

The Arawai Kākāriki ('Green Waterway') Wetland Restoration Programme aims to enhance the ecological restoration of three of New Zealand's foremost wetland/freshwater sites, making use of strong community involvement and promoting research into wetland restoration techniques.

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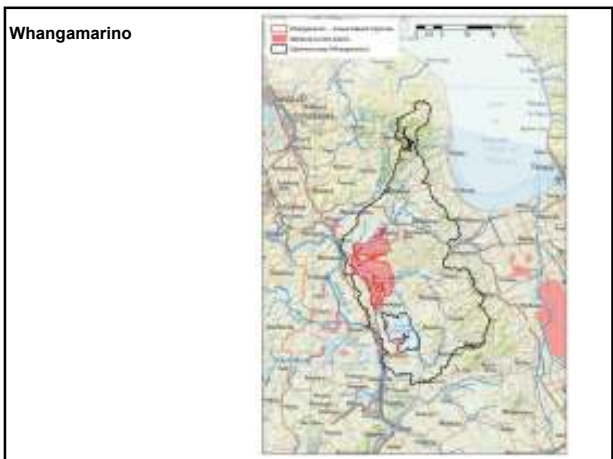
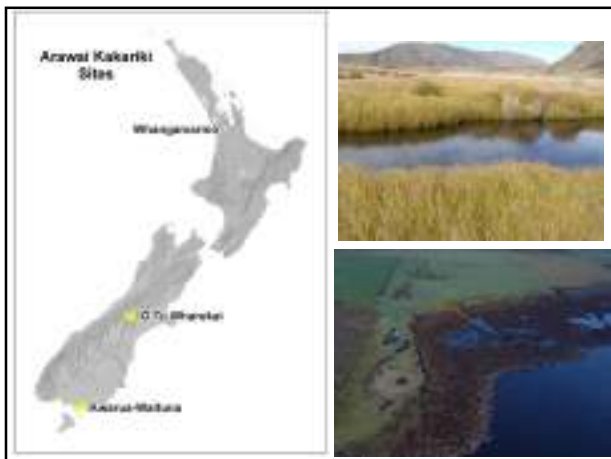
**Commenced June 2007**

**Arawai Kākāriki – national context**

**Ramsar Convention on Wetlands**  
"maintain the ecological character of Ramsar sites"  
"promote wise use of wetlands"

**NZ Biodiversity Strategy**  
"maintain and restore a full range of remaining natural habitats and ecosystems to a healthy functioning state"

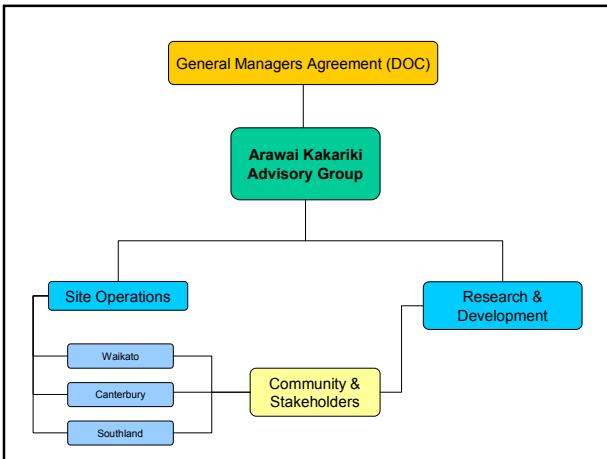
**New Start for Fresh Water**  
"In some parts of New Zealand, water resource limits are being approached, which is seen in deteriorating water quality..."



**O Tu Wharekai (Ashburton Basin & Rangitata River)**



**Awarua/Waituna**



**Site Management Achievements - Biodiversity**

- Baseline inventory of wetland biodiversity, e.g. Wrybill, Giant Kokopu, Eels, threatened plants
- Established monitoring programmes (wetlands, rivers, lakes)
- Repairs to the Whangamarino weir to maintain water levels;
- Fencing to exclude cattle;
- Willow and broom control at Ō Tū Wharekai;
- Science leading adaptive management

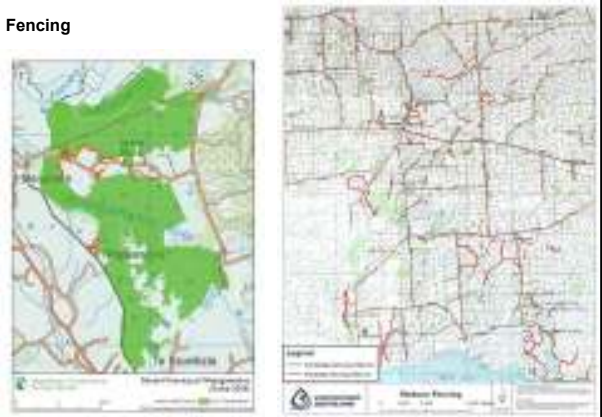


**Site Management Achievements - Community**

- \$80-100,000/annum of grants for riparian fencing and planting in the Awarua/Waituna catchment;
- Installation of walking trails;
- Participation of community in advisory groups, field days, education and information sessions
- Collaboration with Regional Councils such as Environment Southland
- State of Takiwa – Ngai Tahu cultural assessment



**Fencing**



Fencing to exclude cattle (Whangamarino)

Fencing to improve water quality (Awarua/Waituna)

**Future directions**

- Progress Report 2007-2009 (in prep)
- Continue progress towards site objectives
- Collaborate with industry, local government, iwi, researchers and community
- Refine best-practice tools
- Share knowledge across DOC and other agencies
- Share knowledge with community and stakeholders
- Apply methods to other wetland restoration projects



"...ecological restoration of three of New Zealand's foremost wetland sites"



Upper Rangitata River

**1. Define conservation objectives**



Crack willow (*Salix fragilis*) at Whangamarino wetland

**2. Understand ecosystem values  
(intrinsic values, ecosystem services, community values)**



Discussing the values of the Whangamarino Wetland

**3. Understand threatening processes**



Australasian Bittern after fire at Awarua wetlands

**4. Implement management at sites (learning by doing)**



Repairing the Whangamarino weir

Fencing & riparian planting, Awarua/Waituna

### 5. Develop and promulgate tools to manage and monitor wetlands



Aoraki Polytechnic students learning how to survey waterfowl, O Tu Wharekai

### 6. Promote wetland conservation



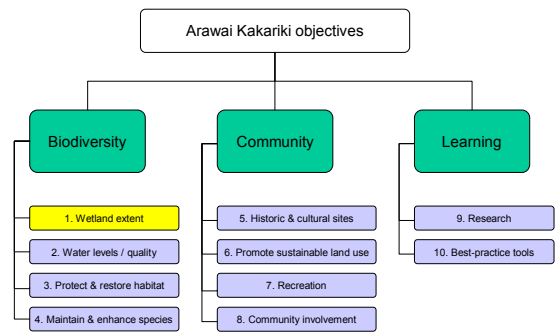
Freshwater monitoring with locals, Awarua/Waituna

### Key messages

- Strategic planning
- Understanding wetlands to inform management (research)
- Adaptive management (developing, applying and testing)
- Sharing tools
- Promoting wetland conservation



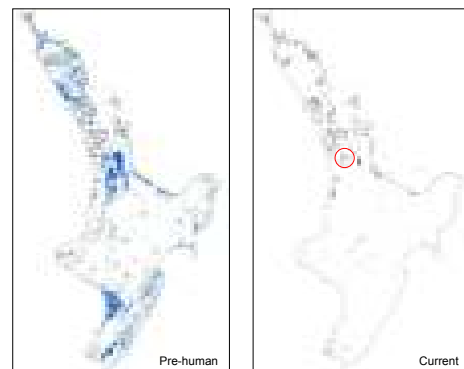
### Define conservation objectives



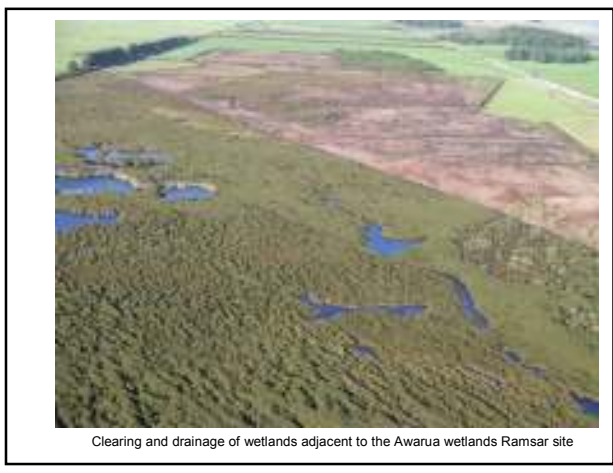
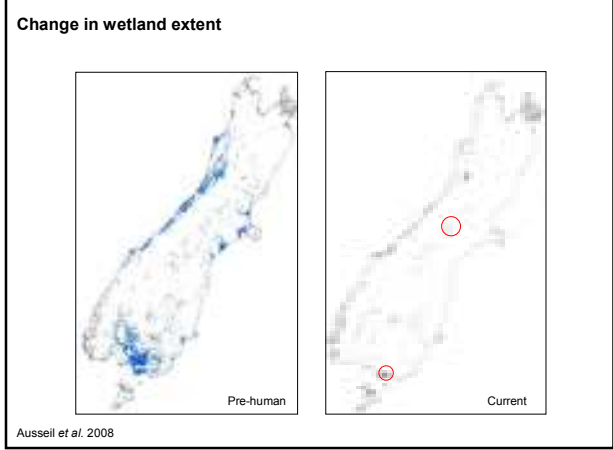
### Strategic Planning Framework – Wetland extent

|                                      |                                     |
|--------------------------------------|-------------------------------------|
| National objective                   | Maintain and enhance wetland extent |
| Values (site)                        |                                     |
| Threats (site)                       |                                     |
| Site goal                            |                                     |
| Inventory actions                    |                                     |
| Management actions                   |                                     |
| Monitoring actions                   |                                     |
| Key performance indicator (outcomes) |                                     |

### Change in wetland extent



Ausseil et al. 2008



### Strategic Planning Framework – Wetland extent

|                                      |  |
|--------------------------------------|--|
| National objective                   | Maintain and enhance wetland extent                        |
| Values (site)                        | Only 37% of wetlands remain in Southland                   |
| Threats (site)                       | Clearing/drainage of wetlands on private land              |
| Site goal                            | <i>Ensure no further loss of wetlands in the catchment</i> |
| Inventory actions                    |  |
| Management actions                   |  |
| Monitoring actions                   |  |
| Key performance indicator (outcomes) |  |

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| Site goal                            | <i>Ensure no further loss of wetlands in the catchment</i> |
| Inventory actions                    | Wetland/vegetation/land use mapping (remote sensing)       |
| Management actions                   | Statutory and non-statutory advocacy (education)           |
| Monitoring actions                   | Repeat mapping – 5 year intervals                          |
| Key performance indicator (outcomes) | Extent of wetlands on and off public conservation land     |

### Best-practice tool - wetland mapping protocol

- Draft protocol applied at Arawai Kakariki sites
- Uses hierarchical approach to map wetlands
- Hydrosystem
  - Wetland Type
    - Vegetation Structure
    - Vegetation composition

Arāwāi Kakariki Restoration Programme  
Survey, Monitoring & Management Tools

**Wetland mapping and classification protocol**

Kate McNutt, Dave West, Colin O'Donnell and Hugh Robertson

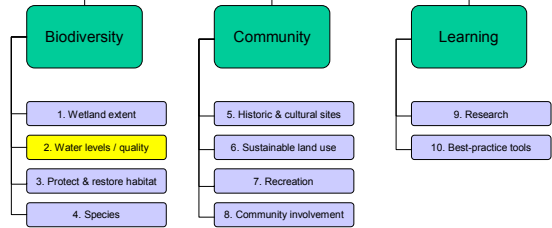
Research & Development Group  
Department of Conservation

Version 2.1  
30 March 2009

**Awarua mapping – hydrosystem** (palustrine, lacustrine, estuarine, riverine)



**Awarua Kakariki objectives**



**O Tu Wharekai – intensification of land use**



**Whangamarino – utilised for flood storage (Lake Waikare/Waikato River)**



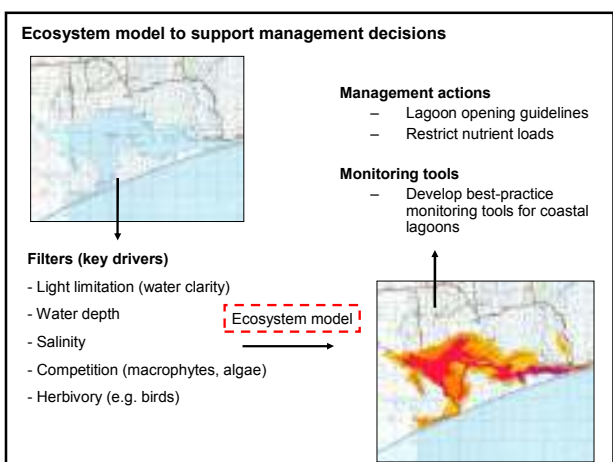
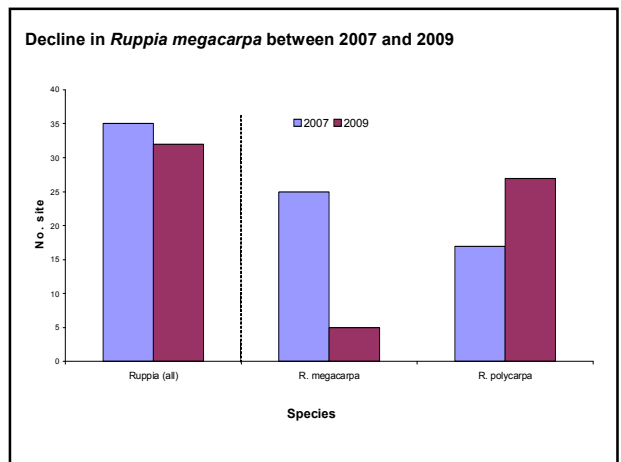
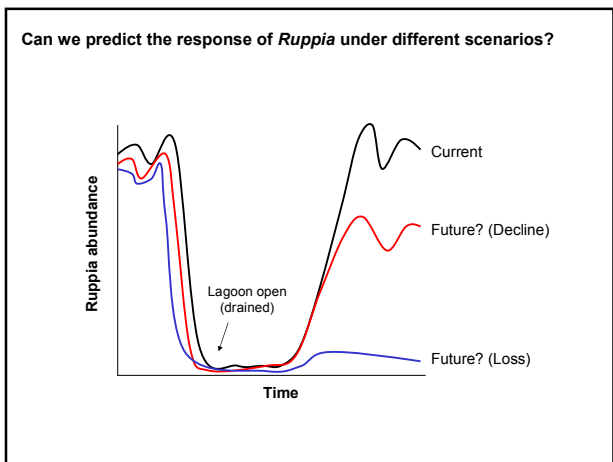
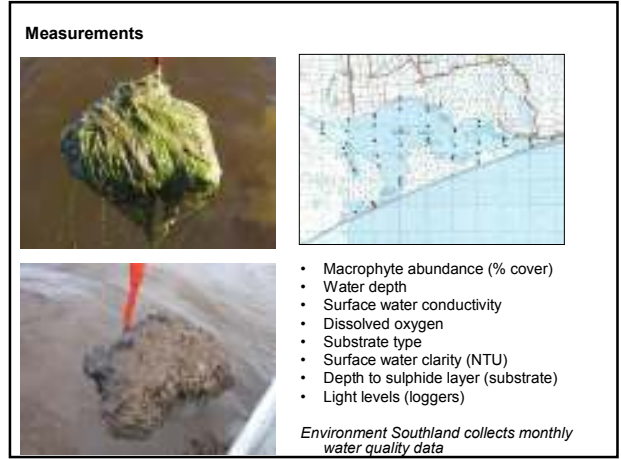
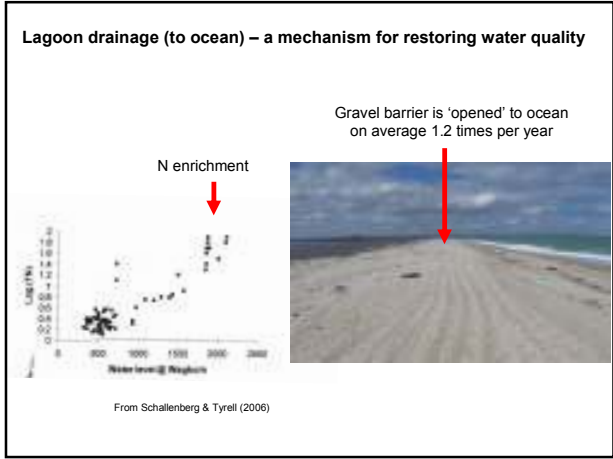
**Waituna Lagoon – a coastal wetland under threat**

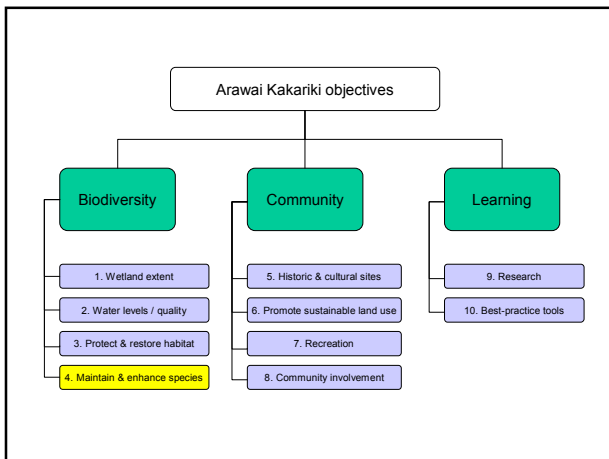
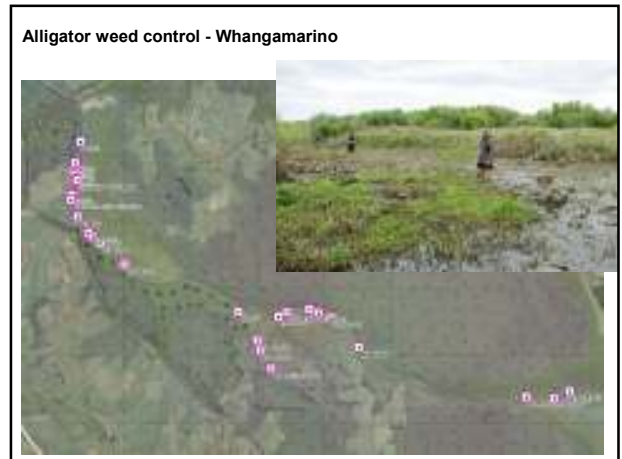
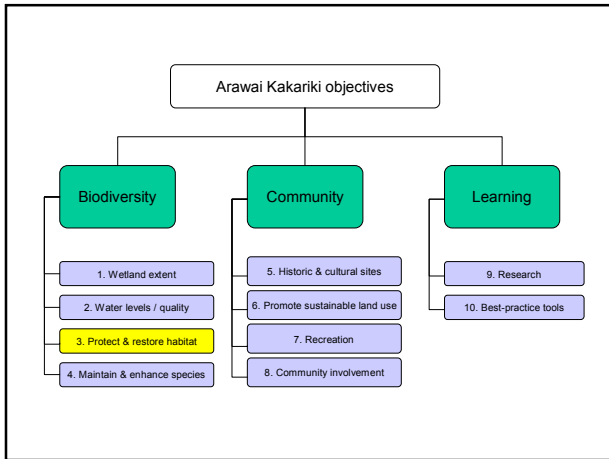


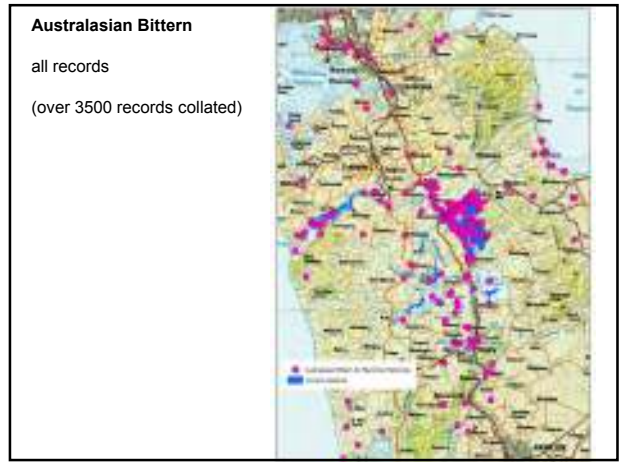
- Increase in intensive agriculture (dairy)
- Increased N & P loads
- Wetland drainage
- Resuspension of sediment (light limitation)
- Altered hydrology (opening to ocean)

**Research project – understand the status and vulnerability of Waituna Lagoon to changes in water quality and hydrology**









### Best-practice tool – protocols for bird counts

- Draft protocols developed for
  - Bittern
  - Fernbird
  - Spotless Crake
  - Marsh Crake
- Tested in Spring 2009
  - Whangamarino
  - Other AK sites
  - Community
- Will help long-term monitoring of threatened wetland birds

Arāwāi Kakariki Restoration Programme  
Survey, Monitoring & Management Tools

Draft protocols for index counts:  
**Spotless crake**


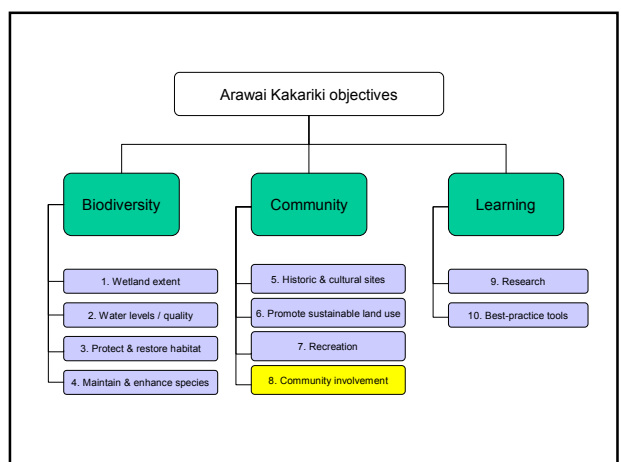
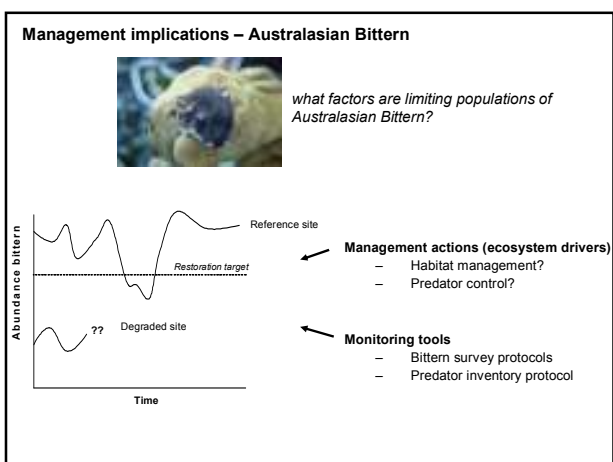


Photo: G.S. Mann, DOC ImageLibrary

Colin O'Donnell  
Research & Development Group  
Department of Conservation  
2009



### Community involvement

- CEPA Plan
- Community groups leading catchment management (Awarua-Waituna Advisory Group, Waituna Landcare)
- Tourism operators involved in Crested Grebe projects
- State of the Takiwa assessments
- Field days
- Sites used for education (e.g. Polytechnic, online education, University)




### Take home messages

- **Strategic planning**
- Understanding wetlands to inform management (research)
- Adaptive management (developing, applying and testing)
- Sharing tools
- Promoting wetland conservation



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#### Research projects

- Waituna Lagoon management
- Cryptic bird monitoring
- Ecosystem Services
- Predators in wetlands
- Changes in wetland extent & protection (since 1990)
- Wrybill breeding success
- Palaeolimnology (Uni Otago & Uni Queensland)
- Eco-hydrology (Uni Waikato)

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Willow control, Maori Lakes

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- Understanding wetlands to inform management (research)
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- **Sharing tools**
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#### Wetland restoration tools

- Wetland mapping protocol
- Cryptic bird index count protocols
- Mammalian predator monitoring
- Wetland vegetation monitoring
- Strategic planning framework

### Take home messages

- Adaptive management (developing, applying and testing)
- Sharing tools
- **Promoting wetland conservation**



**Arawai Kākāriki - helping protect global freshwater biodiversity**



*Arawai Kākāriki*  
wetland restoration programme

**Thanks to**

All involved in the Arawai Kākāriki Wetland Restoration Programme

**Visit:** [www.doc.govt.nz/conservation](http://www.doc.govt.nz/conservation)

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