
*Management and monitoring of shorebirds in the
Ashley-Rakahuri River during the 2018/19 season*



Part of the crèche of black-billed gull chicks at the Smarts site



Ashley-Rakahuri Rivercare Group, Inc.

Management and monitoring of shorebirds in the Ashley-Rakahuri River during the 2018/19 season

A report by:

N. J. (Nick) Ledgard

G. R. (Grant) Davey

Prepared for:

Ashley-Rakahuri Rivercare Group, Inc.

(composition of Group given on last page – Appendix 3)

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Summary

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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 for its day-to-day existence, with finances coming from a trap making and selling project, donations and sponsorship via Karikaas Natural Dairy Products Ltd cheese sales. Grants for larger special projects (such as weed clearing and video creation) come from DOC, ECan and its Waimakariri Zone Committee, and the Rata Foundation.

Activities were focussed on management to assist the feeding and breeding of the threatened species in the river, particularly the wrybill (ngutupare), black-billed gull (tarapuka) and black-fronted tern (tarapirohe). To this end, the main actions undertaken involve habitat management (mainly weed control), monitoring bird populations and breeding success, predator control, restricting 4WD access to the river during the breeding season, and improving awareness by the public and river management decision-makers.

The Group's finances are in good shape. We are now mostly self-funded, with finances coming from a trap making and selling project, donations and a sponsorship via Karikaas Natural Dairy Products Ltd - plus grants for larger specialist projects (such as weed clearing and video making) from DOC, ECan and its Waimakariri Zone Committee, and the Rata Foundation.

Habitat enhancement. The impact of weeds has changed considerably over recent years. After their increase between 2014 and early 2017 causing a major loss of clear gravel areas (essential for bird breeding), large floods over the 2017 winter increased clean shingle areas from around 30ha to over 250ha. However, these clear areas are now being reinvaded. So past weed clearing efforts have been continued, with a bulldozer used to rip and blade 10ha in July, 2018, but weed regrowth over the subsequent summer was significant. Over this past winter a trial using a tractor-mounted ripper was initiated, with early results indicating that this may lead to a more cost-effective and environmentally friendly means of maintaining weed control in the future.

Bird surveys. Although the bird population trend up to 2014 was a positive rising one, it reversed (declined) in the following 2 years - most likely associated with increased weed invasions. However, the survey figures for November 2017 and 2018 indicate that this decline in bird populations has stopped. Wrybill survey numbers (20) were the second highest ever. Black-fronted terns and S. Is pied oystercatchers were also more frequent than usual, but numbers of banded dotterels and pied stilts were down on last season and the long-term average. Black-billed gull survey numbers were low, but did not include a large colony of over 2000 birds which arrived after the survey date.

Monitoring of breeding birds. At least eight pairs of wrybill took up territories in the study area in 2018-19 – the same number as in the previous two seasons. A minimum of 6 chicks were fledged by six pairs, for a productivity of 0.75 chicks fledged per pair. Such productivity is above the previous season (0.63) and close to the long-term average of 0.79. Black-fronted tern breeding attempts remain fickle, with many nests abandoned, often for unknown reasons. As in the previous year, 70-80 pairs built nests, but productivity was only 0.25, well below the long-term average of 0.41. For the second time in 5 years, a black-billed gull colony returned to the riverbed. The first attempt by over 2000 birds below the SH1 bridge was flooded out, but the colony re-established at the Smarts site. This colony was closely monitored, mainly by aerial bird counts using a drone. Approximately 700 nests resulted in 450-500 chicks fledging, for a productivity of between 0.64 - 0.71. This is well above the long-term riverbed average of 0.32. Breeding productivity of other species was not recorded, but signs of success were noted at many sites.

Predator control. The number of trap-nights during the 2018/19 summer breeding season was 33,742 – the highest since regular trapping started in 2004, and 36% more than in the previous season. The overall summer catch rate was 0.41 per 100 trap nights, close to the previous season's rate of 0.44, and well below the long-term average of 0.86. The main reason for this decline over the long period is due to fewer hedgehogs being caught. The outstanding feature of the summer period was the large increase in rat catch – 43 compared with 9 in the previous period. Weasel catch also was considerably larger – the reasons for both increases are unknown. The overall winter catch rate was 0.73 per 100 trap nights - the highest recorded since winter trapping began in 2014. It is mainly due to the large increase in rats and weasels caught. Moves are underway to increase trap numbers to cover the entire 21km riverbed margin on

both banks, raising the total number of traps from the current 242 to close to 500. Rats will be specifically targeted by the deployment of poison bait tunnels, and colonies of breeding birds will be protected by a surrounding grid network of traps. Over the past year, the Waikuku Estuary Trapping Group has been managing over 100 traps around the estuary. The trap catch rate was 0.63 - close to the riverbed average of 0.59. As in the riverbed, the most notable feature was the high numbers of rats and weasels caught.

Meetings /members and awareness / education. The group has 45 members and 103 recipients of regular update emails. During the 2018/19 season, the Group held four meetings, with attendance numbering between 15-18. The Group also has an 8-person Management Committee for decision-making and funding approval of small tasks requiring immediate attention. Over the past year, many opportunities have been taken to ensure that the public were kept aware of the Group's activities. Fifteen articles appeared in local papers. Powerpoint presentations were given to six schools, plus presentations were given to the Waimakariri Zone Committee, local scouts and four service clubs. An interview was given to the local radio 'Compass FM' and from October through to February the Rangiora cinema showed a 'screen vista' about the Group prior to every film showing. A regular email update was sent out during the breeding season. The Group's 20-minute documentary/ video 'Rakahuri Rescue' was launched in the Rangiora Town Hall on March 21. It has been well received throughout the country, with some seeing it as a 'benchmark' record of a successful community group in action. A definite highlight of the past year, was the Group's winning of the Australasian Wildlife Management Society's 'Practical Management Award' for 2018. We were invited to accept this award and present a talk at the annual conference of the Society, held in Hobart during December. Other highlight talks were given at the launch of the 'Year of the Wrybill' event at Miranda, south Auckland (March 10), and the BRaid-organised braided river seminar on June 26. Karikaas Natural Dairy Products Ltd in Loburn now uses our name, plus images of riverbed birds, on their premier cheese packages, in return for which we get a percentage of profits. Our website (www.ashleyrivercare.org.nz) was upgraded, and managed, by Sonny Whitelaw, while Steve Attwood ran our Facebook page (<https://www.facebook.com/ashleyrivercare>). Relative to the latter, Steve records 'a record performance across the board'. Both social media outlets are vital as they serve as our 'shop window'. 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.

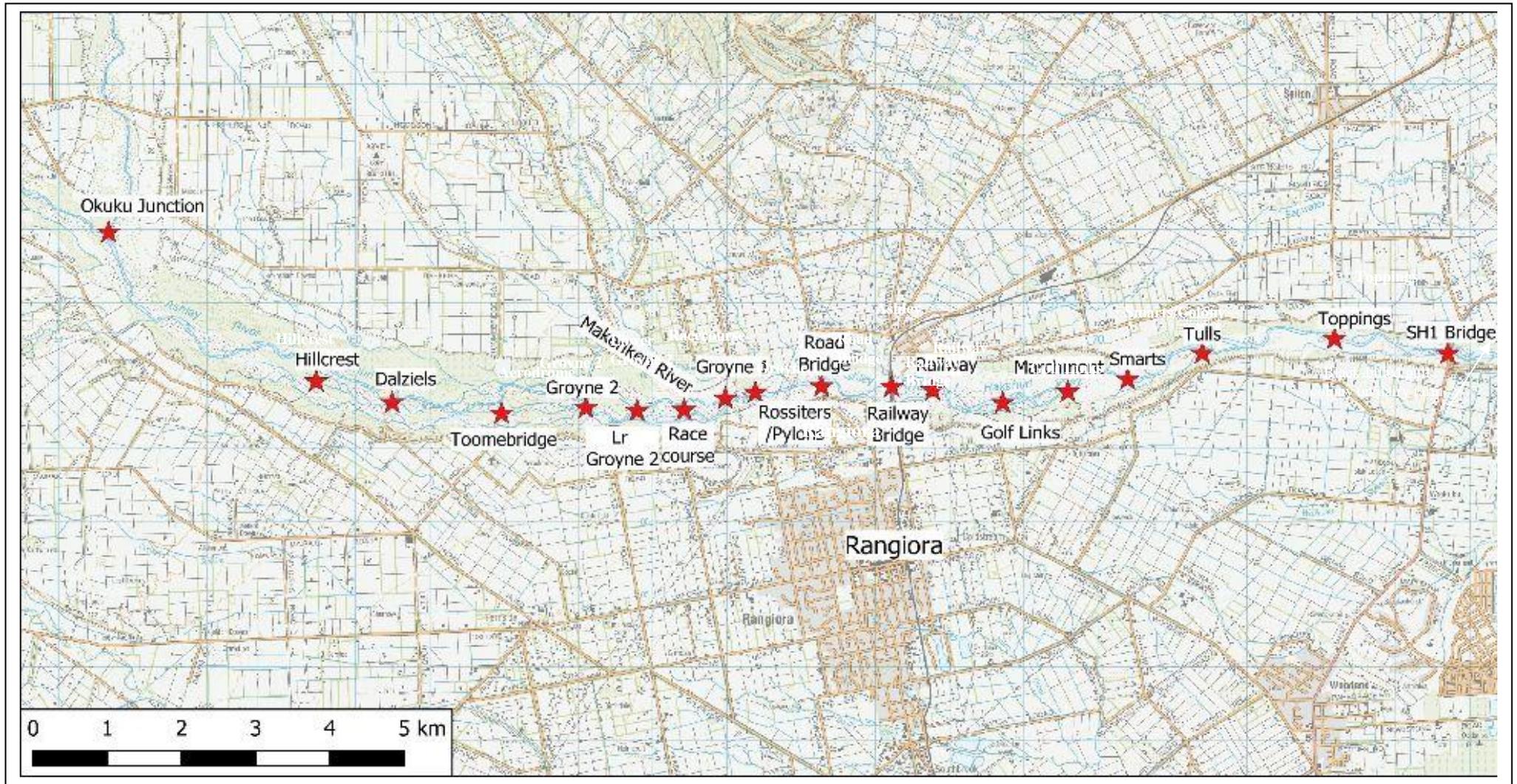
Conclusion. Relative to the future success of rare and endangered shorebird species breeding in the Ashley-Rakahuri river, bird populations and breeding success increased significantly from 2000 - 2014, but then declined through the subsequent 2 years - due primarily to a major increase in weed-infested areas. Over the past 2 years, much effort has gone into artificial weed removal and increasing predator trapping. It appears that the bird population decline has been arrested. The major challenges now involve maintaining adequate weed control, further improving predator control (particularly relative to climbing numbers of rats and weasels), and 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. Extend annual bird surveys and monitoring of breeding activities 1.5km down to estuary margin - focussing on the three key threatened shorebird species (wrybill, black-billed gull and black-fronted tern).
To date: Surveys and monitoring being maintained adequately, but extension needed.
2. Create and maintain improved habitat, particularly extensive weed-free sites, for breeding and feeding, and to reduce cover for predators. Identify cost-effective and environmentally-friendly means of maintaining weed control.
To date: Significant artificial weed removal by 2017 floods, with promising potential for new trials involving a custom-made ripper mounted behind a farm tractor
3. Improve record keeping / mapping (traps and bird nesting), and band more birds.
To date: Record keeping and data presentation plus feedback to end-users now excellent. Moves underway for approval of new wrybill banding attempts.
4. Explore opportunities for increasing trapping coverage and using new technologies for predator control. Complete trapping coverage and strengthening of the riverbed margins and its estuary is integral to any relocation of the kaki (currently under consideration). Colonies of gulls and terns need special attention.
To date: Trapping adequate and appears to have lowered predator numbers. In addition there is now a good trap network around the estuary. Additional funding is being sought

- to complete the entire river margin (doubling current trap numbers), add poison bait tunnels, plus install grid trapping around all breeding colonies.
5. Develop a PR strategy to continue advocacy initiatives both by members and other agencies such as DOC, making use of the website and Facebook, the Powerpoint presentation, the documentary / video 'Rakahuri Rescue' and printed material. Particular attention should be paid to schools and field interpretation / awareness signs for the public.
To date: Good advocacy to date, with 'Rakahuri Rescue' a powerful new tool. Winning the Australasian Wildlife Management Society's 'Practical Management Award' for 2018 further increased our national profile. In addition, the estuary interpretation panel will be repeated up-river, and there is now good website and Facebook outreach, particularly to the younger generation.
 6. Maintain funding via local sponsorship and Group initiatives such as trap-making.
To date: Funding adequate over recent years. However, new trapping, weed control and promotion intentions will stretch our current resources.
 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 with the likes of Taggart Earthmoving Ltd, 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. The access-way blocking during the breeding season is an example of this, but there are still on-going issues relative to inappropriate motorised use of the riverbed and estuary.

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 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).



Ashley-Rakahuri river by rail and road bridges, July 2018

The Ashley-Rakahuri Rivercare Group (ARRG) is a community group (see Appendix 3 for composition) 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. Between 2004 and 2012, the Group received considerable 'set-up' funding from the Pacific Development and Conservation Trust, the New Zealand National Parks and Development Foundation, the Habitat and Protection Fund of World Wildlife Fund and the Lotteries Environment and Heritage Committee. 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, Ledgard, 2015, 2016, 2017; Ledgard and Davey, 2018), 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 2018/19 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, a number of wrybill pairs have recently been recorded breeding 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.



Banded dotterel on nest in riverbed, Sept 2018

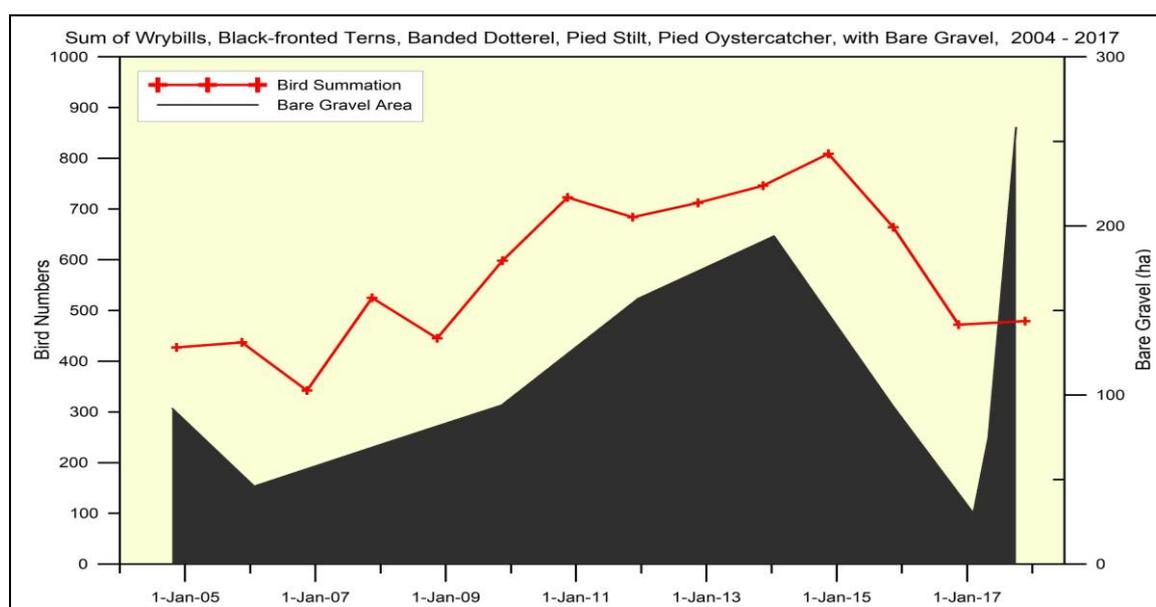
2. Study area

The study area has traditionally comprised the 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. In 2018, the area was extended to 1.5km below the SH1 bridge, which marks the upper reaches of the tidal estuary.

3. Habitat management

Controlling weeds. Over the past 4 years, the negative impact of weed invasion on bird populations and breeding has become very obvious. 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 the winter of 2017, and hence the area of clear, weed-free shingle declined significantly, from nearly 200ha to around 30ha. Following that drop remarkably closely, came a decline in bird numbers (Figure 2).

Figure 2. Changes since 2005 in bare gravel area relative to numbers of key bird species.



For this reason, weed clearance using heavy earth-moving machines was initiated in the winter of 2016, with further removals to the present day (Table 1 – see also Internal report listed at end of References). Major floods between April and October, 2017, including a ‘1-in-10’ year event of 570cm in July, cleared large areas of weeds, increasing the area of clear shingle in the study area from around 30ha to close to 250ha (Figure 2).

Table 1. Areas cleared of weeds in AR river between 2016-2018, plus methods used.

Date	Area treated (ha)	Method
July, 2016	0.7	Hand pulling
August, 2016	3.0	Digger
August, 2017	3.2	Bulldozer blade
April/May, 2018	5.6	Spray
July, 2018	10.0	Bulldozer rip and blade

In the autumn of 2018, chemical sprays were used to clear a total of approximately 5.6ha in two riverbed sites (Table 1).

In July 2018, a ripping / blading trial was undertaken in the Smarts / Tulls area, funded by DOC. This is described in a report (see Internal Reports listed at end of References).

In June / July, 2019, a new trial funded by DOC and ECan was initiated in the same area, this time using a locally constructed ripping unit towed by a dual-wheeled tractor. At time of writing, this trial was being installed.



Tractor-mounted ripper clearing weeds, Aug 2019

Discussion. The continuing and vigorous invasion of woody weeds within the study area remains as arguably the greatest challenge to successful bird breeding in the

riverbed. 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. With this increase in weeds came a decline in bird numbers (Figure 2). For this reason, the Group has artificially cleared around 22ha of weeds since 2016.

The challenge remains one of maintaining future weed control on the core breeding sites - as floods of the right size cannot be guaranteed. To this end, early in 2018, consent was gained for the use of a glyphosate spray mix at two sites. However, due to the issues involved in using chemicals in close proximity to running water, they have not been used since and will be avoided in the future. Hence, the Group will be exploring cost-effective means of mechanical clearance. The 2018 winter ripping trial in the Tulls / Smarts area attempted to copy a riverbed ripping treatment used in Hawkes Bay, using a specially designed ripper towed by a dual-wheeled tractor. However, such specialist equipment was not available, so the machine used was a Komatsu D65ex bulldozer (equivalent to a D6) which had a normal blade in front and a 3-tyne ripper at the rear. Although this did considerably reduce the existing weed cover, the effect was relatively short-lived, so that by the season's end, weeds were once again growing well. It is hoped that the new trial initiated in the winter of 2019, using a locally constructed ripping unit towed by a farm tractor, will give more lasting results.

4. Predator control

Recently a summary report of trapping results since 2004 has been written (see Internal Reports listed at end of References). It includes some detail on the trapping results not given in this section of the report. In mid-2018 trapping began around the Ashley estuary, results from this are given in another Internal Report (see list at end of References).

During the 2018-19 season, trap numbers have increased from about 182 to 242. Currently we have 155 DoC traps (predominantly DoC 200s with a few DoC 150s and 200s), 84 Timms 3 Trapinators and 2 traps in home-made experimental boxes (Figure 3). These are to target the

mammalian predators rats, feral cats, mustelids (ferrets, stoats and weasels) and hedgehogs. Some mice and possums are also caught. The traps are divided into 17 lines and are being checked by 16 volunteers. Traps are baited with a range of baits, usually fresh meat, salted rabbit or hen eggs, and checked every 2-3 weeks.

After the birds 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. Last nesting season several Timms traps were sited around the black-billed gull colony at Smarts and DoC traps were used near the Swamp Road black-fronted tern colony and banded dotterel nesting area. It is planned in future to do more of this style of ‘grid’ trapping, although no catches were recorded in the above traps this year.

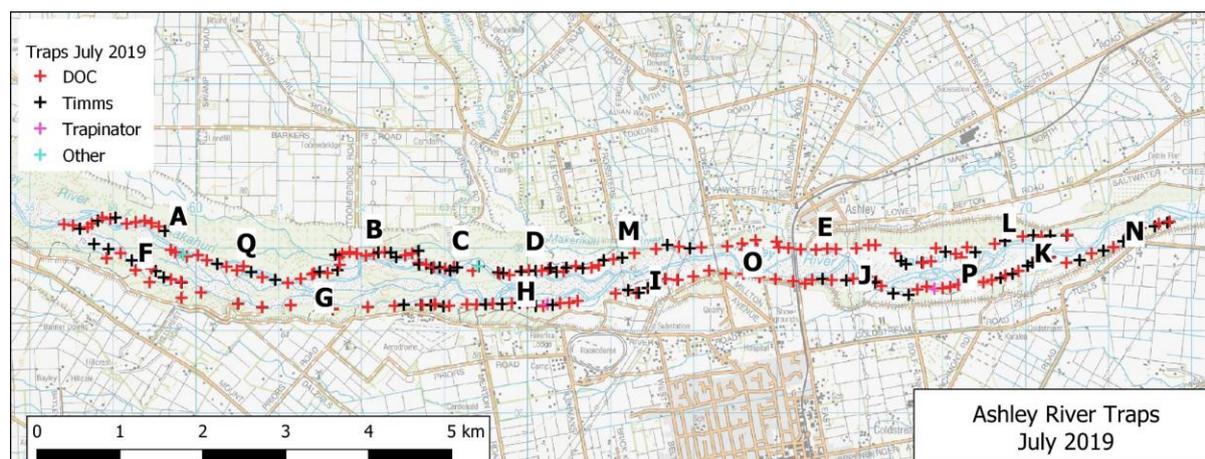


Figure 3. Trap locations, July 2019

Results

As trapping only took place during the summer breeding months up until 2014, the following results for summer (August 1 to January 31, 2004 – 2019 – Table 2) and winter (February 1 to July 31, 2014 – 2019 – Table 3) are presented separately.

Summer results.

Table 2. Summer (Aug1 to Jan 31) predator trap-nights and trap-catch from 2004 – 2019

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
2018-19	33752	6	12	31	33	43	5	0.41
Mean	9526	5.7	4.5	6.0	38.1	4.5	1.1	0.86

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

Details of trap nights and trap catches since 2004 are shown in Table 2 above. The overall catch rate was 0.41 per 100 trap nights, this was down very slightly on the preceding period which had a rate of 0.44. This is still less than half the average rate since 2014. The Internal Report covering the long-term summary (see list at end of References) shows that the dropping catch rate over time has been almost solely due to fewer hedgehogs being caught. The reason for this is unknown.

The outstanding feature of this period was the large increase in rat catch – 43 compared with 9 in the previous period. There were considerably more rats caught in the past summer than had been caught in all previous summers – 25 rats in total. Weasel catch also was considerably larger. These increases are not just due to more traps, they are also increases on a trap night basis. Hedgehog and cat catch this period was lower than the previous summer. Hedgehogs caught were outnumbered by rats for the first time.

Total volunteer hours were approximately 450 with about 182 traps being checked by the end of the period.

Winter results.

Table 4. 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
2019	242	39464	80	29	19	49	10	100	0.73

Details of winter trap nights and trap catches since 2014 are shown in Table 4 above. The overall catch rate was 0.73 per 100 trap nights. This is the highest recorded since winter trapping began and is due mainly to a very large increase in rats caught. Weasels and hedgehog numbers were also significantly higher.

From the start of February 2019 trapping results have been collected in a purpose-built MS Access database which allows rapid graphical and tabular collation of results. The figures below are some of the output from this.

Figure 4 shows a quite marked variation in catch per line between February and July, 2019. The main reason for this appears to be the vegetation under which the traps have been placed. Traps under trees appear to catch more predators, especially rats, than those in gorse and

broom. Rat species (ship or Norway) have not historically been recorded, this has now started and will be reported in future.

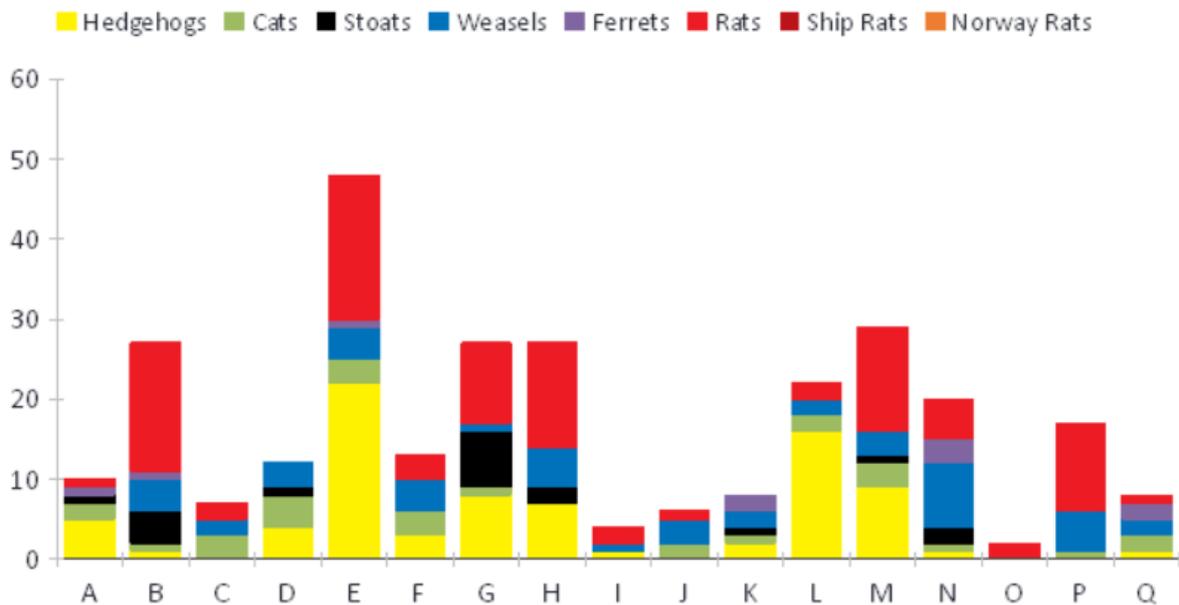


Figure 4. Catch per line from February to July, 2019

Figure 5 shows catch per month from February to July 2019, with partial data for August 2019. Greatest catch was in March with the lowest being in July. The reasons for such a low catch in July are not properly understood, however some species may find warmer places to live than the riverbed and berm over winter – and hedgehogs hibernate.

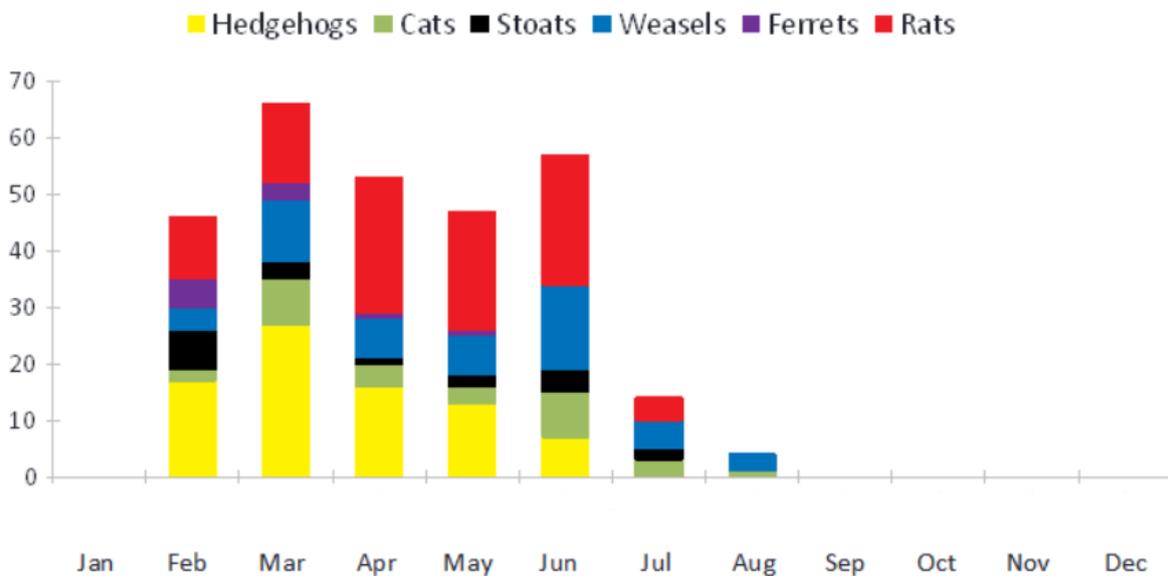


Figure 5. Catch per month from February to July, 2019

In the period February 1 to July 31, 2019 trap lines were checked 165 times, for approximately 330 volunteer hours.

Discussion.

The outstanding feature of the trapping results during the period of this report has been the increase in rats caught – this is illustrated in Figure 6 below. Reasons for the rat increase are unknown, but media reports suggest a boom in rats throughout the country. Most rats are caught in traps under trees, this perhaps suggests that they could be ship rats. It is unknown if this species is likely to predate braided river bird nests. However, rats have been seen on the gravel of the river and are strongly suspected of raiding banded dotterel and black-fronted tern nests at the Swamp Road site.

Plans to poison rats along the berms are well advanced. If these rats are largely Ship rats and they don't affect the river birds, they will still raid nests in trees along the berms.. Identification of rat species is already in place.

Weasel numbers have also increased significantly. This could be partly due to the increase in rats but increasing signs of mice have been seen in traps – 30 were caught in the winter period, but many would not be of sufficient weight to trigger DOC200 traps.

Hedgehogs are no longer the most abundant predator caught and they are decreasing on a catch per 100 trap night basis. Reasons for this are not known.

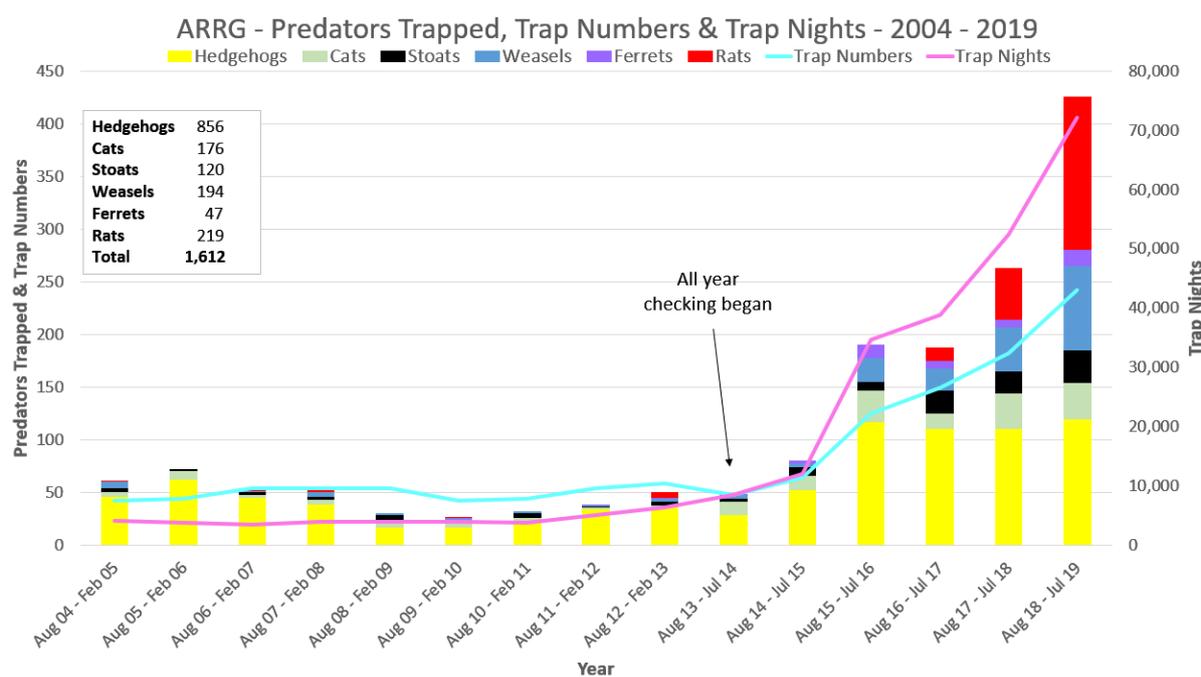


Figure 6. Catch per species, trap numbers and trap nights since 2004

With the predation of nests at Swamp Road (perhaps by rats) and the killing of fledgling black-billed gulls at Smarts in the 2018 nesting season (perhaps by ferrets), further justification for increased trapping exists. Figure 7 shows the river and estuary traps that are already in place, and the planned extensions – increasing the number of traps from the current 242 to close to 500. Funding is being sought for the new traps and to employ a professional to check them. Greater catch under trees in the last 6 months than in the gorse and broom covered berm suggests that most new traps should be under trees. These locations usually are more accessible and less flood prone.

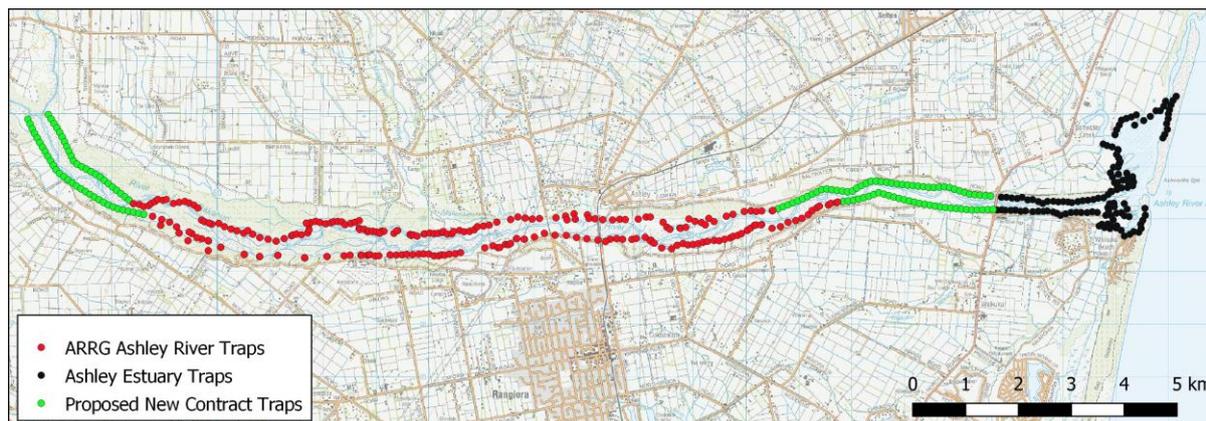


Figure 7. Existing river and estuary traps with planned new trap locations

The incidents mentioned above clearly show that our existing trap lines along the margins of the river are insufficient to protect nesting birds. In the coming nesting season a grid pattern of DoC and Timms traps will be installed around all colonies and perhaps near wrybill nests. Rat traps and tunnels containing poison baits will also be used. Floods are a potential major hazard to traps out on the fairway.

Over the past year, the Waikuku Estuary Trapping Group has been managing over 100 traps (137 currently) around the estuary (see Figure 7). Over this period the trap catch rate was 0.63 - close to the riverbed average of 0.59. As in the riverbed, the most notable feature was the high numbers of rats and weasels. An Internal Report on the estuary trapping has been written is listed at the end of the Reference section.

5. Bird survey

The annual summer survey of all resident birds was undertaken on November 24 from the Okuku river junction down to 1.5km below the SH1 bridge – a distance of 21km. It involved 18 participants. In past years, the survey has not extended below the SH1 bridge, but from now on it will extend east as far as the upper tidal limit. 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).

Figures from the annual summer survey (November 24) are given in Table 5, along with results of earlier counts.

Total bird numbers, minus black-billed gull (due to hugely variable numbers between years), were slightly lower than in 2017 – 506 vs 531. The changes in total bird numbers from 2004 – 2018 are shown in Figure 8 (minus black-billed gulls).

Figure 8. Changes in total numbers of birds, 2004 – 2018*

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

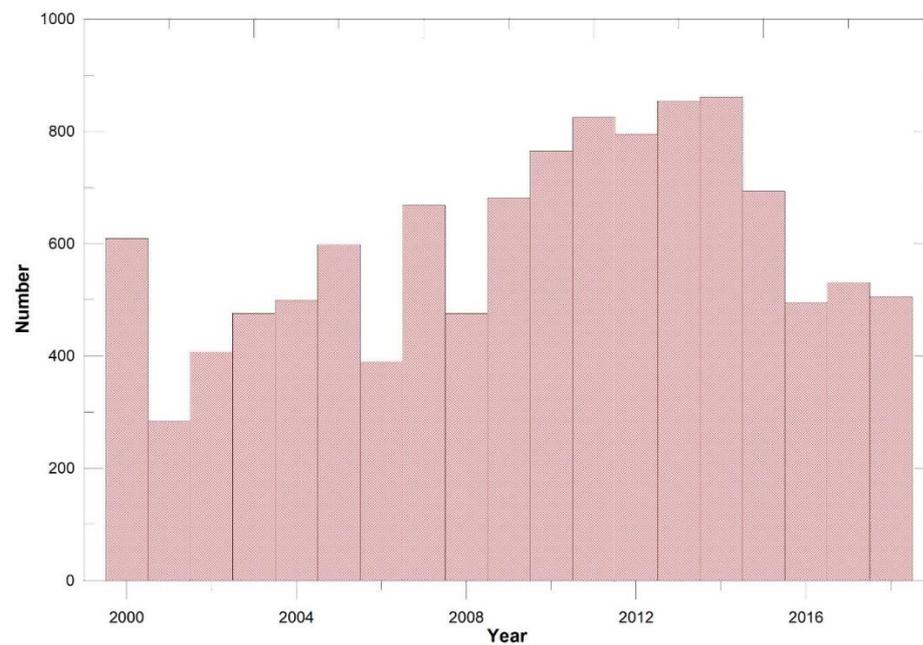


Figure 9 graphically shows how the 2018 numbers of the most common species compares to the numbers in 2017.

Table 5. Results of the annual bird survey undertaken in the Ashley-Rakahuri River (from Okuku junction down to SH1) on November 24, 2018. Counts from previous years, plus the 18-year mean, are shown for comparative purposes.

Species	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Ave 2000 - 2017
Black shag	18	3	nc	8	7	2	2	10	9	6	2	5	6	3	4	1	5	2	5	5
Little shag	3	6	nc	4	7	6	2	4	0	17	6	13	11	19	5	6	8	3	8	7
SI Pied oy'catcher	25	22	19	22	37	22	5	26	27	32	20	35	38	23	32	24	14	14	50	24
Variable oy'reatcher	0	0	0	0	2	0	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	83	163
Black stilt	0	0	0	0	2	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0
Banded dotterel	199	130	115	169	213	245	84	237	198	233	260	250	248	301	263	276	222	167	136	212
Wrybill	17	7	6	16	9	7	5	9	8	13	18	15	17	19	21	19	13	9	20	13
Spur-wing plover	18	nc	16	13	27	149	37	116	11	39	15	89	55	65	37	9	6	32	17	43
Black-back gull	26	nc	11	10	27	3	5	12	10	19	19	2	11	17	7	13	4	1	15	12
Black- billed gull	314	3	5	0	10	1	213	13	16	2	41	425	202	364	23	13	9	361	16	112
Black- front tern	74	44	165	102	28	26	180	89	81	124	192	190	200	156	263	128	128	150	172	129
White- front tern	0	0	0	0	0	0	0	0	0	0	8	77	6	2	0	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	0	1
Totals	923	297	407	486	509	599	603	681	492	682	814	1295	1003	1217	885	706	504	892	522	726
Totals (minus BBG)	609	284	407	476	499	598	389	668	476	681	765	825	795	853	861	693	495	531	506	614

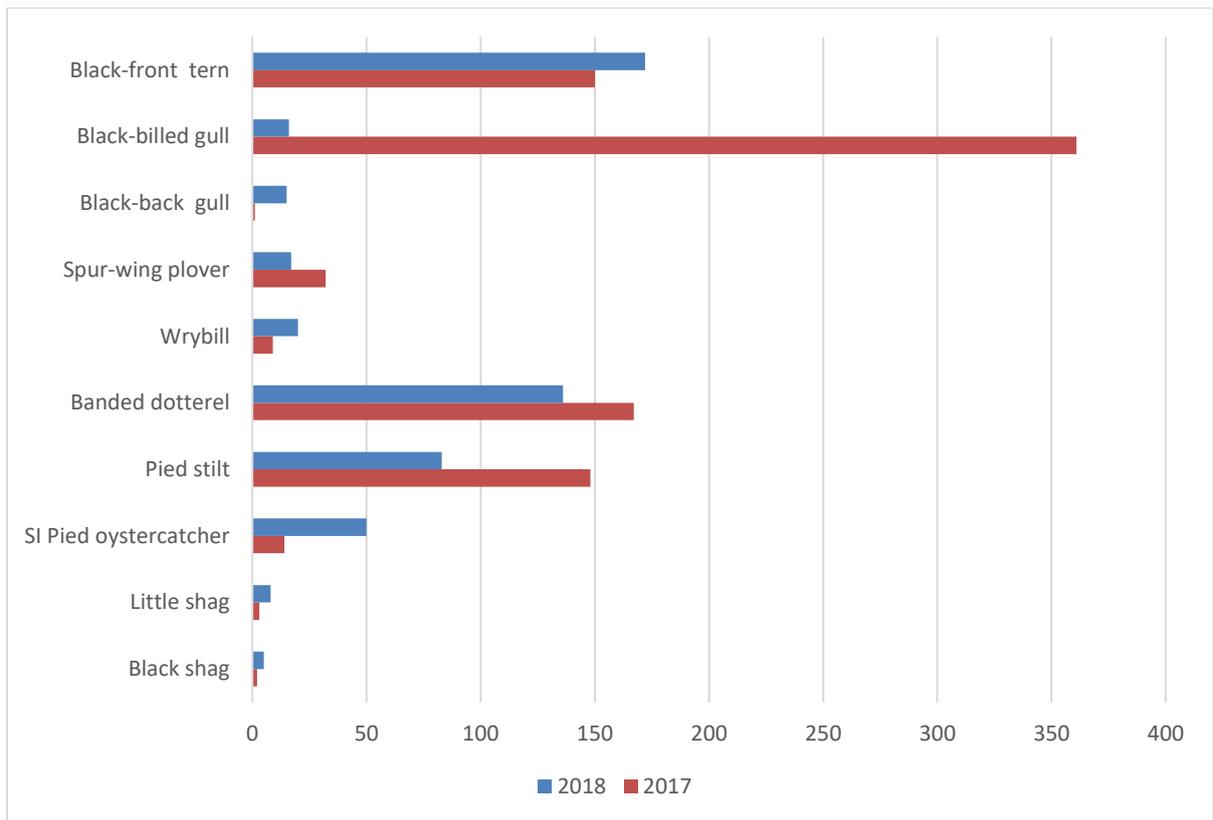


Figure 9. 2018 most common bird species count compared to the 2017 count

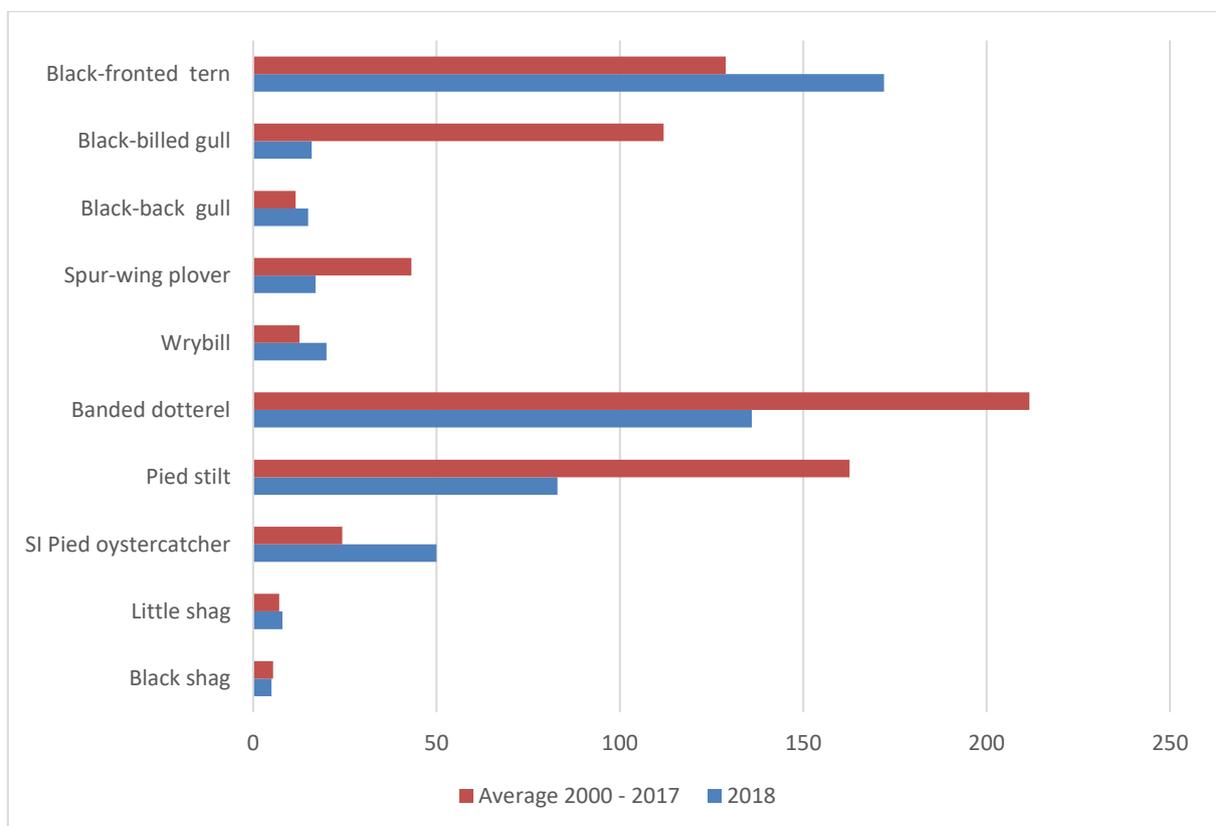


Figure 10. 2018 most common bird species count compared to the average since 2004

Figure 10 graphically shows how the 2018 survey numbers compare to the long-term average.

Figure 11 shows the distribution along the river of the main braided river birds that we aim to protect.

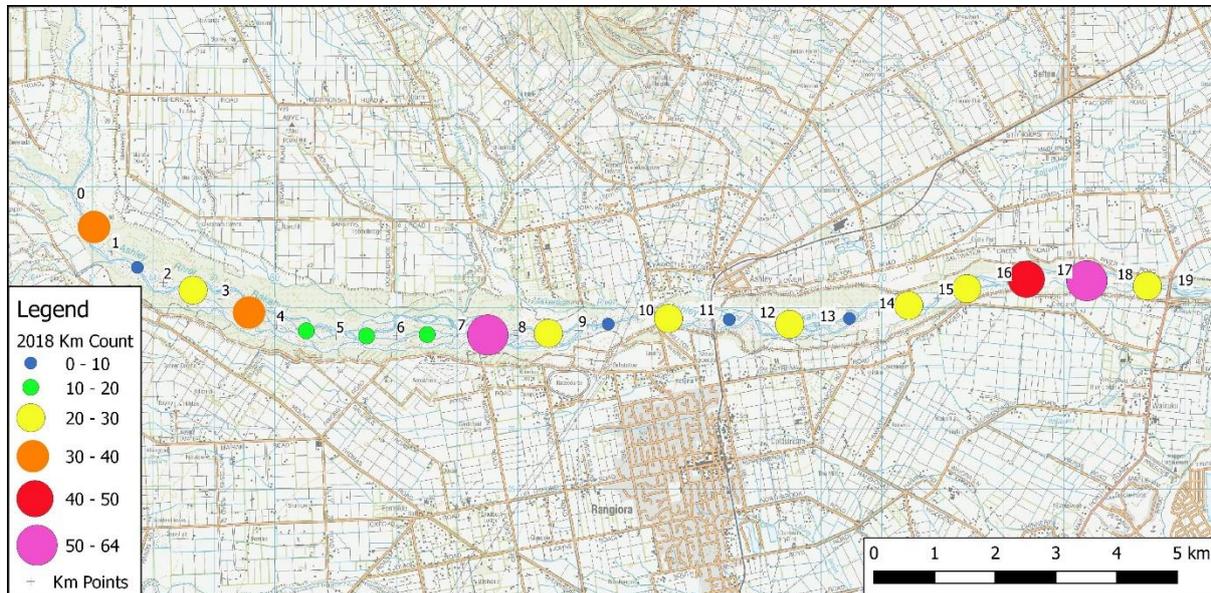


Figure 11. 2018 distribution of bird numbers along the study section of the river

Extended survey area. As previously mentioned, the count this year was extended 2km down from the SH1 bridge to the tidal limit of the estuary. Just below the bridge a colony of 1,290 black-billed gulls was counted on the survey day. This colony began around 13 November, and on 15 November approximately 2,500 birds were counted from a drone photograph. A large flood swept away nests in the early morning of 26 November but by 1 December they were already nesting further up the river between kilometres 14 and 15. On 2 December 1,652 were counted from drone photographs. There were also 3 colonies of black-fronted terns near the gull colony – with 50 counted. In total 1,355 of the core braided river bird species were counted in this section, although excluding the gulls, the number was 65. This was one more than the next highest count which was from kilometres 17 to 18. Figure 12 shows the summer survey bird distribution by kilometre, including the extended area i.e., from the Okuku junction down to the estuary (2km below the SH1 bridge).



Figure 12. 2018 bird distribution including the extended area ie., from the Okuku junction down to the estuary

Winter bird counts. Since 2014, birds have been counted every month between Groyne 1 and Groyne 2 (Figure 13) – a distance of 2km. The timing within the month has varied due to river flows sometimes being too high for safe crossing. The main reason 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.

Figure 13. Approximate route of G1 – G2 bird survey, done once a month (flows permitting)

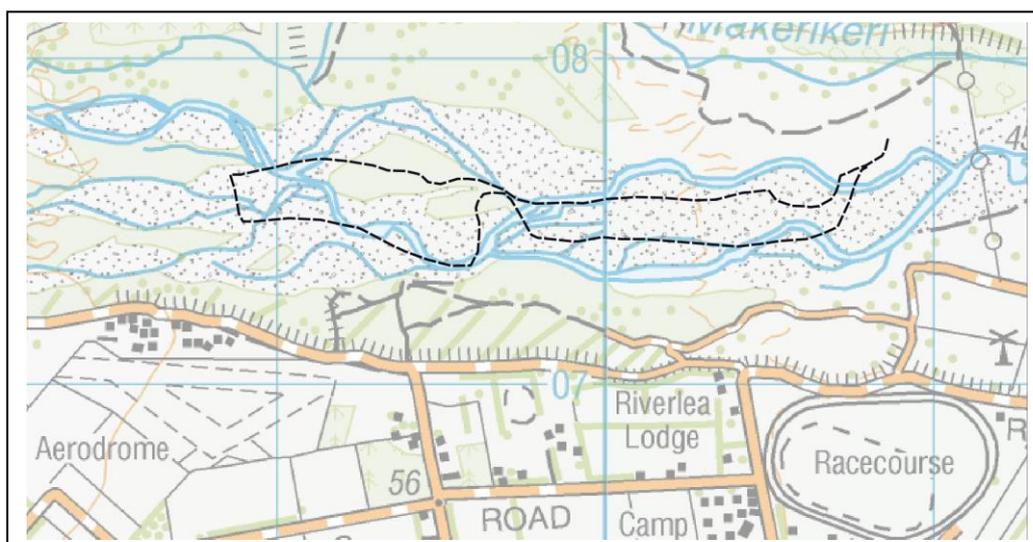


Table 6 shows the figures for the core winter months (April, May and June) and the core summer months (October, November and December) from 2014-2018. There is a major difference between the number of core indigenous species and their total numbers during winter and summer. In the summer, the average number of core indigenous species (5.4) is almost 5 times greater than in the winter (1.1), whilst the total bird numbers are over 6 times greater. In contrast, the numbers of other species (half of which are introduced) vary little between summer and winter.

Table 6. Average monthly number of species, plus total bird numbers for winter (Apr, May and June) and summer (Oct, Nov and Dec), 2014-2018

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	1.1	9.8*	5.4	64.1*
Other – black-backed gull, spur-winged plover, white-faced heron, welcome swallow, harrier hawk, Caspian tern, shags, finches	4.9	17.1**	4.4	19.5**

* 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

Discussion.

Summer survey. There have now been 3 years of stable bird numbers after the steep decline from 2014, which is attributed to a significant loss of clean gravel due to weed invasion (see Figure 2 above). It had been hoped that the large areas of bare gravel still available after the major 2017 floods would have led to a significant increase this year. However, total bird numbers, minus the black-billed gull, were slightly lower than in 2017. Wrybill numbers (20) were the second highest ever, after 2014 (21). Ten wrybill were seen in the Cones Road to Tulls Road section of the river, with 3 – 4 seen in the other reaches. This is unusual, as in the past most have been seen above Cones Road. Black-fronted terns and S. Is pied oystercatchers were also more frequent than usual, but numbers of banded dotterels and pied stilts were down on both last season and the long-term average. Table 5 and Figures 9 and 10 show very few black-billed gulls present during the survey, but this does not include the large colony present below the SH1 bridge, which was flooded out on November 26 and had moved 6km further upriver by early December.

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 up to 2014, particularly since 2000, and it suggested that ‘the Rivercare Group’s management actions have contributed to these successes.’ Hence, we were alarmed by the population decline after 2015, and relieved to see the 2017 survey indicating an arrest of that decrease. The 2018 survey confirmed a levelling off of numbers.

Figures 11 and 12 show the distribution along the river of the main braided river birds that we aim to protect. This year there were 4 hot-spots of bird numbers with the greatest abundance of them being between kilometres 16 and 18 – just above the SH1 bridge. In this location most birds were banded dotterel and black fronted tern – with a colony of the latter present.

The second hot-spot was between kilometres 7 and 8 – with the greatest contribution coming from a colony of black-fronted terns. This is historically an area (Groyne 2 to Groyne 3) of abundant nesting birds.

The third hot-spot was in the area south of Swamp Road where gravel extraction has been ongoing through the nesting season. Many dotterel and black-fronted tern have nested here this season, along with at least 2 pairs of pied stilts. Eleven black-billed adults were also present.

The final hot-spot was in the uppermost kilometre surveyed – where banded dotterel, pied stilt and pied oystercatcher are the main contributors. Last year there was a colony of black-fronted tern in this area, not present in 2018. It will be interesting in future years to see if these hot-spots are repeated.

Not recorded on the survey day, but seen in the weeks prior were the at least two black-fronted dotterels. Successful breeding could well have taken place, as an adult and a flying juvenile were seen close to the gull colony below the SH1 bridge on November 15, and a single adult was observed at the Racecourse site on November 19. This is the first record of this species in the core survey area. Numbers of spur-winged plovers seen during the survey (17) were well down on the long-term average (43), but large flocks were seen at other times – more than 100 at Smarts on September 10; 38 at Racecourse on December 11 and 50 at Hillcrest on January 1.



Black-fronted dotterel – a new riverbed sighting

These could have had a high component of post-breeding birds, as the species is known to start nesting earlier than most other species.

Winter numbers. Like most shorebird species, the sites where they breed – in this case braided riverbeds – are vacated for the non-breeding winter months. On the Ashley-Rakahuri, only a few black-fronted terns remain. Half of the other species found during winter are relatively recent Australian immigrants – spur-winged plover, white-faced heron and welcome swallow. These, and the ‘other’ species which do not vary so much between summer and winter, are those which do not have braided riverbeds as a favoured breeding habitat. Amongst these, spur-winged plovers are usually the most numerous.



White-faced heron – more common in winter

6. Monitoring of breeding birds

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. Location names of shorebird territories are shown in Figure 1. 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.

Small floods of 65m³ and 72m³ on October 30 and November 9 only slightly disrupted early nesting attempts, but a major one of 190m³ on November 25-26, is known to have swept away a number of nests, including the first attempt by a black-billed gull colony of over 1000 birds (see Appendix 2 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. However, no new birds have been banded over the past 5 seasons.

Breeding pairs

Eight pairs of wrybills took up territories in the 2018-19 season see (Figure 17 below) but two probably did not reach the egg-laying stage, and one may have been a re-nesting attempt as it was only 500m from a nest which was predated 1 month earlier. Eight is the same number of pairs that were present in the 2016 and 2017 seasons, but less than the ten present for the two seasons prior to that.

1. Male: UB Female: UB

This pair were first observed at the lower Smarts site on September 1, and a 2-egg nest was located on September 10. On October 21 and November 7, an adult was present with a single chick. This chick was seen flying on November 23. For part of the incubation period this nest was monitored with a trail camera.

Result: One chick fledged

2. Male: UB Female: UB

A UB pair were first seen at the upper Smarts site on August 27, with a 2-egg nest located on September 13. The eggs were chipping on October 4, and two young chicks observed on October 9. Only one of these survived, and was seen flying on November 23.

Result: One chick fledged.

3. Male: UB Female: UB

A UB pair was first seen at the Groyne 1 site on October 28, and acting as if they had a nest on November 8. However, the suspected nest site was flooded on November 9, and the birds were not seen again. The large flood of November 25/26 would almost certainly have removed any nest.

Result: No chicks fledged.

4. Male: UB Female: UB

A UB pair were first seen at the eastern end of Groyne 2 on August 28. On October 5 they appeared to be defending a nest, but it was not found. An adult plus a flying chick were seen on Nov 15 and again on November 24..

Result: One chick fledged.

5. Male: BW-BW Female: UB

BW-BW and three other UB birds were first seen just above Groyne 2 on August 17. A 2-egg nest was found on September 14, and the pair appeared to be defending chick(s) on October 15. One chick was seen on October 28, and observed flying on November 6.

Result: One chick fledged.



BW-BW only remaining banded bird on the river

6. Male: UB Female: UB

A UB pair was first seen at the Toomebridge site on October 1, and a 2-egg nest found on October 5. A visit on October 15 found the nest to be empty – presumed predated. A new 2-egg nest was located on October 28 and was still present in early November. It was presumed that the eggs had been lost in the large flood of November 25/26, but they must have hatched just beforehand, as an adult was present with 2 flying juveniles on Jan 7. These were seen flying on January 15..

Result: Two chicks fledged

7. Male: UB Female: UB

A UB pair was first seen in the middle Hillcrest site on September 18, with a 2-egg nest found on October 9. However, this was empty on October 21 (presumed predated) and no wrybills were seen at this site again.

Result: No chicks fledged

8. Male: UB Female: UB

A single bird was seen in early November, and a 3-egg nest was located on November 17. However, an inspection on November 19 found just egg-shells – predation by rats (seen by a near-

by trail camera) is suspected. No birds were seen thereafter. It is possible, that this pair was the same as that which lost their nest at the middle Hillcrest site in mid-October.

Result: No chicks fledged

Overall result: Seven to eight pairs took up different territories at some stage of the season, raising a minimum of 6 chicks, for a productivity of 0.75 chicks fledged per pair. Such productivity is very similar to the 13-year average of 0.79. It is above last year's figure (0.63), and well above the previous year's (0.38).

In addition to the above breeding results, 'resident' wrybills were first observed at the eastern end of the Railway site (on October 7) and further up-river at the Racecourse site (on August 31). Both birds were seen on occasions through to mid-November, but no other bird or signs of breeding were noted.

Of particular note was a 'flock' of 12 wrybills seen at the Toomebridge site on August 28, but these numbers were not seen together after that date

Black-fronted terns

As in past years, the majority of pairs had on-off nesting seasons - there was only one colony which appeared to have some success. Occasional birds were present on the river over winter, with numbers starting to build up and courting flights seen during August. As in past seasons, there was a colony just above the shingle extraction pools west of the SH1 bridge. Up to 10 pairs were breeding in mid-November, and these must have escaped the November 25/26 flood - as 15 flying juveniles were counted on January 8. Some of these may have come from the colony which started about 500m below the SH1 bridge in late October (see last paragraph in this section).

About 2km further up-river by the Tulls pylons, terns started gathering at the end of September, but numbers did not grow appreciably until late November. By mid/late December, there were up to 20 breeding pairs present, with eggs hatching and even some flying juveniles - although these may well have come from the colony down closer to SH1. However, despite the promising start, the colony was deserted early in January. This site had been partially cleared of weeds in the late winter, but by the end of the year had a scattered cover of lupins, which may well have contributed to the desertion (cover for predators?).



Black-fronted tern on nest – a fickle breeder

Another 1.5km upriver, there were around 50 terns gathering on an island at the Smarts site in early September, and by the month's end there looked to be up to 10 pairs settled, with some on eggs. However, they were all absent when visited on October 9.

Three kilometres further west, just above the railway bridge, up to 20 birds were gathered in mid-November, with at least 2 pairs on egg-nests. However, none of these progressed to the hatching stage.

Further west again (about 2.5km), up to 40 birds were gathered at the Racecourse site by early September, and on November 19 there were 50 birds present, with a number of egg-nests. However, on November 23 just 10 were left with 3 nests, and within a week the site was deserted. Two egg-nests were found 1 km further west off Groyne 2 on October 10, but they did not survive the minor flooding of late October / early November. Similarly with 3-5 pairs of

terns which, by late October, had probably reached the egg laying stage at Toomebridge (1km further west).

Another colony which reached at least 12 pairs started gathering in mid-September at upper Hillcrest within the shingle extraction site being operated by Taggarts Earthmoving Ltd. By mid-October, most were on egg-nests, but only one was seen to hatch chicks and no flying juveniles were ever seen. All birds had deserted the site by late November, and it is suspected that predation of eggs, most likely by rats, was the cause of many nest failures. An Internal Report was written on this colony – see list at end of References.

At the western end of the riverbed study area (the Okuku junction), a few terns were present on November 24, but it is unlikely that any of these bred successfully.

Overall result: Similarly to last season, 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 <20 chicks are estimated to have fledged, so if all pairs had separate nests then productivity was around 0.25. This is well below the 14-year average of 0.41, and if some of these pairs nested twice then the 2018 productivity would have been even less.

The above description covers the traditional riverbed study area between the SH1 bridge and the Okuku junction. Outside this stretch of river, within the first kilometre east of the SH1 bridge, at least 20 pairs of terns attempted to breed on both banks, close to the initial colony of black-billed gulls (see next section). Most had progressed to the late egg/young chick stage when they were washed out by the November 25/26 floods, but a few had mobile chicks which may well have escaped. Some pairs attempted to renest in this area, but were unsuccessful – easy access for the public would not have helped.

Black-billed gulls

The first sighting of these gulls in any numbers was in mid-September, when 12 were present at the Smarts site for a couple of weeks. In early October, 200 were gathered on an island just below the SH1 bridge, but these did not stay for long. Twelve were present for some time in the Swamp Road area and on 24 November there were 2 nests – one of these was 60cm from a pied stilt nest. However these were washed out by a flood and the gulls didn't return to the area.

On 15 November a colony of 2,570 was counted just below the SH1 bridge, these had almost certainly come from the Waimakariri River where a large colony had recently been washed out by a flood. On this date some nests had already been made and nesting material was being brought in. A major flood on November 25/26 completely inundated this colony. For several hours the birds swam in the water above their nests, 1175 were counted doing this (Figure 15), but there were no birds present a couple of days later. However, on December 2, 1695 birds were counted 4km up-river at the lower Smarts site. These were



Black-billed gulls hovering over flooded nest site

almost certainly birds from the colony submerged by the late November flood. This built up to a maximum of 2185 on 8 December, after this numbers ebbed gradually away.

From then on gull numbers were counted on a semi-regular basis by drone – DJI Phantom 3 – until all fledglings had left on 18 February. This was initially done by counting gulls from oblique photographs with each gull counted off with an ink spot using Photoshop Elements. Later vertical photographs were stitched together with the free Microsoft ICE software and gulls were counted with free click-counting software – ClickMaster2000. Later again stitched photographs were georeferenced in QGIS and gulls were manually counted within QGIS. All gulls in the area of the colony were counted, although the resolution of the camera made distinguishing those on nests unreliable - some could clearly be seen on nests, some were clearly not, but for a significant number it was unclear. Counts of the gull colony are summarized on Figure 14. By late January numbers were less reliable – distinguishing adults and chicks on the drone photos was becoming difficult.

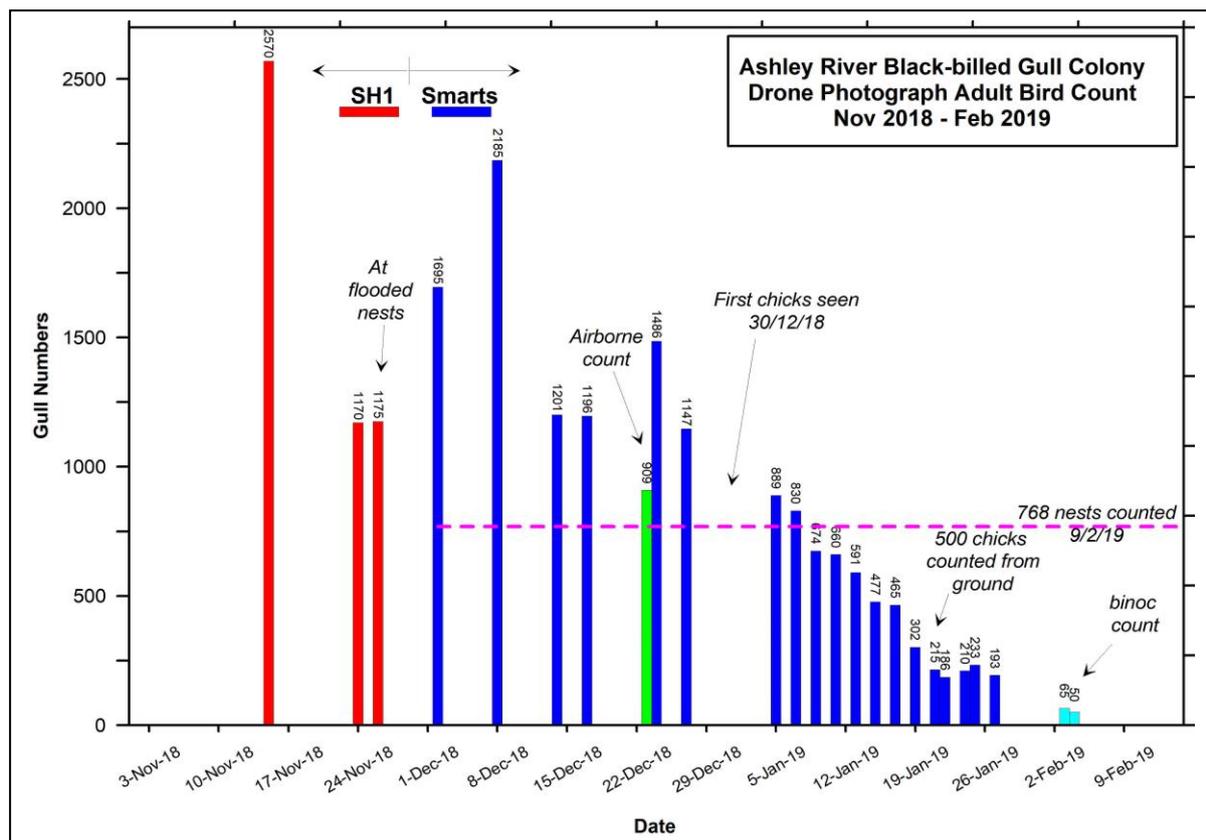


Figure 14. Black-billed gull colony numbers from mid-November to early February, 2019.

None of the river birds were at any stage wary of the drone – which was operated at 50m above the ground as per DoC guidelines. It was briefly dropped down to 20m above the colony in an attempt to count chicks – this also did not disturb the birds. Perhaps the lack of drone disturbance was due to the Phantom 3 being large, boxy, white, and not resembling a harrier in any way.

First chicks were seen on 30 December at which stage there were approximately 1000 adults on site. By 9 January chicks were starting to congregate in a creche beside the river just north of the nesting area (figure 15). On 21 January a quite accurate scope count of chicks resulted in 500. At this stage there were only 219 adults counted – the reduced numbers probably due to most adults being away foraging for food to feed their chicks. It proved impossible to count chicks from the drone images, and no accurate later chick figures were possible due to lack of clear views and crowded chicks – partial counts however were up to 300.

By 31 January about 260 adults were seen approximately 300m upstream from the nesting area. By 4 February a creche had formed in this area (Figure 15) with most chicks at fledgling stage – and some being skilful fliers. However, there were at least 2 chicks yet to reach fledging – they must have walked there. Soon after, all chicks had moved to the second creche area. The last day the birds were seen on site was 18 February – numbers had been dwindling markedly until then as fledged chicks moved to outside feeding areas. On 19th February a large number were seen feeding in an irrigated paddock just south of the river and creche area.

During the night of 2 February 9 fledgling or near fledgling chicks were killed by a 4wd vehicle. Tracks could be seen leading toward the middle of the creche site, the 4wd then reversed and went around the northern edge of the creche – but still managed to cause the damage.

After the birds had left the river the area around the nests and creches was inspected for signs of dead birds. Twenty-five piles of feathers were found along riverbanks, mainly north and south of the second upstream creche, but also near the first creche (Figure 15). This is almost certainly the result of harrier predation – with the fledglings taken on the ground or in the air and the harriers retreating to riverbanks to pluck and eat them. This activity was not observed, but on several occasions adult gulls were seen chasing harriers from the first creche area. Early in the history of the Smarts colony 2 black-backed gulls were seen observing the nesting area, but later on they were not seen and do not appear to have done any predation.

Nine piles of probable fledgling or near fledgling feathers, some probably of more than one bird, were found in vegetation near the nesting area and first creche. This seems to have been the result of ground predation. The predators may have been ferrets as several were caught in traps along the south side of the river after the birds had left. A number of Timms traps were laid out in weeds to the east of the colony at about the time the first creche was formed, these did not catch any animals. It appears that most of the ground and air predation was done when the chicks were at a reasonably advanced state in the nesting area or creches and there were fewer adults to protect them.

Twenty-one dead chicks were found in the nesting and first creche areas (Figure 15). Most of these appeared to be a few days to maybe a week old and causes of death were probably natural.

On 8 February the nesting area was flown with a drone at 12m altitude, images stitched together, and 701 nests were counted. Some nests were obscured by vegetation – the colony was within a

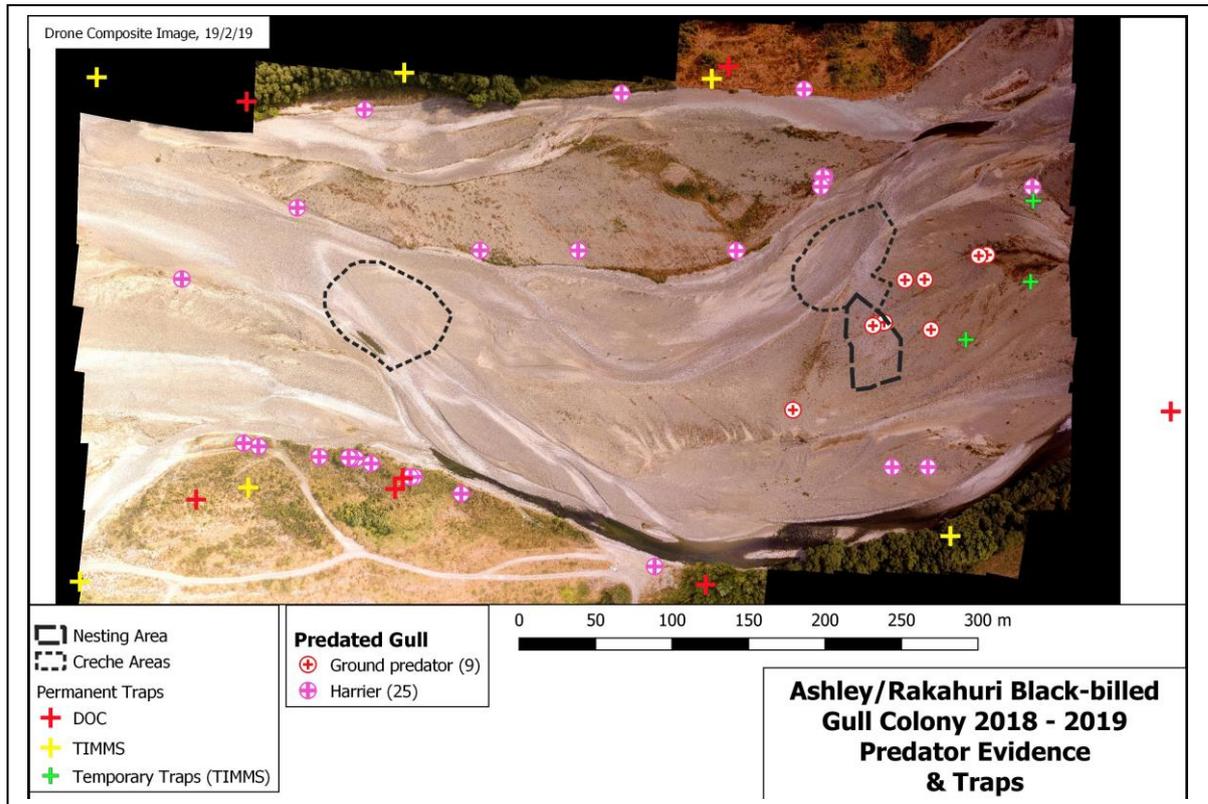


Figure 15. Evidence of predation at the lower Smarts black-billed colony site

largely weed-free area, but some nests were clustered around logs, and under spotty lupin plants. Nest density was derived and plotted on (Figure 16). Nests were then very carefully counted from the ground – between ropes spaced about 2m apart across the colony. Average counts from 4 people were used with 768 nests resulting.

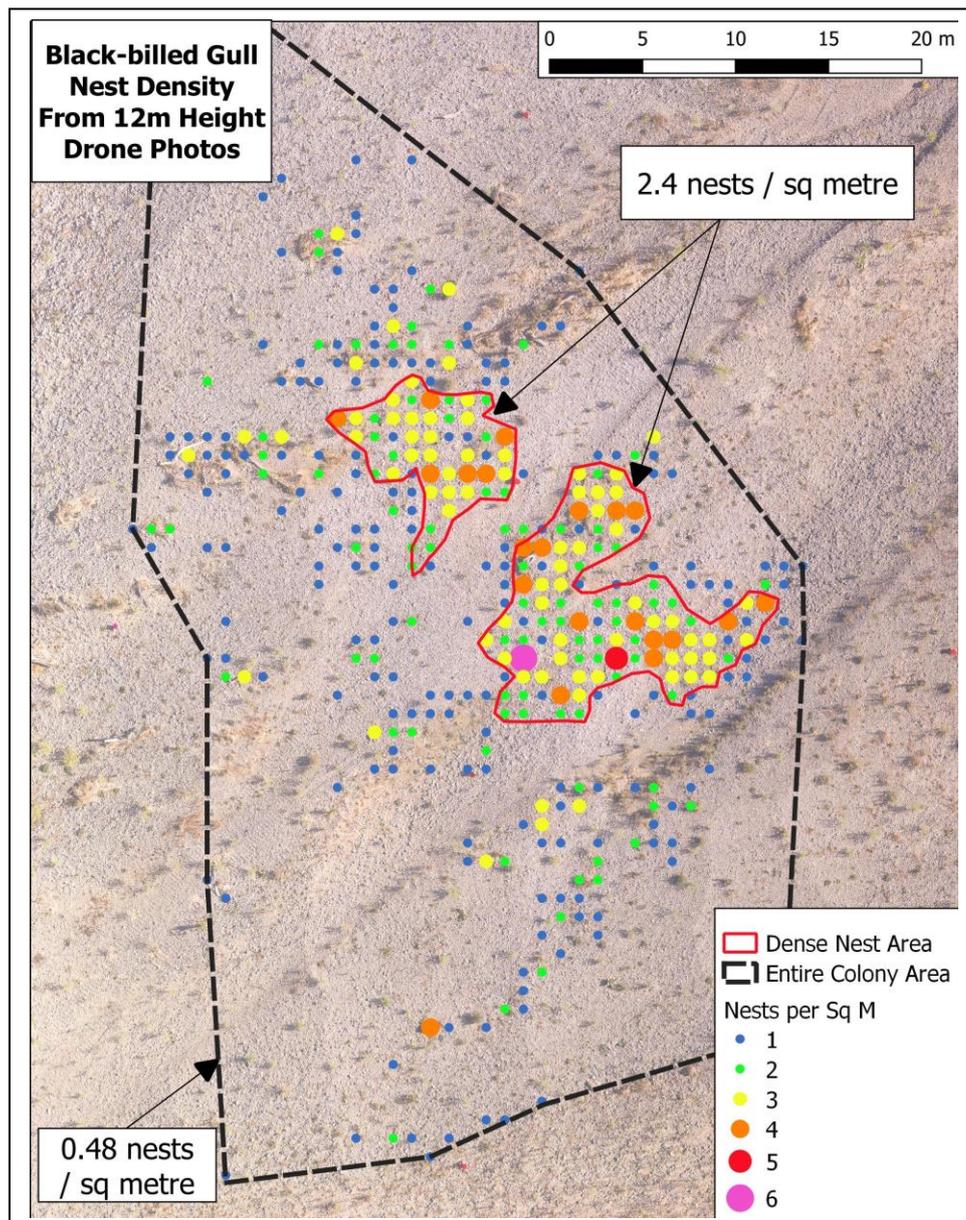


Figure 16. Black-billed gull nest density at the lower Smarts site

Result: If a figure of 700 occupied nests is used from the colony, resulting in 450-500 chicks fledging, then productivity ranged from 0.64 to 0.71. This is well above 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

Normally a few are seen on the river, with the occasional pair nesting alongside black-billed gulls and black-fronted terns. However, none were seen on the river this season.

Pied oystercatchers

During the season, breeding pairs were noted to be present at a minimum of eight locations. Numbers appeared to be down on previous seasons (as indicated in the November 24 survey), but some chicks were observed to reach fledging age. 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 (136) 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 at the end of July, and by the end of August they were present at virtually all sites. The first nest was found at the lower Smarts site on September 10, and 3 nests were located within the Taggarts shingle extractions site on September 18. A week later, a total of seven nests had been located, with the eventual total reaching 11 – although some of these could have been renestings. Only three of these are known to have hatched chicks, with some of the others suffering from predation (most likely by rats). The flocks of adults and juveniles normally seen towards the end of the season were not noted, with just one of 18 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 after the breeding season, although the occasional pairs were seen during the 2019 winter. By the end of August, pairs of this species were present at most sites. A 4-egg nest was found at upper Hillcrest on September 26, and this was known to have fledged two chicks. On the November 24 survey, numbers (83) were well under the long-term average (163). Many pairs bred in the study area, with concentrations at certain areas. The best breeding sites appeared to be at Smarts (where 25 were present on October 1), Toomebridge (14 present on October 1), and Hillcrest (14 seen on September 28). The season appears to have been good for stilts as in the New Year many pairs were seen with 2-3 flying juveniles.

Black stilt

No black stilts or obvious hybrids were seen on the riverbed this season. However, a black male bird (banded but colours unclear) most likely bred 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. One or two black stilts (and hybrids) were present at the estuary for much of the year.

Black-backed gull

Numbers remain low. Since 2000, only one pair has been observed breeding on the river (2013), with no chicks fledged. There are colonies of reasonable size at the river-mouth estuary and at the river's head in Lees valley.

Caspian tern

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

Spur-winged plover

A few pairs of this species breed on the river, but their nests and chicks are rarely observed. Flocks of many dozens are not uncommon at any time of the year.

Discussion.

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 after 2014, when a link with weed invasion and loss of bare gravel areas is suspected (see Figure 2). However, they appear to be on a recovery since 2017, due to the removal of large areas of weeds by major floods in that winter / spring. This was probably the reason why a colony of black-billed gulls returned to nest on the river in 2017, after an absence of 3 years. They also returned to the riverbed in 2018.

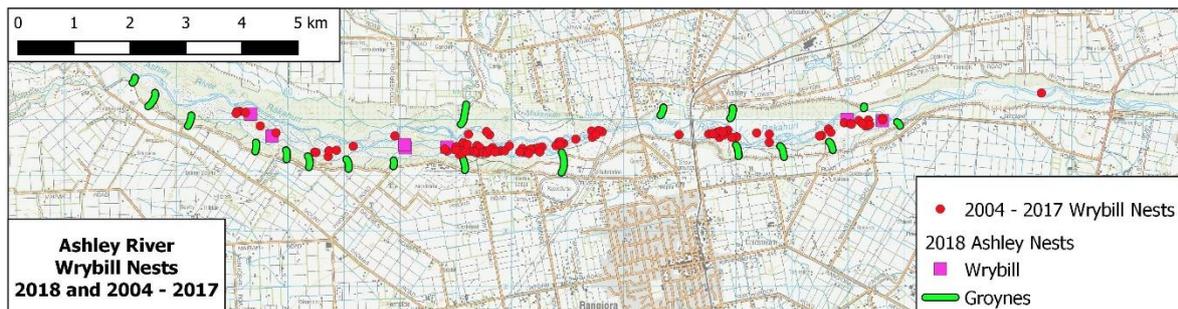
During the 15-year monitoring period, breeding has tended to concentrate in certain stretches of the river – Smarts, Ashley bridge to Groyne 1, Groyne 2 and most recently, Hillcrest. These four areas stretch over about 11kms of the total 21km study area. There was on-going weed clearance in these areas over the 2019 winter in order to further improve feeding and breeding habitat.

Wrybill. Wrybills are the icon species of braided rivers, and attract 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. Eight pairs took up territories in the study area in 2018-19– the same number as in the previous two seasons. A minimum of 6 chicks were fledged by seven pairs, for a productivity of 0.75 chicks fledged per pair. This is close to the 14-year average of 0.79, and above the level (0.75) which is needed to maintain a wrybill population (Dowding and Ledgard, 2006).

Fortunately, the timing of floods during the past season meant that all wrybill nests either escaped destruction or the eggs had hatched and the chicks could be moved to safety.

Most popular site. As shown in Figure 17, 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, with three pairs present last season. Significant weed clearance has been carried out at this site during the 2016-19 period.

Figure 17. Wrybill nesting sites from 2004 to 2018



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. Breeding numbers and outcomes during the last season were similar to the previous one. Productivity was 0.25, which is well below the 15-year average of 0.40, and if some of the pairs nested twice then productivity would have been even less.

The largest colony of up to 20 pairs was at the Tulls site. This developed to the egg-hatching stage, but soon after that the colony was deserted. It is likely that desertion was caused by predation and/or night-time disturbance – possible aided by the increasing cover of lupins.

The late November flood washed away a number of nests in the good colony just below the SH1 bridge, plus those of smaller colonies further upriver. By the time of this flood, the colony at the western end of Hillcrest, closely associated with the Swamp road shingle extraction operation, had failed due to predation. But before this, the terns demonstrated little concern about the nearby heavy machinery, choosing to nest within meters of tracks used daily by heavy trucks. This interesting story of tolerance to what many may regard as disturbance is written up in an Internal Report (see list at end of Reference section).

To the authors, it is a mystery how black-fronted tern numbers appear to remain relatively stable in the Ashley-Rakahuri river, when breeding success is so low. 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 is that the later the nesting the greater the failure to hatch eggs and raise fledglings.

Figure 18 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 (grid trapping) and adequate signage to deter human disturbance. Habitat creation and maintenance along these lines is ongoing.

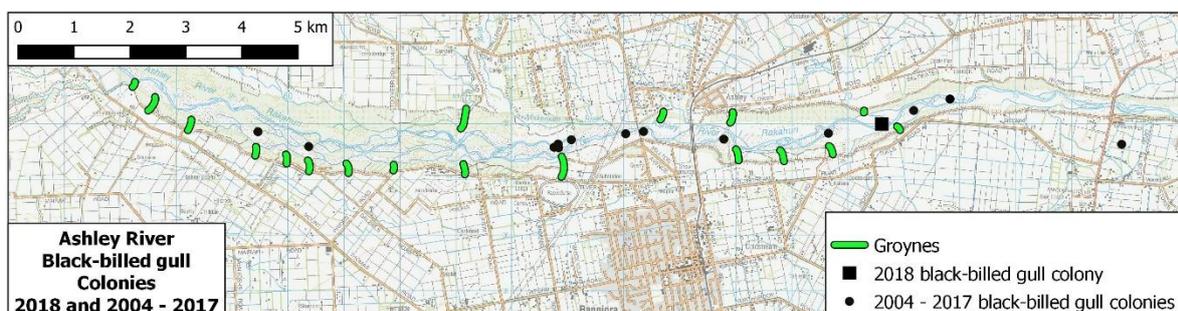
Figure 18. Black-fronted tern nesting sites from 2004 to 2018.



Black-billed gull. Success with this species depends primarily on whether a colony chooses to nest on the riverbed. After 3 years with no riverbed colonies, the birds returned to breed in 2017, and again in 2018 – possibly due to the more weed-free situation created by the major floods of mid-2017. Around 2500 birds first appeared just below the SH1 bridge, most likely from the Waimakariri river, where a major flood had swept away a large colony a couple of weeks before. But, these were washed away by the late November flood just as the first eggs were being laid. Fortunately, this was not too late for them to move again – this time to a site 3km upriver to the Smarts site, where over 2000 settled on around 700 nests. We were able to monitor the colony closely until the chicks fledged. A drone allowed reliable counting of birds on a regular basis, showing how although adult numbers appeared to drop dramatically over time, this did not appear to act negatively on fledging success. It is likely that more and more adults were away foraging for food as the demands of chicks increased. It is estimated that around 700 pairs fledged 450-500 chicks to give a productivity of 0.64 to 0.71. This is well above the long-term average and if it can be maintained, should ensure the long-term presence of black-billed gulls on the river.

The location of the Smarts site and those of previous years is shown in Figure 19. The only other colony on the river was at Hillcrest, where up to twenty gathered in mid-November, and some nests were made – but the November 25 flood prevented any further activity.

Figure 19. Black-billed gull colony sites from 2004 to 2018



Other species. Breeding success or productivity was not recorded for S. Island pied oystercatchers, pied stilts and banded dotterels during the 2018-19 season, but signs of successful breeding were noted at many sites – particularly for pied stilts. Flying juveniles of oystercatchers and banded

dotterels were not observed as frequently as usual, so their breeding season could well have been below average. 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, but is welcomed, as they can be major predators of eggs and young chicks on other rivers.

7. Members and meetings, advocacy and public liaison

Members and meetings. The group email list contains 103 people, who in the past have served as its membership. However, the Charities Commission now requires us to have ‘registered members’. Forty-five members have requested to be placed on the formal membership list, and only they can vote at meetings. No subscription is charged. During the 2018/19 season, the Group held general meetings in the Department of Conservation’s offices on River Road, Rangiora, on July 2, September 19 (included the AGM), December 10 and March 20. Attendees numbered between 15-18. The Group also has a Management Committee which has the capacity to make decisions and approve funding for small tasks requiring immediate attention – for final approval at the next General meeting. It has seven members and met on November 28, February 19 and June 19.

Advocacy and public liaison. This is a primary focus and 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). 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 an upgrade of our present signage, plus greater use of interpretation signs on the river.

During 2018-19, 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. Fifteen articles appeared in local papers. Powerpoint presentations were given to six 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. Talks were also given to the Waimakariri Zone Committee, local scouts and four service clubs. An interview was given to the local radio ‘Compass FM’ and from October through to February the Rangiora cinema showed a ‘screen vista’ about the Group prior to every film showing. A regular email update was sent to all Group members during the breeding season.

A documentary video of the Group’s activities over a bird breeding season ‘Rakahuri Recovery’ was completed in 2018, and launched in the Rangiora Town Hall on March 21. This 20-minute video, produced by Tony Benny, a professional film maker from Oxford, can be seen / downloaded from the ARRG website. It has been well received throughout the country, with some seeing it as a ‘benchmark’ record of a successful community group in action.

During the past year the Group won the Australasian Wildlife Management Society’s Practical Management Award for 2018. The Award is ‘in recognition of outstanding best practice in wildlife management’. We were invited to accept this award and present a talk at the annual conference of the Society, held in Hobart during December. Other highlight talks were given at the launch of the ‘Year of the Wrybill’ event at Miranda, south Auckland (March 10), and the BRaid-organised braided river seminar on June 26.

In early 2018 the Group gained its first sponsor. Karikaas Natural 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. ARRG receives a percentage of the profit made from the sale of these cheeses.

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) along with open 'dirt-bike' areas. As in previous years, a digger was hired in August to close off tracks running through the berm into the river, with appropriate signage alongside. Over 50 such blockages are now in place during the breeding season (Figure 20) and there is little doubt that this reduces vehicle use of the riverbed. Most blockages were removed in early February, so that public use can resume during the remaining summer weeks and over winter.

During 2018-19, 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. 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.

The Group's website (www.arrg.org.nz) is now maintained by Sonny Whitelaw, who also manages BRaid Inc and maintains their website. During the year, Sonny built this new site, which includes links to our annual reports, projects, and videos. The previous domain name www.ashleyrivercare.org.nz points to the new site. Our Facebook page (<https://www.facebook.com/ashleyrivercare>) continues to be maintained by Steve Attwood.

An email update was sent to all those on the email list on four occasions during the year.

Discussion.

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.

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 six primary school visits over the past year.

Our revamped website is now right up to speed and readily answers the questions of most visitors. Between August 1, 2018 and July 31, 2019, our Facebook page had a 'record performance across the board', according to its keeper, Steve Attwood. We had 624 'followers' and the 58 posts are up from last year's 37, with the total number of views being 92,927 (up from 26,278 last year). The most popular post (17,897 views) concerned an aerial photo of the Waimakariri river braided channels in an article about braided river environments, followed by 10,253 views of an article appealing for volunteers to help with this year's weed clearing days. The average number of views per post was 1602.

Definite highlights of the past year was being awarded the Australasian Wildlife Management Society's 'Practical Management Award for 2018', the launch and positive reception of the video film 'Rakahuri Recovery', and the continued sponsorship by Dairy Products Ltd in Loburn.

8. Walkway, bike track, 4WD track and riverbed access

The Ashley-Rakahuri Regional Park staff continue to develop tracks and recreational areas in the berm alongside the river. This discourages people from recreating in the riverbed itself.

Walkway and bike track. The track is sited along the south bank, and is now complete from Groyne 1 down to the estuary. It is much appreciated by the public and gets frequent use by both locals and visitors from further afield.

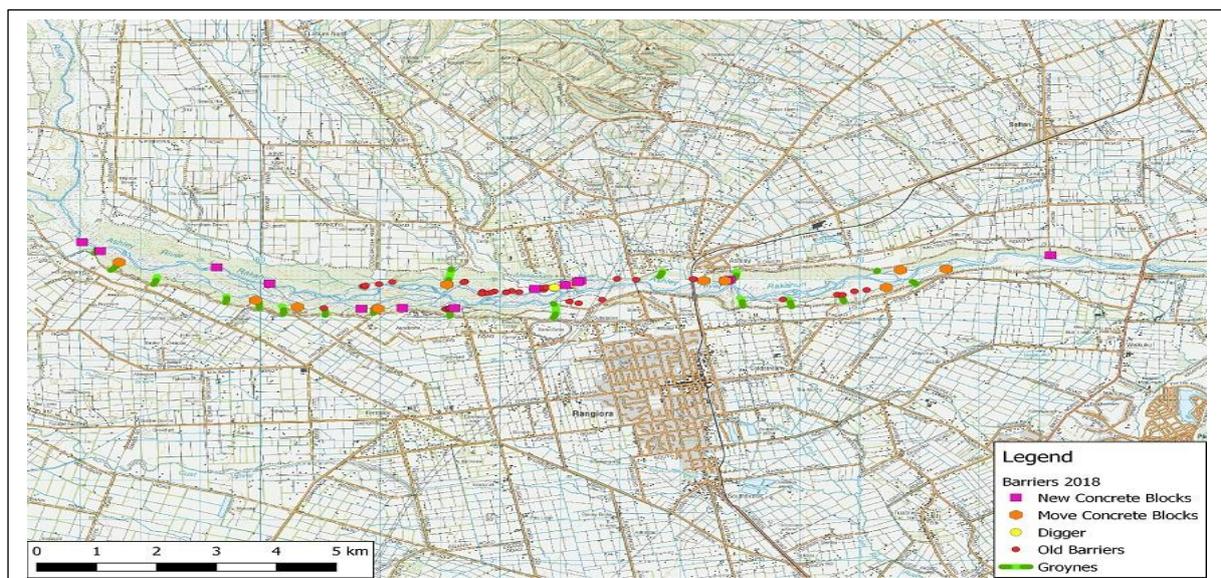
4WD track. This is located in the north bank berm, extending from the end of Rossiters road up to the Okuku junction (a distance of approximately 8km). It is used reasonably frequently, but the most favoured area for 4WD vehicles is the north bank stretch of berm extending from the SH1 bridge up to the 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. Gates have been installed on the stopbank either side of where riverbed access tracks cross. This has prevented the stopbank from being used as a general vehicle track. In September 2018, 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 – as agreed with the Combined 4WD Club. One cubic meter concrete blocks are the favoured means for preventing access, as they are very visible and are not difficult either to install or to remove at the season’s end.



Blocking vehicle access for breeding season – best of all are gates with signs.

Figure 20. Access barriers as at September 2018.



Discussion.

Tracks. All the purposely created tracks (for walking, biking and 4WDs) in the berm area are getting increasing attention. There is little doubt that they attract use that could otherwise take

place in the riverbed. Those with many years of familiarity with the river report far fewer sightings of people and vehicles than there used to be – especially during the breeding season.

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). There is good circumstantial evidence that efforts over the last few years by the Group and Regional Park staff to block off all but the major access tracks in the spring, has reduced vehicle access during the bird breeding season. Such work will continue, even though 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. Vehicle pressure is greatest to the east where there is ready access just above SH1.

9. Income and Expenditure

Income. Over the last year the Group's income has come from a mix of sources. Most was obtained from trap making and selling. For every trap made and sold (\$70), a percentage is retained for the Group. Funds for traps was received from ECan (\$3,724) and Sargood Bequest (\$4,800). The Australasian Wildlife Management Society awarded the Group \$1000 for winning its Practical Management Award for 2018. During the year, Karikaas Dairy Products Ltd in Loburn continued to sponsor the Group and BRaid, using our names, plus images of riverbed birds, to promote their premier cheeses. In return, the Group receives a percentage of profits from sales. The largest donation of the year (almost \$2000) came from the Rangiora Lions. Smaller amounts of income came from sales of books and donations – including \$750 from DOC (an infringement diversion payment), \$200 from Hurley Excavations and \$100 from pupils at Ashley school.

Expenditure. Most expenses have been associated with buying materials for trap making, filming of the documentary video, and predator control. Smaller amounts have been spent on maintaining the website and advertisements.

Over the year ending June 30, 2019, the Group's Net Cash Flow was -\$3,132.76.

Discussion.

As stated above, 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 2018-19 year, the Group made 169 traps for sale. 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 the video documentary. These have come from ECan and its local Waimakariri Zone Committee, 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.

10 Conclusions

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 summer 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. However, that rising bird population trend up to 2014 reversed (declined) in the following 2 years. The survey figures for November 2017 and 2018 show that this decline has stopped. Wrybill numbers (20) were the second highest ever, just behind the 21 observed in 2014.

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 2018-19, the Group created many opportunities to improve awareness. Most involved media articles, presentations to schools and local groups, and displays at public events. Two definite highlights were the launching of our video / documentary ‘Rakahuri Rescue’ in February and winning the Australasian Wildlife Management Society’s ‘Practical Management Award’ for 2018..

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, with outside support for major projects, such as the video/ documentary, and on-going commercial sponsorship from a local firm, Karikaas Natural 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.

11 Recommendations

1. Extend annual bird surveys and monitoring activities down to estuary margin - 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. Continuing 1.5km east to the tidal estuary is a logical extension down to a natural margin.

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, and to reduce cover for predators. 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 artificial weed removal since 2017 floods, with promising potential for current trials using tractor-mounted ripper.

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 and data presentation plus feedback to end-users is now excellent,. Moves are underway for approval of new wrybill banding attempts.

4. Explore opportunities for increasing predator trapping and monitoring effort using new technologies. This effort needs to extend to include grid trapping around colonies, a second line of traps along the riverbank and estuary margins.

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 riverbed margins and its estuary is integral to any relocation of the kaki (currently under consideration). Colonies of gulls and terns need special attention.

To date: Trapping has been adequate and appears to have lowered predator numbers, plus a good trapping network is now established around the estuary. Additional funding is being sought to complete the entire river margin (doubling current trap numbers), add poison bait tunnels, plus increase use of trail cameras and install grid trapping around all breeding colonies. In the future, it is intended to widen river margin coverage in order to reduce 'leakage'.

5. Develop a PR strategy to continue advocacy initiatives both by members and other agencies such as DOC, making use of the website and Facebook, the Powerpoint presentation, the documentary/video 'Rakahuri Rescue' and printed material such as handout fliers, 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, including better utilisation of social media, more field interpretation panels and appropriate modern technologies. Children are excellent advocates for influencing adults, and future management will be in their hands.

To date: Good advocacy to date, with 'Rakahuri Rescue' video documentary an excellent new tool. Winning the Australasian Wildlife Management Society's 'Practical Management Award' for 2018 further increased our national profile. In addition, the estuary interpretation panel will be repeated up-river, and there is now good website and Facebook outreach, particularly to the younger generation.

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. Larger projects have been supported by outside agencies, such as DOC. ECan and the Rata Foundation. However, new trapping, weed control and promotion intentions will stretch our resources.

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 – plus with other influential local stakeholders, such as the Rangiora Airfield.

Justification

Decisions on the future improvement and maintenance of braided river ecosystems rest with these agencies and committees. They also dispense considerable funds for river management.

To date: Good collaboration, including help by Rangiora Airfield personnel to reduce aerial disturbance. However, 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 with the likes of Taggart Earthmoving Ltd, but needs extending to other operators. 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. The access way blocking during the breeding season is an example of this, but there are still on-going issues relative to motorised use of the riverbed and estuary.

12. 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

Acknowledgment for significant more recent funding is owing to the Department of Conservation, ECan and its Waimakariri Zone Committee's Immediate Steps fund, the Waimakariri District Council, the Rata Foundation, Sargood Bequest, the Rangiora Lions Club, plus our first 'sponsor', Karikaas Dairy Products Ltd.

The Australasian Wildlife Management Society donated \$1000 as part of its Practical Management Award for 2018.

The Group is most grateful for a number of smaller donations received from a range of sources.

Agencies who have offered special operational assistance are the Dept of Conservation (most recently with weed removal trials using tractor-mounted ripper) 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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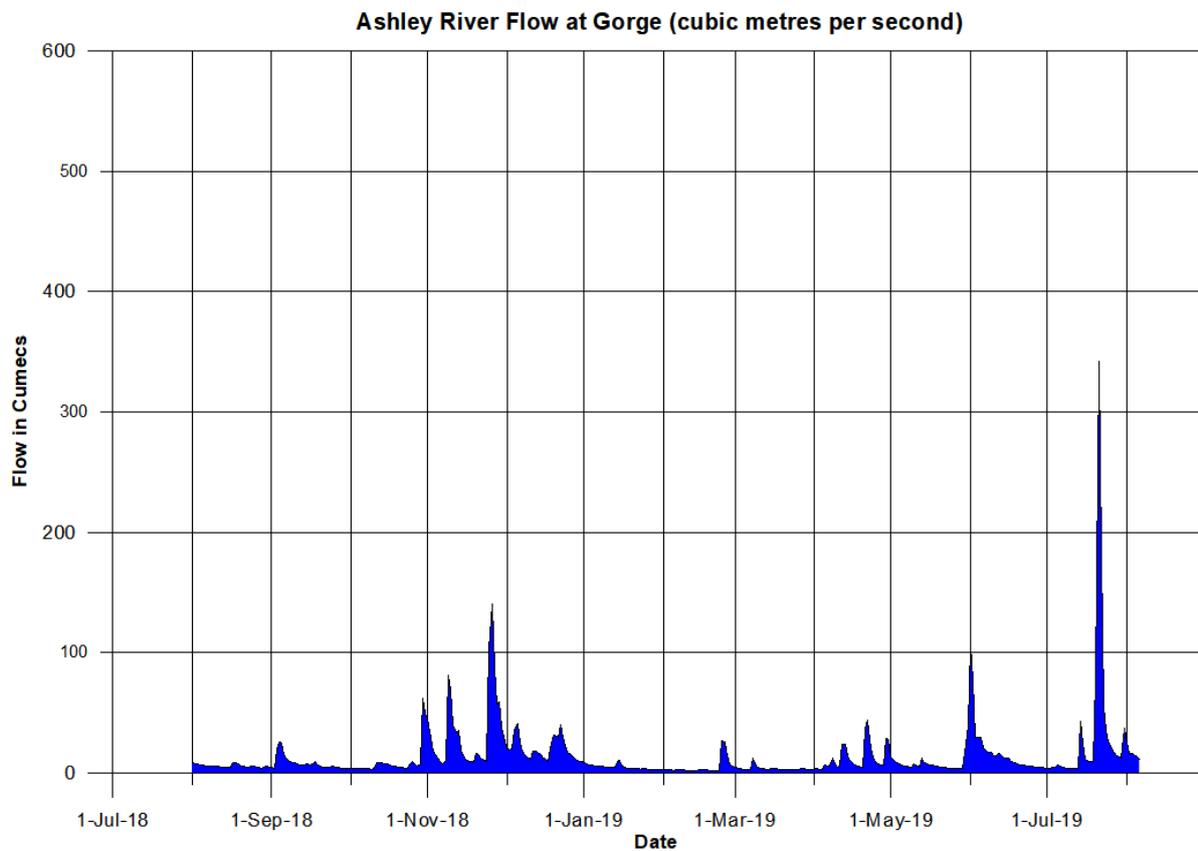
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Appendix 1. Promotional activities, July 1, 2018 – June 30, 2019

Promotion / activity	Date	Comment
Meetings – General	Jul 2, Sept 19, Dec 10, Mar 20	DOC offices, Rangiora: 15-18 participants
Management Committee	Nov 28, Feb 19, Jun 19	6-7 present
AGM and meeting	Sept 19	DOC offices, Rangiora: 13 participants
Annual bird survey	Nov 24	18 participants
Presentations/Representation		
Loburn School	June 11 & 13	Back paddock series
Riverbed meeting	June 11	With Matt Doocey and National's Sarah Dowie
Waimak Zone Committee	July 9	Ppt presentation
Orari rivercare group, Geraldine.	July 25	Ppt presentation
Hanmer School and Cons Club	Aug 8	Ppt presentations
Sefton School	Aug 22	Back Paddock series
CWMS future	Sept 19	Meeting at ECan in Ch/Ch
Twilight walk in riverbed	Oct 2	Conservation week event
Tuahiwi School	Oct 18	Back Paddock event
Lions, Rangiora	Nov 1	Ppt presentation
Probus, Rangiora	Nov 8	Ppt presentation
Ashley School	Nov 26	Accept \$200 donation at assembly
Compass FM, Rangiora	Nov 27	Local radio interview
AWMS conference, Hobart	Dec 5	Accept 'Practical Management Award, 2018'
Meeting w DOC Partnerships	Jan 23	Geoff Ensor (DOC)
Meet with ECan	Feb 1	David Owen, principal braided river advisor
Probus, Hanmer	Feb 5	Ppt presentation
Rangiora Friendship Society	Feb 14	Ppt presentation
Lions Ramble	Mar 3	Fund raiser for ARRG
Rangiora Scouts	Mar 5/6	Ppt and talk
Pukorokoro-Miranda Trust	Mar 10	Ppt - Launch of Yr of Wrybill
'Rakahuri Recovery' launch	Mar 21	Video launch in Town Hall
Woodend School	May 7-10	Back Paddock series
Ripping trial preparation	May 21	Meet w Cresslands Contracting and R Maloney
BRaid seminar, Lincoln Univ	June 26	Ppts on ARRG and Drones
Media Articles		
Northern Outlook	Aug 31	Beware of braided birds
Northern Outlook	Sept 19	Tampering with traps a real pest
NC News	Sept 27	Protection for nesting birds
NC News	Oct 18	Banded wrybill breeds
Northern Outlook	Nov 23	Endangered gulls nest on Ashley River
Press (front page)	Nov 29	Flooding takes out rare gull nests
Northern Outlook	Nov 30	Rare gulls nests wiped out
NCNews	Dec 13	Endangered gulls back nesting
Northern Outlook	Dec 19	Flood-hit gulls make new nests
Northern Outlook	Jan 9	Rivercare group takes out top award
NC News	Jan 17	Conservation award for Ashley river group
Media general	Jan 20 on	4wd driving over BBG chicks
NO and Press	Jan 30	Endangered birds mown down
Latitude magazine	Feb/Mar	Recognised across the Tasman (P164)
NC News	Mar 14	Film focuses on unique birds
Other		
Trap installation around estuary	Late June / early July	New trapping network for estuary group
Weed clearing	July 2-10	Ripping / blading trial at Smarts / Tulls
Trap making	Aug 17/20	Traps for Clarence Group
R'bed access ways	Aug 21 & Sept 18/19	Locating and installing by Nigel Winter
Cinema screen vista showing	Sept 25 on	Rangiora - played b4 all shows from Sept to Feb

Appendix 2. River flow (cumecs). Taken at the Ashley Gorge from July, 2018 to July, 2019 (from Environment Canterbury website www.ecan.govt.nz). The 2018/19 bird breeding season lasted from August 1, 2018 to February 1, 2019.



Appendix 3. 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: Peter Whitehead (peter@sabretech.co.nz)

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 seven members on this Committee – office bearers plus Bev Alexander, Chris Martin, Grant Davey, Peter Whitehead and Bruce Newland.

The Group has 45 signed-up members, plus 103 interested people on our email list.

The Group has a website (www.ashleyrivercare.org.nz) maintained by BRaid manager, Sonny Whitelaw, while our Facebook page (<https://www.facebook.com/ashleyrivercare>) is maintained by member, Steve Attwood.