Understanding Brown Trout – genes, ecology and citizen science. General Over-view

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What does all this genetic stuff tell us about Irish Brown Trout

- High level of brown trout genetic diversity throughout all catchments studied
- Virtually no impact from stocking of hatchery reared fish
- All lakes and large main channels have a mixed stock of brown trout – contributions from a number of tributary sub-catchments
- Can provide information on gene flow through a system - limited gene flow between river catchments studied so far
- Can identify unique genetic groups within a system that may warrant protection
- Most populations in all systems studied so far can mainly be explained by the presence of contemporary and/or historical barriers or water quality issues
- With exceptions, most adult fish seem to concentrate in areas close to their respective river baselines

In conservation terms these genetic programmes clearly have a role to play in identifying the sub populations of fish which are genetically unique to ensure that their status, as such, is recognised and that they are afforded special protection in the long term.

Over long periods of time genetic data will be useful in illustrating how the balance of stocks in the larger catchments are changing.

Much of the genetic data we currently have on trout stocks reflect man's interference (both in physical and water quality terms) and with our waterways over time.

Some times a project will give you as many questions as answers:

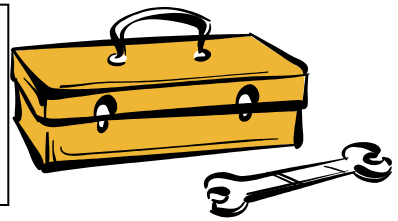
- Further work required in relation to sea trout both for the Moy catchment and the Dublin Rivers
- Consider “effective population size”
- Consider mitochondrial DNA analysis
- Lakes were sampled using both angler caught fish and IFI survey samples – was there any difference observed in the % contribution to the adult stock between the two methods
- No adult samples taken from the Moy main channel is that why no observed contribution by certain rivers to the adult stock of the lake?
- Complete the Shannon picture & review data from all Shannon projects to-date (L. Derg, L. Ennell, mid Shannon & L. Sheelin)

Generic Questions to consider:

- How best might we use the genetic information
- What can it be used for
- What are the options for its use
- How do/can we apply it to IFI and fisheries management
- Can it be used to identify which rivers may require development work
- What can genetics tell us that we didn't know before

Genetics should be used along with all other available information – it should be regarded as an additional source of information – (*remember the Fisheries Toolbox*)

The Fishery Biologists Tool Box



Basic biology and ecology of fish.

Genetics ???

Monitoring water quality.

Baseline surveys Physical and Ecological

Management of Wild Brown Trout Stocks

Restoring fish production in physically damaged channels.

Quantification of Stocks and Monitoring.

Interactions with other fish species.

Genetics and Brown Trout river development

Consider a river contributing little to the adult stock in the main channel or lake;

Why might this be so?

- Is it because it has water quality issues (agriculture, wwt, forestry)
- Or insufficient habitat for spawning and nursery (naturally or man-made - drainage, urban development, land management practices)
- Is it due to barrier pressures (obvious ones and sometimes not so obvious ones – eg Cloone R. & L. Rinn ?, Derryhippo and series of small ponds between it and Suck mc)
- Or perhaps adult fish don't need to migrate downstream to the main channel / lake, eg Robe R., Nenagh R.
- Some systems can sustain the full life cycle of its brown trout population in terms of providing suitable spawning, nursery and adult waters

Therefore it is critical to review all available information (redd counts, fish counter, electrofishing data, habitat data, land management practices) before making any decision on how to manage any river / stream

Future of Brown Trout Genetics in Ireland

- Set up index sites from across a range of the catchments which have already had genetic studies completed and repeat every 10/15 yrs
- Select from stable and unstable catchments/sub-catchments
- IFI to establish a National Genetic Sampling Programme (for brown trout and perhaps other spps ?)
- Continue to encourage anglers to collect adult samples
- IFI to act as a storage centre for samples collected until future projects come online

Thank You