Native birds and their habitat needs on Canterbury rivers

Ken Hughey
Lincoln University
2006
Outline

• Wildlife context – communities of birds and conservation status on Canterbury rivers
• Critical rivers
• Key habitat drivers
• Ability to sustain bird populations based on scientific modelling:
  – PVA modelling
  – Habitat modelling
• Impacts and mitigation measures
• Information needs in future planning: Hurunui, Ashburton, etc
Communities of birds (guilds) on Canterbury rivers

(i) Open water divers. Cormorants and diving waterfowl that usually forage in open, deep waters on both lakes and rivers.

(ii) Deep water waders. Waders with medium-long legs that allow them to forage in water depths of >200 mm as well as shallow water (e.g., stilts, herons, oystercatchers).

(iii) Shallow water waders. Waders with short legs that restrict them to feeding in water <80 mm, and most use is of water <40 mm deep (e.g. plovers, sandpipers).

(iv) Dabbling waterfowl. Ducks and swans (e.g., NZ shoveler, paradise shelduck)

(v) Aerial hunting gulls and terns e.g., black-fronted tern, black-billed gull). They nest on open shingle bars and islands.

(vi) Swamp specialists. Rails, such as marsh crake and pukeko, and bittern that dwell in dense swamp vegetation associated with wetlands.

(vii) Riparian wetland species. Species that do not exclusively depend on either terrestrial or aquatic habitats (e.g., swallows, pipits, kingfishers).
Conservation status of key species

- Wrybill: 3-4,000 – nationally vulnerable
- Banded dotterel: 30-50,000 – gradual decline
- Black-fronted tern: 5-10,000 – serious decline
- Black-billed gull: 95,000 – serious decline

(Source: Hitchmough and Bull in press)
Distribution of key braided river wildlife in Canterbury

- Waimakariri – wrybill, black-fronted tern
- Mackenzie Basin: black stilt, wrybill, black-fronted tern
- Hurunui – black-fronted tern
- Rakaia – wrybill, black-fronted tern
- Lower Waitaki – black-fronted tern
- Rangitata – wrybill, black-fronted tern
- Ashburton – black-fronted tern, black-billed gull
- Ashburton
Canterbury’s key rivers for particular birdlife

- Canterbury’s braided rivers are unique on a world wide basis - they are large, wide, unstable, in relatively low lying areas, instream value laden, and in demand for extractive uses.

- Key rivers and catchments are, from north to south (noting that most contain birdlife of some importance but the following are the key rivers; also note the single best river outside Canterbury is the Wairau):
  - Hurunui: black-fronted terns (BFT)
  - Waimakariri: BFTs, wrybills (WB), banded dotterel (BD)
  - Rakaia: BFTs, WBs, BDs
  - Ashburton: BFTs, BDs, black-billed gulls (BBG)
  - Rangitata: BFTs, WBs, BDs
  - Waitaki and catchment rivers: BFTs, WBs, BBGs, BDs, black stilt
Key habitat needs and drivers of change

The bird community and individual species have synergistic and sometimes overlapping needs:

- multiple channels – for feeding in/over and for providing protection on islands from invading predators
- suitable flow regime – as above
- ‘bare’ shingle islands – for nesting
- large areas of habitat for territorial species – for wrybills up to several hectares per pair.
Examples of hypothesised interactions between the different factors include:

1 – river flow is modified by abstraction, damming or a combination of the two, changing river flows and flood frequencies and magnitudes;
2 – surrounding land use directly impacts on water quality and river management including flood protection schemes which reduce the area of active riverbed;
3 – rabbit control on farmland lowers rabbit abundance;
4 – differing land use practices changes habitat availability for predators;
5 – predator abundance is altered by changes to rabbit abundance but also helps control rabbit abundance;
6 – vegetation on riverbeds provide cover for predators;
7 – predators prey on eggs, chicks and adults;
8 – weeds clog up breeding habitat and alter feeding habitat;
9 – vegetation provides cover and food for rabbits, but some weed species are controlled by rabbit grazing;
10 – lowered water flows and floods allow vegetation to establish on riverbed;
11 – floods destroy nests;
12 – lowered water flows can alter abundance of aquatic insects and feeding areas;
13 – food abundance can influence survival of young or condition of breeding adults;
14 – fishers, campers and four-wheel drivers can destroy nests or disturb breeding birds;
15 – extreme cold spells can kill eggs and chicks;
16 – high rainfalls can cause floods.
The braided Tasman riverbed - Mt Cook in background
Photograph 4-2 Typical braided section, Kurow to SH 1, river flow 152 cusecs
Habitat degradation is, in some cases leading to species decline, namely via the often interactive/ synergistic effects of:

- Water abstraction, and damming;
- River protection works;
- Encroachment of exotic plants;
- Predation by introduced mammals;
- Disturbance by stock, fishers & vehicles.
Trends - habitat & species

HABITAT:

• Vegetation encroachment is increasing on most rivers (Opihi now virtually destroyed as a habitat for key species) - new habitat equilibrium on some rivers;
• Water loss is increasing but mitigation and compensation in some places, e.g., Project River Recovery in the Mackenzie Basin;
• Predators not controlled, virtually anywhere.

AS A RESULT OF DECLINING HABITAT QUALITY:

KEY SPECIES:

• Black-fronted tern – declining as fast as brown kiwi
• Black-billed gull – declining very quickly
• Wrybill – static or slight long-term decline
Ability to sustain bird populations based on scientific modelling:

- **Population Viability Modelling (PVA):** an interactive model which predicts short and long term changes according to a range of measures, e.g., known breeding success, habitat changes.
  - Has been applied to several species including black-fronted tern: given existing trends, including habitat loss, the long term outlook is very bleak.

- **Habitat modelling:** 1-D and 2-D hydraulic modelling based on river behaviour changes and known attributes of bird habitat needs, e.g., feeding habitat, nesting habitat, predator access.
  - Limited application to birds but much better information available for fish and invertebrates;
  - Used for predictive purposes with limited success on the Rangitata and Wairau rivers.
Management/research needs

• We do not know, despite the suggestions of a few consultants, the relationship between river flows and mammalian predation, but the theory is the higher the flows the lower the predation.

• We do not have a good understanding of the energetics of some species, especially terns, in relation to feeding and habitat requirements.

• In the absence of ‘quality’ science on the above, conservation managers have to be extremely cautious and recommend ‘high’ minimum flow and sharing regimes and/or expensive mitigation packages, esp. around predator control.
### Impacts and mitigation measures

#### Impact
- Lowered flows will increase predator access
- Weed growth enhanced – reduced & poorer nest sites & better predator habitat
- Reduced flows will reduce feeding habitat
- Increased disturbance from stock and people

#### Mitigation
- Active predator control for colonies
- Mechanical and herbicide control to maintain existing areas
- Feeding habitat not seen as limiting
- Fencing of stock and controls on recreation access
Conclusions

• Canterbury’s rivers, especially the wide braided rivers, are special habitats for birdlife, occupied by a range of bird guilds.
• Several threatened and endangered species are enormously reliant on these rivers.
• The habitat needs of birdlife are highly dependent on controls maintained by river flows.
• There is a lack of research and at least 2 key critical habitat relationships: predation-flow; energetics;
• Some mitigation measures are possible but key ones are very expensive, e.g., vegetation management and predator control.