



Whangamarino



Carex secta swamp at Ō Tū Wharekai



Published by  
Department of Conservation  
Research and Development  
Christchurch  
2009

Waituna Lagoon, part of Awarua Wetland

## Research and development

Arawai Kākāriki (Green Waterway) is a national DOC programme aimed at understanding and restoring three of New Zealand's most significant wetland/freshwater sites with the participation of community. The three sites are—Whangamarino (Waikato), Ō Tū Wharekai (mid-Canterbury) and Awarua Wetland (Southland).

A key focus of the programme is research to guide wetland restoration and the development of best-practice management and monitoring tools; and to share this information with other wetland managers. Programme outcomes will also contribute to the department's Natural Heritage Management System (NHMS).



### Why is research and development needed?

#### 1. To support wetland restoration in New Zealand

A wide range of conservation issues threaten the ecological integrity of wetlands, both on and off public conservation land. Research under Arawai Kākāriki has an important role in supporting the restoration of swamp, fen, bog, lake and river ecosystems in New Zealand.

#### 2. Increase understanding of ecological processes

Scientific understanding of the ecological processes that maintain resilient and functioning wetland ecosystems underpins effective management. However, there is still limited information of how changes in abiotic (e.g. nutrients, hydrology) and biotic (e.g. fish community) factors threaten wetland biodiversity and other values.

#### 3. To define wetland restoration goals

Wetlands are naturally dynamic, which makes setting meaningful restoration goals difficult. As part of the Arawai Kākāriki programme site managers and scientists are combining efforts to describe sensible and feasible goals for wetland restoration.

#### 4. Optimising management and monitoring

Even when restoration goals are defined there often exists a 'knowing-doing' (implementation) gap. Site managers require information on the most effective and efficient methods to restore wetlands, and how to monitor the response of ecosystems, species and community projects to management initiatives.



Australasian bittern/matuku after fire at Awarua Wetland



Vegetation monitoring at Whangamarino



Electric fishing at Ō Tū Wharekai



Collaborative research on macrophytes and water quality at Waituna Lagoon

## Arawai Kākāriki research projects

A number of research projects are being led by the department's Research and Development Group. Current projects include:

- Monitoring the status of submerged macrophytes (particularly *Ruppia*) and water quality in Waituna Lagoon, Southland.
- Review of the historical and current distribution of threatened wetland birds—e.g. Australasian bittern/matuku (*Botaurus poiciloptilus*).
- Testing methods to detect cryptic wetland birds—implications for monitoring.
- Review of the ecology, impact, monitoring and control of mammalian predators in wetlands.
- Field research of the population dynamics and threats to avifauna of mammalian predators in wetlands.
- Use of LiDAR (airborne laser) remote sensing in New Zealand wetland management.
- Assessment of the ecosystem services of wetlands.
- Analysis of change in the extent and protection of New Zealand wetlands.

## Best-practice tools – wetland management and monitoring

Through the knowledge we are gaining the department is developing best-practice tools for use in wetland management across New Zealand. Priority tools include:

- Setting restoration objectives: a framework for identifying priority wetland management objectives and monitoring requirements.
- Wetland mapping guidelines.
- Inventory and monitoring of cryptic wetland birds.
- Inventory and monitoring of mammalian predators in wetlands.
- Monitoring changes in wetland vegetation.

## Collaboration with external researchers

Linkages with Landcare Research, NIWA, regional councils, University of Otago, University of Queensland (Australia), University of Canterbury and University of Waikato has enabled a coordinated approach on key wetland issues, such as the control of willow (*Salix* sp). The Arawai Kākāriki programme has also supported post-graduate students at the three sites; Awarua/Waituna (palaeoecology), Ō Tū Wharekai (palaeoecology); and Whangamarino (hydrology and ecology).

## Publications

Key publications, research findings and wetland management and monitoring tools will be made available via the DOC website.

For further information visit: [www.doc.govt.nz](http://www.doc.govt.nz) and search for Arawai Kakariki or email: [arawai.kakariki@doc.govt.nz](mailto:arawai.kakariki@doc.govt.nz)