

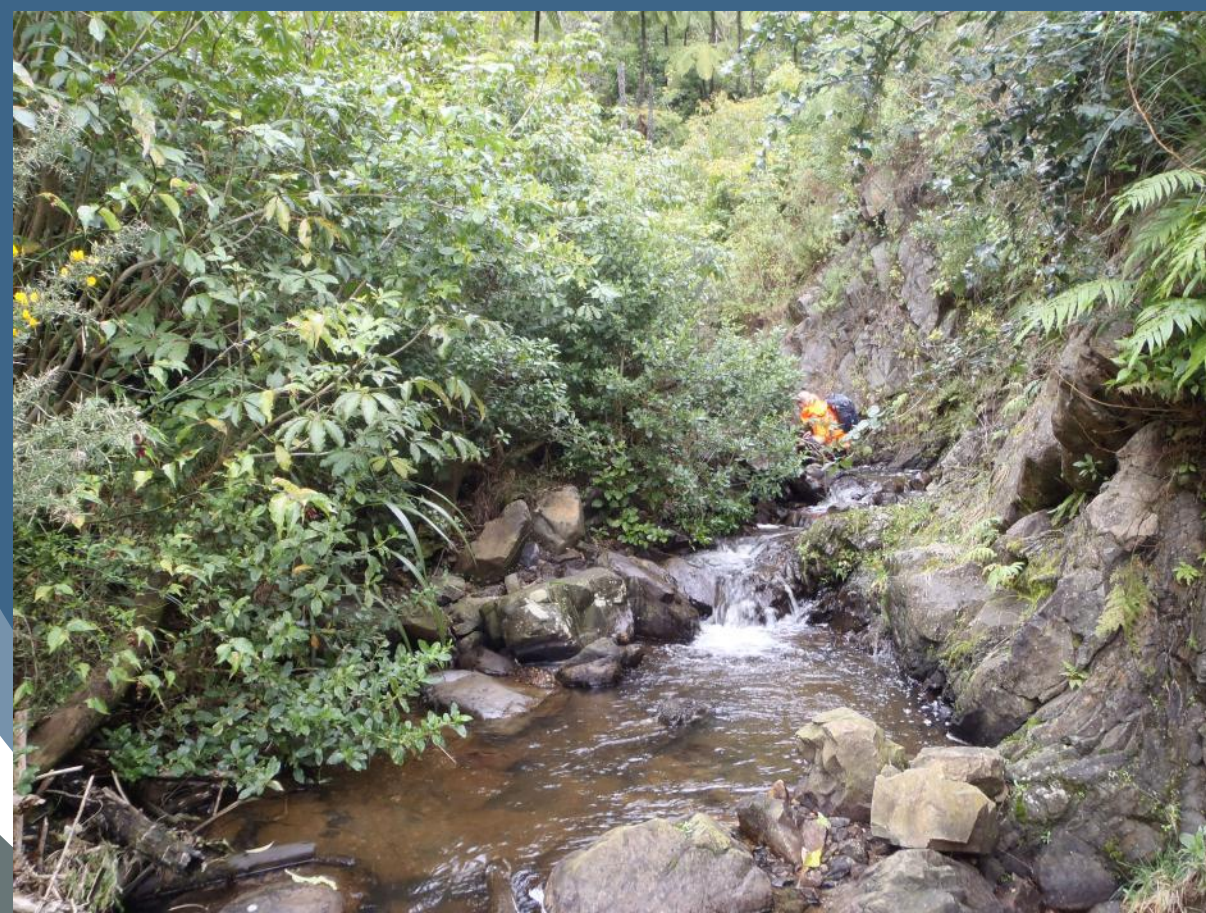
# Lessons from the Horizons Region





# Identifying the problem

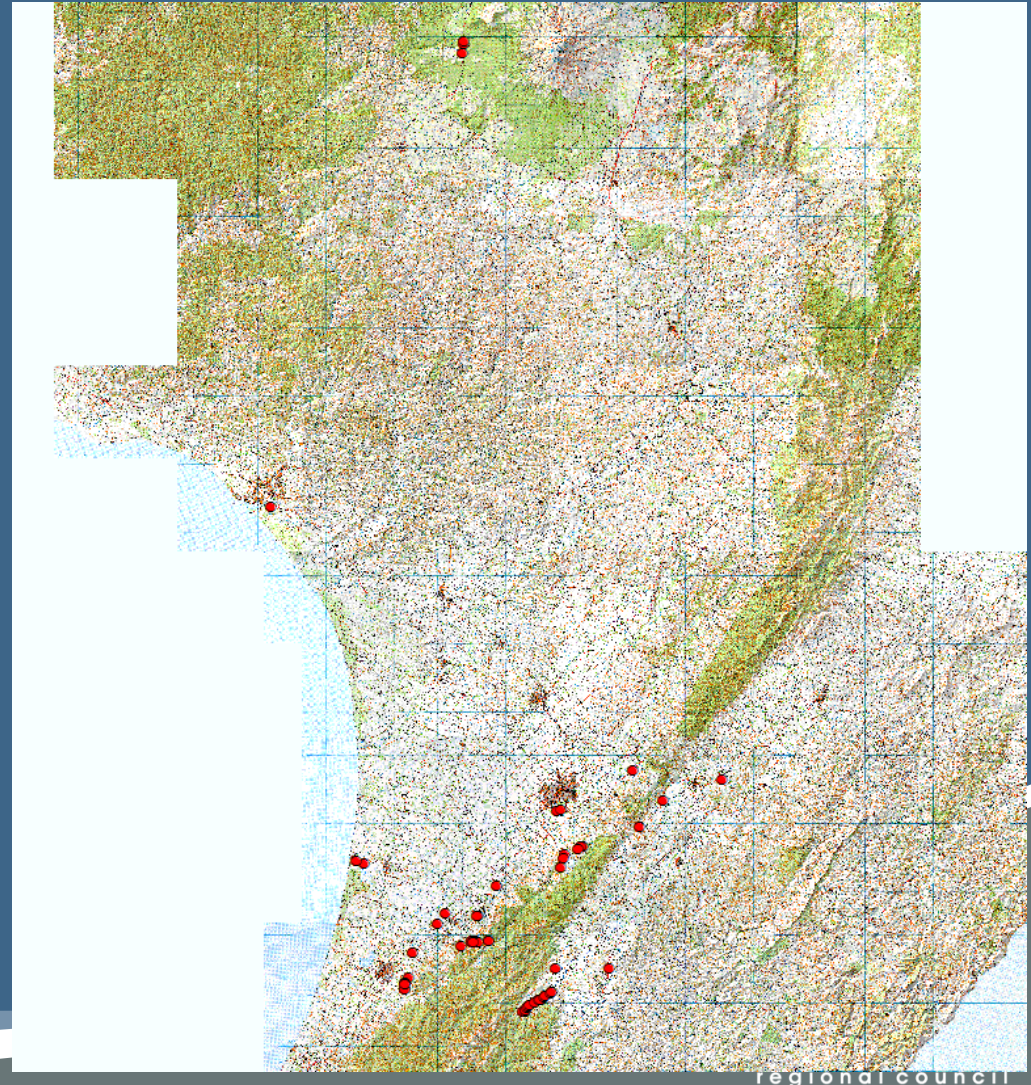
- Horizons Regional Council staff walked many kilometres of streams in search of fish barriers.
- Streams were walked from their confluence, either with another river or with the sea, up to their source (in practice usually to the boundary with DOC land).





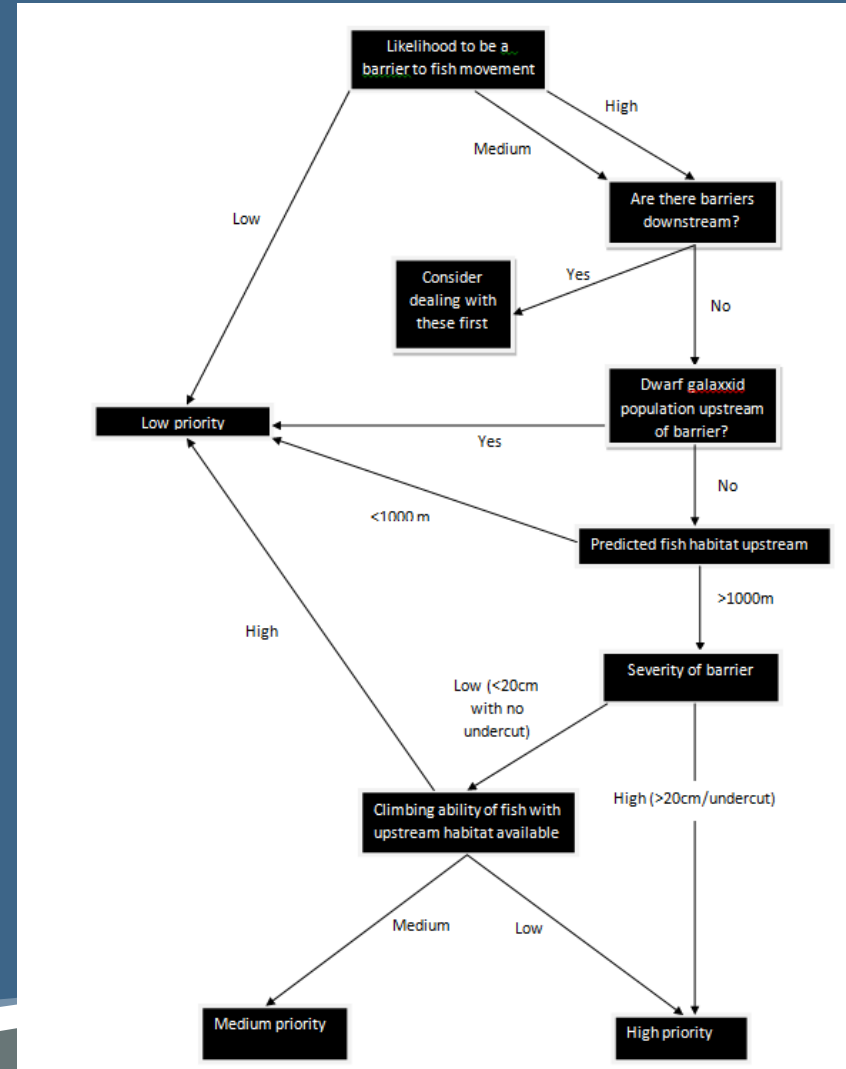
# Fish barrier layer

- From this work Horizons has started a GIS layer of our known fish barriers.
- Most of the work done to date has been carried out in the Manawatu catchment.



# Selecting which barrier to fix and when

- A decision tree was used to determine which barriers had highest priority for remediation.
- This is a changed version of the one proposed by James and Joy (2008).



# Clean Up fund

- Horizons Regional Council applied for funding from central government through the fresh start for fresh water clean up fund.
- One aspect of the funding was to provide for native fish habitat restoration. This has occurred through the fencing off and planting of riparian strips on targeted waterways. It also provided some funding for the remediation of fish barriers.
- Currently eight barriers in the Manawatu catchment are being partially funded in this way, in targeted high value catchments.
- Other barriers are also being repaired through other means!
- As part of the requirements by MfE it is necessary to get at least partial funding from other parties (i.e. owner) for the barrier to be repaired.

# The Carrot and the stick

- Convincing the owners of these structures to undertake remediation has had a two sided approach to it.
  - The incentive is that equal funding usually comes from two other parties (central government through MfE and Horizons Regional Council); Horizons staff undertake the assessment and put forward informed suggestions for remediation; and there is a large public perception win to be had.
  - On the other hand, requirements of the One Plan are that if a structure in a waterway does not allow for fish passage then a consent is required for the structure to exist.
- Some groups, such as Horowhenua District Council, and NZTA have jumped on board and are working towards remediation of a number of barriers.
- Other groups have been much harder to convince...



# What we found:



- Perched culverts

- Perched culverts with perched concrete aprons



- Ridiculously perched culverts

- Floodgates



- Culverts with perched concrete aprons

- Weirs



# Early attempts

- Fish ladder
- Constructed of fibreglass and prefabricated into sections





# Early Failures!

- The same ladder seen from the side.
- Broken off half way down. Large, highly mobile substrate and fibreglass ladders do not mix!





# Possible successes?

- Some of these ladders are still in place and seem to be working.
- Lower gradient and smaller substrate.





# Definite Success – Before





# Definite Success – After



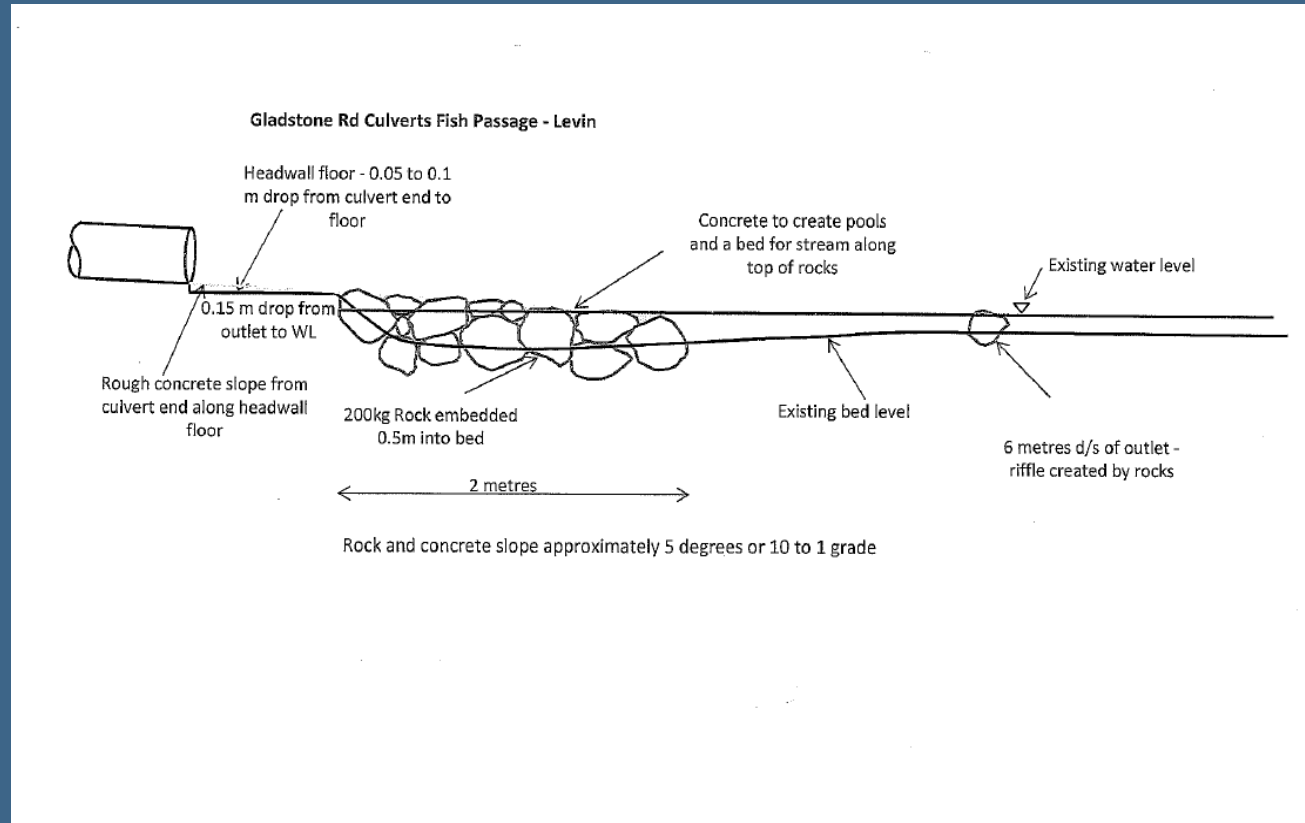


# Fish friendly floodgates



# New Approach

- Designed by our engineers with expert advice from NIWA to lift the level of the water to above the concrete apron
- An artificial riffle is created downstream of the weir to hold water in the pool





# In Practice

- A concrete ramp with embedded rocks will go from the base of the pipe to the end of the ramp
- The pool will be filled with large boulders heeled in place
- An artificial riffle will be created downstream to hold water at the appropriate level
- Mussel rope will be utilised through the culvert





# Baseline monitoring

- Find out what species are currently above and below certain culverts before remediation is attempted
- This will be repeated after fixes are in place
- Targeting sites with particularly poor climbers such as Inanga. If they can make it others should too





# The future

- The installation of eight fish passes in the next three to four months (weather dependent)
- Subsequent monitoring (baseline has already been done in some cases) to measure effectiveness
- Continue to extend our database of known barriers around the region
- Continued to work with landowners, Councils, etc. to fix fish barriers