



NZ TRANSPORT AGENCY
WAKA KOTAHI

WATERVIEW CONNECTION PROJECT Environmental Overview – Te Atatu

WATERVIEW CONNECTION TEAM

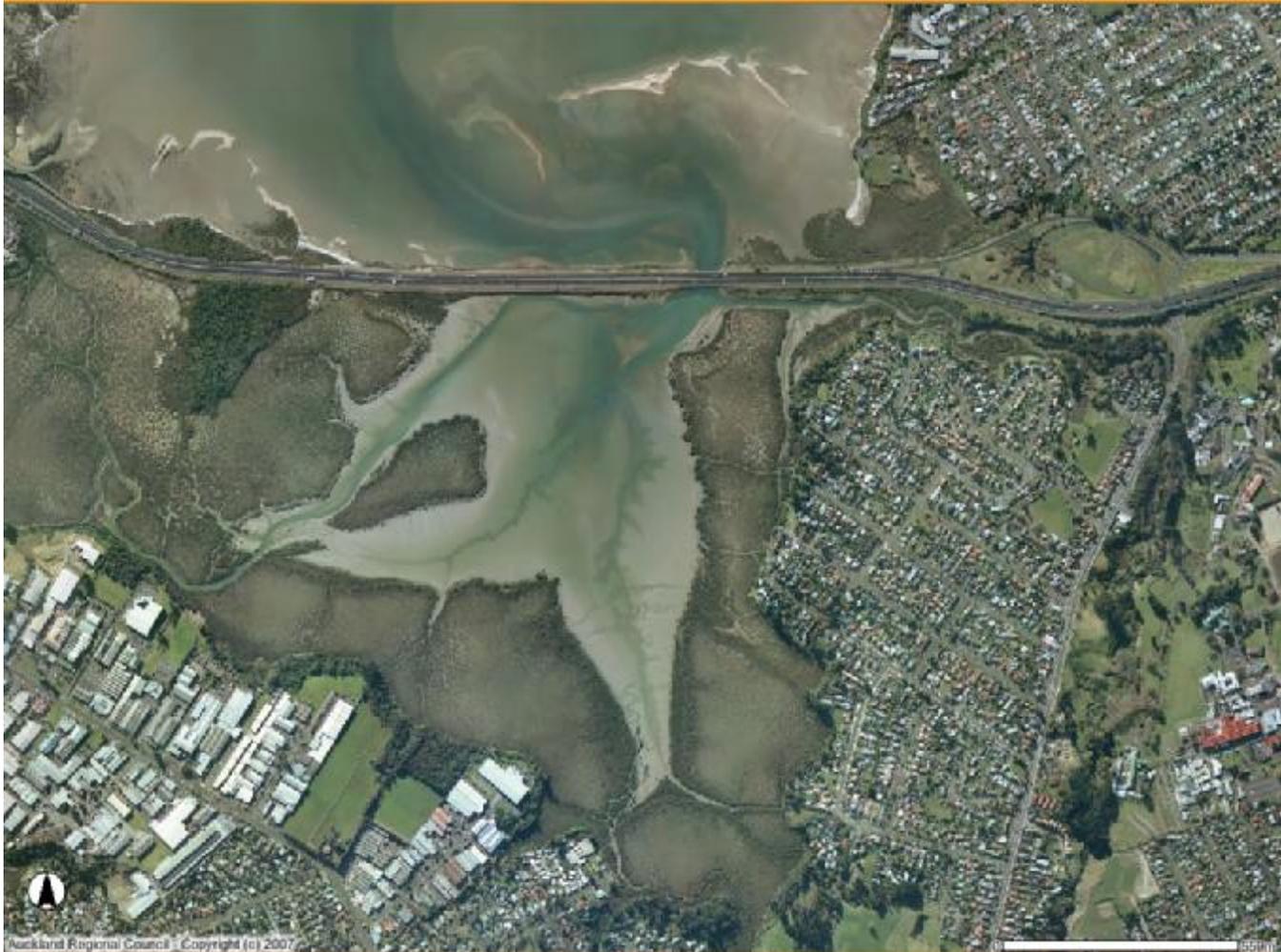
Outline

- **Existing environment/ investigations.**
- **Potential impacts on the environment.**
- **Proposals to avoid, remedy and mitigate adverse effects.**
- **Opportunities for enhancement.**

Environmental Investigations

- **Coastal processes**
- **Land/ Sediment contamination**
- **Marine ecology**
- **Birds**
- **Vegetation**
- **Lizards**
- **Freshwater ecology**
- **Flooding**
- **Archaeology**

Coastal Processes- change in Waterview Inlet: 1940 to present



Contamination Investigation

Scale of Investigation

Boreholes	Test Pits	Augers	Soil/ Sediment Samples	Groundwater Samples
133	56	25	338	61

Investigation covered:

- At Grade Section (SH20)
- Tunnel Section
- Interchanges (Maioro & Waterview)
- SH16 widening

Assessed:

- Soil
- Groundwater
- Landfill Gas

Contamination Investigation

- Currently ongoing



Contamination - Summary

Soil Samples

- No significant soil contamination
- Awaiting results from area of possible 'refuse'

Marine Sediment

- No significant soil contamination found to date

Groundwater

- No significant groundwater contaminationManagement

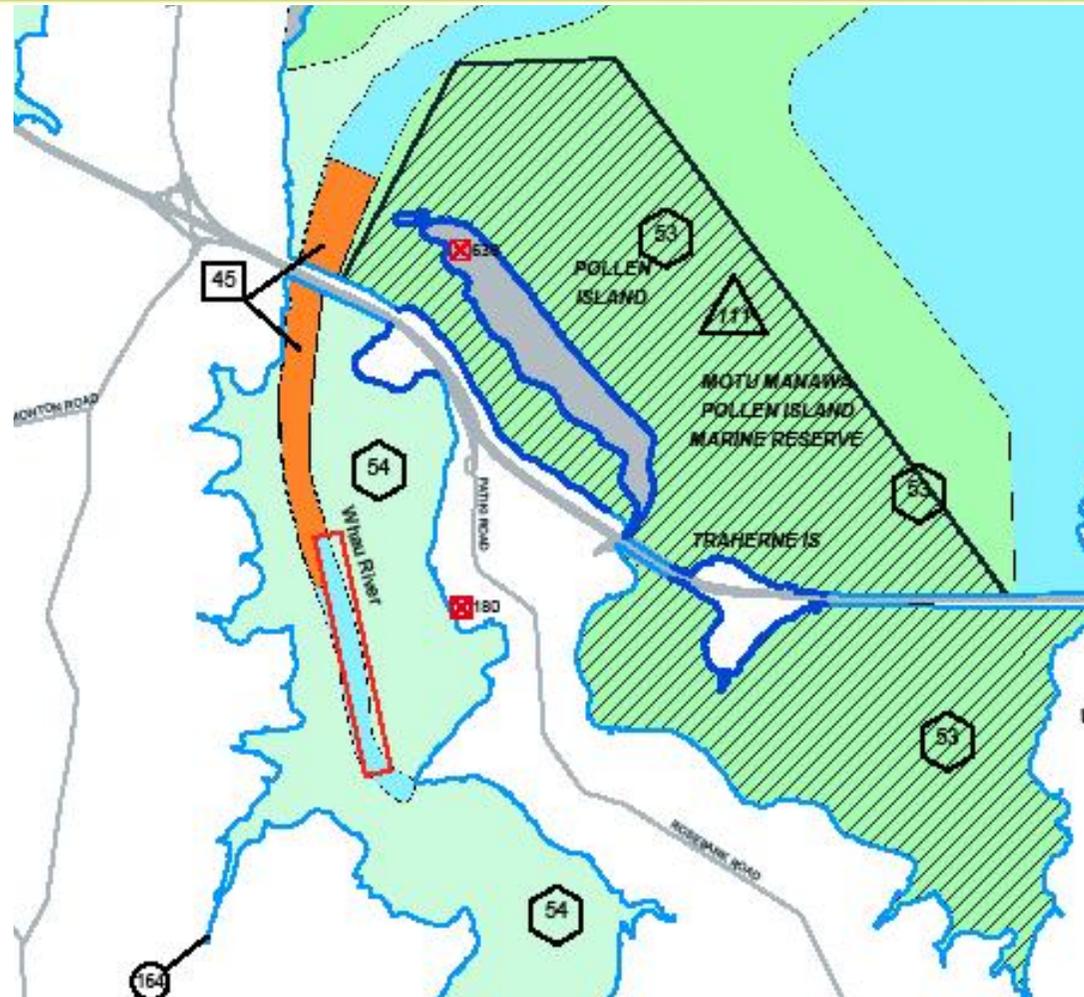
Contingency

- Management Plans deal with random "hot spots".

Marine Ecology - Motu Manawa Marine Reserve

- **Established 1995 and included in the Hauraki Gulf Marine Park.**
- **500 ha of mudflats, channels, mangroves, saltmarsh, and shellbanks.**
- **Intertidal flats examples of mangrove and saltmarsh habitat support numerous wading birds.**
- **Mudflats and sandflats support a diversity of coastal invertebrates and fish.**

Marine Ecology - Regional Coastal Plan map



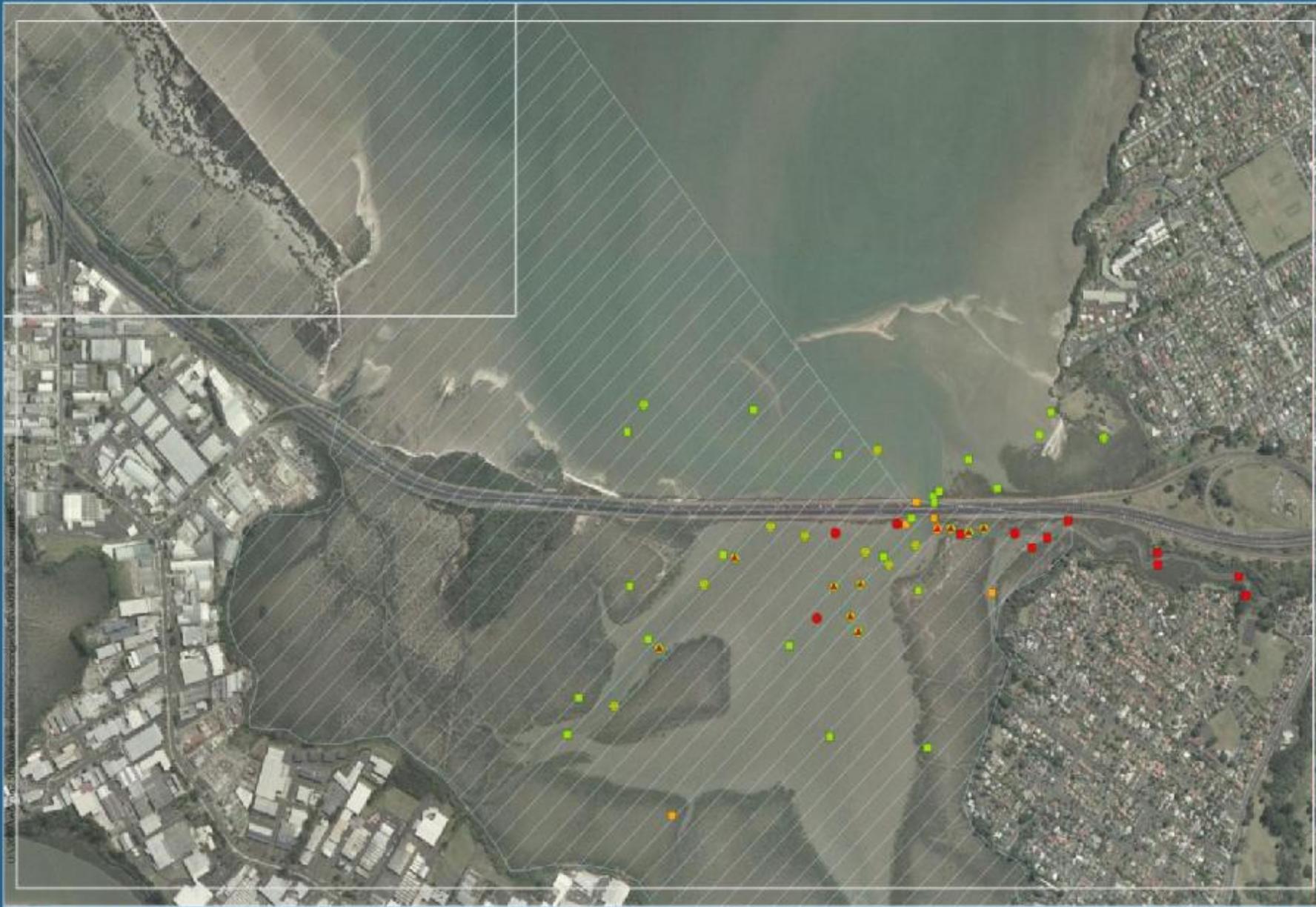
Marine Ecological - Investigations

- **Surface sediment sampling for contaminants and sediment grain size – intertidal & subtidal.**
- **Invertebrate community composition (shellfish, snails, mud worms and crabs.**
- **Literature review for fish**
- **Qualitative coastal vegetation inventories.**

Marine Ecology - Sediment

Waterview Inlet

- Past and present landuse/ discharges have impacted sediment quality.
- Sediment predominantly very fine silt and clay fraction.
- Constriction of tidal exchange, stormwater and contaminant discharges has resulted in elevated contaminant concentrations in sediment.
- Contaminants often exceed ARC criteria



SH20 Waterview
Assessment of Environmental Effects

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 Level 3, 116 On-Campan, One Cameron Rd & Wharf Street, Tauranga

Legend

ARC ERC thresholds (mg/kg)		
ERC < 63µm	ERC 63 - 500µm	ERC total
▲ < 124	● < 124	■ < 124
▲ 124 - 150	● 124 - 150	■ 124 - 150
▲ > 150	● > 150	■ > 150

Motu Manawa Marine Reserve

Concentration in sediment
Zinc
Waterview

11 February 2010



Marine Ecology - Invertebrates

- **Invertebrate composition related to sediment grain size and hydrodynamic environment.**
- **Waterview Inlet has fine sediment (gloopy mud) with low diversity.**
- **Outer sites had more diversity of sediment grain size and invertebrates.**

Marine Ecology - North of Waterview Causeway (firm, coarse sediment)



Marine Ecology- Within Waterview Inlet (soft deep gloopy mud)



Marine Ecology - Summary

Ecological values within proposed area of disturbance:

- **Waterview Inlet – patchy moderate**
- **Mouth of Oakley Creek – moderate to low**
- **Between Waterview and Te Atatu – patchy moderate to high**
- **Whau Bridge – moderate**

Bird Surveys

- **Terrestrial birds along SH20**
- **Marsh birds at various locations**
- **Coastal birds**
 - 1) Overview survey around Marine Reserve
 - 2) Causeway survey – north & south sides

Bird Survey - Summary

- **Terrestrial birds:**
 - Common species only
- **Marsh birds:**
 - Within and immediately adjacent to the footprint
 - No banded rail or fernbird found
- **Coastal birds:**
 - 1) **Overview survey:**
 - 18 species recorded (9 species were wading birds)
 - 'Threatened' & 'At risk' species (pied shag, red-billed gull and wrybill)
 - 2) **Causeway survey:**
 - Three dominants (pied oystercatcher, white-faced heron, pied shag)
 - Northside bias: red-billed gull, black-backed gull
 - Southside bias: pied stilt, wrybill

Vegetation: Traherne Island - Rosebank



Vegetation- Mimulus Repens

Waterview Connection Project - Location of *Mimulus repens* (Maori musk)



Lizards

- **Copper Skinks (*Oligosoma aeneum*)**

- Not threatened
- Restricted to NI
- Probably most common native lizard in NI
- Commonly found in rank grass and bush edges
- Suburban environments, reserves, roadsides
- Relocation of population possible



- **Rainbow skinks (*Lampropholis delicata*)**

- Introduced
- Potential pest
- Upper NI of NZ



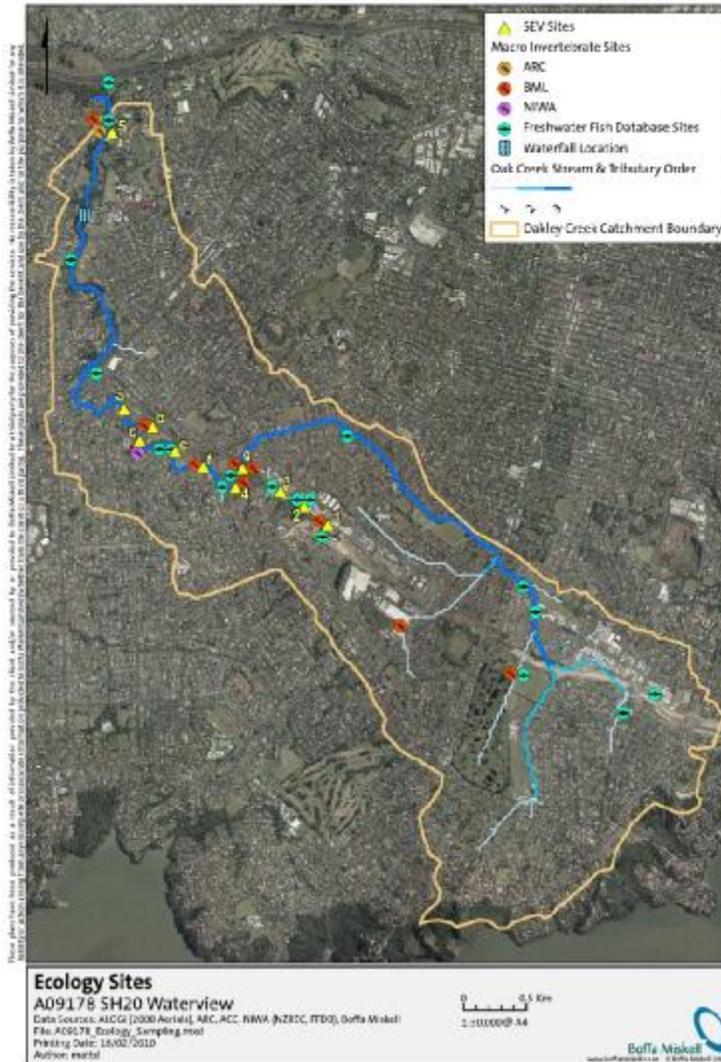
Freshwater Ecology- Auckland's Streams

Figure 3 – NIWA stream reaches, produced by KMA and Beca



© National Institute of Water & Atmospheric Research Ltd 2005
Auckland City Stream Classification 2004

FreshWater Ecology - Oakley Creek



Freshwater Ecology - Oakley Creek Waterfall



Freshwater Ecology - Oakley Creek Fish Species

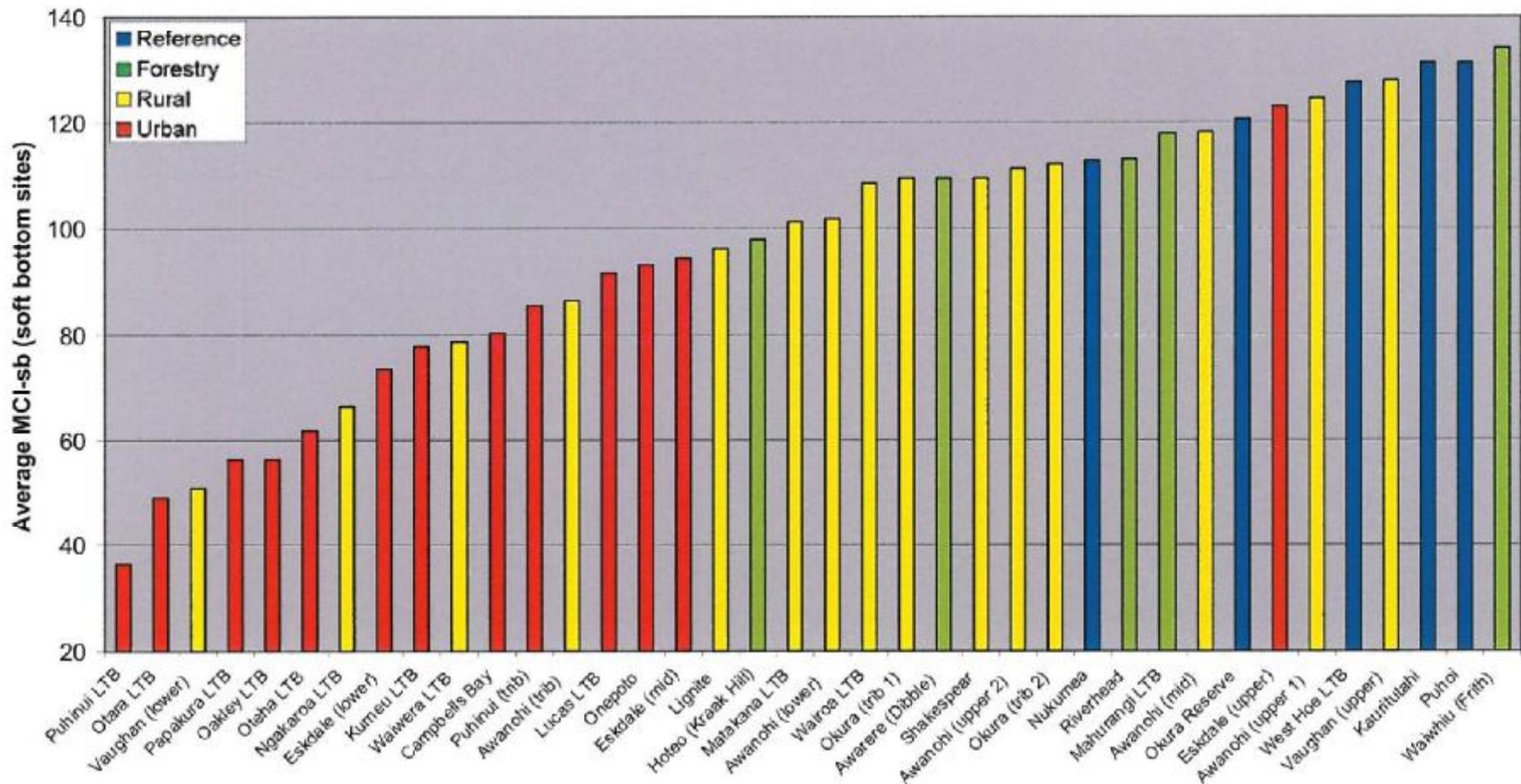
Fish Species Below Waterfall:

- longfin eel
- shortfin eel
- common smelt
- inanga
- common bully
- redfin bully (one record)
- giant bully (one record)
- torrentfish (one record)

Fish Species Above Waterfall:

- longfin eel
- shortfin eel
- goldfish
- mosquitofish
- banded kokopu (one record)

Freshwater Ecology - Regional Invertebrate Data



ARC, 2008

Freshwater Ecology - Summary

- **Three streams affected, the most significant being Oakley Creek.**
- **Receives stormwater/sewer overflows typical of urban environments.**
- **Macroinvertebrate communities indicate polluted conditions.**
- **Native fish diversity limited by waterfall.**
- **Rehabilitation guidelines prepared to detail how this will be achieved.**

Archaeological Evaluation process

- Historic research, databases and early plans
- Detailed survey of archaeological remains
- Creation of a Heritage GIS constraints layer
- Identification of constraints and enhancement opportunities contributing to the appreciation of Auckland's Heritage

Archaeology - Sites around the Great North Road Interchange



Thomas Mill and Garrett Tannery

Date	Event
1859	John Thomas buys Lot 18A
1860	First historic reference to the mill
1865	John Thomas dies intestate John's brother, George, buys the mill and sells to George Binney
1867	John's widow, Jane, marries storekeeper Thomas Barraclough
1870	John's son, William, owns two thirds of the mill, Thomas Barraclough the other third
1873	Mill burns down on 8 January - mill reopens on 19 June
1876	Mill is bought by G. Binney & Co.
1879	Mill is bought by Garrett Brothers who convert it to a tannery
1882	Garretts still on south side of Oakley Creek; north side of Oakley Creek quarried by at least this time mid 1880s economic depression in Auckland
1890	Garretts become insolvent tannery closed
c 1912	Mill demolished
1920s	Waitemata County Council quarry operates on north side of Oakley Creek
c 1949	Present bungalow built at 15 Cowley Street



Potential Environmental Impacts

- **Land disturbance (Erosion and sediment control)**
- **Reclamation/ channel excavation**
- **Stream diversion**
- **Vegetation removal**
- **Land contamination**
- **Construction Dust**
- **Groundwater abstraction**
- **Stormwater management**

Motorway Construction



Erosion Protection - Mulch



Erosion protection- Stabilisation



Sediment Retention Pond



Sediment Retention Pond



Sediment control



Erosion and Sediment Control Measures

- **Works still ongoing:**
 - Current possibilities include
 - Aquadam (or similar)
 - Silt curtain



Waterview Inlet encroachment



Stormwater - Design Philosophy

Stormwater treatment provided for

- all new impervious surfaces
- for existing impervious surfaces where practicable

Sediment removal achieved by :

- q Wetlands
- q Grassed swales
- q Grassed filter strips
- q Proprietary cartridge filters

Stormwater Management –Te Atatu



Sector 1

Proposed site for

Jack Colvin Wetland



Stormwater pond



Conclusions

- **Existing environment is diverse ranging from high value through to degraded.**
- **Extensive investigations have helped to understand the values.**
- **The project will generate effects that will need to be managed.**
- **There are a range of measures through the design and implementation to avoid, remedy or mitigate effects.**