

Ko Tāngonge Te Wai: Challenges of Restoration and Management of a Flood Plain Lake

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Water NZ Regional Meeting -
Stormwater Management
Whangarei , 29th October 2015



Where is Tāngonge?

Near Kaitaia township in
Northland, North Island,
New Zealand

What was Tāngonge?



NC(167)
Shooting On The Kaitiaki Lake In 1912

Northwood Brothers collection

- Once a lake and wetland.
- Part of the wider catchment and ecosystem.
- Food bowl that supported a large population.
- A taonga of spiritual, intellectual and physical significance.
- Part of hapu and Iwi identity.

WHAT HAPPENED TO TĀNGONGE?



Lake Tāngonge was drained in the 1930s



NC(169)
Drainage Of The Kaitaia Swamp By Unemployed



NC(170)
The Dredging Of The Kaitaia Swamp



NC(369)
Draining The Kaitaia Swamp 1930's



NC(370)
Draining the Kaitaia Swamp Using Dredge

Major impacts on the lake from the early 1900s



April 2013

Colonisation; people removed, areas drained and modified in a major government drainage scheme.



September 2013

Environmental manipulation destroyed the productive ecosystem, created huge changes for the people and the land.

Species disappeared; rangatiratanga and kaitiakitanga practices and knowledge were eroded.

Current Catchment overview



Te Oneroa a Tohe
/ 90 Mile Beach

Tāngonge

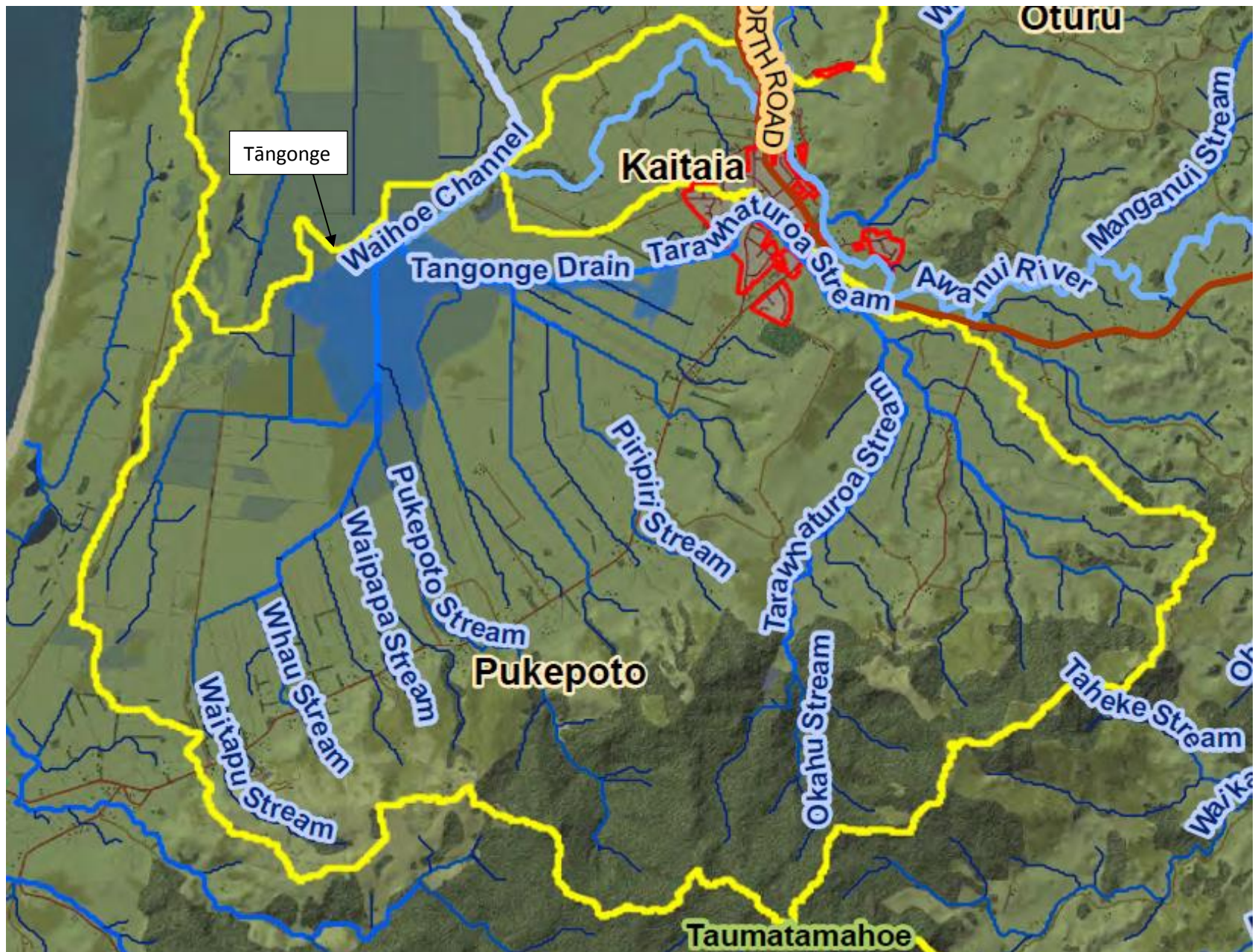
Kaitaia
WWTP

Kaitaia

Lake Waimirihi

- 7000Ha catchment
- Within a low lying peat basin on the alluvial plains of the Awanui River
- Many stream tributaries feeding into irrigation drains
- Outflow to Awanui River via Floodgates
- Mainly agricultural pasture with forested upper slopes
- Adjacent to Kaitaia WWTP
- Part of Awanui River Flood Protection Scheme

Catchment overview



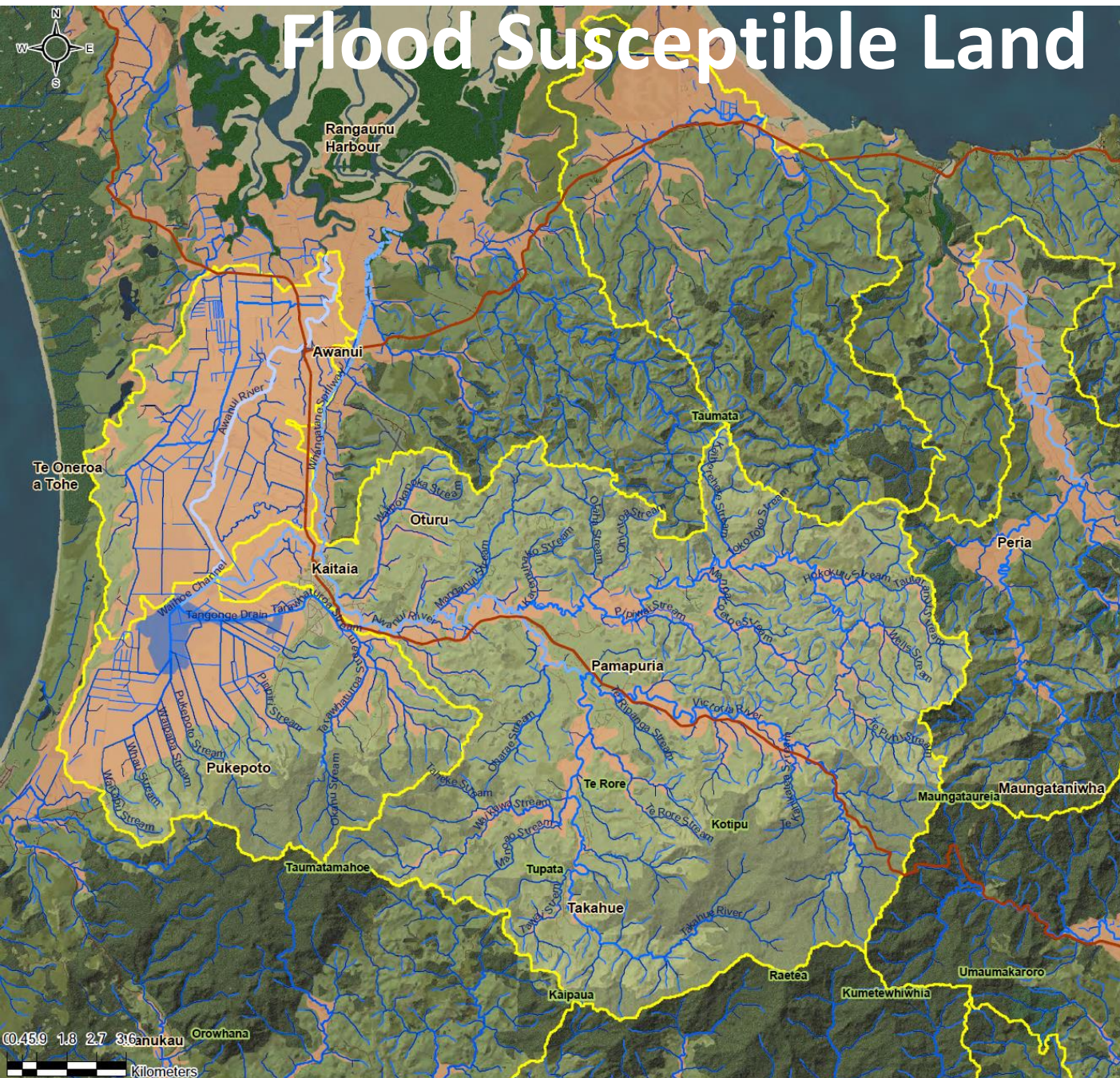


Land use

- Agricultural (majority Dairy)
- Large man-made irrigation drains
- Unfenced waterways, with little or no riparian margins

Flooding

- Adjacent low lying land - Flood Susceptible!
- Temporary storage as part of Awanui Flood Protection Scheme
- Not unusual for back to back 1:100yr storms!!



Tangonge Catchments and Flood Susceptible Land

There are two inter-related catchments that impact on Tangonge. The first referred to as the Awanui River Catchment is a large area of over 50000 acres (21000 ha) that drains into the Rangaunu Harbour. The second referred to as the Tangonge Catchment is an area of approximately 17500 acres (7000 ha) that feeds into the Tangonge wetland area. The two catchments have been manipulated as part of flood control measures to protect Kaitiaki and surrounding farm land.

The headwaters of the Awanui River Catchment are located on the western slopes of the Maungataniwha and northern slopes of the Raetea Ranges, south of Kaitiaki. The catchment flows northwest through hill country around Takahue and Pamapuria and opens to a wide floodplain extending between Kaitiaki and the Rangaunu Harbour.

The sand dunes along Te Oneroa-a Tohe/ 90-Mile Beach form the western boundary of the catchment. A large peat basin has developed between the Awanui River and the dunes, with Lake Tangonge occupying the lowest part of the basin.

The low-lying Awanui plains have an extensive drainage network, and include the lower reaches of the Awanui River. Drains carry runoff created by excess infiltration during rainfall events as well as base flow derived from drainage of artesian groundwater from the surrounding unconfined aquifer.

How the flood control system works

The Awanui floodplain and Kaitiaki township area is highly prone to flooding. Prior to the construction of flood protection infrastructure (stop-banks, drainage channels, floodgates etc), flood waters would frequently inundate the plains west of Kaitiaki. Floodwater drainage during this time was transmitted via the Pairatahi River to the east and the Waipapakauri Creek to the west. In 1958, water levels rose to a depth of 1 m on Commerce Street in Kaitiaki. The current flood protection scheme includes the Whangatane Channel, the Tangonge drain, Lake Tangonge and the Waihoe Channel.

Whangatane Channel

Floodwaters in the Awanui River are diverted primarily into the Whangatane Channel, which diverges northward from the Awanui in the northern extent of the township. Removal of sediment from the Whangatane Channel has resulted in a significant improvement of its flood carrying capacity. It was also altered from a v-notch to a broad-crested weir since initial construction, facilitating higher peak flow but causing a lag in transmitting flood flows.

Tarawhataroa Stream, Tangonge Drain, Lake Tangonge and Waihoe Channel

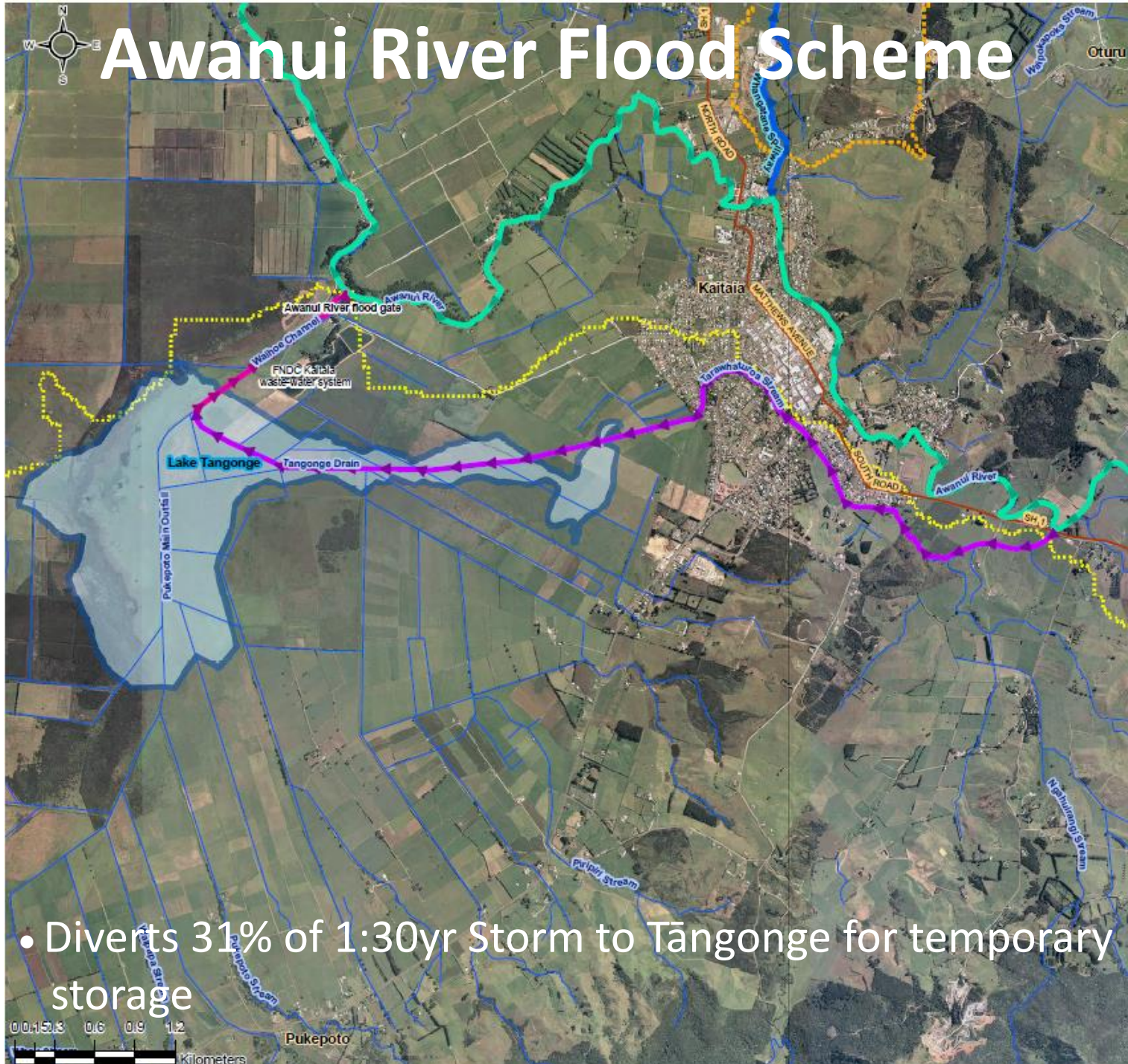
During large flood events, the flood carrying capacity of the Whangatane Channel can be exceeded, which can cause overflow across State Highway 1 (SH1) at the southern extent of the Kaitiaki township. These overflowing waters move into the upper catchment of the Tarawhataroa Stream, which directs flow into Lake Tangonge. During large floods, the lake area can remain inundated for extended periods.



Tangonge
Research Project



Awanui River Flood Scheme



- Diverts 31% of 1:30yr Storm to Tāngonge for temporary storage

Kaitāia WWTP

- Serves Kaitāia & Awanui Townships
- 3 existing oxidation ponds in series (109,000m²)
- Future expansion at resource consent
- Effluent discharges to Waihou Channel



Tāngonge

Waihou Channel

Floodgate

Awanui River

Why is Tāngonge Important





Interconnectedness:

- Whakapapa
- Rights: access to lands and resources
- Mana Tiaki: responsibilities, relationships
- Mahinga Kai

Underpinning values:

- Whakapapa
- Mauri
- Conflict
- Tapu vs Noa



Environmental modification:

- Land use: cultivations, farming
- Gum digging
- Waste water treatment

RESTORATION AND REJUVENATION

- Mana whenua vision
- Team approach
- Building local capacity and capability
- What next?



Vision to put life back into Tāngonge

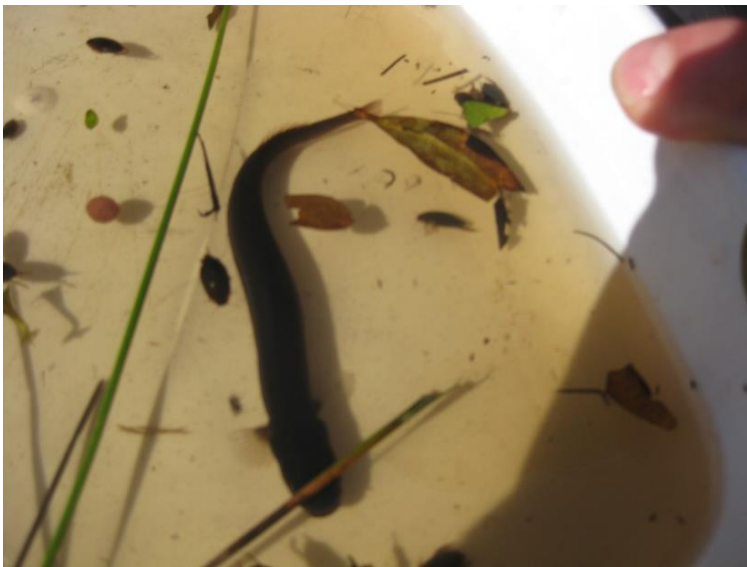


1000 acres of Tāngonge will be returned through Treaty of Waitangi settlement.

A call for restoration that balances economic development and environmental sustainability.

Long-term staged approach for the next 100 years to:

- Regenerate the food and resource producing capacity.
- Contribute to health, social, economic, cultural and environmental gains.
- Restore Mauri of Tāngonge



Team approach to restoration

- Mix of expertise and skills.
- Positive relationships with local whanau, iwi, marae, community, Government agencies, researchers, storm-water, hydrology and GIS experts.
- Working with five local schools.



Research collaborations helping to build local capacity and capability

A series of small research projects are underway to build knowledge, understanding and skills, and to inform planning and decisions.

Support from the James Henare Māori Research Centre:

- Established the physical extent of the catchment.
- A comprehensive suite of maps.
- Hydrology information to inform the next steps in restoration.
- Identification of information gaps.
- Development of restoration scenarios.

Support from Te Wai Māori, NIWA and the Northland Regional Council:

- Flora and fauna species and ecosystems – past and present, and strategies to reinstate species.

Support from Auckland Botanical Society:

- Plant species survey

What next?

Further research to understand more about:

- Technical make-up of the lake/wetland catchment.
- The relationship between the water sources; the lake, the wetlands, the underground aquifers, and various parts of the catchment.
- Flooding, sewerage, silting, water use/supply, water treatment oxidation ponds.

Practical projects involving:

- Fencing areas for restoration
- Planting buffer areas to improve the eco system
- Pest control and monitoring
- Species and water quality monitoring

CONCLUSION

- Return 400Ha of Tāngonge lands as Treaty settlement cultural redress.
- Tāngonge is a taonga of great cultural significance.
- Long term (100year) collective vision to restore and rejuvenate the wetland and catchment that will:
 - reconstitute ecosystems
 - regenerate species
 - rebuild the food and resource producing capacity
- An integrated holistic catchment wide approach
- Consideration of a mix of local and technical knowledge, thorough research, and action.



"Maringi noa ngā roimata"