



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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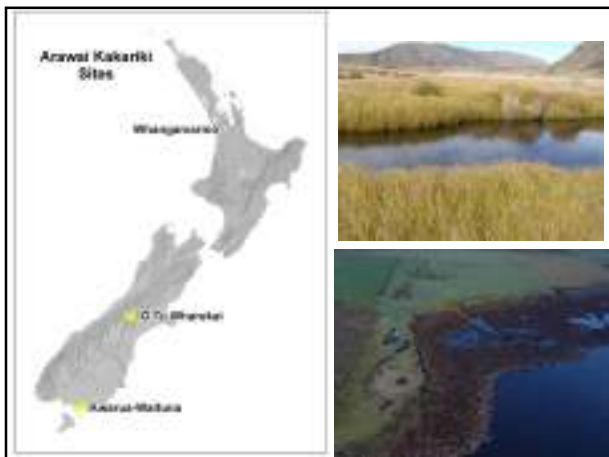
Commenced June 2007

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"

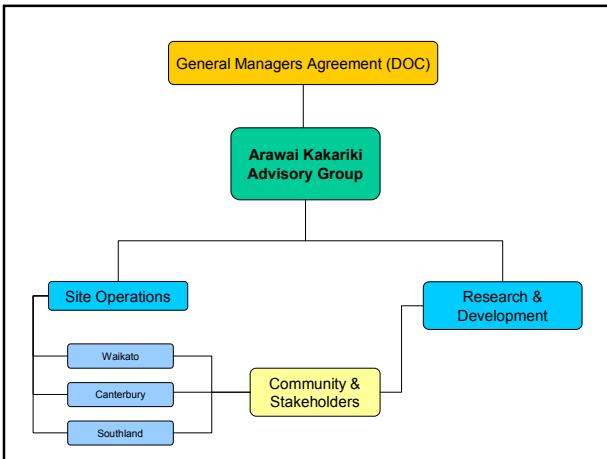
New Start for Fresh Water
"In some parts of New Zealand, water resource limits are being approached, which is seen in deteriorating water quality..."



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



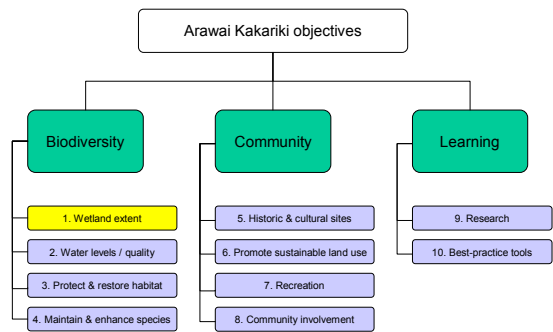
Freshwater monitoring with locals, Awarua/Waituna

Key messages

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



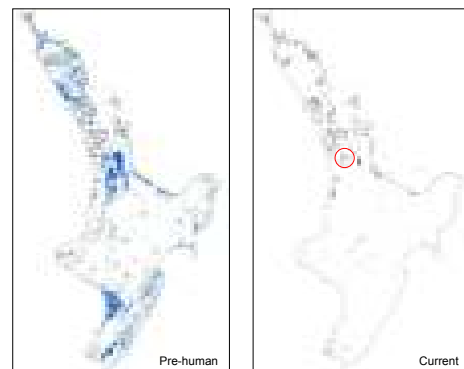
Define conservation objectives



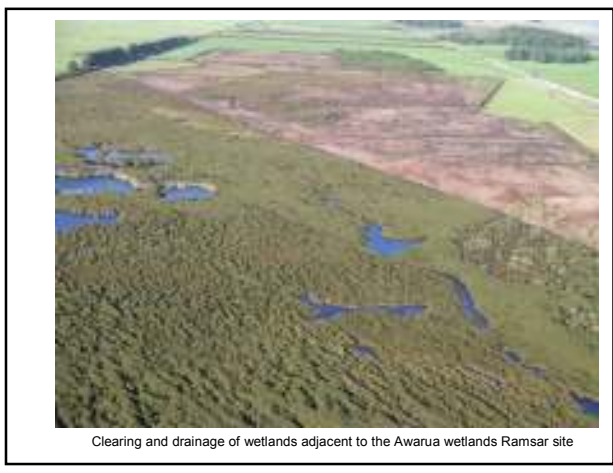
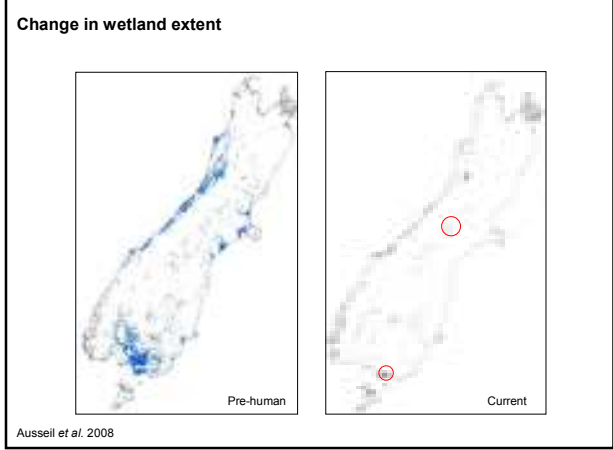
Strategic Planning Framework – Wetland extent

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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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	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

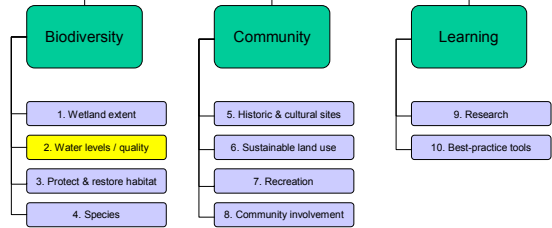
Research & Development Group
Department of Conservation

Version 2.1
30 March 2009

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



Arawai Kakariki objectives



O Tu Wharekai – intensification of land use



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

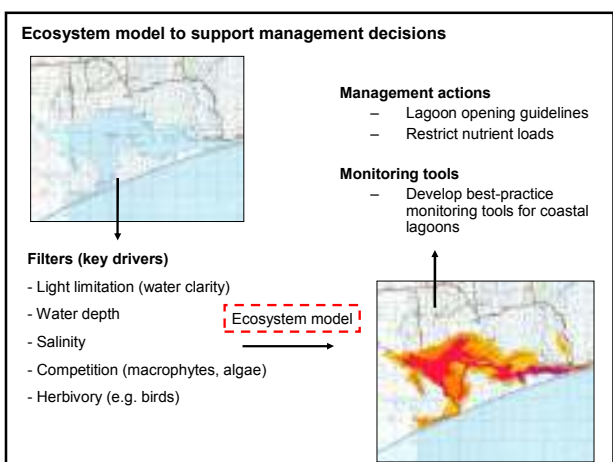
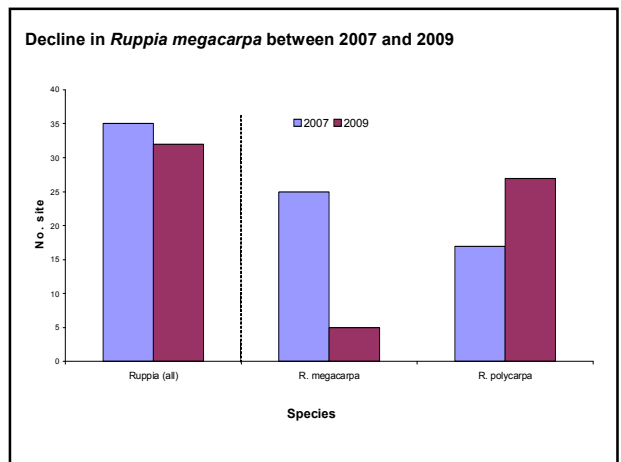
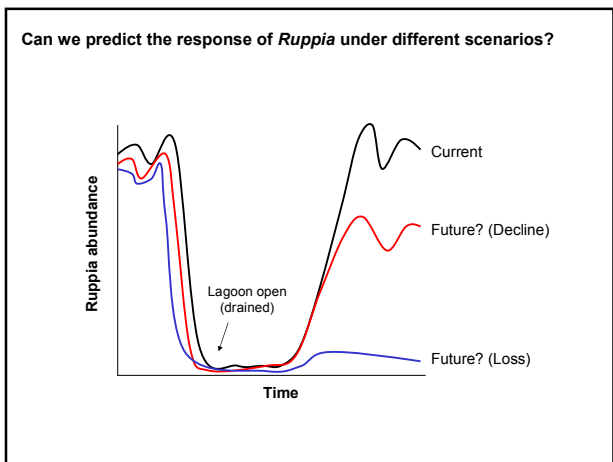
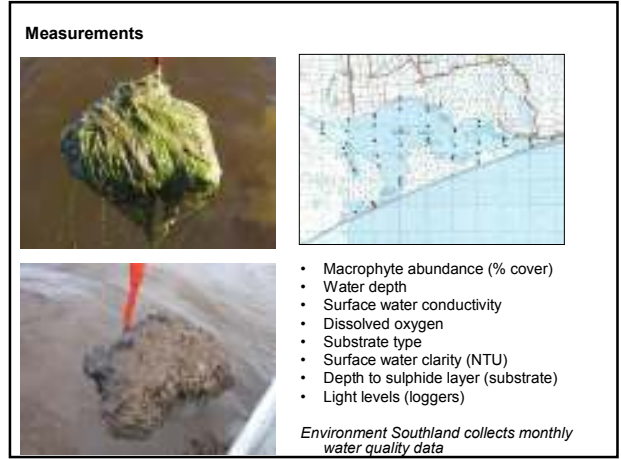
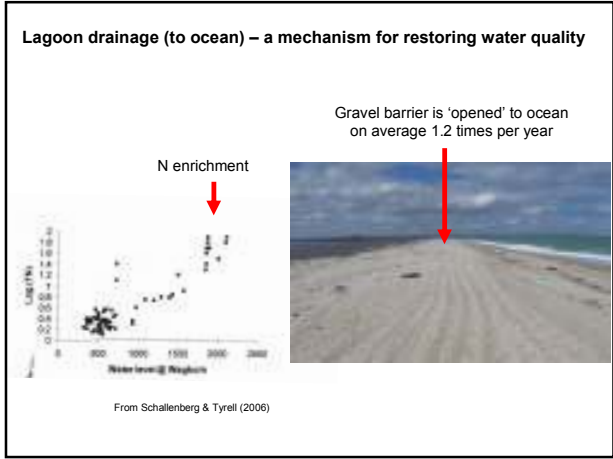


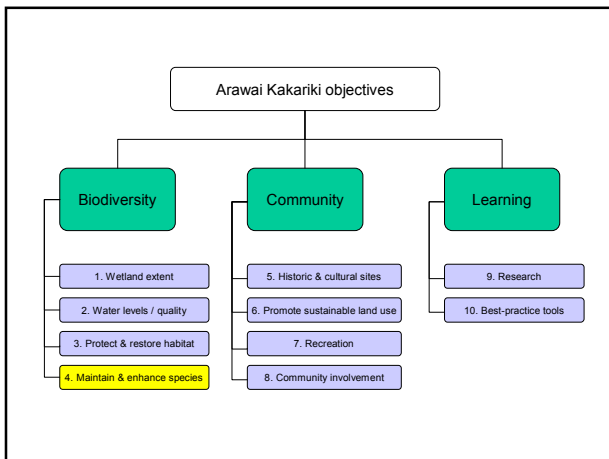
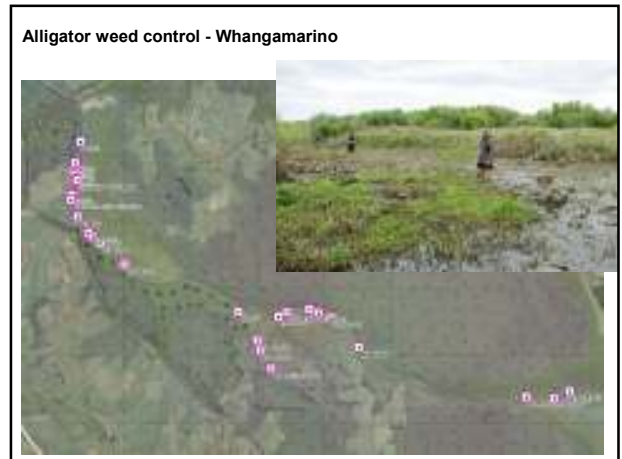
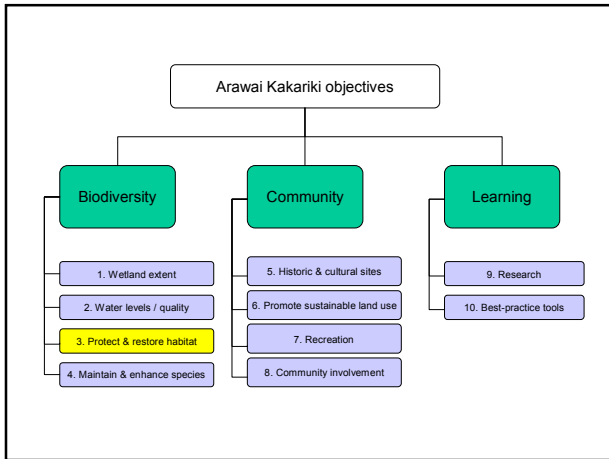
Waituna Lagoon – a coastal wetland under threat

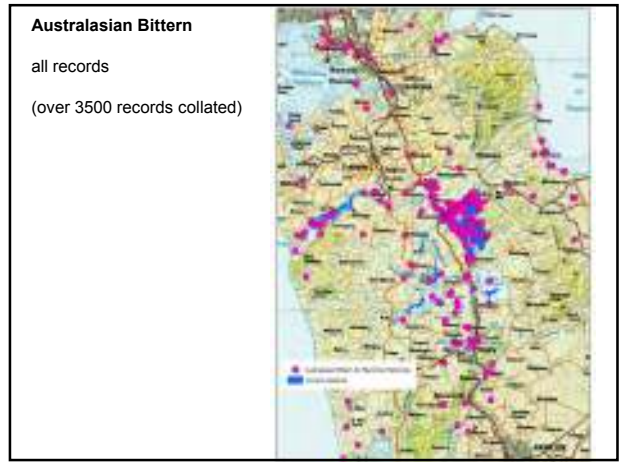


Research project – understand the status and vulnerability of Waituna Lagoon to changes in water quality and hydrology









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


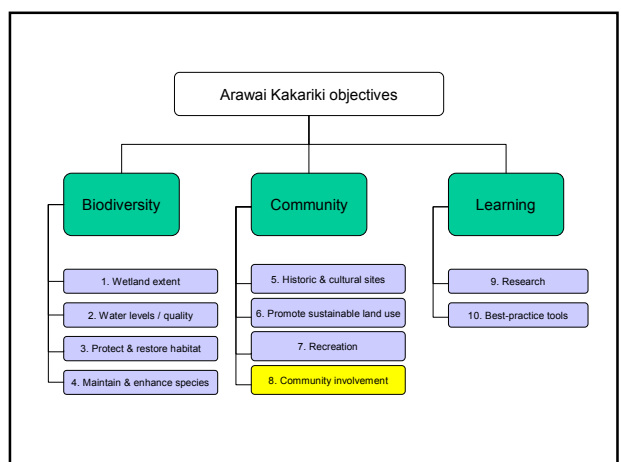
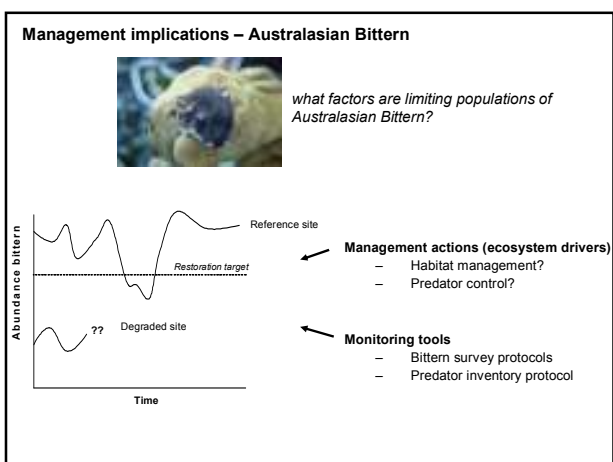


Photo: G. Mann, DOC ImageLibrary

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
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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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- **Adaptive management (developing, applying and testing)**
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Willow control, Maori Lakes

Take home messages

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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

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