The Ghillies Seminar

Friday 27th April 2018

West Sutherland Fisheries Trust) – Trust update

Work undertaken in 2017 was mentioned and a map of the sites shown. Any reports are available from the Biologist.

The work programme for 2018 was discussed. Those present were asked to assist with site selection for the National Electrofishing survey and the development of an educational booklet within the area.

The conservation limits for 2018 were also discussed. The majority of the area is now classed as Category 3 and therefore 100% catch and release must be implemented. This includes the return of dead fish also, as it is illegal to retain fish from category 3 waters.

David Morris (Marine Scotland Science) Tracking on the west coast of Scotland

Detailing the work being undertaken to look at the wild fish - farmed fish interactions. It was noted that there were 2 strands to the work, a look at genetic introgression and sealice. Within the interactions group, work on introgression has started. This talk centred on the sea lice issue.

The life cycle of the sea lice was run through, starting with the non-infectious free swimming stage before the infectious stage develops. It was noted that sea lice are natural in the sea but that fish farms cause the numbers to increase.

The Scottish Government want to grow a sustainable aquaculture industry but also has to consider the wild fish. They therefore need to know where the salmon migration routes are in order to keep the cages away from these areas. This also holds for renewable energy development. This has led to a variety of tracking projects.

Two methods are used, computer modelling and acoustic tracking. The computer models must be validated and acoustic tracking can help with this. The results are linked to the model and fed back into it in order to improve it.

Within the SALSEA project from several years ago, trawls were used to detect the presence of salmon smolts. Genetics were then used to determine where these fish came from. The next step is to look at how the fish get from the coastal areas to the trawl locations.

By using data on currents, salinities, temperatures, etc. to model the water and combining this with particle transport models to represent the fish, it is possible to get a predicted migration route. This can then be altered to give different behaviour traits and directional swimming.

Directed swimming, with current, gave the best overlap with the observations, although different populations may use different strategies to leave the coast. The best strategy appeared to be a swimming direction of NW to meet the main currents. This will have implications if it passes through the Minch and the main aquaculture zone. It will be less of an issue in the north west.

All models need validating, hence the use of acoustic tracking. There are limitations but a study at Applecross showed that no fish moved south, all headed in a north direction agreeing with the north/north west vector in the model.

Another study in Loch Linnhe looked at the movement of fish in the upper loch. This showed that, while both salmon and sea trout entered the estuary in the evening on an ebbing tide, they showed different behaviours when in the estuary. Here, salmon moved down Loch Linnhe while sea trout primarily moved into Loch Eil. This information can help with management decisions.

A different study in Loch Linnhe tagged fish in Linnhe and Etive. This showed that the fish do not all follow the same route, with some fish from the River Awe going into the Sound of Mull while others used the Sound of Lourne. Fish from the Lochy also split, but mainly used the Sound of Mull. Some predation was also noted, although the technology is too limited to put numbers to this.

During 2018 they will be looking at the Sheildaig. Here there is a long term data set on lice abundance and sea trout populations. The findings have shown a greater lice population, and lower return rate to freshwater, in the 2nd year of production on the farm. Where stocking was undertaken there fish had the lowest return rate of all.

Adam Beynon-Jones (WSFT) – Laxford tracking project

The Laxford tracking project was introduced, together with the rationale for the project. Following on from the sweep netting, this project will tell us how the sea trout use the estuary and sea loch. An array of 40 receivers will be placed around the loch, covering bays as well as the main channel. 100 sea trout – smolts, post-smolts and adults – will then be tagged and hopefully detected by the receivers. The project is being run in conjunction with Scene (University of Glasgow), Atlantic Salmon Trust and Marine Scotland Science.

Chris Daphne (Ness & Beauly Fisheries Trust) – Atlantic and Pacific - A tale of two Salmon!

The Garry restoration project was presented. There is a dam on the system and also an old heck attached to a hatchery. There are also freshwater cages on Loch Garry. Salmon abundance has declined in the last 50 years, with previous stocking being unsuccessful.

The restocking programme used broodstock from the Garry. Smolts are captured and on-grown in freshwater – initially in cages in Loch Garry before transferring to a hatchery in Lochaber. It is planned to trap smolts for 4 years, with the project running for 10 years.

The fish are stripped after 2 years with eyed ova stocked into the river. They will then be re-conditioned and stripped for a second year before dispatch.

2017 was the first year of stripping. The fish were 3-4 lb in weight and produced low numbers of small eggs. This should increase in 2019 following re-conditioning and growth.

Genetics are being used to manage the programme. All smolts are PITT tagged for identification and genetically tested. At this point any with fish farm genes are removed. During stripping this is then used to make the crosses – keeping river groups together but avoiding inter-breeding.

This project is to kick start a self sustaining population within the system. There will also be tested undertaken to see if the smolts can make it through the turbines. Hopefully at the end of the project the Garry will be restored.

Chris then moved on to talk about pink salmon.

Native to the Pacific and Arctic, they are found from Siberia to Korea and Japan. They emerge from the gravel as smolts and head to sea.

There is a 2 year life cycle so 2 'populations' – odd and even. The odd year fish are poor at homing but good at adapting so this may explain why they are so successful. They are small, no bigger than about 5lb, and poor eating. You will get about 1700 eggs from a 5lb salmon.

Large numbers were found in 2017, with spawning confirmed. There was little sign of overlapping of redds, with the female staying around and defending it (unlike Atlantics) before dying. All pink salmon die after spawning so will have a beneficial nutrient input. However, we don't know where they feed in the sea so there may be competition there.

To determine spawning success, 200 eggs were collected and placed in incubation boxes. The eggs are well spread and it took 4 people 8 hours to collect the eggs. The eggs successfully hatched and silvered in 2 months before all died. However this may have been due to disturbance, so it is likely that some spawning was successful. However, emergence was earlier than in the native range and therefore the juveniles may have died.

These fish were odd year fish and it is therefore likely that there will be more in 2019. These fish can be killed and taken to the Biologist. It will be helpful if this is done – or at least samples taken (eg. a fin clip) – to determine where the fish came from. The assumption is that they are from Russia, where fish were stocked previously, but it may be a natural spread as a result of changing climate.

They are reportedly good fish for angling but may create a loophole for poachers as pink salmon are not covered by current legislation. It is therefore possible for people to claim that they are fishing for pinks.

Shona Marshall (WSFT) Scottish Invasive Species Initiative

This is a 4 year Heritage Lottery Funded (HLF) project being run across a large area of Scotland. WSFT are partners, together with 13 other Trusts and Boards covering an area of 29500 km^2, while Scottish Natural Heritage are the overall managers. This is a citizen science project and will use a number of volunteers.

The project has a number of aims:

- Map invasive plant species within the area and remove
- Monitor for and remove American mink
- Promote biosecurity around the area
- Angling development

Help was asked from all present in a number of areas:

- Report the presence of any invasive non-native species to the Biologists. In particular Japanese knotweed, Himalayan balsam and Skunk cabbage.
- If you are able to monitor a mink raft then please let us know.
- If you trap a mink while undertaking other trapping then please pass the carcass over to the Biologists for analysis.
- We would like help with the angling days. Suggestions of places to take the children as well as physical help with teaching fishing would be much appreciated.