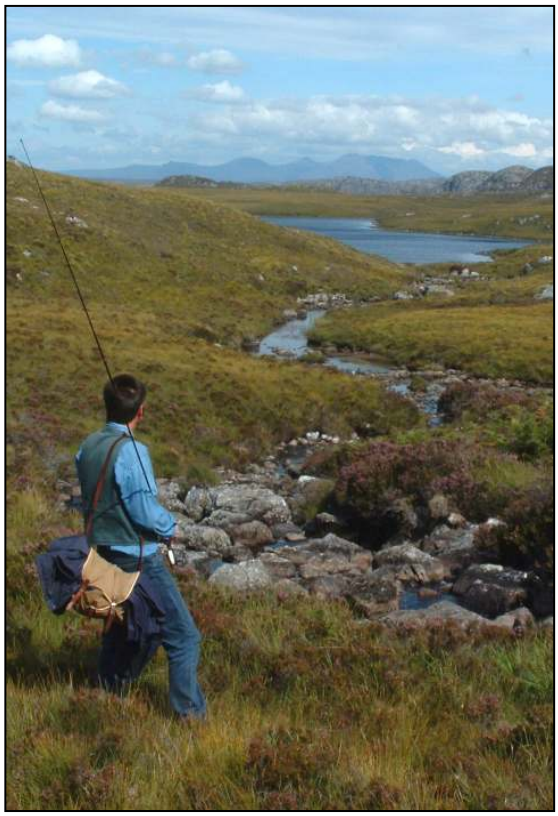
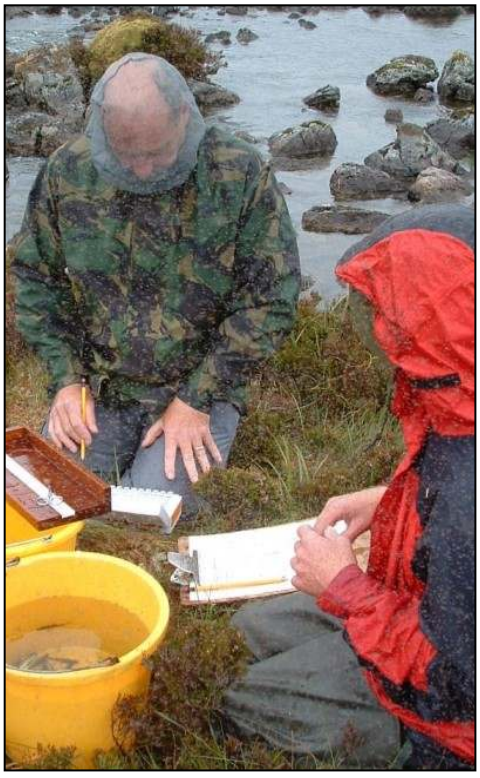
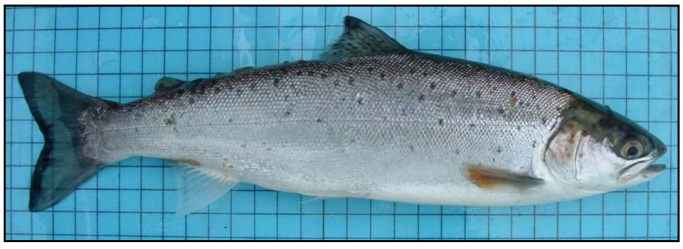
WESTER ROSS FISHERIES TRUST

REVIEW MAY 2009







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REVIEW

by

Peter Cunningham, Ben Rushbrooke, David Mullaney, John Mackenzie, Dr Barry Blake, Bob Kindness, Peter Jarosz, Veronica Mullaney, and Dr Lorna Brown

May 2009

Cover photos (all photos © WRFT unless stated otherwise):

(clockwise to centre from top left) Nick Benge looking towards Loch na h' Uidhe (August 2008); Bob Kindness, volunteers Dougal (with sea trout) and David Foreman, Jim Raffell and Stephen Buttle by the mouth of the River Carron (June 2008); Garry Bulmer and David Mullaney at a particularly midgy electro-fishing site by the Little Gruinard River (August 2008); plump finnock from the River Ewe (July 2008), New Zealand flatworm from near Poolewe (photo by Stephen Kett, May 2008); brown trout from a hill loch (August 2008); ?Leptophlebia vespertina, just hatched on a quartzite stone by the side of a fishless lochan by the Beinn Eighe NNR mountain trail (May 2008).

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Dr Eric Verspoor photographing a trout from Loch na Sealga in the WRFT office, as Ron Greer, Stephen Buttle and Jim Raffell sort the catch in the background (Peter Cunningham).

Contacts

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Conan House,
Conon Bridge,
Dingwall,
Ross-shire,
IV7 8AL

Prof Barry Blake, *Vice Chairman*, Gairloch
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Mr Ben Hadfield, Marine Harvest (Scotland) Ltd
Mr Richard Wilson, Os Lair, Strathcarron

WRFT Fisheries Biologists and Administration

Peter Cunningham (Biologist)
info@wrft.org.uk

Peter Jarosz (Administrator)
admin@wrft.org.uk

Wester Ross Fisheries Trust,
The Harbour Centre,
Gairloch,
Ross-shire,
IV21 2BQ

Tel: 01445 712 899
Web site: www.wrft.org.uk

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Chairman's preface

The past year has been one of ups and downs. We lost some very long standing, highly committed and expert Trustees but gained valuable new blood. Conditions in 2008 were generally not helpful for salmon and sea trout and hence for those wishing to catch them. Catches were good in some rivers; disappointing in others. Sea lice infestations on sea trout were serious in some parts of the Trust's vast area and much less so in others. But overall, thanks to another year of unceasing effort and commitment on the part not only of the Trust's professional staff but the legions of ever-willing and enthusiastic volunteers, a huge amount of work was done, much knowledge gained and much progress made.

The Trustees were very sorry that Johnie Parry, my predecessor as Chairman, decided to stand down from the Trust in November. He had been a trustee for almost all the life of the Trust and given unstintingly of his time and expertise. Sandy Lindsay who stood down at the same time had been a Trustee since the inception of the Trust and in almost 13 years missed only a single meeting. His eagle eye for detail was legendary: if terrifying. The other Trustee to leave us in 2008 was Jane Maclay, a supporter for many years. We are deeply indebted to them all. Their places have been taken by new, equally enthusiastic people, Graeme Wilson, Mark Williams and (now Vice-Chairman) Barry Blake, whose scientific background and expertise are already proving invaluable to the Trust as a whole and to Peter Cunningham in particular. WRFT is fortunate to be able to call on their skills and knowledge.

The drought conditions of 2008 were not helpful for salmon and sea trout. Overall, catches were down on 2007 although, as reported within the review, there were significant exceptions, particularly for salmon. It is abundantly clear that sea lice pose a threat, particularly to sea trout, and it is equally clear that despite much work over the years we still do not fully understand the picture. In 2008, Peter started monitoring sea lice via a programme of sweep netting under the aegis of the Tripartite Working Group. Sweep netting is now being done up and down the west coast and it is hoped that the consistency of sampling method will yield valuable information. Again, there is a detailed and interesting report within, as well as an account of the WRFT Sea Lice Seminar in April 2009.

An important, but not widely recognised activity is what might be called education. Again in 2008, WRFT ran a number of, largely outdoor, events at which people – and in particular children - learned about fish and the freshwater environment. However, whilst there was much outdoor work to be done, office work could not be ignored and at the end of the year the Wester Ross Fisheries Management Plan was published. This was the culmination of a huge undertaking which took a great deal of time and effort and the plan provides a firm basis for the Trust's activities for the next few years. Still on the office front, it will be seen from the accounts that last year was again financially solid so the Trust remains in sound financial health and can face the current economic difficulties with confidence.

None of the things above – let alone the many, many other projects and activities - would have been achieved without a great deal of hard work, dedication and enthusiasm. The Trust is fortunate indeed to have these in very large measure from our "in house" people, the inexhaustible Peter Cunningham (who must be known to just about everyone outdoors in Wester Ross) and Peter Jarosz and Ronnie Mullaney who quietly but very efficiently keep the administration and finances in such good order. Perhaps most remarkable is the amount of help given by so many volunteers: from those carrying buckets around midge infested watercourses to those who give advice and those who reach into their sporrans to give financial support. Please have a good look at the list on page 43: the sheer number speaks volumes for the esteem in which the Trust is held. We are most grateful to every one of them.

John Mackenzie, May 2009

Part 1 **Introduction**

The Wester Ross Fisheries Trust area encompasses many small river systems of which at least 30, from the River Kanaird in the north to the River Barrisdale (Knoydart) in the south, have supported juvenile Atlantic salmon (*Salmo salar*) and sea-going brown trout (*Salmo trutta*). Until the 1990s, the Loch Maree sea trout fishery was the largest rod fishery in the area. The largest salmon fisheries, which have partially recovered from lows in the 1990s, are currently those of the following river systems: Ewe, Carron, Gruinard and Little Gruinard. There are also 400 lochs with an area of 0.5ha or greater, many of which support landlocked populations of Brown trout and/or Arctic charr (*Salvelinus alpinus*).

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***. In December 2008, Wester Ross Fisheries Trust published the WRFT Fisheries Management Plan 2009+ (see website www.wrft.org.uk) which describes the systems and fish populations they support, and presents an assessment of problems and the wide range of management activities that are being taken to address them.

The Trust's purpose will be achieved through the delivery of 4 core outputs:

- **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.

These objectives are supported by the following management activities:

- Electro-fishing surveys to assess the distribution and abundance of juvenile salmon (see Part 2.2)
- Surveys of fish populations in lochs (see Part 2.3)
- Rod catch analyses to assess relative abundance of salmon and grilse (see Part 2.4)
- Genetic screening of salmon and trout populations (samples collected – report next year)
- Whole population studies: the Tournaig trap project (see Part 3)
- Sea lice monitoring of sea trout in coastal waters (see Part 4)
- Habitat restoration and management (see Part 8)
- Stock restoration programmes (Part 8)

This review presents a summary of progress over the past 12 months.

Ben Rushbrooke, David Mullaney and Peter Cunningham recording details of sea trout from sweep net sample by Boor Bay on 2nd July 2008. (photo by Roz Gordon)

Part 2 **Salmon and sea trout stocks**

2.1 Overview

Salmon and sea trout, like other fishes, are cold-blooded animals. Growth is usually fastest between April and September when water temperatures are warmer and production of prey species is highest. During the spring and summer months, sunlight shines more brightly through the surface of the water, promoting growth of algae. Algae is the primary source of food for most of the insect larvae (in freshwater) and zooplankton (in the sea and freshwater lochs) upon which many small fishes feed.

For local stocks of salmon and sea trout, 2008 was a year of mixed fortunes. The late spring and much of the summer were warm and sunny. Marine plankton blooms were prolific, attracting large shoals of mackerel and the gannets, whales and dolphins which feed on them. Filter feeding basking sharks were seen regularly around the Wester Ross coastline between July and October. Salmon post-smolts also feed on zooplankton as they migrate north. For some of the sea trout which made it to the sea, conditions were good for growth; the plump finnock on the cover of this report was caught in the Rive Ewe in early July 2008.

However, 2008 was a year of drought in Wester Ross. Smolts in some river systems were delayed from migrating to sea. At the Tournaig trap (see Part 3), the smolt run fizzled out in early May; some salmon smolts were then unable to migrate downstream until late June, over one month behind schedule. Salmon and sea trout smolts were filmed stranded in small pools in nursery streams around Loch Maree by the BBC; 'Secrets of the Highlands' is to be broadcast later in 2009. In some sea lochs, sea trout were rapidly infected with sea lice (*Lepeophtheirus salmonis*) and returned to river estuaries earlier than they should have done generally in poor condition having been unable to benefit from the rich feeding. In the rivers and streams, a lack of freshwater restricted the productive area for aquatic insect larvae, so the relative abundance and growth of salmon fry and parr was lower than in some other recent years.

Low water delayed the entry of returning adult salmon to many river systems until later in the season. Rod catches were generally down on those of 2007 (see Part 2.2). At the Tournaig trap, almost half of the total number of grilse was taken in October. Salmon which enter freshwater only a month or two before they spawn are not nearly as valuable for a fishery as those which enter earlier in the year.

This brown trout was caught at during the Tournaig electro-fishing survey on 24th of July 2008 and had been feeding almost exclusively on flying ants.

2.2 Juvenile fish surveys

Juvenile fish surveys are carried out by WRFT electro-fishing teams between July and October. The Trust aims to survey each river system where there is a salmon fishery at least once every 2 years. Several smaller rivers systems are also surveyed each year in order to maintain an up-to-date understanding of the distribution and relative abundance of juvenile salmon and other fish (trout, eel, minnow, lampreys) within the WRFT area. Scottish Fisheries Coordination Centre [SFCC] 'timed' e-fishing protocol is followed.

Results (summarised below) are expressed as numbers of fish caught per minute fishing or 'catch per unit effort' (CPUE). When river conditions are conducive to effective fishing, CPUE relates closely to fish density. However, sometimes having traveled a long way to reach a river, fishing conditions turn out to be less than ideal and results have to be interpreted according to river conditions. Table 2.1 specifies the CPUE 'grades' used in the summary of results presented below (Figures are available on request from WRFT):

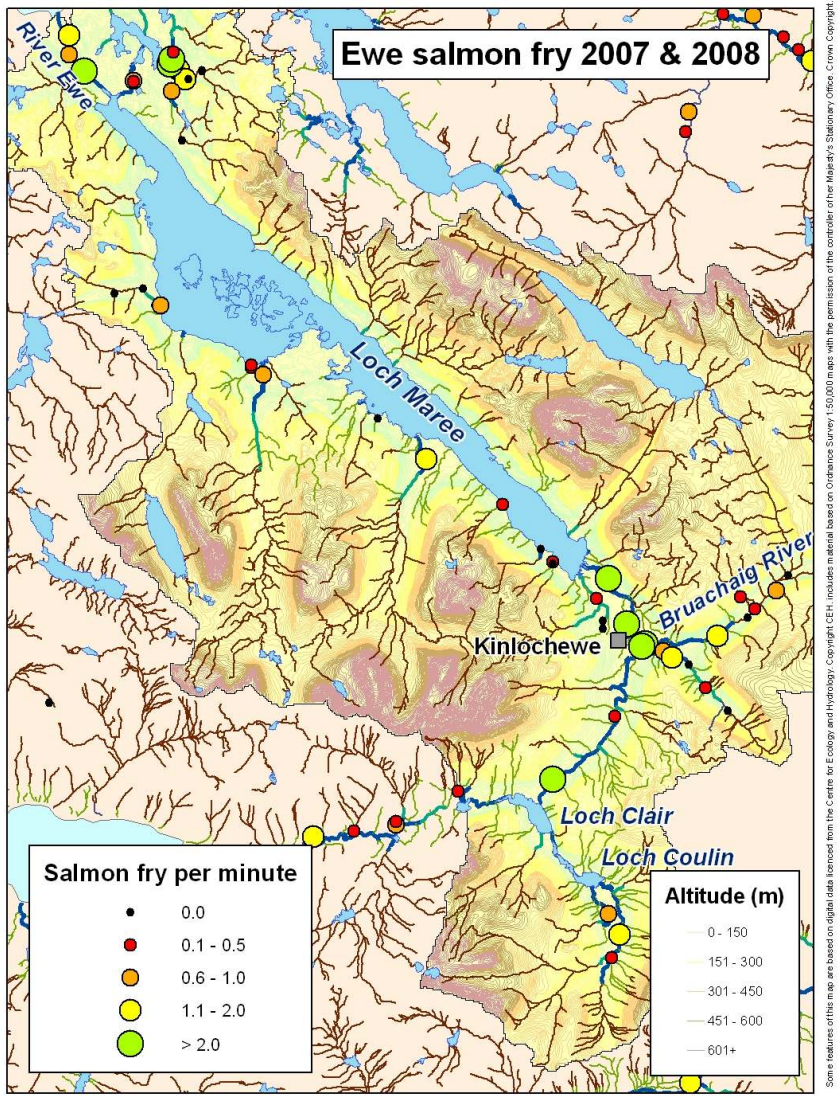
Table 2.1 Definition of Catch-per Unit effort grades as used in the following text.

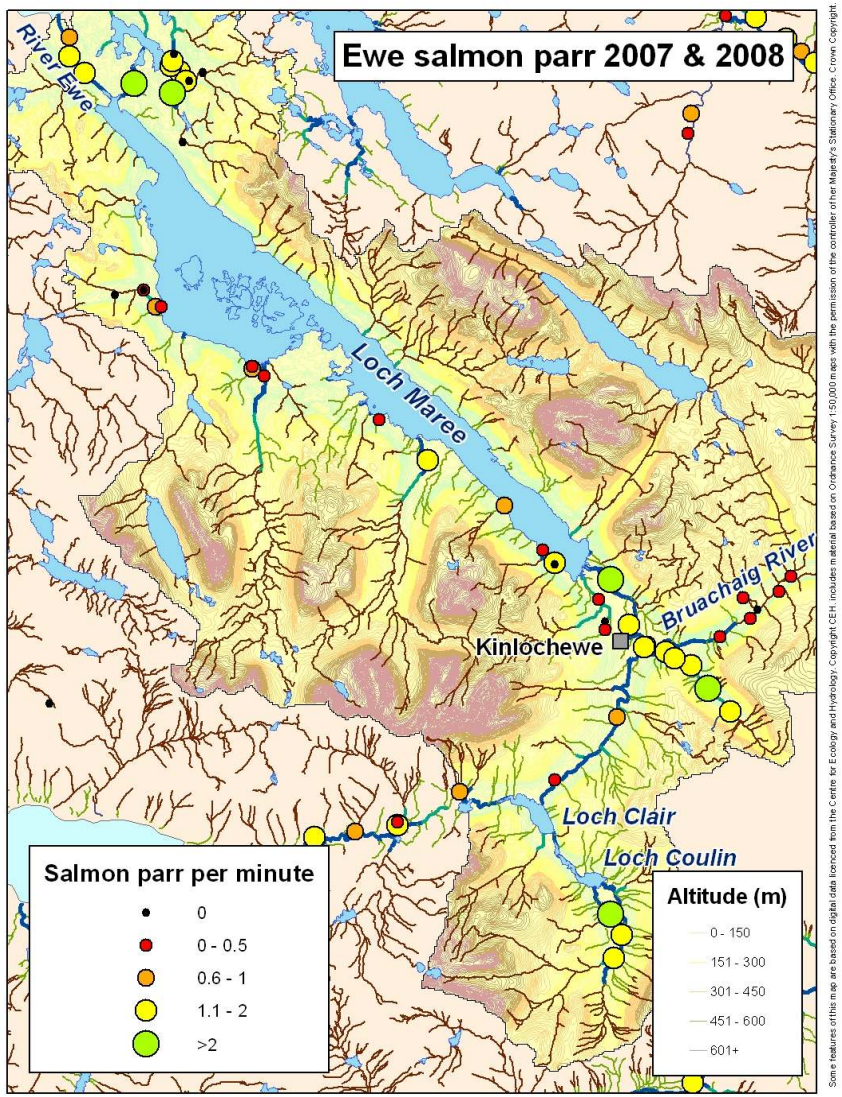
CPUE	**Grade**
0	Absent
0.1 – 0.5 fish per minute	Very low
0.6 – 1.0 fish per minute	Low
1.1 – 2.0 fish per minute	Moderate
> 2 fish per minute	High

Broom: In addition to two sites on tributaries, 4 sites on the mainstem were surveyed by Ross Gardiner from Fisheries Research Services with help from WRFT and Alan McGillivray of Foich Estate. Ross has been surveying the same 4 sites in the river since 1990. Salmon fry and parr were found at all sites, though fry densities at the Auchindrean site were lower than in previous years.
Dundonnell (S)**:** Salmon fry and parr were found at all sites fished in the main river, generally at moderate CPUE. Juvenile salmon were relatively large for their age, reflecting good growth (see below). Trout fry and parr were present at tributary sites.
Gruinard (lower river)**:** Salmon fry were recorded at moderate to high CPUE at two mainstem sites. However, in contrast to the Dundonnell River, salmon fry were typically small and thin – see below.
Little Gruinard (below Fionn Loch): Salmon fry were recorded at high CPUE at all sites except one site where fry were absent. This backwater channel may have dried out during the drought earlier in the year.
Tournaig: Salmon fry and parr were found throughout the accessible area at beginning of August, at low-moderate CPUE.
Ewe: In the Bruachaig (S), salmon fry and parr in areas stocked were caught at very low CPUE. In contrast, the highest salmon fry CPUE for any site in WRFT area in 2008 was in the Kinlochewe River at Taagan (7.8 fry per minute). High salmon parr CPUE also recorded. Trout and salmon parr were found in the Slattadale burn, but not salmon fry.
Sguod: low - high CPUE salmon fry and parr in small spawning streams around Loch Squod. Very low – moderate CPUE for trout fry.
Sand: one salmon fry was found during e-fish demo at the Gairloch Gathering on 30th June.
Kerry: generally high CPUE for salmon fry and parr at all mainstem sites.
Badachro: generally high CPUE for salmon fry and parr at all mainstem sites.
Elchaig (S): high salmon fry CPUE; moderate salmon parr CPUE, but high water, so parr underestimated.
Shiel: salmon fry present at high CPUE at three main river sites, parr present though under-recorded due to high water.
*(S) denotes river where stocking of salmon takes place.

Figure 2.1 shows the distribution of salmon fry and salmon parr at sites fished within the River Ewe – Loch Maree catchment area over the period 2007 to 2008. Note that in core areas (Kernsary sub-system, Kinlochewe River and A' Ghairbhe), salmon parr CPUE is high, reflecting near optimal juvenile salmon densities in core parts of this system. However gaps remain, particularly in the upper Bruachaig, where a salmon stock restoration programme continues (see Part 6)

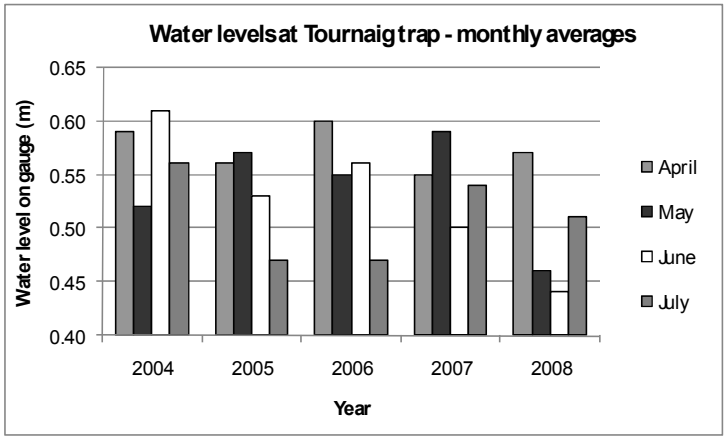
Figure 2.1 Distribution and relative abundance of salmon fry and salmon parr in the River Ewe system in 2007 - 2008. Sites in the Kinlochewe River and Bruachaig were surveyed in 2008; all other sites were surveyed in 2007.





The late spring and summer of 2008 was unusually dry (see Figure 2.2). Water levels in many rivers fell to their lowest levels for many years, and some areas of river bed were exposed (along with Freshwater pearl mussels) for the first time in many years. At Tournaig, sea trout and salmon smolts were unable to migrate to the sea through most of May and June. Smolts were seen trapped in isolated pools between long stretches of dried up river bed in the Taagan burn and other streams entering Loch Maree.

Figure 2.2 Average monthly water levels recorded at the WRFT Tournaig trap.



Contrasting rivers and juvenile salmon populations

There is much variation in growth rates of juvenile salmon from river to river within Wester Ross. The 2008 drought may have exacerbated this variation. Two contrasting rivers are the Gruinard River and the neighbouring Dundonnell River. In August 2008, the WRFT electro-fishing team surveyed sites in both these rivers, with contrasting results.

The Gruinard drains a catchment area with very little human habitation. Below Loch na Sealga the river flows through an open valley grazed by deer and cattle. Along the Dundonnell River there is more woodland, and the section of river accessible to salmon and sea trout flows through a valley with human habitation and farmland. Over the years, Dundonnell Estate has developed several woodland schemes to improve riparian habitat. The riparian corridor is lined with trees including alder, birch and ash.

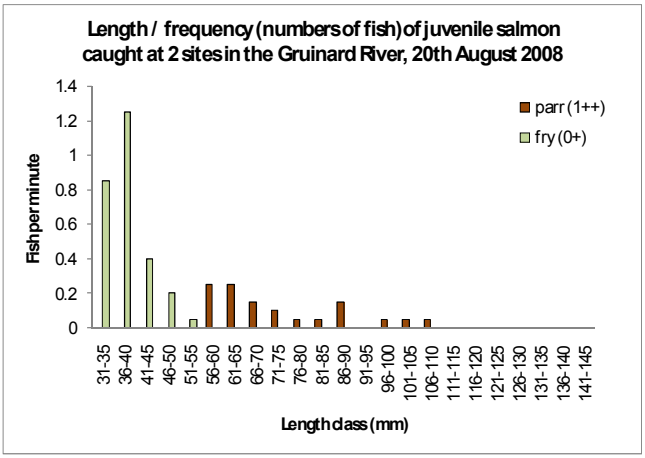
The Gruinard River (left) flows through an open valley and riparian areas are grazed by cattle and deer; in contrast much of the Dundonnell River valley is wooded.

As in previous years, juvenile salmon were abundant at sites within the mainstem Gruinard River. However, fry were particularly small. At two mainstem sites in the lower Gruinard River, the average median length

class of salmon fry was 36 - 40mm. In contrast, in the Dundonnell River, the median length class of salmon fry was 56-60mm (Figure 2.3).

Overall, more fish were caught per minute fishing in the Gruinard River than in the Dundonnell River (Figure 2.3). Catch rates for juvenile salmon were 3.9 fish per minute for the Gruinard River and 3.3 fish per minute for the Dundonnell River. In terms of weight of fish per minute, however, the Dundonnell River greatly surpassed the Gruinard, with 20.0g of juvenile salmon caught per minute in the Dundonnell River, vs. only 7.4g for the Gruinard River (Figure 2.4).

Figure 2.3 Length-frequency (in numbers of fish per minute) for juvenile salmon caught at survey sites in the Gruinard River and Dundonnell River in August 2008.



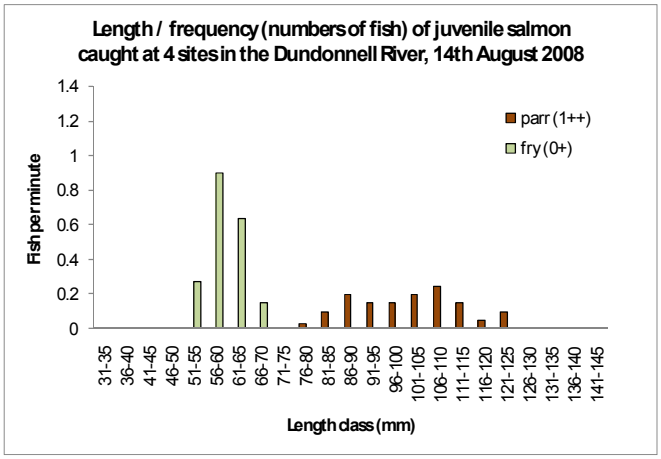
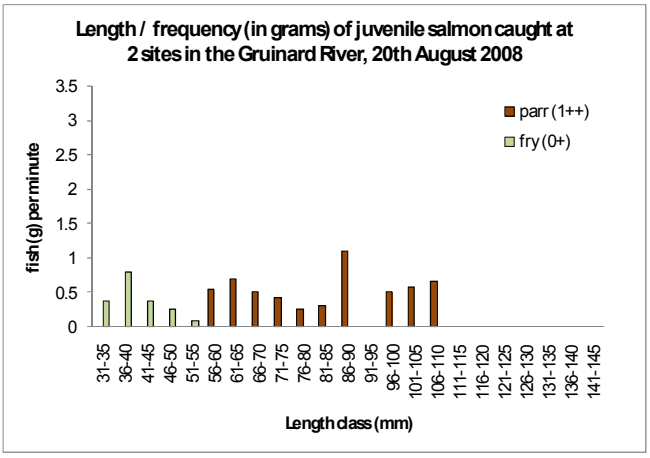
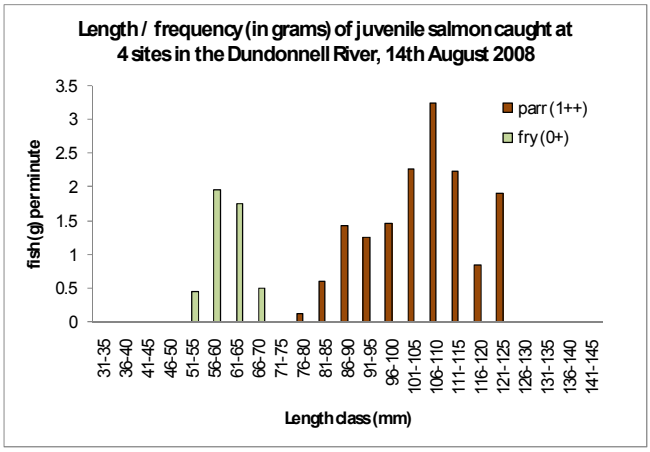


Figure 2.4 Length-frequency (in grams per minute) for juvenile salmon caught at survey sites in the Gruinard River and Dundonnell River in August 2008. Weight in grams has been estimated from length measurements using the formula: weight (grams) = length (cm) ^{3} / 100. This assumes a standardized condition factor of 1 for all fish.





In the Gruinard River, juvenile salmon production is sustained by food produced within the river itself. During a period of drought which leads to desiccation of large areas of stream bed, production of aquatic insect larvae (juvenile salmon food) is restricted.

In contrast, the Dundonnell River has more productive riparian areas. The supply of terrestrial insects and other nutritious matter from bankside vegetation (leaves, etc.) may help to alleviate the consequences of drought, such as that experienced in May – June 2008. Although the Dundonnell river has been unstable in recent years, smolt production per unit area of river may higher than from the Gruinard River.

2.3 FRS Loch Surveys

As part of a study of fish populations in Scottish lochs, a team from the Scottish Government's Fisheries Research Services [FRS] led by Dr Eric Verspoor and Ron Greer visited Wester Ross twice in 2008 to carry out inventory netting surveys of Loch na Sealga, Loch Maree, Loch Damh and Loch Doughaill. The aim of the surveys was to record the occurrence of different fish of different sizes at different depths within respective lochs, and to gather catch per unit effort type data to describe fish occurrence.

Standard Nordic multi-mesh size survey gill nets were set to fish overnight and recovered in the morning. Benthic nets were set to fish from the bottom of the loch at depths of from1.5 m to over 40m; the pelagic nets were suspended in the water column, and fished the surface waters down to 3m below the surface. All fish were measured, and bagged up for studies of parasites, genetics and ages.

Fish from Loch na Sealga and Loch Maree surveys were sorted, measured, photographed and sampled at the WRFT office in Gairloch. WRFT received an initial data set from the study from which the following summary has been prepared. A more detailed report will be provided by FRS, which will include comparative data from all other lochs surveyed as part of this study of fish populations in Highland lochs.

Preliminary results (see Figure 2.5)

Loch na Sealga (5th July 2008)

With support from Gruinard and Eilean Darach estates, nets were set in Loch na Sealga on the 4th of July to fish overnight. In total, 67 fish were caught, comprising 44 trout, 21 charr and 1 minnow. Eels were also detected by the presence of slime rings. Juvenile salmon were not recorded; juvenile salmon are primarily fishes of running water.

More fish were caught per net in the shallow nets than in deeper water. Only one minnow was caught. Charr were more abundant than trout in the deepest benthic nets (27.5m and at >40m depth). Charr were also more abundant than trout in the pelagic net.

The biggest trout from Loch na Sealga, a 'ferox' of 476mm weighting 1.3kg, taken at night at a depth of 4.5m.

The smallest charr: a fry of 59mm, taken at a depth of 1.5m. This young of the year is the first charr fry seen by the WRFT biologist. The location of Arctic charr spawning areas remains elusive for most populations.

Loch Maree (9th – 13th September 2008)

Ron and Eric returned to Wester Ross in September. With support from local estates (Kinlochewe, Letterewe and Gairloch), the Loch Maree Hotel and Wester Ross Fisheries Trust, nets were set in the evening and recovered in the morning over two nights at the south east end of Loch Maree, then set at the 'west end of the loch' in the Ardlair basin and finally in the Slattadale basin.

Catches were relatively modest, with fewer charr caught than anticipated. Only one pelagic charr was caught in the 'west' end of the loch. However, 8 small benthic charr were taken. Please see Part x for more about Arctic charr in Loch Maree.

Of interest, was the capture of 11 larger trout of between 220 and 415 mm in length in benthic nets set at depths of 33m & 50m. These relatively large, deep-water trout may be the main predators of the benthic charr in this part of the loch: the Loch Maree *'ferox'* trout. No larger trout were taken.

Box 2.1 **Multi-spawning salmon in Wester Ross: Scotland's oldest?**

Alasdair Macdonald collected scale samples from all broodstock taken in the Dundonnell River to check that all the fish were of wild rather than escaped-farm origin. One of the fish (left), a hen salmon of 30 inches (77cm), taken on 22 October 2008, had two previous spawning marks, and had therefore returned to the river for the third time. Salmon with previous spawning marks are relatively common in Wester Ross; typically one in ~10 broodfish has a spawning mark. However, this is the first time the WRFT biologist has seen a scale from a salmon with two previous spawning marks. The picture on the right, reproduced from Menzies 1931 'The Salmon: Its Life story' is of scale from a salmon taken in Loch Maree in May 1924. It has 4 spawning marks, and at the time was regarded as Scotland's oldest salmon. Indeed only one other salmon with 4 spawning marks was known to Menzies – a fish taken in Canada. Does this remain Scotland's (Europe's) oldest wild salmon on record?

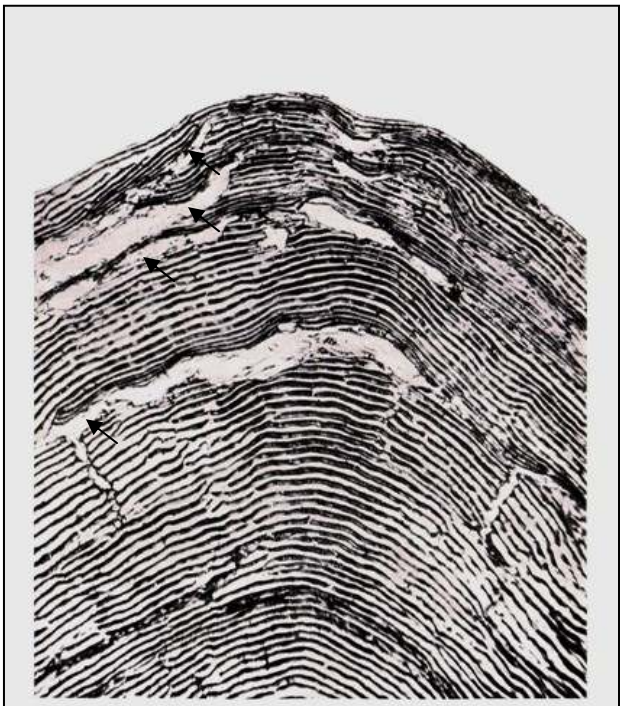
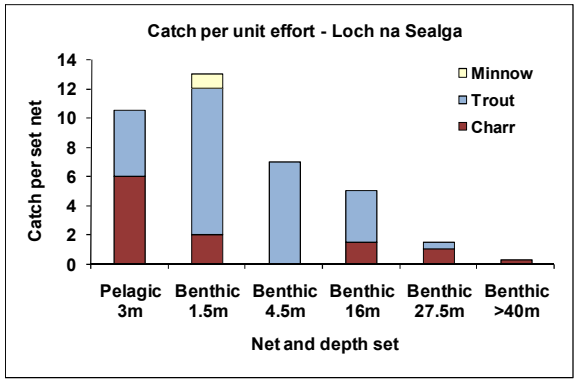
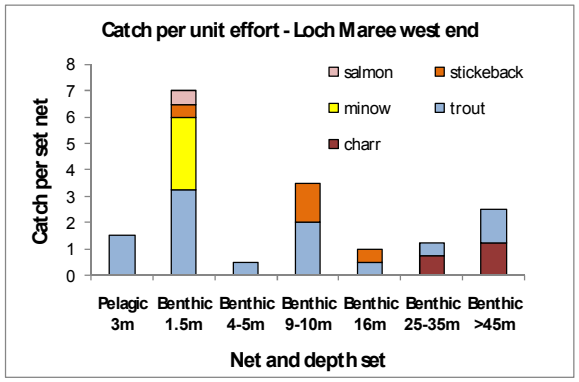


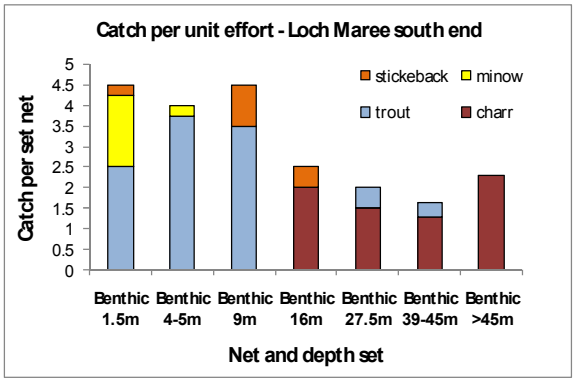
FIG. 36.

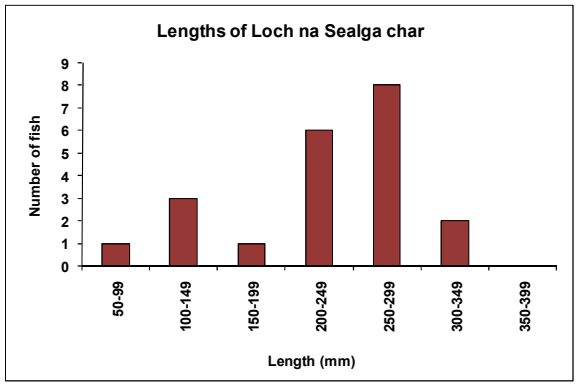
Enlargement of part of the scale of a fish caught in Loch Maree in May, weighing 29½ lb. and 43½ in. long. Four spawning marks are clearly visible; probably a year was spent in the sea between each visit to the river.

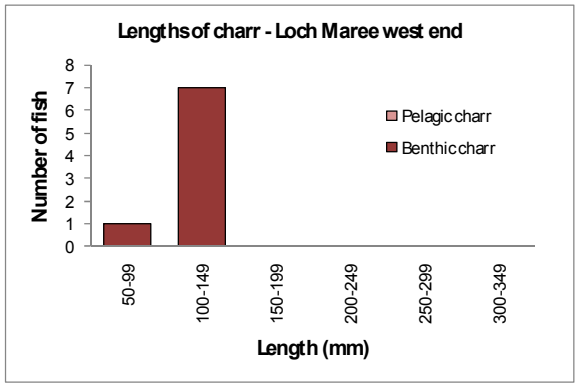
Figure 2.5 Catch results for Nordic Gill net surveys in Loch na Sealga (15th July 2008) and Loch Maree (9th – 13th September 2008)

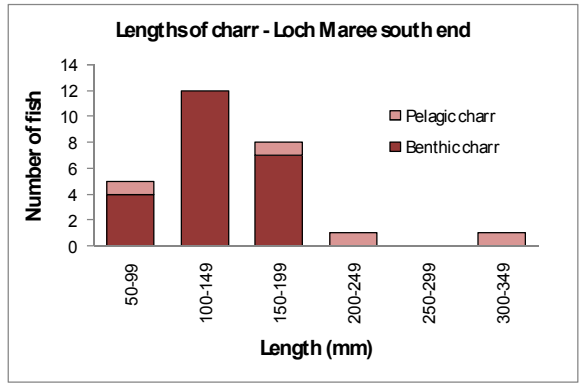


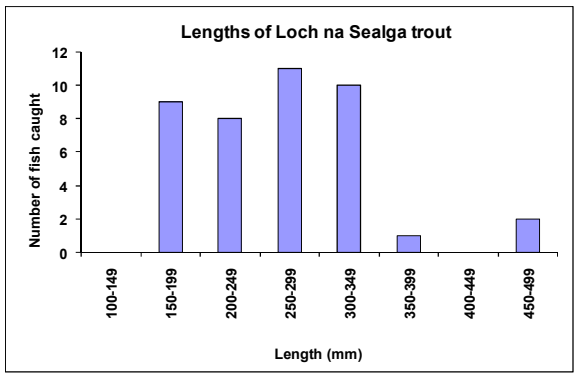


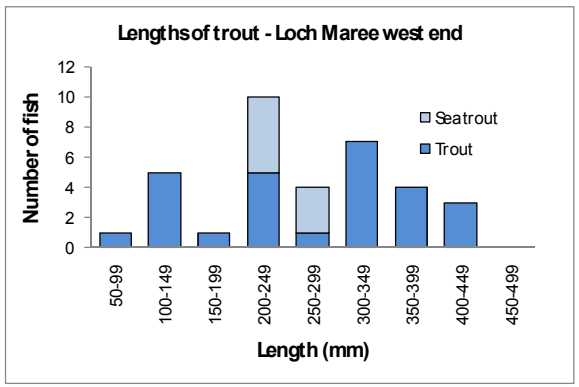


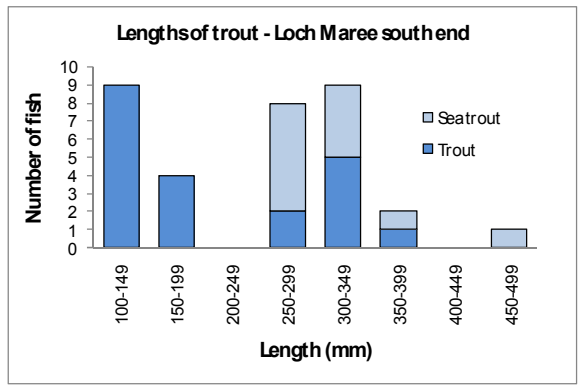












2.4 Rod (and net) catches

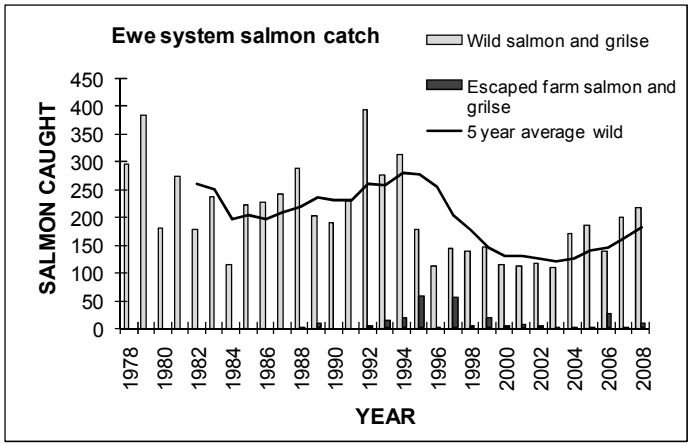
Rod catches provide an indication of the numbers of wild and escaped farmed fish returning to and entering local waters. In the absence of other information, rod catch data has been used to estimate 'spawning escapement' (the number of spawning adult salmon) for management purposes. For rivers in Wester Ross, catches may vary from year to year according to fishing effort, the skill and knowledge of anglers, and to fishing conditions especially river levels. So far as the health and status of salmon and sea trout populations is concerned, any interpretation based on catch figures needs to take all these factors into account.

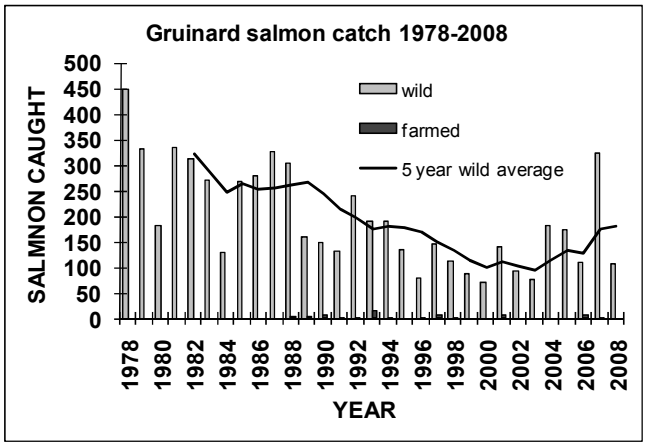
Under the Freedom of Information (Scotland) Act 2002, the Scottish Government's Fisheries Research Services kindly provided WRFT with copies of all catch returns from rivers in the WRFT area for the 2008 season for fisheries management purposes. Each year, FRS compiles and publishes summarised information from catch returns usually towards the latter part of the year following the season in question. As the catch figures from several rivers may be grouped together, these summaries are inadequate to provide an indication of how individual rivers are performing within the WRFT area.

Salmon

For most rivers, rod catch totals in 2008 were lower than in 2007 (Figure 2.6 – 2.8). This was particularly so for the smaller rivers where low water delayed entry from the sea or made fishing difficult. The exception was the River Ewe, which enjoyed another good season, with a mix of grilse and larger salmon up to 32lb.

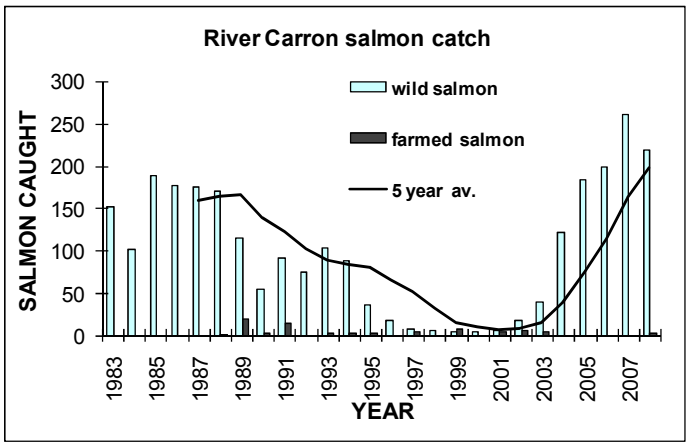
Figure 2.6 River Ewe system and Gruinard River salmon catches





Ray Dingwall and Jon Penny with a salmon of estimated weight 15kg (32lb) taken from the Lower Narrows of the River Ewe on 4th October 2008, the largest taken in the River system for several years. The fish was carefully returned after the photograph was taken (photo Glyn Williams)

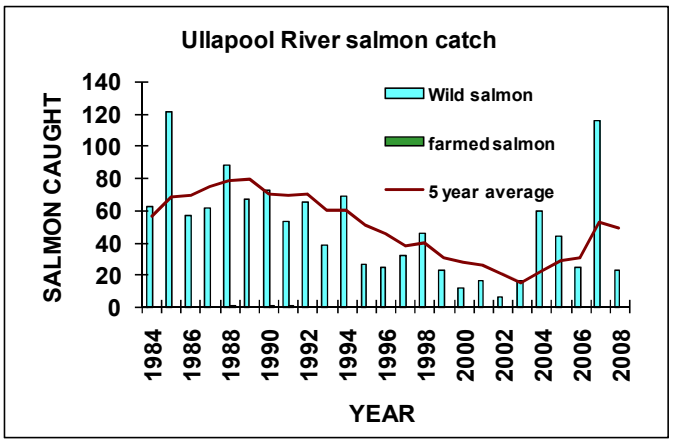
Figure 2.7 River Carron system salmon catches. and rotary screw trap (see Part 7)

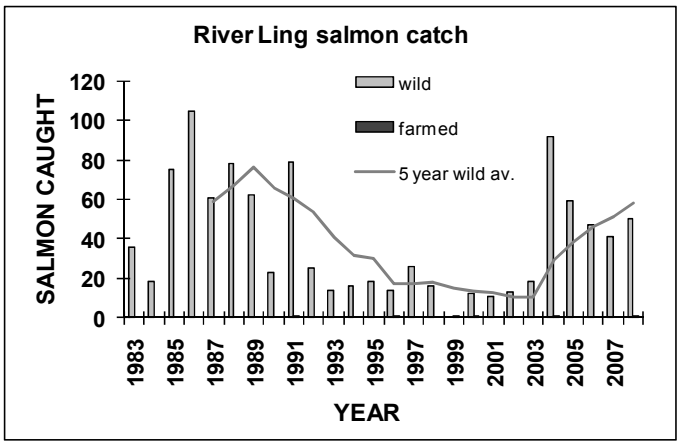


In the south of the area, the River Carron had another good season with a catch of 219 salmon. Over 60 of these were taken in October towards the end of the season all were returned except those retained for broodstock.

Two of the rivers in which salmon have to ascend sizeable falls to reach spawning areas are the River Ullapool and River Ling. Low water levels restricted access for salmon into the Ullapool river system, and the total catch was much lower than in 2007. However, the River Ling had a reasonable year, with a slightly higher catch than 2007.

Figure 2.8 Ullapool River and River Ling salmon catches





Netting catches

The only netting station in operation in the WRFT area is located in Loch Long, and was operated for a limited period in May 2008. In total 20 wild salmon and grilse were caught, and 18 escaped farm salmon and grilse.

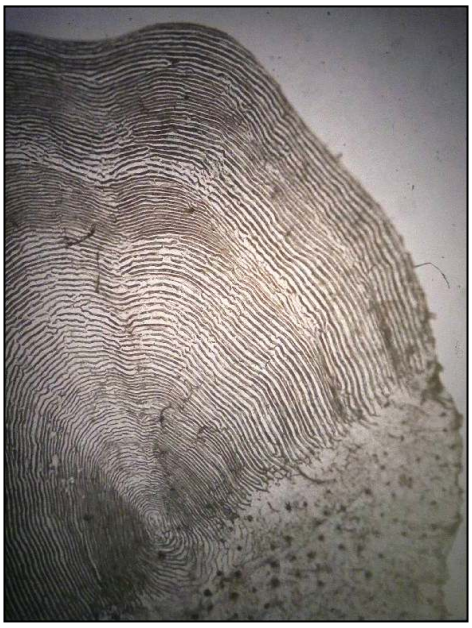
Escaped farm salmon

There were few catches of escaped farm salmon in the WRFT area except in the south of the area. In addition to the net caught escaped farm salmon in Loch Long, 52 escaped farm salmon and grilse were taken by rods in the River Croe representing over 40% of the total salmon catch from this river. Of these, 42 were caught in October.

Elsewhere, a minimum of 8 escaped farm salmon were taken in the River Ewe system, representing less than 5% of the total rod catch of salmon; a few other escaped farm salmon may have been returned as some fish were not easily identified until scales had been read. One escaped salmon was caught in the Tournaig system.

Box 2.2 **Escaped farm salmon taken in the River Ewe on 7th October 2008**

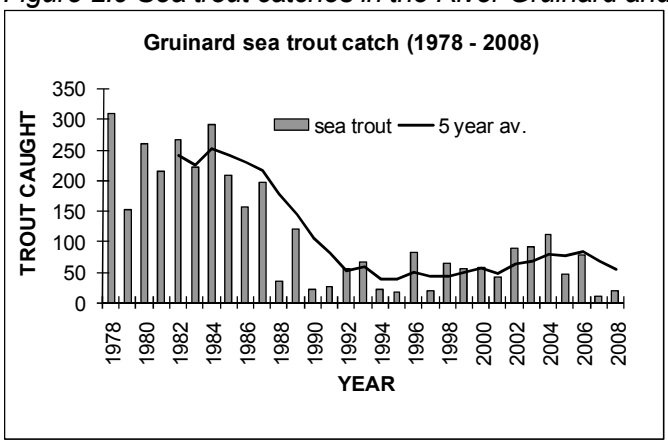
This rod caught salmon was in good condition and nearly fin perfect. Both the WRFT Biologist and River Ewe ghillie failed to recognize this fish as a farm escape until after the scales had been read. The fish had escaped in 2006, and spent a lean winter at sea, possibly entering freshwater (and spawning?), then a second summer at sea in 2007 and a second lean winter (?at sea) before entering the River Ewe in 2008. Numbers of escaped farm-salmon may be underestimated in rod catches. However, less than 10% of broodfish taken at the end of the year in rivers Ewe and Dundonnell were of escaped farm origin.

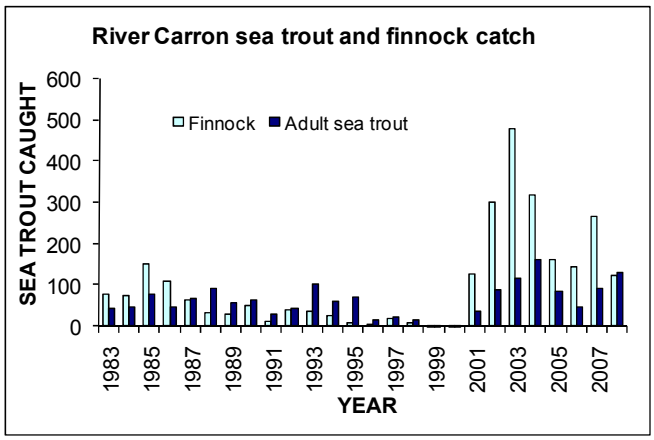


Sea trout

Sea trout catches were mixed (Figures 2.9 – 2.10). The River Carron had a good catch of larger sea trout, though fewer finnock were taken than in 2007. Some finnock were taken early in the year in the Rotary Screw trap – see Part 7. The Gruinard sea trout catch was poor again with few fish seen. Fewer sea trout were taken in the River Ewe than in 2007. Sea trout with high numbers of sea lice were recorded in the Loch Broom, Loch Carron and Loch Long (Loch Duich) areas (see Part 4)

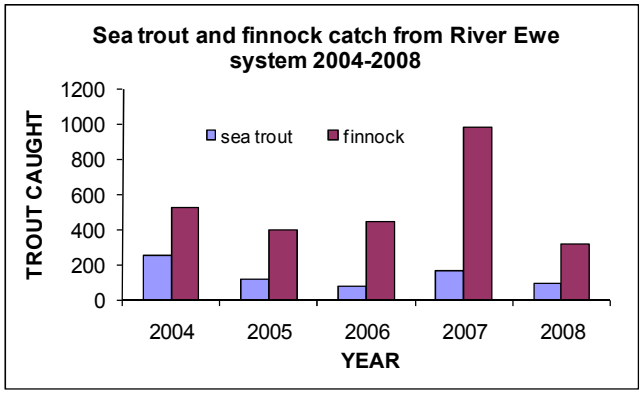
Figure 2.9 Sea trout catches in the River Gruinard and the River Carron



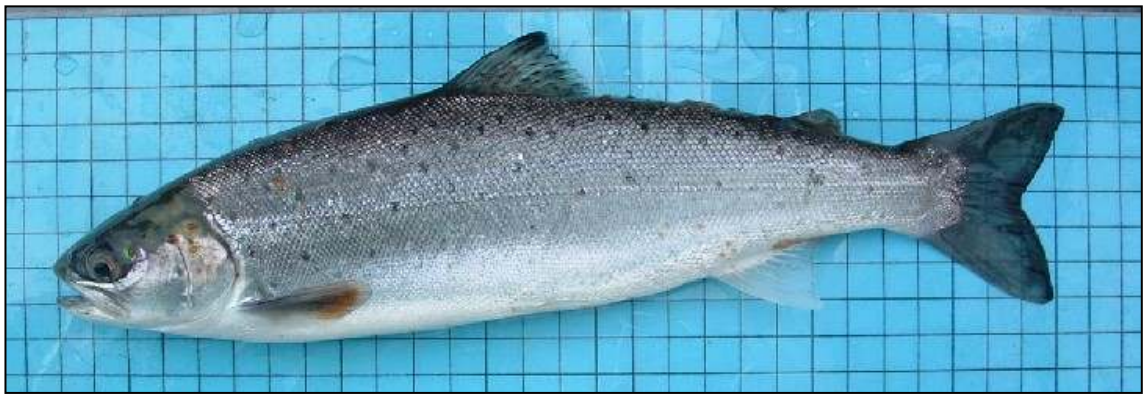


Traditionally, the River Ewe – Loch Maree system was by far the most productive sea trout system in the WRFT area. Although there were fewer sea trout taken from the River Ewe system in 2008 than in 2007, those that were taken were in better condition with less damage from sea lice.

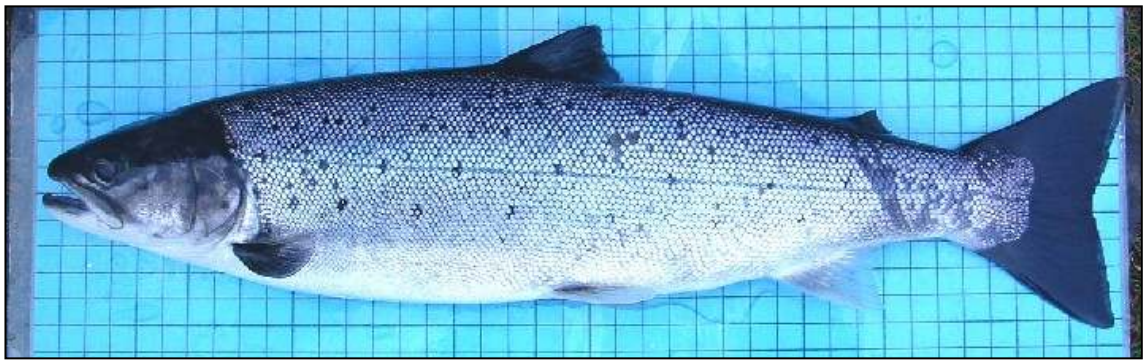
Figure 2.10 Sea trout and finnock catch from the River Ewe system in 2008.



Plump, fin-perfect finnock of 270mm taken on 10th July 2008 in the River Ewe. This fish had a 'condition factor' of 1.38, one of the 'fattest' sea trout caught in 200 (see Part 3 for sea lice summary).



Sea trout of 390mm taken in the River Ewe on 22nd July 2008 with a condition factor of 1.16.



Part 3 **Tournaig Trap Project Review**

Supported in 2008-2009 & 2009-2010 by Marine Harvest Ltd.

The Tournaig trap project was set up in 1999 to monitor the salmon and trout populations in the Tournaig river system near Poolewe. The Tournaig system is the smallest river system in the WRFT area known to support juvenile salmon. Traps located in an old fish ladder are operated for 10 months of the year (in some years throughout the year) and record fish as they descend towards the sea and ascending fish as they enter freshwater. All fish are released to continue their migrations. In addition to records from the fish trap, the Trust carries out an annual electro-fishing survey to establish juvenile fish distribution, relative abundance and size variation, within the spawning and nursery streams of the catchment. Altogether, the Tournaig trap project provides a unique opportunity to investigate relationships between juvenile salmon abundance and growth, smolt production, and numbers of returning sea trout and salmon, for fisheries management purposes.

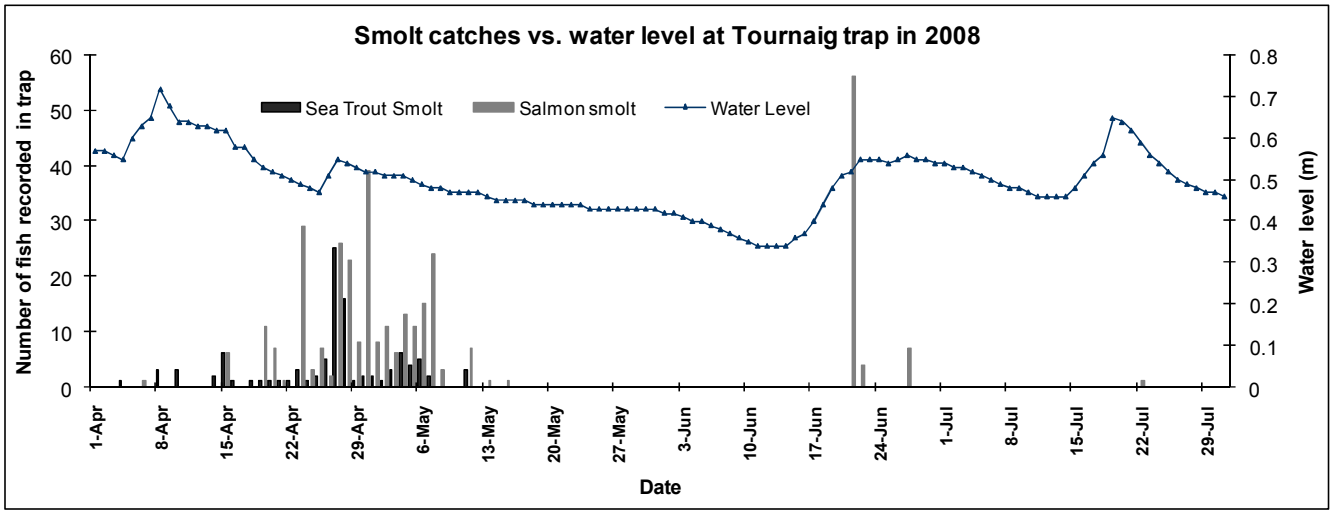
In addition to gaining an understanding of relative marine survival from one year to the next, the project has been able to document the recolonisation of the system by stray wild salmon from 2004, following the extirpation of salmon from the system in 2003. Results to date were presented in some detail in the WRFT Review May 2008 and the forthcoming results of genetic sampling will help to clarify the origins of adult trap entering the system. In 2008 traps were operated by Ben Rushbrooke ben@gcnursery.co.uk .

Catches of smolts migrating downstream

The first salmon and sea trout smolts were recorded in early April (Figure 3.1 & 3.2). As in previous years, a few fish were recorded most days until early May, but then a period of drought set in. For five weeks, water levels were too low to enable fish to migrate downstream from Loch nan Dailthean to the sea. Eventually, towards the end of June, we had the first rain for many days, and following a rise in water level on the 22nd June, the trap intercepted 52 salmon smolts migrating downstream, the record catch of smolts for the year.

No sea trout smolts were taken in 2008 after early May. Unlike salmon which all go to sea after smolting, sea trout smolts that are delayed may remain in freshwater rather than attempting to head to sea later in the season.

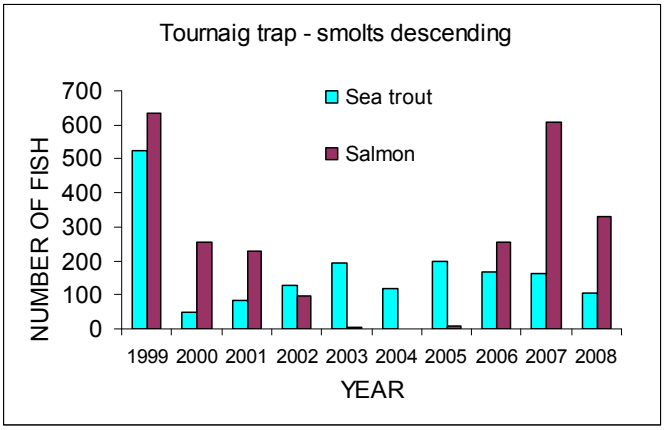
Figure 3.1 Daily smolt catches in the downstream trap at Tournaig in 2008 vs. water level recorded at the trap. Note the late 'peak' run of salmon smolts in late June following the 4 week drought.



Upstream catches of sea trout and adult salmon

The number of adult salmon entering the system was also lower than for 2007 (Figure 3.2). Eight of the 19 grilse that ascended during the season were caught in October, an even later 'peak' in monthly totals than in previous years (Figure 3.3). The results from Tournaig further illustrate the tendency of many small salmon populations in Wester Ross to be dominated by adult fish which may not enter freshwater until the salmon angling season is almost over!

Figure 3.2 Total numbers of smolts caught in the downstream trap at Tournaig (left) and numbers of sea trout and salmon taken in the upstream trap (right).



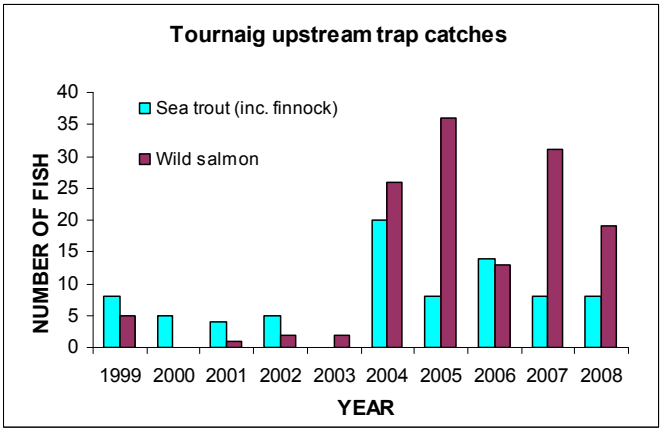
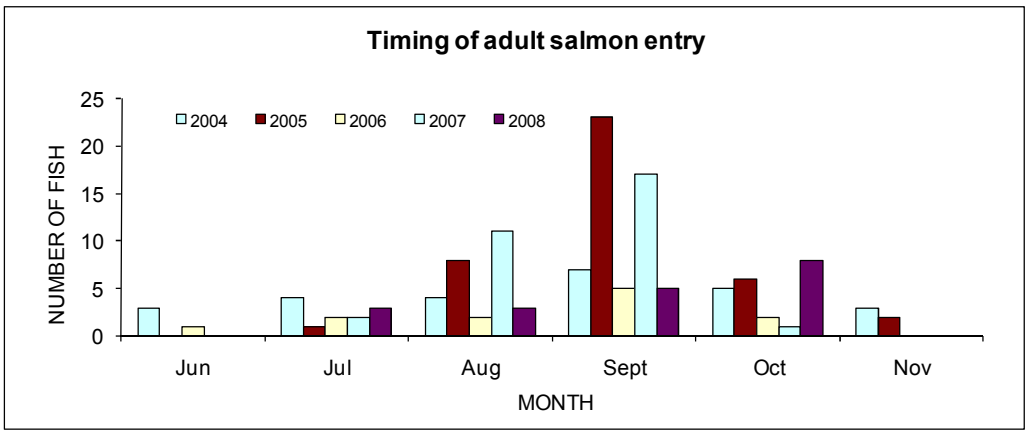


Figure 3.3 The timing of adult salmon entry at Tournaig, 2004-2008.



(top) Fresh run grilse taken in the upstream trap at Tournaig on 20th July 2008.

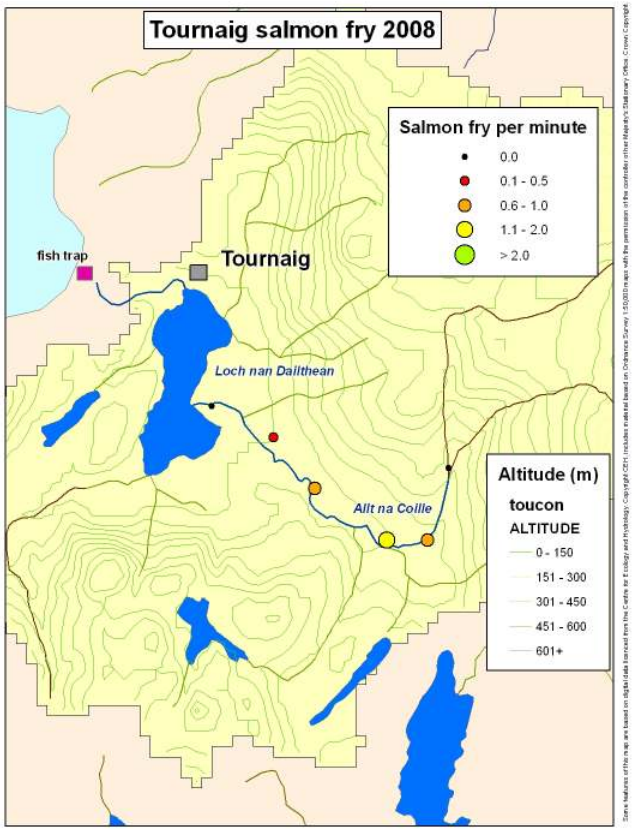
(bottom) escaped farm salmon taken on 28th August 2008. This was another near fin-perfect fish which was not recognized as an escaped farm salmon until scales had been read. At 85cm long, the fish was the largest salmon taken in the trap to date.

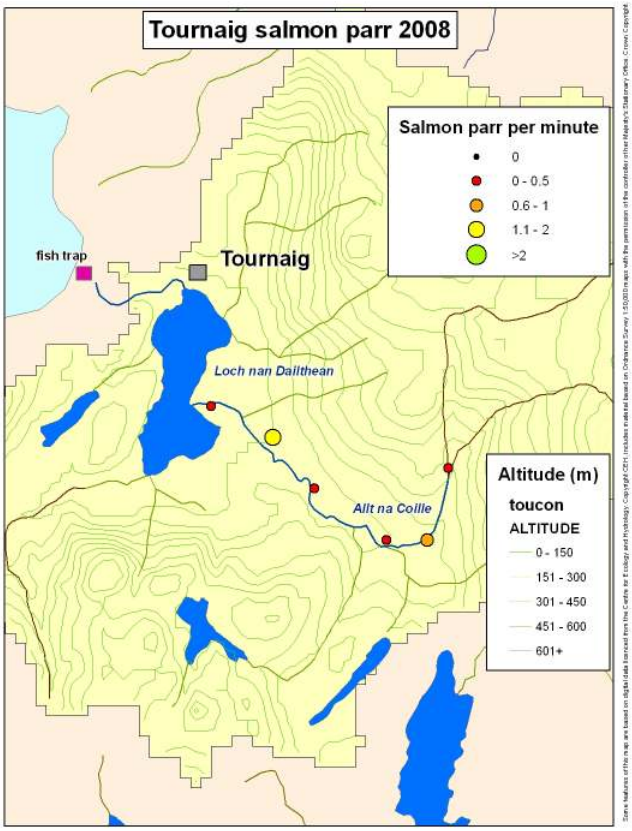
(photos by Ben Rushbrooke)

Juvenile fish survey

The electro-fishing survey of the main spawning stream within the catchment area demonstrated that salmon parr were distributed throughout the accessible area of the Tournaig catchment and salmon fry were present at core spawning areas (Figure 3.4). The average Catch Per Unit Effort (CPUE) for salmon fry and parr was slightly lower than in 2006 and 2007 (Figure 3.5). At the site nearest Loch nan Dailthean, over 100 minnows were recorded and no salmon fry. In previous recent years, salmon fry have been found at this site. Water levels were low on the day of survey and had been even lower earlier in the year. The warm sunny weather with low water may have been better suited to recruitment of minnows rather than juvenile salmon.

Figure 3.4 Relative abundance of salmon fry and salmon parr at sites surveyed within the Tournaig catchment on 1st August 2008.





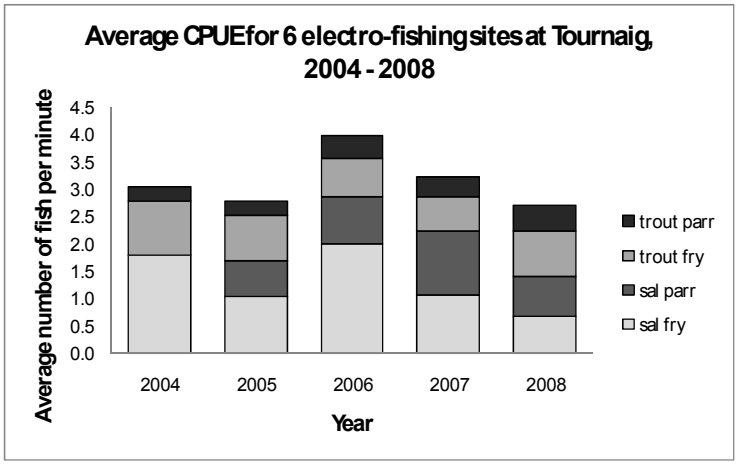


Figure 3.5 Average Catch per Unit effort at 6 electro-fishing sites along the Allt na Coille at Tournaig.

Part 4 **Sea lice monitoring and AMAs**

Supported by Scottish Government's Tripartite Working Group, Dundonnell Estate and Eilean Darach Estate.

4.1 Sea lice monitoring

The parasitic copepod (*Lepeophtheirus salmonis* Krøyer), commonly known as the sea louse, is a major health problem for both farmed and wild salmonids [salmon and sea trout] (Revie, et al., 2009: http://wwf.worldwildlife.org/site/PageNavigator/SalmonSOIForm).

Although catches of wild salmon and sea trout from river systems in Wester Ross fluctuated widely during the last few decades, stocks of both species collapsed during the late 1980s and early 1990s. In the west of Scotland, the sea trout collapse has been linked with sea lice epizootics[1] (Butler and Walker, 2006). Similar conclusions have been reached in Ireland and Norway (e.g. Tulley et al., 1999; Gargan et al., 2003; Bjorn et al., 2001; Grimnes et al., 2000).

To learn more about sea lice infestations on sea trout, WRFT began monitoring sea lice abundance on early-returned post-smolt sea trout during the month of June in the Dundonnell, Gruinard and Ewe river estuaries in 1997. In 1998 the post-smolt sampling programme was extended to 17 river estuaries in the west of Scotland as part of a collaborative study by the Association of West Coast Fisheries Trusts (AWCFT). Initial results were presented and implications for the management of marine salmon farm discussed in Butler, 2002. Within the WRFT area, the Trust continued a programme of lice monitoring at Dundonnell and Poolewe until 2007, and promoted a surveillance programme to encourage anglers to report lice levels on rod caught sea trout within other parts of the area and enable opportunistic sampling. This approach addressed two objectives:

1. to continue to develop a clearer understanding of year to year patterns of lice infection of sea trout, in relation to climate, sea conditions, and salmon farming activities in nearby areas.
2. to gather additional information by responding to reports of sea lice epizootic, in order to investigate the severity of an epizootic, its extent and distribution, and possible causes.

Monitoring and surveillance results were reported to all stakeholders with an interest in sea lice.

Alasdair MacDonald of Dundonnell Estate checking the fyke net Dundonnell River. The trap has been set each year to fish for early-returning sea trout at the mouth of the Dundonnell River during June each year since 1997.

[1] An epizootic is defined as a disease which affects animals as an epidemic does mankind (Chambers 20th Century Dictionary). In the context of sea trout and sea lice, we refer to the occurrence of sea trout with high levels of sea lice infection (average of 30 or more lice per fish in a sample of 10 or more consecutive fish), or 'early-returned' sea trout with evidence of high level of sea louse infection (scarring and eroded fins).

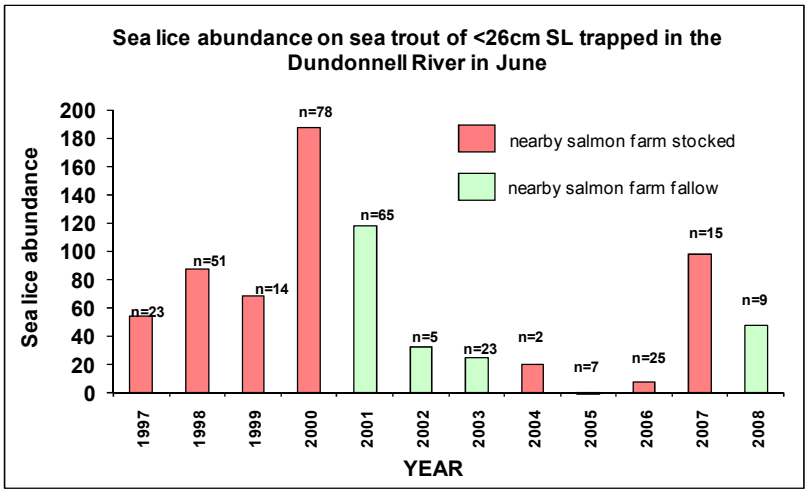
Sea lice occurrence in 2008

In 2008, WRFT embarked upon a programme of sweep netting for sea trout, as part of the Tripartite Working Group [TWG]'s Northwest Scotland Regional programme of support for the Area Management Agreement process. With financial support from the Scottish Government, the trust purchased a sweep net and a small boat, and carried out netting for sea trout in Loch Ewe, Loch Gairloch and Loch Carron. In addition to WRFT sites, the TWG's Regional Development Officer carried out sweep net sampling in Loch Kanaird, Little Loch Broom and Loch Long. As a result of this alternative netting programme, the traditional sampling at Poolewe using a gill net was not carried out in 2008. However, the traditional sampling for early-returned sea trout using a fyke net at the mouth of the Dundonnell River continued, with support from Dundonnell and Eilean Darach Estates (Figure 4.1).

Within the WRFT area, sea lice infection levels of sea trout reached 'epizootic' levels in Loch Kanaird, Loch Carron and Loch Loch (by Loch Duich) in 2008. However, lice levels on sea trout were not uniformly high within the WRFT area. Samples of sea trout from Loch Ewe had low sea lice abundance. Sea trout in good condition with low levels of lice were caught in the River Ewe in August 2008 (see photos on p 19).

Lice levels were highest on samples taken from river estuary sites. Sweep net sampling at beach sites in Loch Ewe (Boor Bay) and Loch Gairloch (Kerry bay) were less productive with fewer fish caught, and at Boor Bay Lice epizootics may have been exacerbated in 2008 by unusually warm, dry sunny weather. Bright, sunny conditions with low rainfall are typical of April and May in Wester Ross.

Figure 4.1 Sea lice abundance on post-smolt sea trout taken at the traditional monitoring site at Dundonnell.



Analyses of sea lice results from 2007 and 2008

The sea lice monitoring and surveillance data from 2007 and 2008 were analysed together. Relationships between levels of lice infection of sea trout and distances to salmon farms were explored by plotting 'intensity' of infection (the average number of lice on the infected fish in a sample of three or more fish) against distance to the nearest salmon farm.

The results tend to support the hypothesis that levels of chalimus stage (attached) lice on sea trout were highest at sites nearest salmon farms in the second year of their production cycle (Figure 4.2). Levels of chalimus lice infection of sea trout were generally greatly reduced at distances over 20km from the nearest salmon farm in the second year of the production cycle. In contrast, there was no clear trend in the numbers of older pre-adult and adult lice on sea trout with distance from salmon farms (Figure 4.3).

However, the small sample size means that no firm conclusions can be reached without inclusion of additional data. Other fisheries trusts and the Governments Fisheries Research Services have been invited to contribute data to enable more thorough analyses.

Figure 4.2 Average numbers of copepodid and chalimus lice per infected sea trout in samples of sea trout collected within the WRFT area in 2007 and 2008 vs. distance from the nearest salmon farm in second year of the production cycle.

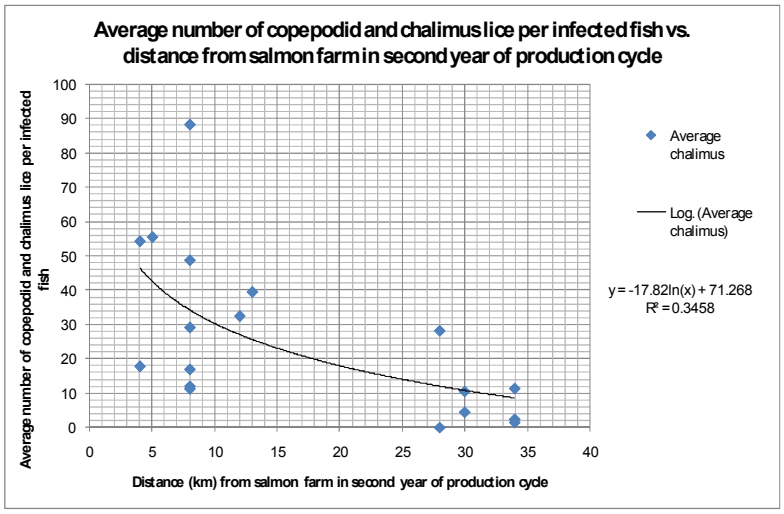
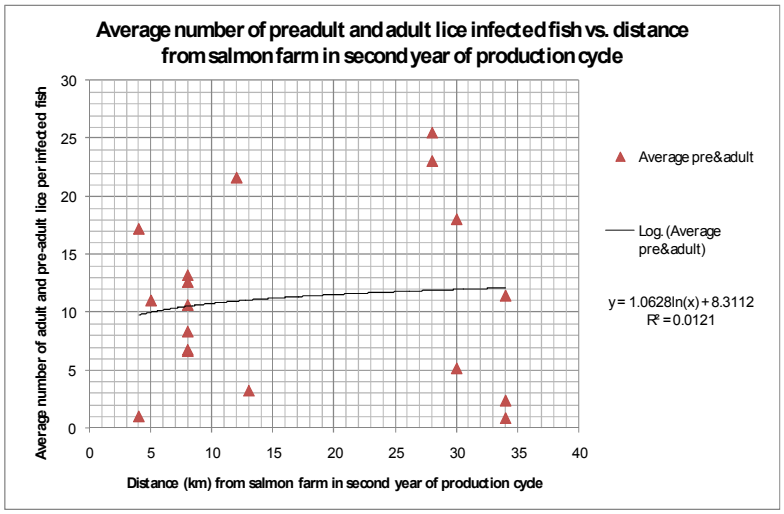
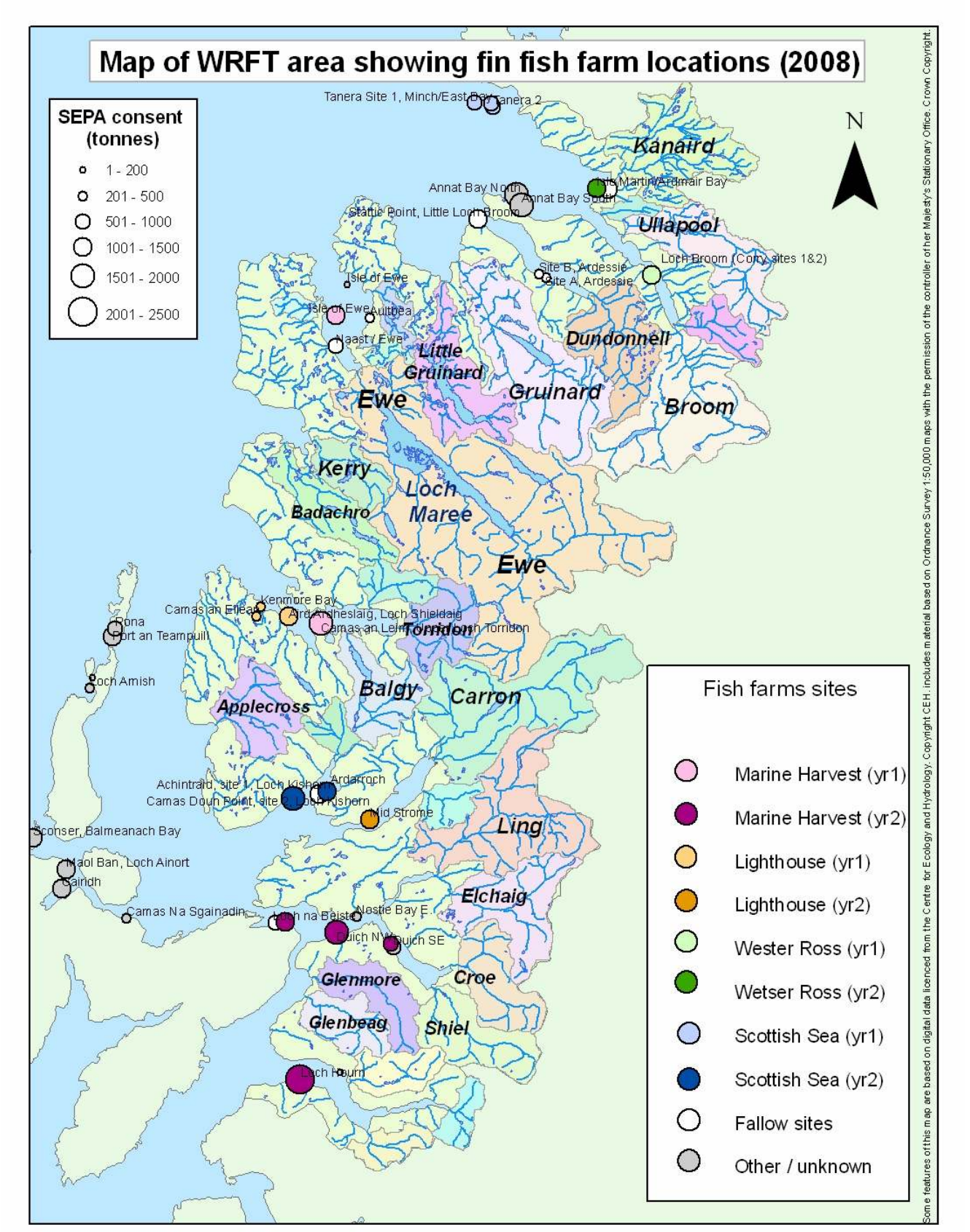


Figure 4.3 Average numbers of pre-adult and adult lice per infected sea trout in samples vs. distance from salmon farm in second year of the production cycle.



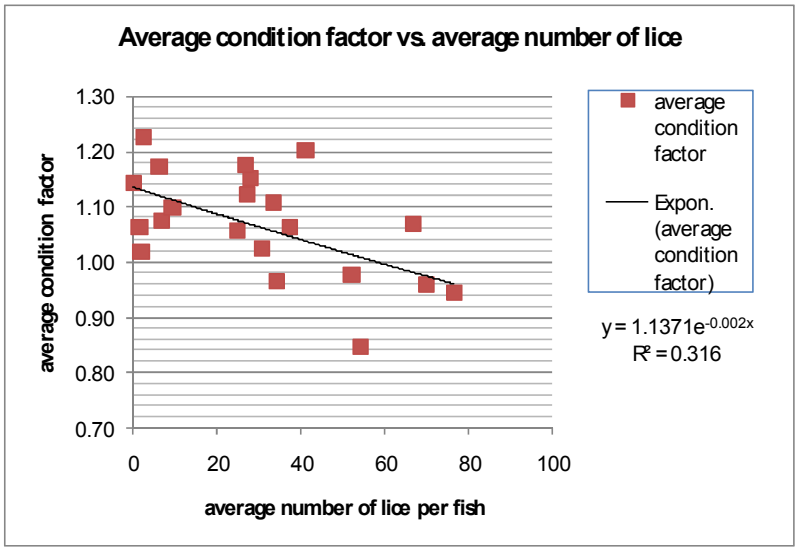
In 2008, salmon farms in the second year of the production cycle were located in Loch Broom, Loch Carron and Loch Alsh-Duich area (Figure 4.4). This study also hints that some areas are naturally more prone to sea lice epizootics than others (e.g. Little Loch Broom).

Figure 4.4 Map of salmon farms in the WRFT area, showing SEPA consented biomass. For farms in production in Wester Ross, year of production cycle in 2008 is indicated.

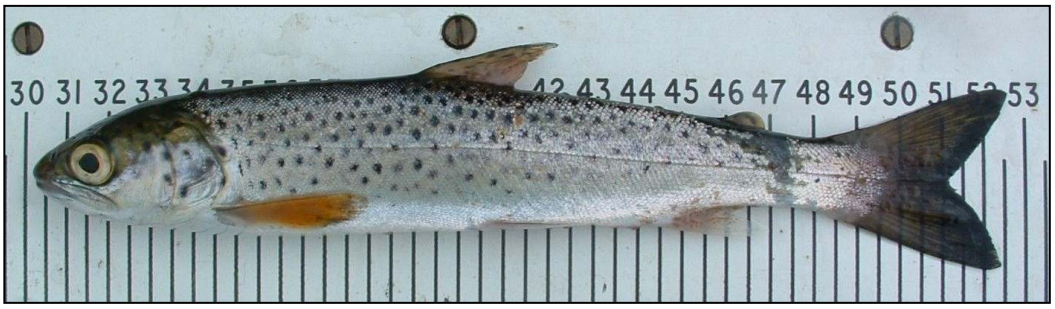


In 2008 sea trout were weighed as well as measured, to enable a condition factor to be calculated. The samples with the highest average numbers of lice were usually of fish in poorer condition (Figure 4.5).

Figure 4.5 The average condition factor of sea trout samples taken in the WRFT area in 2007 and 2008 vs. condition factor. Fish with a higher condition factor have a higher weight : length ratio than those with a lower condition factor.



This post-smolt sea trout taken from the River Carron in May 2008 had over 500 very small copepodid and chalimus lice on it suggesting recent infection within 1 - 2 weeks prior to capture. This was by far the highest lice burden seen on any fish in 2008. Dorsal fin damage tends to be associated with chalimus attachment.



Head of a finnock taken in the River Ewe in early July 2008. The lice include both small and larger pre-adult and adult lice suggesting infection several weeks earlier. Head damage tends to be associated with feeding by 'mobile' lice. This fish was otherwise in good condition and had fed well at sea prior to returning to freshwater.

4.2 Sea lice Review seminar, 16th April 2009

Supported by the Scottish Government via RAFTS

On 16th April, WRFT was pleased to welcome other biologists from Marine Scotland's Fisheries Research Services and local salmon farming companies, and a range of other people with interests in wild fisheries, salmon farming and the sustainable development of Wester Ross, to Gairloch, to review the latest findings from research projects and management trials.

The meeting was supported by the Scottish Government via the Tripartite Working Group (TWG) and Rivers and Fisheries Trusts Scotland (RAFTS). **Arthur Griffiths** (TWG Project manager) kindly agreed to chair the meeting and provided an introduction. **Dr Campbell Pert** (Marine Scotland, Marine Lab) described the biology and life cycle of the two species of sea louse most commonly found in Scottish coastal waters, referring to scanning electron microscope images. Sentinel cage experiments in Loch Torridon stocked with sea trout provided information on rates of infection. The results suggested that in 2007, it would have taken 6 weeks for the stocked fish to become infected with 50 or more lice. **Jim Raffel**l (Marine Scotland, Shieldaig Project) summarised findings from planktonic larval lice sampling in Loch Torridon. There was a correlation between larval lice concentrations along the shoreline and lice numbers on nearby farms. The bulk of sea lice on sea trout fished from the lower Shieldaig River in 2007 were early stage lice indicative of recent infection. Jim stressed the importance of treatment synchronisation on nearby salmon farms as a means of controlling sea lice within the local area.

Dr Michael Penston (Marine Scotland, Marine Lab) presented the results of plankton tows in Loch Torridon. Local salmon farms were sources of larval lice in 2007. Modelling indicates that lice dispersal is dependent upon wind direction, and that infective larval lice can be transported several km from source. **Peter Cunningham** (WRFT) reviewed results of monitoring of sea trout in Wester Ross in 2007 and 2008. Although the highest levels of infection of attached lice (copepods and chalimi) tended to be within 20km of salmon farms in the second year of the production cycle, incorporation of sweep net data from beach sites away from river mouths may have biased this result. In contrast, levels of infection of pre-adult and adult lice showed no relationship with distance to the nearest salmon farm in the 2nd year of the production cycle. Additional existing data sets for sea trout sampled across the west of Scotland are needed to rigorously test the hypotheses presented.

Hugh Richards described how Wester Ross Fisheries use both SLICE and bath treatments for sea lice infection on their farms. Observations suggested fewer jellyfish in the Loch Broom area in 2008 and 2009 than earlier years. Following temperatures of over 1°C above average up to 2006, sea temperatures had returned to near ten year averages in 2007 and 2008. **Dr Chris Wallace** (Marine Harvest) explained how the use of a new in feed product, SPMP, had increased the efficacy of *emamectin benzoate* [SLICE] as a treatment for sea lice. Initial trials had indicated good results and from 2009 the product was widely used in conjunction with SLICE to manage lice on MH farms.

A wide-ranging discussion followed, not without some controversial points. WRFT would like to thank all participants, particularly presenters for their much valued input, and especially Arthur Griffiths for chairing a lively meeting.

Sea lice monitoring acknowledgements

Thank you to Ailsa McLennan, Jim Raffell, Steve Buttle, Brian Fraser, Alastair Macdonald, Johnny Parry, Mark Williams, Dougie Williams, Ray Dingwall, Norman Thomas, Lloyd Gudgeon, Marcus Simpson and friends, Greg Jeffries, Alastair Pearson, Frank Buckley, and to everyone else who helped with lice monitoring in 2007 and 2008.

Part 5 **Arctic charr populations in NW Scotland: conservation & management requirements**

Report of a workshop at the Loch Maree Hotel on 27 November 2008 during the second WRFT Arctic charr discovery week, supported by the Scottish Government (via RAFTS) and SNH.

5.1 Introduction

In 2008 the Arctic charr (*Salvelinus alpinus*) was added to the UK LBAP 'Priority species list' and to the Scottish Biodiversity Strategy list of priority species. It's fair to say that few people, including anglers, pay much attention to charr, largely out of ignorance. Charr are rarely caught, rarely seen; perhaps readily overlooked by some of those involved with managing salmon and trout fisheries.

Following the 1st WRFT Arctic charr discovery week in 2006, a 2nd WRFT Arctic charr discovery week took place from 23rd – 29th November based at the Loch Maree Hotel. The aims of the week were to confirm the continued occurrence of charr in nearby waters from which there were few recent records, to attempt to locate spawning areas, and to gain further information about local charr populations for conservation and management purposes.

Wester Ross is one of the most important areas for the conservation of Arctic charr in the UK, with at least 28 known populations. As part of the discovery week, a workshop was held at the Loch Maree Hotel to provide an opportunity for reviewing 'charr' action points for RAFTS Fisheries Management Plans. The workshop included a practical session by the loch-side to set nets and learn about loch habitat surveying using an ROV, and an indoor session to review charr distribution, biodiversity, conservation and sampling methodology. We were delighted to welcome Scotland's leading charr biologists to the Loch Maree Hotel: many thanks to all for supporting the event.

Dr Colin Adams, Fergus MacKenzie, Prof Peter Maitland, Alex Lyle, Dr Colin Bean, Nicola Tallach, Greg Jeffries, Ben Rushbrooke, Ron Greer outside the Loch Maree Hotel boatshed, November 2008.

5.2 Summary of presentations

Prof Peter Maitland reviewed charr distribution and the history of charr recording in Scotland. The species is highly variable; different populations exhibit different morphological characteristics. Taxonomists still debate whether charr should all be treated as a single species or whether different morphs in waters such as Loch Maree should be regarded as separate species.

Following the pioneering work of Kim Friend and Niall Campbell, an Arctic charr database has been developed over many years by the Fish Conservation Centre (FCC). There is still incomplete knowledge of charr distribution in Scotland. An initial objective for FMPs could be to survey lochs on a catchment-by-catchment basis; which river catchments with lochs have charr populations and which do not? In the WRFT area, charr have not been recorded in the Ullapool River or Broom catchment despite the existence of apparently suitable lochs.

In a useful divergence from theme, **Dr Colin Adams** drew attention to a report funded by SNH, which considered the biodiversity and conservation priorities for all lochs and lochans including those without fish populations. Participants at the workshop re-stated the value of lochs without fish. Where fish are not present, invertebrates thrive; and in some fishless lochs and lochans, the Palmate newt is top predator. Fishless lochs tend to be undervalued, and may be seen by anglers as vacant 'niches' for fish. There is a need to catalogue such waters and raise awareness of their conservation value.

Colin then described how morphological variation between charr populations makes them of particular interest to those studying the dynamics of evolution. Charr are in many ways analogous to 'Darwin's finches' in the way they have evolved in response to the environmental pressures of the lochs they inhabit. Populations of Scottish charr, even compared to those in other countries, remain relatively undisturbed and are therefore of great value for studies of evolution.

Dr Eric Verspoor summarised knowledge of charr genetics. Two major groups of charr are found in Scotland: 'east type' and 'west type'. 'East type' charr populations are found in lochs draining into river systems which drain into the North Sea. 'West type' charr populations are found in lochs in river systems which drain towards the Atlantic. So far all charr populations from WRFT lochs (Loch na Sealga, Loch Maree, Loch Dughaill, Loch Damph), as expected, are 'west type' charr.

One of the most interesting aspects of charr in Scotland is the occurrence of polymorphic populations. Loch Rannoch is of particular interest: three sympatric charr populations have been recognised, including both 'east' and 'west type' charr, suggesting colonisation by charr from both directions as the glaciers retreated 10,000+ years ago. Within the WRFT area, two forms of charr are known in Loch Maree, and from studies by Verspoor and Greer 2008, now also Loch Doughaill (River Carron), and possibly also in Loch na Sealga (Gruinard). Lochs with polymorphic populations tend to be over 50ha in area.

Dr Colin Bean presented a summary of a study to develop a protocol for assessing charr populations in Scottish lochs. Five lochs were selected for assessment from Orkney to Galloway: Lochs Builg, Doon, Eck, Girsta and Inch. Of a range of methods tested, a protocol combining hydro-acoustic surveying (to assess the sizes and abundance of fish per unit area and volume) and gill netting provided the most useful results. Colin stressed the importance of carrying out gill netting at the time of the hydro-acoustic survey to establish the identity of the fish recorded by the hydro-acoustic survey. Gill netting after the hydro-acoustic survey was of less value as fish movements would make interpretation of hydro-acoustic data less certain.

Having developed the most efficient means of assessment, the study evaluated charr populations in each of the lochs. Of charr populations in each of the five lochs, 3 passed the initial assessment (Builg, Inch and Girlsta) and two failed (Doon and Eck). A second round of charr population assessments is currently underway (2009).

5.3 Charr Conservation and Management

After a wide ranging discussion, a series of action points were proposed. These can be summarised as follows:

Aims for local Fisheries Management Plans

- To maintain the distribution of charr
- To maintain favourable conservation status of charr populations

Proposed actions

Surveying and recording charr populations and maintaining the Scottish Arctic charr database

- Catalogue information about charr occurrence in the area
- Anglers log book schemes may help establish occurrence of charr.
- Gill netting and acoustic surveys might best be carried out by scientists working
- the Scottish Fisheries Coordination Centre (SFCC) may be able play a useful role

Conservation

- Populations rather than species should be targeted for conservation.
- An understanding of genetic biodiversity should guide conservation priorities.
- Extend awareness and knowledge of new legislation which makes it illegal to move fish from one loch to another.
- Ask the Scottish Government to produce a leaflet for anglers outlining the new legislation and why it has been developed.
- Extend awareness of the value of fishless lochs to support other wildlife for example, invertebrates, newts, and breeding ducks (e.g. Common scoter).
- Develop a network of priority lochs for charr conservation where stocking of trout or other fish should not be permitted.

Charr fisheries?

- Anyone who wishes to promote charr angling should first assess the conservation status of the charr population and be able to demonstrate that the population is in good health.

During the week, charr were sampled from Loch Maree, Loch Coulin, Loch Clair, Loch Braigh Horrisdale, Loch Tollie. One of the charr from Loch Clair, with bright red belly, went on tour to Gairloch and Poolewe Primary schools, before being returned to Loch Clair near Badachro.

WRFT would like to thank all participants especially volunteers including Lloyd and Christian Gudgeon (*left, with the Loch Clair char*) , Greg Jeffries, Nicola Tallach, Fergus MacKenzie, and Two Lochs Radio www.TwoLochsRadio.co.uk for loan of a projector. Thank you to Mary Gibson and SNH for help with organising and supporting this event.

Special thanks again to Mark Vincent and the Loch Maree Hotel for hosting the event and for providing excellent hospitality.

A more detailed report from the Arctic charr discovery week and workshop can be found on the WRFT website, www.wrft.org.uk.

Part 6 **Action plan preparation**

6.1 WRFT Fisheries Management Plan 2009+

Supported by The Scottish Government via RAFTS

The Wester Ross Fisheries Management Plan 2009+ was completed in December 2008 following a two month consultation. This document, which was developed over a two year period, provides a framework to guide the work of the Trust over future years. Aims and objectives were presented in the WRFT Review May 2008, so need not be re-stated here. Please visit the website www.wrft.org.uk to see the whole document, or contact the Trust at info@wrft.org.uk for a copy of the summary document.

Thank you to everyone who contributed to the consultation with ideas for work and comments on the earlier draft. Responses were received from government agencies, fisheries proprietors, and a range of other interested individuals. As a living document, the plan has been and will be periodically updated as new information or opportunities arise.

6.2 Wester Ross Local Biosecurity Action Plan

Supported by The Scottish Government, SNH and the Esmee Fairbairn Foundation via RAFTS

Biosecurity Issues [see www.RAFTS.org.uk]

Biosecurity issues are of increasing economic and ecological significance. Globalization has expanded the possibilities, extent and complexity of world trade and the growth of the tourism market has expanded the number of destinations for activity holidays and travelers. These trends have led to the increased probability of the unintentional as well as intentional introduction, establishment and spread of non-native species, parasites and diseases in Scotland and the UK. According to a survey, **'An Audit of Alien Species in Scotland',** conducted by Scottish Natural Heritage, there are approximately 1000 non-native species present in Scotland the majority of which exist in small populations with little impact on native flora and fauna. However, a small but significant proportion of these non-native species are invasive.

Invasive species are the second greatest threat to biodiversity. Their ecological impacts and economic consequences can be devastating (e.g. ***Gyrodactylus salaris***). This is reflected in the increasing priority given to non native invasive species in the European, UK and Scottish legal, strategy and planning frameworks. Recognition of the importance of the prevention, control or eradication of non-native invasive species, parasites and diseases in river catchments provided the justification for the implementation of the RAFTS Biosecurity Planning Project.

Within the WRFT area, actions by local estates, NTS, SNH and others to tackle the spread of *Rhododendron ponticum*, Japanese knotweed and mink are ongoing (summarised in WRFT Review May 2008). The WRFT Local Biosecurity Action Plan will review existing actions to control these and other species which threaten fisheries and native wildlife, and develop a strategic, catchment-by-catchment based approach. We look forward to hearing from anyone concerned about invasive non-native species within their area especially anyone who can provide useful information and help formulate priority actions.

New Zealand flatworms are found in areas close to human habitation. They may decimate populations of earthworms. Are moles displaced by New Zealand flatworm populations?

Part 7 **Monitoring smolt output on the River Carron**

Report contributed by Bob Kindness (Seafield College)

Introduction

Following the collapse of salmon and sea trout stocks in the River during the 1990's, a stock restoration programme wasestablished to restore the river as a viable fishery. This programme involved the establishment of captive broodstocks enabling significant numbers of young fish to be stocked into the Carron system from 2001. From 2004, there was a dramatic increase in rod catches and increases have continued every year until 2007.

Although the increases in rod catches display a very close correlation with the stocking effort, it has been difficult to disentangle the stocked fish from fish produced via natural spawning. This is because once stocked fish have been in the wild for a period of time, they become indistinguishable from genuine wild fish and, by the time they reach the smolt stage, they are ostensibly the same. In an attempt to evaluate the contribution being made by stocked fish to the fishery, late summer salmon fry have been tagged using coded wire tags (CWT) injected into their noses before being released into various parts of the river. These fish have also been adipose fin-clipped to indicate the presence of a tag. Releases were made in October with 24,000 in 2006, 41,000 in 2007 and 40,000 in 2008. Tagged smolts were also released in 2007 and 2008. While the ultimate success of these fish will be determined by the number appearing as adults in rod catches, it was considered important to establish their level of survival to the point at which they leave the river as smolts.

Rotary screw trap

A rotary screw trap, purpose-designed to catch smolts migrating downstream, was positioned in the river on the 18th of April 2008 within a few hundred metres of the tidal limit. The aims of the trap project were to provide information on the smolts that had been tagged as fry and also to give an indication of the smolt run generated both from natural spawning and from stocked but un-tagged fry.

The trap was visited daily with all fish being netted from the box, anaesthetised and examined before being released downstream from the trap. Until the 4th of May, the fork length of all smolts was taken. After that date, time did not allow lengths to be taken since catches were high. As a result of the drought, there was sufficient flow to run the trap for a total of only 18 days in the latter half of May and early June. The trap remained in position until the 26th June.

Bob Kindness netting fish from the holding box of the rotary screw trap in the River Carron.

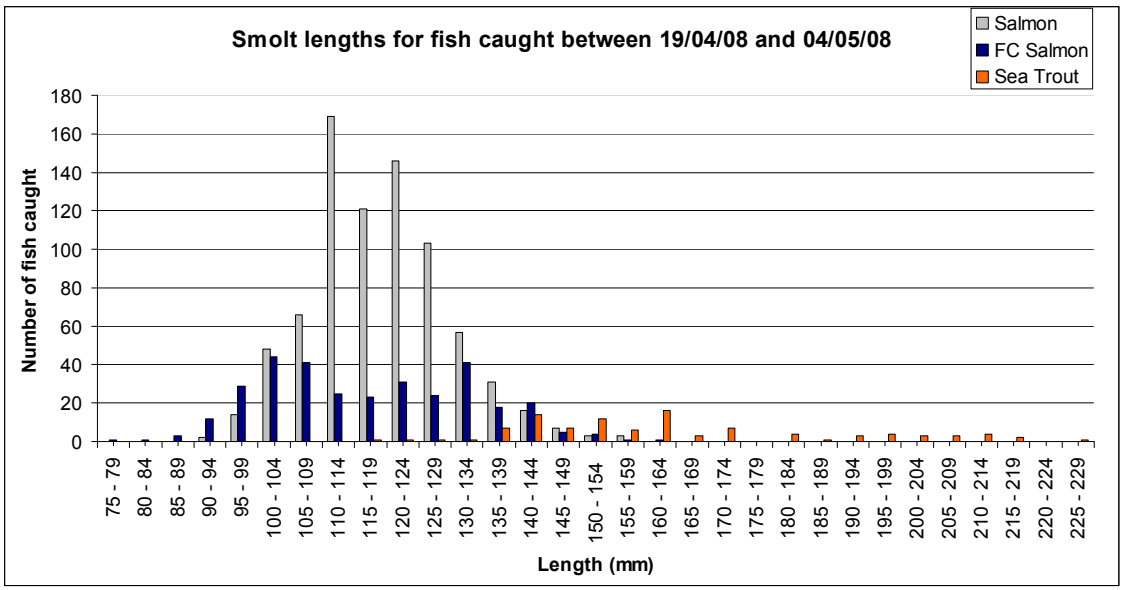
Catches

Fish were caught in the trap from the day it was installed. The numbers of descending smolts steadily increased until the 4th of May. The smolt catch comprised un-tagged salmon, tagged salmon and sea trout. The tagged salmon (recognised by the adipose fin-clip) comprised fish that had been tagged as late-summer fry in 2006 and were migrating as S2 smolts, smaller fish that had been tagged as late-summer fry in 2007 and were migrating as S1 smolts, and smolts that had escaped from the smolt release pond in 2008. These fish could be differentiated from tagged fish that had smolted naturally in the river because the flukes of their tails were slightly rounded.

By the time the trap was removed from the river on the 24th of June, a total of 3,003 un-tagged salmon smolts, 698 tagged salmon smolts (of which 348 were estimated as coming from the release pond) and 336 sea trout smolts had been caught. The number of smolts from tagged fry was estimated at 350 or 11.5% of the overall smolt run. The total would have been much higher had the screw not been raised for 2 days at the peak of the run to allow unhindered passage for the released smolts. In addition to salmon and sea trout smolts, several finnock and sea trout kelts were caught. These included fish in excellent condition which had over-wintered in freshwater and were heading down to the sea. However, in early May some of the finnock were early-returned from the sea and had evidence of sea lice infestation.

A total of 787 un-tagged salmon smolts, 324 tagged salmon smolts and 102 sea trout smolts were measured between the 19th of April and the 4th of May (Figure 7.1)

Figure 7.1 Fork lengths of salmon and sea trout smolts caught in the trap.



The length distributions for captured smolts followed a different pattern for the 3 groups. Un-tagged salmon smolts varied in size from 90 mm to 160 mm and peaking at 112 mm, reflecting differences in smolt ages and also where within the catchment they were nurtured. Tagged smolts ('FC salmon' in Figure 7.1) varied in size from an initial peak at a smaller size (~102mm) and then a second peak at a larger size (~132mm) than for the un-tagged smolts. The sea trout smolts were bigger than the salmon smolts ranging from 115 mm to 230 mm with the bulk of them between 140 mm and 170 mm.

The smaller salmon smolts were thought to be fish that were big enough when tagged in October to go on and become S1 smolts in the spring of 2008. The remaining smolts either side of the first peak were thought to be S2 smolts from the fry tagged in October 2006. The second peak was thought to have been a

combination of fish tagged in October 2006 and reared smolts, of larger average size than wild smolts, that had escaped from the release pond in 2008.

(left) Salmon smolt from the release pond displaying a rounded tail. (right) This salmon was tagged as a fry and smolted naturally in the river. The tail of this fish displays sharp lines.

Lessons learned for the smolt release programme

With a smolt release programme in operation on the River Carron, information from the screw trap proved to be invaluable in relation to the release of the reared smolts in 2008. To enhance the success of such a programme, it is important to get the timing of the smolt release right. Correct timing results in the smolts descending to the sea very quickly thereby making no impact on wild stocks and giving fewer opportunities for losses to predators.

The benefits of the trap were two-fold. Firstly, the pattern of rising catches enabled the smolt release to be carried out at exactly the peak of the smolt run from the river. This ensured that all smolts, both from the river and from the release pond, would migrate down the river and out to sea and beyond at the same time. This would have the effect of reducing the impact of predation on the smolt run in general, since predators can only eat a finite number of fish during a short period, and would enable the released smolts to join their wild counterparts on their migration to the North Atlantic. Secondly, the trap provided a clear indication of how quickly released smolts move downstream if the timing of the release is right. The majority of the smolts would be in the sea within two if not one day following their release.

Future operations

The information gathered from the screw trap in 2008 has proved to be very illuminating, particularly in terms of the success of the tagged fish to the smolt stage of their development. With salmon fry being tagged in 2007 and 2008, it will be important to run the trap in 2009 and 2010 to monitor the success of these stocks. It will also be possible to gather a more comprehensive set of smolt lengths and scale samples so that ages of migrating smolts can be determined. More extensive mark and re-capture can be carried out to get a better estimate of total smolt output which is the most important element of all salmon fisheries. Continued use of a screw trap will also provide a warning of problems associated with sea-lice infestations which otherwise would go un-noticed. This type of information is vital in maintaining good working relationships between the local salmon farming companies and those with interests in wild fish.

Although the limited work done on marking and re-capture was inconclusive in terms of estimating total smolt runs, it seemed to indicate that the river had a healthy smolt output in 2008. A more extensive programme of mark and re-capture is underway in 2009 to get a more accurate estimate of smolt output.

*With support from the Scottish Government via RAFTS, WRFT is pleased to be able to provide support for the project in 2009. In addition to the River Carron Screw Trap project, a rotary screw trap has been purchased by Inveran Estate for the River Ewe. Over future years the River Ewe screw trap will produce comparable data for smolt production from the River Ewe-Loch Maree system. Many thanks to Angus Morrison and Ray Dingwall for their support for this project, to be reported in the next WRFT Review.

Part 8 **Habitat management and stock restoration**

8.1 WRFT-FWAG Habitat management workshop

Supported by The Highland Council and Landfill Tax Credit Scheme

New riparian woodland enclosure in the headwaters of the River Ewe above Loch Coulin.

Many new native woodlands have been created over the past 10 years within the WRFT area.

There are still places where riparian habitats could be improved or enhanced to support higher production of juvenile fish.

WRFT was delighted to welcome John Robertson from the Farming and Wildlife Advisory Group (FWAG) to explain how the Scottish Government's Scottish Rural Development Programme (SRDP) can support projects to restore and improve habitats for fish production and other wildlife in Wester Ross. The workshop, supported by FWAG and SNH, took place on the 26th of January 2009 at the WRFT office in Gairloch and was attended by representatives of local estates and others with an interest in fish habitat improvement.

By way of introduction, Peter Cunningham presented a summary of the habitat related issues that affect the production of salmon and trout in Wester Ross. Many of the opportunities for improving habitat for fish are linked to land and wildlife management at the river catchment scale. John's presentation explained ways through which the SRDP can support a range of activities that will help fish and fisheries in Wester Ross. His presentation, which can be downloaded from the WRFT website www.wrft.org.uk , includes links to related SRDP web pages. During the afternoon, participants explored the SRDP website via a projected internet link.

At the time of the workshop, the future of FWAG was uncertain, and we were particularly grateful to John for pressing ahead with the workshop at a difficult time. Thank you also to Prof Barry Blake for helping to draft the minute, and to all the participants for supporting it.

8.2 River Ewe Fisheries Management Group

At a meeting of river proprietors, ghillies and other people with an interest in managing the fisheries of the River Ewe system on the 21st April 2009, WRFT was given the go ahead to seek funding to develop a suite of projects to improve habitat for production of juvenile salmon and sea trout within the River Ewe – Loch Maree system. By working as a management unit, with support from the Wester Ross Fisheries Trust, the River Ewe Fisheries Management Group will be able to access funding from a range of sources for projects which will benefit both wild fish populations and other wildlife.

Opportunities for habitat improvement include improving access to spawning areas for sea trout, de-silting of spawning gravels, restoration of riparian vegetation, and re-creation of nursery habitat for sea trout, juvenile salmon and Freshwater pearl mussel. Further details will be presented in the next WRFT Review.

8.3 Bruachaig restoration project

The Bruachaig River is a major tributary of the Kinlochewe River, which in turn, is the largest and most important spawning and nursery stream for wild salmon within the River Ewe system. Records indicate that wild salmon were formerly present within the Bruachaig River above the waterfall complex at OS Grid Reference NH 059 608 as far upstream as headwaters in Strath Chrombuill. However since the late 1990s, no salmon of wild origin have been recorded within a 10km stretch of spawning stream above the falls.

The primary aim of this fishery management project is to attempt to kick-start the recovery of a wild salmon population. This follows on from a stocking trial in 2004 when about 800 hatchery reared fry of local wild origin (progeny of fish collected as parr Bruachaig River 2001) and raised at the FRS Aultbea Fish Cultivation Unit were stocked. Unfortunately, the captive broodstocks at Aultbea had to be culled before a larger number of fry were available for stocking. Nevertheless, follow-up electro-fishing surveys of the stocked area demonstrated very good growth to 1+ parr stage by summer 2005 and the potential for production of large numbers of salmon smolts from the area above the lower falls.

In both 2007 and 2008, approximately 5,000 salmon fry of Kinlochewe River origin were stocked into the Bruachaig River between the falls and the Heights of Kinlochewe in June of respective years. In 2008, a similar number of fry were stocked into the Bruachaig headwaters in Strath Chrombuill. In 2007, the salmon fry were progeny of six female and six male salmon caught in the Kinlochewe River in November 2006. In 2007, the fry were progeny of 18 broodfish from the Kinlochewe River and A' Ghairbhe rivers. DNA samples of broodfish were taken to enable subsequent identification
Fry were hatched at the Coulin Estate hatchery.

In Autumn 2008, eggs from 12 female salmon caught in the Kinlochewe and A' Ghairbhe were fertilized with milt from 11 cock salmon (from same rivers) at the Coulin hatchery. Approximately 30,000 salmon fry will be stocked into the Bruachaig River in June 2008 if all goes well.

(left) Simon Stewart at the Coulin Hatchery stripping a hen salmon in November 2008.

(right) Stocking out salmon fry into a headwater streamabove the Bruachaig falls, with help from Frank Kalinowski, Keiran and Holly Morrison, and of (photo by Roz Gordon)

Thanks to Pat Wilson and Frank Kalinowski and Ian Cross of Kinlochewe Estate, and Dr John Ogle for help in obtaining broodfish. Special thanks to Neil Morrison, Simon Stewart and Philip Smith of Coulin Estate for providing hatchery facilities and help at all stages of the project. This project was supported with funding from the Scottish Government via TWG in 2006-2007 and 2007-2008.

8.4 River Ewe – Loch Maree system Fisheries Regulations for 2009

Background

The River Ewe – Loch Maree salmon and sea trout fisheries are currently recovering from historic 'lows' in the 1990s. Electro-fishing surveys by the Wester Ross Fisheries Trust in 2007 and 2008 demonstrated that there are healthy populations of juvenile salmon in core parts of the system, including the River Ewe, the Kernsary sub-catchment and the Kinlochewe River. However, in recent years, wild salmon have failed to ascend the Bruachaig falls and there is a large section of river above the falls where production of salmon smolts is minimal and currently sustained only though a stocking programme. In recent years, rod catches in the river have been increasingly dominated by summer and autumn salmon and grilse, with a tendency towards later runs of grilse. Formerly, more salmon were taken in spring months. As elsewhere in Scotland, early entering salmon are increasingly scarce and need protection. Stocks of sea trout within the system, particularly of older fish, remain very low.

At a meeting of river proprietors and ghillies to review fisheries conservation and management in Gairloch on 21st April 2009, the following regulations for the 2009 season were agreed by all present:

Regulations for 2009

1. 'Catch and release' is mandatory for all sea trout throughout the season. Anglers should return all fish as carefully as possible and use smaller hook sizes as appropriate.

2. 'Catch and release' is mandatory for all salmon and grilse before the end of June. Early running two-sea winter female salmon are particularly valuable as broodstock for the future of the fishery. Please treat them as carefully as possible!

3. From 1st July onwards, anglers are asked to return salmon and grilse unless there is a special reason for keeping a fish. Please respect the guidance of your ghillie. If you wish to keep a fish for the table, a fresh run male grilse should be taken in preference to a hen salmon, especially one that may have been in the river for several weeks!

4. All escaped farm salmon should be killed. If in doubt as to whether a fish is wild or farmed, use a keep net and seek a second opinion (scale reading may be required).

[post-meeting recommendation from WRFT & AST Biologists: treble hooks should not be used]

Fisheries Management Activities for 2009

On-going fisheries management activities within the River Ewe catchment include restocking programmes and habitat management projects, led by Coulin Estate and Inveran Estate, with support from Kinlochewe, Letterewe and other estates in the catchment area, Scottish Natural Heritage, and the Wester Ross Fisheries Trust (WRFT).

The WRFT work programme for 2009 is the most ambitious to date and includes juvenile fish surveys, assistance with stocking programmes, the development of a range of habitat restoration projects, a hands-on habitat management day (18th September), sea lice monitoring, genetic sampling, and much other fisheries restoration work. Any anglers who would like to support this work, or join a WRFT team for a day in the field are welcome to contact the WRFT Biologist on 01445 712 899. Further details can be found on the WRFT website, at www.wrft.org.uk.

Many thanks for your co-operation and support. Enjoy your fishing. Tight lines!

Part 9 **Education and Awareness**

9.1 WRFT in the Classroom (article by Dr Lorna Brown)

In December 2008 I contacted three schools who had participated in our Salmon and Sea Trout in the Classroom Project to ask whether they would like to take part again. The teachers at Badcaul, Bualnaluib and Inverasdale were delighted, telling us how much the pupils had enjoyed the project. Their enthusiasm doubled when I told them that we had funding for new classroom hatcheries which would not involve staff having to come into the school over the weekends to change ice packs! We managed to convince the Gaelic teacher at Gairloch to join the project as well, using the new system as a selling point for how easy the project was to run.

Our super new systems, with insulated tanks and temperature regulating coolers, arrived on the 16th of February which gave me two days to work out how to set the systems up and become an expert before I took them to the schools!

As ever we were supported by the local fisheries in the provision of eggs and permission to release young fish into their rivers. Neil Morrison of Coulin Estate kindly donated eggs for Gairloch and Inverasdale. Alasdair MacDonald of Dundonnell Estate donated eggs for Bualnaluib and Badcaul, bringing the eggs to Badcaul himself. Alasdair stayed during the introductory talk, helping with the new games and activities we introduced this year.

The new systems were extremely effective - if anything they were too effective. As the days went by and the eggs still hadn't hatched we began to panic. Would the young alevins be ready before the Easter holidays? We were very relieved when the hatching started after some subtle temperature manipulation. There were very few mortalities in any of the school hatcheries and all schools deemed the new systems a great success. Alasdair joined us for the Badcaul release trip and we managed to have a lovely period of sunshine in between two horrendous hail showers.

In April 2009 our application to the Royal Society for funding was successful and we bought a variety of surveying equipment for schools' projects. The first project to use this equipment, including handheld computer microscopes and a remote sensing camera, commences in the Gairloch High School at the end of May. This is a similar project to those carried out with primary schools in the past under our Life in Lochs scheme and we hope the secondary pupils will benefit as much as the primary pupils seemed to. This equipment will be stored at the High School and we hope to use it for similar projects in the future.

Gairloch Primary Pupils test the freshwater food web game.

9.2 Loch Maree Family Day 2008

Supported by The Scottish Government via RAFTS and Scottish Natural Heritage

Over 60 people attended the Loch Maree family day on 11th October. The heavy showers stayed away for the guided walk to the hotel burn and though the woods to the Talladale River in search of fishes and other wildlife. Trout, minnows and an eel were caught by the electro-fishers from the Hotel burn and inspected by many enthusiastic children. Larger salmon parr were found in the Talladale River.

The expedition in search of small fishes and other animals sets off from the back of the Loch Maree hotel on 11th October. A large toad was one of the first discoveries. (photo by Lindsey Duncan, Highland Council Countryside Ranger)

Thanks to Jim Raffell of FRS Shieldaig sea trout project for plankton sampling demonstrations and explaining the 'science' of scale reading to budding fish biologists in the boatshed; to Lindsey Duncan, HC Countryside Ranger and Nicola Talloch of SNH who had their very own tent 'with a view. . .' with wildlife displays and bird cake making demonstration. And thanks, again to Mark Vincent and Nick Thompson at the Loch Maree Hotel for burgers, refreshments and a warm fire in the ghillies bar.

9.3 BBC Natural World 'Secrets of the Highlands'

BBC Natural History Unit film crews, under the direction of producer Fergus Beeley and assistant Christina Holvey, were hard at work in the Loch Maree area and surrounding hills throughout 2008, filming wildlife for a forthcoming BBC 'Natural World' programme, 'Secrets of the Highlands', to be broadcast in Autumn 2009.

Aaron Forsyth and John Sangster of Wester Ross Marine Reserve Partnership with the ROV by the River Ewe prior to filming in August 2008.

One of the challenges of the film was to record images of wild salmon within the River Ewe catchment. In August, the WRFT Biologist joined the Wester Ross Marine Reserve Partnership ROV team (Aaron Forsyth and John Sangster) to film wild salmon in the River Ewe. Conditions on the appointed day were near perfect for filming with low water and sunshine. However, the salmon were wary of the underwater camera. After several hours of snorkelling, repositioning the ROV, trial and error, we were able to record a sequence with large 2SW salmon in the T-Pool of the River Ewe.

In November, the WRMRP-WRFT team were joined by the BBC film crew to record spawning salmon along a headwater stream. Few salmon were seen spawning in the tributary burn and we were lucky to be able to record a pair of salmon on their redd, a large bank of gravel.

Thank you to Ray Dingwall (Inveran Estate ghillie) for help and to all estates for permissions to film.

Part 10 **Financial Statement**

For the year ended 31 March 2009

		Unrestricted Funds	Restricted Funds	2009	2008
Incoming resources from generated funds		£	£	£	£
	Voluntary income				
	WRASFB	23500		23500	22000
	Membership	1010		1010	490
	Sub Total	**24510**		**24510**	**22490**
	Activities for generated funds				1488
	Investment Income	2914		2914	1675
	Gift Aid	895		895	4341
	Sub Total	**3809**		**3809**	**7504**
	Incoming resources from charitable activities				
	Inveran Estate	2000			
	Coulin Estate	2000			2000
	Kinloch Woodland Trust	1000			1000
	Orrin Trust	500			2000
	Fish Farms	4725			4725
	Southern River Proprietors	4394			4806
	Rafts Highland Council	792			1667
	Rafts Whitley Animal Protection trust	1425			2698
	Individual donations	150			568
	Sales	22			70
	Contracts	3365			
	Other Highland Council	1185			0
	Sub Total	**21558**	**0**	**21558**	**19534**
	Total Voluntary incoming resources	**49877**	**0**	**49877**	**49528**
	Incoming resources from charitable				
	activities Restricted.				
	Salmon & Trout in the classroom 2009/10	**8304**			
	AMA Seerad completed	**1167**			**37727**
	Sweep netting / sea lice	**15275**			
	Tournaig trap	**2857**			
	FRS Contract Completed	**0**			**13000**
	Life in Lochans completed	**0**			**5309**
	Loch Maree Family day	**1509**			
	Arctic Charr week	**5052**			
	SNH Website completed	**0**			**1400**
	Mayfly &Stonefly workshop ccompleted	**0**			**800**
	Grants Via RAFTS				
	Marine Seminar	**1700**			
	River Ewe RST project	**7284**			
	Biosecurity plan	**2000**			
	Fisheries Management plan	**8636**			
	Atlantic salmon	**712**			
	Other / Meetings	**1417**			
	Sub Total	**55913**	**0**	**55913**	**58236**
	Total Donations	**105790**		**105790**	**107764**
	Figures shown in Book keeping	105792			107765

		Direct	Support	2009	2008
Resources expended		**Costs**	**Costs**		
	Costs of generating funds	**£**	**£**	**£**	**£**
	Fundraising trading cost of goods sold				
	Charitable activities				
Total resources expended		**0**	**0**		
Costs of activities in furtherance of charity's objectives					
	Support Costs				
	Wages & Contract labour	12333			14269
	Insurance	1708			1320
	Telephone	880			897
	Heat & Light	677			498
	Subscriptions	2017			2017
	Training expenses	0			760
	Printing/Post / Stationery	1830			2373
	Sundry expenses	2793			1507
	Comp equipment	1302			630
	Maintenance				
	Sub Total	**23540**	**0**	**23540**	**24271**
Charitable activities direct costs					
	Publishing				86
	Motor vehicle travel & subsistance expenses		4012		4742
	Wages ,Soc Security , Pension		34218		37250
	Equipment / Hire / repairs		491		236
	Equipment new		8221		
	Governance costs		1573		1528
	Depreciation				
	RAFTS/FRS Commission		750		650
	Sundry		12		509
	Sub Total	**0**	**49277**	**49277**	**45001**
Charitable activities total costs		**23540**	**49277**	**72817**	**69272**
	Figures as shown in book keeping	**72816**		**72816**	**69271**
IMPORTANT NOTICE					
The 2009 figures are for information only and have					
not been checked or audited.					
The figures have been checked to Book keeping					
However there will be adjustments made by the Accountants					

Acknowledgements

Wester Ross Fisheries Trust has received a great deal of help and advice over the past year. Thank you to:

Aaron Forsyth
Ailsa McLellan
Alasdair Macdonald
Alison Rowe
Andrew Graham-Stewart
Andrew Slaughter
Angus Morrison
Anne and Alex Gray
Arthur Griffiths (TWG)
Prof Barry Blake
Barbara Souter
Ben, Ron and Lesley Rushbrooke
Billy Forbes
Bob Kindness
Brian Fraser
Callum Sinclair (RAFTS)
Campbell Pert
Colin Adams
Colin Bean (SNH)
Colin Macdonald
Colin Russel
Prof Andrew (Dave) Barclay
David Dunkley (Scottish Government)
Dave Hargraves
David Hay (FRS)
David Stewart (FRS)
Donald Macleod
Donald Rice
Dundonnell Estate
Eilean Darach
Emma Hatfield (FRS)
Eoghain Maclean
Eric McVicar
Eric Verspoor (FRS)
Ewen and Jenny Scobie
Fergus Mackenzie
Frank Buckley
Frank Kalinowski
Gilpin Bradley
Greg Jeffries
Hamish Lawrie
Hugh Richards
Ian McWhinney
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Karen Starr
Ken Williamson
Kenny Nelson (SNH)
Kevin Ginty
Letterewe Estate
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Mary Gibson (SNH)
Michael Penston
Neil Morrison
Nick Benge (Watergems)
Nick Sanders (Glenelg AC)
Nick and Mrs Thomson (Loch Maree Hotel)
Nicola Tallach (SNH)
Norman Thomas
Prof Peter Maguire
Prof Peter Maitland
Philip Smith
Ray Dingwall
Rob Dewar
Roger Macdonald
Roger Brook
Roger and Tracy McLachlan
Ron Greer
Ross Gardiner (FRS)
Roz Gordon
Stephen Buttle
Dr Steve Kett (Middlesex University)
Tim Fison

…and all the other anglers, keepers and ghillies, fish farmers, school teachers, schoolchildren and parents, and everybody else who has helped us with our work.

Supporting wild fisheries and the Trust's Work

The current work programme for 2009 – 2010 includes excursions to sample trout lochs and streams, electro-fishing surveys of many of the rivers between Ullapool and Knoydart, sweep netting for sea trout, biosecurity plan preparation, 'family days' at Loch Maree, and much else which may be of interest. There are many opportunities for becoming actively involved with the work of the Trust or for simply coming along for a day in the field to find out what we do. Please contact the WRFT Biologist for further details.

Wester Ross Fisheries Trust

Harbour Centre, Gairloch, Ross-shire, IV21 2BQ

Tel: 01445 712 899
Email: info@wrft.org.uk

WRFT Registered Charity No: SCO24787

1. Member details

Please complete details

Title: Ms Miss Mrs Mr

First name: _____

Surname: _____

Postal address: _____

_____

_____

_____ Post code: _____

Tel: _____

E-mail: _____

2. Renew my membership

		Please Tick
One year	**£20**	
Single Life (1 card)	**£150**	
Joint Life (2 cards)	**£200**	

Rates are valid until 31/12/2006

3. Payment details

Membership Fees (from section 2)	**£**
Donation	**£**
TOTAL DUE	**£**

4. Method of payment

a. ☐ I enclose a cheque payable to Wester Ross Fisheries Trust for **£**

b. ☐ I would like to pay by Standing Order (please fill in the Standing Order form below – UK bank account holders only)

5. Gift Aid

Use gift aid and you can make your donation worth more. For every pound you give to us, we get an extra 28 pence from the Inland Revenue and it costs you nothing.

I want all donations I've made since 6 April 2000, and all donations I make in the future, to be Gift Aid until I notify you otherwise.

To qualify for Gift Aid, what you pay in income tax or capital gains tax must equal the amount we will claim in the tax year.

Just tick the box and sign below: ☐

Signature Date / /

Please return this completed form to: **Wester Ross Fisheries Trust, Harbour Centre, Gairloch, IV21 2BQ**

Data Protection: The information you provide will be held for processing your membership and for mailing with information about Wester Ross Fisheries Trust. Your details will only be used by Wester Ross Fisheries Trust and will not be made available to any other organisation.

Instruction to your Bank or Building Society to pay Standing Order to:

Bank Name & Address: Bank of Scotland – Gairloch Office

Account Name: Wester Ross Fisheries Trust **Sort Code:** 80-06-87 **Account No:** 06000911

PLEASE PAY THE FOLLOWING

Amount £ In Words

Commencing:

Thereafter: Due Date: Annually On / /

TO BE DEBITED FROM MY ACCOUNT

Bank Name: _____

Bank Address _____

_____ Postcode _____

Name(s) of account holder(s)

Branch sort code ☐☐-☐☐-☐☐ Bank/ Building Society Account Number ☐☐☐☐☐☐☐☐

WRFT Ref. No: (office use only)

Instruction to your Bank or Building Society: Please pay Wester Ross Fisheries Trust Standing Order Mandate from the account detailed in this instruction. I understand that this Instruction may remain with the WRFT and, if so, details will be passed electronically to my Bank/Building Society. A photo copy may also be kept on file with the SGA.

Please cancel all previous standing order and/or direct debit mandates under Wester Ross Fisheries Trust.

Signature(s) Date / /

Fish shown on the back cover of this report are as follows:

(upper top left) Juvenile **Grey gurnard**, *Eutrigula gurnardus*, taken in the sweep net at Kerry Bay on 12th August 2008. This fish is heavily infected with the parasite, *Cryptocotyle lingua*. The metacercariae of this digenean parasite appear as black dots on many fish, including sea trout, pollack and cod. The life cycle of this parasite also includes the marine snail, *Littorina littorea*, in which the early larval stages live, and fish-eating birds and mammals in which the adult stages live.

(lower top left) **Lesser weever**, *Echiichthys vipera*, taken in the sweep net at Kerry bay on 12th August 2008. This fish has poison glands along the spines of the dorsal fin. Weevers bury themselves in sand up to their eyes and may be troddon on by bathers! The poison causes severe pain and localised swelling, though can be inactivated if the unfortunate bather puts his foot in to hot water which is just bearable.

(top right) Juvenile **Cod**, *Gadus morhua*, caught in the sweep net at Boor Bay, by Poolewe on 7th August 2008. Juvenile cod were regularly caught in sweep net samples in Loch Ewe and Kerry Bay. Juvenile Pollack, *Pollachius pollachius,* were more abundant than juvenile cod and were the most numerous fish caught at Boor Bay.

(upper middle left) **Corkwing wrasse**, *Crenilabrus melops*, taken in the sweep net at Boor Bay on 18th August 2008. The Corkwing wrasse was the most frequently caught wrasse at this site *(photo by Ben Rushbrooke).*

(upper middle right) Juvenile ?**Ballan wrasse**, *Labrus bergylta*, taken in the sweep net at Boor Bay on 18th August 2008. The Ballan wrasse is highly variable in colour; please contact the WRFT biologist if you disagree with this identification! *(photo by Ben Rushbrooke).*

(lower middle left) Egg case of a **Common skate,** *Dipturus batis,* found by the WRFT Biologist on 13th December 2008 by Gruinard Bay. The Common skate is the largest ray in European waters. Females can grow to 2.5m long and weigh 100kg. It is listed as Critically Endangered on the **IUCN red list 2006**. There are no longer commercial skate fisheries in the area, and all rod caught skate are released. The waters around Wester Ross may now be of vital importance for the continued survival of this spectacular fish.

(lower middle right) **Ray's bream**, *Brama brama*, found at Badachro harbour by Ian McWhinney on12th March 2009. The fish is usually found in deep water, though during the summer and autumn migrates north and into the North Sea. Most strandings occur during the late autumn and early winter.

(bottom) **Dealfish,** *Trachypterus arcticus,* found by Hamish Lawrie on 10th of November 2008 by Badachro harbour, after a period of stormy weather. The dealfish may grow to 3m long and is normally found in oceanic waters. The large eye (2 pence coin for scale) may be an adaptation for seeing prey in the twilight zone, or perhaps nearer the surface at night. Dealfish have potrusible mouthes to snatch unsuspecting fish and squid as prey. The tail is attached to the fish at an angle of 45°, a further clue to the fishes normal orientation in the water column.

Name that fish . . . . The health of the marine environment is vital to both salmon and sea trout. In 2008, the WRFT carried out a programme of sweep netting for sea trout to monitor parasitic sea lice (see Part 4 of this report). Other fish which were caught in the sweep net or were reported to the WRFT Biologist over the past year include the following. Can you recognize them? Please see page 45 for the answers and further details. *Photos ©Wester Ross Fisheries Trust & ©Ben Rushbrooke.*