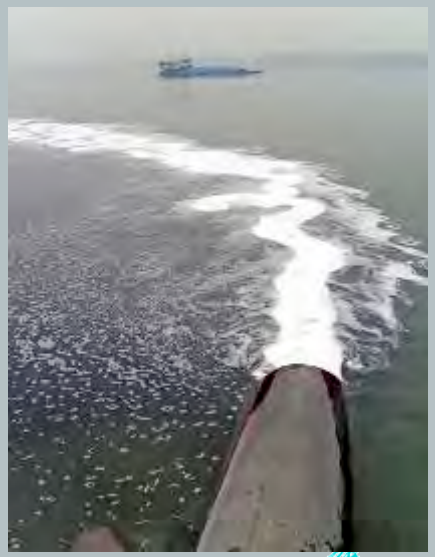
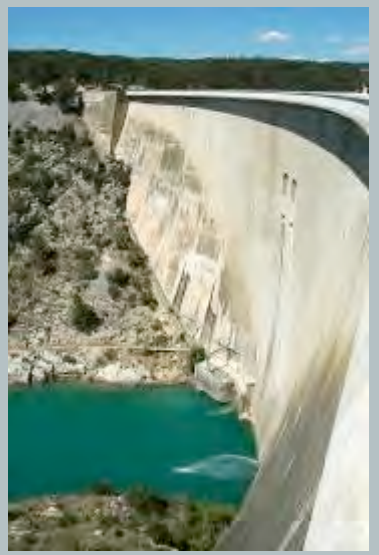
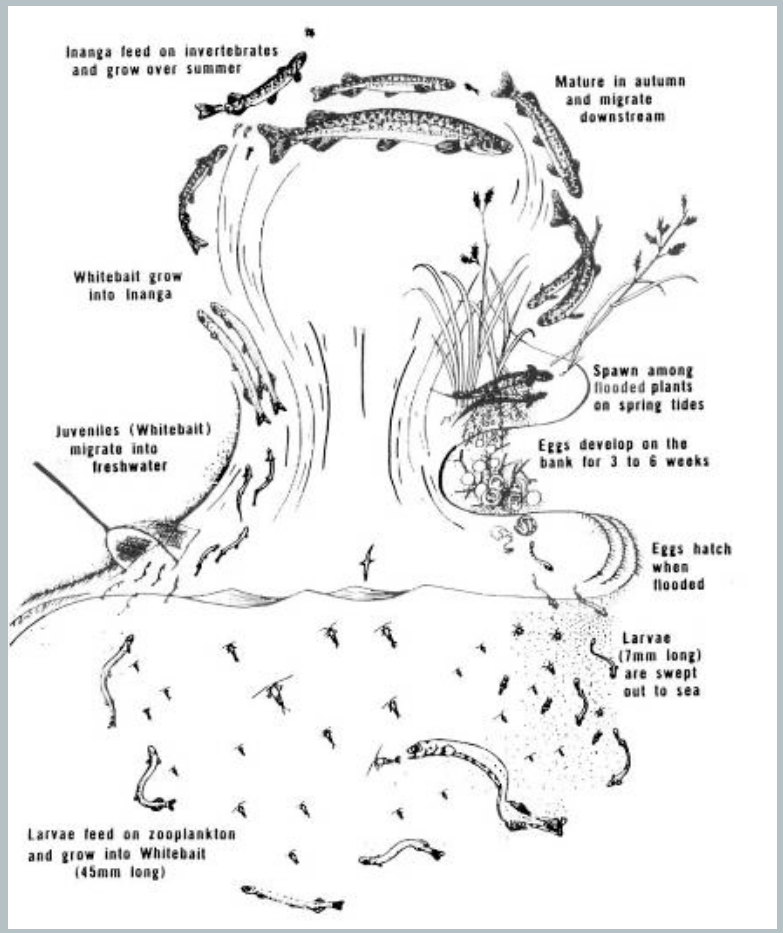
Obstructions to Fish Passage





Most of the 35+ species of NZ native fish need to migrate annually or at some time in their life cycle.



Many birds and marine species rely on the migrating fish for their food supply.

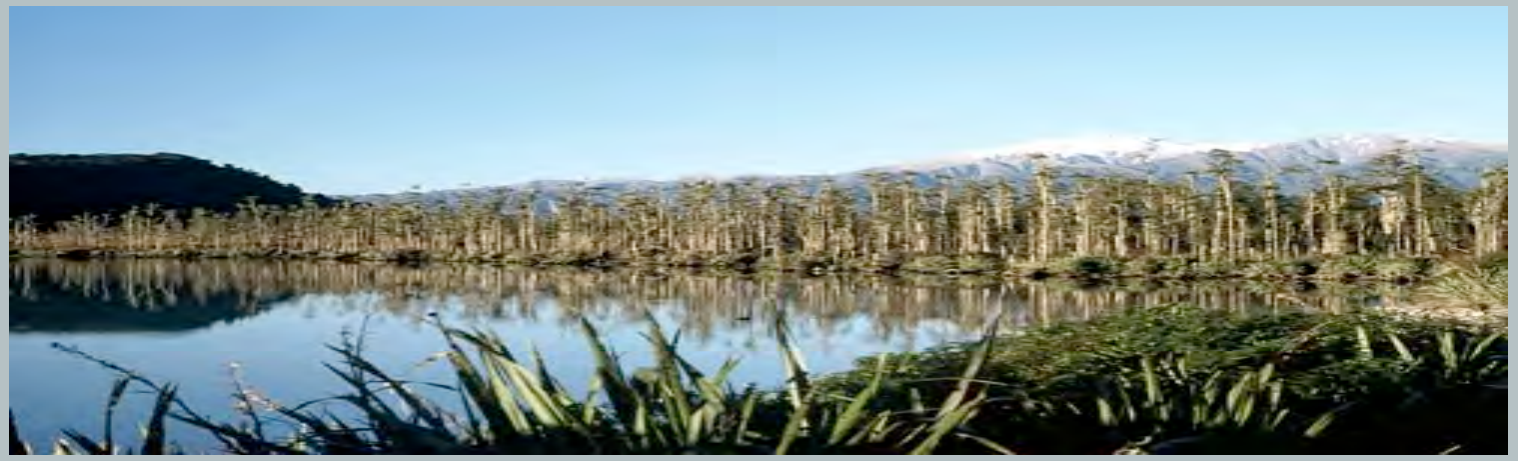
Where are our native fish?

Digital catchment background image: Phil Jones, Dialogue Design. Photos: Longfin eel, Dwarf galaxias, Koaro, Grey mullet, Smelt, Shortfin eel, Giant bully, Shortjawed kokopu, Redfin bully, Black flounder, Torrent fish. Courtesy of Peter Hamill, Marlborough District Council. Banded kokopu, Common bully, Giant kokopu, Brown mudfish, Inanga, Lamprey. Courtesy of Stephen Moore, Landcare Research.

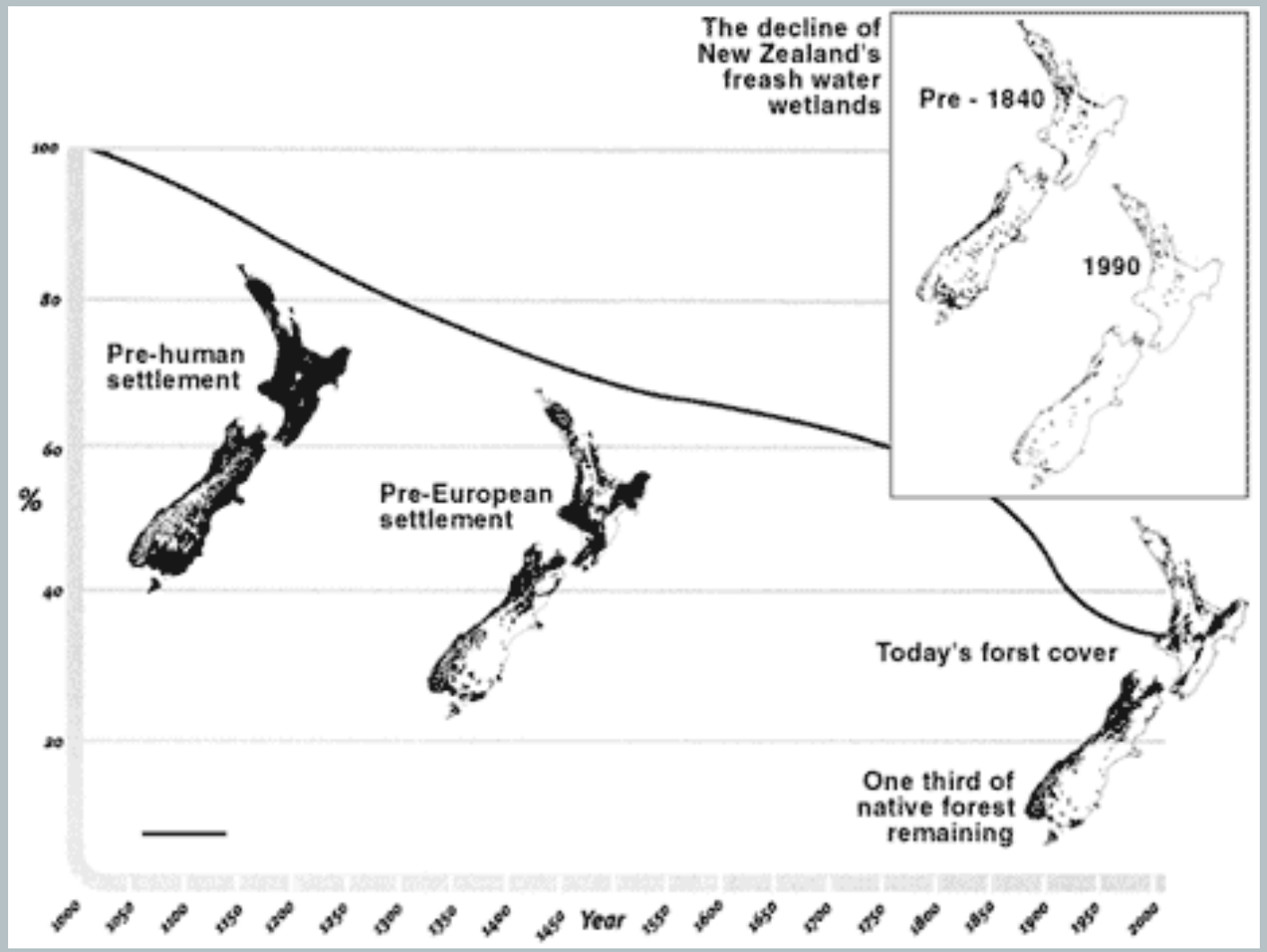
Wetlands are extremely productive

NZ has lost 98% of its wetland habitat

Remaining streams & rivers are largely inaccessible thereby removing thousands of tonnes of biomass from the national food web



The decline of New Zealand's freshwater wetlands



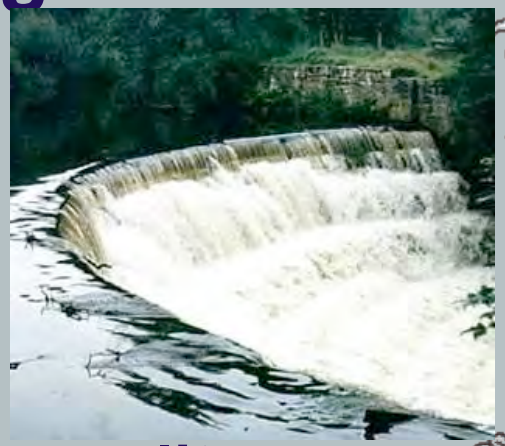
On the journey from inland breeding habitats to and from the oceans, there can be many obstructions to native fish passage.

These fish are a very important part of the food-chain for our entire eco-system.

Without these native fish we lose:

Natural Biodiversity
Tourism
Customary food gathering
Recreational Fishing
Commercial Fishing
Clean Green Image

Obstructions to fish passage fall into 3 main groups:



1. Manmade Physical - Engineered
2. Manmade Environmental – Water quality
3. Semi-natural – Pests

Manmade Physical

- Dams (hydro and irrigation)
- Flapgates (including floodgates & tidegates)
- Culverts (perched and smooth bottoms)
- Shallowing (irrigation uptake, wide aprons)
- Under-grounding (urban areas)
- Pumps
- Weirs

Manmade Physical cont..

Perched culvert

Bay of Plenty

Manmade Environmental

- **Water Temperature** (lack of shade, industrial discharge)
- **Oxygen levels** (raised temperature and poor flow)
- **Nutrient levels** (farm run-off)
- **Toxins and other pollutants** (industrial)
- **Salinity** (natural tidal pulse restricted by floodgates etc)

Semi-Natural

- **Introduced competitors** (trout, carp, catfish etc)
- **Introduced Predators** (rats, stoats, gambusia)
- **Easy-Kill zones** (shags, gulls, eels etc)
- **Weeds & Toxic Algae**
- **Human** (recreational and commercial fishing)

Solutions to Manmade Physical Obstructions

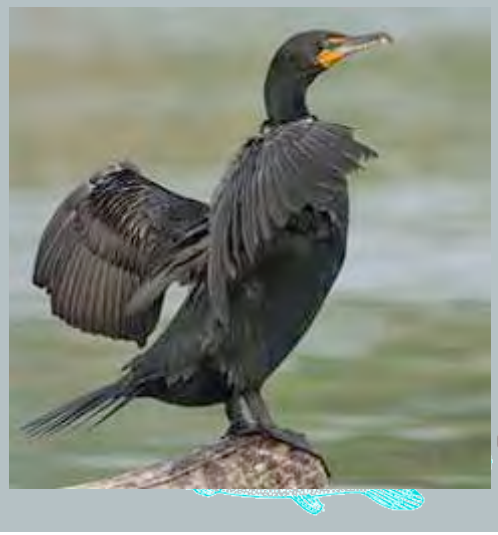
- **Dams –** Fish passes.
- **Floodgates –** modify to be “Fish Friendly”.
- **Culverts –** Modify and/or reinstall. Fit baffles.
- **Shallowing –** reduce uptake, modify watercourse.
- **Under-grounding –** redesign urban spaces.
- **Pumps –** replace with “Fish Friendly”.
- **Weirs –** Fish passes.

Solutions to Manmade Environmental Obstacles

- **Water Temperature –** Plant margins, eliminate discharge, legislation.
- **Oxygen levels –** Flushing, Planting, landscaping.
- **Nutrient levels –** Fencing, education, legislation.
- **Toxins and other pollutants –** Education, legislation.
- **Salinity –** Allow natural tidal pulse.

Solutions to Semi-Natural Obstacles

- **Introduced Competitors –** Eliminate/control.
- **Introduced Predators -** Eliminate/control.
- **Easy-Kill zones –** modify with engineering and/or landscaping.
- **Weeds –** biological control, manage nutrients, allow natural saline pulses.
- **Human –** education and regulation.



Many waterways have several different obstacles along their course.

Any improvement will go some way towards increasing fish numbers and biodiversity.

Engineering, Education and Legislation all form part of an overall Sustainable solution.

Concerned Agencies

Government Ministries & Departments

- *Fisheries*
- *Conservation*
- *Environment*
- *Agriculture*
- *Forestry*
- *Transport*
- *Tourism*

Other Groups

- *Local & Regional Government*
- *Iwi & Hapu*
- *Educational Intuitions*
- *Conservation & Care Groups*
- *Recreation and Sports Groups*
- *All individuals who gather aquatic food*