Black-fronted terns
Population status, trends and threats

Colin O’Donnell and Jo Hoare
Department of Conservation, PO Box 13049, Christchurch
Black-fronted terns

• Braided river specialist
• Breeds on rivers then most migrate to coast and to North Island
• Thought to be declining
Status - Endangered

- Reviewed historic counts for 55 rivers
- Data for 1962-2007
  - 24 rivers = >4 counts
  - 9 rivers = >8 counts (max=17 counts)
- GLMs used to explore population trends
- Preliminary results - overall decline
  - Highly significant trends detected for the 9 rivers where n >8
Number of black-fronted terns on 55 rivers (Post 1995 counts)

Only 8 with > 200 terns
(Ahurst, Hurunui, Oreti, Rangitata, Waiau, Waimakariri, Wairau, Waitaki)
• 67% of rivers had lower counts than when first surveyed (post 1995 counts)
• mean = -ve 68% difference between first and last counts in series

Black-fronted tern population sizes on South Island rivers
Typical pattern of decline

Number of black-fronted terns on the Ashburton River

Number of terns

Year
Number of black-fronted terns on the Pukaki River
Number of black-fronted terns on the Ahuriri River

![Graph showing the number of black-fronted terns on the Ahuriri River from 1955 to 2010. The graph displays a decreasing trend in the number of terns over time.](image-url)
Number of black-fronted terns on the Ashley River

![Graph showing the number of black-fronted terns over the years from 1975 to 2010. The number of terns decreases over time, with a trend line indicating a downward trend.](image-url)
Number of black-fronted terns on the Opihi River
Number of black-fronted terns on the Orari River
Number of black-fronted terns on the Dart River

![Graph showing the trend of the number of black-fronted terns on the Dart River over time. The graph indicates an increasing trend with data points from 1965 to 2010.](image-url)
Number of black-fronted terns on the Lower Rangitata River

Year

Number of terns
0 100 200 300 400 500 600 700
Number of black-fronted terns on the Tekapo River

![Graph showing the number of black-fronted terns on the Tekapo River from 1955 to 2010. The number of terns decreases over time.](image-url)
Number of black-fronted terns on the Waitaki River

![Graph showing the number of black-fronted terns on the Waitaki River from 1970 to 2010. The y-axis represents the number of terns, ranging from 0 to 700, and the x-axis represents the years from 1970 to 2010. The graph indicates a fluctuation in the number of terns over time.](image-url)
Number of black-fronted terns on the Lower Rakaia River

![Graph showing the number of black-fronted terns on the Lower Rakaia River from 1975 to 2010. The graph indicates a peak in 1985 with a number just below 300, followed by a decline to around 150 in the 2000s.]
Flows and threatening processes

- Reducing flow
  - Loss of foraging habitat
  - Increased weed encroachment
  - Increased predation
  - Lower breeding success and survival
The ‘moat’ effect – islands separated from the mainland by large flows appear to limit predation
Need to understand relationship between predator risk and flows
Modelling island “isolation”
(Georgina Pickerell, PhD, Otago)

• Predicted to be functions of flow, distance, connectivity, island size
Habitat use by black-fronted terns on the Wairau River

Colin O'Donnell, Jane Sedgeley & Ian Westbrooke
Department of Conservation, PO Box 13049, Christchurch
Objectives

• To establish the importance of aquatic versus terrestrial habitats for feeding by black-fronted terns on the Wairau River during the breeding season.
• To determine the relative importance of aquatic microhabitats within the river for black-fronted terns.
Sampling design

• Instantaneous sampling on random transects

Numerous habitat features measured where terns were feeding
Sampling......
Results

• 2005-2006
  – 80 transects
  – 68622 m sampled (22% farmland, 22% terraces etc, 42% islands, 14% aquatic)
  – Median flow = 15.016 cumecs (13.120 during sampling)
  – 1384 observations

• 2006-2007
  – 80 transects
  – 107328 m sampled (42% farmland, 21% terraces etc, 26% islands, 11% aquatic)
  – Median flow = 26.553 cumecs (21.898 during sampling)
  – 1244 observations
Terns selected small to medium sized channels, but shallow water wherever they fed.
Preliminary models: Greater the wetted area, the larger the number of terns feeding.
Urgent need for research:

• Develop robust predictive models of impacts – focusing on interactions
  – Requirements of a range of threatened species
  – Sample full variability in flows and seasons across a range of rivers

• The costs and benefits of maintaining flows

• Experimental weed management