Wester Ross Fisheries Trust

Newsletter, March 2022

The 'new' Wester Ross Fisheries Trust has been active for almost a year following the Covid-19 restrictions and funding shortfalls. Our focus has been on catching up with core fish surveys, monitoring and sampling fish to understand the status of wild salmon and sea trout in local waters. Data from our surveys continues to inform the Wester Ross Area Salmon Fishery Board and others who share the responsibility for looking after the wild salmon and sea trout populations and associated wildlife of Wester Ross.

This newsletter provides a summary of some of our work since the Trust reformed in April 2021.

Sweep netters and helpers by the head of Little Loch Broom on 23rd July 2021. Only two sea trout were caught, however many other fish, including sea bass and flounder. Thank you to many volunteers for your support in 2021! Photo by Anwen Page

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Focus on wild salmon in the Badachro River

Wild adult salmon are able to ascend the Badachro River from the sea to Loch Bad a' Chrotha only when the river is in spate. The loch provides salmon fishing for anglers. As habitat for the production of juvenile salmon, the loch may be of greater importance than previously anticipated.

As part of the Wester Coast Salmon Tracking Project, a collaborative three-year research venture led by the Atlantic Salmon Trust with support from Marine Science Scotland, Fisheries Management Scotland, and many other organisations, Wester Ross Fisheries Trust was contracted to sample smolts in the Badachro River as they migrated to sea in the spring of 2021.

A rotary screw trap was set in the pool below the weir at the outlet of Loch Bad a' Chrotha in April 2021 to find out whether it would be possible to capture 100 smolts of over 140mm in length from this location to provide for a possible future tagging study as part of the bigger project.

Water levels fell steadily until there was insufficient flow to turn the rotary screw trap, so a fyke net was put in behind it. By mid May 2021, over 200 salmon smolts had been recorded, of which over 100 were of 140mm or more, some much larger. Big smolts are known to have higher marine survival rates than small ones.

Only two sea trout smolts were recorded in the project, consistent with anglers' reports of sea trout rarely being captured in Loch Bad a' Chrotha. Mills and Graesser (1981) in the 'The Salmon Rivers of Scotland' state that no sea trout ascend the Badachro.

The importance of loch habitat for production of juvenile salmon in Wester Ross remains poorly understood. Several major salmon river systems including the River Ewe and the Little Gruinard river system (a Special Area of Conservation for the Atlantic Salmon) also have large areas of loch habitat. How do these habitats contribute to salmon smolt production?

Further details can be found on the WRFT website here.
https://www.wrft.org.uk/news/newsitem.cfm?id=230

Following the trap project, the waterfalls in the Badachro Gorge were explored. These falls may be too difficult for sea trout to ascend except under exceptional flow conditions. Other nearby rivers with complex falls which salmon ascend more often than sea trout include the Ullapool River (above the Ness Falls) and the Little Gruinard River (above the 'Hippo pool

and falls). There are no reports of sea trout above the Bruachaig falls. Sea trout are not such powerful jumpers as salmon; however they can sometimes scramble around complex falls in high water.

Challenging waterfalls in the Badachro Gorge, July 2021; salmon can ascend, however these falls may be virtually impassable for smaller sea trout.

The main spawning and nursery areas for salmon fry in the Badachro River are within the 2km of main river above the Loch Bad a' Chrotha. Densities of salmon fry and salmon parr were recorded as moderate to high at two main river sites on 19th July 2021.

Access to higher lochs is obstructed by impassable falls located just above a new hydropower house. Water is stored and released from Loch Braigh Horrisdale according to electricity generation; flows below the powerhouse are regulated.

Both the Badachro River and the neighbouring River Kerry (which does not have an accessible loch) are of high value for biodiversity conservation. In both river systems, the Atlantic salmon is a keystone species. It is therefore particularly important to safeguard emigrating post-smolt salmon from both rivers from sea lice infestations. As salmon smolts were migrating to sea, parasitic sea lice infection pressures within nearby coastal waters were very high in April 2021, based on lice levels on sea trout in the sea nearby (see later in this newsletter). How many grilse will return to the Badachro River in 2022?

Gairloch sea trout were infested with sea lice in 2021; sea trout within the Wester Ross MPA carried fewer sea lice

On 30th April 2021, twenty four larger sea trout, mostly carrying potentially lethal burdens of parasitic sea trout, were caught in the estuary of the Flowerdale Burn, Loch Gairloch.

This sea trout monitoring site is in close proximity to mouth of the River Kerry, a Special Area of Conservation [SAC] for the Freshwater Pearl Mussel. Freshwater pearl mussel populations are usually dependent upon a healthy wild juvenile salmon population for their survival. The mouth of the Badachro River is only 5km away from Flowerdale. Post-smolt salmon from these and other rivers may also have experienced high sea louse infection pressure as they migrated through coastal waters nearby.

To alert interested parties of the unsatisfactory situation for wild fish, results were reported on the WRFT website. Please see: https://www.wrft.org.uk/news/newsitem.cfm?id=229

Subsequent sweeps in June and July failed to produce large samples of sea trout; instead, an unusually large amount of filamentous algae (nutrient enrichment also associated with salmon farming?) made the sweep net very heavy to pull. In June early-returned lice-infested sea trout were sampled using electro-fishing equipment nearby in the Flowerdale burn below the footbridge by The Old Inn; all were carrying high sea lice burdens.

Fewer adult sea trout were caught in the September sweep of Flowerdale estuary than in previous recent years; three maturing female sea trout had eroded but healing dorsal fins. In October just one thin female adult sea trout with sea louse damaged dorsal fin was caught in a fyke net in a spawning burn in the Sand River (which enters Loch Gairloch by the caravan and camping site).

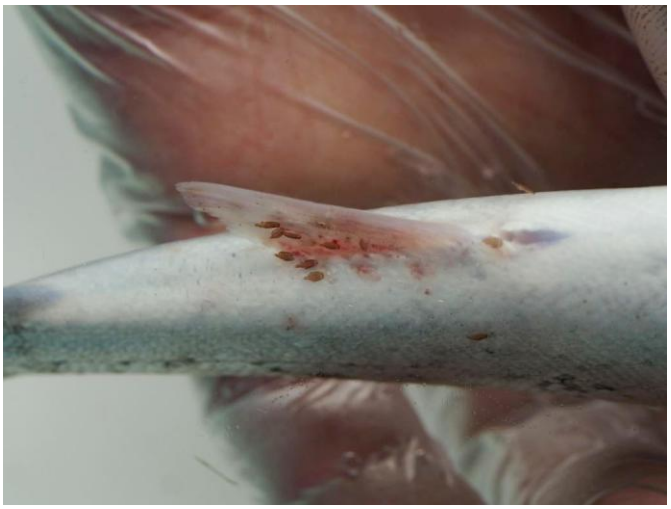
There is therefore much evidence that lice burdens on sea trout around Gairloch were much too high in 2021. How many sea trout will we catch in the springtime sweep in April 2022?

In contrast to Gairloch, the sea trout sampled in the River Kanaird estuary in June and July carried low levels of sea lice and dorsal fins were in good condition. Just four sea trout were caught in Little Loch Broom over two sweep netting sessions during the school holidays together with many other fish.

Many salmon farms in Loch Torridon and in the east of Skye reported high levels of sea lice in spring 2021, these farms (over 25km away) are the most obvious sources of sea lice

infestation in Loch Gairloch. In contrast salmon farms in Loch Broom, Little Loch Broom and around the Summer Isles reported low (zero or near zero) sea lice levels in spring 2021.

Sea lice on an early returned sea trout taken from the Flowerdale burn under the bridge by The Old Inn, Gairloch using electro-fishing equipment on 8th June 2021. Photos by David Foreman



At the time of writing (February 2022), reported sea lice levels across the salmon farming zone are yet again much too high overall. These figures demonstrate continuing failure by several companies, including MOWI and Scottish Salmon Company, to produce farm salmon in ways that are compatible with sustaining healthy wild fish populations in nearby waters. Follow links at http://aquaculture.scotland.gov.uk/ for the latest on-farm sea lice figures.

Most of the sea lice on this sea trout are adult female Caligus elongatus, with just one adult female salmon louse (Lepeophtheirus salmonis). This fish was caught in a sweep net in Loch Ewe on 1st July 2021.

Given continued uncertainty for wild salmon and sea trout elsewhere within the west of Scotland, WRFT recommends that both the Brown Trout *(Salmo trutta)* and the Atlantic Salmon *(Salmo salar)* are afforded special protection status within the Wester Ross Marine Protected Area and the rivers which flow into it.

Not a single adult salmon or sea trout in the upstream trap at Tournaig in 2021

Despite our best efforts to operate the fish traps at Tournaig, not a single fish was recorded in the upstream trap in 2021. The most obvious reason was a lack of water in the burn until mid September and there was not enough water to enable adult fish to enter the burn from the sea. However, thereafter fish were anticipated. A second factor that might have affected the chances of salmon entering the trap was that at least 20 common seals spent much of the summer fishing in Loch Tournaig, not far from the burn mouth. There is still a slim possibility of finding salmon fry in 2022; a very high spate in late September may have enabled adult salmon to ascend the waterfall and bypass the trap. The juvenile fish survey in 2022 provides an opportunity to find out whether any salmon spawned within the system in 2021.

Records at Tournaig mirror those from other places, highlighting the more extreme nature of river flows from sustained periods of drought to very high flows after heavy rain.

When water levels are as high as this at Tournaig, salmon are able to ascend the waterfall and bypass the fish traps. This photo was taken by Ben Rushbrooke in March 2021; there was a spate in September of similar flow.

Thank you to MOWI for supporting the Tournaig trap project and to NTS and Tournaig estate for permissions.

Wester Ross retains strong populations of wild juvenile salmon in most rivers flowing into the Wester Ross Marine Protected Area

The main challenge for the WRFT juvenile fish survey team in 2021 was to visit as many stream systems within the Wester Ross area as possible to gather data describing the status of wild salmon populations. Over 80 sites were surveyed in river systems from the River Kanaird (Canaird) in the north to the Applecross River to the south.

Good numbers of salmon fry and parr were found in core production areas for most of the major river systems, except at main river sites within the Torridon River and Applecross River. Year classes were missing above complex falls in the upper Kanaird and Bruachaig (Ewe system).

Factors that can affect the distribution, abundance and density, and growth of juvenile salmon include exposure of post-smolts to high sea lice infection pressure, in-stream habitat, and catchment productivity.

A more detailed report can be found on the WRFT website via links at https://www.wrft.org.uk/news/newsitem.cfm?id=232 .

The biggest salmon parr recorded by the WRFT juvenile fish survey team in 2021: 196mm long, from the upper Bruachaig River at NH 08318 64313 on 16th September 2021 (with two younger trout bleow). This was the only juvenile salmon recorded at this site, progeny of salmon that spawned in 2018 (based on scale reading).

Genetic integrity of wild salmon populations in some rivers in Wester Ross compromised by interbreeding with escaped fish farm salmon

Interbreeding between escaped farmed Atlantic salmon and wild indigenous salmon (hybridisation) introduces genetic material from farmed stocks into wild populations (introgression) with resulting disruption of the adaptive genetic composition of individuals and populations. This can impact their fitness resulting in a significant negative pressure on the viability of wild populations. Recent advances in analytical and statistical techniques are able to differentiate between farmed salmon of Norwegian origin, native wild Scottish salmon and progeny resulting from interbreeding. This follows on from earlier work in the 1990s by John Webb and others using pigments (natural and artificial) in salmon eggs and fry to distinguish progeny of wild female salmon from those of escaped farmed female salmon. In 2018 and 2019, the WRFT field survey team collected genetic samples from salmon parr from a series of sites within the WRFT area. Samples classed as 'poor' or 'very poor' (genetic integrity compromised) were collected from the rivers Kanaird, Dundonnell, Kinlochewe River (Ewe system), lower Torridon (but not upper) and Balgy. However sites in the Ullapool, Gruinard, Kerry, Talladale (Ewe) and upper Torridon River (above two small waterfalls) were classified as good. So even in Wester Ross, after many years of escaped farm fish entering rivers and spawning, some wild indigenous salmon populations remain.

Lower Torridon River by pine trees on 2nd September 2021. No salmon fry and very few parr were recorded here. The salmon population was assessed as 'poor' from genetic sample taken from near here in 2019.

For further information please see:

https://data.marine.gov.scot/dataset/national-assessment-influence-farmed-salmon-escapes-genetic-integrity-wild-scottish-atlantic

Female salmon returns to the Gruinard River for a third time

In 2021 WRFT was invited to participate in a project to record accurate length and weight data for adult salmon from one or more rivers within the Wester Ross area. The initial aim of the project, led and funded by Marine Scotland Science, was to ask ghillies to take measurements and scale samples from rod caught fish. However because of sustained low water levels and high temperatures, concerns for fish welfare meant that an opportunity to sample adult fish was not forthcoming until mid September when permissions were gained to net a sample of salmon.

However the river rose rapidly on the morning when netting was planned, and the current was too strong. Eventually, in the last week of September an opportunity arose to accurately measure and weigh rod caught salmon from the Gruinard River and Dundonnell Rivers, thanks to anglers. These fish were lightly sedated to enable processing, including scale sampling. One of the fish, a hen salmon of 739mm caught and returned to the Gruinard River by Damian M on 29th September 2021, turned out to be a very notable fish, returning to freshwater to spawn for a third time. Here she is:

This is the second known third-time returnee to a Wester Ross River in the past 20 years. A previous third time returnee was recorded from the neighbouring Dundonnell River in 2008, details of which can be found here: https://www.wrft.org.uk/news/newsitem.cfm?id=62.

Wester Ross may also still hold record for one of the oldest wild salmon, a fish taken by H Nall in Loch Maree on 10th May 1924; its scale which has 4 spawning marks is illustrated in WJM Menzies (1931) ‘ The Salmon’, figure 36. It was estimated to be 13 years old at the time of capture.

Thank you to all the anglers (especially DM, MK, TK, TC, THV & AL), ghillies and all the other helpers for supporting this project. We may be looking for help again later this year . . .

WRFT Life Member and volunteer, Gerry Lucas within the now well established riparian woodland restoration WGS enclosure by the Coulin Farmhouse burn, an important sea trout spawning stream in the River Ewe headwaters, in November 2021. We were looking for spawning salmon; and saw some later in the week in other rivers nearby.

Riparian alder trees by the Abhainn Gleann na Muice on 19th August 2021. There is no regeneration of trees along the upper part of this remote salmon and sea trout spawning burn in the heart of the 'Great Wilderness'. When these old trees die, they are not replaced. River banks erode as the alder roots rot away and much fertile soil is lost. This tributary could be much improved for wild salmon and sea trout production.

Learning about freshwater zooplankton in the lochs and lochans of Wester Ross

Dr Steve Kett's research, together with students and colleagues at Middlesex University, over many years, is providing many new insights into the ecology of trout lochs, the genetic structure of wild trout populations in Wester Ross, and the parasites of trout in Wester Ross. Many of these studies can be found via links on the trout page of the WRFT website at: https://www.wrft.org.uk/fishes/trout.cfm .

In August 2021, we were delighted to welcome Becca Macpherson (*below, with Dr Kett*) to begin a new study on freshwater zooplankton. Zooplankton are part of a complex web of freshwater life. This study will investigate the occurrence of different species of zooplankton in lochs and lochans, in relation to surrounding land use and the presence of water-birds, some of which may act as vectors to enable zooplankton species to move from loch to loch. In some lochs in Wester Ross, zooplankton provide an important part of the diet of brown trout, arctic charr and perhaps also salmon parr. Much to learn!

Ponticum control continues along the River Kerry

Invasive non-native plants, particularly *Rhododendron ponticum* are a growing threat to biodiversity in Wester Ross including freshwater wildlife. With support from Scottish and Southern Energy, Landfill Communities Fund and Gairloch Estate, the Manta Ecology team (led by Eamonn Flood and Chantal Awbi) continues its work to control *R. ponticum* from along the River Kerry near Gairloch.

As elsewhere in Wester Ross, ponticum has spread from around nearby gardens to surrounding land, where it has formed a dense almost impenetrable barrier to light for other plants and to people attempting to move about. Large plants have been treated using stem-injection techniques, and a large area to the north of the River Kerry has now been tackled. The pictures below illustrate the successful outcome following stem and stump treatment of larger plants.

SSSI Woodland after Phase 1 and follow-up treatment

SSSI Woodland edge…

… same area followed up by cut and stump treatment

Sustained success is dependent upon long-term commitments from all concerned including local landowners and funding agencies to ensure that follow up treatments are carried out regularly, and the invasive plants are not allowed to grow back again.

A detailed report describing progress in the first half of 2021 was prepared by Manta Ecology.

In some situations, beyond the main zone of older bushes there is an outer zone of many smaller bushes and seedlings. Where landowners have been unable to keep on top of the problem, local volunteers can make a difference by removing seedlings before they are too big. Please contact WRFT Biologist at info@wrft.org.uk if you would like to help.

Some plans for 2022

- Funding has been received Wild Salmonid Support Fund to address **habitat problems in the Rhidorroch River** (Ullapool River headwater) associated with high discharge of sediment and extreme spate flows. The project will identify sources of sediment within the upper catchment in Glen Douchary and develop solutions to reduce peak flows, bank erosion and sediment transportation into the river. The project will build upon peatland restoration initiatives within the catchment. The long-term aim is to make the Rhidorroch River less prone to washout and bank erosion and collapse, and more resilient to extreme weather events associated with climate change.
- **Trainees.** As part of the Nature Scot Working with Rivers Training Placement Scheme, Colin Simpson and Emma Watson have been recruited. We look forward to working with them to develop and update all of our skills for carrying out fisheries management activities and related work.

Julien Legrand, Colin Simpson, Emma Watson and Peter Jarosz by the Rhidorroch River in the Ullapool River headwaters on 2nd March 2022

- **Herring hunt.** We are looking forward to assisting the West of Scotland Herring Hunt project to learn more about the herring which live around Wester Ross and spawn on the seabed in coastal water. This is a follow-on project from work led by WRFT to learn about spawning herring from former fishermen and sea bed surveys in previous years, https://www.wrft.org.uk/news/newsitem.cfm?id=224. The Trust is also providing support for an exhibition on spawning herring and related ecology at Gairloch Museum in March and April 2022.
- **Sea trout & sea lice monitoring.** In addition to routine sampling of sea trout by Flowerdale (Loch Gairloch) and by the Kanaird (near Ullapool) from April 2022, supported by WRASFB and in the past by the Scottish Government, there are plans to sample sea trout in the Applecross estuary and in Loch Torridon to fulfil wild fish monitoring requirements for Environment Management Plans for nearby salmon farms.

Thank you to all the volunteers, supporters, funders and others who helped with the work of WRFT in 2021. There are various opportunities to help with field work or provide support in other ways in 2022.

Please contact WRFT at info@wrft.org.uk (Peter Cunningham) or admin@wrft.org.uk (Peter Jarosz) if you are interested in helping in 2022.