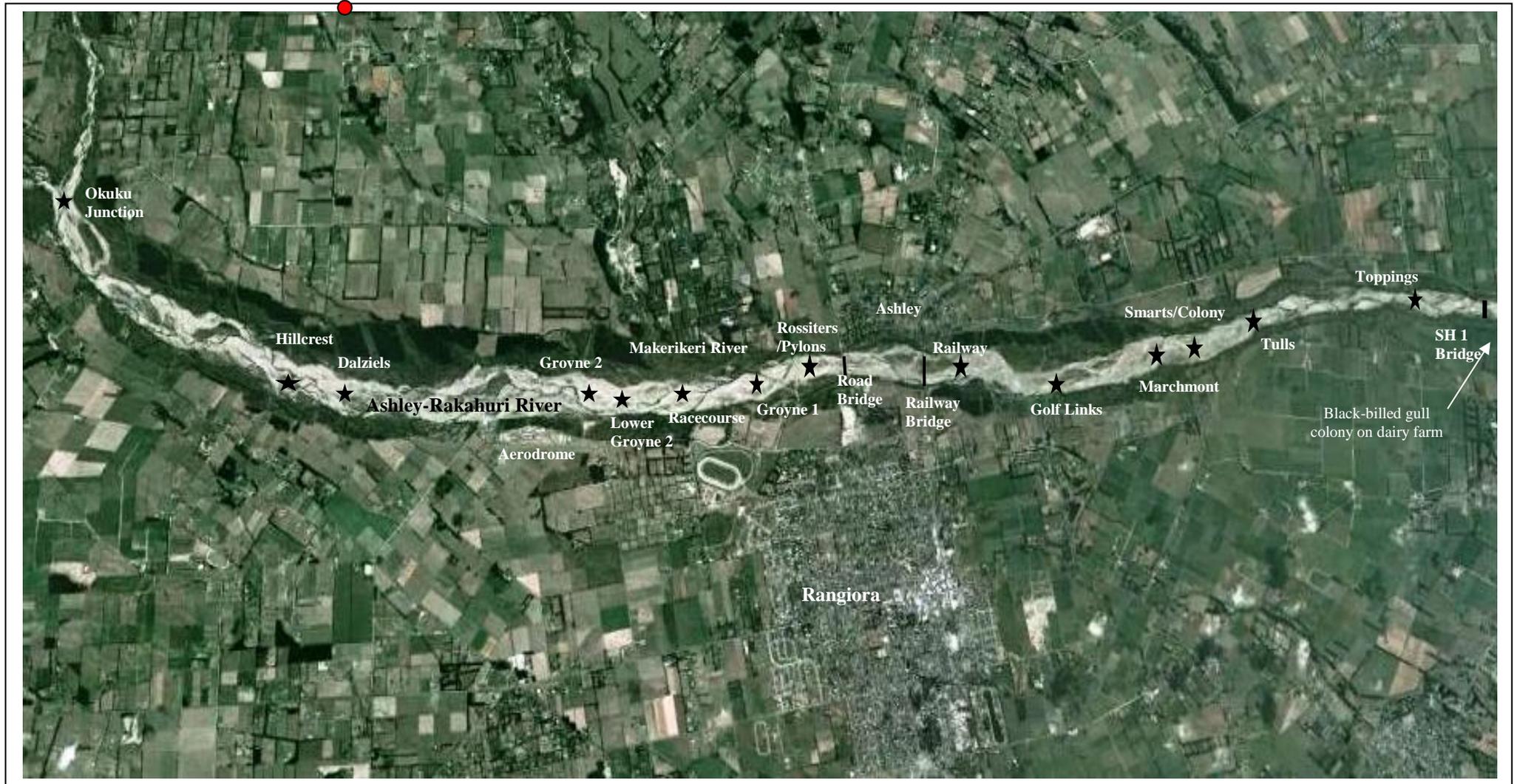
9. Maintain and improve collaboration with commercial shingle extractors.

To date: Good collaboration, but needs extending. Need to promote appropriate regulation enforcement by ECan, particularly of the smaller operators.

10. Support management of Environment Canterbury's Ashley-Rakahuri Regional Park, and implementation of the Northern Pegasus Bay Bylaw 2016.

To date: Good collaboration, but on-going issues relative to inappropriate use of riverbed and estuary, particularly by vehicles, ATVs, trailbikes etc.

Figure 1. Map of lower Ashley-Rakahuri river, showing main breeding areas.



1 Introduction

The braided rivers of the South Island are a unique habitat of outstanding importance to endemic wildlife (Cromarty & Scott 1996, Dowding & Moore 2006). In particular, they provide breeding habitat for a range of threatened shorebird species, some of which depend largely or entirely on braided rivers for their survival. Braided rivers commonly have large areas of bare, mobile shingle, multiple channels, and variable flows (O'Donnell & Moore 1983). However their ecological values are increasingly threatened; most have been invaded by weeds and introduced mammalian predators, and are further degraded by a wide variety of human activities. This is well covered in DoC's publication 'Management and research priorities for conserving indigenous biodiversity on New Zealand's braided rivers' (O'Donnell *et al*, 2016).

The Ashley-Rakahuri is a medium-sized river located in North Canterbury. From the Ashley Gorge, the river flows east and enters the sea about 25 km north of Christchurch. Halfway to the coast it is joined by its major tributary, the Okuku river. In contrast to the larger snow-fed rivers, the Ashley-Rakahuri is fed by rainfall from the foothills and has relatively low flow rates. The estuary where the Ashley-Rakahuri drains into the Pacific Ocean has large areas of tidal mudflats, and is recognised as one of the best shorebird feeding sites on the South Island's eastern coastline.

The shorebird values of the Ashley-Rakahuri are well-recognised. The Ashley-Rakahuri River and estuary are included in a list of wetland sites which meet criteria prescribed to be of international importance by the International Union for the Conservation of Nature (IUCN) (Cromarty & Scott 1996). Following surveys of Canterbury rivers in the 1970s and early 1980s, the New Zealand Wildlife Service ranked their wildlife and conservation values; the Ashley-Rakahuri was one of five rivers given the highest



Ashley-Saltwater creek estuary and river in July, 2018

possible ranking of 'Outstanding' (O'Donnell & Moore 1983). In 2009, declining bird numbers over the previous 25 years led to a reclassification of 'Regional' importance (Hughey *et al*. 2010).

The Ashley-Rakahuri Rivercare Group (ARRG) is a community group (see Appendix 4 for make-up) formed in 1999 to assist with management of the lower reaches of the Ashley River. Its main aims are to protect shorebirds and their habitat in the riverbed, to monitor breeding success, and to promote these activities to the wider public, while at the same time recognising other sympathetic users. In 2005, the Group became an incorporated society. Since 2004, ARRG has received four grants to assist it in carrying out its aims. Initially, funding was supplied by the Pacific Development and Conservation Trust and the New Zealand National Parks and Development Foundation. During 2006/07, the principal sponsor was the Habitat and Protection Fund of World Wildlife Fund (WWF) - New Zealand. In June, 2007, a 2-year grant was approved by the Lotteries Environment and Heritage Committee. A partial extension was granted through to December 1, 2009. In July 2010, a further 2-year grant was approved by WWF-New Zealand. Currently, the Group supports itself by local fund raising, sponsorship and donations, with larger projects funded by grants from outside agencies. The activities undertaken since 2004 have been described in the Group's annual reports (Dowding & Ledgard 2005, 2006, 2007, 2008, 2009, 2010; Ledgard &

Dowding 2011; Ledgard, Spurr and Crossland, 2012; Ledgard and Muga, 2013; Ledgard & Dowding, 2014 and Ledgard, 2015, 2016, 2017), which also record the results of bird monitoring, habitat enhancement, predator control, and advocacy, and make recommendations for future management. The present report documents the management activities and monitoring of birds that were undertaken during the 2017/18 season. An analysis of longer-term results since 2000 is given in the 2013-14 report, with a more recent paper by Eric Spurr and Nick Ledgard published in *Notornis* 63(2), 2016.

In the past, the river has provided breeding habitat for significant numbers of black-fronted terns and many hundreds of pairs of black-billed gulls. In the 1990s and early 2000s, the number of gulls in particular declined substantially (Dowding & Ledgard 2005). The Ashley-Rakahuri used to be described as the most northerly river on which wrybills breed, following a southward contraction of the core range of the species over the past century (Riegen & Dowding 2003). However, wrybill have recently been recorded breeding as a few isolated pairs on the Waiau river, which is about 70 km north of the Ashley-Rakahuri. The Ashley birds remain the northern-most population which is known to have been stable for some time. These three key species have been the main focus of management activities of the Group; all are endemic, have declining national populations and are considered threatened.

The threat categories of all New Zealand birds were revised in 2012 and the results reported by Robertson *et al.* (2017). The most endangered species on the Ashley-Rakahuri River is the black-billed gull which is now classified as Nationally Critical, and internationally as Endangered, making it the world's most threatened gull species (BirdLife International 2014). However, a more recent study suggests its current threat status may be too high (Mischler 2018). The next most threatened species on the Ashley-Rakahuri is the black-fronted tern, which is classified as Nationally Endangered, the second-highest ranking possible under the New Zealand scheme. The wrybill has a declining range and is classified as Nationally Vulnerable, as is the banded dotterel, which is considerably more common on the Ashley-Rakahuri River. Other shorebird species which breed on the river (such as the pied stilt and the South Island pied oystercatcher) are listed as At Risk.



Black-billed gull – threat status questioned.

2 Study area and methods

2.1 STUDY AREA

The study area consists of an 18 km stretch of the lower Ashley-Rakahuri river, from the State Highway 1 road bridge up its confluence with the Okuku river. It was described in detail in the Group's first report (Dowding & Ledgard 2005) and an updated Google-based map of the area is presented in Figure 1 above.

2.2 HABITAT MANAGEMENT

Controlling weeds. Over the past 3 years, the negative impact of weed invasion on bird populations and breeding has become very obvious (see photo series in Appendix 2). As areas of clear shingle decrease so also do bird numbers. Consequently, major efforts have gone towards weed clearance and control. Early reports describe a combination of physical hand-pulling and

earth-moving machines which was used to remove weeds from specific sites in order to create potential bird breeding areas. However, experience has shown that these cleared areas can only be small and there is no guarantee that birds will use them. Hence, the reliance has been on natural floods to clear away large areas of weeds. However, after the May, 2014 flood (480cm³) there was no major flood event until April 6, 2017 (235cm³), and hence weed areas and density increased significantly (Figure 4). For this reason, weed clearance using heavy earth-moving machines was carried out in July/August, 2016. Major floods between April and October, 2017 (Appendix 3), cleared large areas of weeds (see photos in Appendix 2), remnants of which were further cleared by machine in August 2017 (Ledgard, 2018).

2.3 ADVOCACY

Advocacy and liaison activities are a priority focus. This is undertaken in the form of media articles, displays, videos, talks to schools, service clubs, land administration agencies and the public (usually accompanied by the Group's PowerPoint presentation), a web page and Facebook site, sales of a children's book and bookmarks, plus advertising (both by Group members and local DOC officers) are used to raise public awareness of shorebirds in the river and of the Group's activities. During the breeding season, riverbed visits are organised for the public and customised Corflute signs are placed in managed riverbed areas to ensure people are aware of the location of breeding birds. The Group currently has a sub-committee looking into greater use of interpretation signs on the river.

Another new advocacy project during the past season has been work on a documentary video of the Group's activities over a bird breeding season. Filming and interviews were undertaken throughout the season by Tony Benny, a professional film maker from Oxford. The final product will be available by the end of 2018.

During the past season, sponsorship was arranged with Karikaas Dairy Products Ltd., in return for promotion of the bird management work being carried out by the Group and BRaid Inc. Plus a wrybill image supplied by the Group was used on the Waimakariri Library's junior membership card.



Riverbed signs during the breeding season are the key to good bird protection.

2.4 WALKWAY, BIKE TRACK, 4WD TRACK, RIVERBED ACCESS AND SWIMMING HOLES

The Ashley-Rakahuri Regional Park staff have continued to develop walking and trail bike tracks and grass recreational areas in the berm alongside the river. This discourages people from recreating in the riverbed itself, as does the 4WD track (on the northern bank) and open 'dirt-bike' areas. Every spring, a digger is hired to close off tracks running through the berm into the river, with appropriate signage alongside. There is little doubt that this reduces vehicle use of the riverbed during the breeding season, but after blockages are removed in early February, it resumes during the remaining summer weeks and over winter. In December swimming holes are usually dug in the riverbed to encourage public activity away from bird breeding sites.

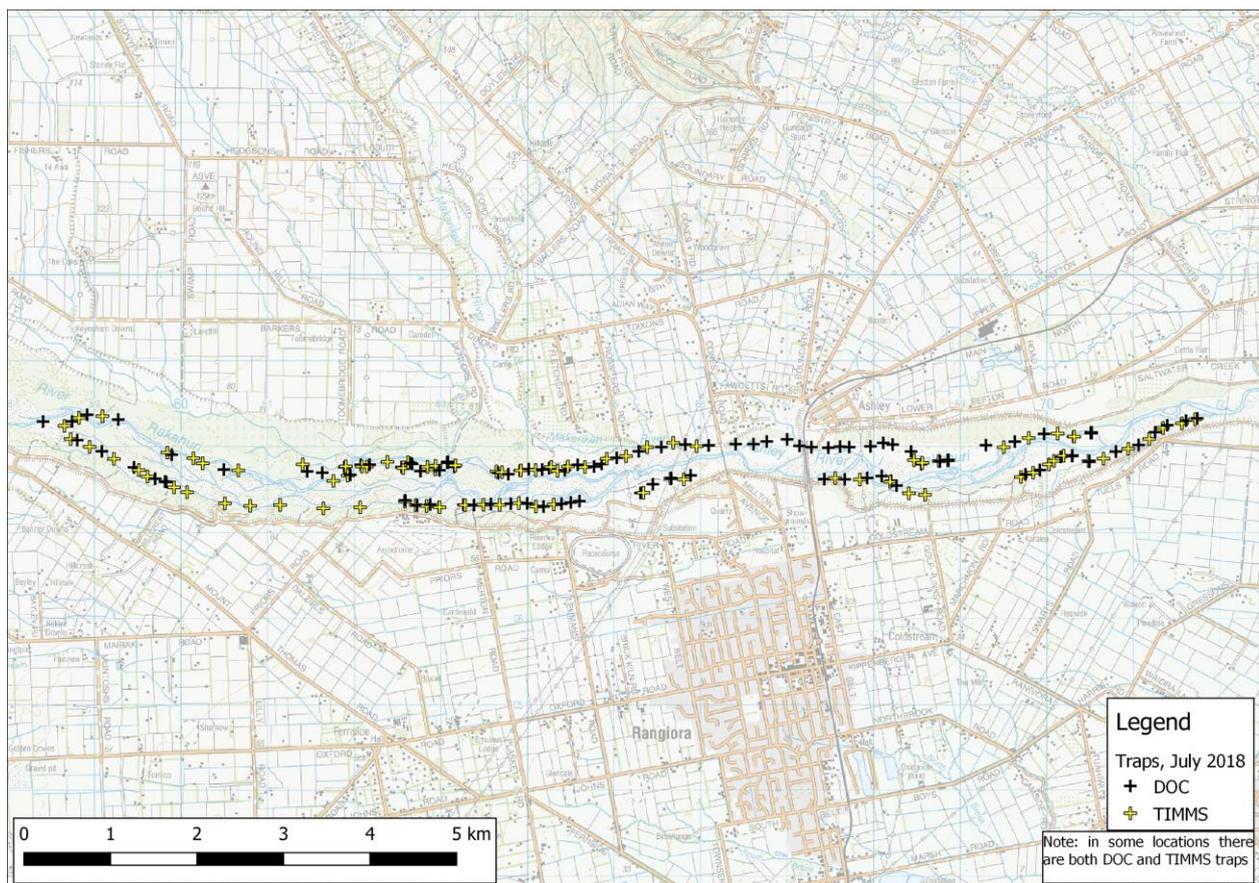
2.5 PREDATOR CONTROL

The area trapped was around the major bird breeding sites on the Ashley-Rakahuri river (see Figure 1), extending over approximately 12 kms from the Tullies site in the east (NZTopo50-BW24; E157180, N510880) upriver to the Hillcrest Road site in the west (NZTopo50-BW23; E155920, N510820). Trap locations as of July, 2018, are shown in Figure 2.

Trapping takes place all year, with 11-13 trappers using up to 180 traps to target mammalian predators (mainly feral cats, mustelids and hedgehogs). Trap locations are shown in Figure 2. Trap types included cage, Bushby tunnel and PossumMaster, but the vast majority are Timms traps and DOC 200 and 250 traps. When the birds start to arrive in September for the breeding season, traps can be concentrated at sites with a history of use by nesting birds and added or moved as required. Traps were baited with a range of baits, usually fresh meat, salted rabbit or hen eggs, and checked every 2-3 weeks.

The floods of August, September and October 2017 swept away 21 traps, which together with the 26 lost earlier, cost the Group about \$2300. All traps were replaced, the DOC200s from our manufactured stock, and the TIMS from our purchased stock.

Figure 2. Location of traps on Ashley-Rakahuri river as of July 2018.



2.6 BIRD SURVEYS AND MONITORING

Survey. The annual spring survey of all resident birds was undertaken on November 18 from the Okuku river junction down to the SH1 bridge. It involved 16 members. There was no survey of the 22 km stretch between the Okuku river junction and the Ashley Gorge, which was last surveyed

in 2011 (for the first time since 1981). Nor was there any survey of the Lees Valley section of the river (last undertaken by DOC in 2011).

Monitoring. Monitoring of wrybills, black-billed gulls, and black-fronted terns during the breeding season was carried out as described in previous reports (e.g., Dowding & Ledgard 2005, 2006, 2007), and began this season in August. Riverbed visits were undertaken at least 2 times every week until early February, with most efforts concentrated in the core bird breeding area between the Tulls Road site and Hillcrest Road (Figure 1). Breeding success (productivity) for each of these species was recorded as the average number of chicks fledged per pair.

Banding of wrybills has been undertaken in the past, but has not occurred over the past 4 seasons.

In addition to the monitoring undertaken during the breeding season, a walk between Groyne 1 and Groyne 2 (2km) is carried out every month - river flows permitting. Bird species and numbers are recorded, with the aim of determining changes throughout the year. Interim results from this monthly monitoring are given in 3.5.1 below.

2.7 MEMBERS and MEETINGS

Members. The group email list contains 88 people, who in the past have served as its membership. However, the Charities Commission now requires us to have 'registered members'. Forty members have requested to be placed on the formal membership list, and only they can vote at meetings. No subscription is charged.

Meetings. During the 2017/18 season, the Group held meetings in the Department of Conservation's offices on River Road, Rangiora, on July 14, September 20, October 26 (AGM), February 8 April 11 and June 7 (Appendix 1). Fourteen members attended the AGM, with an average of 14 present at other meetings.

Management Committee. In September, 2017, it was decided to form a Management Committee which had the capacity to make decisions and approve funding for small tasks requiring immediate attention – for final approval at the next General meeting. The Constitution had to be amended to incorporate this change. Six members were voted onto the Management Committee, which met on September 20, October 4 and April 11.

2.8 INCOME and EXPENDITURE

Income. Over the last year the Group's income has come from a mix of sources. Most were obtained from trap making and selling (200 in the past year), ECan and their Waimakariri Zone Committee's Immediate Steps fund, (weed clearance in the riverbed), DOC (traps) and the Rata Foundation (video filming). For every trap made and sold (\$70), a percentage is retained for the Group. During the year, the Group and BRaid were approached by Karikaas Dairy Products Ltd in Loburn to use our names, plus images of riverbed birds, to promote their premier cheeses. In return, the Group receives a percentage of profits from sales. Smaller amounts of income came from sales of books and bookmarks at the Ohoka market, and donations – including over \$400 from pupils at Swannanoa school.



Trap making and selling is the Group's major fund raiser.

Expenditure. Most expenses have been associated with buying materials for trap making, filming of the documentary video, and weed clearance in the riverbed - largely by machine, followed by maintenance spraying. Smaller amounts have been spent on trapper mileage, maintaining the website, advertisements and riverbed signage.

Over the year ending June 30, 2018, the Group's Net Cash Flow was \$2,867.

3 Results

3.1 HABITAT MANAGEMENT

Riverbed birds require open shingle for breeding. Until the April 2017 flood, there had been no major floods since mid-2014, resulting in the river arguably becoming as choked up with weeds as it had ever been. Hence, the clearance of weeds over 3.2ha at five sites in August, 2016. A full report on this work was submitted to ECan in January, 2017 (Swales and Ledgard, 2017). Consents to clear a further 71 ha were applied for in early 2017, and were granted. This was before the major floods of April 6 and July 22 (570cm), the latter being the largest flood since the Group began regular monitoring of the river in 2005. Needless to say, the floods removed large areas of weeds (photo sequence in Appendix 2), with mapping indicating that the area of clear shingle in the study area had increased from around 30ha to 250ha (Figure 4).



Clearing remnant weeds on favoured bird nesting sites after major floods of 2017.

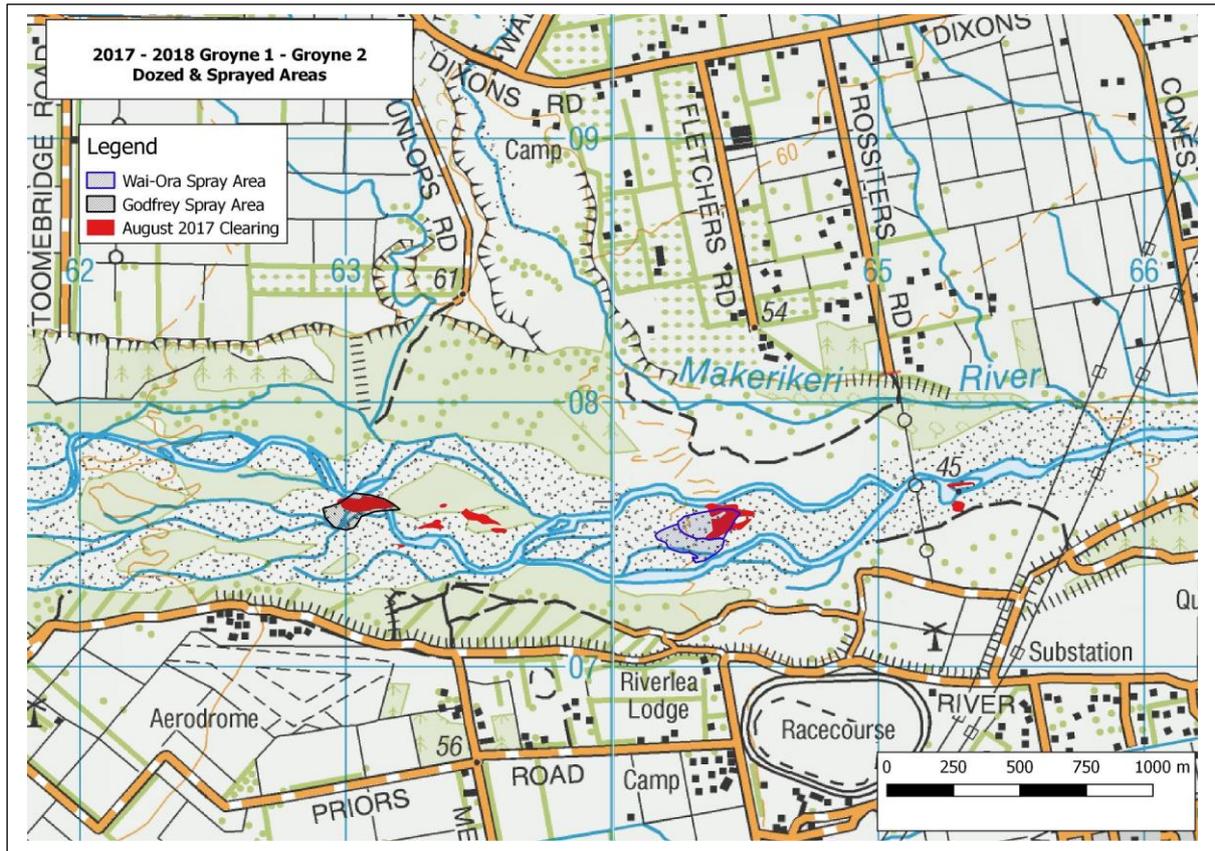
All the same, it was decided to go ahead with the intended August clearing work in order to remove small patches of remnant weeds, and to create entirely weed-free sites for maintenance into the future. A Komatsu D65ex bulldozer (equivalent to a D6) operated by Lewis Green of Tim George Earthmoving Ltd was employed for 2 days (August 28/29) to clear weed remnants at 5 sites on the river (Table 1 and Figure 2). On some sites e.g., the Pylon site, remnant weeds (including some willows) were left intact at the up-river end of the island, to divert strong currents and better protect the site from the higher floods.

This work was fully described in a report to ECan (Waimakariri Zone Committee) in May, 2018 (Ledgard, 2018).

Table 1. Sites and areas cleared on August 28-29, 2017 – intended and actual

Site	Name	Area (ha)			Comments
		Total	Intended to clear	Actual clear	
1	Smarts	26.2	11.8	0	Nearly all cleared by Taggarts as part of shingle extraction
2	Groyne 1	11.4	3.6	1.35	Most cleared by April and July floods
3	Groyne 2	11.9	13.0	1.58	Significant clearance by April and July floods
4	Hillcrest	20.5	5.7	0	Almost totally cleared by April and July floods
5	Pylons	1.0		0.28	2 islands - not in original plan (added after spring floods)
	Totals	71.0	34.1	3.21	Floods cleared balance between 'intended' and 'actual'

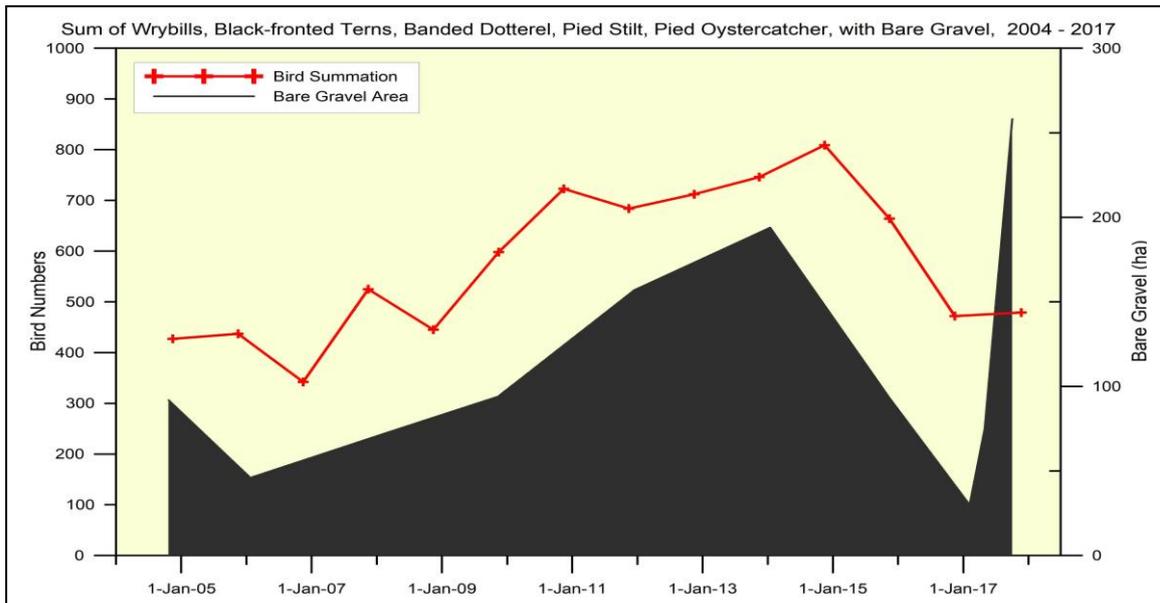
Figure 3. Location of weed remnants cleared by bulldozer on August 28/29, 2017, plus areas maintenance sprayed in April/May, 2018.



Apart from the major floods of April 6 (235cm) and July 22 (570cm), other floods on September 19 and October 9 (355cm and 180cm resp), and on February 20, 2018 (Appendix 3) helped to minimise weed regrowth over much of the recently cleared shingle areas.

In early 2018, consent was gained to use some of the funds not spent on weed clearing (due to the floods) to keep on top of weed regrowth starting to appear on some of the higher riverbed sites during the 2017-18 summer season. This was done in April / May, 2018 using glyphosate-based sprays at two bird-favoured sites off the end of Rossiters Road (3.6ha) and off Groyne 2 (2ha) – see Figures 1 and 3.

The rising threat of weeds was emphasised in last season's report. Figure 4 below is graphic quantification of changes in bare gravel extent since 2004. The figure shows how the total area of bare gravel declined by 85% between January 2014 and early 2017 – from almost 200ha down to around 30ha. This decline was reversed by the big floods of 2017, which resulted in an increase of bare shingle areas up to over 250ha. A photo sequence in Appendix 2 illustrates these changes over time.

Figure 4. Changes since 2005 in bare gravel area relative to numbers of key bird species.

The reasons for the sudden rise in weed area and the impact of the 2017 floods are addressed further in 4.1.

3.2 ADVOCACY

During 2017-18, many opportunities were taken to ensure that the public were kept aware of the Group's activities in the riverbed. These are listed in Appendix 1. Ten articles appeared in local papers. Powerpoint presentations were given to nine schools; most of these as part of a 'Down the Back Paddock' series organised by Kerry Miles of the Waimakariri District Council Community Team. The aim of the series is to visit all primary schools in N. Canterbury every 4-5 years. In November, the Group was involved in introducing students from Rangiora High School to aquatic invertebrate sampling in the Ashley-Rakahuri river. Talks were also given to interest groups (such as Birds NZ and the Orari River Protection group), the Waimakariri and Hurunui/Waiarau Zone committees, and as part of DOC's Conservation Week and Predator Free NZ workshops. From October through to February (the bird breeding season) the Rangiora cinema showed a 'screen vista' about the Group prior to every film showing.

In early 2018 the Group gained its first sponsor. Karikaas Dairy Products Ltd in Loburn now uses our name (together with that of BRaid Inc), plus images of riverbed birds, to promote their premier cheeses. For example, their award-winning Vintage Gouda features a wrybill on the package front, with information and mention of BRaid and the Group on the back.

Another new advocacy project during the past season has been work on a documentary video of the Group's activities over a bird breeding season. Filming and interviews were undertaken throughout the season by Tony Benny, a professional film maker from Oxford. In May, a half-day was spent with a TV2 camera person in the riverbed filming bird management subjects from the



Filming video for Group documentary (left) & riverbed visit by Rangiora HS students (right)

viewpoint of three school children. This item appeared in TV2's 'Fanimals' series in early August.

Our website (www.ashleyrivercare.org.nz) was maintained by the District Council's VisitWaimakariri office, while our Facebook page (<https://www.facebook.com/ashleyrivercare>) was maintained by Steve Attwood. Usage is discussed further in 4.3 below.

During 2016-17, the Group remained closely associated with staff from DOC, the Waimakariri District Council and Zone Committee, ECan, the Tuhaitara Coastal Park and the Ashley-Rakahuri Regional Park, representatives of which usually attend our meetings. ARRG also contributes actively in the running of BRaid Inc, a group which aims to improve the ecological welfare of all braided rivers in Canterbury.

A regular email update was sent to all Group members during the breeding season.

3.3 WALKWAY, BIKE TRACK, 4WD TRACK, RIVERBED ACCESS AND SWIMMING HOLES

Walkway and bike track. This is sited along the south bank, and encourages recreational activities away from the actual riverbed. In mid-2017 significant funding was granted to the Ashley-Rakahuri Regional Park to extend the mountain bike and walking tracks down the southern bank of the river towards the estuary – these tracks are now complete. No new planting of native species alongside the walkway was undertaken by the Group over the 2016 and 2017 winters, but native plants are being established by others elsewhere. As part of this track development, gates have been installed on the stopbank either side of where riverbed access tracks cross the stopbank. This has prevented the stopbank from being used as a general vehicle track, which has also probably decreased vehicles moving onto the riverbed.

4WD track. This is located in the north bank berm, extending from the end of Rossiters road up to the Okuku junction (a distance of approximately 8km). It is used reasonably frequently, but the most favoured area for 4WD vehicles is the stretch of berm

extending from the SH1 bridge up to the railway bridge (7km). In this area there are some very testing ‘mud-holes’. The purpose of these tracks is to encourage 4WDers to stay in the berm area and out of the actual riverbed.

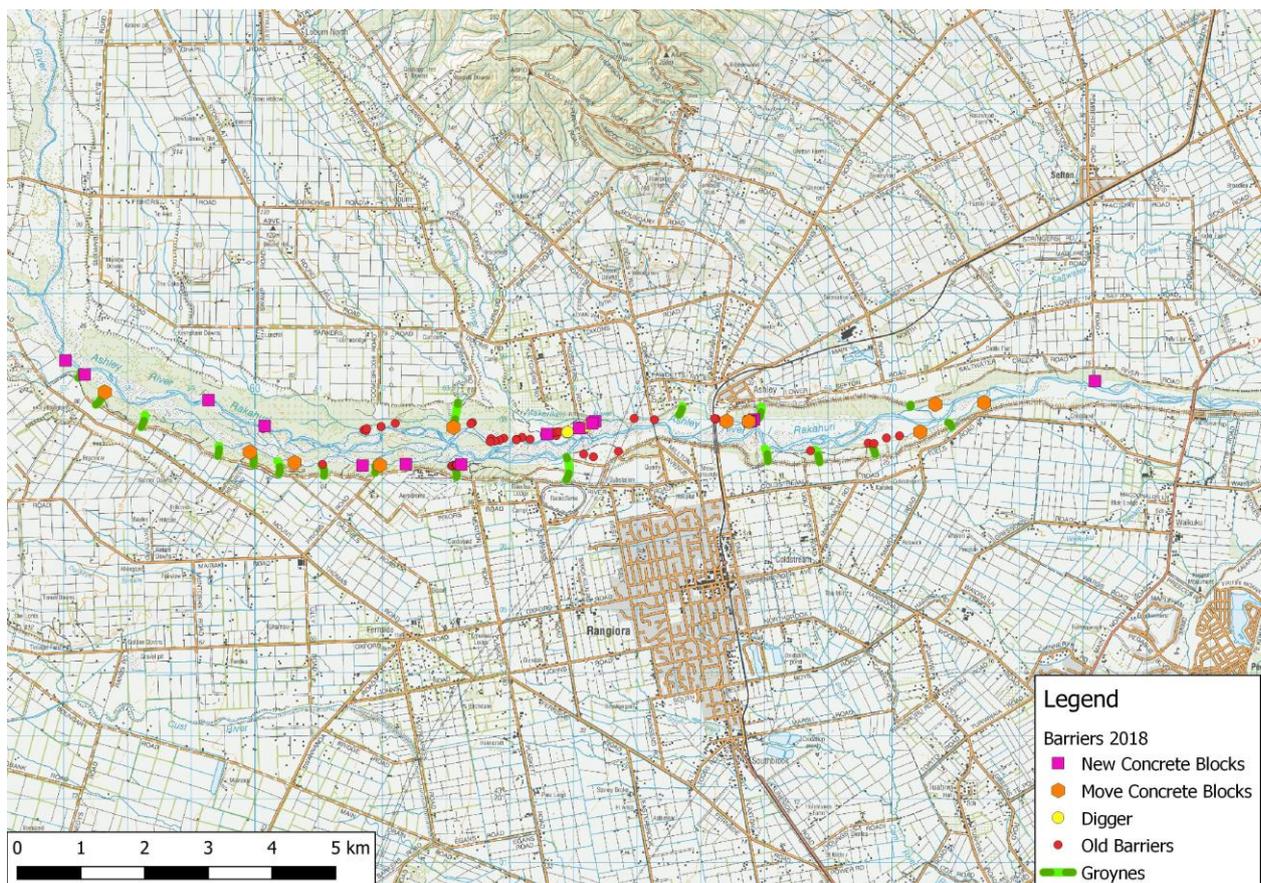
Access to riverbed. In September 2017, a digger was used to close all 4WD access ways into the open riverbed (except the major ones). Signs notifying closures and restricted vehicle access were erected at the major entrances in September and removed in February at the end of the bird breeding season. At the Marchmont site, where Taggart's were extracting shingle, a lockable metal gate was installed. This is the best way of preventing vehicle access, but the expense involved prevents its wider use.



4WD vehicles are actively discouraged from driving on the riverbed during the breeding season.

Figure 5 shows the 4wd access blocking plans for the nesting season of 2018. Many of these are at the same locations as in previous years. Red dots show other previous blocking points, some of these are now permanent. Due to health and safety concerns, it appears that we may no longer be able to block tracks with pits.

Figure 5. Access barriers



Swimming holes. For various reasons, no swimming holes were created in 2017.

3.4 PREDATOR CONTROL

This summer season (August 1 – January 31) saw an increase in trap numbers from 139 to 150, which were attended by 11 volunteers for an estimated 251 on-river hours. In total, during the summer bird breeding season, 108 potential predators were trapped over 24,752 trap-nights. This is the highest number of predators ever caught in a summer season, plus the highest number of trap-nights. The overall trap-catch rate for the 2017-18 summer period was 0.44 predators per 100 trap nights. Although higher than the figure for the previous season (0.34), it is less than half the 14-year average of 0.90.

Details of trap nights and trap catches since 2004 are shown in Table 2. Predator numbers consisted of 54 hedgehogs, 14 cats, 9 stoats, 18 weasels, 9 rats and 4 ferrets. All figures are higher than in the previous season, and are also greater than the long-term averages. The number of trap-nights (24,752) was considerably greater (42%) than the previous highest in 2015-16 (17,459). Hedgehogs remain the most trapped predator (second highest ever), followed by the highest ever numbers of weasels, cats, stoats, rats and ferrets. The reasons for this increase in predator numbers is discussed in 4.2 below.

Table 2. Summer (Aug 1 to Jan 31) predator trap-nights and trap-catch from 2004 – 2018

Season	Trap nights			Cat	Stoat	Weasel	Hedgehog	Rat	Ferret	Catch/100 trap nights
2004-05	4092			4	4	6	46	1	0	1.5
2005-06	3834			8	2	0	62	0	0	1.9
2006-07	3445			3	2	1	45	1	0	1.6
2007-08	3983			4	3	4	39	3	0	1.4
2008-09	3980			7	5	1	17*	0	0	0.75
2009-10	3981			3	3	2	17	1	1	0.68
2010-11	3732			3	4	2	23	0	0	0.51
2011-12	5048			2	1	1	34	0	1	0.78
2012-13	6373			2	3	3	36	5	1	0.79
2013-14	5786			4	2	3	28	0	0	0.65
2014-15	7560			6	7	3	35	0	1	0.66
2015-16	17459			14	6	10	51	0	3	0.48
2016-17	15114			5	4	6	31	5	1	0.34
2017-18	24752			14	9	18	54	9	4	0.44
Mean	7795			5.6	4.0	4.2	37.3	1.8	0.79	0.90

*Major drop in hedgehog numbers probably due to large flood in Feb 2008

A post-season trapping period was initiated in the winter of 2014. In 2018, the trap-lines ran from the Marchmont site up to Hillcrest (about 9 km) from February through to the end of July - when the spring bird breeding season trapping began. During this time, 12-13 trappers spent an estimated 376 on-river hours attending 180 traps for 27,657 nights, resulting in the capture of 155 predators (56 hedgehogs, 12 stoats, 24 weasels, 3 ferrets, 20 cats and 40 rats), giving a trap-catch of 0.56 predators / 100 trap nights.

Table 3 below records predator numbers caught over winter (February 1 to July 31), since winter trapping began in 2014.

Table 3. A summary of winter trapping (February 1 – July 31) since initiation in 2014

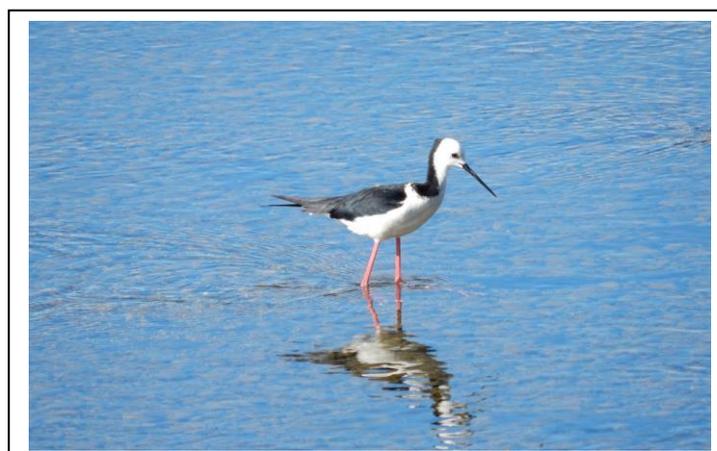
Year	No traps	No of trap nights	H'hog	Cat	Stoat	Weasel	Ferret	Rat	Catch / 100 nights
2014		2680	1	8	1	1	1		0.48
2015		4477	17	8	1	1	1		0.64
2016	119	17136	66	16	2	13	9		0.61
2017	136	23729	79	10	18	15	6	8	0.57
2018	180	27657	56	20	12	24	3	40	0.56

3.5 BIRD COUNTS

3.5.1 Summer bird counts. The changes in total bird numbers from 2004 – 2017 are shown in Figure 6 (minus black-billed gulls due to hugely variable numbers). Figures from the annual survey (18 November 2017) are given in Table 4, along with results of earlier counts.

Total bird numbers were 44% higher than in the previous season. However, if the black-billed colony numbers (350) are deducted (as colonies often not present) total bird numbers drop to 542 – not far above the 2016 figure of 504, which was the lowest since 2010. The 17-year total bird average is 721. This means that the decline of the previous 2 years, since the peak numbers between 2011 and 2014 (Figure 6), appears to have been arrested. The possible link between this and the increase in clean shingle areas (due to 2017 floods) is addressed in 3.1 above (Fig 4).

Wrybill numbers (9) were down on the previous year (13), and were the lowest since 2008 - well below the peak years between 2013–2015 (19, 21, 19). However, this could be a result of the one-day nature of the survey, as 8 pairs had been observed just prior to that day. The biggest drop amongst the key species was for banded dotterels, where numbers were 22% down on last season and 21% down on the long-term average. The biggest increase was for black-billed gulls, but this was due to the presence of a colony (over 300 pairs), whereas there was no colony present in 2016, when only 9 birds were counted.



Pied stilt numbers (148) were well above the 2016 figure, but still below the 14-year average of 164.

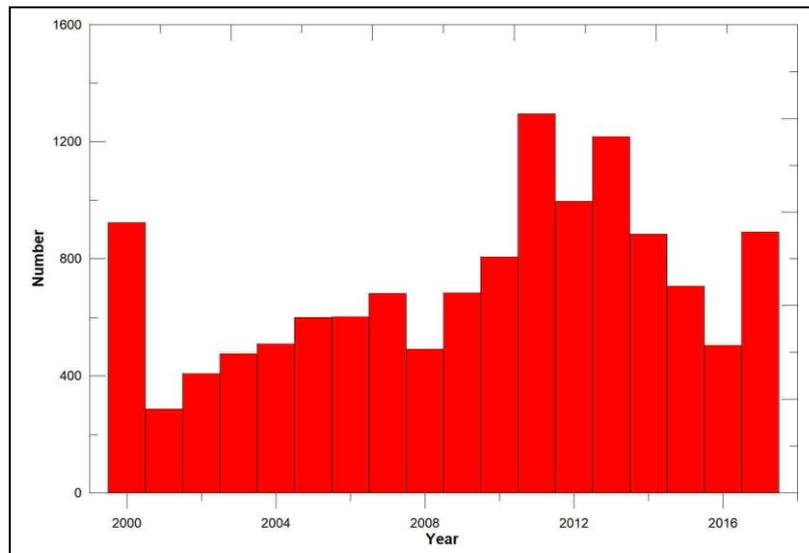
Pied stilts numbers (148) were significantly (57%) above the 2016 figure (95), but still below the long-term average of 164. Numbers of black-fronted terns (150) were also up (17%) on the previous 2 years and up on the long-term average of 122.

Of note were the most Caspian terns (5) ever seen on the river (usually none), and an increase from the previous 2 years in spur-winged plovers - although the number (32) was below the long-term average of 44. As usual, larger flocks of 20+ plovers were observed at a few sites from January on, with one of at least 90 birds seen at Marchmont in June, 2018.

Table 4 Results of the annual bird survey undertaken in the Ashley-Rakahuri River (from Okuku junction down to SH1) on November 18, 2017. Counts from previous years, plus the 17-year mean, are shown for comparative purposes. nc – not counted

Species	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Ave
Black shag	18	3	nc	8	7	2	2	10	9	6	2	5	6	3	4	1	5	2	6
Little shag	3	6	nc	4	7	6	2	4	0	17	6	13	11	19	5	6	8	3	7
SI Pied oy'rcatcher	25	22	19	22	37	22	5	26	27	32	20	35	38	23	32	24	14	14	25
Variable oy'rcatcher	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pied stilt	229	82	70	138	140	137	68	164	131	196	233	194	209	247	230	217	95	148	164
Black stilt	0	0	0	0	2	1	1	1	1	1	0	0	0	0	0	0	0	0	1
Banded dotterel	199	130	115	169	213	245	84	237	198	233	260	250	248	301	263	276	222	167	214
Wrybill	17	7	6	16	9	7	5	9	8	13	18	15	17	19	21	19	13	9	13
Spur-wing plover	18	nc	16	13	27	149	37	116	11	39	15	89	55	65	37	9	6	32	44
Black-back gull	26	nc	11	10	27	3	5	12	10	19	19	2	11	17	7	13	4	1	12
Black-billed gull	314	3	5	0	10	1	213	13	16	2	41	425	202	364	23	13	9	361	97
Black-front tern	74	44	165	102	28	26	180	89	81	124	192	190	200	156	263	128	128	150	122
White-front tern	0	0	0	0	0	0	0	0	0	0	8	77	6	2	0	0	0	0	5
Caspian tern	0	0	0	4	0	0	1	0	0	0	0	0	0	1	0	0	0	5	1
Totals	923	287	407	476	509	599	602	681	492	683	806	1295	997	1217	884	706	504	892	721
Totals (minus BBG)	609	284	407	476	499	598	389	668	476	681	765	825	795	853	861	693	495	531	624

Figure 6. Total numbers of bird species, 2004 – 2017 *



**black-billed gulls not included due to hugely variable numbers depending on colony presence*

3.5.2 *Winter bird counts.* Since 2014, birds have been counted every month between Groyne 1 and Groyne 2 (Figure 1) – a distance of 2km (Figure 7). The timing within the month has varied due to river flows sometimes being too high for safe crossing. One of the reasons for this monthly survey has been to determine differences in species and total numbers between the summer breeding season and winter, when many species migrate to warmer environments. Table 5 below shows the figures for the core winter months (April, May and June) and the core summer months (October, November and December) from 2014-2017.

Figure 7. Approximate route of G1 – G2 bird survey, done once a month (flows permitting)

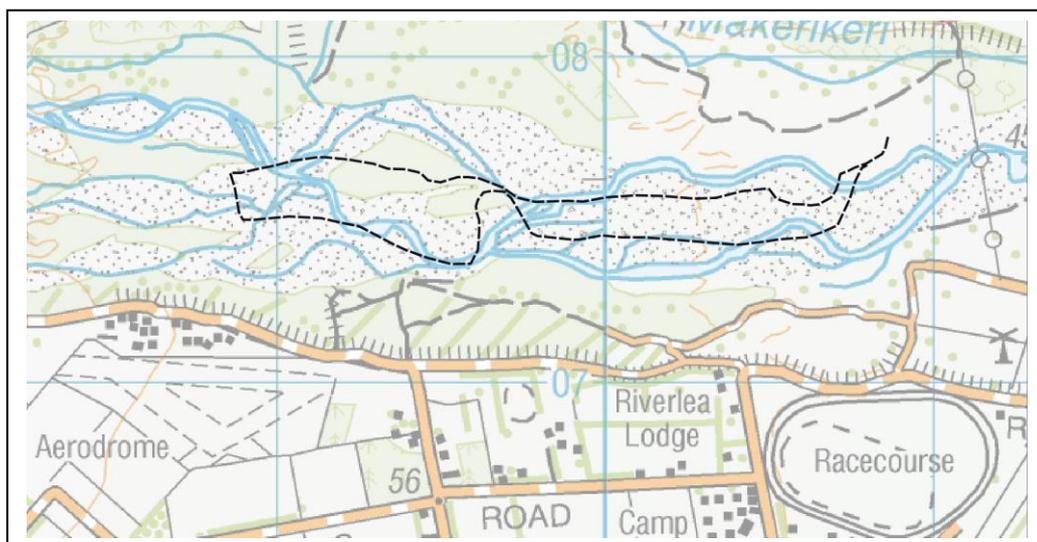


Table 5. Average monthly number of species, plus total bird numbers for winter (Apr, May and June) and summer (Oct, Nov and Dec), 2014-2017

Species	Winter (Apr, May, June)		Summer (Oct, Nov, Dec)	
	Number of species	Total numbers	Number of species	Total numbers
Core indigenous – wrybill, black-fronted tern, black-billed gull, pied stilt, banded dotterel and S. Is pied oystercatcher	1.2	7.1*	5.6	65.6*
Other – black-backed gull, spur-winged plover, white-faced heron, welcome swallow, harrier hawk, Caspian tern, shags, finches	4.2	15.7**	4.3	16.7**

* Black-billed gulls not included, as either present in colonies (100s) or by few individuals

** Welcome swallow and finch numbers not included, as difficult to count accurately

Table 5 shows a major difference between the number of core indigenous species and their total numbers during winter and summer. In the summer, the average number of core species (5.6) is almost 5 times greater than in the winter (1.2), whilst the total bird numbers are over 4 times greater. In contrast, the numbers of other species (half of which are exotic) vary little between summer and winter.

3.6 SHOREBIRD BREEDING

Location names of shorebird territories are shown in Figure 1. A major flood of 355m³ on September 19, plus another of 180m³ on October 9, are known to have swept away early nests, including those of at least two wrybill pairs (see Appendix 3 for river flow data).

Wrybills

Banded 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.

Breeding pairs

Eight pairs of wrybills took up territories in the 2017-18 season (Figure 10), but two probably did not reach the egg-laying stage. This is the same number of pairs that were present last season, and less than the ten present for the two seasons prior to that.

1. Male: UB Female: UB

A UB pair were first seen at the Smarts site on August 24, and occasionally thereafter, with a 1-egg nest located on November 22. The egg was no longer present a week later, and no chick or adult was subsequently seen.

Result: No chicks fledged

2. Male: UB Female: UB

The pair were first seen in the Marchmont site on September 14, with a 2-egg nest found at the eastern end on October 3. This was observed (and videoed) closely until swept



Filming a wrybill nest at the Groyne 2 site

away by the October 9 flood. A second nest nearby had 2 eggs by the end of October, which were in the process of hatching (1 egg, 1 chick) on November 22, when it was run over by a 4WD vehicle. The adults were seen in the same area for a couple of weeks, but did not re-nest.

Result: No chicks fledged.

3. Male: UB Female: UB

A UB pair was first seen at the Railway site on September 14. This pair had a 1-egg nest at the eastern end of the site on November 10, which had hatched by December 5. An adult acting chick-like was seen a few days later. However, by December 18 the river was dry and there was no sign of wrybills.

Result: No chicks fledged.

4. Male: UB Female: UB

A UB male was first seen under the Pylons above the Cones Road bridge on September 10. A lone male bird was often seen near this site during November, but no indication of breeding was observed.

Result: No chicks fledged.

5. Male: UB Female: UB

A UB pair were first seen off Groyne 1 on October 2, and again in mid-November. The pair, were acting chick-like in early December, but no nest or chicks were ever observed, so it is assumed that breeding was not successful.

Result: No chicks fledged.

6. Male: UB Female: UB

The first pair of wrybills were seen off Groyne 2 on August 28. The birds were observed during September but the October 9 flood probably swept away their first nest. A 1-egg nest was found on November 12, and had hatched by November 26, when a small chick was seen. The pair were observed with a flying juvenile in early January.

Result: One chick fledged

7. Male: BW-BW Female: UB

BW-BW and a UB mate were first seen just above Groyne 2 in late August. A 2-egg nest was found on September 17, but was swept away by the September 19 flood. The birds were observed many times during October, and were acting chick-like in early December. At the end of that month they were seen with two flying juveniles.

Result: Two chicks fledged.

8. Male: UB Female: UB

A UB pair was first seen at the Hillcrest site on September 4, and looked as if they had a nest by the end of that month. But they probably lost that to the October 9 flood. No nest was ever found, but by the end of November they appeared to be defending chicks, and in January 22 a single UB adult was seen with two flying juveniles.

Result: Two chicks fledged

Overall result: At least 8 pairs took up different territories at some stage of the season, raising a minimum of 5 chicks, for a productivity of 0.63 chicks fledged per pair. Such productivity is well

above last year's figure (0.38), and similar to the previous year's (0.7) – but below the 13-year average of 0.79.

Black-fronted terns

As in past years, many pairs had on-off nesting seasons, but there were two relatively successful colonies of more than a few pairs. Occasional birds were noted on the river over winter, with numbers starting to build up and courting flights seen during August. A few pairs usually attempt to breed about 1 km upriver from the SH1 road bridge, just above where ReadyMix spent much of the season removing gravel. This activity ended around 200m below the colony, and is unlikely to



Black-fronted tern on its nest in the riverbed.

have disturbed the birds. By November 20, there appeared to be 6-8 pairs nesting, and on Dec 30 there were at least 6 well-grown chicks being fed, one of which was seen flying. Close to the pylons east of the Tulls site, there were an estimated 30–40 pairs nesting on November 6. This number slowly declined, but young chicks were observed a week later. The arrival of a black-billed gull colony on November 18 forced them to take their chicks about 200m further downriver. On December 18 they were actively feeding at least 15 chicks (some of which could fly), and these had gone (hopefully all flown) by Dec 30. Between the Marchmont and Railway sites, two pairs were defending a nest or chick(s) in mid-December, but such lone pairs are rarely successful this late in the season. Similarly, just below the Cones road bridge, two pairs had nests (almost certainly second attempts) on December 20, but these were abandoned soon after. Seven pairs nested here at the same time in 2016 – with the same result. Up to 8 pairs of terns were nesting at the Pylons/Rossiters site by early November, but numbers slowly declined and although some eggs hatched, no chicks were ever seen flying. Between Groynes 1 and 2, at least two lone pairs were defending nests / chick(s) in mid-December, but no chicks are known to have fledged. Just down from Groyne 2, at least 6 pairs appeared to reach the nesting stage by early October, but they did not persist. These birds may well have moved to a site 1km above Groyne 2, where at least 15 pairs were nesting on December 2. This turned out to be the best colony on the river, where it is estimated that at least 20 chicks had reached the flying stage by mid-January. No pairs were seen to nest from here up to the Okuku junction, but at the time of the November 18 survey 6-8 pairs were seen nesting at the junction. It is not known how successful they were.

Result: Over all the sites, it is estimated that 70-80 pairs attempted nesting, but many of these could well have done so at more than one site. A total of 40-45 chicks are estimated to have fledged, so if all pairs had separate nests then productivity was between 0.5-0.64. This is above the 13-year average of 0.41, but if some of these pairs nested twice then the average probably remains about the same.

Black-billed gulls

Last year, for only the second time in 13 years, no black-billed gulls nested on the river. Instead, a colony established on a nearby irrigated dairy farm - and very successfully too. In the 2017-18 season, after being seen inspecting a recently worked farm paddock (close to last year's

farm site) in late October, the gulls returned to the river – maybe due to the fact that the riverbed was much clearer of weeds than previously (see 3.1 above). The colony of over 300 pairs was first seen at the eastern end of the Tulls site on November 18, displacing the tern colony which had been there since the start of that month. A drone-count on Nov 25 determined 740 birds to be present. On December 18, 350 birds were counted, with 180-200 on nests. But this was a count from the ground,



A drone's view of the black-billed gull colony at the Tulls site.

so was almost certainly an under-estimate, especially as 380 nests were counted in early January after they had been vacated. The first small chicks were noted in mid-December. The river braid nearest the colony dried up during December, with the closest water about 80m away, so over the Christmas period the adults shifted chicks to this stretch of the river, where they located along the southern shore for a stretch of about 150m. From then on, the birds and chicks slowly moved further down-river, generally in three separate groups. By mid-January, the furthest downriver were 11 chicks accompanied by 22 adults - located 400m east of the SH1 bridge (3km away from where they had hatched). About 1 kilometer upriver from the bridge were 120 well-grown chicks accompanied at the time by 50 adults, whilst furthest upriver (500m below the colony site) were 12 adults with at least 6 chicks (others were hidden in vegetation). It is difficult to determine how many chicks eventually reached the flying stage, but it is likely to have been between 120-140.

Result: If a figure of 350 occupied nests is used from the colony, resulting in 120-140 chicks fledging, then productivity ranged from 0.34 to 0.4. This is close to the long-term riverbed average of 0.32, but considerably down on the exceptional productivity of the 2016-17 farm colony of 1.17 to 1.70.

White-fronted terns

A single pair nested alongside the black-billed gull colony at the Tulls site, but it is unknown if it was successful.

Pied oystercatchers

During the season, breeding pairs were noted to be present at a minimum of seven locations, with a 2-egg nest found at Marchmont on September 14. Although a few chicks were observed later in the season, numbers appeared to be lower than in previous years. No formal count of pairs or chicks has been attempted since 2008.

Banded dotterels

Banded dotterels nested throughout the study area. The numbers seen on the November 18 survey (167) were well down on the long-term average of 212. Although no attempt was made to record productivity, some nests were found and a number of chicks seen. The first birds (competing for territory) were seen in mid-July, and by the end of August they were present at virtually all sites. Numbers appeared to be evenly spread with no 'hot-spots' noted. The flocks of adults and juveniles normally seen towards the end of the season were not noted, with just one of ten birds at

Hillcrest in early January. Hence, the season may well have been one of the less successful for banded dotterels.

Pied stilts

This species is largely absent over winter, with the first pairs appearing in August. On the November 18 survey, numbers (148) were just under the long-term average (164), but this was 50% more than at the same time the previous year. Many pairs bred in the study area, with concentrations at certain areas. The best breeding sites appeared to be at Smarts (where 18 were present in early December), Rossiter's/Pylon, Groyne 2 (20 present in early December), Dalziels and Hillcrest. The season appears to have been good for stilts as in the New Year, many pairs were seen with 2-3 flying juveniles.



A black stilt (kaki) bred with a pied stilt on a farm pond close to Woodend beach.

Black stilt

The black stilt (GK-OW) which bred on the river (always with a pied mate) for many years up to 2009, has not been seen on the riverbed since.

However, a black male bird (banded but colours unclear) nested with a pied mate in a swamp just inland from the sand-dune forests, about 1km south of the end of Ferry Road – which is a side-road at the eastern end of the Woodend Beach road. During December – January two obvious hybrid birds, which could have been the off-spring of this pair, were seen on a few occasions under the pylons just below the Tulls site.

Black-backed gull

Numbers remain very low (1 on Nov 18 survey). Since 2000, only one pair has been observed breeding on the river (2013), with no chicks fledged.

Caspian tern

Lone Caspian terns were seen on the river during the season, but there was no sign of breeding.

Spur-winged plover

This species is most often seen in flocks on the riverbed over winter. A few pairs breed on the river, with one 3-egg nest found at the Rossiters/Pylon site on August 29.

4 Discussion

The shorebird species in the Ashley-Rakahuri river face three main threats – the invasion of weeds (mainly grasses, yellow lupins, broom / gorse and willows), reduced survival and productivity due to introduced predators, and disturbance by human activity. The Group's attention continues to be focussed on reducing impacts from these – with particular focus on assisting the wrybill, black-fronted tern and black-billed gull.

The success of management in reducing the above threats is assessed by an annual survey of bird populations, plus monitoring of breeding success in order to determine productivity (number of chicks fledged per nesting pair of adults). Spurr and Ledgard (2016) present evidence that management by the Group since 2000 has led to improved bird populations on the Ashley-Rakahuri river.

4.1 HABITAT MANAGEMENT

4.1.1. Weed removal. In the past, we have largely relied on natural floods to clear excess weeds from the riverbed. However, the lack of floods between 2014 and early 2017 allowed a significant increase in weeds and a corresponding decrease in weed-free clean shingle areas – from around 200ha in the study area down to less than 50ha (see 3.1 above). With this increase in weeds came a decline in bird numbers (Figure 4). For this reason, the Group applied for, and were successful in being granted, funds to use machines to clear weeds from over 30 ha at sites historically favoured for bird breeding. However, before this could be undertaken, there was a series of major floods from early 2017, including one of 570cm on July 22, which was the largest flood since the Group began regular monitoring of the river in 2005. Needless to say, the floods removed large areas of weeds (Figure 4). Despite this, it was decided to go ahead with the intended over-winter clearing work in order to remove small patches of remnant weeds, and to create entirely weed-free sites for maintenance into the future.



The 355m³ flood of Sept 9, 2017, cleared away weeds, but also swept away a wrybill's nest at this site.

The challenge then becomes one of maintaining future weed control on the core breeding sites - as floods of the right size cannot be guaranteed. To this end, some of the funds granted for weed clearance were used to contract the spraying of weed regrowth over 5.6 ha at two sites. Consent was gained for the use of a glyphosate mix, and indications are that this has been successful. However, the use of chemicals for such work, especially near waterways such as rivers, is



Using a hose pressure spray to maintain weed control.

contentious now – and likely to become more so in the future. Hence, the Group will be exploring cost-effective means of mechanical clearance. In the Hawkes Bay, a tractor-towed ripper is used for maintaining weed control in their riverbeds. The cost of this is said to be under \$200/ha, whereas our spray control varied from \$400 - \$800/ha. Even though it will be difficult to replicate the ripping set-up used in Hawkes Bay, a pilot trial is proposed for the late winter of 2018 to compare weed clearance using a mechanical ripper and a bulldozer blade.

4.1.2 Vehicle access. Braided riverbeds are not only attractive to birds, but they also encourage greater use by off-road vehicles (trail bikes, ATVs and 4WDs), especially if access tracks remain open after summer riverbed operations - such as for shingle extraction or stopbank repair. For this reason, the Group works with the Regional Park staff to erect appropriate signs and to block off all but the major access tracks early in the season. The Group also has an agreement with the Combined 4WD Drivers Club, that their members will not use the bird-breeding section of the riverbed from September 1 to February 1. Vehicle pressure is greatest to the east where there is ready access just above SH1, plus established tracks into the river bed at the end of Toppings Road and at the Tulls, Smarts and Marchmont sites. Without a doubt, improved public awareness, combined with access blockages and appropriate signage, has reduced vehicle access during the bird breeding season. However, there will always be a small percentage of drivers who do not read signs or care for restrictions, and will therefore find ways to negotiate barriers and drive on the riverbed.



Riverbed access ways are blocked during the bird breeding season (with appropriate signs).

4.1.3 Drying river. Dry conditions over the 2015 and 2016 summers led to a rapidly reducing water flow from December on, mainly from the Railway bridge down to the Toppings Road access. However, wet weather periods during the 2017-18 season meant that there was no significant drying of the river. Drying in the lower Ashley-Rakahuri has been documented as occurring every few years since records began, and when coupled with recent climate change, there can be little doubt that we will see more periods with a dry river bed in the future.

4.2 PREDATOR CONTROL

4.4.1 Summer trapping. The number of trap-nights during the 2017/18 breeding season (August 1 to January 31) was 24,752 - the highest since regular trapping started in 2004. The reason for this is extra trappers in the volunteer trapping team (now 12-13), additional work by the regular trappers (a total of 251 hours of on-river effort), and an increase in trap numbers from 120 in 2015-16 to 150 currently. The trap-catch rate of 0.44 predators / 100 nights (Table 2) was the second lowest on record - 29% more than last year (the lowest), but still well below the 14-year long-term average of 0.90. This maintains the significant downward trend over time.

Numbers of the six main predators were higher than expected. Hedgehogs remained the most trapped predator (54), the second highest total ever, with cats (14) also the equal highest. Numbers of the other four species (stoats, weasels, ferrets and rats) were the highest ever recorded. The standout animals in this respect were weasels and rats. Weasel numbers (18) were 80% more than in any previous season, while rat numbers (9) were 44% greater. Most of this increase is probably attributable to the increased trap nights – up 52% on the average for the previous two seasons.

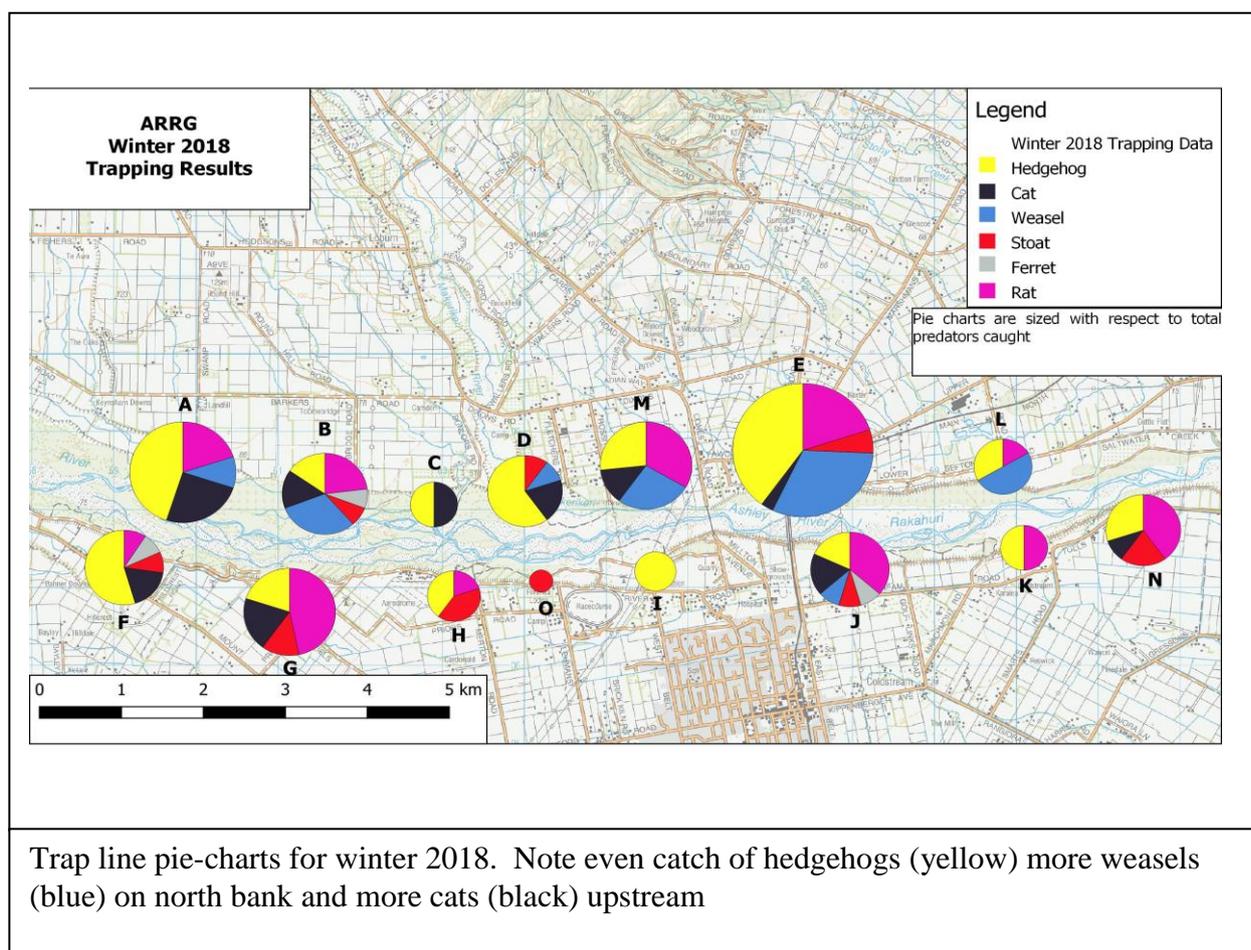
The floods of August, September and October 2017 swept away 21 traps, which together with the 26 lost earlier in 2017, resulted in a total loss of 47 traps. All traps were replaced.

4.4.2 Winter trapping. During the 2018 winter trapping period (February 1 to June 31), the trap-catch rate (0.56) was close to that of the 2017 winter (0.57) and virtually the same as the 5-year average of 0.57. As for the summer trapping period, hedgehogs were caught most often (Figure

8), although this usually tails off once hard frosts become frequent. Also, as for the summer period, the standout increase was for weasels (60% more than in the previous winter), and for rats (500% higher than previously). Most weasels were caught on the north bank (Figure 8). More cats (20) were also caught – 50% more than in 2017 and 20% more than in 2016.

Apart from the increased trap-nights, other reasons why predator numbers have increased in recent years, as has the ratio of species caught, can only be postulated. It could be associated with there being more food sources present in the riverbed. Even though rabbit numbers have never really recovered since RCD was introduced in the late 1990s, trappers are reporting small increases in rabbit sign over the last couple of seasons. Other major food sources for predators are rats and mice. Rat numbers are increasing, and although mice populations are not monitored, they are quite frequently seen in trail camera footage. The overall higher winter predator numbers is often noted elsewhere (particularly in autumn) and is most likely associated with more limited food sources, plus young animals being forced from parental territories at the end of the breeding season.

Figure 8. Winter 2018 Trapping Results



4.4.3 Trail cameras. These are being increasingly deployed by trapping agencies such as DOC. Now that they are not so costly to purchase, the Group aims to have each trapper operating at least one. Not only are they excellent for learning about animal activity around traps, and getting a more accurate picture of the real predator situation, but they are an added incentive to maintain regular checks.

4.4.4 Estuary trapping. As part of the kaki release goal, the Group hosted a trapping workshop in Woodend on October 28, which resulted in the formation of the Waikuku Estuary Trapping Group. Ninety-nine DOC200 traps were made by our Group's trap-making team for use at the

estuary, plus 20 Trapinators (aimed at cats) were purchased using the Group's funds. The DOC200 traps were installed in early July, with the Trapinators added in August. The estuary group currently has seven volunteers servicing their traps. It will eventually become an independent group, but is collaborating closely with ARRAG, especially relative to record keeping.

4.4.5 Avian predation. Investigations into shorebird predation on other braided rivers, such as the Waimakariri (Dale McEntee, pers comm.) and Wairau (Steffens *et al*, 2011) rivers have revealed significant losses to avian predators, notably black-backed gulls and to a lesser extent, harrier hawks. This does not appear to be the case on the Ashley-Rakahuri river. On the lower reaches of the river, numbers of black-backed gulls have always been low. The long-term average from annual surveys is just twelve, and the survey figure for 2017 was just a single bird. Swamp harriers (harrier hawks) are not counted in the annual surveys, but are common on the Ashley-Rakahuri river. However, even though they are frequently seen being chased away by breeding birds, no actual predation has been observed on the river in recent years.

The future. Despite the increased work, the trapping team remains small, and the Group continues to try to attract more volunteers. Our aim is to have all the riparian land in the study area trapped within the next few years. To cover the riverbed between the Okuku junction and the estuary trapping area would require 178 new traps – installed at 100m intervals. This is needed to meet criteria set by DOC for a possible release of the kaki (black stilt) in 2021 (see 4.4.2 below). For this reason, the Group needs to keep well informed of new, more time-efficient predator control techniques being developed, and also to explore the possibility of employing professional trappers.

Recording of trapping results can be improved by either using the DOC on-line database, or the MS Access – QGIS system now used by the estuary group. The Group has opted for the latter system, from which data will be periodically uploaded to the DOC system.

4.3 ADVOCACY

The Group's advocacy efforts over the past years continue to improve local awareness of the problems faced by riverbed birds, and of the Group's activities to protect them. Appendix 1 lists 42 occasions used to improve awareness, and these are addressed in more detail in the Results section above.

The long-term future of braided river birds will rest in the hands of today's children. Therefore, it is pleasing to report that the Group is part of a Waimakariri District Council-assisted programme 'Down the Back Paddock', which aims to address all primary schools in N. Canterbury over a 4-year period. At primary school visits, every child is given an 'Endangered Birds' book mark featuring one of the seven indigenous species which are the focus of our riverbed management. There were seven primary school visits over the past year, plus two sessions with students at Rangiora High School. It is hoped that the aquatic invertebrate sampling being undertaken by this school will become a regular feature in their environmental curriculum, with the result of not only enhancing student knowledge of braided river issues, but also learning more about the life cycles of the river's insect community – which is at the base of the birds' food chain. Little is



Sponsorship from Karikaas Dairy Products Ltd

known about the interaction between the availability of this basic food source and the presence/absence of birds on the riverbed.

Our first sponsor came on board in early 2018. Karikaas Dairy Products Ltd in Loburn now uses our name (and BRaid's), plus images of riverbed birds, to promote their premier cheeses. The Group is proud to be associated with such a nation-wide Award-winning business.

Out on the river, the deployment of customised Corflute signs in managed areas during the season remains the major means by which the public are alerted to bird presence, and hence the need to 'keep their distance'. We are also in the process of making interpretation signs to be erected at the most visited parts of the river. To date, these have been largely absent, and are essential to improve public awareness and to provide a permanent on-site source of greater detail.

In late 2014, it was decided that we needed to have a greater presence within today's social media, and to this end a Facebook page (<https://www.facebook.com/ashleyrivercare>) was launched in September, 2014. It is maintained by member, Steve Attwood. The period 1 August 2017 to 31 July 2018 has been our most successful year for Facebook activity. Over this period we put up 37 posts, an average of three posts a month though we posted more in the spring and summer when there was activity to report, and fewer over autumn and winter.



Keeping a low profile is less threatening to birds.
Banded dotterel passing close by.

We experimented more with video footage this year and it certainly paid off. Nearly all of the most popular posts had a short video clip instead of, or as well as, photos. Posts with neither photos nor video were the least popular so it shows how important it is to have not only good stories to tell but good imagery too. In total our posts received a record 26,478 views from more than 5000 unique visitors. Two posts in September last year giving updates on wrybill activity with one also telling the story of the only remaining banded bird, wrybill male BWBW, received 5602 and 5801 views respectively. The average number of people reached per post (people who have "looked" at a specific post) has risen from 200 the previous year to 780 this past season. The key to maintaining this level of interest is fresh content. We need to ensure that all activities on or about the river, and our other efforts, are reported so they can be placed on the Facebook page. Social media remains a very effective way of reaching out to our communities.

The floods of 2017 cleared large areas of weeds, which meant that the funds obtained to mechanically clear weeds were not all required for that purpose. We managed to get agreement from the Rata Foundation that a good portion of the 'spare' funds be spent on making promotional video material, using the services of professional film maker, Tony Benny, of Oxford. The intention is to create a range of videos, from short clips of a few minutes which could be used for advertising and social media, through to a 20-25 minute version suitable for a stand-alone documentary for use on TV (similar to 'Country Calendar'), in short film festivals, or for viewing by other NGOs and conservation institutions wanting the full story. At time of writing, all the footage has been shot and editing is underway, with the final material to be completed by the end of the year.

All these promotional activities take considerable time and effort, but if awareness is to be continued at a high level, such effort must be maintained on an annual basis.

The Group remains actively involved in the running of BRaid Inc, a group which aims to improve the ecological welfare of all braided rivers in Canterbury. Our Group serves as a good example of how communities might contribute. Nick Ledgard (Group chairman) is currently BRaid Chairman.

4.4 SPRING BIRD COUNTS

The 2017 annual survey of the lower reaches of the Ashley-Rakahuri took place on Nov 18. Results show that bird numbers appear to have levelled off, after the decline of the previous 2 years, which took place after peak bird years between 2011 to 2014 (Figure 6). Figure 4 highlights the relationship between the population decline and the loss of bare gravel areas, and indicates that the major removal of weeds by the 2017 floods may well be the reason for the slight recovery in 2017 bird counts. There is no evidence that the other major factors which influence bird numbers, predators and human disturbance, have changed significantly in recent years.

Total bird numbers (526) were just above (6%) the 2016 figure (495), which was 30% lower than the 17-year average and the lowest since 2008. Black-billed gulls are not included in these figures as the presence or absence of just a single colony (usually hundreds of birds) is too much of an irregular influence. For example, over the period 2014-2016 gull numbers were 23, 13 and 9 respectively, whereas the count was 361 in 2017, as a colony returned to nest on the river. Amongst the other core species, the biggest increase was in pied stilts (56%), although this rise still did not bring numbers (148) back up to the long-term average of 164. There was also an increase (17%) in black-fronted terns (150 birds), with their total 17% above the long-term average of 128 birds. Wrybill numbers (9) were the lowest since 2008, and 31% lower than the long-term average (13), but from more widespread monitoring during the season, it is known that there were at least six pairs nesting on the river at the time of the mid-November survey.

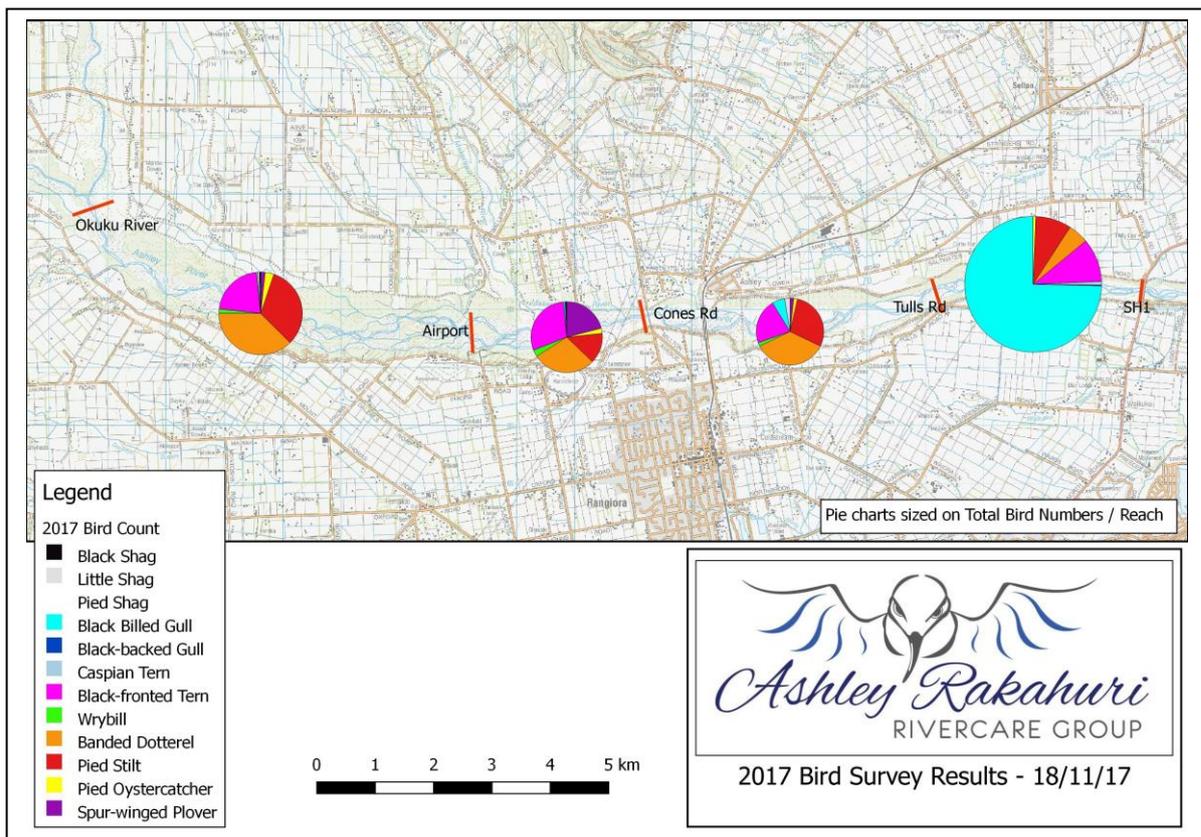
Fortunately, the Group has excellent records of bird numbers since 2000, against which to compare future changes. Population trends were described in detail in a *Notornis* paper by Spurr and Ledgard (2016). This peer-reviewed paper described a significant improvement in

bird numbers on the river, particularly since 2000, and it suggested that ‘the Rivercare Group’s management actions have contributed to these successes, and support continuation of their actions.’ Hence, we were alarmed by the population decline after 2015, and relieved to see the 2017 survey indicating an arrest of that decrease. We await the outcome of the 2018 survey with considerable interest, as hopefully it will show improvement to be continuing.

Figure 9 shows bird percentages within each of the four river reaches surveyed. Percentages were similar, with the exception of the eastern-most reach, where the river’s sole black-billed gull colony dominates.



Black-fronted terns are the only core indigenous bird species remaining on the river all winter.

Figure 9. Bird percentages shown by reach surveyed on November 18, 2017

4.4.1 Winter bird counts. As shown in Table 4 above (3.5.1) the majority of the core indigenous species, which Group management aims to assist with breeding over the summer season, disappear from the riverbed over the winter months. Only a few black-fronted terns remain. The ‘other’ species, numbers of which do not vary so much between summer and winter, are mostly those which do not have braided riverbeds as a favoured breeding habitat. Amongst these, spur-winged plovers had the highest numbers, almost always present in flocks of dozens or more.

4.4.2 Kaki (black stilt) relocation. The 2015-16 report described how the lower Ashley-Rakahuri river had been evaluated as a potential site for the relocation of the kaki – arguably the country’s most threatened species, the last remnants of which are only found in the Mackenzie Basin. The evaluation report found that the lower river, combined with the Ashley-Saltwater Creek estuary and the Tuhaitara Coastal Reserve, compared very favourably with another potential release site in the upper Rangitata river catchment. The Group continues to implement the report’s recommendations in preparation for a possible release in 2-3 years’ time.

4.5 SHOREBIRD BREEDING

The Group has been monitoring bird breeding since 2004 – although since 2008 this has only involved the three focus species of wrybill, black-fronted tern and black-billed gull. As with population numbers, breeding attempts declined in the 2016-17 season, when a link with weed invasion and loss of bare gravel areas is suspected (see 3.1 above). However, breeding attempts appeared to be on the recovery during the 2017-18 season, due to the removal of large areas of weeds by major floods in 2017. This was probably the reason why a colony of black-billed gulls returned to nest on the river, after an absence of 3 years.

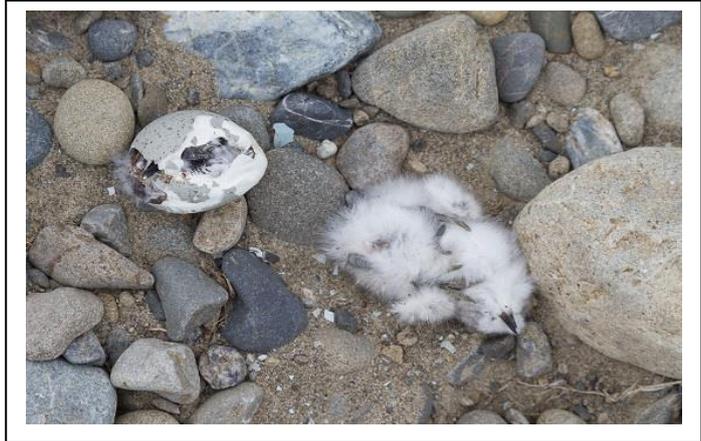
During the 15-year monitoring period, breeding has tended to concentrate in certain stretches of the river – Smarts, Ashley bridge to Groyne 1, Groyne 2 and most recently, Hillcrest. These four

areas stretch over about 11kms of the total 18km study area. There was on-going weed clearance in these areas over the 2018 winter in order to further improve feeding and breeding habitat.

Wrybill

Wrybills are the icon species of braided rivers, being the only species out of 10,000 in the world, which have a sideways bending bill – and only breeding in Canterbury’s braided rivers. Hence, it attracts the most attention. Since regular monitoring of the species began in 2004, the number of breeding pairs has approximately doubled from 4-6 to 8-10, most likely due to the riverbed management activities of the Group (Spurr and Ledgard, 2016).

At least eight pairs took up territories in the study area in 2017-18 (Map 8) – the same number as in the previous season. Hence, a minimum of 5 chicks were fledged by six pairs, for a productivity of 0.63 chicks fledged per pair. Productivity may have been higher as it is suspected that two of the eight pairs never actually nested. A productivity of 0.63 is well above last year’s figure (0.38), and similar to the previous year’s (0.7) – but below the 13-year average of 0.79.

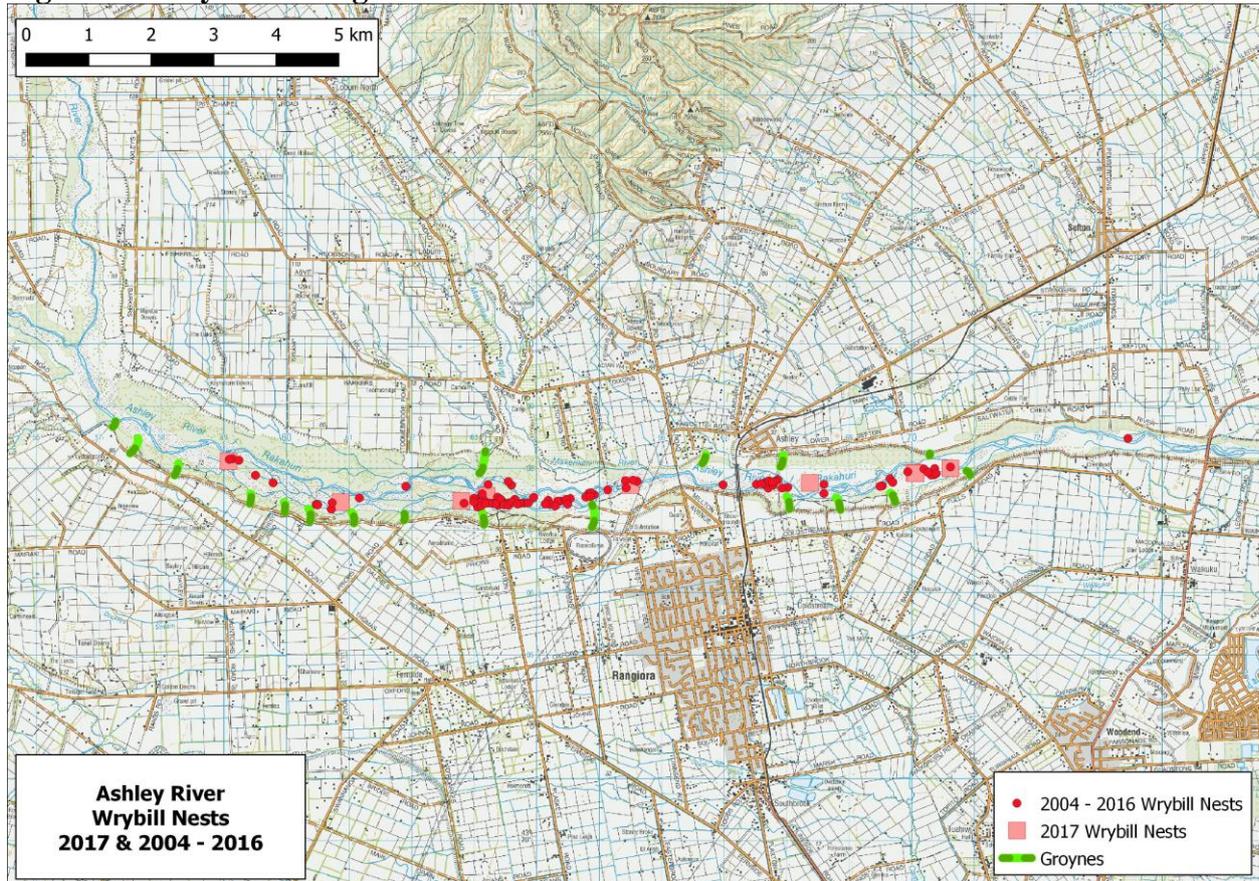


The crushed egg and recently-hatched chick run over by a 4WD vehicle at the Marchmont site.

If destruction by floods is avoided, most of the nests found in the Ashley-Rakahuri river reach the egg hatching stage, with the majority of losses occurring during the first days after chick emergence. One notable exception was at the Marchmont site, where the local pair’s first nest was lost in the October 9 flood. They had laid 2 eggs in a new nest nearby before the end of October, and these were in the process of hatching (1 egg, 1 chick) on Nov 22, when it was run over by a 4WD vehicle. This was the first such incident since regular monitoring began in 2004, and it is ironic that it should occur when vehicle traffic in the riverbed is far less than it has been in the past.

Most popular site. As shown in Figure 10, the most frequented area for wrybill nesting has been off Groyne 2. Six pairs were present in 2014-15, with four pairs the next season. Just two pairs nested there in 2016-17 and 2017-18, the same number as at Marchmont / Smarts site over the last two seasons. Significant weed clearance has been carried out and maintained at both sites during the 2016-18 period.

Banding and adult survival. Many NZ native birds depend on good adult survival for maintaining populations (as opposed to higher breeding productivity and shorter life spans). Therefore banding is vital if we are to learn more about the long-term survival of individuals. This season, just one banded bird was present on the river – BW-BW off Groyne 2. This bird was banded in the 2010-11 season, so is at least 10 years old (wrybill start breeding at age 2). Two other Ashley-Rakahuri birds are known to have lived longer – to at least 12 years of age. Although we cannot monitor unbanded individuals, the number of returning adults and juveniles appears low (see 2015-16 report). To learn more about long-term survival, the Group needs to get more adults banded, and to push for more investigation into why the level of adult survival on the Ashley-Rakahuri river is not better. Wrybills are netted and banded annually while wintering in large flocks at the Firth of Thames, east of Auckland. When written up, the results of this work should significantly increase current knowledge of wrybill longevity.

Figure 10. Wrybill nesting sites**Black-fronted tern**

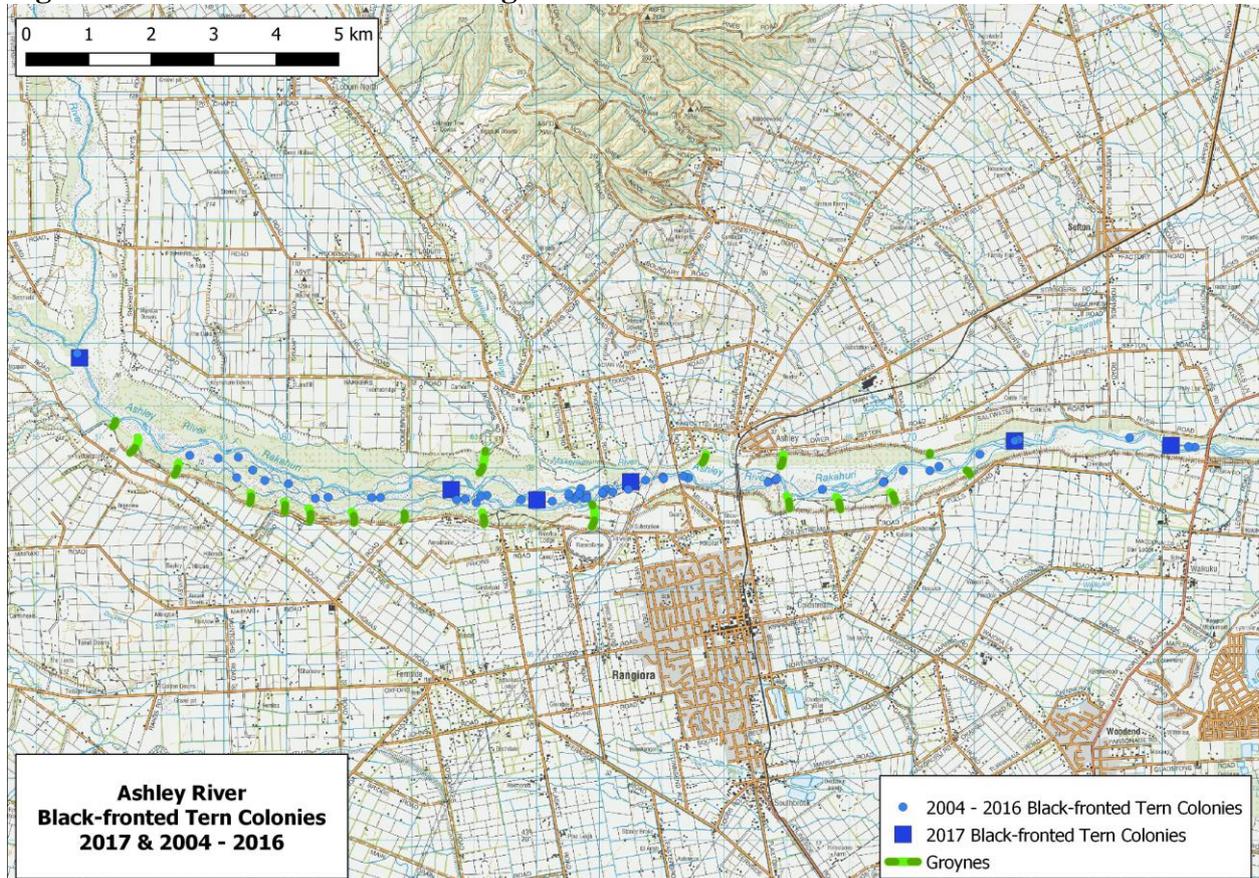
Although always present on the river (one of the few native species remaining over winter, albeit in low numbers), breeding success for this species remains variable at best, poor at worst. It is therefore pleasing to note that breeding numbers and outcomes during the last season were better than normal. The greater areas of clean shingle created, particularly by the record July flood, may well have contributed to this increased success – as the floods appear to have done in halting the decline in overall bird numbers.

Detailed results are given in 3.6 above, but overall it is estimated that 70-80 pairs attempted nesting, although some of these could well have done so at more than one site. This number is the highest for many years, and 70% above the 14-year average of 44 pairs. A total of 40-45 chicks are estimated to have fledged, so if all pairs had separate nests then productivity was between 0.5-0.64. This is above the 14-year average of 0.41, but if some of these pairs nested twice then the average probably remains about the same. This does not include those known to have unsuccessfully re-nested at the end of the season. Black-fronted terns do not normally begin egg-laying before early October, so the last large flood of 2017 (October 9) should not have negatively impact on nesting birds.

One can only admire the persistence which terns apply to their breeding attempts. Many nests fail early on, but re-nesting is nearly always reattempted at least once. If that also fails, it appears that they may try yet again, but experience on the Ashley-Rakahuri and elsewhere is that the later the nesting the greater the failure to hatch eggs and raise fledglings. Figure 11 shows the scattered nature of nesting sites, with a slight preference for the 4km stretch between the Cones road bridge and Groyne 2.

The Group feels that its best strategy for improving tern productivity is to persuade them to nest in numbers on weed-free island sites surrounded by water, together with good predator control and adequate signage to deter human disturbance. Habitat creation and maintenance along these lines is ongoing.

Figure 11. Black-fronted tern nesting sites



Black-billed gull

Success with this species depends primarily on whether a colony chooses to nest on the riverbed. Last season, for the third year running, no gull colony established – in fact, not a single pair nested on the river in 2016-17. As with the wrybills and terns, there appeared to be a link between the poor nesting and the rise in weed-infested areas. In 2016, this most probably encouraged the gulls to set up a good colony on a cultivated dairy farm paddock just south of the SH1 road bridge (Figure 11). The eventual productivity of between 1.17 and 1.70 was amongst the best ever recorded in the country.



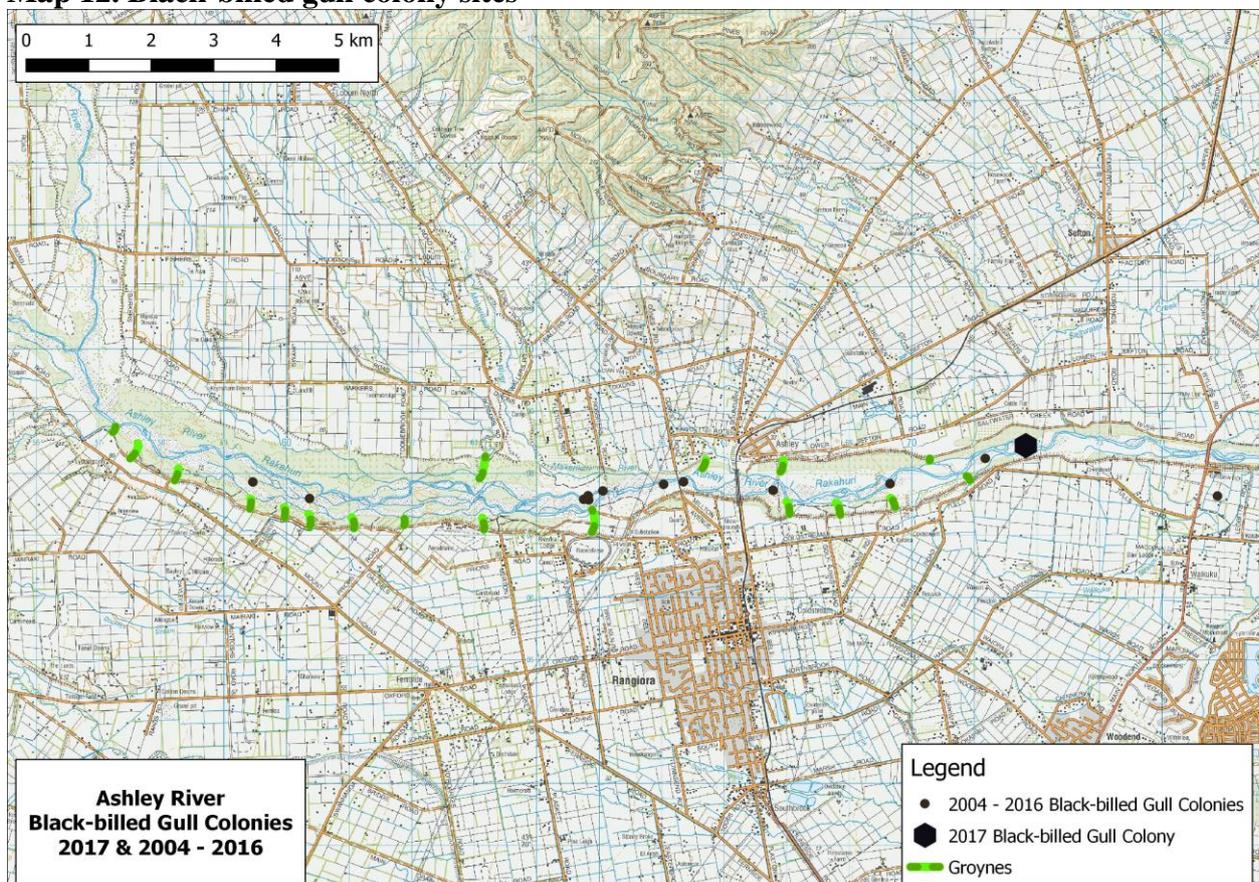
Black-billed gull colony at the Tulls site, 2017

In 2017 a gull colony of over 300 pairs returned to the riverbed at the Tulls site (Figure 12), after being seen indicating settlement on cultivated pasture on the dairy farm where they nested the previous season. Their return to the riverbed was most likely encouraged by the much larger expanses of weed-free gravel brought about by the mid-2017 floods. As has often been recorded

elsewhere, they settled alongside a black-fronted tern colony, which they effectively displaced. But fortunately, by the time the gulls arrived, most of the tern chicks were mobile, so moved to less contested ground downriver. Interestingly, the only other record of breeding gulls in 2017, was a single pair which nested alongside the small tern colony just above the SH1 bridge. It is unknown if this pair fledged any chicks. As described in the Results section above, the gull chicks, plus the associated adults, steadily migrated downriver in groups as the season progressed. This made them difficult to monitor, but it is estimated that 120-140 chicks fledged, to give a productivity between 0.34 to 0.4. This is close to the long-term riverbed average of 0.32, but considerably down on the exceptional productivity of the 2016-17 dairy farm colony.

Over the winter of 2018, the remaining weeds present at the Tulls site where the gulls nested has been treated by dozer ripping and blading, so it is hoped that the gulls will return there for the 2018-19 season.

Map 12. Black-billed gull colony sites



Other species

Breeding success or productivity was not recorded for S. Island pied oystercatchers, pied stilts and banded dotterels during the 2017-18 season, but signs of successful breeding were noted at many sites. Pied stilts with flying juveniles were often seen later in the season, and it appears that this species had better than average breeding success. Flying juveniles of oystercatchers and banded



South Island pied oystercatchers are regular breeders on the river, usually in widely separated pairs.

dotterels were not observed as frequently as usual, so their breeding season could well have been below average.

The kaki (black stilt), which bred on the river for three consecutive years through to the 2009-10 season, has not been seen since. However, it was pleasing to see a single bird breeding with a pied mate in a swamp just inland from the sand-dune forests, about 1km south of the end of Woodend Beach road. This bird was banded but the colour combination was difficult to read. The property owner reported that this bird has also been present during previous breeding seasons. Kaki in low numbers visit the Ashley-Saltwater creek estuary fairly regularly, and at least one was present for most of the 2018 winter. An investigation continues relative to a possible kaki relocation attempt on the Ashley-Rakahuri in a few years' time (see 4.4.2 above)

The continual absence of breeding black-backed gulls on the Ashley-Rakahuri river is unusual, considering the high numbers which breed on the Waimakariri river, only 20 km to the south. There is also a colony which breeds regularly at the estuary and in the upper reaches of the river in Lees Valley. The reason for their absence in the lower river is unknown, as good numbers of gulls can often be seen feeding in cultivated and irrigated paddocks close to the Ashley-Rakahuri river, and at the estuary. Their absence on the riverbed is welcomed, as they can be major predators of eggs and young chicks on other rivers.

Spur-winged plovers were present in low numbers throughout the season. No breeding was observed on the riverbed, although nests in such sites are always hard to find. Sizeable flocks of 20+ birds were most obvious at the end of the season and through into the autumn and winter. In June, the flock of 90+ seen at Marchmont was the largest flock ever recorded on the river. This pattern of sizeable flocks in the autumn / winter has often been recorded on other Canterbury braided rivers (Andrew Crossland, pers. comm.).

No doubt, all these other species would have benefitted from the greater expanses of clear, open shingle created by the major floods of 2017, plus the lower predator numbers and less human disturbance associated with the management targeted primarily at wrybills, black-fronted terns and black-billed gulls.

4.6 INCOME and EXPENDITURE

This is addressed under 2.8 above. As stated there, the Group is now well supported by its own fund-raising (mainly from trap-making), sponsorship (from the likes of Karikaas Dairy Products Ltd) and donations. During the 2017-18 year, the Group made 200 traps for sale – including 100 for the Makarora river protection group in western Otago. Local fund-raising has not only been successful, but has the advantages of encouraging community participation and obtaining better public exposure. The main expense has been on materials for traps, but this is all recovered in sales.

The Group still depends on outside grants for major projects such as weed clearance and the making of a video. These have come from DOC, ECan and the Rata Foundation.

The Group is keen to use 'excess' funds for habitat management and studies which improve the prospects for birds on the river, with the proviso that at least \$7,000 is always kept in reserve for 'emergency' use.

5 Conclusions

Relative to the future success of rare and endangered shorebird species breeding in the Ashley-Rakahuri river, the rising bird population trend up to 2014 reversed (declined) in the following 2 years. However, the survey figures for November 2017 indicated that this decline has stopped and that populations could even be rising again. Although wrybill numbers were the lowest since 2008, it is known that ‘unseen’ others were present on the river at that time. There was a 56% increase in pied stilts, and a 17% increase in black-fronted terns, plus the return of a black-billed gull colony (over 300 birds) for the first time in 4 years.

The 2016-17 report attributes a decline in bird numbers to a surge of weed invasion leading to major losses of bare gravel areas needed for breeding, plus clear water-shingle margins essential for feeding. The major floods of mid-2017 increased the clear gravel area from around 30ha to 250ha, which probably influenced the slight increase in bird populations detected in the November 2017 survey. We await the outcome of the 2018 survey with considerable interest, as hopefully it will show improvement to be continuing.



Riverbed birds only nest on clear shingle. Maintaining control of introduced weeds, such as the yellow lupins seen here, remains a major challenge.

The Group continues to maintain a high profile relative to public awareness and education, assisted by agencies such as DOC and ECan, particularly staff from DOC’s Rangiora Field Base and ECan’s Ashley-Rakahuri Regional Park. During 2017-18, the Group created many opportunities to improve awareness. Most involved media articles, presentations to schools and local groups, and displays at public events. Video material was taken for a documentary on a season’s management, plus use in presentations and general promotion.

During all its initial years, the Group relied on outside agencies (e.g. Lotteries, WWF) for funds, requiring considerable time and effort in writing applications and supplying reports. Hence, it is pleasing to record that for the last 5 years, the Group has been able to increase self-sufficiency by its own fund-raising projects, plus donations. During the last year, we attracted commercial sponsorship from a local firm, Karikaas Dairy Products Ltd. The generosity of such a sponsor and the public in general is due to our improved public profile.

Looking into the near future, the major challenges involve maintaining control of weeds and improving bird nesting and feeding habitat, continuing/improving the control of predators, plus banding more adult birds (particularly wrybills). To these challenges and opportunities must be added the ever-present challenge of maintaining public interest, and the involvement of the local community in bird management on the Ashley-Rakahuri River. This not only enhances fund raising opportunities, but also helps to reduce human disturbance in the riverbed during the breeding season.

5 Recommendations

1. Continue annual bird surveys and monitoring activities - focussing on the three key threatened shorebird species (wrybill, black-billed gull and black-fronted tern). Trial the use of trail cameras to monitor nest/colony sites.

Justification

Collection of information through surveys and monitoring is vital, as it indicates if the Group is attaining its goal of improved bird numbers, as well as providing vital data for future management and decision-making.

To date: Surveys and monitoring being maintained adequately.

2. Create and maintain improved habitat (e.g., extensive weed-free sites – preferably islands) for breeding and feeding. Identify cost-effective and environmentally-friendly means of maintaining weed control.

Justification

Recent experience has shown that weed invasion and loss of bare shingle areas can lead to declining bird numbers. Natural floods have helped reverse this situation, so challenge is to maintain weed-free status into the future.

To date: Significant weed removal by 2017 floods, supported by machine clearance of remnant vegetation, plus follow-up maintenance (by spraying).

3. Improve record keeping and mapping (traps and bird nesting), and band more birds.

Justification

Good records and mapping are essential for effective monitoring over the long-term. Banding provides information on adult survival and pairing, plus movements of individual birds.

To date: Record keeping adequate, but mapping effort has been vastly improved over the past 2 years. Banding recently has been almost non-existent – needs improvement.

4. Explore opportunities for increasing trapping effort and using new technologies for predator control. This effort needs to extend to include all the riverbank in the study area.

Justification

Predator control occupies more of the Group's time than any other single activity. Improved finances allow for increased trapping effort, plus new techniques involving self-resetting traps and user-friendly poisons could reduce the level of this commitment considerably. Complete trapping coverage of the river and its estuary is integral to any relocation of the kaki (currently under consideration).

To date: Trapping adequate and appears to have lowered predator numbers, but need to keep in touch with improved trapping techniques. A good trapping network is now established around the estuary.

5. Continue advocacy initiatives both by members and other agencies such as DOC, making use of the website (including social media such as Facebook), the Powerpoint presentation, video footage and printed material such as handout fliers, posters and bookmarks. Particular attention should be paid to schools and field interpretation / awareness signs for the public.

Justification

Although awareness has improved significantly since the Group was formed in 1999, it can only be maintained and improved by continued effort, plus the utilisation of appropriate modern technologies. Children are excellent advocates for influencing adults, and future management will be in their hands. Most field sites have no interpretation panels.

To date: Good advocacy to date, plus video documentary should improve this. However, the almost complete lack of field interpretation signs needs priority attention.

6. Maintain funding via local sponsorship and Group initiatives such as trap-making.

Justification

Obtaining funding from traditional agency sources involves considerable time and effort both in applications and reporting (all carried out by volunteers). The Group now has a sufficiently high profile to seek more local donations and sponsorship - such as that from Karikaas Cheeses. These not only further increase community exposure, but also lessens the time and effort spent securing funding from further afield.

To date: Funding adequate over recent years. Our major fund raiser, trap-making and selling, not only adds to funds, but promotes effective predator control elsewhere. Large projects involving the likes of weed clearance and video creation have been supported by outside agencies, such as ECan and the Rata Foundation.

7. Continue full support for BRaid Inc.

Justification

BRaid Inc aims to improve environmental awareness and management on all South Island braided rivers. It has become a recognised 'umbrella' group for maintaining braided river ecosystems. BRaid has a part-time Manager, and regularly organises advocacy workshops and training courses.

To date: Good support of BRaid and its outreach programmes.

8. Maintain and improve collaboration with ECan's Biodiversity Programme, the Waimakariri Zone Committee, the Canterbury Water Management Strategy's Regional Committee, Fish and Game and local iwi/runanga.

Justification

Decisions on the future use of water from braided rivers rest with these agencies and committees. Too much water taken from braided rivers for hydro generation and irrigation will adversely affect bird numbers. These agencies also dispense considerable funds for river management.

To date: Good collaboration, but links with iwi/runanga and F&B need improvement.

9. Maintain and improve collaboration with commercial shingle extractors.

Justification

Gravel (shingle) extractors are the major commercial users of the Ashley-Rakahuri river and have opportunities to create weed-free sites and islands surrounded by water that encourage successful bird breeding.

To date: Good collaboration, but needs extending. Need to promote appropriate regulation enforcement by ECan, particularly of the smaller operators.

10. Support management of Environment Canterbury's Ashley-Rakahuri Regional Park, and implementation of the Northern Pegasus Bay Bylaw 2016. .

Justification

A major objective of the Park's plan is the long-term maintenance of key shorebird populations on the Ashley-Rakahuri River, plus the Pegasus Bay Bylaw is integral to the future protection of the birdlife in the Ashley-Saltwater creek estuary

To date: Good collaboration. On-going issues relative to vehicle use of riverbed and estuary.

7. Acknowledgements

We are particularly grateful for major past financial support from national agencies such as:

- World Wildlife's Habitat and Protection Fund
- Pacific Development and Conservation Trust
- New Zealand National Parks and Development Foundation
- Lottery Environment and Heritage Committee of the New Zealand Lottery Grants Board

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Smaller sums have been received from Taggart Earthworks Ltd, the Ohoka Market, and Jane Buxton, author of the children's book 'Ria the reckless wrybill'.

Agencies who have offered special operational assistance are the Dept of Conservation and the Ashley-Rakahuri Regional Park and its staff, whose aspirations for the birds on the river mirror those of the Group. The Group also thanks its members and their friends and families for help with bird monitoring, participation in the spring survey, advocacy, and attendance at meetings. Particular acknowledgement must go to the small band of trap-makers, and the trappers who weekly maintain many traps over the full year.

The activities recorded in this report would not have been possible without the above support.

All figures / maps in this report were created by Group member, Grant Davey. Images are courtesy of Grant Davey, Steve Attwood and Nick Ledgard.

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Appendix 1. Promotional activities, July 1, 2017 – June 30, 2018

Promotion / activity	Date	Comment
Meetings	Jul 14, Sept 20, Oct 4, Feb 8, Apr 11, Jun 7	DOC offices, Rangiora: 9-17 participants
AGM and meeting	Oct 26, 2017	DOC offices, Rangiora: 14 participants
Annual bird survey	Nov 18	16 participants
Presentations/Representation		
Rangiora High School	July 31	Blue Planet Group plus classes (150 present)
Oxford School	Aug 21	Back Paddock series
Oxford School	Aug 23	Back Paddock series
Kaiapoi Borough School	Aug 28	Back Paddock series
Birds NZ evening	Aug 28	Christchurch
Predator Free NZ launch	Sept 12	Botanic Gardens
Cons Week event	Oct 14	Botanic Gardens
Trapping workshop	Oct 28	Woodend (79 present)
Loburn School	Nov 1	Riverbed visit
Rangiora Borough School	Nov 6	Back Paddock series
Twilight Walk	Nov 7	Riverbed
Rangiora High School	Nov 13	Field session in riverbed
Tuahiwi Marai Open day	Nov 25	In ECan marquee
Ohoka market display	Fridays, December	Ohoka domain
Karikaas cheese talk	Dec 3	Talk to sponsors
Trapping workshop,	Feb 24	Ashburton (18 present)
Estuary talk	Mar 3	'Freshwater meets sea', Tuhaitara Open Day
New Brighton group	Mar 4	Sea week talk (22 present)
Swananoa School	Mar 26&28	Back Paddock series
Braided river advice group	Apr 4	DOC, Christchurch
DOC, Christchurch	Apr 11	Kaki relocation discussion
Hurunui/Wairau Zone Committee	May 21	Greta Valley
Hurunui/Waiarau Zone Committee	May 23	Culverden
DOC, Christchurch	May 23	Future plans
Rangiora High School	May 23	Riverbed visit w EnviroSchools
Loburn School	June 11 & 13	Back Paddock series
Environment MPs (Doocey/Dowie)	June 11	Riverbed visit
Waimak Zone Committee	July 9	Ppt update
Orari rivercare group	July 25	Geraldine
Media articles		
Northern Outlook	July 28	'The upside of the flood'
Film	Aug 25	'Walk the 7 rivers'
Northern Outlook	Nov 8	'Keep an eye out for black-billed gulls'
Northern Outlook	Nov 29	'Rare bird nest crushed by 4WD'
The Press	Nov 29	'Rare wrybill's nest crushed by 4WD'
Social media	Nov 27 on	'Wrybill nest destroyed by 4WD'
NC News	Dec 9	'River visitors urged to consider risk to birds'
NC News	Jan 31	'Minimal risk from work' (shingle extraction)
NC News	March 8	'Video to show river work'
NC News	April 19	'Golden Glow for Karikaas'
Other		
Cinema vista filming	Sept 25	Rangiora - played b4 all shows from Sept to Feb
Trap making	Oct 6, Nov 3, Apr 26, May 19	Over 200 traps for self-use and sale
Video documentary filming	2017: Oct 2/6/8; Nov 6/12/14/25/30; Dec 18/20 2018: Jan 2; Apr 16, May 22	Documentation of one season's activities

Appendix 2. Weed invasion and clearance by floods.

The same photo point off Groyne 2 – 2014-2017



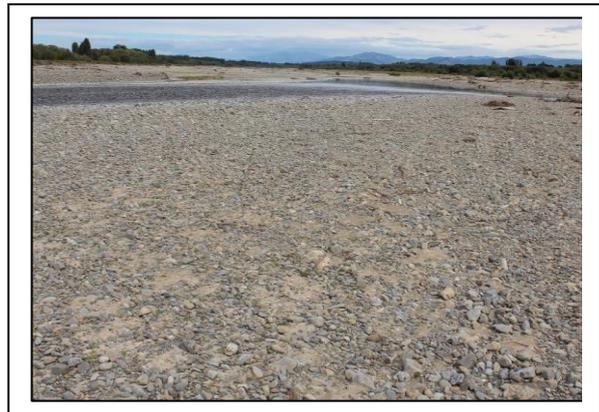
November, 2014



December, 2015



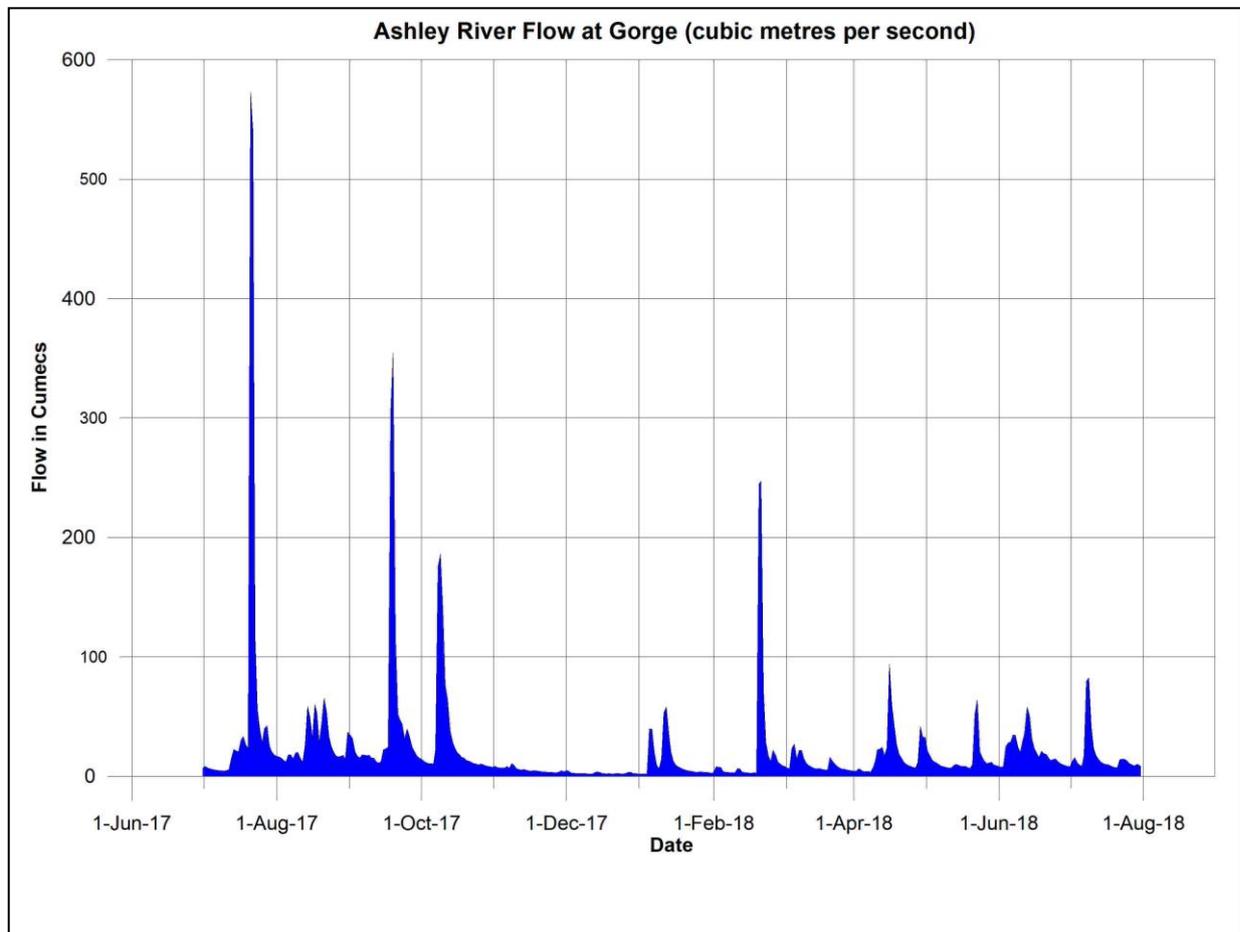
December, 2016



December, 2017 (after floods)

Appendix 3. River flow (cumecs).

Taken at the Ashley Gorge from July, 2017 to July, 2018 (from Environment Canterbury website www.ecan.govt.nz). The 2017/18 bird breeding season lasted from August, 2017 to February, 2018.



Appendix 4. ARRG office bearers and management structure

Chair: Nick Ledgard (nick.ledgard@xtra.co.nz)

Secretary: Joan Miles (k.jmiles@icloud.com)

Treasurer: Sue Mardon (suemardon02@gmail.com)

Trapping organiser: Geoff Swailes (swailesgc@xtra.co.nz)

Committee: Office-bearers, plus Bev Alexander, Steve Attwood, Chris Martin, Linda Pocock and George Scott

Management Committee. In September, 2017, the Constitution was amended to allow the creation of a Management Committee with the capacity to make decisions and approve funding for small tasks requiring immediate attention – for final approval at the next General meeting. There are six members on this Committee.

The Group has 42 signed-up members, plus 88 interested people on our email list.

The Group has a website (www.ashleyrivercare.org.nz) maintained by the District Council's VisitWaimakariri office, while our Facebook page (<https://www.facebook.com/ashleyrivercare>) is maintained by member, Steve Attwood.