

Native birdlife in Gisborne District: Application of the river values assessment system (RiVAS and RiVAS+)



Sandy Bull
Andy Bassett
Ken F.D. Hughey

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Executive Summary

The River Values Assessment System (RiVAS and RiVAS+) was applied to the native birdlife value in Gisborne District. The method was applied to differentiate native fish sites of national significance from those of regional significance or local significance. Of 19 rivers or river segments evaluated one was considered of regional significance, namely the Lower Waiapu; the remainder are of local significance. No contemporary survey data are available for the rivers, although a field trip to the Lower Waiapu by SB and KH confirmed the presence of at least three nationally 'threatened and at risk' bird species on the river, two at least of which were breeding. The expert panel therefore was the basis for almost all data used in the report. The RiVAS+ methodology was also applied to all 19 river units. In total, four rivers were identified as having potential to improve river conditions in a way that would enhance the native birdlife value. For the upper Waioweka, Hangaroa and Ruakituri the interventions chosen were all:

- 6a. Improve riparian habitat – Weed control
- 6b. Improve riparian habitat – Pest control

For the Motu four interventions were chosen, namely:

- 6a. Improve riparian habitat – Weed control
- 7a. Enhance water quality - Remove/fence out stock
- 7b. Enhance water quality - Reduce non-point source nutrient pollution
- 7d. Enhance water quality – Reduce sediment input.

None of these interventions would change the relative importance of each river.

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Chapter 1

Introduction

1.1 Purpose

This report presents an application of the River Values Assessment System (RIVAS) to native birdlife in the Gisborne District, undertaken over October-December 2011. An Expert Panel workshop was held in Gisborne on 4th October 2011. This Gisborne District bird report needs to be read in conjunction with the method and with other native bird application reports (see Hughey et al. 2010 and Gaze et al. 2010).

1.2 Preparatory step: Establish an expert panel and identify peer reviewers

The Expert Panel for the native birdlife application in the Gisborne District comprised Andy Bassett (Department of Conservation), Sandy Bull (Ornithological Society New Zealand) and Ken Hughey (Lincoln University) who managed the case study and who took part in a scanning survey of two rivers post the workshop. Credentials of the Expert Panel are provided in Appendix 1.

Chapter 2

Application of the method

Step 1: Define river value categories and river segments

River value context for native birdlife in Gisborne District

Most Gisborne District rivers are single channel and have their headwaters in catchments largely dominated by native forest and/or unstable eroding physical features – in these catchments the rivers are dominated by a relatively depauperate single channel bird fauna. The lower sections of these rivers typically run through intensively developed farmland and into estuarine or lagoon systems and the bird fauna is more diverse but still dominated by a relatively limited range of species. A few rivers, notably the Waiapu, are braided in their lower reaches. The Waiapu contains a diverse bird fauna including nationally ‘threatened and at risk’ species.

River value categories

There is a distinction, typically, between the birdlife of braided rivers and that of single channel rivers. The former is typified by a community of birds that includes gulls and terns, waders, shags and a variety of waterfowl – multiple species are considered ‘threatened or at risk’; the latter is typified by waterfowl and shags with far fewer species threatened or at risk. Despite this distinction it is proposed to treat all rivers primarily in the same way, except where distinctive indicators for the prime attributes (see steps 3 and 4 below) can be identified and used appropriately.

River segments

Work in advance of the expert panel meeting to collate existing data, indicated that expert knowledge primarily held by DoC and also by The Ornithological Society New Zealand, would be the primary data source. Little recent data, formally collected as parts of surveys, or informal, exist for the braided sections of key rivers or for blue duck in the region.

Some of the rivers in the Gisborne District are complex. For example the Waiapu has a range of different physical conditions ranging from deeply incised eroded catchments, to relatively broad braided sections lower down. For the purposes of this analysis the larger rivers are often considered therefore in several sections.

Following a preliminary scanning exercise some rivers within the Gisborne District area were excluded from further assessment (Table 1). Criteria considered as part of this preliminary scanning were that the river or stream has:

- no known or suspected presence of breeding threatened or at risk species;
- a very small amount of habitat (e.g., less than 3km for a single channel river) of very low quality;
- very low numbers (e.g., less than 100 and no breeding ‘threatened or at risk’ species) of native riverine birds; and/or
- little or no flow at critical times, e.g., during the breeding season.

Table 1
Rivers not included in the assessment of native birdlife values

Wharekahika	Oweka
Awatere	Taurangakautuku
"Coastal"	Waipuhake Stream
"Coastal"	Tunanui Stream
Waiapu	Waiapu River including tributaries
Waiapu	Mangaoporo River
Waiapu	Tupuaeroa
Waiapu	Poroporo
Waiapu	Maraehara
"Coastal"	Mangahauinui River
Uawa	Uawa River
Uawa	Hikuwai
Uawa	Waiau
Uawa	Mangaheia
Uawa	Mangatokerau
"Coastal"	Pakarae River
"Coastal"	Waiomoko River
"Coastal"	Pouawa River
Taruheru	Taruheru River
Waipaoa	Waipaoa River and tributaries
"Coastal"	Maraetaha River
Waimata	Waimata
Motu	Waitangirua
"Coastal"	Whareponga
"Coastal"	Horoera, Waipuhake, Waiawa, Te Pito, Matapokia, Waipohatu Streams
"Coastal"	Orutua River
"Coastal"	Waipapa River

Lagoons and/or estuarine systems are excluded from analysis.

Other Considerations

Some species are particularly difficult to find, e.g., crake and bittern, and until a reliable survey method is found, are excluded from this analysis. Equally, threatened and at risk species such as grey duck are present, but difficult to identify correctly – they too are excluded from that part of the analysis dealing with threatened and at risk species. At least one other species identified as 'threatened or at risk', i.e., NZ pipit, is not considered as it is mostly not recorded (for some unknown reason) in surveys.

Outcomes

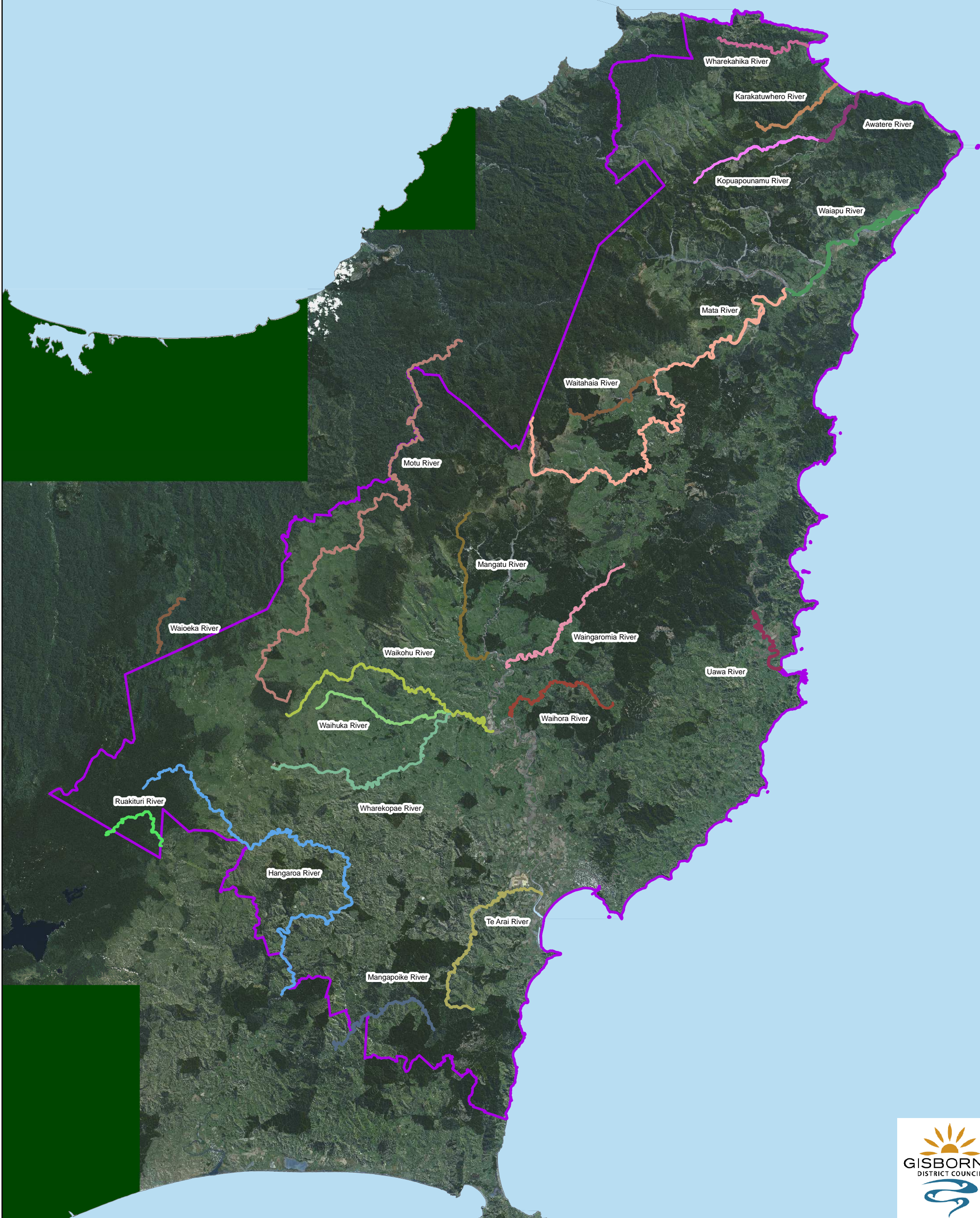
Use major sections for major rivers and whole catchments for smaller rivers as the primary data set and populate with existing expert panel considerations (Figure 1).

Ignore the presence of swamp species such as bittern and marsh crake until reliable survey data become available.

Do not include NZ pipit until routinely required within the standard survey method, and then record appropriately.

Do not include grey duck.

Figure 1
Rivers assessed for their value for native birdlife in Gisborne District



Step 2: Identify attributes

Attributes are the facets of the birdlife river value. The same attributes as used by Hughey et al. (2010) and Gaze et al. (2010) for Canterbury and Tasman respectively were used here.

Step 3: Select and describe primary attributes

The same six primary attributes used by Hughey et al. (2010) and Gaze et al. (2010) are used here.

Step 4: Identify indicators

The same indicators used by Hughey et al. (2010) and Gaze et al. (2010) are used here.

Step 5: Determine indicator thresholds

Thresholds are applied to an indicator to determine high, medium and low relative importance for that indicator. Thresholds are defined by real data (e.g., for recreational fishing <1,000 angler days per annum = relatively low importance, or expert panel judgements, e.g., the relative distinctiveness of river habitats for birds in this study) for each indicator and were identified by the Expert Panel. Because native birdlife is comparatively data rich in many regions (c.f. some other river values), this step was informed by 'hard' data (albeit much from expert panel assessment for this district) for five of the six indicators.

Step 6: Apply indicators and indicator thresholds

Most indicators were assessed using expert panel based knowledge. Data were kept in their original format (e.g. *actual area* of habitat, *number* of birds). This assisted the Expert Panel when evaluating the data, and helps achieve process transparency.

Step 7: Weighting of primary attributes

As per the Hughey et al. (2010) and Gaze et al. (2010) applications weightings are equal.

Outcome

Equal weighting

As a consequence of the decision to retain equal weighting it was decided for Canterbury and Tasman to introduce a 'species stronghold' criterion into the decision support system for defining priorities, i.e., if a river contains 5% or more of a population of a 'threatened or at risk' species then it is of national importance – such a criterion is consistent with decisions made for national water conservation orders. In the case of Tasman no species on any river reached this criterion. However, it should be noted that blue duck is being managed to get to 50 pairs as one of 8 selected sites nationally - if successful then it will rise to more than the 5% threshold and the river will rise to National significance. This same criterion is used for this study.

Step 8: Determine river significance

Step 8a: Rank rivers

The spreadsheet in Appendix 2 was used to sum the indicator threshold scores for each river. The sums of the indicator threshold scores were placed in a column and then sorted in descending order. This provided the list of rivers ranked by their significance scores.

Step 8b: Identify river significance

Using the ranked list from Step 8a, the Expert Panel closely examined the rivers, and their attribute scores. The following criteria were applied to defining importance within the Appendix 3 evaluation:

National significance:

Criterion 1: *Species strongholds* – if any river contained one or more species with over 5% of the total population(s) then = 3, and automatic national significance. We chose 5% as this level has been used in a number of Water Conservation Order decisions as being a threshold for national importance (despite the fact that the World Conservation Union (IUCN) uses a 1% level for international significance); or

Criterion 2: total score is 15 or more then national significance.

Regional significance:

Those rivers in the table not defined as nationally or locally significant, and scoring 11-14.

Local significance:

Sole criterion: *Number of 'threatened or at risk' species present* = 0 and all other indicator columns (i.e., 1-5) are 2 or less then automatic local significance; or if the total score <11 = local significance.

Translation of these functions to rivers is shown in Appendix 3.

The Expert Panel assessed the output from this process against the results of existing assessments and other relevant considerations, including:

1. Sites of Special Wildlife Interest for braided rivers in Gisborne District
2. Existing Water Conservation Orders associated with birdlife
3. Existing planning documents, including Regional Plans under the Resource Management Act, and
4. Reference to Ministry for the Environment Waters of National Importance work.

It is acknowledged that, owing to the judgmental nature of this exercise, rivers close to the threshold points could 'swing either way'.

Outcome

A list of rivers ranked by a scoring system from highest to lowest, which represents an initial significance ranking list (Appendix 2).

Rivers identified as significant at the national, regional and local level - see Appendix 2. No Gisborne District rivers are considered of national importance to native birdlife. Indeed, only the lower Waiaapu was considered of regional importance; this designation accorded by the Expert Panel despite the river scoring only 10 in the assessment. The Expert Panel considered the lower Waiaapu's combination of:

- relatively high habitat quality,
- the confirmed presence of three 'threatened and at risk' species (one of which, banded dotterel, confirmed as breeding there (K Hughey pers. obs. November 2011), and
- the fact it is the only significant habitat of its type in the area meant the river warranted regional importance status.

Rivers in the Gisborne District not listed have either very low value to birdlife dependent on rivers or streams or are of unknown value.

Step 9: Outline other factors relevant to the assessment of significance

Perhaps the most telling other issue concerns the inadequate 'state' of the survey data – apart from our own very limited November 2012 visit to the braided section of the Waiapu. As a consequence, and unlike for Canterbury (and to a lesser extent Tasman and Hawkes Bay), there is little quantitative data available and this needs to be noted. Despite these comments we are of the view that our assessments are likely to be 'reasonably accurate' at least as far as diversity is concerned, if not in terms of absolute numbers.

Outcome

Notes have been made in Appendix 2 about other species based on expert knowledge.

Chapter 3

Application of the RiVAS+ Methodology

Step 10: Identify rivers and interventions

Rivers for potential state assessment

The river sections identified in the RiVAS assessment (see Appendix 2) were used as the basis for the RiVAS+ analysis. The Expert Panel considered every river section for its potential value.

Potential interventions

Means by which river conditions may be enhanced are listed in Table 2.

Table 2
Potential interventions to enhance river values

1. Manage access
1a. Enhance access and/or 1b. Control access
i) Helicopter access
ii) Vehicle access
iii) Boat access
iv) Foot access
2. Enhance flow
a. Increase minimum
b. Stabilise (around targeted specific flow)
c. More natural variability
d. Restore flood flows
e. Transfer water between catchments
3. Improve bed & in-stream habitat
a. Maintain channel works (e.g. groynes, other structures) that enhance worth
b. Remove channel works (groynes, stop banks etc) that detract from worth
c. Control weeds (in-stream, including active river bed) to enhance worth
d. Remove hazards (e.g., wire, trees, old structures, forestry slash)
e. Leave woody debris in river that enhance worth
f. Improve timing of management within flood control area, including root raking
4. Remove or mitigate fish barriers
a. Culverts
b. Dams
c. Flood gates
d. Chemical
5. Set back stopbanks
6. Improve riparian habitat
a. Weed control
b. Pest control
c. Native revegetation
d. Remove litter
7. Enhance water quality
a. Remove/fence out stock
b. Reduce non-point source nutrient pollution (e.g., farm nutrient budgets)

- c. Reduce point source pollution (e.g., mining waste)
- d. Reduce sediment input (e.g., forest management practices)

8. Stock with fish

9. Provide amenities

- a. Boat launching facilities
 - b. Car parking
 - c. Toilets
 - d. Storage facilities (for kayaks etc)
 - e. Artificial hydraulic feature (for kayakers, swimmers, anglers)
 - i) Slalom course
 - ii) Play wave
 - iii) Swimming hole
 - f. Interpretive signage
 - g. Riverside track (for access)
-

10. Construct water storage

- a. In-river
 - b. Out-of-river
-

11. Develop a run-of-the-river diversion

12. Provide telemetered flow monitoring (& communicate readings)

Outcomes

Appendix 3 lists the Gisborne District river sections used for the RiVAS+ assessment. Table 2 and Appendix 3 record potential interventions.

Step 11: Apply indicators and indicator thresholds for potential value

Taking each river in turn, the Expert Panel considered which interventions were relevant to that river. These were recorded in Appendix 3.

The Panel then considered the net effect of these interventions upon the value of the river to native birdlife. The degree or extent of intervention was discussed. The RiVAS+ methodology calls for the panel to select the two most important interventions for each river, and for these to be practical and feasible rather than ideal. As only two interventions for each of three of the four river sections where potential changes could occur were recorded this task was not necessary. But, for the Motu interventions 6c and 7a were identified as the priorities, although interestingly the benefits to blue duck would occur in the Environment Bay of Plenty region.

The effect of the potential interventions was assessed for each indicator by considering the current score (from RiVAS) and identifying whether the score would change as a result of the interventions.

The new scores were recorded. Where the Panel believed the interventions were likely to enhance (or degrade) river conditions for native birdlife, but that the score itself would not change, '+' or '-' was recorded, indicating a positive or negative shift respectively. Where no change was thought likely, the RIVAS score was not altered (cells were left blank for convenience).

As may be expected, rivers with high current value did not change – rivers with lower current value offer the greatest opportunities for enhancement, but not enough in the assessment to change any overall rankings.

Outcome

Appendix 3 records the indicator scores for potential value.

Step 12: Weight the primary attributes for potential value

Because no attributes or indicators were altered for the RIVAS exercise, weightings were not revisited (i.e. an equal weighting regime was automatically applied to the RIVAS+ exercise).

Outcome

The RIVAS weighting regime (equal weighting) applied.

Step 13: Determine river potential value

The scores were summed for each river. A score of 0.5 was given to each '+' and '-' (i.e. +0.5 or -0.5).

Of the 19 rivers, four altered their sum, all in a positive direction. However, no river shifted by more than half of one numeric point, i.e., by more than 0.5.

In total, four rivers were identified as having potential to improve river conditions in a way that would enhance the native birdlife value (Appendix 3). For the upper Waioeka, Hangaroa and Ruakituri the interventions chosen were all:

- 6a. Improve riparian habitat – Weed control
- 6b. Improve riparian habitat – Pest control

For the Motu four interventions were chosen, namely:

- 6a. Improve riparian habitat – Weed control
- 7a. Enhance water quality - Remove/fence out stock
- 7b. Enhance water quality - Reduce non-point source nutrient pollution
- 7d. Enhance water quality – Reduce sediment input.

Outcomes

Appendix 3 provide a list of rivers ranked by their potential increase in value for native birdlife, with possible interventions identified for each river.

References

- Hughey, K.F.D., O'Donnell, C.F.J., Schmechel, F., Grant, A. 2010. Native Birdlife: Application of the River significance assessment method to the Canterbury region. Pp.61-80, in: Hughey, K.F.D., Baker, M-A. (eds). (2010b). [The River Values Assessment System: Volume 2](#): Application to cultural, production and environmental values. LEaP Report No.24B, Lincoln University, New Zealand.
- Gaze, P., James, T., Hughey, K.F.D. 2010. Native birds in Tasman District: Application of the River Values Assessment System (RiVAS). Pp.81-92, in: Hughey, K.F.D., Baker, M-A. (eds). (2010b). [The River Values Assessment System: Volume 2](#): Application to cultural, production and environmental values. LEaP Report No.24B, Lincoln University, New Zealand.

Appendix 1

Credentials of the Expert Panel members and peer reviewers

The Expert Panel comprised three members. Their credentials are:

Sandy Bull (MNZM) has a long history of involvement in native birdlife matters, in the Gisborne area in particular, including acting as a wildlife consultant. and is currently director of a consultancy "Wildlife Enterprises". Sandy was previously employed by the Department of Internal Affairs (Wildlife Services) and the Department of Conservation (Protected Species) and was a wildlife/fisheries ranger for some ten years in the Gisborne, Wairoa, East-Coast Districts. Sandy is a former member of the East Coast Conservation Board and a current member of the Ornithological Society. Sandy is the Wildlife Coordinator/Advisor to the Gisborne District Council relating to Marine Oil Spill, reporting to Massey University. He is also Chairman of Tuahine Point Ecological Trust, Wildlife monitor to Nicks head station – Muriwai. In 2006 Sandy was awarded the MNZM for services to conservation.

Andy Bassett is the Area Manager for the Gisborne/Opotiki/ Whakatane Area with the Department of Conservation. Andy has worked in the conservation field for 33 years and has been located on the East Coast for the past 22 years. He has an extensive knowledge of the East Coast, Opotiki and Gisborne regions. He is a keen ornithologist and partakes in bird sighting and identification as a past time, commonly referred to as "bird ticking" and is up to 167 bird species found in New Zealand. Andy has also been involved in many bird species programmes throughout New Zealand including the Chatham Islands and Raoul Island.

Ken Hughey is Professor Environmental Management at Lincoln University. His expert knowledge of river birdlife spans the period 1981-2011, including his PhD thesis (habitat needs of birds of braided rivers), multiple river bird surveys in almost all regions of the South Island, expert evidence at multiple hearings and published research papers (e.g., Hughey 1997, 1998, Duncan et al., 2008). Ken is overall project manager of the river values project. Selected references related to riverbed birds include:

Duncan, M.J., Hughey, K.F.D., Cochrane, C.H., Bind, J. 2008. River modelling to better manage mammalian predator access to islands in braided rivers. In: Sustainable Hydrology for the 21st Century, Proc. 10th BHS National Hydrology Symposium, Exeter. 487-492.

Hughey, K.F.D. 1997. The diet of the wrybill (*Anarynchus frontalis*) and the banded dotterel (*Charadrius bicinctus*) on two braided rivers in Canterbury, New Zealand. *Notornis* 44: 185-193.

Hughey, K.F.D. 1998. Nesting home range sizes of wrybill (*Anarynchus frontalis*) and banded dotterel (*Charadrius bicinctus*) in relation to braided riverbed characteristics. *Notornis* 45: 103-111.

Appendix 2 Significance assessment calculations for birdlife (Steps 1 and 5-8)

Catchment	River	PRIMARY ATTRIBUTES						SCORING OF PRIMARY ATTRIBUTES						Step 8: River significance	Step 9 - issues	Notes		
		Step 6A: Apply indicators and thresholds						Step 6B: Apply indicators and thresholds										
		1. Relative distinctiveness (Subj)	2. Amount of Habitat (Obj) - measured in area for braided rivers and distance for single channel rivers. Note that while some braided rivers also have single channel reaches it is the dominant habitat that is recorded	3. Numbers (Obj)	4. Foraging guilds (Obj)	5. Number of 'threatened or at risk' species present (Obj) (Note: 3 species not included: grey duck, NZ pipit, Australasian bittern - see main report for reasons)	6. Proportion of 'threatened or at risk' species present with a significant (>1% or >5%) proportion of their total populations (Obj/Subj)	1. Relative distinctiveness of habitat	2. Amount of Habitat	3. Numbers (ranked with SBBG removal adjustment)	4. Foraging guilds	5. Number of 'threatened or at risk' species present (Obj)	6. Species strongholds				Sum Weights	Overall evaluation of importance
		Step 6A: Apply indicators and thresholds						INDICATOR THRESHOLDS										
		1= Habitat type or species assemblage widely represented elsewhere in NZ; 2= Habitat type or species assemblage rarely represented elsewhere in NZ; 3= Habitat type or species assemblage not represented in other regions in NZ	ha for braided river birds	km for mainly single channel bird rivers	Number adjusted by removing SBBGs	Ranges from 0-8, i.e., a= open-water divers; b= deep water waders; c= shallow water waders; d= dabbling waterfowl; e= torrent specialists; f= aerial hunting gulls and terns; g= swamp specialists; h= riparian wetland birds	Principally: blue duck (BD), black stilt (BS), wrybill (WB), banded dotterel (BDo), black-fronted tern (B-FT), black-billed gull (B-BG), pied stilt (PS), NZ pied oystercatcher (NZPO), white-fronted tern (W-FT); red-billed gull (R-BG); Caspian tern (CT); southern crested grebe (SCG); NZ dabchick (DC), white heron (WH), Royal Spoon Bill (RSB)	Principally: blue duck (BD), black stilt (BS), wrybill (WB), banded dotterel (BDo), black-fronted tern (B-FT), black-billed gull (B-BG), pied stilt (PS), NZ pied oystercatcher (NZPO), white-fronted tern (W-FT); red-billed gull (R-BG); Caspian tern (CT); southern crested grebe (SCG); NZ dabchick (DC) - note that where surveys are based only on part sections then expert assessment is used to estimate proportionality.	1= low; 2= medium; 3= high	1=<5000ha and/or <10km; 2=5000-9999ha and/or 10-30km; 3= >10000ha and/or >30km	1=<1000 individuals; 2= 1000-4999 individuals; 3=>5000 individuals	1-4 = low = 1; 5-6= medium = 2; 7-8= high = 3	1=1; 2-3= 2; 4 or more = 3	0= no species with >1% of the total population; 1= 1 at 1-4.9% = low; 2= 2 at 1-4.9% = medium; 3= 1 or more > 5%, or 3 or more 1-4.9% = high	Standard	DSS: If column 6, of Step 6B, (threatened spp >5%) = 3; or total score is 15 or more = national importance; if all columns 1-5 are 2 or less and column 6 is 0; or the total score <10 = local; otherwise regional	Data source - note that for the Canterbury area the best source of data is the Department of Conservation via A. Grant. He has compiled a relatively comprehensive and up-to-date set of survey data incorporating DoC, ECan and other surveys.	
Wharekahika River and tributaries	2	c.20	100	a,b,d,h	0	0	2	2	1	1	0	0	6	Local	Grey duck			
"Coastal" Karakatuwhero River	1	c.50	c.40	200	a,b,c,d,g,h	BD,PS	0	1	3	1	2	2	0	9	Local	Large swamp with bittern, marsh & spotless crane, NI fernbird		
Awatere River and tributaries	1	c.50	c.40	200	a,b,c,d,g,h	BD,PS	0	1	3	1	2	2	0	9	Local			
Awatere Kopuapouamu	1	c.100	c.50	400	a,d,h		0	1	3	1	1	0	0	6	Local	S Bull, K Hughey and J Callis looked at on 29th November 2011 - very poor, overgrown, few native riverbed birdlife	NZ pipit	
Waiapu Upper Mata River (Incl. Waitahaia)	1	>30km	50	a,b,d,h			0	1	3	1	1	0	0	6	Local			

Waipapu	Lower Waiapu (below Mokoivi, braided section)	2	c.300	c.50	500	a,b,c,d,f,h	BD,PS,CT	0	2	3	1	2	2	0	10	Regional	S Bull, K Hughey and J Callis on 29th November 2011, undertook brief field visit - good quality habitat and stilt, dotterel and Caspian tern seen	NZ pipit
	Lower Uawa	1		c.30	50	a,b,c,d,g,h	BD,PS	0	1	3	1	2	2	0	9	Local		Attaches to good estuarine lagoon
Waipaoa	Te Arai River	1		c.20	50	a,b,d,h		0	1	2	1	1	0	0	5	Local		
Waipaoa	Wharekopae	1		c.15	50	a,b,d,h		0	1	2	1	1	0	0	5	Local		More stable - better habitat
Waipaoa	Waihuka	1		c.30	<50	a,b,d,h		0	1	2	1	1	0	0	5	Local		
Waipaoa	Waikohu	2		c.15	50	a,b,d,h		0	2	2	1	1	0	0	6	Local		More stable - better habitat, Grey duck
Waipaoa	Wairongomia	1		c.25	<50	a,b,d,h		0	1	2	1	1	0	0	5	Local		
Waipaoa	Waihora	1		c.30	<50	a,b,d,h		0	1	2	1	1	0	0	5	Local		
Waipaoa	Mangatu	1		c.20	<50	a,b,d,h		0	1	2	1	1	0	0	5	Local		NZ pipit
Motu	Motu	1		c.25	100	a,b,d,h		0	1	2	1	1	0	0	5	Local		
	Upper Waioweka	1		c.10	40	a,b,d,e,h	BD	0	1	1	1	2	1	0	6	Local		
Wairoa	Hangaroa (incl. Mutuera)	1		c.30	200	a,b,d,e,h	BD (<30)	0	1	1	1	2	1	0	6	Local		Grey duck
Wairoa	Mangapoike	1		c.20	50	a,b,d,h		0	1	2	1	1	0	0	5	Local		
	Ruakituri	1		c.30	200	a,b,d,e,h	BD (<30)	0	1	1	1	2	1	0	6	Local		

Significance thresholds (highlighted columns)

Green	High = National	
Blue	Medium = Regional	
Yellow	Low = Local	

Misc (highlighted rivers)

Pink	Rivers overlap with neighbouring council
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Data reliability (font colour)

Black	Reliable data
Blue/Purple	Less reliable data, also
Red	Data checked by Expert Panel and has been adjusted

Appendix 3

Potential significance assessment calculations for native birdlife (RiVAS+) (Steps 10-13)

	River	Interventions (choose from pick list)	PRIMARY ATTRIBUTES						SCORING OF PRIMARY ATTRIBUTES						Step 8: River significance		Overall evaluation of importance	
			Step 6A: Apply indicators and thresholds						Step 6B: Apply indicators and thresholds						Sum Weights 1	Sum Weights 2		
			1. Relative distinctiveness (Subj)	2. Amount of Habitat (Obj) - measured in area for braided rivers and distance for single channel rivers. Note that while some braided rivers also have single channel reaches it is the dominant habitat that is recorded	3. Numbers (Obj)	4. Foraging guilds (Obj)	5. Number of 'threatened or at risk' species present (Obj) (Note: 3 species not included: grey duck, NZ pipit, Australasian bittern - see main report for reasons)	6. Proportion of 'threatened or at risk' species present with a significant (>1% or >5%) proportion of their total populations (Obj/Subj)	1. Relative distinctiveness of habitat	2. Amount of Habitat	3. Numbers (ranked with SBBG removal adjustment)	4. Foraging guilds	5. Number of 'threatened or at risk' species present (Obj)	6. Species strongholds				
INDICATORS						INDICATOR THRESHOLDS						Standard	New rating after RiVAS+					
			1= Habitat type or species assemblage widely represented elsewhere in NZ; 2= Habitat type or species assemblage rarely represented elsewhere in NZ; 3= Habitat type or species assemblage not represented in other regions in NZ	na for braided river birds	km for mainly single channel bird rivers	Number adjusted by removing SBBGs	Ranges from 0-8, i.e., a= open-water divers; b= deep water waders; c= shallow water waders; d= dabbling waterfowl; e= torrent specialists; f= aerial hunting gulls and terns; g= swamp specialists; h= riparian wetland birds	Principally: blue duck (BD), black stilt (BS), wrybill (WB), banded dotterel (BDo), black-fronted tern (B-FT), black-billed gull (B-BG), pied stilt (PS), NZ pied oystercatcher (NZPO), white-fronted tern (W-FT); red-billed gull (R-BG); Caspian tern (CT); southern crested grebe (SCG); NZ dabchick (DC)	Principally: blue duck (BD), black stilt (BS), wrybill (WB), banded dotterel (BDo), black-fronted tern (B-FT), black-billed gull (B-BG), pied stilt (PS), NZ pied oystercatcher (NZPO), white-fronted tern (W-FT); red-billed gull (R-BG); Caspian tern (CT); southern crested grebe (SCG); NZ dabchick (DC) - note that where surveys are based only on part sections then expert assessment is used to estimate proportionality.	1= low; 2= medium; 3= high	1=<5000ha and/or <10km; 2=5000-9999ha and/or 10-30km; 3= >10000ha and/or >30km	1=<1000 individuals; 2= 1000-4999 individuals; 3=>5000 individuals	1-4 = low = 1; 5-6= medium = 2; 7-8= high = 3	1=1; 2-3= 2; 4 or more = 3	0= no species with >1% of the total population; 1= 1 at 1-4.9% = low; 2= 2 at 1-4.9% = medium; 3= 1 or more > 5%, or 3 or more 1-4.9% = high	Standard	New rating after RiVAS+	DSS: If column 6, of Step 6B, (threatened spp >5%) = 3; or total score is 15 or more = national importance; if all columns 1-5 are 2 or less and column 6 is 0; or the total score <10 = local; otherwise regional
	Wharekahika River and tributaries		2		c.20	100	a,b,d,h		0	2	2	1	1	0	0	6		Local
"Coastal"	Karakatuwhero River		1	c.50	c.40	200	a,b,c,d,g,h	BD,PS	0	1	3	1	2	2	0	9		Local
Awatere	Awatere River and tributaries		1	c.50	c.40	200	a,b,c,d,g,h	BD,PS	0	1	3	1	2	2	0	9		Local
Awatere	Kopuapounamu		1	c.100	c.50	400	a,d,h		0	1	3	1	1	2	0	8		Local
Waiapu	Upper Mata River (Incl. Waitahaia)		1		>30km	50	a,b,d,h		0	1	3	1	1	0	0	6		Local
Waiapu	Lower Waiapu (below Mokiwi, braided section)		2	c.300	c.50	500	a,b,c,d,h	BDo,PS	0	2	3	1	2	2	0	10		Regional
	Lower Uawa		1		c.30	50	a,b,c,d,g,h	BDo,PS	0	1	3	1	2	2	0	9		Local
Waipaoa	Te Arai River		1		c.20	50	a,b,d,h		0	1	2	1	1	0	0	5		Local

Waipaoa	Wharekopae		1	c.15	50	a,b,d,h		0	1	2	1	1	0	0	5		Local
Waipaoa	Waihuka		1	c.30	<50	a,b,d,h		0	1	2	1	1	0	0	5		Local
Waipaoa	Waikohu		2	c.15	50	a,b,d,h		0	2	2	1	1	0	0	6		Local
Waipaoa	Wairongomia		1	c.25	<50	a,b,d,h		0	1	2	1	1	0	0	5		Local
Waipaoa	Waihora		1	c.30	<50	a,b,d,h		0	1	2	1	1	0	0	5		Local
Waipaoa	Mangatu		1	c.20	<50	a,b,d,h		0	1	2	1	1	0	0	5		Local
Motu	Motu	6c,7a7b,7d	1	c.25	100+	a,b,d,h		0	1	2	1(+.5)	1	0	0	4	5.5	Local
	Upper Waioweka	6a,6b	1	c.10	40	a,b,d,e,h	BD+	0	1	1	1	2	1	0(+0.5)	6	6.5	Local
Wairoa	Hangaroa (incl. Mutuera)	6a,6b	1	c.30	200	a,b,d,e,h	BD (<20)+	0	1	1	1	2	1	0(+0.5)	6	6.5	Local
Wairoa	Mangapoike		1	c.20	50	a,b,d,h		0	1	2	1	1	0	0	5		Local
	Ruakituri	6a,6b	1	c.30	200	a,b,d,e,h	BD (<30)+	0	1	1	1	2	1	0(+0.5)	6	6.5	Local

Significance thresholds (highlighted columns)

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Misc (highlighted rivers)

Pink	Rivers overlap with neighbouring council
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Data reliability (font colour)

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Red	Data checked by Expert Panel and has been adjusted

RiVAS+ (highlighted rows)

Blue	Also assessed for potential future state (RiVAS+)
Orange	Score changed by proposed interventions (RiVAS+)
Green	Positive influence on attribute but not enough to shift value - counted as an increase of 0.5 (RiVAS+)