



Restoring the habitat in Waituna Creek – a stream in an agricultural landscape

E. Funnell, R. Allibone, R. Holmes, H.
Hudson, and M. Beech

**WATER WAYS
CONSULTING LTD**



Arawai Kākāriki
wetland restoration programme
Whangamarino • Ō Tū Wharekai • Awarua-Waituna



WORKING TOGETHER TO CARE
FOR FIVE KEY CATCHMENTS

Department of
Conservation
Te Papa Atawhai

Overview

- Conservation values of Waituna Creek
- A history of change and modern challenges
- Impact on biodiversity values
- Restoration programmes in partnership
- Restoring the Mauri (life force) of the creek
 - Objectives
 - Challenges
 - Options



Conservation Values of Waituna Creek

- Part of the Awarua wetlands in Southland
- Internationally significant wetland under Ramsar convention
- Flows into Waituna Lagoon
- Accounts for the major proportion of available fish habitat
- Diverse assemblage of fish species e.g. tuna, kanakana, giant kokopu, inanga
- Culturally significant to Ngāi Tahu
- Esplande Reserve and Marginal strip



History of Change

- Intensively farmed catchment
- Large sections of stream straightened
- Channel deepening
- Loss of riparian habitat
- Routine mechanical clearance
- Result is a highly modified channel and hydrology



Current issues – Nutrients and sediments

- Reducing sediment and nutrients key to health of Waituna Lagoon
- Extensive and ongoing bank erosion (Holmes *et al.* 2015)
- Study indicated between 64% and 94% of sediment originates from eroding banks (McDowell *et al.* 2013)
- Bank reconstruction carried out by Regional Council to reduce bank erosion



Impact on Biodiversity Values

- Riparian and tuna habitat quality study (Holmes *et al.* 2015)
- Bank reconstruction monitoring (instream habitat and fish biomass) (unpublished data) – 6 sites (3 impact and 3 control)
- Waituna creek restoration options (Allibone, 2015 *draft*)



Impact on Biodiversity Values

- Riparian habitat in average to good condition with isolated segments in poor condition
- Instream habitat for tuna considered poor to average. Isolated areas of high quality habitat exists in the upper catchment
- Poor habitat characterised by excessive fine sediments, uniform shallow habitat and little stream edge cover.

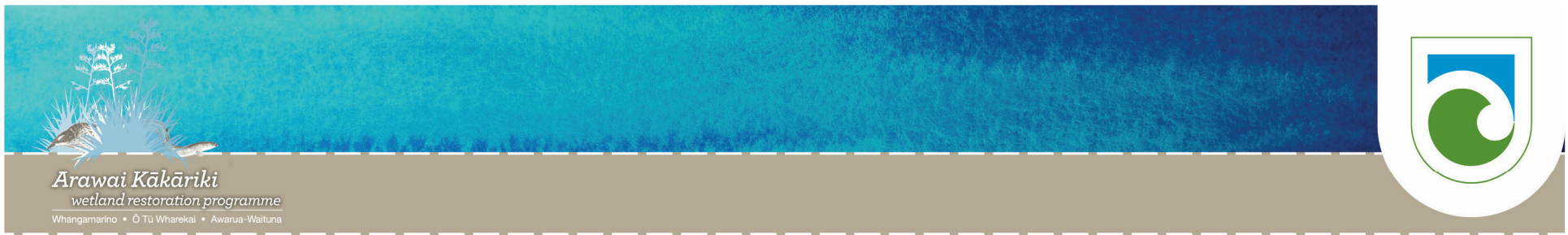


Impact on Biodiversity Values

- Signification reduction of tuna biomass in reaches where stream banks re-shaped
- Bank edge cover significantly reduced
- Lower catchment:
 - Fish cover is limited – compact substrate, few undercut banks, and minimal overhanging vegetation
 - Predominant run habitat with few pools and backwaters
 - Lack of suitable habitat for large fish such as tuna and giant kokopu
- Invertebrate fauna sparse – lack of EPT fauna

Key Limiting Factors





Restoration Programmes in Partnership

Arawai Kakariki – Awarua/Waituna

Aimed at understanding and restoring three of New Zealand's most significant wetland/freshwater sites, with the participation of community

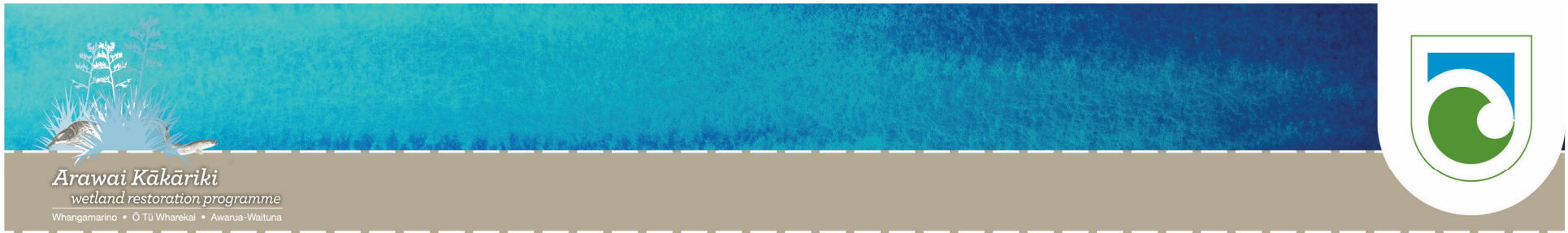
‘The Awarua/Waituna complex remain a large coastal low-lying plain of bogs, swamps, heaths, forest and open water; functionally linked to its catchment...’

Living Waters in Waituna

Vision – A sustainable dairy industry is part of healthy, function ecosystems that together enrich the lives of all New Zealanders

‘The programme will work with farmers to protect, restore and connect fragmented wetlands; improve in-stream habitat and water quality...’





Restoration Objectives

Vision of the Restoration is to:

- Restore the mauri (life force) of the Creek and Lagoon for the whole community
- Restore the Creek to the best possible ecological condition
- Promote particular ecosystem services in the Creek to help protect the ecological condition of Waituna Lagoon
- Restore potential for cultural harvesting and food gathering
- Promote the lower reaches of the Creek as a place to visit

Whilst maintaining the drainage and flood capacity of Waituna



Restoration Challenges

- Moving beyond fencing and planting...
- Principles of Riparian management well established... But high level and generalised
- Consideration needs to be given to;
 - Catchment scale processes e.g. sediment transport and flow regimes
 - Fish communities and specific habitat requirements e.g. undercut banks, overhanging vegetation, pool depth, spawning habitat etc
 - Erosion
 - Drainage requirements (part of drainage network)
 - Community values including boundaries

Restoration Options

- Reach scale vs catchment scale activities
- Adaptive riparian management
- **Encourage natural processes** e.g. channel erosion, formation of scour holes
- Riparian zone restoration – areas of shrubs and trees, areas of native grass
- Fencing setbacks
- Channel reconstruction e.g. widened flood plain, secondary channels, floodplain reconnection
- Addition of large woody debris
- Flow deflection structures
- Addition of meanders and backwaters





Acknowledgements

Te Ao Mārama Inc
Waituna Community



WORKING TOGETHER TO CARE
FOR FIVE KEY CATCHMENTS

**WATER WAYS
CONSULTING LTD**

Arawai Kākāriki
wetland restoration programme

Whangamarino • Ō Tū Wharekai • Awarua-Waituna

New Zealand Government

Department of
Conservation
Te Papa Atawhai