Site assessments of two Canterbury braided rivers to determine the suitability for reintroducing Kakī (*Himantopus novaezelandiae*)

Ashley-Rakahuri River & Upper Rangitata River

Julia Nicholls  
Master of Wildlife Management, University of Otago

Kakī background

- Wading, insectivorous shorebird
- Inhabits braided rivers of the Mackenzie Basin
- New Zealand’s only endemic stilt species
- Critically Endangered (IUCN Red List)
- Formally widespread
- 1980 – low of 23
- 2015 – 77 adults
- Threats include predation, habitat modification and hybridization

Photo: Julia Nicholls

Adult kakī
Management

• Recovery Plan (2001) aim: to increase kakī numbers, breeding success and adult survival in the wild (Maloney & Murray 2001)

• Management includes:
  – egg manipulation
  – captive breeding and rearing for release
  – controlling the formation of mixed pairs
  – predator control
  – habitat protection and enhancement

• Recruitment:
  – Captive reared & released birds: 20% for juveniles, 24% for sub-adults
  – Wild hatched chicks: 4%
Rationale & Objectives

Rationale

• Previous recovery plans have considered translocation as an additional management option
• An additional site would be useful as an insurance population, in case of loss of the current small and restricted population through natural or anthropogenic disturbances
• Could be useful to test if other parts of the former kakī range provide better habitat than is available for the current remnant population

Objectives

• To determine whether the two sites, the Ashley-Rakahuri River or the Upper Rangitata are suitable reintroduction sites for kakī
• Select criteria to be assessed at each site
Methods – Study Sites

• Ashley-Rakahuri river
  – North Canterbury lowland river
  – Managed by the Ashley-Rakahuri Rivercare Group

• Upper Rangitata river
  – Mid Canterbury
  – Managed by the Department of Conservation
Methods - Assessment Criteria

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Justification</th>
</tr>
</thead>
</table>
| 1. Habitat Availability   | • Breeding occurs on shingle islands, absent of weeds  
                               • Additional habitat includes river deltas, estuaries or wetlands, used during the winter and flooding  
                               • Flooding during the breeding season can destroy nests |
| 2. Food Availability      | • Kakī feed primarily on aquatic invertebrates  
                               • Opportunistic, generalist feeders |
| 3. Predators              | • Mammalian predators are the main cause of population decline  
                               • Predator control can increase fledging success and adult survival |

Methods - Data Collection

Field observations
• Ashley-Rakahuri River
  – Weed coverage estimates
  – Pied stilt observations

Additional sources
• Communications with ARRG and DOC, additional information from Environment Canterbury, the scientific literature, internal reports and raw data

Criteria assessment
• Discussion with and guidance from the Kakī Recovery Programme DOC officers on the suitability of each site, based on each criterion
• Each criterion was assigned a ranking of 1-5 (1=not suitable, 5=suitable)
Assessment – Habitat & Food Availability

• Ashley-Rakahuri River

Map source: Canterbury Maps – Latest Imagery
Habitat & Food availability: Ashley-Rakahuri River

• Weed coverage estimates
  – Dense vegetation: 35%, light vegetation: 41%, open gravel: 15%, water: 9%

• Flooding (past 20 years)
  – Over 100 m³s⁻¹: 51 flood events
  – Flood every year, except 1998 and 2005
  – 45% during breeding season, 55% outside breeding season

• Variety of habitat
  – Estuary, various ponds and wetlands (Tūhaitara Coastal Park)
  – Provides foraging habitat during floods and outside breeding season

Photo: Julia Nicholls
2014 breeding pairs: 60-80 black-fronted tern pairs, 10 wrybill pairs, many pied stilts pairs

Pied stilt feeding observations: 30 feeding from 118 observations

Figure 1: Counts of river bird species on the Ashley-Rakahuri River during a single, one day survey in 2015
Habitat & Food Availability: Ashley-Rakahuri River

Criteria Rankings (1=not suitable, 5=suitable)

• Habitat availability – 3
  – Weeds are abundant
  – Floods occur frequently, but island creation would ensure increased nesting habitat
  – Other species indicate nesting habitat available
  – Diverse habitat types

• Food availability – 4
  – Presence & observations of pied stilts
  – Presence of other river bird species
  – Diverse habitat types
Habitat & Food Availability

- Upper Rangitata River
  - Weeds are localized
  - Russell lupin, yellow tree lupin, gorse & broom
  - Annual weed control

Map source: Canterbury Maps – Latest Imagery
Habitat & Food Availability: Upper Rangitata River

- Flooding (past 20 years)
  - Over 400 m$^3$s$^{-1}$: 190 days of flooding, 89 flood events
  - At least 1 flood occurred every year
  - 69% during breeding season, 31% outside breeding season

- Species counts in 2012

Figure 2: Counts of river bird species on the Upper Rangitata in 2012
• Ashburton Lakes
  – Small areas of foraging habitat e.g. Lake Heron
  – 2 pied stilts observed on 14/11/15
  – Majority of lakes unsuitable for large numbers of stilts due to deep water and steep edges

Lake Heron

Photo: Julia Nicholls
Habitat & Food Availability: Upper Rangitata River

Criteria Rankings (1=not suitable, 5=suitable)

• Habitat Availability – 4
  – Weeds are scarce & localized
  – Efficient annual weed control
  – Presence of other species
  – Limited foraging habitat outside breeding season and during floods

• Food Availability – 3
  – Other species abundant
  – Lacking habitat diversity
  – Food may be limiting during floods or winter
Figure 3: Pied stilt observations – red stars (n = 118). Trap Types: light blue triangles – Timms (n=57), light green circles – DOC200s (n = 53), dark blue circles – DOC250’s (n = 2), magenta circles – Tunnel traps (n = 2).
Predators: Ashley-Rakahuri River

Figure 4: Predator density (catch/100 trap nights) for the Ashley-Rakahuri River (blue diamonds), Upper Rangitata River (green triangle) and Tasman River (red squares) between September to January.

- Total catch - Ashley: hedgehogs (234), cats (36), stoats (26) and weasels (10)
- Total catch - Tasman: hedgehogs (1739), stoats (448) and cats (162)
Predators: Ashley-Rakahuri River

Outcome monitoring

- Wrybill average productivity: 0.84 chicks/pair
- Black-fronted tern average productivity: 0.41 chicks/pair

Black-fronted tern numbers

- 1980-2008: no significant increase, but positive trend (O’Donnell & Hoare 2011; Monks et al. 2013)
- 2000-2015 – managed by the AARRG, significant increase ($P=0.024$; Monks et al. 2013; Spurr & Ledgard unpubl. report)
- Also significant increases in abundance of wrybill, pied stilt and banded dotterel (Spurr & Ledgard unpubl. report)

Figure 5: Black fronted tern numbers on the Ashley-Rakahuri River from 2000-2015.
Predators: Ashley-Rakahuri River

Criteria Ranking (1=not suitable, 5=suitable)

• Predators – 3
  – Traps placed in proximity to where nests are, but not distributed along entire length of the river
  – Catch rates are higher than the Tasman River
  – Outcome monitoring parameters not comparable to the Tasman River
  – Predator control contributing to increasing river bird numbers
Predators: Upper Rangitata River

Figure 4: Locations of traps on the Upper Rangitata River. Trap types: light blue triangles – Timms (n = 139), pink circles – DOC150’s (n = 558), dark blue circles – DOC250’s (n = 244), yellow circles – Conibear (n = 114).
Predators: Upper Rangitata River

- 2015/16 catch rate – 0.47 predators/100 trap nights
- September-January - 0.39 predators/100 trap nights
- Main predators caught: hedgehogs (667), rats (92), cats (70), stoats (63) and ferrets (56)
- Average number of Southern black-backed gulls – 401

Outcome Monitoring

- Pre-trapping breeding success
  - Wrybill: 2011/12 – 0.26 (Sullivan 2011; Langlands & Long unpubl. report)
  - Black-fronted tern: 2014/15 – 0 (no chicks fledged)
- Tasman River breeding success
  - Wrybill: 2014/15 – 0.28
  - Black-fronted tern: 2014/15 – 0.35
Predators: Upper Rangitata River

Criteria Ranking (1=not suitable, 5=suitable)

- Predators – 3
  - Large trapping effort
  - Not complete on true left side
  - Only active for 1 year, no analysis into trapping effectiveness

DOC150 trap

Photo: Julia Nicholls
Conclusions & Recommendations

Ashley-Rakahuri River

• Overall, moderately suitable as a reintroduction site for kakī

Recommendations

• Implement annual weed control, targeting specific areas
• Increase trapping intensity & distribution
• Outcome monitoring needs to incorporate egg success, hatching success, fledging success and breeding success.
Conclusions & Recommendations

Upper Rangitata River

• Overall, moderately suitable as a reintroduction site for kakī

Recommendations

• Assess options for future habitat creation as additional foraging areas
• Continue weed control under current regime
• Need at least 3 years of post-trapping monitoring data to assess effectiveness of predator control

Photo: Julia Nicholls
Acknowledgements

• Richard Maloney
• Phil Seddon
• Yolanda van Heezik
• Ashley-Rakahuri Rivercare Group
• DOC Rangiora
• DOC Geraldine
• DOC Twizel
• Kakī Recover Programme
• Tūhaitara Coastal Park
• Environment Canterbury