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A Repeat Bird survey of the Upper Waimakariri River

October 16-19, 2016

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On Behalf of BRaid Inc.

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Photo: Nick Ledgard

Summary

Braided River Aid Inc. (BRaid) completed its third riverbed bird survey of the Upper Waimakariri River from the Bealey Road Bridge to the Esk River confluence at the top of the Waimakariri Gorge from 16-19 October 2016.

Good coverage of the riverbed was achieved and weather and river conditions were generally suitable for observing birds. A jet boat was essential in moving observers across main channels.

All three surveys (2012, 2014, 2016) showed that this river section supports a significant number and diversity of nesting riverbed species including the critically endangered black-billed gull (*Larus bulleri*), the nationally endangered black-fronted tern (*Chlidonias albostriatus*), the vulnerable wrybill (*Anarhyncus frontalis*), and the vulnerable banded dotterel (*Charadrius bicinctus*).

It continues to be a river that justifies its "Outstanding habitat" status (O'Donnell, 2000) that was based on earlier surveys in 1981 and 1995.

Only one nesting colony of black-billed gulls was found in 2016 (21 nests). Six small colonies of black-fronted terns appeared to be establishing during the survey between Mt. White Bridge and the Esk River confluence. The high number of black-fronted terns recorded on this survey (444), and the previous recent surveys (mean 361), indicates the Upper Waimakariri is a stronghold of the species with a higher count/km (11.3) than most other rivers. It is also a stronghold for wrybill (44 counted; mean 62.3 for the three surveys). The number/km of wrybill recorded in the Upper Waimakariri (2.0) is only matched or exceeded by the Upper reaches of major rivers south of the Waimakariri as far as the Upper Waitaki Basin. The count of banded dotterels in this survey (404) was much higher than any of the previous four surveys (mean 356.7) and along with high counts in the upper sections of other rivers indicates the importance of the high country to this species. Counts of the "At risk" South Island pied oystercatcher (*Himantopus finschi*) (53) were also higher in this survey than in the previous recent surveys (mean 50.7).

There is no evidence of a decline in numbers of any of these threatened species in the Upper Waimakariri in the last thirty-five years.

Although the counts of black-backed gulls (*Larus dominicanus*) (mean for the three recent surveys 619) are less than most other rivers they remain a threat to nesting success of the other riverbed birds. This report recommends control of their numbers. Improvement in the riverbed habitat is also recommended by strategic control of shrub weeds, especially Russell lupin (*Lupinus polyphyllus*). A third recommendation is to explore the educational opportunities for the braided river habitat recognising that the river runs next to both road and rail tourist routes and facilities for education already exist nearby.

1. Introduction

This is the third survey of the birds of the Upper Waimakariri River organised by Braided River Aid Inc. (BRaid). Previous surveys by BRaid were in 2012 and 2014 (Jolly, 2013 and 2015) following early surveys in 1981 and 1995 by NZ Wildlife Service and Department of Conservation (DOC). Together with surveys of birds of other braided rivers in Canterbury by other organisations[1], these surveys have contributed to a much better understanding of the populations and status of this specialised and highly vulnerable avifauna (see Jolly, 2015).

Each survey on the Upper Waimakariri has covered the same stretch of river from the Bealey Bridge to the Esk River confluence 35km downstream. Repeated counts are important in giving a better estimate than one-off counts of the true size of populations.

These surveys found that the expected range of braided river bird species was present in the Upper Waimakariri River including four key threatened species, wrybill (*Anarhyncus frontalis*), banded dotterel (*Charadrius bicinctus*) black-billed gull (*Larus bulleri*), and black-fronted tern (*Chlidonias albostriatus*). On the basis of the early surveys, the river was rated as an outstanding habitat in terms of high species diversity, high population numbers, and breeding habitat for threatened species (O'Donnell, 2000).

2. Methods

As with the previous surveys, birds were counted in a formal walk-through survey, a standard method on braided rivers (O'Donnell and Moore, 1983; Maloney et al, 1997).

The survey commenced at the Bealey Road Bridge over the Waimakariri River and finished at the confluence of the Esk River at the top of the Waimakariri Gorge a total distance of 35 Km (Fig. 1). The following stretches of river were covered in the four days: Bealey Bridge to Broad Stream, Broad Stream to Mt. White Bridge, Mt. White Bridge to power line crossing near Gooseberry Stream, and from the power line crossing to the Esk River confluence. Between 6 and 11 observers were present on each day of the four-day survey and were spaced about 100m apart across the river.

A jet boat was used to ferry observers across the main channels downstream from the Mt. White Bridge, but all counts were made on foot to give the best coverage of the riverbed possible.

However, some species are relatively inconspicuous (e.g. dotterels and wrybills) and can be missed, and others, such as the terns, tend to fly up and down the river and can be double counted. Although all observers took steps to reduce these errors, including radios to keep

[1] Environment Canterbury, the Department of Conservation, private conservation groups such as Royal Forest and Bird Protection Society (Ashburton), the Ashley/(Rakahuri) River Care Group and Orari River Protection Group, and private consultants e.g. Boffa Miskell (Waitaki) and Jolly Consulting Ltd. (Upper and Lower Rangitata and Lower Waimakariri)

in contact and reduce double counting, the results should be treated as estimates of the relative abundance of the populations present, rather than as absolute numbers.

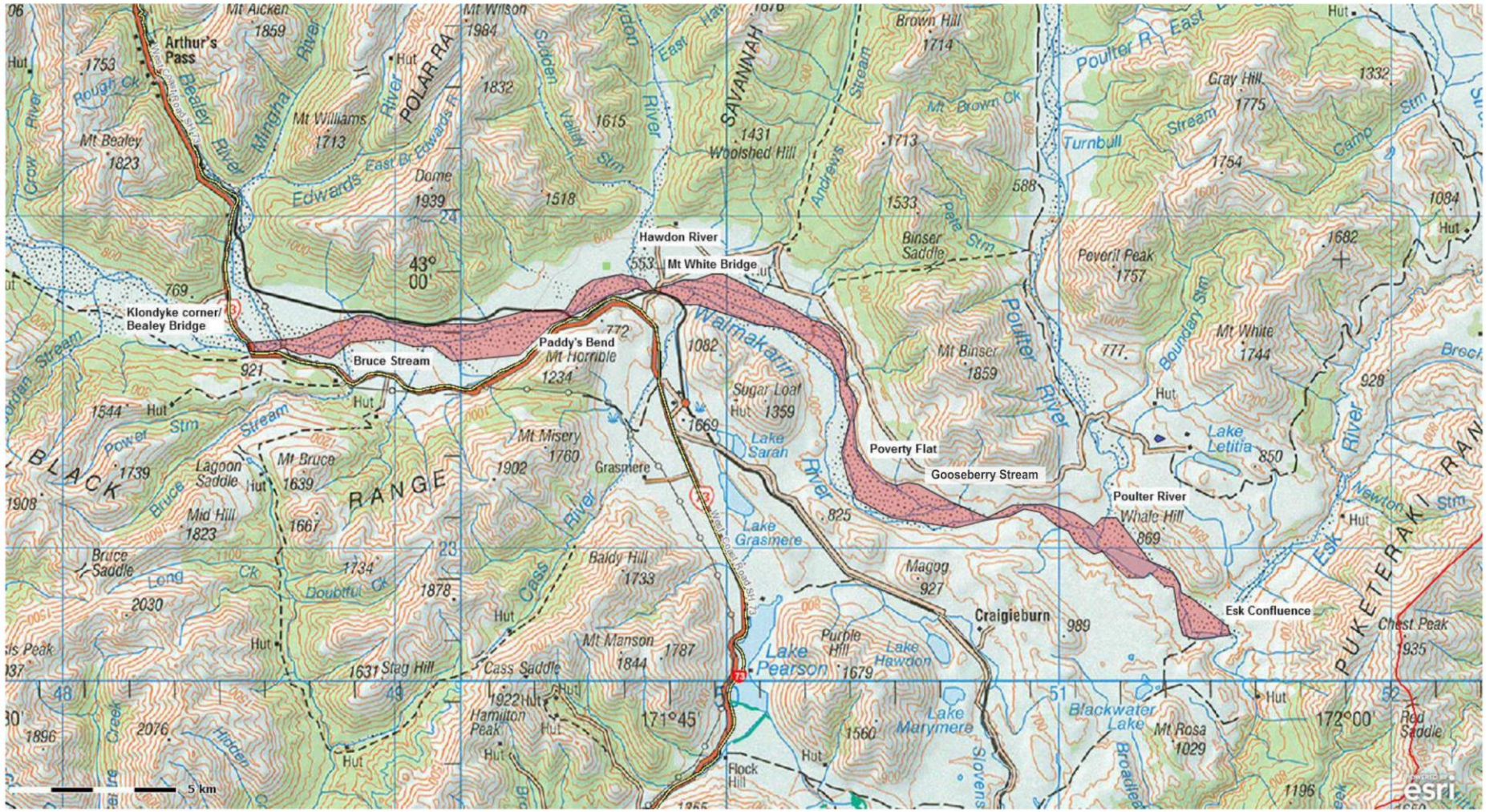
Furthermore, comparisons in counts between rivers or over time should be made cautiously, and only major differences in numbers should be taken as being meaningful. In comparing counts between rivers or over time on the same river, the assumption is that the relationship between counts and the true number of birds is reasonably consistent within a species.

In addition to counts of all native species, the locations of wrybills and of breeding colonies of gulls and terns were recorded by GPS or by locality. These records are held on file by BRaid.

The results are presented in two sections (upstream and downstream of the Mt. White Bridge) consistent with all earlier surveys[2].

[2] The five daily counts (Bealey Bridge-Broad Stream, Broad Stream-Mt. White Bridge, Mt. White Bridge-Gooseberry Stream, and Gooseberry Stream-Esk River confluence) are held on file by BRaid: http://braid.org.nz/braided-rivers/waimakariri-river

Fig. 1. The surveyed reach of the Upper Waimakariri River (Bealey Bridge to Esk confluence)



3. Results

The survey was completed over four days from 16 – 19 October with 6 observers on the first day and 11 observers on the following three days. Weather conditions during the survey were generally good for observing birds although windy and with rain on the second morning. River conditions were suitable for the survey. Flows ranged from 75 – 140 m^3/s (at Otarama gauge site) during the survey. There were no floods in the two months prior to the survey and one fresh (500 m^3/s) in mid-September.

Table 1. Counts of Riverbed Birds Upper Waimakariri River

October 16-19 2016

Species list	Section		
	Bealey Bridge-Mt. White Bridge	Mt. White Bridge- Esk Confluence	**Total**
	12 Km	23 Km	35 Km
	6/11 observers	11 observers	
Canada goose	44*	151*	195
Paradise shelduck	36	44	80
Grey teal	0	0	0
Mallard	6	11	17
Grey duck	0	0	0
Little shag	0	0	0
Black shag	2	4	6
White-faced heron	1	0	0
Pukeko	0	0	0
South Island pied oystercatcher	34	19	53
Pied stilt	0	8	8
Banded dotterel	151*	253*	404
Wrybill	6*	38*	44
Black-fronted dotterel	0	0	0
Spur-winged plover	12	6	18
Southern black-backed gull	341*	166*	507
Black-billed gull	120*	16	136
Caspian tern	0	2	2
Black-fronted tern	105	339*	444
White-fronted tern	1	2	3
Total number of birds			**1918**
* nesting recorded			

One nesting colony of the critically endangered (Robertson et al, 2012) black-billed gull with 103 adults and 21 nests with eggs was found opposite the Bruce Stream fan[3]. (Table 1) (Fig.2a). However, subsequent observations found that this colony failed.

Six small colonies of 5-15 adults of the endangered black-fronted tern were found but nests were found at only one site and colony defense was reported at two other sites. All of these were downstream from the Mt. White Bridge (four of these have localities shown in Fig.2b & c).

The vulnerable shallow water waders, banded dotterel and wrybill, nested both above and below the Mt. White Bridge although wrybill were much more common below the Bridge.

Three colonies of southern black-backed gulls (*Larus dominicanus*) were found. Two of these were above the Mt. White Bridge

All of these species were noticeably more common adjacent to the shingle fans of tributary streams such as Bruce and Andrews Streams and the Hawdon, Poulter and Esk Rivers (Figs. 1&2)

Native species that utilise the riverbed habitat but do not nest there were noted. 42 pipits (*Anthus novaeseelandiae*), one tomtit (*Petroica macrocephala*) and one falcon (*Falco novaeseelandiae*) were recorded.

The riverbed habitat upstream from the railway bridge at Paddys Bend is noticeably infested with shrub weeds, particularly Russel Lupin (*Lupinus polyphyllus*).

[3] A colony of at least 1000 black-billed gulls and some black-fronted terns was found after the survey at Horseshoe Bend in the Waimakariri Gorge (Claudia Mischler, pers. comm.). The colonies had not established at this site on 18 October.

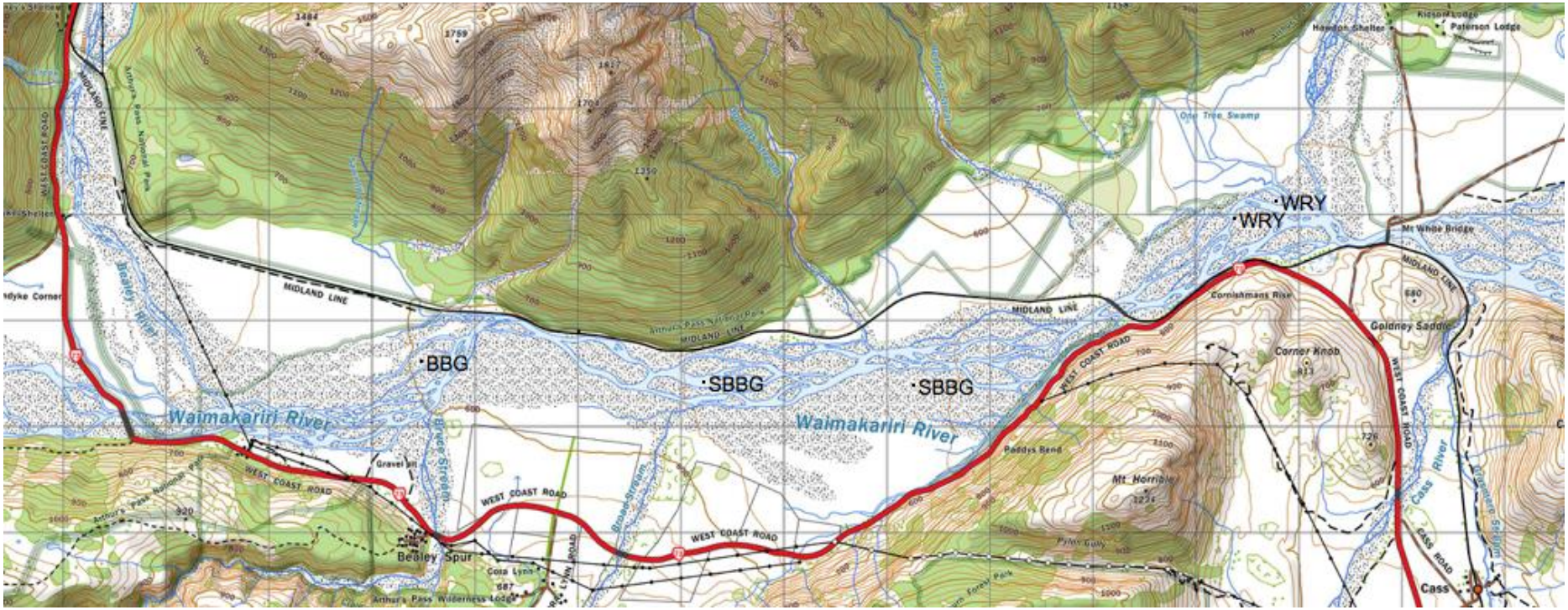


Fig. 2a Upper Waimakariri: Bealey road Bridge to Mt. White Bridge

BBG black-billed gull. SBBG black-backed gull. WRY Wrybill plover. BFT Black-fronted tern

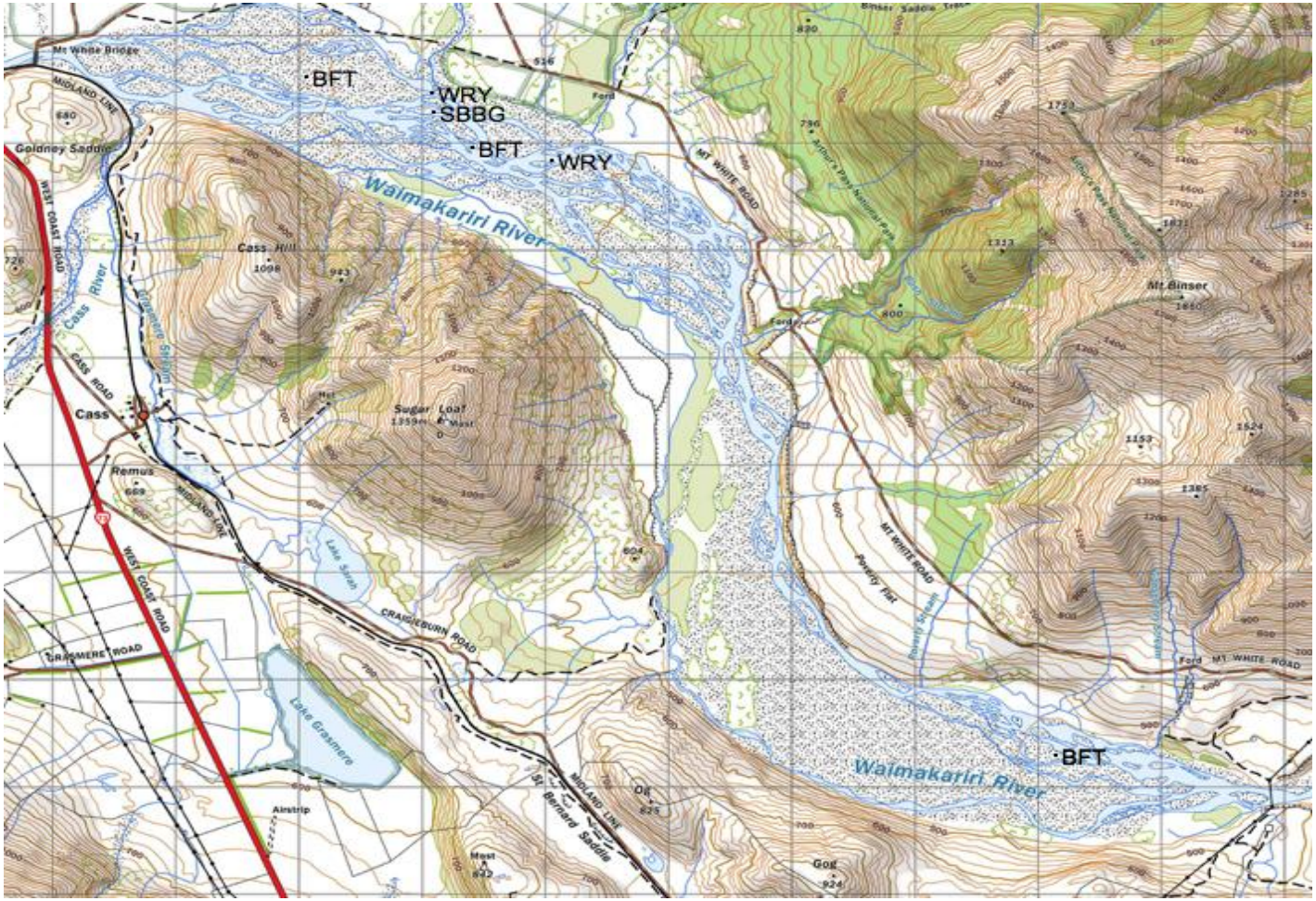
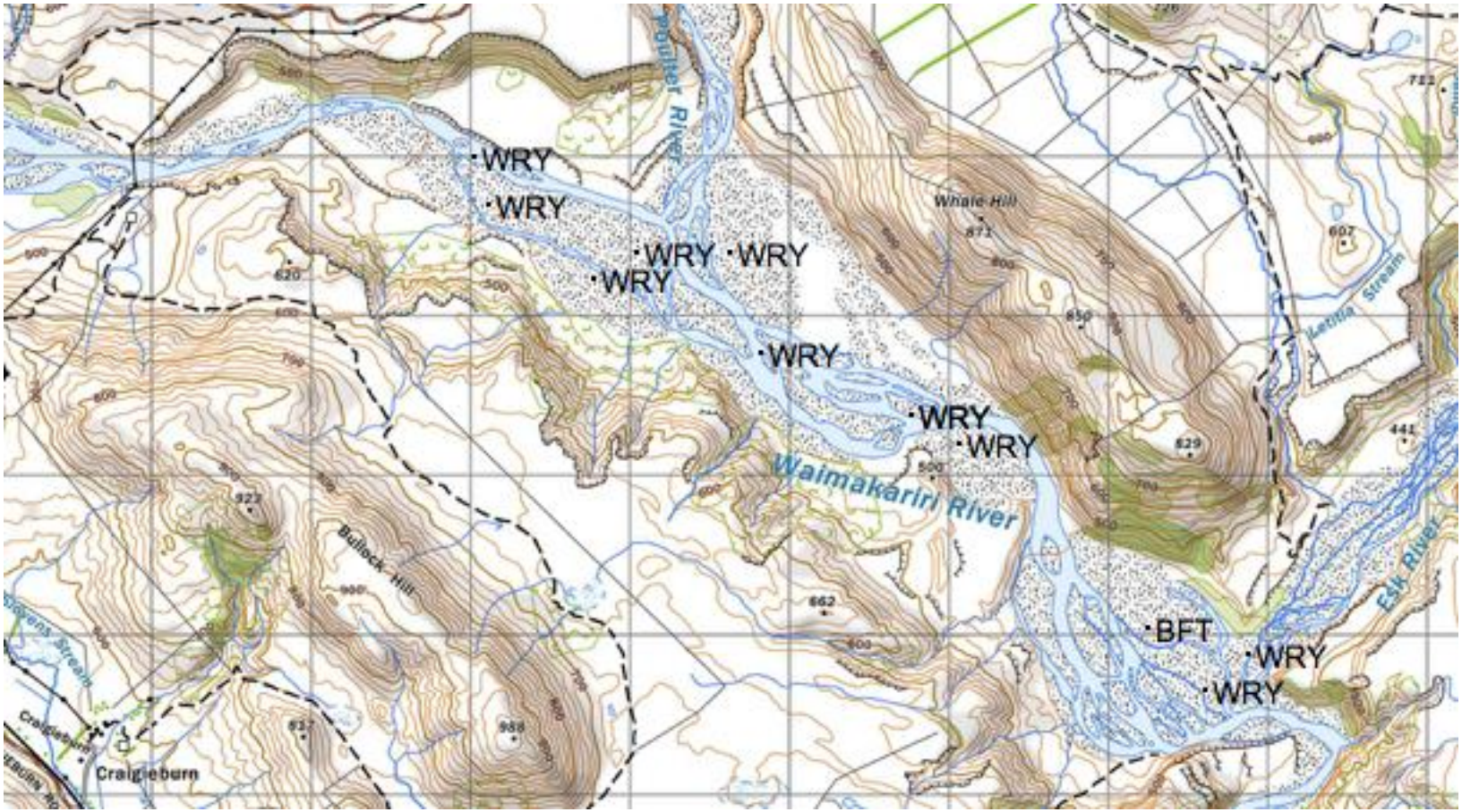


Fig. 2b Mt. White Bridge to Power line crossing (Gooseberry Stream)

Fig. 2c Power line crossing (Gooseberry Stream) to Esk River Confluence



4. Discussion

The numbers of birds counted in each of the five surveys are shown in Table 2 along with the mean counts for the three recent surveys.

Table 2. Numbers of riverbed birds counted in 1981, 1995, 2012, 2014, and 2016 in the Upper Waimakariri River between the Bealey Bridge and the top of the Gorge (Esk Confluence) (35 Km).

Species	**1981**	**1995**	**2012**	**2014**	**2016**		**Mean 2012-2016**
Black shag	1	5	9	4	6		6.3
White-faced heron	4	1	2	1	1		1.3
Canada goose	158	291	434	194	195		274.3
Paradise shelduck	181	74	25	26	80		43.7
Duck spp.	28	23	12	7	17		12
S.I.pied oystercatcher	22[4]	64	36	63	53		50.7
Pied stilt	18	4	11	0	8		6.3
Wrybill	33	58	49	94	44		62.3
Banded dotterel	235	247	332	322	404		352.7
Spur-winged plover	40	64	20	28	18		22
S. black-backed gull	424	465	347	1003	507		619
Black-billed gull	31	185	21	120	136		92.3
Black-fronted tern	69	303	238	401	444		361
Caspian tern	0	4	0	0	2		0.7
Total birds	**1244**	**1788**	**1536**	**2305**	**1918**		**1919.7**

The counts of black-billed gulls and black-fronted terns were similar or a little higher than in 2014 (136:120 and 444: 401 respectively) and much higher than in previous years except for the count of black-billed gulls in 1995 (185).

Wrybill appeared to be in much lower numbers in 2016 than in 2014 (44:94) but were similar in number to previous years. There is no obvious reason for the high count in 2014

The count of banded dotterels was much higher in 2016 than in any of the previous surveys and counts were also higher in the three recent surveys than in the two early surveys. Considering that the more stable river terraces are favoured for nesting by the dotterels and are more prone to weed invasion this would be an unexpected trend if maintained. However, if shrub weeds, particularly lupin, are allowed to spread down river below the Mt. White Bridge where more dotterels were present the trend may well be reversed.

[4] Probable typographical error in original 1981 record of 222 SIPO

South Island pied oystercatchers (SIPO) (*Haematopus finschi*) numbers were a little higher than the mean for the last three years but lower than in 1995 and more than twice the number counted in 1981.

There is no indication from these counts of any decline of these threatened species in the Upper Waimakariri River except for the one (1995) count of black-billed gulls (185) compared with the recent count mean of 92.3.

Of the remaining birds common in the Upper Waimakariri, paradise shelduck count (*Tadorna variegata*) (80) was more than three times the counts for 2012 and 2014 but within the range of the early counts (Table 2). Canada geese (*Branta canadensis*) numbers were well down on the 2012 high count (195: 434) but within the range of the other counts.

Black-backed gull numbers were half that in 2014 (507:1003) but higher than in the earlier surveys. They constitute a significant predation risk to the nesting of other birds on the river.

The numbers of birds counted in 2012 - 2016 can be compared with counts in the Lower Waimakariri (Gorge Bridge to McLeans power lines: Jolly, unpublished data, 2006; DOC unpublished data, 2006 - 2009) (Table 3). Counts are expressed in numbers/km to adjust for the different survey lengths. Wrybill counts were similar (2.0:1.7/km Upper: Lower) but banded dotterel counts were much higher/km in the Upper Waimakariri (11.0:6.4/km Upper:Lower). Black-billed gulls counts were slightly lower in the Upper Waimakariri (2.9/km) than the Lower River (3.3/km). Black-fronted tern counts were higher in the Upper River (11.3:7.8/km). Counts of South Island pied oystercatchers (SIPO) were similar in the Upper and Lower River (1.6:1.3/km) but paradise shelducks were counted a little more frequently in the Upper river (1.4:0.8/km). The highest counts of all species were black-backed gulls and these were highest in the lower river (142.9:19.3/km).

Table3. Comparison of bird counts/km between upper and lower river sections

	Upper Waimakariri	Lower Waimakariri	Upper Rangitata	Lower Rangitata
Paradise shelduck	1.4	0.8		0.8
SIPO	1.6	1.3	5.0	5.4
Wrybill	2.0	1.7	18.1	0.4
Banded dotterel	11.0	6.4	19.1	2.0
Black-fronted tern	11.3	7.8	12.3	16.2
Black-billed gull	2.9	3.3	5.8	84.1
S. black-backed gull	19.3	142.9	14.6	293.4

Counts in the Upper Waimakariri can also be compared with other rivers (Table 3). Banded dotterel and wrybill counts/km were much higher in the Upper Rangitata (Jolly, 2003; DOC 2003-2006, unpublished data) than in the Upper Waimakariri. Unlike in the Waimakariri, black-fronted tern and particularly black-billed gull counts/km in the Lower Rangitata were higher than the Upper Rangitata. Black-billed gull and black-fronted tern counts were higher in the Upper Rangitata than in the Upper Waimakariri. The counts/km of black-backed gulls were even higher in the Lower Rangitata than in the Lower Waimakariri and were much higher than in the Upper reaches of both rivers.

Table 4. Comparison of bird counts/km between some major, alpine sourced, Canterbury rivers. Data from various sources held by Department of Conservation and Environment Canterbury.

	Upper Waimakariri 2012-2016	Hurunui 2006-2010 (5 counts	Waiau 2008-2016 (4counts)	Lower Waitaki* 2001 (5 counts)
Survey length	32 km	65 km	67 km	70 km
Paradise shelduck	1.4	3.4	1.1	1.25
S.I pied oystercatcher	1.6	1.6	2.3	0.7
Wrybill	2.0	0.02	0.22	0.04
Banded dotterel	11.0	3.4	8.1	1.24
Black-backed gull	19.3	32.4	41.2	66.3
Black-billed gull	2.9	9.9	11.9	21.1
Black-fronted tern	11.3	6.5	9.6	9.03
* counts from boat				

The Upper Waimakariri is a stronghold for black-fronted terns in Canterbury along with other high country river sections (e.g. Upper Rangitata Table 3 and rivers of the Upper Waitaki Basin (Maloney et al 1997). Conversely, black-billed gulls were counted much less frequently than in the other major rivers, particularly the Lower Rangitata and Lower Waitaki[5] (Tables 3&4). It is also a stronghold for wrybill but, unlike black-fronted terns, they appear to be counted in significant numbers only in a limited range of high country rivers from the Waimakariri to the Upper Waitaki Basin. However, the surveys of the Hurunui and Waiau Rivers only include one section of high country (above 400m asl). The one section of 11.7 km of the Upper Waiau River had a mean count of 4 wrybill (0.3/km) still less than the Upper Waimakariri.

Banded dotterels are more widespread than wrybill but also favour the high country sections of the major rivers (Tables 3&4, Maloney et al 1997). South Island pied

[5] Although most of the counts on the Lower Waitaki were from a jet boat (Boffa Miskell, 2002) and were made 15 years ago, I suggest that in assessing relative abundance the counts are still useful.

oystercatchers are also widespread in these rivers but were counted much more frequently in both the Upper and Lower Rangitata than in the other rivers (Table 4).

The results show that the Upper Waimakariri is an important habitat for riverbed birds, particularly black-fronted terns and wrybill. It is also a section of river that has a diversity of bird fauna with six of the eight water bird guilds identified by O'Donnell (2000) nesting and feeding there in significant numbers: (open water divers (shags feeding only), deep water waders (SIPO), shallow water waders (wrybill and banded dotterel), dabbling waterfowl (paradise shelduck and mallard duck), aerial hunting gulls and terns (black-billed gulls and black-fronted terns), and riparian wetland species (pipits, swallows and kingfisher). In this section of the river there is no habitat for the torrent specialist (blue duck) and there is less for swamp specialists than some major rivers hence few pied stilts (8 in this survey) and pukeko were not recorded.

The Upper Waimakariri continues to justify its rating as an outstanding habitat with the presence of a nesting colony of the critically endangered black-billed gull and significant numbers of the nationally endangered black-fronted tern and the vulnerable wrybill and banded dotterel and for the diversity of species guilds.

5. Recommendations

1. Black-backed gulls continue to be present in large numbers, exceeding 1000 in 2014, and are a threat to other birds nesting on the river. Their numbers are much lower than in other rivers (Table 4) including the Lower Waimakariri (Table 3) and therefore control to a level that would improve protection of the valuable birds present is more achievable.

2. Shrub weed spread, particularly upstream from the railway bridge and particularly of Russell lupin, is a threat to the nesting habitat in covering the open shingle and mat plant habitat these birds need. Strategic control (either mechanical or herbicide) targeted especially at the tributary fans is needed outside the bird nesting season (September to January).

3. This section of river is bordered by both a State Highway and a railway leading to an important recreational and tourist attraction at Arthurs Pass and further on to the West Coast. Conservation education facilities already exist at Cora Lynn Station (Wilderness Lodge) and the Hawdon outdoor education facility (which border this section of river) and at Arthurs Pass. The Transalpine tourist train follows this section of river, as well as crossing it, and has an excellent, informative commentary. All of these offer an opportunity for improving awareness and education about braided rivers, riverbed birds and their conservation needs.

6. Acknowledgements

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7. References

Boffa Miskell, 2002. Project Aqua: Terrestrial Ecology and Wetlands Assessment Report. 201pp.

Department of Conservation. 1995. Bird Survey of Upper Waimakariri River. Unpublished data. Waimakariri Field Centre, Department of Conservation.

Jolly, J.N. 2006. Statement of Evidence in the Environment Court: Rangitata Water Conservation Order.

Jolly, J.N. 2013. A bird survey of the Upper Waimakariri River November 5-8 2012.Unpublished Report of BRaid Inc. 10pp.

Jolly, J.N. 2015. A bird survey of the Upper Waimakariri River November 2014.Unpublished Report of BRaid Inc. 10pp.

Maloney, R.F., Rebergen, A.L., Nilsson, R.J. and Wells, N.J. 1997. Bird density and diversity in braided river beds in the Upper Waitaki Basin, South Island, New Zealand. Notornis 44.219-

232.

Miskelly, C.M., Dowding, J.E., Elliott, G.P., Hitchmough, R.A., Powlesland, R.G., Robertson,H.A., Sagar, P.M., Scofield, R.P., Taylor,G.A. 2008. Conservation status of New ZealandBirds. Notornis 55: 117-135.

O'Donnell, C.F.J. 2000. The significance of river and open water habitats for indigenous birds in Canterbury, New Zealand. Unpublished Report UOO/37. Environment Canterbury. 73pp +Appendix.

O'Donnell, C.F.J. and Moore, S.M. 1983. The Wildlife and Conservation of Braided River Systems in Canterbury. Fauna Survey Unit Report No. 33. New Zealand Wildlife Service.73pp.

Robertson, H.,Dowding, J., Elliott, G., Hitchmough, R., Miskelly, C., O'Donnell, C., Pwlesland, R., Sagar, P., Schofield, P., Taylor, G. 2012. Conservation Status of New Zealand Birds. Department of Conservation. 22pp.