Prioritisation tools and systems for remediating, maintaining or creating fish barriers

Fish Passage Symposium November 2013

David West
Aquatic & Reporting Unit, DOC
dwest@doc.govt.nz

www.doc.govt.nz

Department of Conservation
Te Papa Atawbai

The issues

- The "bad" barriers
  - Dams, weirs, abstraction intakes,
  - Stopbanks, floodgates, pumpstations
  - Perched culverts, fiords

- The "good" barriers
  - Perched culverts, weirs
- Its all about location

2

Department of Conservation
Te Papa Atawbai

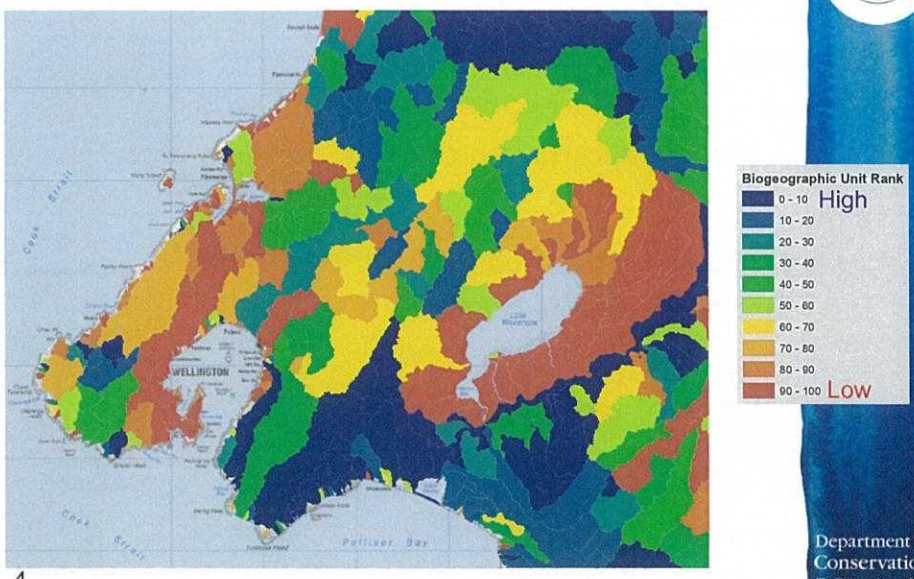
Value features to prioritise "bad" barriers for fixing.

- Inanga spawning sites
- Higher ranked FENZ catchments
  - Nationally, Regionally, complementarity, native fish ranks etc.
- Important migratory pathways
- Rivers downstream of DOC Ecosystem Management Units
- Regional Council schedules of important freshwater places
- Sites of active freshwater restoration

3

Department of Conservation
Te Papa Atawbai

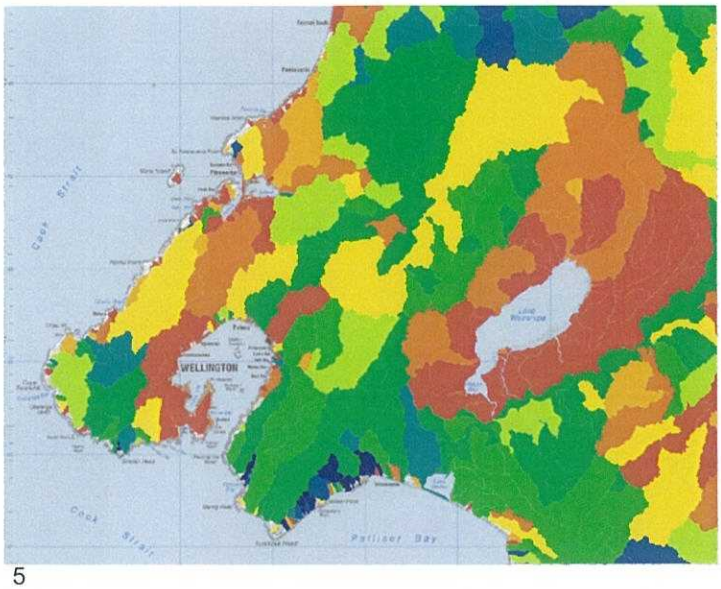
FENZ Biogeographic Unit Rank



4

Department of Conservation
Te Papa Atawbai

National Rank

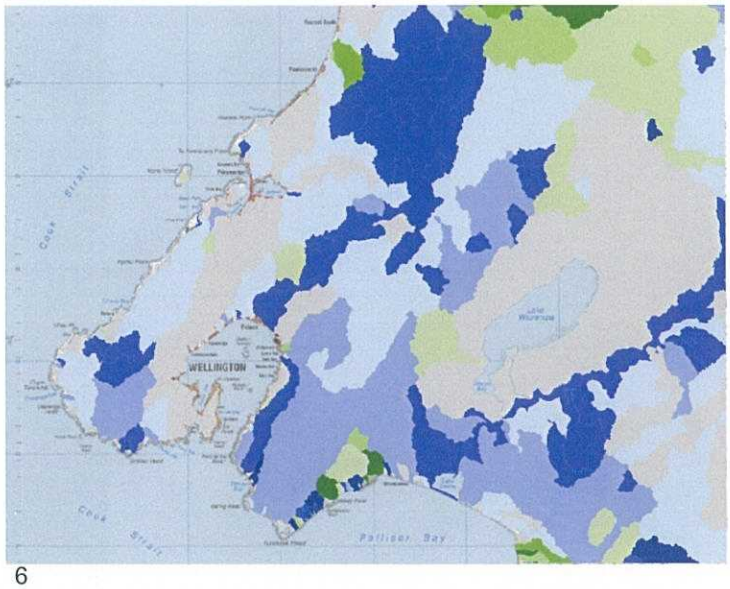


National Rank
0 - 10 High
10 - 20
20 - 30
30 - 40
40 - 50
50 - 60
60 - 70
70 - 80
80 - 90
90 - 100 Low

Department of Conservation
Te Papa Atawbai

5

National Protected Rank

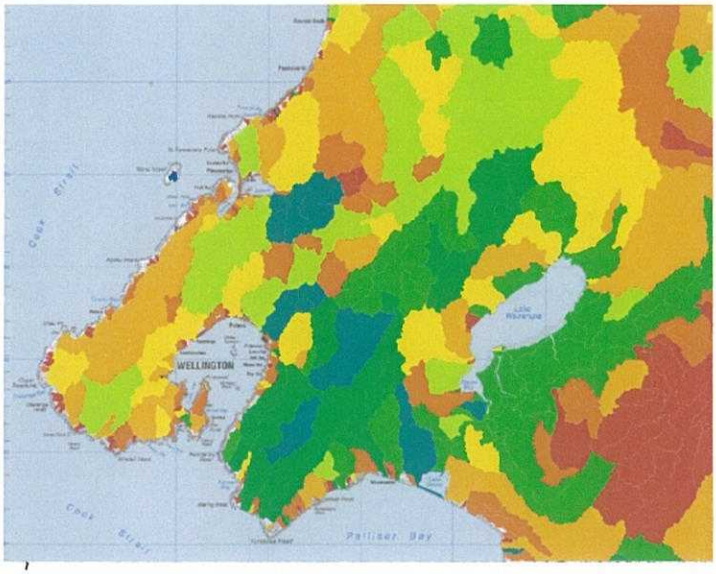


National Protected Rank
0.0 - 5.0 High
5.1 - 10.0
10.1 - 15.0
15.1 - 21.1 Low
21.2 - 31.1 High
31.2 - 41.1
41.2 - 51.1
51.2 - 76.1
76.2 - 100.0 Low

Department of Conservation
Te Papa Atawbai

6

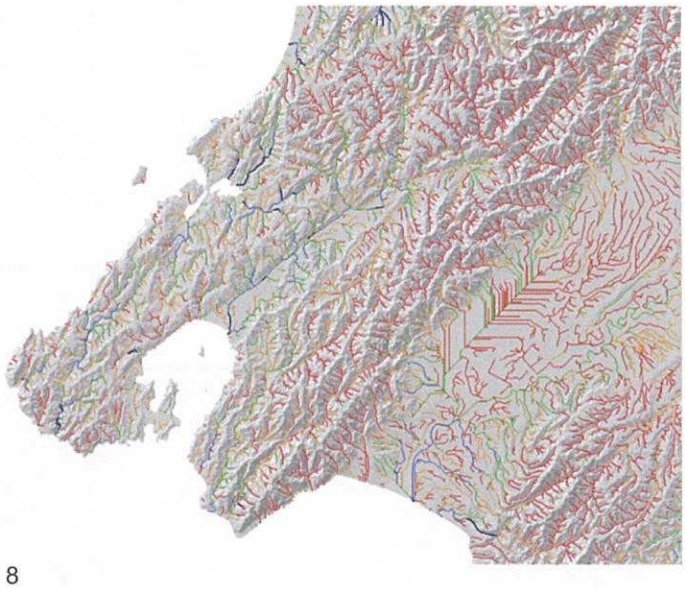
Native diadromous and non-diadromous fish ranking



Fish River Planning Unit Rank
0 - 10 High
10 - 20
20 - 30
30 - 40
40 - 50
50 - 60
60 - 70
70 - 80
80 - 90
90 - 100 Low

Department of Conservation
Te Papa Atawbai

Diadromous fish richness

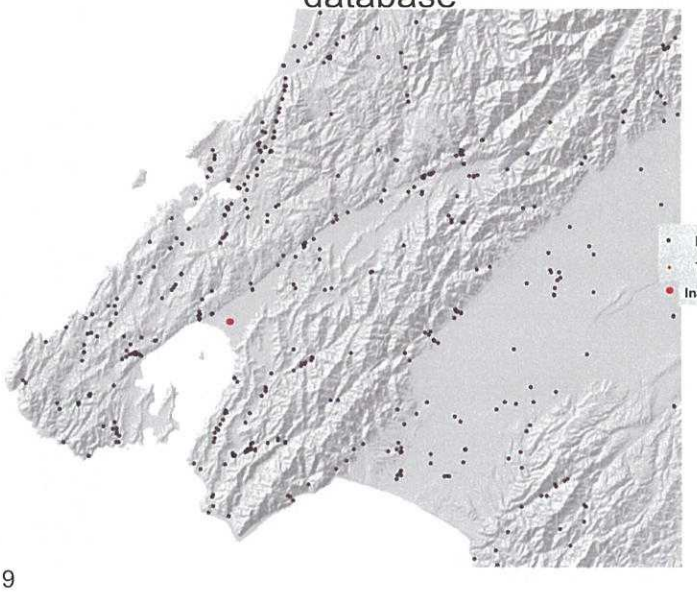


Diadromous Fish Richness
7 - 10 High
5 - 7
3 - 5
2 -3
0 - 2 Low

Department of Conservation
Te Papa Atawbai

8

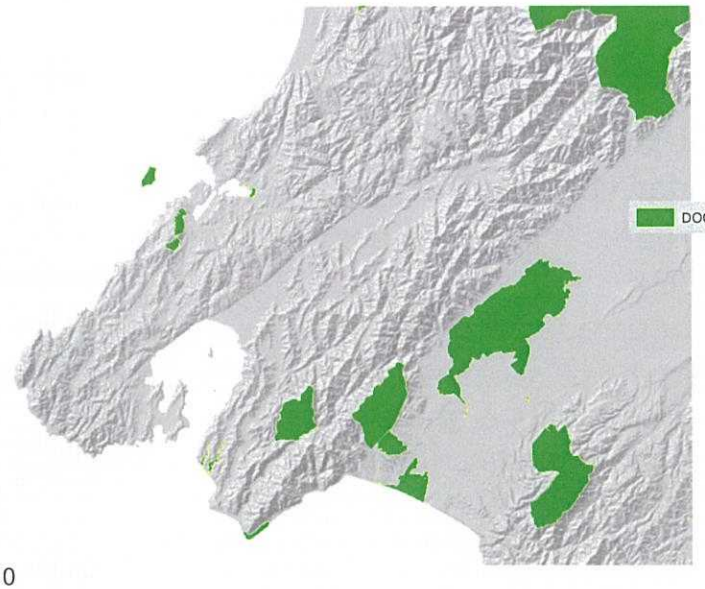
Declining and threatened fish records NZ Freshwater Fish Database, inanga spawning database



Department of Conservation
Te Papa Atawbai

9

DOC Ecosystem Optimisation Sites



Department of Conservation
Te Papa Atawbai

10

Other important freshwater places

- Schedules of special places with freshwater fish values
- Active freshwater restoration sites where diadromous fish likely
- Mahinga kai
- Commercial fisheries

11

Department of Conservation
Te Papa Atawbai

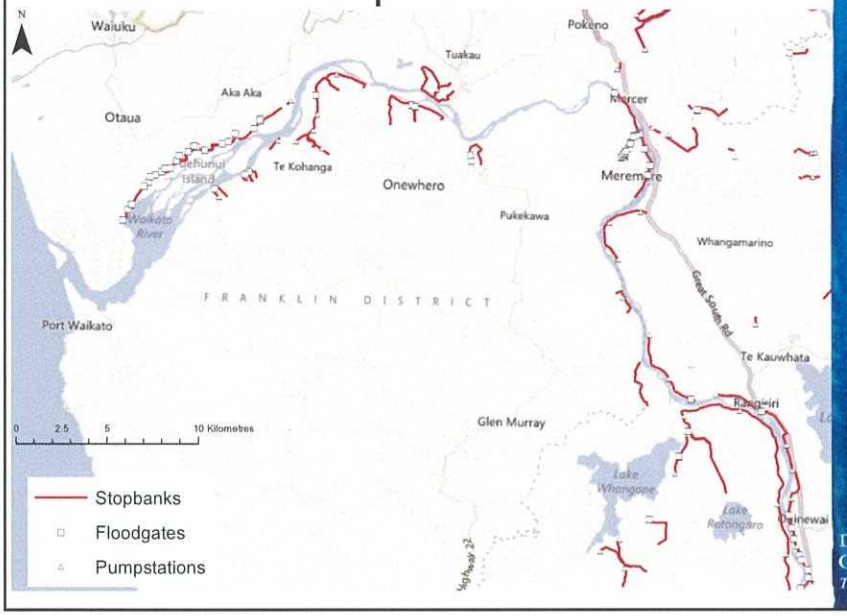
Practical features to prioritise "bad" barriers for fixing.

- **Local government owned structures**
  - Most downstream first
  - Flood gates (older less easy to open designs)
  - Structures due for maintenance
  - Those whose removal can have multiple benefits e.g. Fish passage + Better water quality, floodplain reconnection etc.

12

Department of Conservation
Te Papa Atawbai

e.g. Council feature of Lower Waikato barriers and potential barriers



Department of Conservation
Te Papa Atawbai

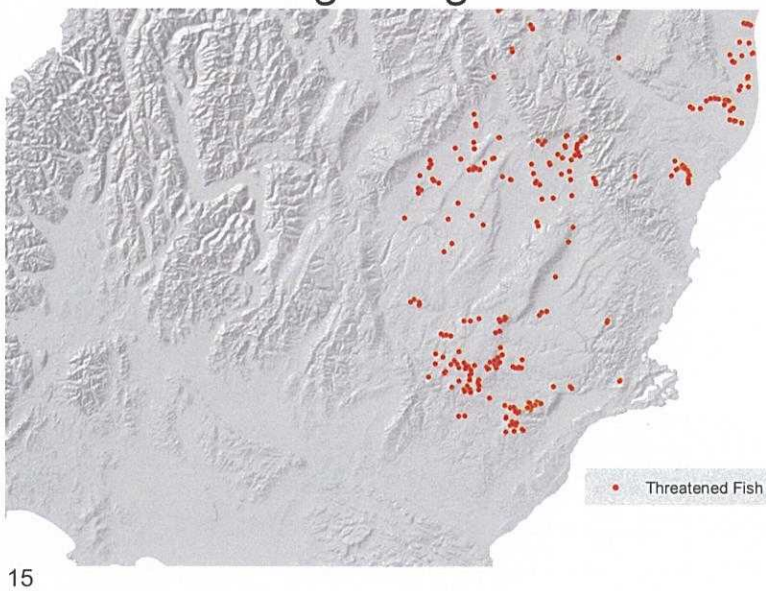
Value features to prioritise where to build or maintain "good" barriers

- Locations of threatened native species
- Catchments selected as key species optimisation sites
- Good habitat for threatened native species (potential translocation sites)
- Where salmonids are absent

14

Department of Conservation
Te Papa Atawbai

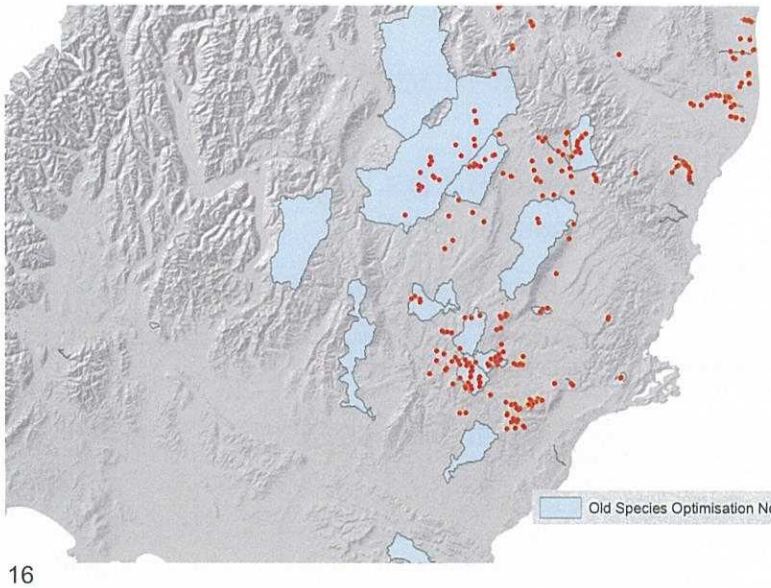
Threatened non-migratory galaxiids, eg. Otago



Department of Conservation
Te Papa Atawbai

15

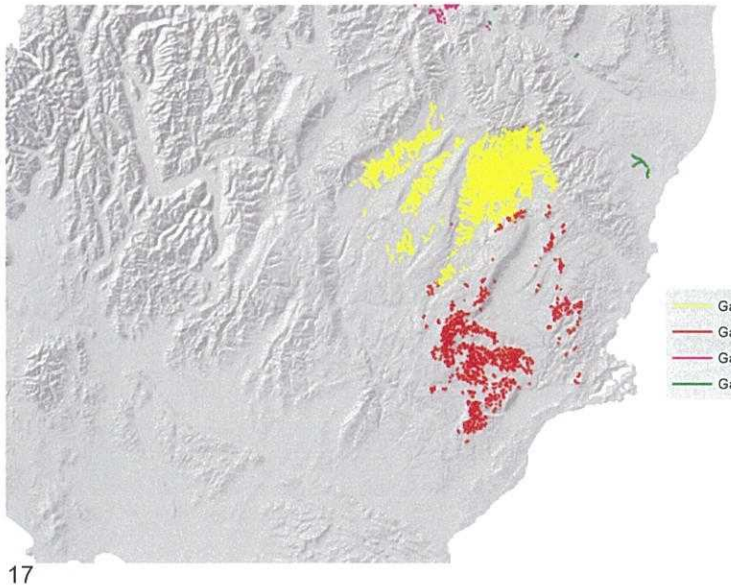
Key catchments for threatened NMGs



Department of Conservation
Te Papa Atawbai

16

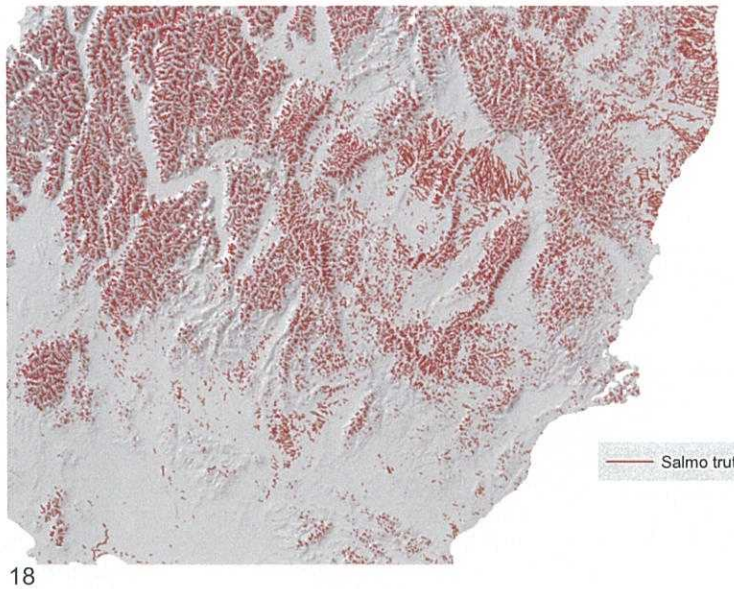
Predicted NMG distributions



Department of Conservation
Te Papa Atawbai

17

Where trout are predicted not to be



Department of Conservation
Te Papa Atawbai

18

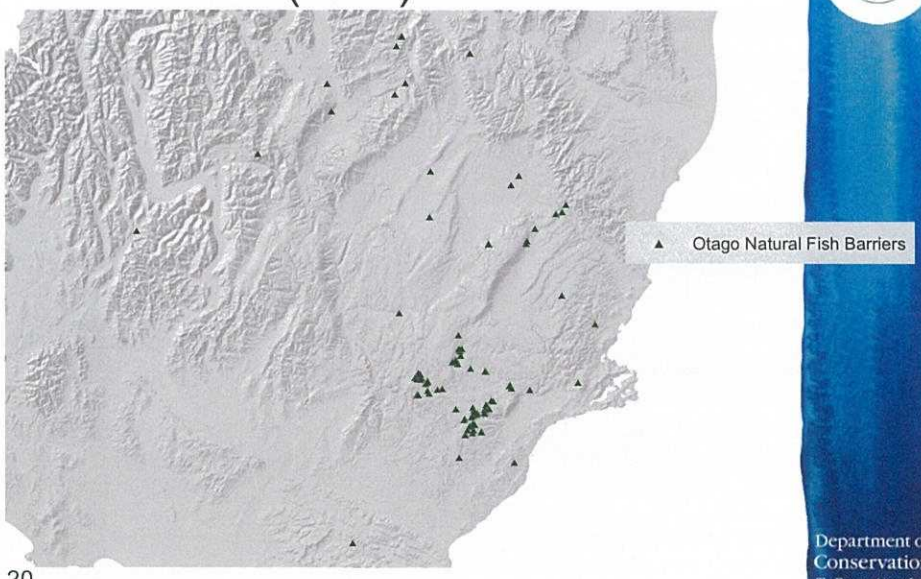
Practical features to prioritise building "good" barriers

- Artificial structures such as culverts or weirs that can be enhanced as barriers
- Natural structures such as waterfalls and bedrock shutes
- Reaches with high slopes

19

Department of Conservation
Te Papa Atawbai

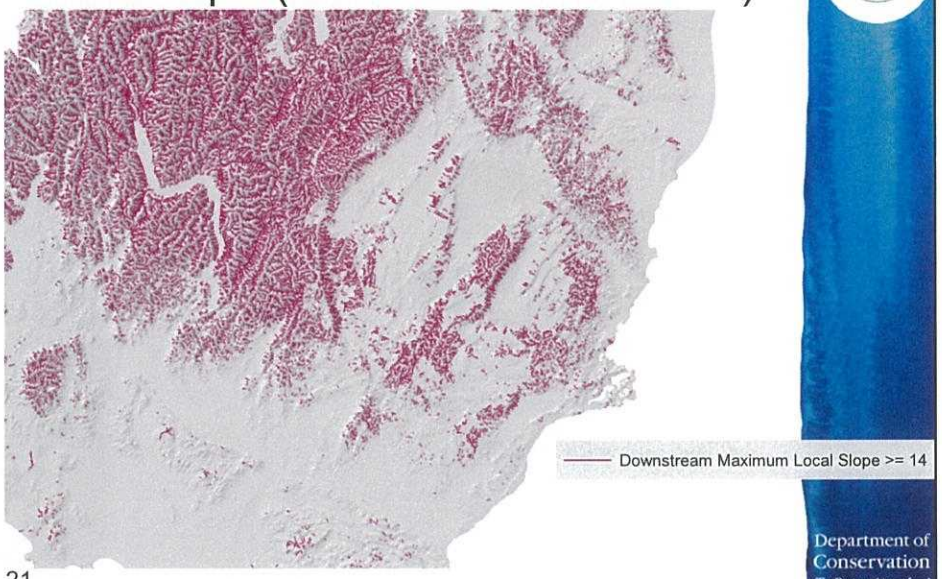
Mapped and assessed natural fish (trout) barriers



20

Department of Conservation
Te Papa Atawbai

Predicted Downstream Maximum Local Slope (> chance of barriers?)



21

Department of Conservation
Te Papa Atawbai

Prioritisation

- Overlay relevant combination of value and pressure features
  - E.g. Whitebait spawning sites & bad floodgates
  - Non-migratory galaxiids and trout, and good trout barriers

22

Department of Conservation
Te Papa Atawbai

Questions?

Acknowledgements

•Coastal Otago barrier sites

23

Department of Conservation
Te Papa Atawbai