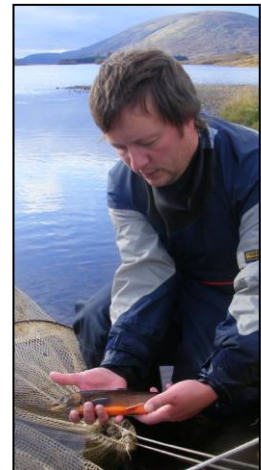




WESTER ROSS FISHERIES TRUST

Fisheries Management in Wester Ross: a review of the work of the Wester Ross Fisheries Trust, 2009 - 2012



Peter Cunningham, December 2012

Supported by



Review of the work of WRFT, 2009 to 2012

Contents

1. Introduction	2
2. Conservation and restoration of salmon populations within Wester Ross.....	4
2.1 Approach to salmon conservation and restoration	4
2.2 Surveys of juvenile salmon distribution and abundance	4
2.3 Carrying Capacity Project	5
2.4 Genetic Analyses: RAFTS FASMOP	6
2.5 Smolt migration studies using rotary screw traps	6
2.6 Analyses of rod catches of salmon	7
2.7 Tournaig Trap Project	8
2.8 Bruachaig Wild Salmon Restoration Project	8
3. Restoration of sea trout fisheries	9
3.1 Approach to restoration of sea trout	9
3.2 Sweep and fyke netting for sea trout	9
3.3 Trout scale reading and annual WRFT wild trout reports.....	10
3.4 Herring rediscovery project and other work in the marine environment	10
4. Other activities.....	11
4.1 Brown trout investigations.....	11
4.2 Arctic charr discovery weeks	11
4.3 Education Projects	12
4.4 Biosecurity & control of invasive non-native species	12
4.5 Seminars, workshops and the WRFT Review	13
5. Future priorities	14
5.1 Conservation and restoration of salmon populations and fisheries	14
5.2 Restoration of sea trout populations and fisheries.....	15
5.3 Other priorities	16
6. Acknowledgements	16

Cover photos (Clockwise to centre from top left): Dr Lorna Brown en route with classroom hatchery to Scoraig Primary School, February 2011; 70cm ferox trout from a spawning stream in the Loch Maree catchment, October 2011; Dr Jonah Tosney about to release a male Arctic charr into Loch Sgamhain, November 2011; male sea trout recovering in Loch Gairloch following capture for the fifth time in September 2012; juvenile salmon from the Rhidorroch River (Ullapool system) in October 2011; Lepeophtheirus salmonis lice on a sea trout taken in the River Carron estuary in June 2012; sweep netting team: Jim Buchanan, Alex Way, Roger McLachlan and Garry Bulmer in the Flowerdale River estuary (WRFT office in Harbour Centre in the background), September 2012.

Review of the work of WRFT, 2009 to 2012

1. Introduction

The Wester Ross Fisheries Trust (WRFT) was set up in 1996 in response to a decline in the productivity of salmon and sea trout fisheries within the river systems of Wester Ross. Over 20 rivers within the area support fisheries for salmon. The rivers drain a mountainous terrain underlain by base-poor metamorphic and sedimentary rocks. Soils are thin or peaty. Many river catchments are predominately grazed by red deer with little human habitation. In terms of rod catch, the three largest and most productive systems are the River Ewe, River Carron and Gruinard River each producing over 200 salmon per year to rod and line during the period 2010-2012. In a landscape which reflects a glacial origin, there are over 400 lochs and lochans. The largest freshwater loch is Loch Maree which formerly supported the area's most prolific fishery with over 1000 sea trout taken by rod and line each year until the end of the 1980s. The Fionn Loch is possibly the most famous brown trout water in Wester Ross; in recent years Loch Damph has yielded some of the largest trout within the area.

The overall purpose of the Trust is to maximise and sustain the productivity of wild salmonid fisheries in the rivers and lochs of Wester Ross and the Loch Alsh area. To address problems facing wild salmon and sea trout populations, the WRFT Fisheries Management Plan [FMP] was published in 2009 with support from the Scottish Government via RAFTS. The FMP can be found at: <http://www.wrft.org.uk/downloads/files.cfm?id=17>

Four primary objectives were set out in the WRFT FMP:

- **Objective 1** Conservation of wild salmon populations.
- **Objective 2** Restoration of sea trout production in the River Ewe – Loch Maree system.
- **Objective 3** Restoration of salmon production in areas where stocks have been lost.
- **Objective 4** Restoration of Sea Trout production in other areas beyond the River Ewe – Loch Maree system where there is the potential to support larger populations.

In addition, the FMP set out a programme to engage the public as well as government and non-government agencies in the activities of the Trust, and provide support to:

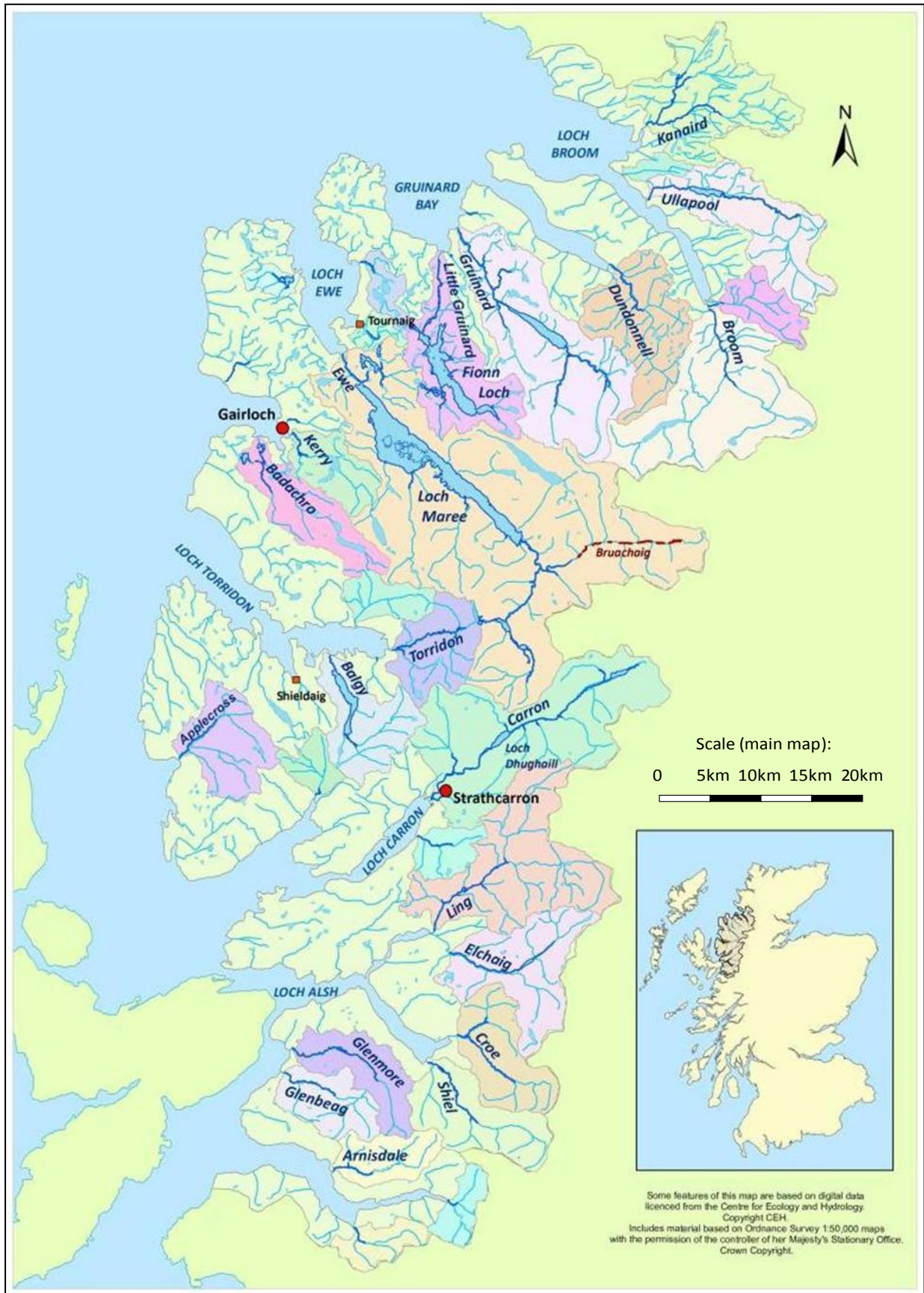
- Development of sustainable wild trout fisheries
- Assessment of Arctic Charr populations
- Monitoring the status of non-salmonid fish species
- Planning to mitigate the impact of alien species (aquatic and terrestrial where relevant)
- Understanding the health of marine ecosystems

This report has been prepared to provide a summary of WRFT activities carried out during the period 2010 – 2012 in support of these objectives. Progress over the past three years is briefly reviewed together with our knowledge of the current status of respective fish populations and fisheries within the area.

Preparation of this report has been supported by the Scottish Government via [RAFTS](#).

Review of the work of WRFT, 2009 to 2012

Figure 1. The Area covered by the Wester Ross Fisheries Trust, highlighting major salmon rivers and showing the location of the WRFT offices in Gairloch (Harbour Centre) and at the Strathcarron Business Centre.



Review of the work of WRFT, 2009 to 2012

2. Conservation and restoration of salmon populations within Wester Ross

2.1 Approach to salmon conservation and restoration

Our understanding of the status of wild Atlantic salmon is based largely upon surveys of juvenile salmon, analyses of rod catches of salmon, and genetic analyses (RAFTS FASMOP). The results of field work and analyses are presented in reports drafted primarily to inform river proprietors, fisheries managers and ghillies and anyone else actively interested in the conservation of wild salmon within the area. Many of these reports can be found on the WRFT website at www.wrft.org.uk (please visit the downloads page or click on links under other pages).

2.2 Surveys of juvenile salmon distribution and abundance

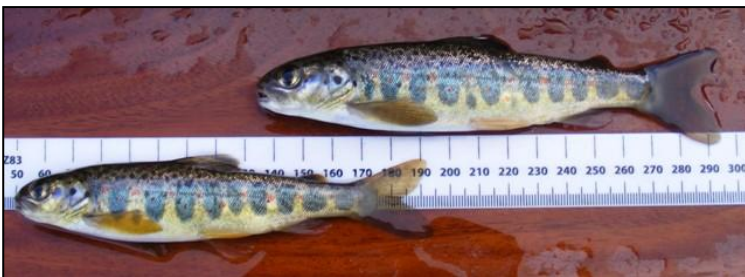


During the period 2010–2012, electro-fishing teams visited all major salmon river systems within the WRFT area. Our primary aim was to maintain an understanding of the distribution and status of juvenile Atlantic salmon within the area. In addition to juvenile salmon, juvenile trout, eels, and other fish were recorded. The most useful field days were often those where the river proprietor or manager was able to join the field team to find out first-hand what was in his / her river and discuss findings and implications for conservation and fishery management.

*Juvenile fish survey team in the Little Gruinard, August 2011
(photo by Dave Barclay)*

In 2010 we discovered that wild salmon had recolonised the upper Glenbeag and Glenmore rivers above waterfalls, following almost a decade of absence from these areas. In subsequent years, juvenile salmon were also recorded in some of the smaller streams where they had been absent for several years, including the Balmacara burn (by Loch

Alsh) and the Shildaig River system (by Loch Torridon) by the FRS Shildaig Project team.



These unusually large 3 year old salmon parr were found in October 2011 in the headwaters of the Gruinard River system.

In all years (2010-2012) densities of salmon parr were highest in the easily accessible, relatively stable 'core salmon habitat' areas of larger rivers downstream from lochs, for example in the River Broom, Gruinard River, Little Gruinard River, A' Ghairbhie (Ewe system) and River Carron. However, in some headwater streams the relative numbers of juvenile salmon recorded were lower; reflecting limited spawning, or a more challenging environment subject to sustained drought, freezing, streambed instability and washout associated with intensive rainfall events and erosion of river banks.

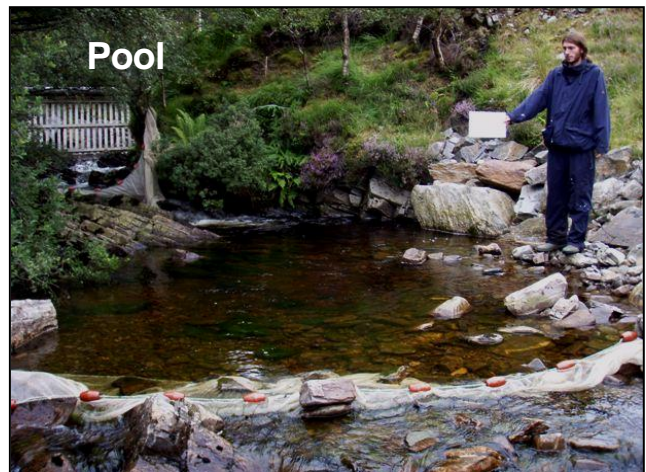
A summary of the results of electro-fishing surveys appears in WRFT annual reviews which can be found on the WRFT website.

Review of the work of WRFT, 2009 to 2012

2.3 Carrying Capacity Project

This is an on-going collaborative project in partnership with the Conon District Salmon Fishery Board / Cromarty Firth Fisheries Trust and Marine Scotland Science Freshwater laboratory. The aim of this series of management trials is to learn more about the factors which limit the numbers and biomass of juvenile salmon in typical Highland streams. By comparing fish occurrence in different types of habitat we are learning how carrying capacity varies according to the type of habitat. Initial results demonstrate that of the habitats investigated to date, shallow cobbly riffle has the highest carrying capacity for salmon fry.

In the study streams around Achnasheen, the 'carrying capacity' densities of salmon fry were highest in 'shallow cobbly riffle' habitat (e.g. below); deeper pools (e.g. right) were dominated by larger trout with fewer salmon fry (all photos WRFT).



Through a better understanding of the carrying capacity for juvenile salmon of different types of habitat, we are better able to interpret the results of surveys of juvenile fish abundance and to recognize a 'healthy' juvenile salmon population.

We also plan to learn more about the relationship between stream fertility and carrying capacity. In oligotrophic areas such as Wester Ross, the management of catchment fertility is potentially a key issue determining levels of production of wild juvenile salmon and associated wildlife. A case can be made for restoring the natural fertility of much of Wester Ross [follow links at <http://www.wrft.org.uk/news/newsitem.cfm?id=120>].

Review of the work of WRFT, 2009 to 2012

2.4 Genetic Analyses: RAFTS FASMOP

To learn about population structuring in Atlantic salmon populations, genetic samples were taken from juvenile salmon from local rivers by WRFT and analyzed by the RAFTS 'Focusing Atlantic Salmon Management on Populations [FASMOP]' team in 2010. Genetic differences were found between populations. However, the degree of differentiation was found to be small, and not sufficient to be able to assign a salmon back to its river of origin.

Over recent years, much concern has been expressed by anglers, fisheries managers and scientists about the threat of genetic introgression of wild salmon populations caused by escaped farm salmon breeding in the wild. In 2011, as part of the RAFTS Aquaculture Project, genetic samples were collected from a selection of rivers to assess the degree to which the genetic signature of wild juvenile salmon within the rivers of the WRFT area reflected Norwegian ancestry, using new technology developed in Norway. Samples of juvenile salmon from the Dundonnell, Torridon, Croe and from most of the Carron river systems had characteristics typical of native west coast Scotland salmon, with only a proportion of sampled parr from the River Balgy (downstream from smolt cages) and from the Tulloch Burn (downstream from a salmon hatchery) having 'Norwegian' attributes.

Juvenile salmon of stocked (top two fish) and wild (bottom two fish) origin from the River Taodail, October 2011.



2.5 Smolt migration studies using rotary screw traps

To learn more about salmon and sea trout smolts descending from Loch Maree and the River Ewe system to the sea, a rotary screw trap was operated on the River Ewe in 2010 and 2011. Despite very low numbers of adult sea trout in River Ewe and Loch Maree rod catches over the preceding ten years compared to 1970s & 1980s, the project demonstrated that in addition to salmon smolts, substantial numbers of sea trout smolts migrated from Loch Maree to sea. However, in 2011 a combination of exceptionally low flows then exceptionally high flows made operation of the trap very difficult and then impossible and fewer smolts were caught.



A rotary screw was also operated in the River Carron system trap to learn more about runs of wild and stocked salmon and sea trout smolts. Operated by Bob Kindness of the River Carron Restoration Project, substantial catches of both salmon and sea trout smolts were taken over several years. WRFT has worked closely with this project and a Trust biologist has been based nearby at Stratchcarron.

Roger McLachlan and Ray Dingwall removing smolts from the Ewe screw trap in 2010.

Review of the work of WRFT, 2009 to 2012

2.6 Analyses of rod catches of salmon

Following a period of steady decline from the late 1980s, rod catches of salmon for all the major rivers within the WRFT areas were at their lowest levels during the period 2000 to 2003. However, from 2004, the number of rod caught salmon and grilse increased in many rivers typically to levels two or more times higher than in the poorest years at the turn of the century.

The recovery in rod catches is thought to be primarily a consequence of higher rates of marine survival. In the River Carron, stocking may have also contributed. The great majority of rod caught salmon (and sea trout) were returned by anglers to spawn supporting continued stock recovery, following the continued adoption of 'catch and release' policies.

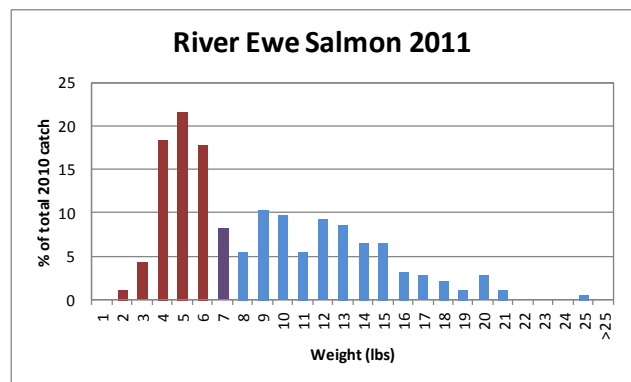
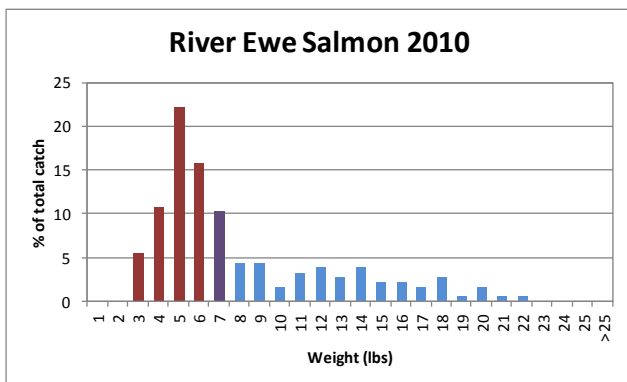
Note that all the salmon net fisheries around the WRFT area's coastline were inactive in 2011 and 2012. The overall catch of wild salmon within the WRFT area remains a fraction of the combined total numbers of salmon and grilse taken by net and rod & line within the Wester Ross area in the 1970s and earlier years.



WRFT member, Jon Penny, with a 21lb salmon from the River Ewe in September 2011 (photo Ray Dingwall).

A comparison of rod catches for the Little Gruinard, Ewe and Carron in 2010 and 2011 suggests that the 2009 salmon smolt-year class performed particularly well at sea. In 2010 many grilse were caught. In 2011, many 2 sea-winter salmon were caught. This observation tallies with extraordinary high condition factor of sea trout taken by WRFT sweep netting teams in June and July 2009 reflecting an apparent glut of sandeels (noted by many observers) in the coastal seas that year. Please refer to WRFT website for further analyses and discussion.

A comparison of the sizes of rod caught salmon taken in the River Ewe in 2010 with those taken in 2011. Note the high proportion of grilse (red columns) in 2010 and higher proportions of multi-sea winter fish (blue columns) in 2011 (from WRFT Review, July 2012).



Review of the work of WRFT, 2009 to 2012

2.7 Tournaiig Trap Project

The Tournaiig project was set up to monitor natural fluctuations in the performance of wild salmon and sea trout populations. The little Tournaiig River system flows into Loch Ewe less than 3km from the mouth of the River Ewe. The numbers of salmon and sea trout entering and leaving the system have been recorded since 1999. The annual electro-fishing survey of the spawning and nursery stream complements the operation of traps within the old fish ladder near the mouth of the stream.

The Tournaiig project has provided much of interest. In contrast to other 'project' rivers in the Wester Ross area, the



Tournaiig system has remained unstocked. Following recolonisation by stray wild salmon in 2004 & 2005, salmon smolt production has varied greatly according to the number of adult fish entering the system, and according to weather and river conditions during the spawning season and during the smolt migration period (April-May). In 2012, 43 adult salmon were taken in the upstream trap representing the largest run of salmon into the system since the project began; all but two of these fish were grilse. Over the past 10 years, the majority of grilse taken in the upstream trap have been female fish.

Ben Rushbrooke photographing a grilse from the Tournaiig trap in 2012.

Tournaiig salmon are believed to be part of a 'metapopulation'. This may be confirmed one day by genetic comparison of genetic samples collected over many years from Tournaiig fish and those of salmon in nearby rivers, when the technology and funding is available.

2.8 Bruachaig Wild Salmon Restoration Project

The aim of this project is to restore a wild, self-sustaining salmon population within a 10km stretch of river in the headwaters of the River Ewe system. Juvenile salmon of wild origin were last recorded in the upper Bruachaig above complex waterfalls in 1996. To 'kick-start' the restoration of juvenile salmon production from a large area of suitable habitat, a restocking programme has been developed. Hatchery produced salmon fry, progeny of rod



caught wild adult salmon taken each year below the falls and incubated at Coulin hatchery, have been stocked into the river each summer since 2007, following a check as to whether progeny of fish that have ascended the falls are present within the system. Pending the outcome of annual electro-fishing surveys in search of wild fry, the stocking programme will continue until 2015. This project is currently supported by Marine Harvest, with genetic advice from Prof Eric Verspoor.

Neil Morrison and a young helper stocking out salmon fry reared at the Coulin hatchery in July 2011.

3. Restoration of sea trout fisheries

3.1 Approach to restoration of sea trout

Sea trout fisheries in Wester Ross have remained in a state of collapse. Our approach to sea trout fishery restoration focuses on understanding problems facing sea trout populations within the marine environment. Trap and netting data (from Tournai trap, River Ewe rotary screw trap, River Carron rotary screw trap) have demonstrated that there were still sizable runs of sea trout smolts migrating to sea from rivers within the past three years. Sea trout have been sampled in coastal waters using a sweep net. Many post-smolt sea trout and finnock have been caught in the lower reaches of major rivers often carrying burdens of 50 or more parasitic *Lepeophtheirus salmonis* lice. Larger sea trout, especially fish of over 1kg in weight, have been rarely encountered in rod catches except in a few sea lochs. Rates of marine survival of sea trout from one year to the next have been much lower in most parts of the Wester Ross coastline than in the past.

3.2 Sweep and fyke netting for sea trout

Sea trout were sampled around the coast of Wester Ross to provide data on parasite burdens for the RAFTS Aquaculture Project and to maintain an understanding of sea trout health for local management purposes. Samples were typically taken from Loch Gairloch between February and October, and from the Kanaird estuary, Gruinard Bay, Loch Ewe and the River Carron between May and July. Samples were also taken from the Dundonnell River estuary in June and July using a fyke net. Sea trout carrying over 100 lice (*Lepeophtheirus salmonis*) were taken at some sites in all three years (see WRFT website for annual monitoring reports and data). Sea trout grew much fatter in 2009 than in 2010, 2011 and 2012. The largest sea trout were taken in Loch Gairloch, where the proportion of older sea trout to finnock & post smolts in some samples was also higher than at other sampling sites.

The WRFT sweep netting team by Gruinard Bay in May 2012. The sea trout caught (inset) was one of those taken at the same location in June 2011.



Review of the work of WRFT, 2009 to 2012

3.3 Trout scale reading and annual WRFT wild trout reports

In February 2011, WRFT invited Dr Andy Walker to provide guidance to WRFT biologists tasked with interpreting trout life-histories from scale readings. Recently, few sea trout have survived for more than two summers at sea. Photographs of images of scales from trout sampled in Wester Ross can be found in the Wester Ross Trout Scale catalogue and Wester Ross Wild Trout Report for 2011 via links at www.wrft.org.uk/fisheries/seatrout.cfm.



Dr Andy Walker and participants at the scale reading workshop in February 2011.

3.4 Herring rediscovery project and other work in the marine environment

The collapse in local sea trout fisheries mirrors that of many other sea fish populations around Wester Ross. The marine ecosystem is complex. It is reasonable to assume that an abundance of other fishes, including both species which sea trout eat and those which provide alternative prey for seals and other predators of sea trout, contributes to higher rates of survival of sea trout at sea. Herring, including juveniles, can be an important source of food for sea trout and other fish, sea birds and cetaceans. To learn more about local herring spawning grounds, Sue Pomeroy carried out a series of interviews with fishermen in 2012, many of whom fished for herring in the 1960s and early 1970s when herring (and sea trout) were abundant. Our aim is to use the information gained as a guide for future sampling to learn more about the occurrence and relative abundance of herring and other sea fish populations within local waters, and the condition of the habitats (e.g. spawning grounds) that are of importance to them. Our interest in herring is shared with many other people who live in coastal communities.

Herring were said to have spawned near Rhu Reidh Lighthouse. These herring, in pre-spawning condition were taken from nearby in January 2010.



Review of the work of WRFT, 2009 to 2012

4. Other activities

4.1 Brown trout investigations

There are over 400 rather wonderful and largely unsurveyed lochs and lochans within the area that the WRFT covers. Some lochs are connected to each other by small streams in which wild brown trout are present. With much help from enthusiastic volunteers, we have continued to document the occurrence and absence of brown trout in lochs and upland streams, and to learn more about factors influencing trout growth, size and productivity.

WRFT members, Dr Steve Kett with David, Dugie and Flora Foreman by a hill loch in August 2011.



WRFT member, Dr Steve Kett of Middlesex University has come to Wester Ross each year since 2006 (for a working holiday) to sample wild trout. Steve and his students have visited many hill lochs around the Gairloch area to collect genetic samples. Through follow up analyses at the Middlesex University genetics lab, Steve's students have gained



experience of genetic techniques and found out more about population structuring of wild hill loch trout in the area. Student projects are also underway, investigating hill loch ecology, and comparing invertebrate biodiversity in lochs with trout with those where trout are not present.

One of Dugie Foreman's wild trout from a lochan in the Gairloch hills.

WRFT has also investigated the composition of trout in several spawning burns to learn more about whether brown trout, sea trout or both are present. The large ferox trout on the cover of this report, the largest trout seen within the Loch Maree catchment in the past 10 years, was taken in spawning burn in October 2011.

4.2 Arctic charr discovery weeks

The lochs of Wester Ross are also a stronghold for Arctic Charr, with at least 28 populations present. In collaboration with charr specialists from elsewhere in Scotland, lochs were sampled in the River Carron system in November 2011, and near Gairloch and Loch Ewe in November 2012 to learn more about the occurrence and status of charr populations.



photo by Ben Rushbrooke

Healthy populations were found in the lochs of the River Carron system and in Loch a' Bhaid Luachraich (locally known as the 'Goose Loch') by netting teams led by Alex Lyle. Prof Peter Maitland's Arctic Charr data base for the lochs of the Wester Ross area has been updated accordingly.

A male Wester Ross charr in spawning colouration.

Review of the work of WRFT, 2009 to 2012

4.3 Education Projects

Education projects aim to raise levels of awareness and understanding of wild fish populations within the WRFT area amongst the younger generation, and thereby foster future interest in looking after them. Drs Lorna Brown and Jonah Tosney continued the very successful and popular 'Salmon in the Classroom Project', which has visited every primary school within the WRFT area at least once. This project has continued to introduce local youngsters to the life cycle of wild salmon and the challenges they face in the context of local river systems.

Jonah Tosney and Plockton Primary School children stocking out salmon fry into the Duirinish burn in 2012.



Lorna has also developed the 'Life in Lochs' project to fit into the curriculum for secondary school pupils where the focus is to learn about a local freshwater ecosystem and to consider how different biota would be affected by possible environmental impacts. WRFT received a Business Partnership award from the Highland Council in 2010 largely in recognition of Lorna's work with schools.

4.4 Biosecurity & control of invasive non-native species

As part of the RAFTS Invasive Species management initiative, the Wester Ross and Lochalsh Biosecurity Management Plan was produced in 2010 to address local problems and deliver local solutions (right). This document can be found at:

<http://www.wrft.org.uk/files/WRFT%20Biosecurity%20Plan%20Final%20Ver%202Aug2010.pdf>

Non-native invasive species that are already causing expensive problems include *Rhododendron x superponticum* and Japanese knotweed. There are potential threats to native biodiversity from many others, including North American mink, New Zealand flatworm and for fish populations, introduction of non-native fish into freshwaters, and the parasite *Gyrodactylus salaris*.

WRFT, in collaboration with SNH and local estates, has supported a biannual mink trapping programme with guidance from Gunnar Scholtz, the Scottish Mink Initiative officer based in Ullapool. The Trust biologist has also attended RAFTS training courses in alien aquatic weeds identification, and North American Signal Crayfish identification and control.

**Biosecurity Management Plan for the
Wester Ross and Loch Alsh areas 2010 – 2015**

Final Version 1 August 2010
Peter Cunningham, info@wrft.org.uk

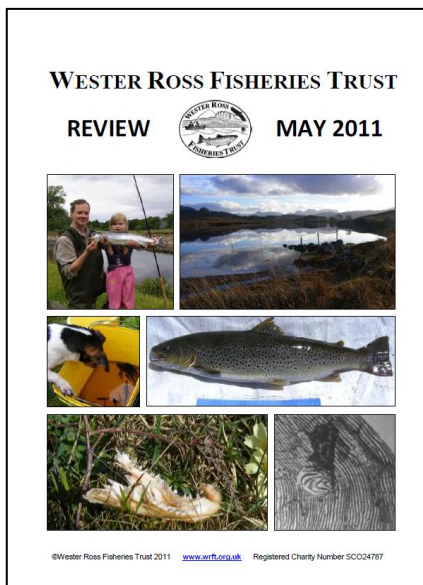
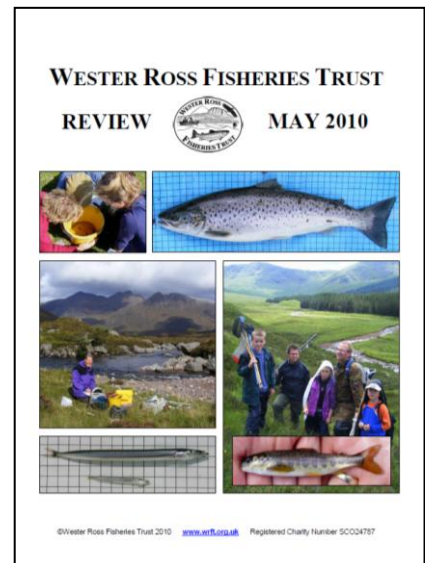
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Review of the work of WRFT, 2009 to 2012

4.5 Seminars, workshops and the WRFT Review

Outreach is an important part of the Trust's work. In May 2009, WRFT organized a workshop to consider the links between sea trout populations and the ecology and productivity of the coastal seas around Wester Ross. Speakers were invited from other organizations and institutions working in the marine environment including Marine Scotland scientists, NGOs and a speaker from a local salmon farming company.

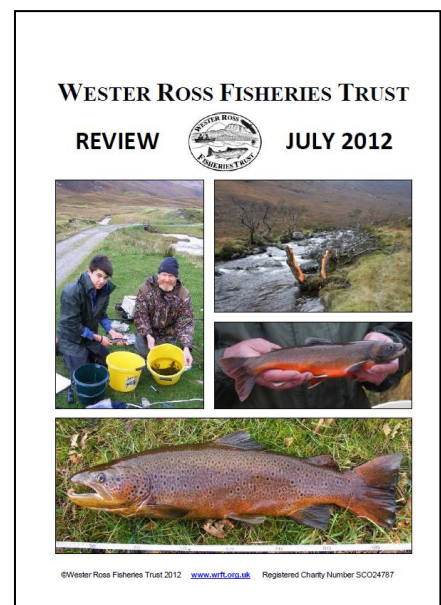
The workshop explored opportunities for accessing and sharing information about the marine environment and concluded that this was sometimes difficult. [Progress has subsequently been made by the Scottish Government]. A summary of this workshop can be found in the [WRFT Review May 2010](#) (right).



In May 2010, our focus was on freshwater production of juvenile salmon and sea trout and the pros and cons of stocking in Wester Ross. Invited speakers to our workshop at Poolewe included fish geneticists, hatchery managers and other fisheries biologists with experience of stocking. The workshop focused on identifying the best way forward for the Loch Maree sea trout fishery and the restoration of salmon production in the River Bruachaig (Ewe system). A summary of the workshop can be found in the [WRFT Review May 2011](#) (left).

In May 2012, the development of a local community third-party bid for a nature conservation Marine Protected Area was led by WRFT Biologist Peter Cunningham. Although much of the work was done in Peter's own time; WRFT was able to provide facilities and support as one of many stakeholders within the local community.

A summary of this bid, and links to related presentations can be found in the [WRFT Review July 2012](#), along with summaries of many of other WRFT activities (right).



WRFT maintains close links with the University of Highlands and Islands through job share of a biologist; and has taken an active role in support of the local biodiversity group, [Wester Ross Environment Network](#), and the local River Basin Management Plan Area Advisory Group for the West of Scotland. The Trust has also spent much time responding to planning applications (especially hydro-power and aquaculture) through provision of information and advice to developers, the Wester Ross Area Salmon Fishery Board, and planning authorities.

5. Future priorities

5.1 Conservation and restoration of salmon populations and fisheries

Salmon populations remain fragile in the headwaters of many river systems within the WRFT area. Pressures, both in the marine environment and in freshwater habitats associated with climate change and other anthropogenic pressures, can combine to threaten the viability of some populations. To protect important fisheries it is important to monitor wild salmon and to take action to address problems.

- **Juvenile fish surveys:** to maintain up-to date knowledge of the distribution and status of juvenile salmon populations within the river systems of the WRFT area, WRFT will continue to carry out an annual electro-fishing survey, aiming to visit all systems where salmon populations are present over a two year period. This will provide information about where to focus actions to support populations and respective fisheries.
- **Restoration of a self-sustaining salmon population within the upper Bruachaig River (Ewe headwaters):** the Bruachaig has the largest area of formerly productive juvenile salmon habitat within the WRFT area where wild salmon are not present. The current restocking programme will continue until 2015.
- **Management trials on carrying capacity stream productivity:** the collaborative carrying capacity project is set to continue; with complementary studies of invertebrates and juvenile salmon production.
- **Tournaig trap project:** as an unstocked system, fluctuations in the performance of the salmon population at Tournaig relate to a range of other environmental variables. Trap catches provide valuable information about both smolt production, and the performance of wild salmon at sea, including data on growth, parasite burdens and predation.
- **Genetic analyses:** developing analytical technologies provide increasingly cost-effective tools for answering a number of questions relating to fisheries management in Wester Ross, for example: salmon population structuring, the contribution of stocking to salmon fishery restoration, and the origin of the salmon that have strayed into the Tournaig river system.
- **Preparation of management reports:** for proprietors and those actively interested in fisheries management, to provide up to date information on wild salmon populations and the pressures they face and opportunities to support wild fisheries.

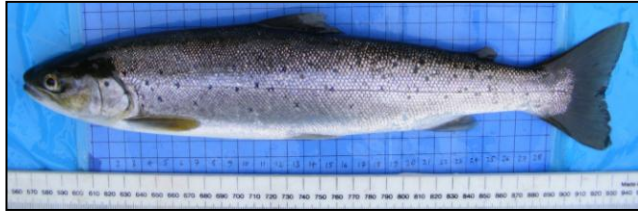
Grilse, from the upstream trap at Tournaig, 30th July 2012 (photo by Ben Rushbrooke)



Review of the work of WRFT, 2009 to 2012

5.2 Restoration of sea trout populations and fisheries

There is still much to do to restore sea trout fisheries in Wester Ross including the once famous Loch Maree sea trout fishery. Sampling in Loch Gairloch has demonstrated that given favourable conditions, sea trout are still able to grow to respectable sizes within the area. Key issues for sea trout are sea lice control on nearby salmon farms and the management of the coastal marine environment including inshore fish populations.



- **Netting of sea trout in the sea:** in addition to collaborative investigations of post-smolt sea trout and their sea lice burdens as part of the RAFTS Aquaculture project, much has been learned about the growth and survival of larger sea trout, particularly in Loch Gairloch. Continued sampling, building on experience gained over many years, can provide much useful information.
- **Sea trout spawning burns:** there is still much to learn about which burns are of importance for the production of sea trout (vs. non migratory trout) within both larger systems (e.g. River Ewe – Loch Maree) and smaller coastal stream systems (e.g. Flowerdale Burn). Options: trapping of trout entering spawning burns; chemical analyses of trout eggs and fry.
- **Small sea trout stream restoration project:** to date much of WRFT work has focused on larger salmon river systems. However, for sea trout, smaller stream systems in Wester Ross can be of importance. There are opportunities for projects to restore access and improve habitat for sea trout and other wildlife in many of these systems, e.g. Laide (Sand) Burn and Strath Burn (Gairloch). (see also www.atlanticsalmontrust.org/research/small-streams.html).
- **Fish farm visits:** WRFT would like to extend a programme of visits to fish farms within the coastal area to work with the salmon farming industry to ensure that everything possible that can be done is being done to minimize the risk of parasitic sea lice infesting wild sea trout.
- **Inshore fish and marine habitat investigations:** WRFT is well placed to provide support for a series of projects in collaboration with UHI Scottish Marine Institute / SAMS focusing upon inshore fish populations, including local herring, and the habitats that are of importance for them. This would tie in well with the Trust's remit to understand the pressures facing sea trout within the marine environment.

Loch Gairloch sea trout (above) 18th March 2011, 416g; (below) same fish, 15th October 2012, 1318g



Review of the work of WRFT, 2009 to 2012

5.3 Other priorities

- **Brown trout investigations:** the Trust is fortunate to have had support from some dedicated volunteers and can continue to provide support for visiting students and their supervisors and collate information on trout waters, including the development of an angler's information network.
- **Arctic charr monitoring:** further collaborative projects and survey expeditions are required to assess the status of charr in the lochs of the WRFT area.
- **Education projects:** these have been popular and have been valued highly by schools and schoolchildren, and do much to raise local awareness of the pressures facing wild salmon and trout populations and the conservation requirements of wild fish populations in local waters.
- **Control of Invasive Non-Native Species:** WRFT will continue to record INNS and raise awareness of species which threaten native biodiversity; and develop and support actions to control INNS where resources allow and action is not being taken by other stakeholders.

6. Acknowledgements

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WRFT Sweep netting team & helpers, Flowerdale Estuary, 22nd June 2012.



