
Bird values of the Ashley River in relation to
an application by Taggart Earthmoving Ltd
to extract gravel from the riverbed



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Summary

Taggart Earthmoving Ltd has applied for a 10-year consent to extract gravel from three sections of the Ashley River. The present report was commissioned by Taggart's in relation to that application. The report summarises the bird values of these sections of the Ashley River, with particular regard to the species listed in recent Environment Canterbury consents. It also assesses the potential impacts and benefits of the proposed activity.

The Ashley River is generally recognised as having outstanding wildlife values. It is of particular importance as a breeding ground for a number of threatened shorebirds, notably 3 key species: the wrybill, the black-billed gull and the black-fronted tern. The main threats faced by these birds in the Ashley are predation by introduced mammals, loss of habitat caused by weed growth, and disturbance during breeding.

Proposed extraction Area 1 is located in the lower river, near Golf Links Road. This area has been used for extraction for many years. The commonest listed bird breeding in the area is the banded dotterel; there are no recent breeding records of the 3 key shorebird species

Area 2A lies between groynes 2 and 5, above the Rangiora Road Bridge. In recent years, this area has contained the highest density of threatened shorebirds in the river. Because of this, extraction is proposed only outside the shorebird breeding season. Area 2B lies immediately upstream of Area 2A between groynes 5 and 10. It regularly contains pied stilts and banded dotterels, but there are no recent breeding records of any of the 3 key shorebird species.

Area 3 is located in the upper river, in the area around Glentui-Bennetts Road. The river is heavily infested by weeds (mainly broom) at this point, and the avifauna values appear low.

Crushing of nests or chicks and disturbance to breeding birds are the main potential adverse impacts of gravel extraction on shorebirds. As long as pre-extraction bird surveys are thorough, such surveys are probably the best method currently available to reduce these impacts, and a requirement for them should be included in all future consent conditions. Extraction also results in easier access to riverbeds for people and vehicles, which can increase rates of crushing of nests and disturbance. It should be possible to reduce public access by imposing conditions requiring the blocking and/or ripping of access roads following extraction.

Shorebirds require open, flat areas free of vegetation for nesting. Gravel extraction almost always results in clearance of weeds from significant areas of the riverbed. This creates breeding habitat for shorebirds and is clearly beneficial in the medium term. Consent conditions normally require extraction sites to be levelled, which is also beneficial.

If appropriate consent conditions are imposed and adhered to, gravel extraction should not have an overall adverse impact on shorebirds in proposed extraction Areas 1, 2B, and 3. In Area 2A, there is the possibility that extraction may be perceived to be in conflict with the activities of the Ashley/Rakahuri Rivercare Group, Inc., which actively manages this section of the river for shorebirds. Discussions between the parties and the Regional Council may be useful in formulating appropriate conditions for this area. However, the fact that birds periodically occupy new sites and/or move breeding territories between seasons makes it almost impossible to predict where important breeding areas will be in the medium term.

1 Background

The braided rivers of the eastern South Island are characterised by having large bare areas of mobile shingle, multiple channels, and variable flows (O'Donnell & Moore 1983). They provide habitat of international significance for a number of threatened, endemic bird species, and in particular are used for breeding by a range of native shorebirds (Cromarty & Scott 1996). Some of these species are highly adapted to these unique conditions, and depend largely or entirely on braided rivers for their survival. However, the wildlife values of braided rivers are coming under increasing pressure from many sources.

Human activities include abstraction of water for irrigation, manipulation of flows for electricity generation, extraction of gravel and sand for construction purposes, and a wide range of recreational activities. In addition, most riverbeds have been extensively invaded by weeds and introduced mammalian predators. All of these factors have the potential to reduce the extent and/or quality of shorebird breeding and feeding habitat in braided rivers.

Striking a balance between human uses of riverbeds and wildlife values is an increasing challenge. It requires a detailed knowledge of the wildlife values of each river, and in the case of larger rivers, knowledge of the values of different parts of those rivers. It also requires an appreciation of the potential short-term, longer-term, and cumulative effects of a wide range of activities, both separately and in combination, on those values.

With such information, it may be possible to permit certain activities while reducing impacts, for example by imposing consent conditions that prohibit the activity in sensitive areas or at particularly sensitive times. In the case of gravel extraction, many recent consents in Canterbury have included such conditions. These either limit extraction to the birds' non-breeding season or, during the breeding season, require a bird survey immediately before extraction. The survey is designed to locate birds of 22 listed species, and the condition prohibits activities from a 100 m zone around birds that have nests or are rearing chicks.

The Ashley is a medium-sized braided river located in North Canterbury, with its upper tributaries draining the Puketeraki Range and Lees Valley. From the Ashley Gorge, the river flows east and joins the sea about 25 km north of Christchurch. In contrast to the larger snow-fed rivers, the Ashley is largely fed by rainfall from the foothills and has relatively low flow rates.

Taggart Earthmoving Ltd has applied for consents to extract gravel from three sections of the Ashley River for a period of 10 years. The present report was commissioned by Graeme McPhail of Taggart Earthmoving in relation to this application. It aims to summarise the bird values of relevant sections of the Ashley River, and to assess the potential impacts and benefits of the proposed activity on those values.

The three areas for which a consent is sought all lie below the gorge and total about 13.3 km of riverbed. Details of the sizes and locations of the areas are shown in Table 1, along with proposed conditions regarding extraction periods and bird surveying.

Table 1 Sizes and locations of proposed gravel extraction areas in the Ashley River

Area	General location	Approx length of area (km)	Grid references	Proposed annual extraction period	Pre-extraction bird report?	Stockpile locations
1	Downstream of Rangiora rail bridge, between Golf Links Rd and Lower Sefton Rd	2.1	78510 69320 to 80620 69670	12 months	Yes, in period 01 Aug–28 Feb	Anywhere in consent area
2A	Upstream of Rangiora road bridge between groynes 2 & 5	2.8	73130 69160 to 70340 69100	6 months No extraction 01 Aug–01 Feb	Only in period 01-28 Feb	Anywhere in consent area
2B	Contiguous with area 2A; immediately upstream of it, between groynes 5 & 10	3.4	70340 69100 to 67270 70490	12 months	Yes, in period 01 Aug–28 Feb	Anywhere in consent area
3	Upper river near O'Hallorans Rd and Glentui Bennetts Rd	2.0	50670 73630 to 52710 73680	12 months	Yes, in period 01 Aug–28 Feb	Anywhere in consent area

2 Bird values of the Ashley River

Between 1974 and 1981, the New Zealand Wildlife Service conducted wildlife surveys in 14 Canterbury rivers, including the Ashley River. Following these surveys, the wildlife and conservation value of each river was ranked, using a set of standard criteria. The Ashley was one of five rivers given the highest possible ranking of 'Outstanding' (O'Donnell & Moore 1983).

The North Canterbury Catchment Board & Regional Water Board (1982) described the estuary as "one of the most important bird habitats on the east coast of the South Island because of the diversity of species". More recently, the Ashley River and estuary were included in a list of 73 wetland sites of international importance in New Zealand (Cromarty & Scott 1996).

In recent years, the numbers of shorebirds and some other species in the lower river (from the Okuku confluence to the State Highway 1 bridge) have been recorded each November by members of the Ashley/Rakahuri Rivercare Group, Inc (ARRG). The ranges of counts for these species over the past three years are shown in Table 2 (data from Dowding & Ledgard 2005).

Table 2 Ranges of bird counts undertaken each November by the Ashley/Rakahuri Rivercare Group in the lower Ashley River from 2003-2005. Species shown in bold type are known to breed in the river.

Species	Threat category	Range of counts November surveys 2003-2005
Black shag (<i>Phalacrocorax carbo</i>)	6 Sparse	2-8
Little shag (<i>Phalacrocorax melanoleucos</i>)	Not Threatened	4-7
Pied oystercatcher (<i>Haematopus finschi</i>)	Not Threatened	22-37
Pied stilt (<i>Himantopus himantopus</i>)	Not Threatened	137-140
Black stilt (<i>Himantopus novaeseelandiae</i>)	1 Nationally Critical	0-2
Banded dotterel (<i>Charadrius bicinctus</i>)	5 Gradual Decline	169-245
Wrybill (<i>Anarhynchus frontalis</i>)	3 Nationally Vulnerable	7-16
Spur-winged plover (<i>Vanellus miles</i>)	Not Threatened	13-149
Black-backed gull (<i>Larus dominicanus</i>)	Not Threatened	1-27
Black-billed gull (<i>Larus bulleri</i>)	4 Serious Decline	0-10
Black-fronted tern (<i>Sterna albobristata</i>)	2 Nationally Endangered	26-102
Caspian tern (<i>Sterna caspia</i>)	3 Nationally Vulnerable	0-4

Three of these species are of particular concern: the wrybill, the black-billed gull, and the black-fronted tern. All are braided river specialists to varying degrees, all are threatened with extinction, and all are endemic.

Particular concerns are held for the wrybill population in the Ashley River. The range of this species has contracted southwards over the past century, and the Ashley is now the northern-most river in which breeding occurs (Riegen & Dowding 2003). In addition, the number of pairs breeding in the Ashley has fallen in recent decades; there were probably only 2-3 pairs during the 2005/06 season, and permanent loss of the species from this river is now a real possibility.

The large colonies of black-fronted terns and black-billed gulls that previously nested in the Ashley have also disappeared, and both species have nested only in small groups or as isolated pairs in recent years.

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

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

Shorebird management in the Ashley River has therefore focussed primarily on clearing weeds from potential nesting habitat, controlling predators during the breeding season, and attempting to reduce disturbance.

Some detailed information is available on the presence and distribution of listed birds within the three areas for which consent is sought.

1. Area 1 (in the vicinity of Golf Links Road) has been used for gravel extraction for many years. A survey undertaken in late August 2005 mapped pairs of listed bird species in the area and the results are shown in Appendix 1. This and subsequent surveys later in the season showed that the banded dotterel was by far the commonest listed species breeding in the area, and that none of the three species of most concern (wrybills, black-billed gulls and black-fronted terns) attempted to breed there.
2. Area 2 (above the Rangiora Road Bridge between groynes 2 and 10) is the most sensitive of the three areas in terms of threatened bird species. Area 2A (groynes 2-5) has been used for breeding by both wrybills and black-fronted terns in recent years. The whole of Area 2 also has breeding banded dotterels, pied oystercatchers and pied stilts each season (Dowding & Ledgard 2005). All are listed species.
3. Area 3 (Glentui-Bennetts Road) has probably not been surveyed for birds for many years, and its current wildlife values appear largely unknown. On 05 September 2006, I surveyed the 2 km of riverbed covered by the application. The area is heavily infested with weeds, notably Spanish broom (*Cytisus scoparium*), and the active channel of flowing water and bare shingle is relatively narrow. Conditions for shorebird breeding are generally less favourable than lower in the river, and this is reflected in the species present, which are listed in Appendix 2. The avifauna is dominated by introduced passerines, and the three listed species seen (little shag, paradise shelduck, and black-fronted tern) were all represented by single birds flying over the area. At the time of the survey, there was no indication that any listed species was resident or breeding. Notably, there were no banded dotterels present; this species is relatively common in the lower reaches of the river and would almost certainly be encountered in any 2 km stretch of the river below the Okuku confluence.

3 Potential impacts of the proposed activity and measures to reduce them

Crushing and disturbance

The most obvious direct impact on birds of gravel extraction is the physical destruction (crushing) of nests and small chicks that can be caused by the operation of heavy machinery in the bed of the river during the breeding season. All New Zealand shorebirds are ground-nesting; their nests and chicks are normally very well camouflaged, and virtually impossible to see from a moving vehicle. Repeated use of large vehicles in the riverbed is therefore very likely to result in losses of at least some eggs and chicks.

The presence of vehicles (and the people operating them) can also cause disturbance to breeding birds. Most shorebirds respond to disturbance by leaving the nest or chicks and displaying at a distance from them, in an attempt to lure the intruder away from the sensitive area. Repeated disturbance may result in birds being away from nests or chicks for extended periods, and eggs may chill or overheat. Similarly, small chicks become much more vulnerable to avian predators (gulls and harriers) when left alone by parents.

The crushing of nests and disturbance caused by extraction can be avoided entirely by restricting extraction to the non-breeding season. However, different braided river bird species breed at slightly different times, with the result that there is commonly some

breeding activity from early August through to the end of January. Avoiding this period reduces the possible extraction time to 6 months of the year. Such a restriction may be appropriate in areas with high densities of birds, or where Acutely Threatened species are involved. However there will often be circumstances where extraction has little impact on listed birds during the breeding season. A blanket ban on gravel extraction during that period will therefore be unnecessary at some locations, but because circumstances can change quite rapidly (see below) it will be important to continue the practice of undertaking bird surveys before extraction.

Increased access

Gravel extraction requires access roads into and within the riverbed. In general, these roads are left in place after extraction. This greatly facilitates access for people, often with vehicles and dogs. This in turn increases the risk of crushing and disturbance over a long period, without any of the constraints provided by conditions attached to the original extraction activities. For example, the original extraction may have been restricted to the non-breeding season to reduce impacts, but subsequent access by the public will occur during the breeding season, with a higher risk of impacts. Haul roads also increase the overall number of vehicles and people in the riverbed, by allowing 2WD access where it was previously difficult or impossible.

Possible conflict with shorebird management

In the case of Area 2A (groynes 2-5), there may be a potential conflict with activities of the ARRГ. That group has spent thousands of dollars and many volunteer hours enhancing and protecting shorebird habitat in the Ashley over the past three years, and most of this has been in proposed extraction Area 2A. There may therefore be a perception among some members of the group that time and money have been wasted if gravel extraction occurs in certain areas. The groyne 2 area is a case in point; as a result of ARRГ activities, there is now a bare raised area that is used for nesting by many shorebirds. While extraction there outside the breeding season (as proposed) would not cause disturbance and would probably increase the area free of vegetation, it would also lower the area significantly. This would make it more prone to flooding, which could easily result in nest losses during the breeding season.

4 Potential benefits of the proposed activity

Habitat improvement

Invasion of riverbeds by weeds is a major problem for shorebirds, primarily because most species will nest only on bare or very lightly vegetated gravel. In addition, weeds provide cover for mammalian predators, and probably result in increased predation rates on adult birds. Weed growth is a particular problem in the small and medium-sized rivers (such as the Ashley), which generally have much lower average flows and fewer of the large floods that clear weeds naturally. Gravel extraction can result in significant areas of riverbed being cleared of weeds, with obvious benefits for nesting shorebirds.

It is also clear that most shorebird species breeding in braided rivers prefer flat areas for nesting, probably because this allows incubating birds to detect approaching threats more readily. Most recent gravel extraction consents contain a condition that requires areas to be levelled and re-shaped to “a state consistent with the surrounding natural river bed” following extraction. This generally results in flat areas following extraction, which is also of benefit to birds.

5 Discussion

Bird values of the Ashley River

Overall, the Ashley is clearly of outstanding importance to endemic shorebirds. Three threatened species are of particular concern. The most highly specialised is the wrybill, which is entirely dependent on braided riverbeds for breeding. The Ashley is the northern-most river in the breeding range of that species, and it is therefore considered extremely important to maintain wrybills in the river. Most wrybill pairs in recent years have been found in proposed extraction Area 2A, between groynes 2 and 5.

Movement of birds

One of the major problems in setting appropriate consent conditions in these riverbeds is that shorebirds move. Even individual pairs of many shorebird species will nest in different territories between seasons, and occasionally within a single season. Colonial species such as black-billed gulls and black-fronted terns commonly nest kilometres from a previous site. At least some of these movements probably result from changes to habitat between seasons caused by higher winter flow rates, which can change the number and depth of braids, create and remove islands, and clear weed cover. In addition, new pairs may set up territories in previously unoccupied areas.

This mobility make it impossible to predict precisely where birds will breed in any season. This in turn makes it difficult to set aside areas for threatened birds permanently, or to set conditions that will ensure minimal impacts on birds over the long periods for which gravel consents are often granted.

Surveys for listed birds

Assuming that they are carried out in a thorough and professional manner, searches for listed birds immediately before extraction are probably the best method currently available for reducing potential impacts on threatened bird species. Inclusion of the current standard survey and reporting conditions in consents should therefore continue. However, it may be possible to modify these conditions to make them more effective. For example, there are individual and species differences that mean a 100 m exclusion zone may be insufficient to reduce disturbance in certain cases. Wrybills and banded dotterels are normally less susceptible to disturbance than some other species, and 100 m is probably an appropriate average distance in those cases. However, black-fronted terns and black-billed gulls are highly susceptible to disturbance and a larger exclusion zone is almost certainly appropriate for these species, especially when they nest in colonies.

Other consent conditions

As noted above, the extraction of gravel almost always results in easier access into riverbeds for the general public, particularly in vehicles. It should be possible to reduce this by further consent conditions. During a survey prior to gravel extraction in the upper Waimakariri River (Dowding 2005), I noted that the Department of Conservation also imposed conditions in addition to those of the Regional Council. Some of these conditions were aimed directly at reducing public vehicle access, e.g.

- “11. The Concessionaire shall park any vehicles and machinery at the end of Waimak Valley Road in such a manner as to prevent other vehicles accessing the riverbed over the truck/machinery access track.”
- “18. Upon completion of the gravel extraction the Concessionaire shall obliterate the track created for the movement of trucks and diggers across the riverbed so

the riverbed appears close to its original condition prior to the works and resembles a natural braided riverbed, free of gravel stockpiles.”

There seems no obvious reason why similar conditions should not be included in Regional Council consents. Restricting even some vehicles from riverbeds in this way should result in greater net benefits of gravel extraction activities.

Potential conflict with ARRГ

As noted above, the only part of the three areas for which consent is sought where there might be conflict with other riverbed users (at least over bird issues) is in Area 2A, between groynes 2 and 5. This area currently contains the highest density of Acutely Threatened shorebirds in the river, and for that reason is actively managed by the ARRГ. As noted above, there is the possibility that the Group (and potentially its sponsors) will see their habitat-enhancement efforts as having been wasted if gravel can be extracted at sites that it has been managing. On the other hand, gravel extraction does normally result in an increase in bare shingle areas, which obviously assists the Group in its objectives in part. Unfortunately, it is difficult in this case to weigh the costs and benefits of gravel extraction (possible degradation of existing managed habitat vs creation of new habitat) and assess what the net outcome for shorebirds may be over a 10-year period.

To date, there has been excellent cooperation between Taggart Earthmoving and the ARRГ, particularly in creation of nesting habitat by clearance of weeds. However, this cooperation has been based largely on the efforts of a few dedicated individuals, and the possibility that personnel in either organisation could change during the 10-year period of the proposed consent must be considered. If consent conditions could be devised that avoided any potential conflicts between the activities of the two groups in the long term, it would clearly be desirable. Discussion of this issue between Taggart Earthmoving, the ARRГ, and Environment Canterbury may be useful.

6 References

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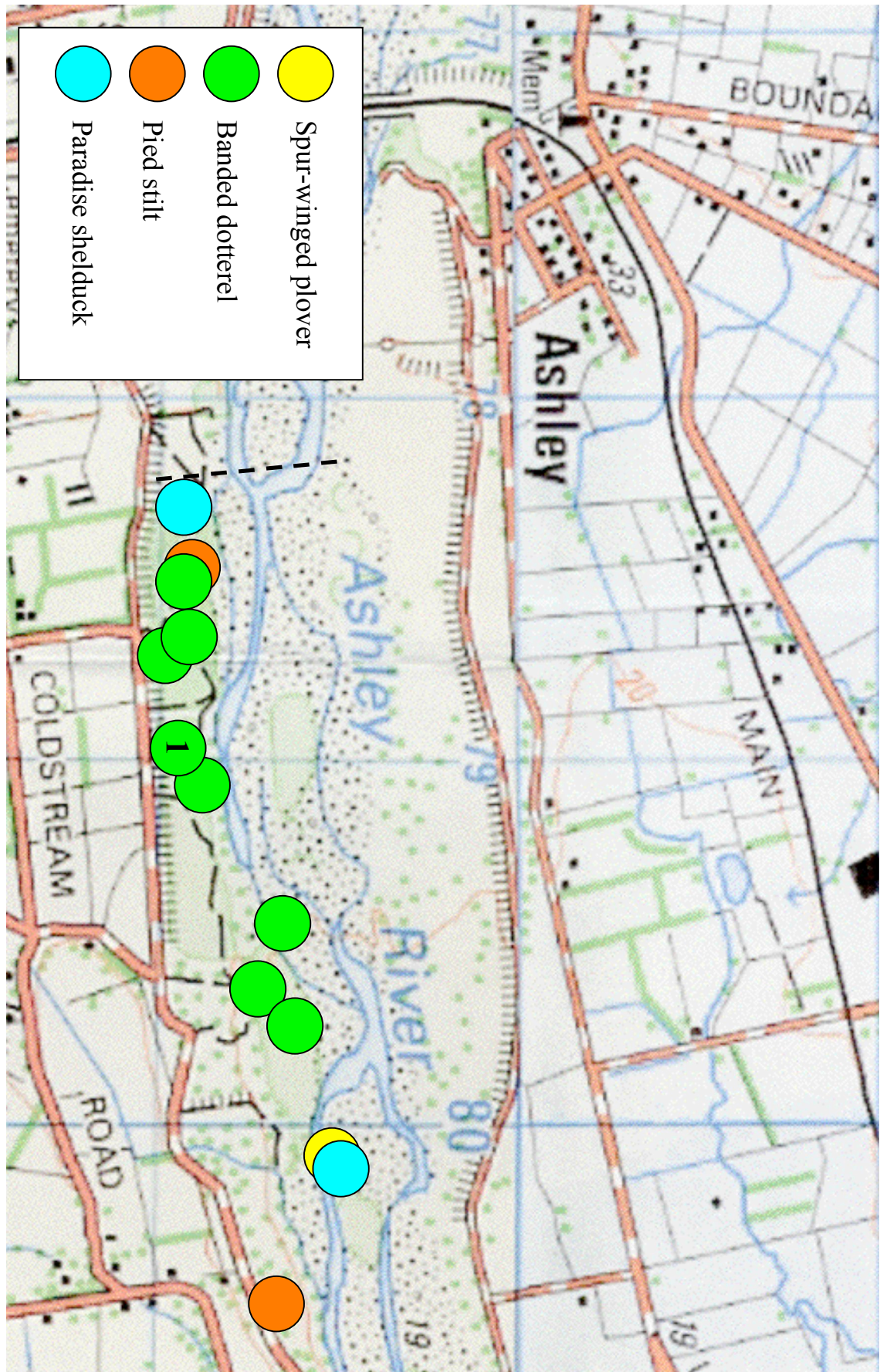
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Appendix 1

Survey for ECan-listed bird species in the lower Ashley River, 30-31 August 2005



Appendix 2

Bird species recorded in Area 3 (Glentui-Bennetts Road, Ashley River) on 05 September 2006. + indicates a species listed in recent Environment Canterbury consents.

Species	Listed?
Little shag (<i>Phalacrocorax melanoleucos</i>)	+
Paradise shelduck (<i>Tadorna variegata</i>)	+
Mallard (<i>Anas platyrhynchos</i>)	
Australasian harrier (<i>Circus approximans</i>)	
Southern black-backed gull (<i>Larus dominicanus</i>)	
Black-fronted tern (<i>Sterna albobriata</i>)	+
Rock pigeon (<i>Columbia livia</i>)	
Kingfisher (<i>Halcyon sancta</i>)	
Skylark (<i>Alauda arvensis</i>)	
Blackbird (<i>Turdus merula</i>)	
Grey warbler (<i>Gerygone igata</i>)	
Silvereye (<i>Zosterops lateralis</i>)	
Yellowhammer (<i>Emberiza citrinella</i>)	
Goldfinch (<i>Carduelis carduelis</i>)	
Redpoll (<i>Carduelis flammea</i>)	
