

# Integrating genetics & fishery management on the Ness & Beaully Catchments

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# Overview

- Why bother with genetics?
- What we did.
- The Upper Garry problem.
- The Beaully: stocking issues.
- Looking Ahead.

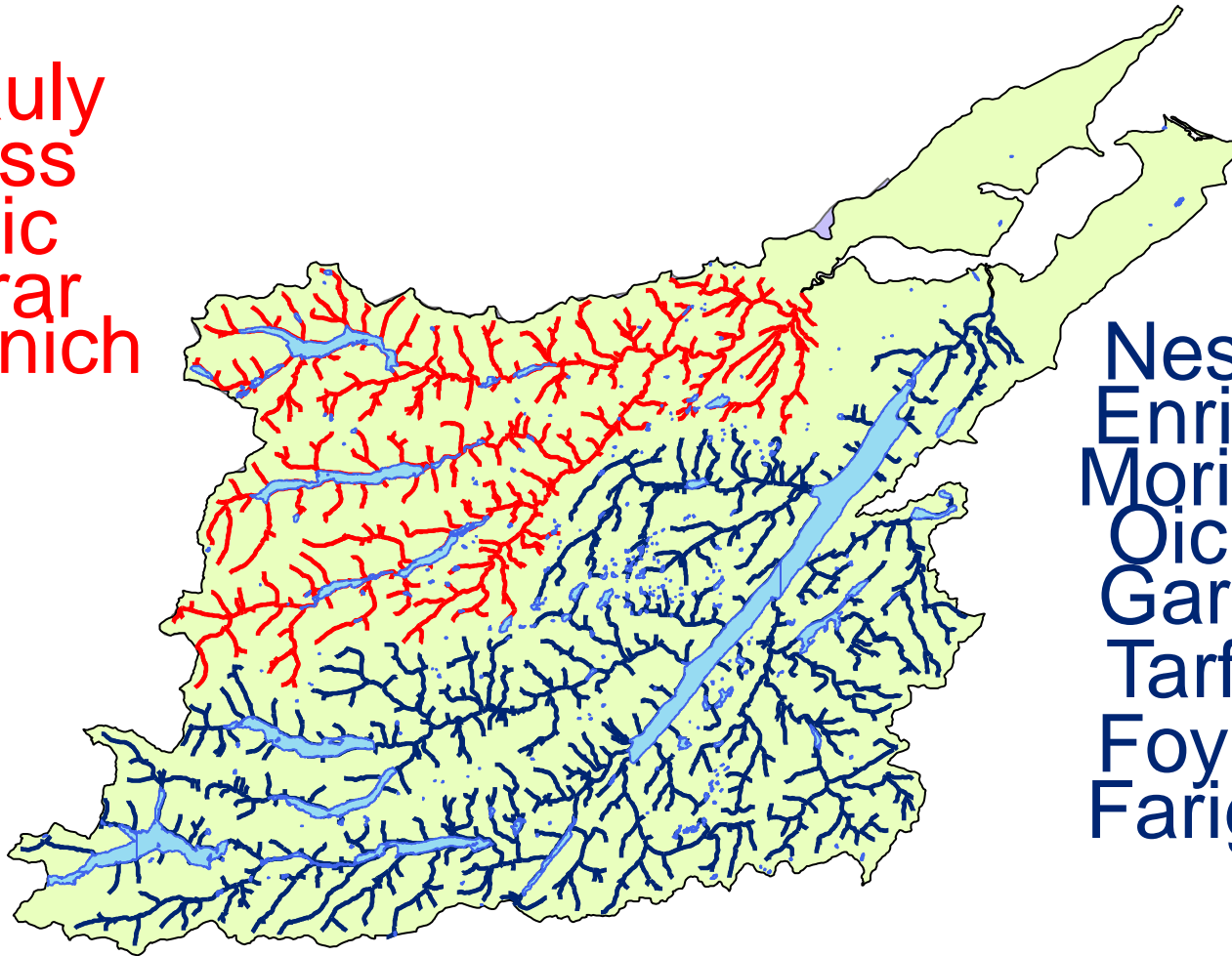


# Why spend so much time and money on genetics?

- As a relatively new fisheries trust it made sense to try and answer a fundamental question. What is it that we are trying to manage?
- Particular problems in parts of the Ness system.
- Historical stocking methodologies appropriate?



Beauly  
Glass  
Affric  
Farrar  
Cannich



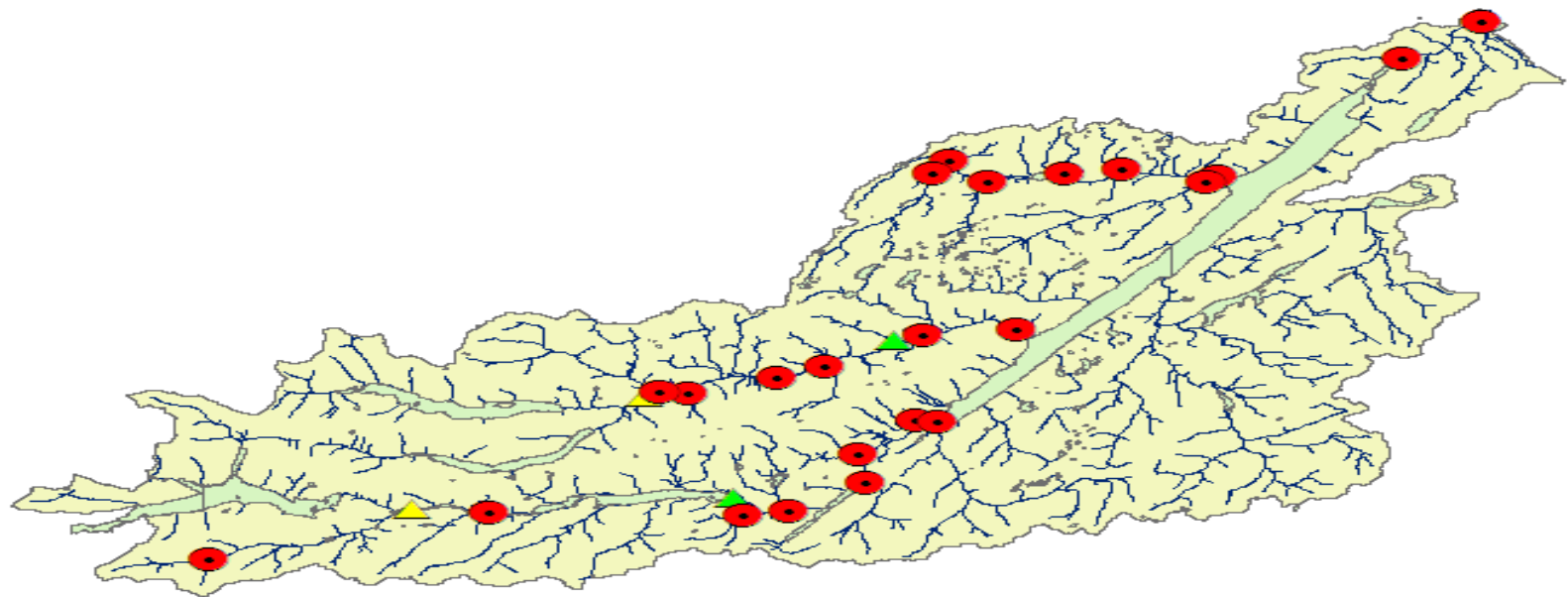
Ness  
Enrick  
Moriston  
Oich  
Garry  
Tarff  
Foyers  
Farigaig

# What did we do?

- Design a plan to sample salmon from a number of locations within the Ness & Beaully catchments.
- Collected over 2000 samples from juvenile salmon captured during electro-fishing surveys.
- Gave them to FASMOP and waited patiently!



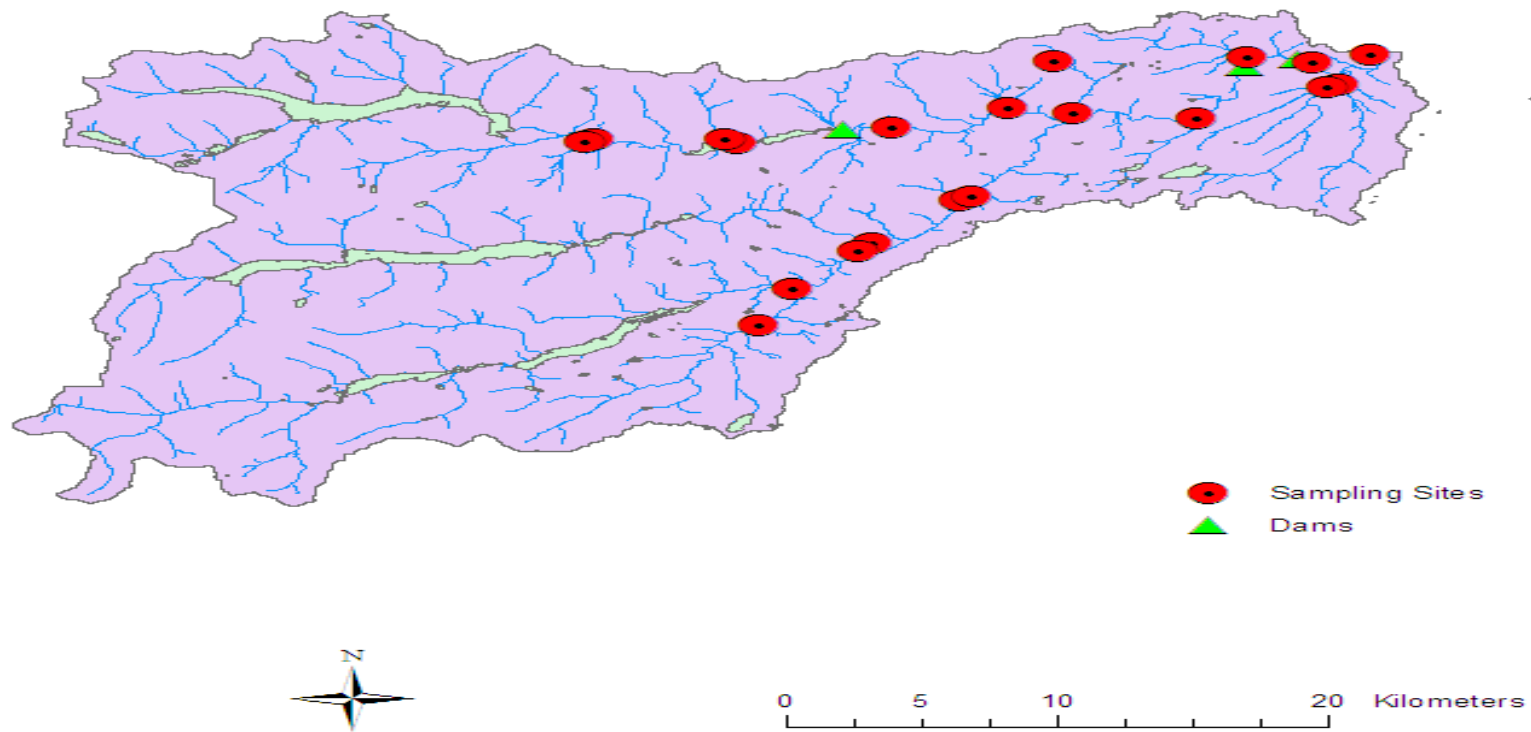
# Ness Genetic Sampling Points

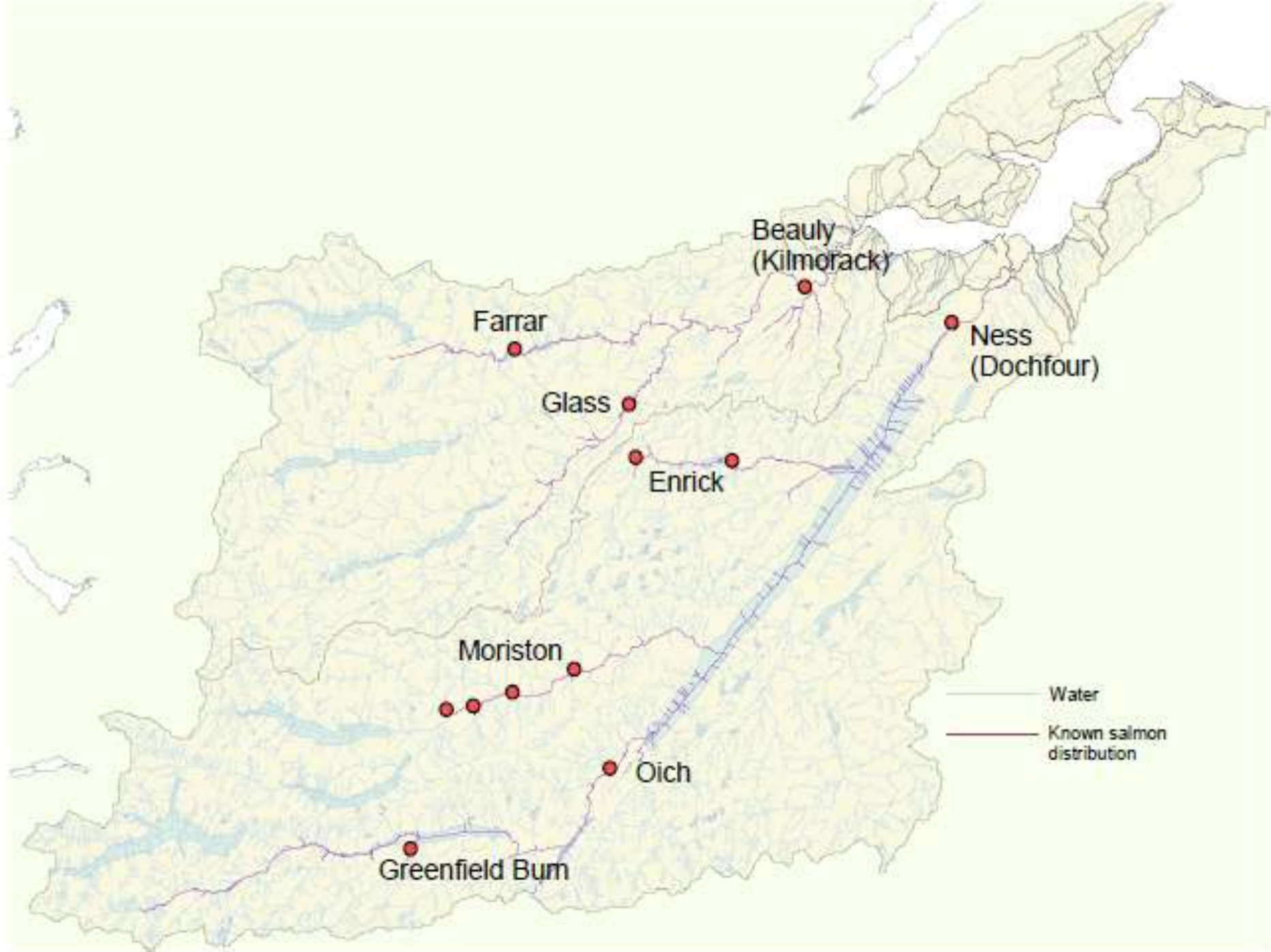


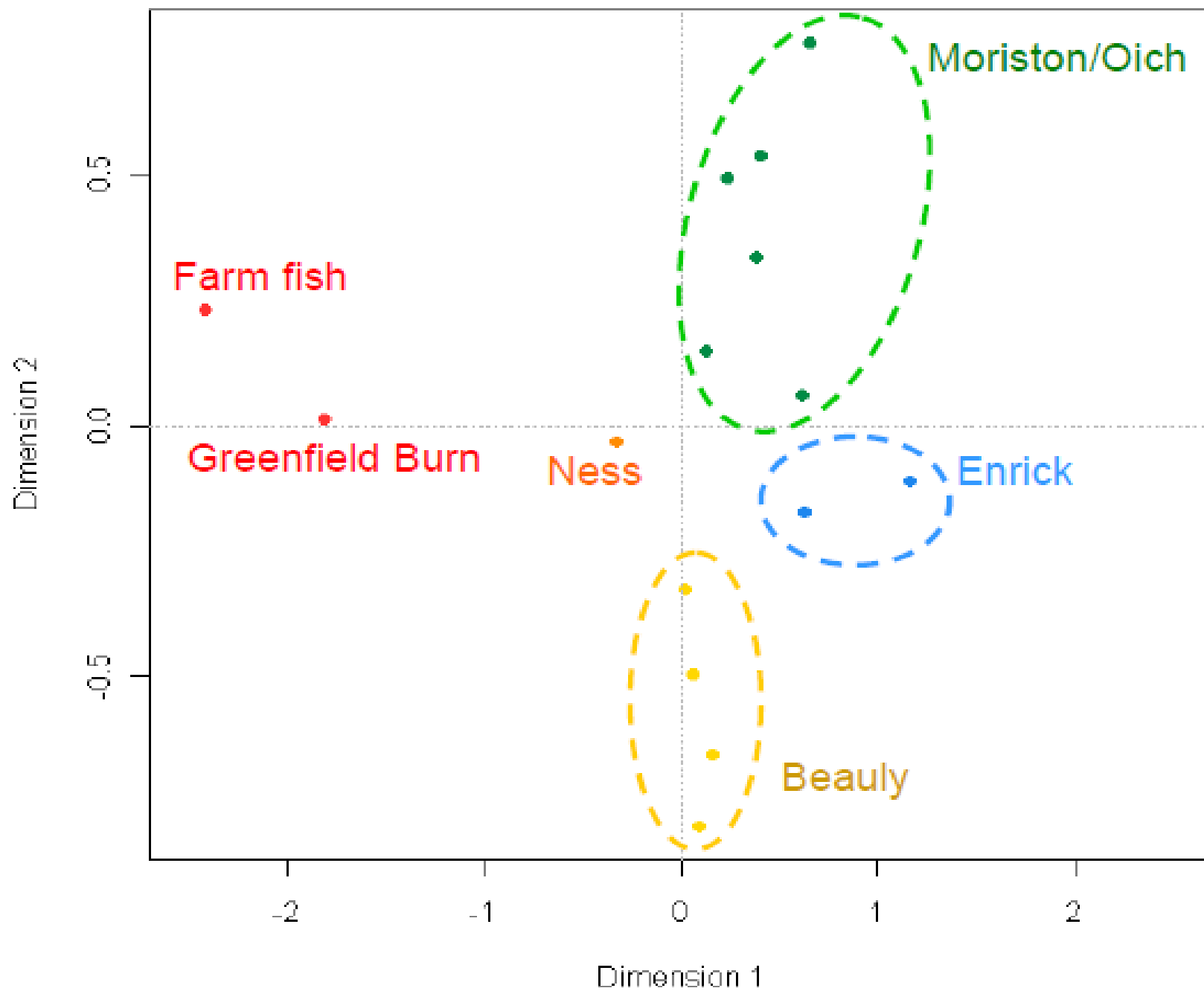
0 5 10 20 Kilometers

- Sampling Points
- ▲ Dams
- ▲ Former Fish Traps

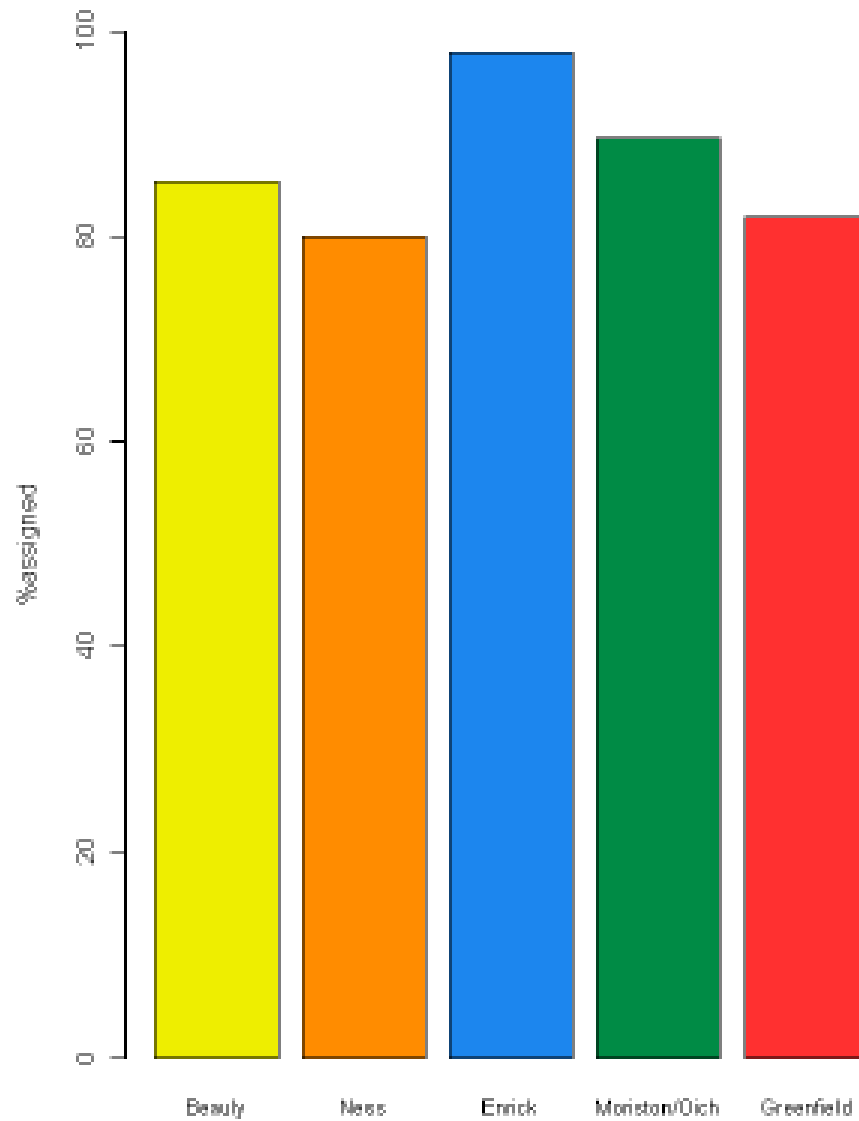
# Beaulieu Genetic Sampling Points







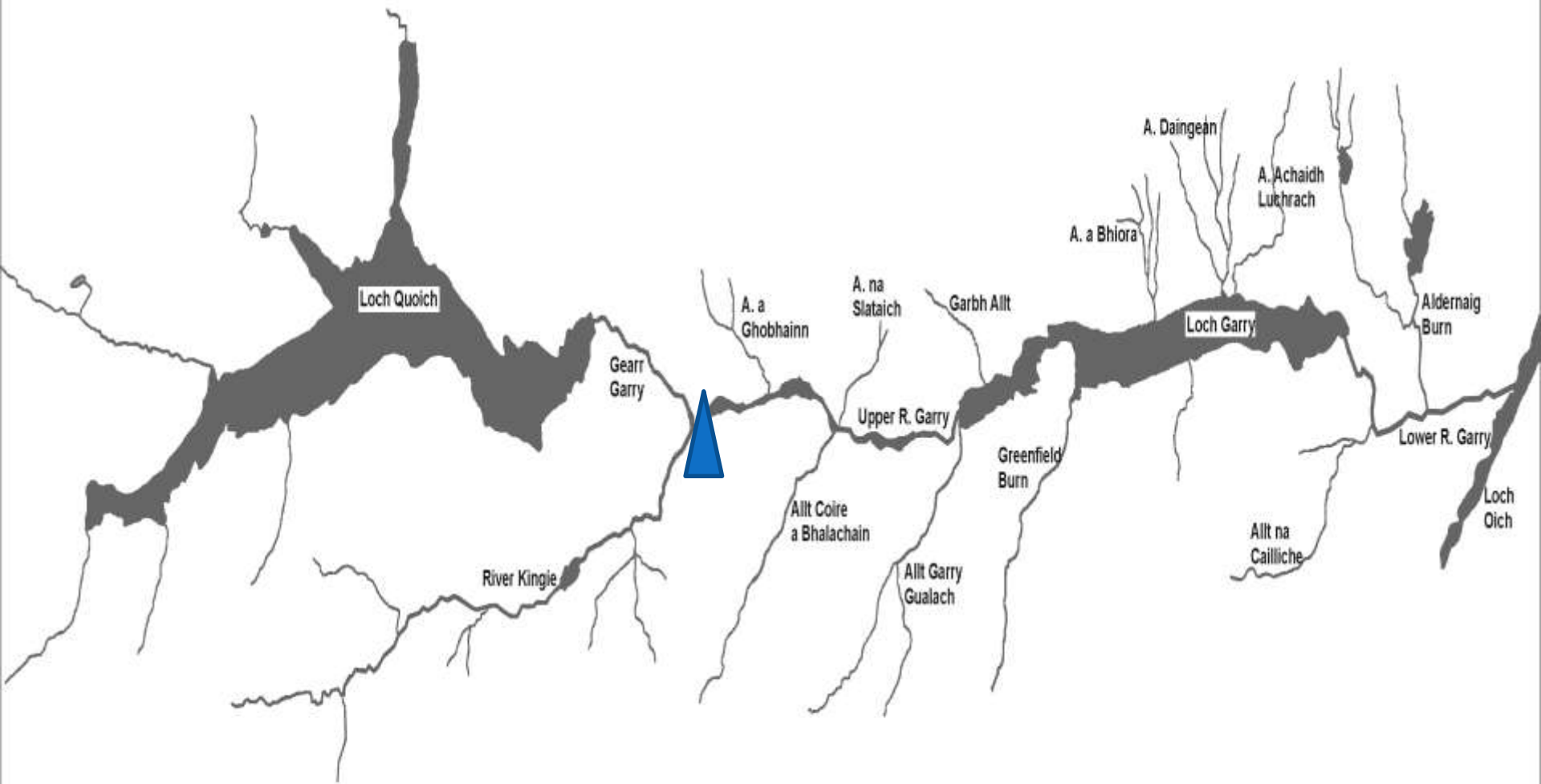
## B. Correct assignment to Level 2



# Management issues - Garry problem

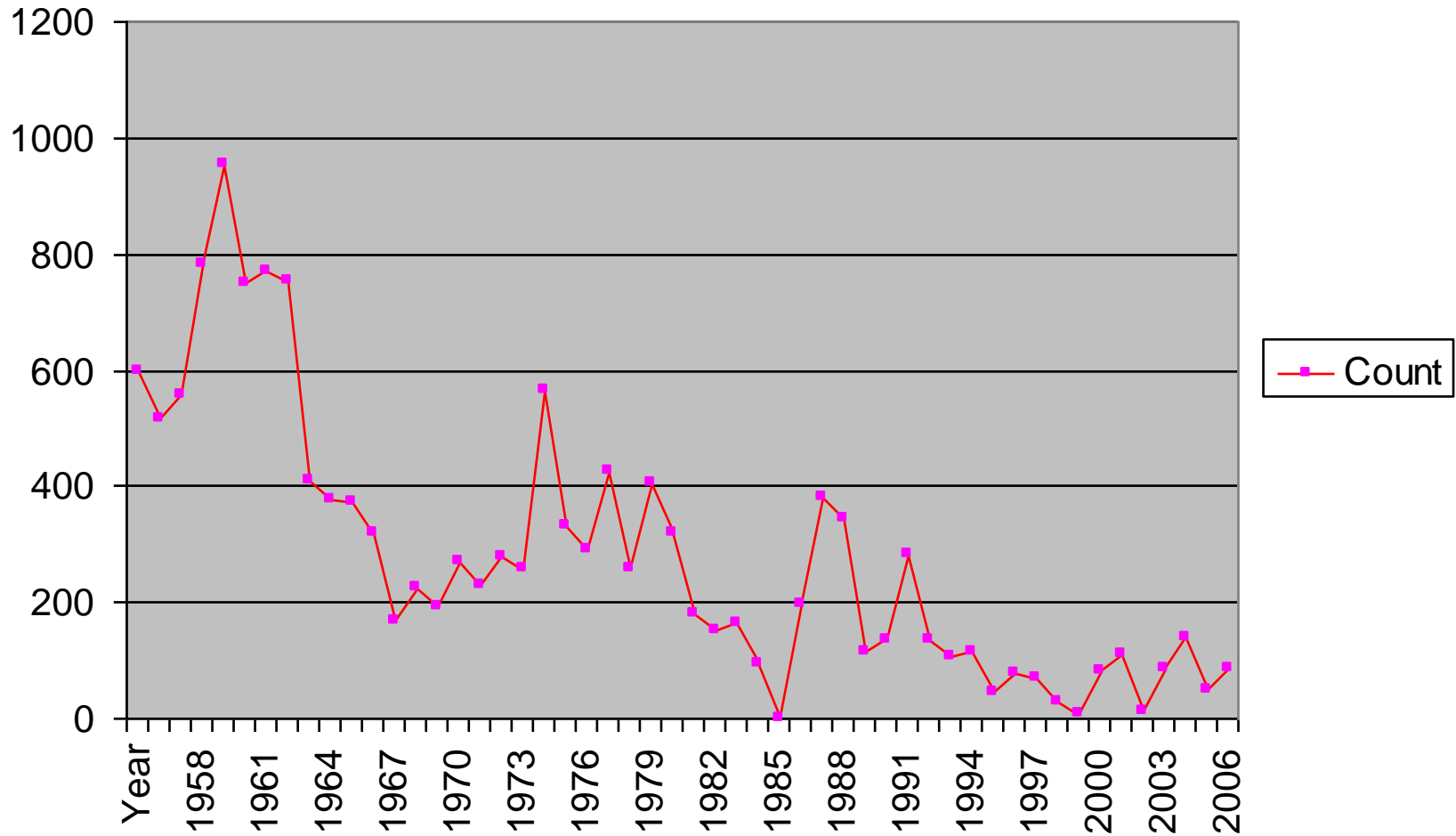
- Fish counter at Invergarry Dam shows a precipitous decline in the number of returning adult salmon. The Upper Garry once the engine room of early-running salmon on the Ness system.
- Many pressures including hydro-electric production and the presence of dams.
- Historically poor management of the resource.





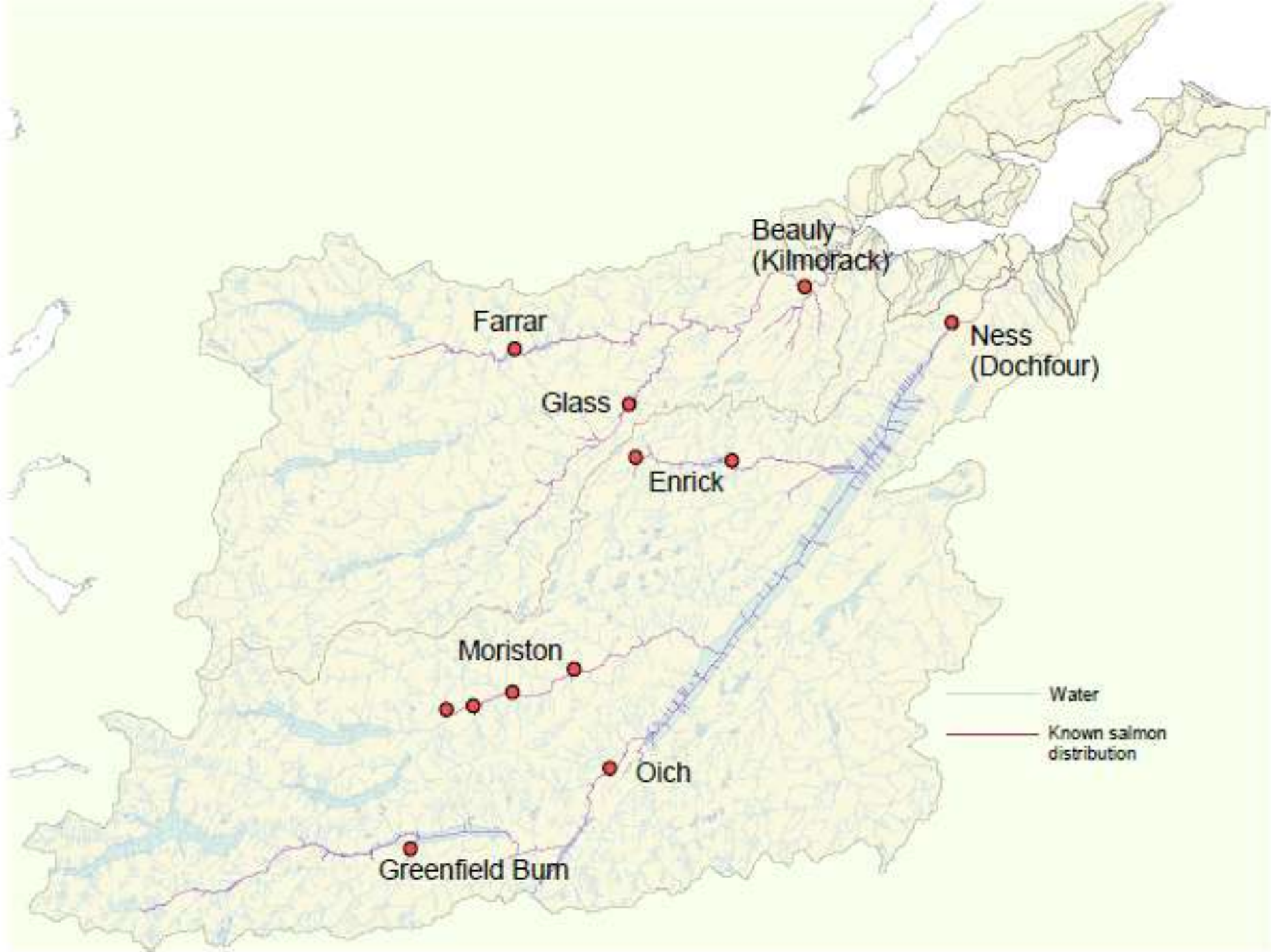
Source: J.Watt 2006. The Garry Catchment Project: Phase 2, Electric Fishing Survey of Juvenile Salmon and Trout Populations

## Invergarry (River Garry)



# Restoration attempts

- In 2004 screens were removed at Poulary Heck allowing access to c17k of the River Kingie. High quality habitat. Salmon fry were found in the Kingie the following year.
- Despite best efforts there appears to be no sign of an ongoing recovery.
- Management options: hatchery?
- What is left of the indigenous Garry fish?



Farrar

Beauty  
(Kilmorack)

Ness  
(Dochfour)

Glass

Enrick

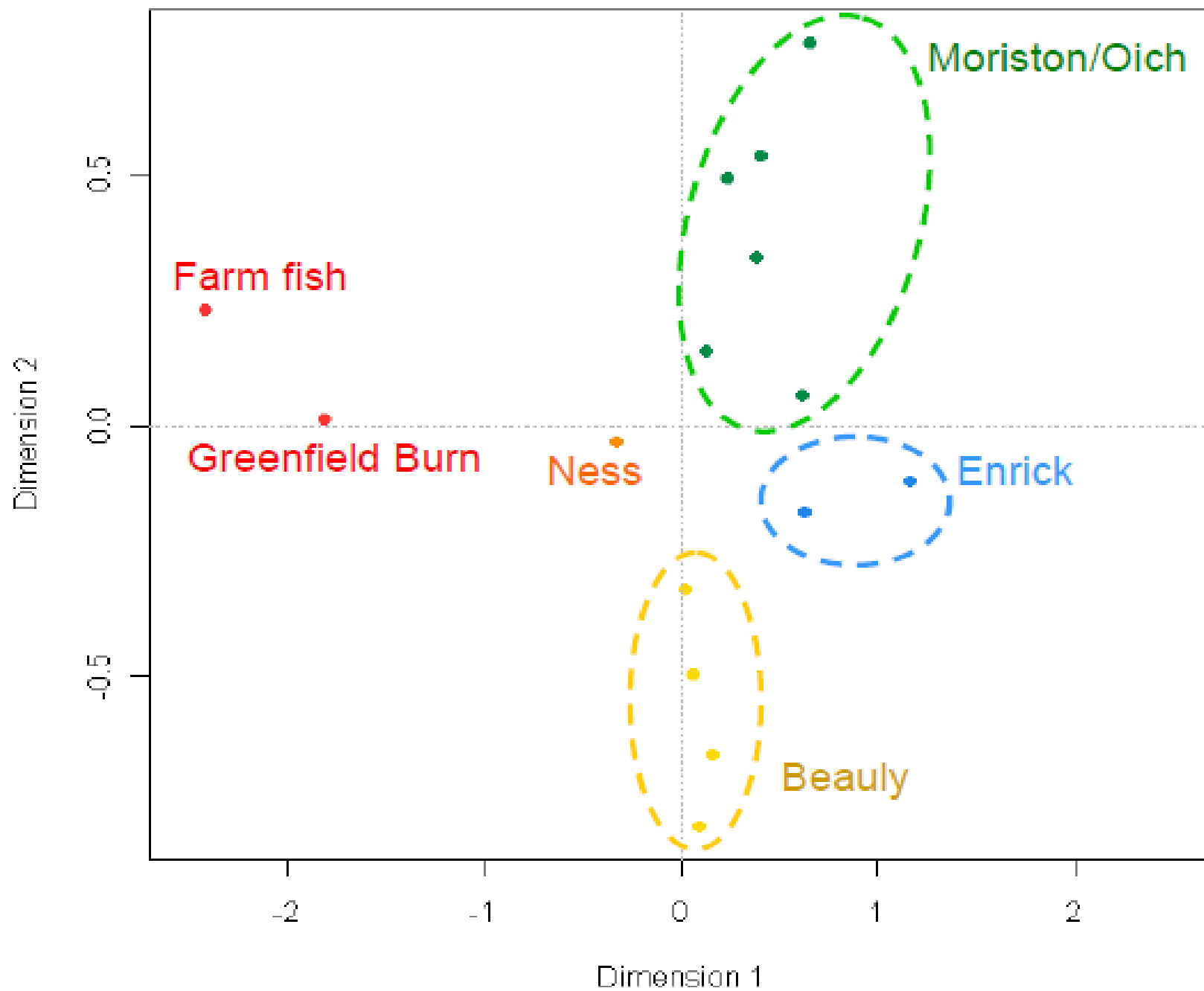
Moriston

Oich

Greenfield Bum

Water

Known salmon  
distribution



# Follow up analysis

- Subsequent analysis has been undertaken on the Kingie and Lower River Garry .
- Kingie samples appear to be mixed in origin.
- No evidence of farmed salmon influences elsewhere on Ness catchment.

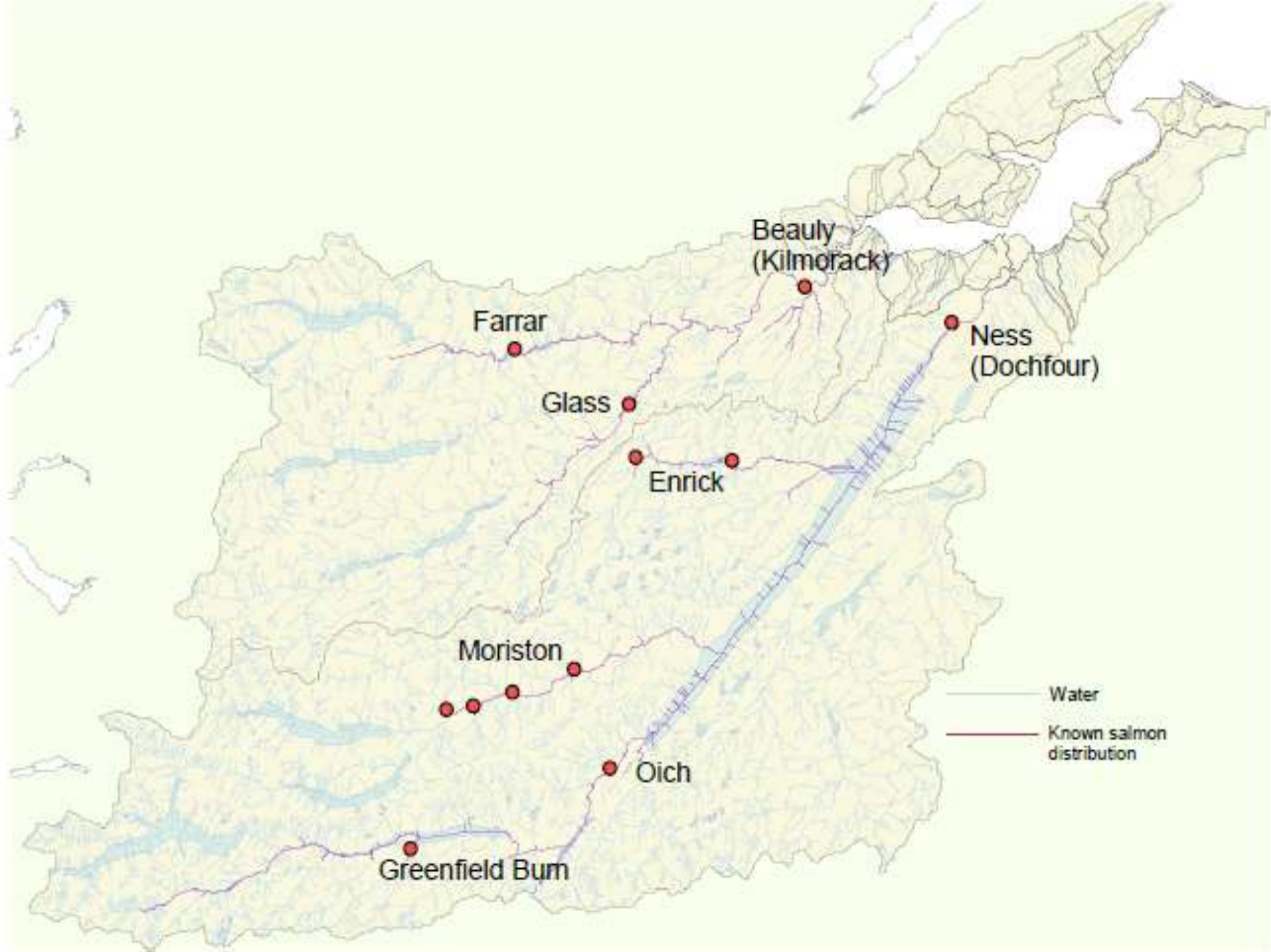


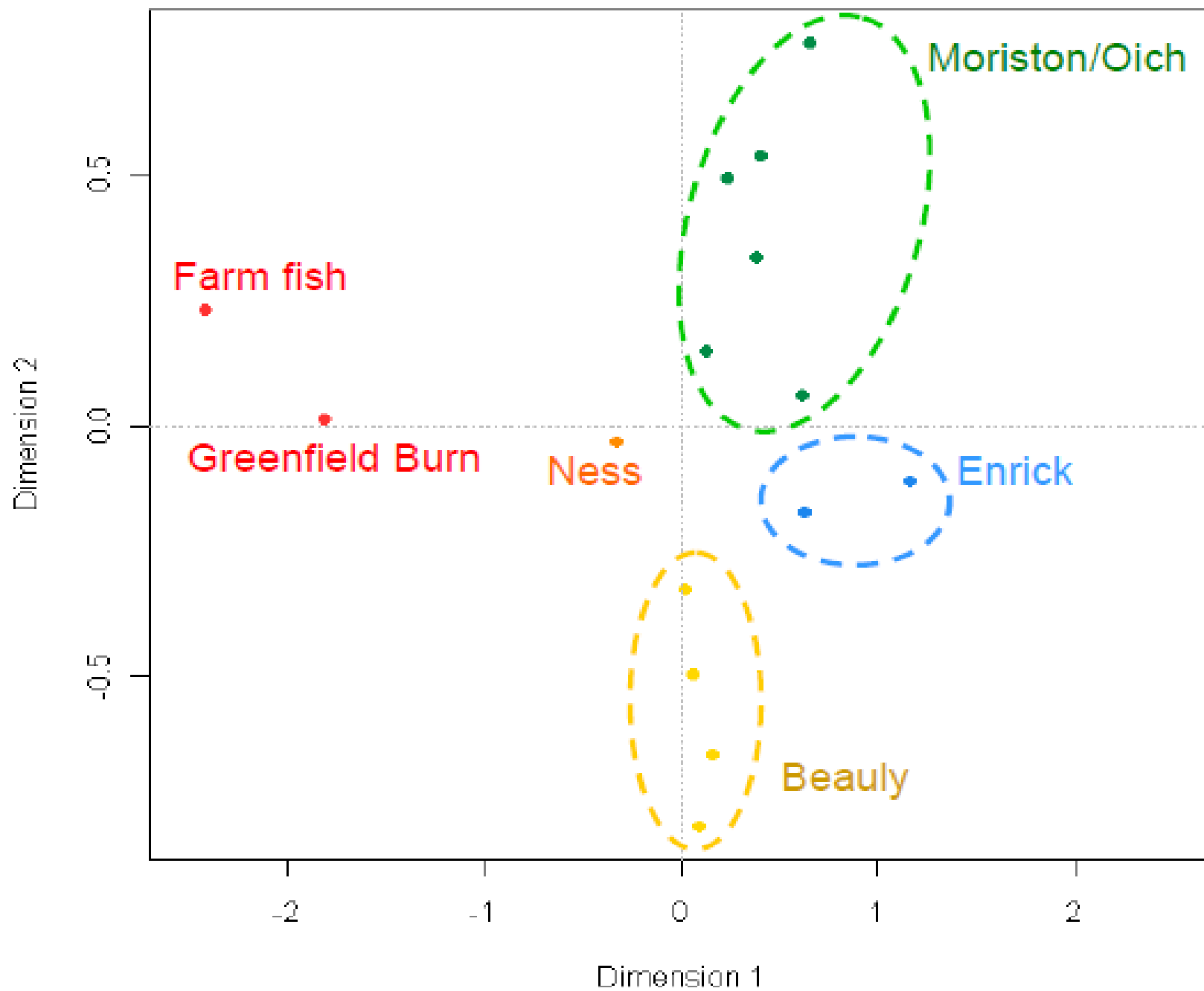
# Management options

- Using fish from Upper Garry catchment for broodstock an unsafe approach.
- Potential for other fish to be used from elsewhere in the system.
- But is the use of such fish in the presence of feral populations appropriate?
- Ness DSFB sub-committee formed to plot a course ahead.

# Beaully stocking

- Widespread feeling on the system that due to the historical presence of fish farms and historical stocking activities there was largely an homogenous stock left.
- Recent history of fish being stocked in the upper reaches of many burns, some in inaccessible areas.
- Is there any evidence of stock structure? Should fish be moved around the catchment?





# Structuring within Beauly system?

- Farrar, Beauly and Glass fish statistically significantly different.
- Further work shows Belladrum/Bruiach samples to be different than the main stem of the Beauly.
- If stocking is deemed desirable, it should be undertaken with care.



# Where next?

- Tools to distinguish farmed and wild salmon at a genetic level would be desirable to ensure that other Ness populations are 'intact'.
- Assignment to populations would be very useful e.g. Trial season extension on the Ness. Where are the fish captured heading to?
- For the Beaully assignment levels are not sufficient to easily answer questions such as the origin of the remaining early running stock component. We have samples from some of these fish. Different techniques e.g. SNPs in the future?

# Acknowledgements

- Eric Verspoor, The FASMOP team, SALSEA-Merge ,RAFTS, Beaulieu DSFB, Ness DSFB, SSE and all owners who permitted access to the rivers.

