WESTER ROSS FISHERIES TRUST

REVIEW MAY 2008

 www.wrft.org.uk Registered Charity Number SCO24787

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By

Peter Cunningham, Ben Rushbrooke and David Mullaney

May 2008

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

(top left) *Ray Dingwall with a fresh 17lb salmon taken by Gavin Ramsay from the River Ewe in May 2007. Rod catches of salmon in 2007 were the best for many years for Wester Ross rivers – see Section 2 [photo © Gavin Ramsay].*
(top right) *Tim Fison and stalker Donald Cameron inspect the electro-fishing catch from the Kinlochhourn River in July 2007. This river was surveyed by WRFT for the first time. In addition to trout, a few large salmon parr were found.*
(middle right) *Otter spraint with trout vertebrae on mossy rock. At the WRFT Ecosystem fertility seminar in November 2007, the issues of phosphorus and food availability, and how they limit smolt production, were discussed.*
(middle left) *Over 370 sea lice were counted on this early-returned sea trout taken in the River Ewe in mid May 2007. Sea lice epizootics were recorded by WRFT or FRS in Loch Broom, Little Loch Broom, Loch Ewe and Loch Torridon.*
(lower left) *View over 'Coree Bay', Loch Maree. The Loch Maree sea trout fishery which collapsed 20 years ago has yet to show signs of sustained recovery. A long-term solution to the sea lice problem is prerequisite.*
(lower right) *Ben Rushbrooke and David Mullaney processing a trap-caught fish at Tournaig in August 2007. Eight sea trout (including finnock and 'slobs') and thirty one salmon were recorded in the trap for fish moving upstream in 2007.*

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Ben Rushbrooke transfers fish from the downstream trap at Tournaig. *(Peter Cunningham)*

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Part 1 **Chairman's preface**

On the whole the 2007 angling season for salmon was as good as any for over 25 years with rivers like the Carron having their best season catching 262 fish. Sadly the news on sea trout was not good, particularly in the north of our area, with heavily liced, early-returning post-smolts and finnock reported from the rivers Ewe, Dundonnell and Torridon, although the Carron again fished well for sea trout. The situation in the Western Isles and Argyll appears similar with heavy lice infestations reported.

The main runs started in mid July, a month later than usual. The removal of the Irish drift nets (both legal and otherwise) may well have had a bearing on the excellent head of fish caught and high numbers of fish reported from the spawning beds. This must auger well for the future, although it should be said the 2007 angling season was particularly wet, with excellent angling conditions throughout July, August and September.

The Trust is commencing a sweep netting programme in 2008 shared with Ailsa Mclennan, our Regional Development Officer, financed by the Tripartite Working Group. We intend to net for sea trout in Loch Kanaird, Little Loch Broom, Loch Ewe, Loch Gairloch, Loch Carron and Loch Alsh and possibly Loch Torridon, with the intention of regular netting for a 6 month period. Fish will be weighed, measured, tagged and a condition factor calculated. The results will be directly comparable with other West Coast trusts that do similar netting programmes.

Peter spent much of the winter fulfilling a contract for Fisheries Research Services to provide information about freshwater fish populations and fisheries management within the WRFT area. He compiled inventories of data held by the Trust, as did the biologists in other Trust areas, completed sections describing the rivers, lochs and fish populations and outlined a series of actions needed to conserve and manage fish populations and fisheries in the area. The Scottish Government now has an overall picture of all the areas covered by all the Trusts and grant monies can now be targeted more accurately. We are now in a position to produce an updated fisheries management plan for the Wester Ross Fisheries Trust area. Over the coming year (2008) a fisheries management plan for the WRFT area will be developed in consultation with a wide range of stakeholders including fishery proprietors, government agencies, and other interested parties.

Many thanks to Ben Rushbrooke for the Tournaig project, David Mullaney for all his support, Dr Steve Kett for support on the Wild Trout project, Mark Vincent for use of the Loch Maree hotel, Philip Smith and Neil Morrison of Coulin Estate for their support of the Bruachaig project, ghillies Ray Dingwall, Brian Fraser and Alasdair Macdonald for sea lice monitoring. Particular thanks go to Peter Jarosz, our admirable and unflappable administrator, Ronnie Mullaney our financial wizard and of course Peter Cunningham for his total commitment and continuing tireless efforts for the Trust. *Johnie Parry, April 2008*

(l - r) Ailsa McLellan, Alasdair Macdonald, Dr Shona Marshall and Johnie Parry pulling in the sweep net at Kildonan Bay, Little Loch Broom in May 2008. (Peter Cunningham)

Part 2 **Salmon and sea trout stocks**

2.1 Overview

Wester Ross Fisheries Trust [WRFT] was set up in 1996 in response to the decline in local salmon and sea trout populations and fisheries. The Trust works within an area extending from the River Kanaird catchment area (north of Ullapool) to the River Barrisdale catchment area (in Knoydart). In line with other members of the umbrella organisation Rivers and Fisheries Trusts Scotland (RAFTS www.rafts.org.uk), the WRFT remit extends to investigating, monitoring and providing information for management purposes for all freshwater fish species within the WRFT area. Of greatest importance to the fisheries and to the ecological health and productivity of the rivers and lochs of the area are populations of wild salmon and brown trout (including sea trout).

An important objective of the Trust's work is to monitor the status and health of salmon populations. Rod catches of salmon for rivers in the WRFT area (see Part 2.2) were generally higher in 2007 than in 2006; some rivers achieved the highest rod catch for over 20 years. In 2007, the number of salmon entering the little Tournaig system was the second highest on record since the WRFT Tournaig trap project was set up in 1999 (see Part 4). As elsewhere around Scotland, many salmon caught in WRFT rivers had Red Vent Syndrome (RVS). Indications from hatcheries elsewhere are that RVS has had minimal adverse impact on the success of spawning.

WRFT electro-fishing surveys (see Part 2.3) indicated that juvenile salmon were distributed more widely within the WRFT area than at any time since the year 2000. However gaps in distribution remain especially in some headwater areas where salmon were present in the past. Elsewhere, densities of juvenile salmon were low at some sites, notably after the flash floods and erosive spates of July 2007. In many 'core' areas where the habitat is more stable, densities were high. The downstream salmon smolt run at Tournaig was the highest recorded (see Part 4). Following the 2007 Tournaig e-fishing survey another sizable smolt run is anticipated in 2008.

2007 was not a good year for the Loch Maree sea trout stock, the most important in the area. For many rivers, rod catches of sea trout were down on those of 2006. The majority of sea trout and finnock taken in the River Ewe system were fish that returned prematurely from the sea to freshwater, following a sea lice epizootic in Loch Ewe (see Part 3). Sea trout that were severely affected by parasitic sea lice were also recorded in rivers entering Loch Broom, Little Loch Broom and Loch Torridon. At Tournaig, 170 sea trout smolts were recorded leaving the system; only 4 finnock were taken in the upstream trap later in the year reflecting poor marine survival.

Dr Steve Kett and David Mullaney en route to survey a site by Kernsary.

2.2 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 2007 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

Rod catches of salmon in 2007 were higher than in 2006 for nearly all major rivers in the WRFT area. Figure 2.1 shows the catch of salmon (including grilse) for the River Ewe system and the Gruinard River; traditionally the two most productive salmon rivers in the WRFT area.

Figure 2.1 River Ewe system and Gruinard River salmon catches

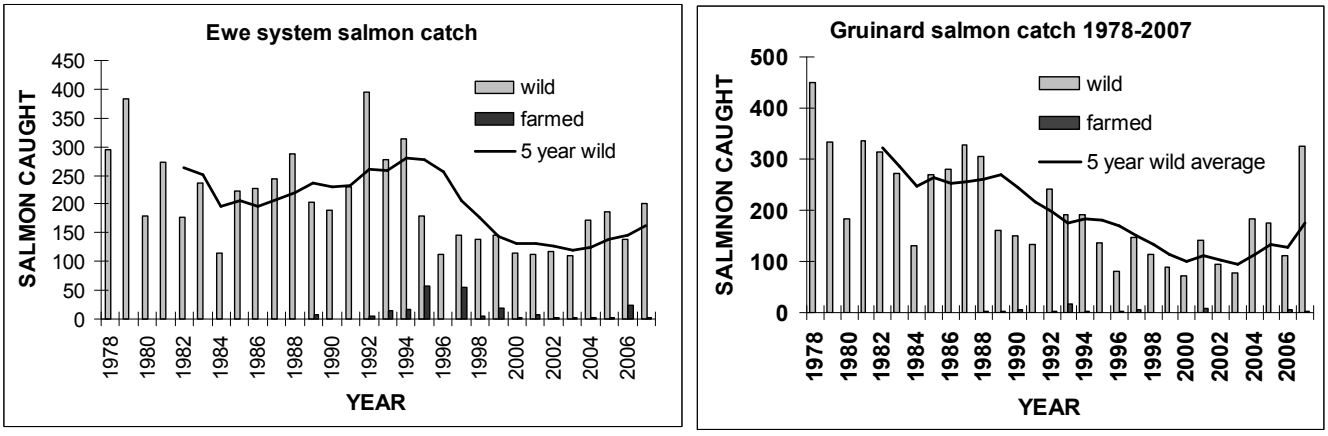
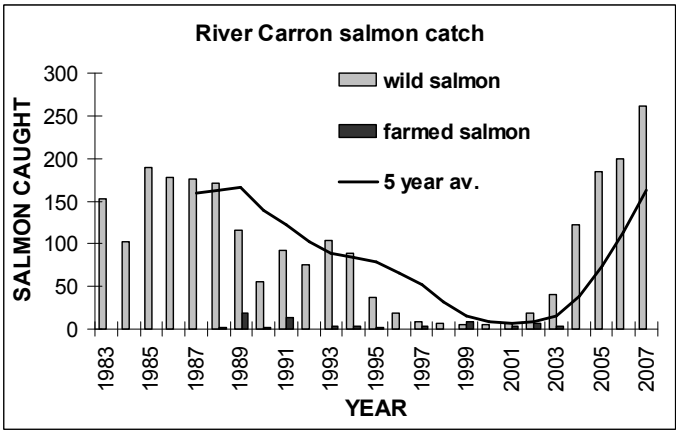


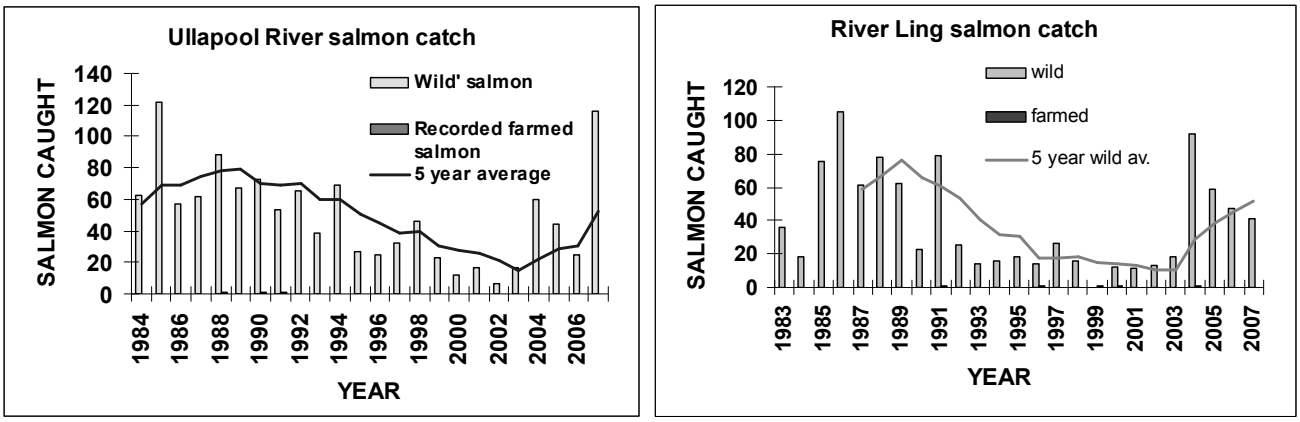
Figure 2.2 River Carron system salmon catches and the record salmon estimated at 32lb taken in September 2007 (photo © Bob Kindness). The River Balgy also produced a record salmon of 32lb in 2007.



In the south of the area, the remarkable recovery of the River Carron fishery continued with a record catch of 262 salmon (Figure 2.2). This included a river record 32lb salmon taken by Bob Kindness.

Two of the rivers in which salmon have to ascend sizeable falls to reach spawning areas are the River Ullapool and River Ling. Figure 2.3 shows that the catch of salmon in the Ullapool River was one of highest for many years; the Ling did less well.

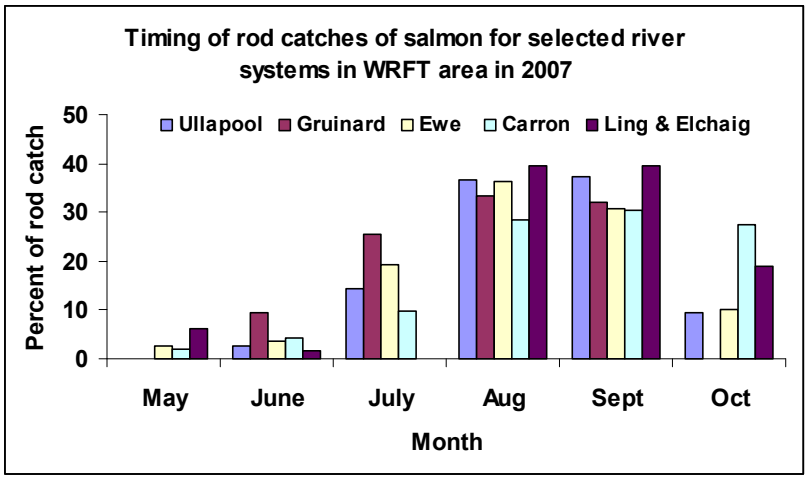
Figure 2.3 Ullapool River and River Ling salmon catches



Timing of rod catches of salmon

Figure 2.4 shows the timing of rod catches for 6 rivers in the WRFT area in 2007. Traditionally, both the Ullapool River and River Ling were noted for a high proportion of 'spring' salmon in the rod catch (see WRFT Review May 2005). In 2007, the majority of the rod catch for these rivers was taken in August and September as elsewhere in the WRFT area. Some rivers cease fishing at the end of September or fish only for broodstock in October, other rivers fish only lightly during spring months to conserve stocks.

Figure 2.4 The timing of rod catches of salmon for selective river systems within the WRFT area in 2007. Note that catches for the Ling and Elchaig have been combined.



Catch and release of salmon

Most fisheries now have a 'catch and release' policy to protect fish stocks. The great majority of salmon and grilse taken by rods in the WRFT area are returned to the water to spawn. 'Catch and release' is widely accepted as a means of helping to conserve threatened stocks. The Little Gruinard was the first river to go

'catch and release'. It is perhaps no coincidence that WRFT e-fishing teams have consistently found juvenile salmon throughout the Little Gruinard river catchment area at relatively high densities, in contrast to most other river systems. The River Carron 'catch and release' policy may also have contributed to the remarkable recovery of the Carron salmon fishery (see WRFT Review May 2007).

Early running (salmon which enter rivers from the sea before the end of May) salmon were taken in May from several river systems within the WRFT area in 2007. Of concern to the WRFT biologist was the loss of some of these fish. Early running multi-sea winter salmon are not only the most spectacular salmon; they also tend to be best able to reach headwater streams and sustain salmon production in areas where later running fish may be unable to reach. They are becoming increasingly scarce.

The timing of river entry of salmon is known to be genetically determined in part. In other words, the progeny of 'spring' salmon are more likely to return to rivers during the early part of the year than the progeny of 'autumn' salmon, as demonstrated by a study using progeny of 'Tummel' and 'Almond' salmon on the River Bran in Perthshire. A summary of this study can be found on the internet at link below: http://www.frs-scotland.gov.uk/FRS.Web/Uploads/Documents/Runtime_leaflet.pdf . If 'spring' salmon, like the Ewe fish on the cover of this report (which was carefully returned) are to continue to enter Wester Ross rivers in the years ahead, every effort needs to be made to protect them and give them the best possible chance of spawning.

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 July and August 2007. 117 wild salmon and grilse were taken by this net fishery during this period, more than were recorded by the rod fisheries of the Elchaig and Ling combined for the entire season (most of the rod caught fish in the Ling were released).

Escaped farm salmon

In 2007, escaped farm salmon were recorded in rod catches from the Gruinard (2 fish), Ewe system (2 fish), and Shiel (31% of catch). The netting station in Loch Long (the only netting station in WRFT currently in operation) recorded 22 escaped farm salmon in July and August. Following a reported escape of 24,000 salmon from cages in Loch Ewe in November 2007, there were no recaptures of escaped farm salmon from nearby rivers despite continuous monitoring using rod and line on the River Ewe during the close season (with special permission of the Scottish Government).

Salmon which escape as juveniles from freshwater production sites are more difficult to recognise as adults than salmon which escape from cages just prior to harvest. As they grow in the wild, farmed salmon develop a more natural appearance. Studies by Fisheries Research Services in the River Balgy suggested that the majority of salmon smolts descending the River Balgy in 2007 were of farmed origin (Raffell, *et al*., 2007). Farmed salmon smolt production cages are located in Loch Damh above the trap site. The Balgy is now the only river system in WRFT area with active salmon smolt production cages.

It is now possible in some situations to ascribe escaped farm salmon to their farm of origin using genetic methods (see Glover *et al.,* 2008). In future years it may be possible to learn more about the survival and movements of escaped farm salmon via genetic sampling of salmon from rod, net or trap catches.

References

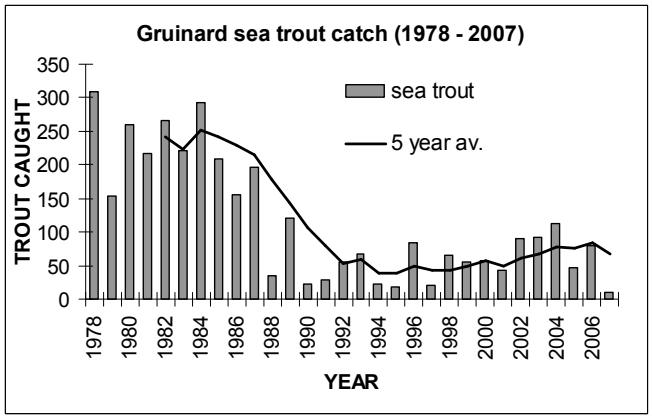
Glover, KA, O T Skilbrei and Ø Skaala (2008) Genetic assignment identifies farm of origin for Atlantic salmon Salmo salar escapees in a Norwegian fjord. ICES Journal of Marine Science, 65

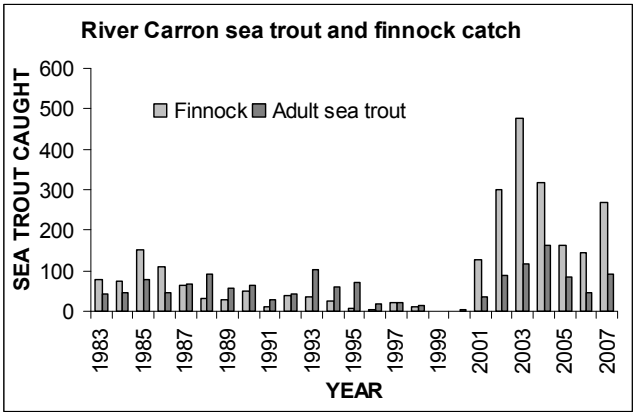
Raffell, J, S Buttle and D Hay (2007) Seventh annual report of the Shieldaig Sea Trout Project. Accessible on line: www.frs-scotland.gov.uk

Sea trout

The sea trout picture was mixed. The River Carron recorded a higher catch of both finnock and sea trout than in 2006. However, rivers further north performed poorly. Only 11 sea trout were recorded from the Gruinard River (in contrast to the high salmon catch) as shown in Figure 2.5.

Figure 2.5 Sea trout catches in the River Gruinard and the River Carron

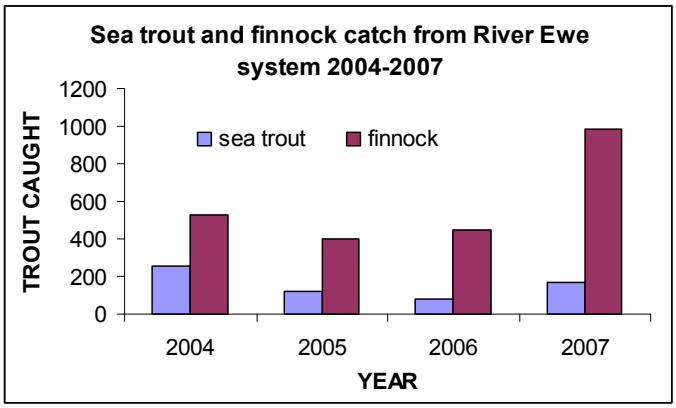


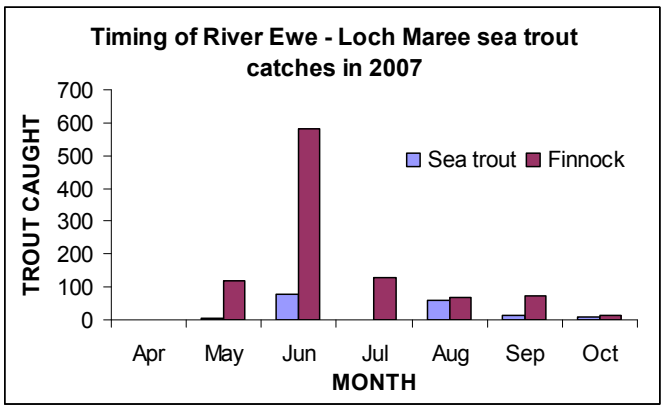


Recorded catches for the River Ewe – Loch Maree system for 2007 were 171 sea trout (fish of over 1lb) and 981 finnock (fish of under1lb); more finnock than for all the other rivers in the WRFT area added together. Presented as annual totals, these figures could be interpreted as an improvement in the status of the Ewe stock over the three previous years (Figure 2.6). Unfortunately, the reality was somewhat different. The majority of sea trout and finnock were taken by rods fishing the lower pools of the River Ewe in May and June having returned prematurely from the sea carrying high numbers of sea lice (see Part 3). The finnock total for the year comprised largely of prematurely returned post-smolts that had been at sea for less than or little more than a month (see also Part 3).

Traditionally, the River Ewe – Loch Maree system was by far the most productive sea trout system in the WRFT area. Annual catches of over 1000 sea trout were sustained from the Loch Maree Hotel beats alone. Fish of 5lb to 10lb+ were regularly taken. This fishery collapsed in the early 1990s. Fishing effort in 2007 was only a fraction of that in earlier years; 25 sea trout were recorded from the hotel boats. In terms of local employment, the Loch Maree sea trout fishery was formerly the most important freshwater fishery in the WRFT area. If the sea trout fishery is to recover, a long-term solution to the sea lice problem is prerequisite.

Figure 2.6 Sea trout catch for the River Ewe – Loch Maree system





2.2 Juvenile fish surveys

The Trust aims to survey each river system where there is a salmon fishery at least once every 2 years. Juvenile fish surveys are carried out by WRFT electro-fishing teams between July and October. 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 (e.g. Arnisdale survey in 2007). Areas which may be affected by stocking of salmon are shown (S):

Kanaird: salmon fry and parr were recorded from upper Kanaird (above Langwell falls) in October.
Ullapool: the Rhidorroch River was surveyed in August. Fry and parr densities were low at East Rhidorroch, though much higher in a tributary stream nearby. The main river channel had been scoured extensively during a spate in July 2007 and low fry and parr densities were attributed to this extreme spate event.
Broom: the juvenile survey (with Ross Gardiner of FRS) was postponed for second year due to high water.
Dundonnell (S)**:** one site was fished in October; moderate fry and parr densities recorded.
Inverianvie: salmon fry and parr found at site by the road bridge in September.
Gruinard (headwaters above Loch na Sealga)**:** Low densities of small fry and parr were recorded in both Abhainn Gleann na Muice (June) and Abhainn Strath na Sealga (October). Both tributaries areas are unstable and subject to washout. Fry and parr were generally small and thin in October: both streams are very oligotrophic (nutrient limited)
Allt Beithe: High salmon parr CPUE at site below fish ladder in July. Very large salmon fry and parr were found at outflow of Loch a Bhaid-Luachraich (above old fish ladder, below new pass). Have salmon spawned above the loch?
Tournaig: salmon fry and parr were found throughout the accessible area at end of July, at slightly lower fry CPUE than in 2006.
Ewe: Moderate to high CPUE of salmon fry and parr in sites fished in River Ewe (fishing effective only in shallow margins of main river). High CPUE of fry and parr found in Kernsary sub-catchment below falls: juvenile salmon and trout present at low densities in Grudie and streams entering Loch Maree from Beinn Eighe NNR. Salmon fry and parr found at low densities in streams running off Beinn Eighe into Loch Bharranch; moderate to high parr CPUE in Coulin streams (S), and Glen Docherty (despite completion of road works). Wild salmon are still absent from the Bruachaig above falls where salmon fry were stocked in June 2007.
Squod: low CPUE salmon fry and parr in small spawning streams around Loch Squod (high trout fry CPUE).
Sand: one salmon fry was found during e-fish demo at the Gairloch Gathering on 30th June
Kerry: one site fished in Allt Loch Druim na Fearna: moderate salmon fry and parr CPUE recorded.
Torridon: 5 sites fished in October: low to moderate salmon fry CPUE; moderate to high salmon parr CPUE
Balgy (headwaters above Loch an Loin)**:** only one salmon fry though moderate CPUE of trout fry and larger trout in Allt a Ghuibhais.
Cuaig: large salmon fry were found at low CPUE ~200m above the road-bridge.
Carron (S): moderate to high fry and parr CPUE at 5 sites fished in late September. % stocked vs % wild unknown.
Ling: moderate to high CPUE of salmon fry and parr at 5 main river sites from top (Blackwater) confluence to Goblet Pool in early October. Only the lowest site was subject to stocking with salmon fry.
Croe: salmon fry and parr were throughout main stem to falls at moderate or high CPUE in early October
Glenmore: salmon fry and parr were found at moderate CPUE at four sites from Glenelg Village to Cnoc Fionn in July.
Arnisdale (S): low to moderate salmon fry and parr CPUE recorded except at lowest site in October. River levels high on day of survey, so abundance of juvenile salmon underestimated.
Kinlochhourn: trout and several large salmon parr in the main river; high trout CPUE in tributary stream below septic tank discharge.

Figures 2.7 and 2.8 show the salmon fry abundance and parr abundance (CPUE expressed as number of fish per minute fishing) at sites fished in 2007 in the WRFT area. In summary, juvenile salmon were recorded by WRFT in 2007 at more sites than previously, including in the Cuaig and Kinlochhourn rivers for first time (by WRFT). Densities of both salmon fry and parr were low in unstable headwater areas, particularly parts of the Rhidorroch (upper Ullapool) and Abhainn Strath na Sealga and Abhainn Gleann na Muice (Gruinard river).

Figure 2.7 Distribution and relative abundance of salmon fry recorded by WRFT electro-fishing team at sites fished in summer-autumn 2007.

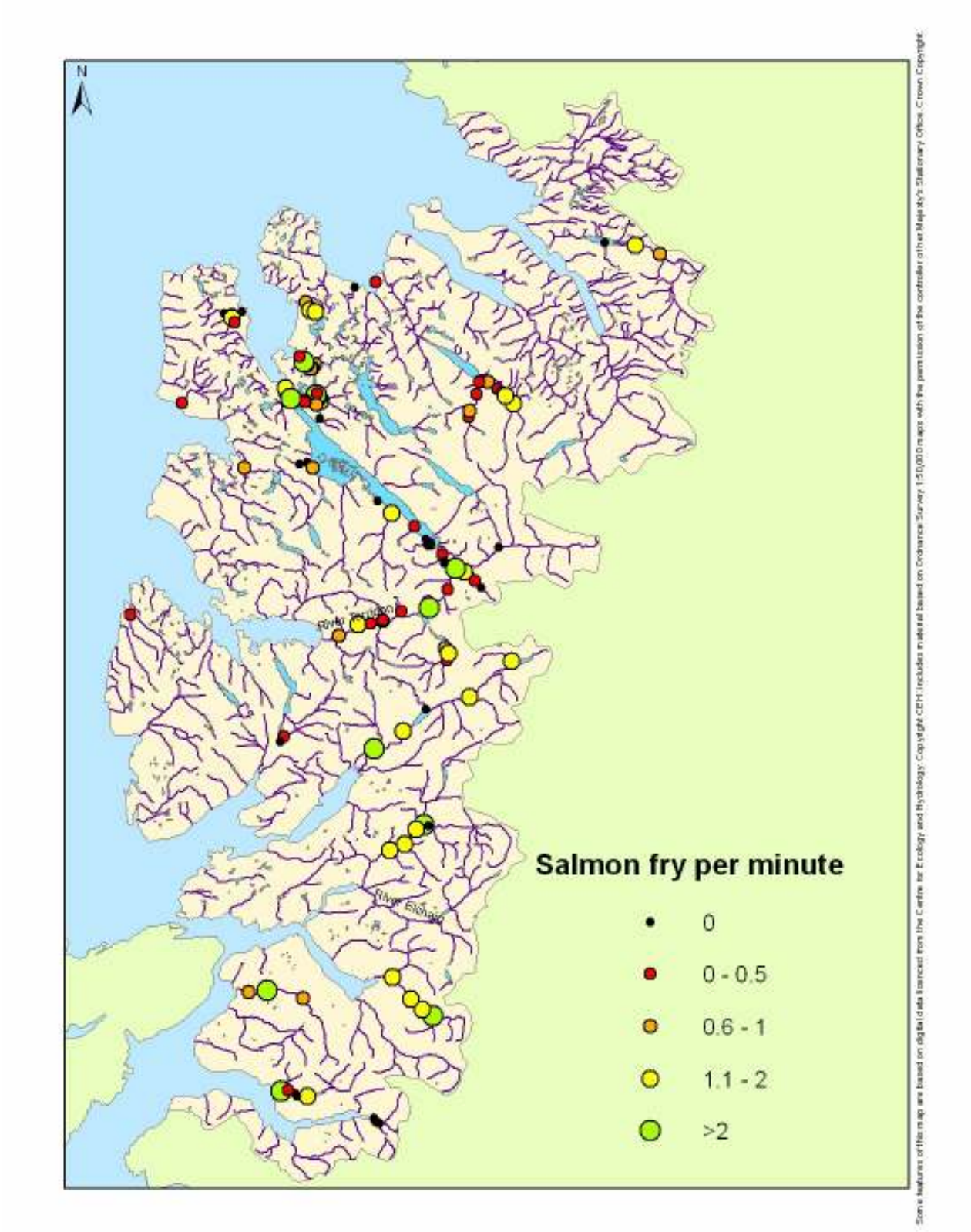
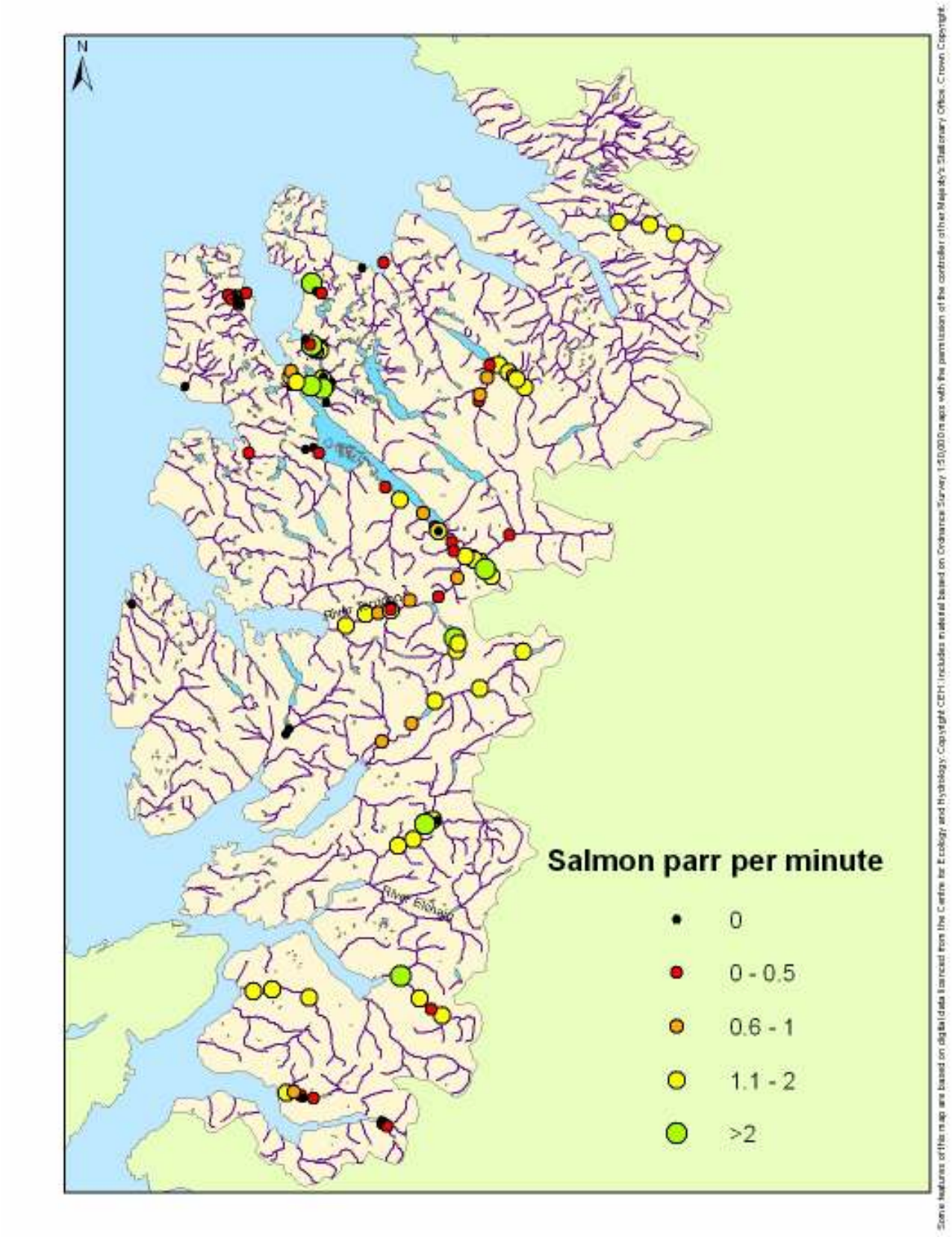


Figure 2.8 Distribution and relative abundance of salmon parr recorded by WRFT electro-fishing team at sites fished in summer-autumn 2007.



The status of juvenile salmon in river systems in the WRFT area is summarised in Table 2.1. Although the 'genetic status' of wild salmon populations is uncertain for most systems, it is included here as a reminder of the increasing importance placed by fisheries biologists on the management of wild salmon at the population level. A wild salmon is not just a wild salmon. Some rivers may have more than one salmon population, with significant differences between salmon spawning in areas above and below a major loch or infrequently passable waterfall (e.g. age and size at maturity, run timing, egg size . . .). Other rivers such as the little Tournaig system may be subject to such frequent straying of salmon from larger neighbouring systems (e.g. the River Ewe in the case of Tournaig) that their salmon 'population' is effectively part of a larger genetic continuum of salmon extending across several rivers.

Table 2.1 River systems where juvenile Atlantic salmon have been recorded by WRFT e-fish teams. 'Distribution' refers to the occurrence of juvenile salmon within the area considered to be accessible to adult fish. 'Date' refers to the time of the most recent electro-fishing survey of the distribution of juvenile salmon. 'Genetic status' refers to the likely status of the population.

	River	Distribution	Date	Genetic status	Notes
1	Kanaird	widespread	2007	uncertain	Genetic status uncertain: stocking & escapees
2	Ullapool	widespread	2007	uncertain	Retains spring run, now dominated by grilse
3	Lael	restricted	2005	uncertain	May be part of Broom metapopulation
4	Broom	widespread	2006	uncertain	escapees present in 1990s
4	Dundonnell	widespread	2007	uncertain	supplementary stocking from native fish
5	Gruinard	part-restricted	2007	part-healthy	salmon absent from headwater
6	Inverianvie	present	2007	metapopulation?	small system
7	Little Gruinard	widespread	2006	healthy	Special Area of Conservation [SAC]
8	Allt Beithe	present	2007	metapopulation?	salmon recolonised area above fish ladder
9	Tournaig	widespread	2007	metapopulation?	salmon spawned in 2004 after absence of 3 yrs
10	Ewe	part-restricted	2007	part-healthy	wild fish absent from Bruachaig headwaters
11	Sguod	present	2007	metapopulation?	lower densities in 2007 than 2006
12	Sand	present	2007	metapopulation?	one site fished each year
13	Kerry	widespread	2007	uncertain	escapees present especially in 1990s
14	Badachro	widespread	2006	?healthy	
15	Torridon	widespread	2007	uncertain	escapees present especially in 1990s
16	Balgy	widespread	2007	uncertain	?feral population decended from escapees
17	Cuaig	present	2007	recolonised	
18	Applecross	unknown	pre 2002	uncertain	stocked with locally native fish (Bob Kindness)
19	Kishhorn	unknown	pre 2002	uncertain	stocked in past with fish from various sources
20	Carron	widespread	2007	uncertain	stocking throughout system (Bob Kindness)
21	Attadale	present	?2007	metapopulation?	Bob Kindness records; small system
22	Ling	widespread	2007	healthy	part-stocked with native fish
23	Elchaig	widespread	2006	uncertain	?wild salmon recolonised top of system in 2005
24	Croe	widespread	2007	uncertain	easily accessible to escaped farm fish
25	Shiel	widespread	2006	uncertain	easily accessible to escaped farm fish
26	Glenmore	restricted	2007	uncertain	salmon absent from top in 2006
27	Glenbeag	restricted	2006	uncertain	salmon absent from top in 2007
28	Arnisdale	widespread	2007	uncertain	stocked from native rod-caught adults
29	Kinlochhourn	widespread	2007	metapopulation?	small system
30	Barrisdale	restricted	2006	recolonised	small system

The Little Gruinard River retains the healthiest salmon population(s) and the River Ling has made a strong recovery. The Ullapool River retains a spring run of salmon though the genetic significance of this is unclear. The extent to which the River Carron retains any stock structuring into different populations following the collapse in stocks in the 1990s and restocking programme can be clarified through genetic analyses of juvenile salmon from different parts of the catchment area. Small rivers (e.g. Sguod, Cuaig, Barrisdale) are likely to have been subject to greater genetic flux than larger rivers.

A conservation priority is to identify 'core' populations that have remained relatively unchanged over recent decades. WRFT and other members of RAFTS are seeking support for FRS (Dr Eric Verspoor and team) to carry out a collaborative genetic screening of all salmon populations in Scotland.

Other fish species

In addition to salmon, WRFT electro-fishing teams record trout, eel, minnow, stickleback, flounder and lampreys where they are encountered. For most sites, juvenile salmon tend to be more abundant than other fish because of the type of habitat selected for fishing. However, for many of the smaller streams and systems, trout are more abundant than salmon.

Trout

Trout tend to be particularly abundant in little side streams; the narrower and more stable (and greener) the stream, the higher proportion of trout. Small trout (including fry) were particularly abundant in the streams flowing into Loch Sguod, in the Second Coast burn, and in the Balmacara burn (where an electro-fishing demo usually takes place during the National Trust For Scotland – Forestry Commission Balmacara Open Day in May), and in the Kinlochhourn system particularly in an enriched section of stream below a septic tank outflow.

It is not possible to distinguish progeny of sea trout from progeny of brown trout in the field. In some situations both forms of trout are likely to have spawned together. Small trout are more vulnerable to extreme spate events because they are less well adapted than juvenile salmon to fast flows.

Eel

Small eels tend to be most abundant at sites nearest the sea. Larger older eels (of 20+ cm in length) are found throughout river systems. They can be particularly abundant at loch outflows. Because eels tend to emerge more slowly from the streambed than juvenile salmon and trout during electro-fishing, numbers recorded usually represent a smaller proportion of the eel population than for salmon and trout.

Eels may live for over 20 years in freshwater prior to descending to the sea. There is much concern that numbers of elvers entering European rivers have fallen. WRFT will continue to monitor the distribution of eels within the area and to measure lengths of eels caught, to see whether there are changes in eel occurrence within the WRFT area.

Minnow

Of note, minnows were found at the outflow of Loch na Sealga in June 2007. This is the first record by WRFT in the River Gruinard system. Minnows are regarded as being non-native within the WRFT area. The spread of the minnow within the WRFT area is thought to have been primarily due to discarded live bait (use of live bait is now banned).

The largest salmon parr recorded during 2007 electro-fishing survey: a 160mm salmon parr from the top of the Allt Beithe below the Loch a' Bhaid Luachraich outflow.

Part 3 **Sea lice monitoring and AMAs**

Supported by Scottish Government's Tripartite Working Group

3.1 Sea lice monitoring

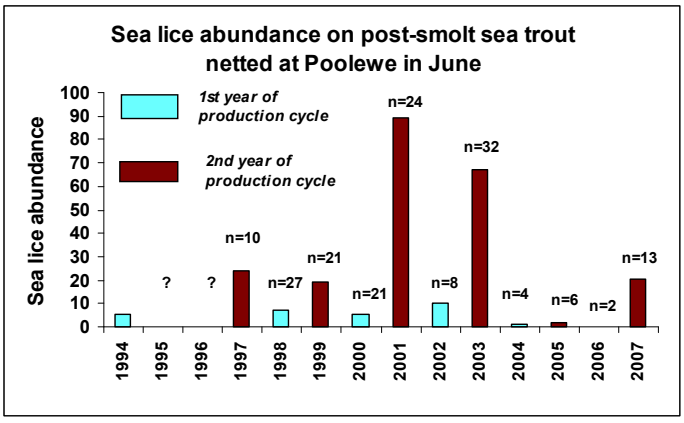
The sea louse *Lepeophtheirus salmonis* is a naturally occurring parasite of salmon and sea trout. Like many other naturally occurring parasites of fish, normal levels of infection are not sufficient to adversely affect the survival of the host fish. However, during the 1990s, many sea trout, especially post-smolts of less than 25cm in length, were recorded carrying unusually high levels of lice in river estuaries within Wester Ross especially during the early summer when they should have been feeding further out in the sea lochs (sometimes an average infestation of 50+ lice per fish). Similar observations were made elsewhere in Scotland, Ireland and Norway (*for a review see Boxaspen 2006*).

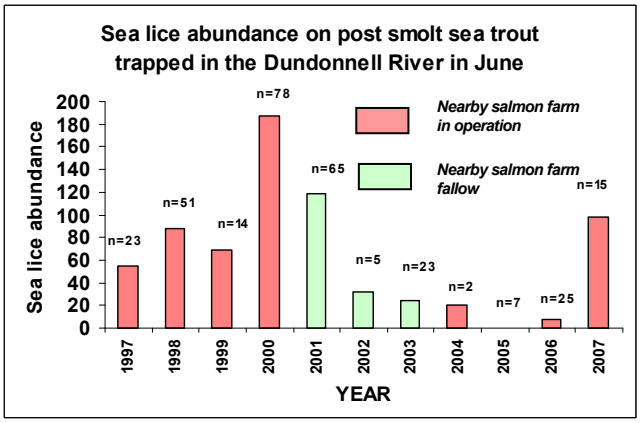
Loch Ewe sea lice epizootic in 2007

The WRFT biologist was first alerted to a sea louse epizootic affecting sea trout in the River Ewe following the capture by an angler of a finnock with high numbers of lice in the river in mid May 2007. Of 28 sea trout subsequently sampled from the river in May using rod and line, 25 carried sea lice. Two of the smallest fish had no lice and were thought to be smolts on their way to sea. Lice numbers counted on live fish ranged from 2 (these may have transferred from a heavily infected fish to a fish that had not yet been to sea in the bucket) to 374 (see cover photo). 21 fish carried thirty lice or more and of these 10 had over 100 lice. Many of the lice were very small stage 'chalimus 1' and 'chalimus 2' indicating recent infection in the sea, probably a short distance from the river mouth. A sample from the river was re-examined by the FRS Fish health inspectorate confirming that all lice were *Lepeophtheirus salmonis*. Results were reported to the Loch Ewe Area Management Group for their consideration.

Traditionally, WRFT has monitored sea lice levels of sea trout from the beginning of June using a gill net set for one hour over high tide at the river mouth to target any early returned post smolts. Subsequent samples in June from both the river using rod and line and from the traditional gill net monitoring site at the mouth of the river provided further documentation of a sea lice epizootic in Loch Ewe (see Figure 3.1).

Figure 3.1 Sea lice abundance on post-smolt sea trout taken at traditional monitoring sites at Poolewe and Dundonnell. The production status of nearby salmon farms is shown for comparison.



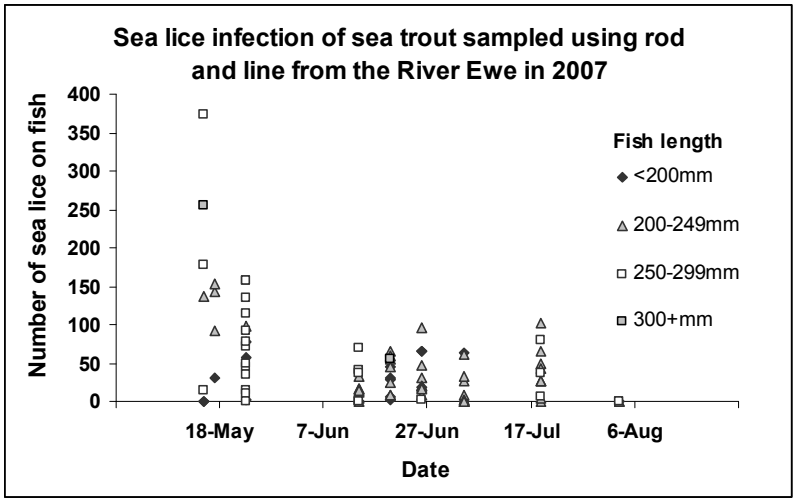


Initially, older fish (over-wintered sea trout and finnock from 26cm up to 33cm in length) were recorded in samples from the River Ewe (Figure 3.2). From the middle of June through July, most of the infected fish taken from the Ewe were less than 25 cm in length. No lice were found on a sample of 5 sea trout from the River Ewe in August. Scarring indicated that these fish had carried lice earlier in the summer though two of the five fish were in reasonable condition and may have subsequently been back to sea and fed.

Figure 3.2
Numbers of sea lice on sea trout sampled from the River Ewe using rod and line in 2007.

Lice abundance was higher in May, when sea trout of over 25cm were caught. From mid June onwards, smaller sea trout (post-smolts) with fewer lice were predominant.

No lice were seen on a sample of 5 fish taken on 3rd August; however scarring and fin erosion indicated that these fish had been infected with lice earlier in the summer.



Fifteen post-smolt sea trout (sea trout of 25cm or less in length) were taken in the Dundonnell Fyke net in Little Loch Broom in June (see Figure 3.1). On 10 of these fish, sea lice levels were high (from 30 to 300+ lice per fish). Heavily infected prematurely returned sea trout were also reported from the Ullapool River in June. On the 28th June 10 fish were taken using rod and line from the sea pool of the River Kanaird following a report of heavily infected sea trout. Lice numbers ranged from 0 to 180. One of these fish was a 38cm long sea trout with no sea lice. However, scarring and dorsal fin erosion indicated that lice had been present earlier in the year.

In Loch Torridon, sea trout with up to 400+ sea lice were recorded in May-June 2007 by the FRS Shieldaig Sea trout Project (Raffell *et al* 2007). Further details of this epizootic and of the numbers of sea trout subsequently surviving to return to the FRS Shieldaig trap in 2007 have been requested.

No reports of heavily infected sea trout were received from the Loch Carron area. Further south, finnock with lice scarring were seen in the River Shiel beneath the Glenelg road bridge in late July 2008; however no reports were received by anglers of infected fish from the area.

Ben Rushbrooke and David Mullaney recording sea lice on a sea trout at Poolewe in June 2007

Discussion and conclusion

After three years without a serious lice epizootic, the 2007 results were disappointing. Many of the fish recorded by WRFT in the River Ewe and at Dundonnell carried over 100 sea lice.

Of particular concern was the presence of larger, older fish in the River Ewe with high numbers of early stage sea lice during May. Many of these fish had survived a first summer at sea in 2006. Nearly all Ewe system sea trout are believed to over-winter in freshwater rather than at sea (Walker, *pers comm.).* At the Tournaig trap over-wintered sea trout and finnock have been recorded returning to sea in March and early April prior to the peak period of sea trout smolt migration.

The fate of heavily infected fish was undocumented. Rod catches of sea trout for the River Ewe – Loch Maree system for 2007 provide little evidence that the sea trout population recovered from the epizootic later in the year (Figure 2.6). The FRS Shieldaig Sea trout project in Loch Torridon may provide information on rates of survival of fish that have been heavily infected.

Because farmed fish greatly outnumber wild fish in local waters, good on-farm sea lice control is vital to enable a recovery of wild sea trout populations [see WRFT Review May 2007]. Until 2007, the in-feed 'medicine' *emamectin benzoate* (trade name 'Slice') was the most effective treatment for maintaining very low levels of lice on salmon farms. Early in 2008, a study was published by Lees *et al.* which investigated trends in the efficacy of the *emamectin benzoate* in Scotland. ''The results show that although sea lice infestations are reduced following the application of *emamectin benzoate*, not all treatments are effective. Specifically there is evidence of variation across geographical regions and a reduction in efficacy over time. Reduced sensitivity and potential resistance to currently available medicines are constant threats to maintaining control of sea lice populations on Atlantic salmon farms. There is a need for on-going monitoring of *emamectin benzoate* treatment efficacy together with reasons for any apparent reduction in performance. In addition, strategic rotation of medicines should be encouraged and empirical evidence for the benefit of such strategies more fully evaluated.'' At the Two Brooms Sea lice review meeting on 4th April 2008, representatives of Wester Ross Fisheries described how they are able to control sea lice using bath treatments in rotation with SLICE.

WRFT will continue to monitor levels of sea lice on sea trout and report to local Area Management Groups and the TWG Regional Development Officer, in order that appropriate action can be taken to safeguard the health of wild fish.

Acknowledgements

For help with sea lice monitoring and providing records in 2006, thanks to Donald Macleod, Johnie Parry, Brian Fraser, Alastair Macdonald, Ben Rushbrooke, David Mullaney, Willie Hardy (for use of a fine boat), Ray Dingwall, Murray Stark; Nicholas Sanders, Gonzalo Zelaya and other members of Glenelg AC, and to Tim Fison. Thanks to Wester Ross Fisheries for hosting a sea lice review meeting in Ullapool in April 2008.

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3.2 AMG / TWG Updates

Compiled by Ailsa McLellan (Regional Development Officer for Wester Ross and West Sutherland)

All 4 Area Management Groups have been holding biannual AMA meetings as normal. Levels of attendance vary, and it would be nice to see some more riparian interest in certain areas.

WRFT has received funding for sea lice monitoring using a sweep net through May and June for the next three years. Currently the sites chosen are in Loch Broom, Little Loch Broom, Loch Ewe, Loch Carron, and Loch Alsh, more sites may be added. Any muscle power volunteered to help with this would be gratefully received. Some of the fish caught will have the adipose fin clipped off and be tagged with a visible impact tag behind the eye. This is a small fluorescent rectangle with a 3 digit number on it. If any of you catch these fish please let Peter or myself know, with length and weight if possible. As normal the fish farm signatories to the AMA's allow the Regional Development Officer to carry out site visits to count sea lice, and all extend an open invitation to members of their groups to visit the sites if they wish.

Ewe (signed in 2005)

Over the last 2 years the Ewe AMA has received TWG funding for the Tournaig trap and the Bruachaig restoration project.
There was a significant escape incident from the fish farm local to the Ewe in November last year. Communication between WRFT, Marine Harvest and the local riparian owners was very good, and nets were deployed as soon as possible. 14 fish were caught in gill nets set around the farm, and none were caught by net, or rod and line in the rivers.

Carron/Kishorn (signed in 2001)

The Carron/Kishorn AMA received funding for a Tagging machine and the labour required to run an experimental tagging of parr in 2007 and 2008: while it is too early to measure success, there have already been some interesting results. The Seafield centre picked up a TWG funded screw trap in April which they are using to measure smolt output.

Torridon (signed in 2001)

This continues to be a very active AMA with FRS sharing a lot of the data from their work in the Loch to the group. This allows a more comprehensive picture of lice movements than in any other area.

Alsh/Duich/Hourn (signed in 2005)

This remains a peaceful AMA (touch wood) with good relations between all of the parties involved. Sea lice levels have been low on both farmed and wild fish throughout 2007.

The AMA process would not be possible without the time and effort invested by the estates and fish farms involved.

Karen Starr and Lorna Brown have left their posts as secretaries to the Carron/Kishorn, Torridon, and Ewe AMA's. Everyone involved in these AMA's would like to thank them for their patience and hard work over the years.

Information on the TWG, AMA's, and updates on project work can be found at www.tripartiteworkinggroup.com

Part 4 **Tournaig trap project review**

Supported by Scottish Government's Tripartite Working Group (until end of 2007-08) and Marine Harvest (from beginning of financial year 2008-09)

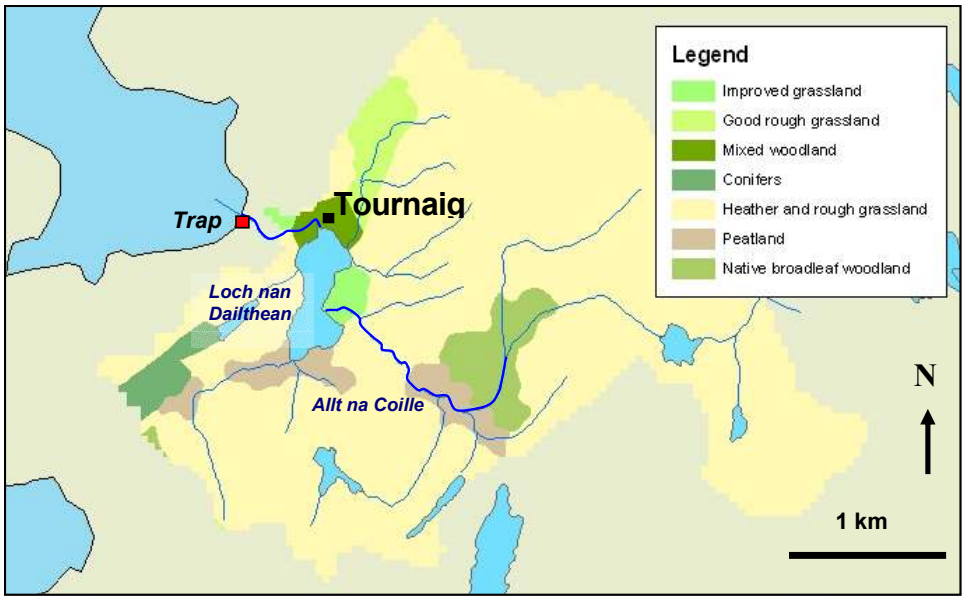
The natural recovery of a wild salmon population

The importance of stocking as a means of restoring a salmon population has been much debated. It has been claimed, for example, that the revival of the salmon fishery in the River Carron in Wester Ross from the year 2000 can be attributed primarily to a stocking programme (Kindness, 2008). Although improved marine survival is acknowledged as a contributory factor, the suggestion is made that without the stocking programme, the recovery would not have taken place to anything like the extent that it has. Some proponents of stocking go so far as to question why river proprietors in other areas don't follow the River Carron example and establish long-term stocking programmes to restore and enhance their salmon fisheries.

Most fisheries scientists and fishery managers agree that stocking can accelerate the restoration of salmon *production* at least in the short-term. However, geneticists have expressed concern that salmon *populations* based on stocking may be less well adapted or less 'fit' for purpose in the long-term than populations descended from natural spawning. In other words, there may be short-term gains from stocking programmes, but in the long-term, a population descended from stocked fish may be less productive than one descended from wild, naturally spawned fish. Geneticists argue that natural rehabilitation should be allowed to progress without intervention except as a last resort (see Verspoor *et al* [eds.] 2007).

How quickly can a salmon population recover without intervention? The Tournaig trap project has enabled WRFT to document the extirpation and regeneration of a salmon 'population' in the little Tournaig River system by Loch Ewe in northwest Scotland. The study is based on records of fish entering and leaving via fish traps opportunistically located in a fish ladder by the mouth of the river over a nine year period from 1999 to 2007, and complimentary data from juvenile fish surveys of the area accessible to migratory salmon within the river catchment.

Figure 4.1 The River Tournaig catchment area showing the location of the fish trap



Project aims

With a catchment area of only 9.6 km^2, the Tournaig River is the smallest river system in the Wester Ross Fisheries Trust (WRFT) area known to have supported wild salmon. Adult salmon and sea trout are able to enter from the sea via a fish ladder reputedly built by Osgood Mackenzie in 1875. In March 1999, an upstream-downstream fish trap was established in the fish ladder. The primary long-term aim of the project was to monitor the status of the salmon and trout populations particularly in relation to marine survival by recording the numbers of smolts leaving each year and the numbers of returning adult fish. Since 2002, details of silver eels leaving the system have also been recorded.

The traps were established with support of Tournaig Estate (the late Lady Horlick) and National Trust for Scotland's Inverewe Estate, and grant funding from The Highland Council, Ross & Cromarty Enterprise, the Atlantic Salmon Trust and the Fishmongers' Company. Operation of the traps since 2004 has been supported by the Tripartite Working Group with funding from the Scottish Government (formerly Scottish Executive) via Highlands and Island Enterprise and the Crown Estate. The trap project provides information for the Loch Ewe Area Management Group about salmon (including farmed escapes), sea trout, and parasitic sea lice.

Extirpation of a salmon population

Following the start of the Tournaig project in 1999, salmon failed to breed within the river system in 2000, 2001 and 2002. Salmon smolt runs fell from an estimated 634 in 1999 to 96 in 2002 (Figure 4.2). In 2003 only 5 salmon smolts migrated downstream: all were retained in a belated attempt to establish a captive broodstock of 'native' Tournaig salmon; all died. No salmon smolts were recorded in 2004.

The need to intervene to restore a salmon population was discussed. A stocking programme was proposed, carefully considered then rejected. It was decided instead to see what would happen without intervention.

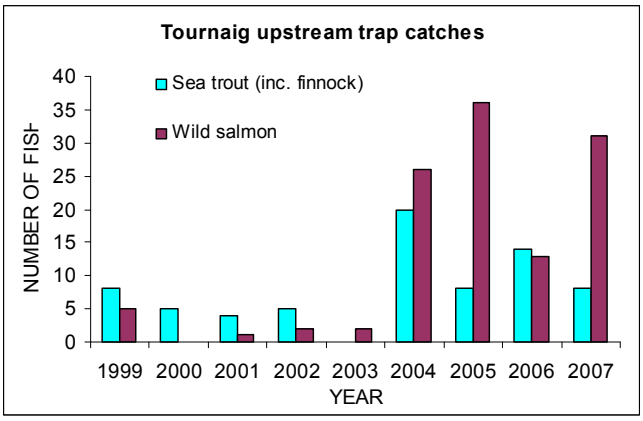
Ben Rushbrooke removing a salmon from the upstream trap at Tournaig.

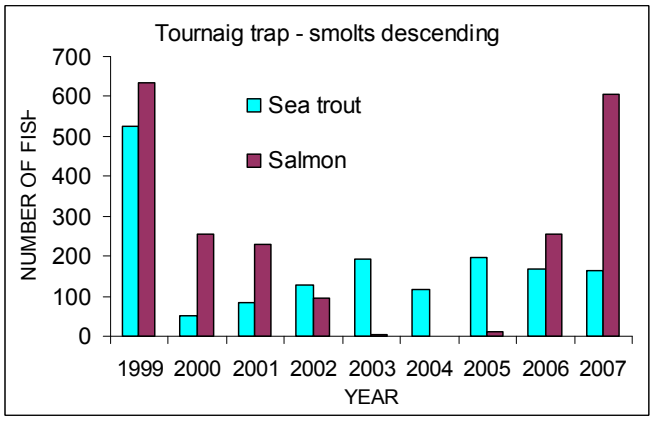
Revival of a salmon population

In 2003, two wild adult salmon were recorded entering the system. In March 2004 two kelts (neither of which matched either of the fish recorded in 2003) were recorded on their way downstream indicating that other salmon had ascended the water falls and bypassed the fish trap in autumn 2003 during a period of exceptionally high discharge. The electro-fishing survey in 2004 demonstrated that salmon spawned in the Tournaig system in autumn 2003 for the first time since 1999.

In 2004, 26 stray wild salmon entered the system via the trap. In the following years numbers of adult salmon recorded entering the system were: 36 in 2005 (all strays); 13 in 2006 (all strays); and 32 in 2007 (may have included returning Tournaig fish; DNA analyses of samples from these fish to follow).

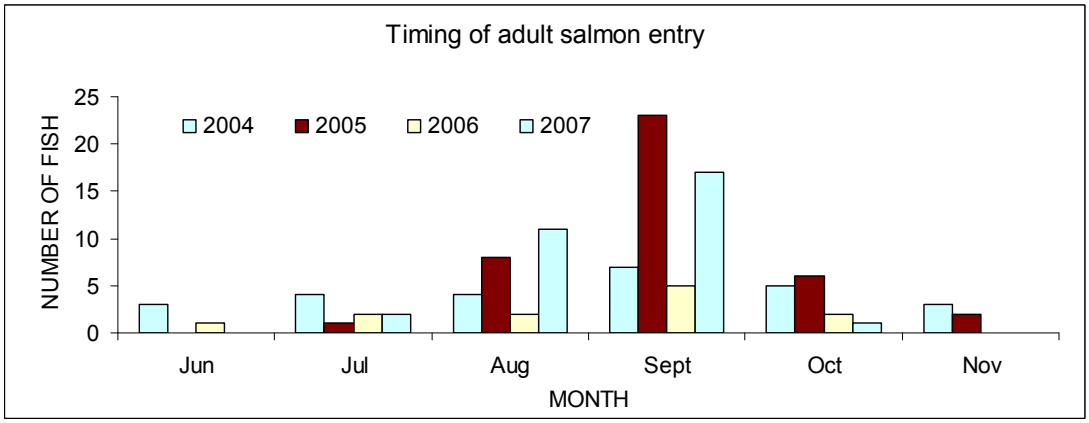
Figure 4.2 Catches of salmon and sea trout in the upstream and downstream traps at Tournaig.





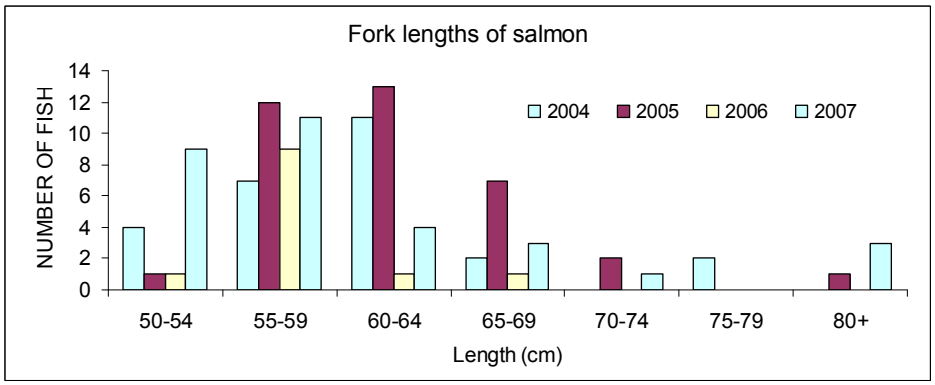
Salmon were taken in the trap between June and November, with September the peak month for entry each year from 2004 to 2007 (Figure 4.3).

Figure 4.3 Timing of adult salmon entry at Tournaig, 2004 - 2007



Most fish were grilse of between 50cm and 65cm in length, with small numbers of larger 2 sea-winter salmon. In 2007 three salmon of 82 - 83 cm were taken, equal to the largest fish taken in the trap to date (Figure 4.4).

Figure 4.4 Fork lengths of adult salmon taken in the upstream trap at Tournaig

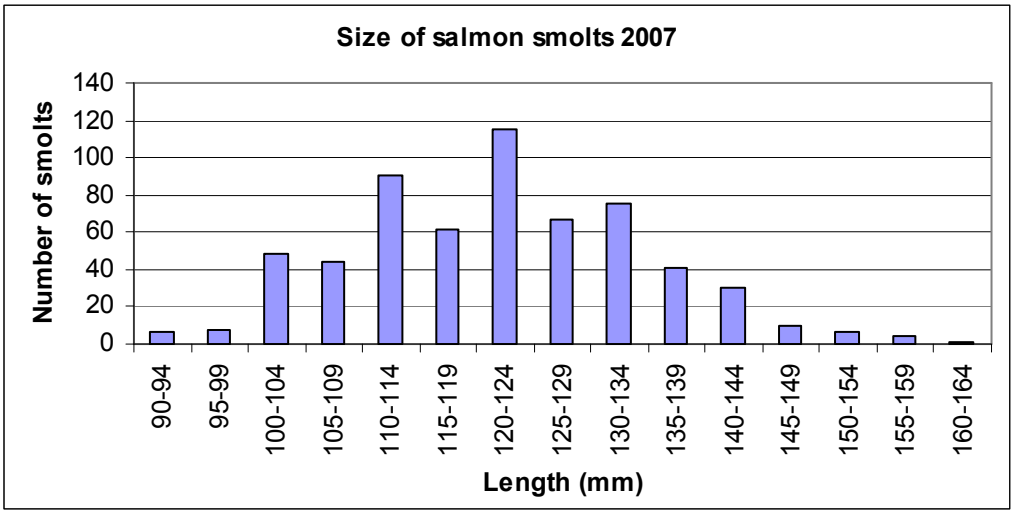


Juvenile salmon production

Salmon fry (young of the year) were found in the Tournaig system in 2004 for the first time since 2000. Salmon fry were found throughout the system in 2005, 2006 and 2007. By summer 2006, the juvenile salmon population was considered to be close to carrying capacity for the river system. Salmon fry were smaller in 2005, 2006 and 2007 than in 2004, indicated that growth rates had declined and suggesting that growth rates were related to the overall density of both salmon fry and parr (there were no salmon parr in the system in 2004).

Numbers of salmon smolts recorded leaving were as follows: 11 in 2005 (all S1s), 257 in 2006, and 607 smolts in 2007. The rate of growth and smolt age of juvenile salmon varied between years. Prior to the collapse of the salmon population, smolts of 3 and 4 years of age were regularly recorded. The mean length of salmon smolts emigrating from the system was 14.5cm in 1999, 14.6cm in 2000, and 15.0cm in 2001. Following recolonisation, the mean length of salmon smolts was 11.3cm in 2005 (all fast growing S1s), 12.6cm in 2006 (fast growing S2s), and 12.0cm in 2007 (approx. 66% S2s and 34% S3s). Figure 3.5 shows the lengths of salmon smolts recorded in the downstream trap at Tournaig in 2007.

Figure 4.5 Lengths of salmon smolts recorded at Tournaig in 2007 (607 fish)



Conclusions to date

This project has already demonstrated that wild salmon can recolonise vacant habitat and re-establish juvenile populations within a few years given favourable conditions and circumstances. The location of the Tournaig river mouth in proximity to the mouth of the River Ewe may have been a factor contributing to high numbers of straying fish. A proportion of the adult salmon were predator damaged; seals were frequently seen around the mouth of the river and may have 'chased' some of the fish into the system.

From for the point of view of fisheries management many questions remain. Are the progeny of the stray wild salmon that have recolonised the system any more likely to have the 'right stuff' in terms of suitable genes than progeny of similar fish that could have been stocked into the system in 2004 (for example progeny of River Ewe salmon)? Will they contribute to the formation of a new, genetically discreet 'Tournaig' salmon population, or are little systems like Tournaig always dependent upon salmon randomly straying (or being chased . . .) into them from other rivers? Higher levels of smolt production in the years 2000 – 2006 could have been achieved through supplementary stocking at Tournaig. A fishery manager might still argue that 6 years of optimum smolt production at Tournaig has been lost for little long-term gain . . . ?

Genetic samples have been collected to provide answers to some of these questions, and to see whether the 'new' juvenile population does indeed contribute to additional numbers of adult salmon entering the system in future years. There is much more still to learn at Tournaig through operation of the traps and monitoring of juvenile salmon populations.

Acknowledgements

Ben Rushbrooke maintained and operated the traps seven days a week through most of the year; recorded fish details and samples; photographed fish (prior to returning them); collated information onto a database, and very often phoned the WRFT office to report catches before 9 am. [After 9am Ben can usually be found at Tournaig Garden Cottage Nursery, coastal plants specialist, www.gcnursery.co.uk]. Many thanks to Letterewe estate and to NTS Inverewe Gardens for continued permission to operate the traps.

A particularly midgy electro-fishing site: Ben and David return samples of fish and invertebrate larvae to the Allt na Coille at Tournaig, July 2007.

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Part 5 **FRS Fisheries Management Contract** & WRFT Fisheries Management Plan

Contracted by the Scottish Government via Fisheries Research Services (FRS)

5.1 Introduction

Over the past 10 years, WRFT has produced a series of fisheries management plans for the major river systems within the WRFT area. These plans were prepared following surveys of river habitats and assessments of fish populations and fisheries within respective rivers. Problems for fish populations in both the freshwater and near-shore environment were considered and recommendations made for actions which would be beneficial for wild fishes and the fisheries that they supported.

The need for science-based fisheries management planning is now widely accepted. In March 2008, WRFT submitted a major piece of work for Fisheries Research Services to provide information about freshwater fish populations and fisheries management within the WRFT area. The contract which earned the WRFT £26,000 over two years was one of a suite of contracts awarded to members of Rivers and Fisheries Trusts Scotland www.rafts.org.uk following discussions with Fisheries Research Services as to how the Scottish Executive (now the Scottish Government) should support the work of fisheries trusts around Scotland.

To fulfill the terms of reference of the contract, WRFT compiled inventories of data held by the trust; completed sections describing the rivers, lochs and fish populations of the area, and outlined a series of actions needed to conserve and manage fish populations and fisheries in the area. An overall aim of the contract was to assemble the building blocks from which an up-to-date fisheries management plan for the Wester Ross Fisheries Trust area could subsequently be developed. Over the coming year (2008), a fisheries management plan for the WRFT area will be developed in consultation with a wide range of people including fishery proprietors, government agencies, and other interested parties.

WRFT Biologist, Peter Cunningham, making survey notes in the upper Gruinard River catchment area in October 2007 (Ben Rushbrooke).

To be successful, fisheries management plans have to compliment management plans for wildlife (& biodiversity), deer stalking, livestock production and forestry.

One factor which affects production of wildlife, livestock and fish (including juvenile trout and salmon) is the very low fertility of the land and waters that drain from it. 'Ecosystem fertility' was the subject of a WRFT workshop in November 2007 (see Part 6).

5.2 Factors limiting fish populations and fisheries in Wester Ross

The fish populations and fisheries of the Wester Ross Fisheries Trust area are subject to pressures from a wide range of factors (see Table 5.1). For salmon and sea trout, levels of productivity are determined by factors within both the freshwater environment and the marine environment. Some are natural, others are man-made. The following brief summary outlines some of the major factors:

Marine environment and the collapse of inshore fisheries

Problems at sea in areas beyond inshore waters are of particular concern to salmon (see www.nasco.int). Closer to home, sea lice remain a major factor limiting sea trout production (see Part 3). Predation by seals is regarded as a significant problem in some parts of the WRFT area; the impact to fish populations is hard to quantify. Salmon and sea trout were not the only fish populations that declined or collapsed in local coastal waters. Wester Ross was formerly a world-class venue for sea angling. The British record rod-caught plaice was taken only four miles from the WRFT office in 'Longa Sound' in 1974. Ullapool hosted the world sea angling championships in the 1970s. Many stocks of white fish (except perhaps pollack) subsequently collapsed in local waters. In 1984, the Inshore Fishing (Scotland) Act removed the three-mile limit that banned the use of mobile gear within three miles of the shore. This opened the inshore fishing grounds to the trawlers. Many local fishermen relate the collapse of inshore fish stocks to the removal of the three-mile limit. Some scallop divers have reported that scallop dredgers have since destroyed many inshore reefs, with loss of topography, biota and habitat for numerous aquatic species. A holistic, collaborative approach is needed *now* to address and monitor these problems.

Freshwater environment

The production of juvenile salmon, trout and other fish species from the rivers and lochs of Wester Ross is limited by a range of factors, some of which affect many rivers; others are specific to particular stretches of water. With little agriculture, industry and domestic effluent entering waters in Wester Ross, there are few pollution problems. 'Space' (the area of suitable habitat available) is not the only factor that limits fish production. Production of fish and other wildlife tends to be limited by the availability of food. In turn, this is determined by the fertility of rivers and the catchment areas from which they drain (see Part 6). An increasing problem is that of habitat instability. WRFT has previously investigated the 'redd washout' problem; in July 2007 floodwaters washed away the railway line by Loch Scamhain and a new channel appeared in part of the upper Rhidorroch River. Eggs, fry, parr and the food they eat (invertebrate larvae) are washed away when the streambed starts to move. This problem is exacerbated by frequent moor burn, high levels of grazing by livestock and deer, and consequent shallow-rooted vegetation and thin soils.

One of few man-made obstructions to fish passage in Wester Ross: the culvert beneath the A832 on the Allt Bad an Luig near Second Coast (Gruinard Bay) is too steep and is impassable to sea trout.

Table 5.1 Factors limiting fish populations and fisheries production in the WRFT area

			Affected species				chronic /	local /
Factor	**Marine**	**Freshwater**	**Salmon**	**Sea trout**	**Brown trout**	**Other spp.**	**ephisodic**	**widespread**
Collapse of coastal fisheries	yes	no	**major**	**major**	no	no	**chronic**	**widespread**
Seal predation	yes	no	?medium	?medium	no	unknown	ephisodic	local
Sea lice infestation	yes	no	?medium	**major**	no	no	ephisodic	local
Lack of adult fish (survival)	yes	yes	**major**	**major**	no	**charr**	chronic	**widespread**
Inadequate spawning habitat	no	yes	**major**	medium	**major**	**charr**	chronic	local
Redd washout	no	yes	**major**	**major**	minor	**charr**	ephisodic	local
Lack of cover for juvenile fish	no	yes	medium	minor	no	no	chronic	local
Lack of holding pools for larger fish	no	yes	**major**	minor	medium	no	chronic	local
Domestic effluent	no	yes	minor	minor	no	no	ephisodic	local
Effluent from aquaculture	yes	yes	minor	minor	**?major +ve**	**charr**	chronic	local
Lack of instream nutrients and food	no	yes	**major**	**major**	medium	no	chronic	**widespread**
Acid flushes	no	yes	?medium	?medium	?medium	unknown	ephisodic	local
Degraded riparian soils	no	yes	medium	medium	medium	no	chronic	**widespread**
Waterfalls and fish passes	no	yes	minor	medium	no	no	chronic	local
Road culverts	no	yes	minor	medium	minor	minor	chronic	local
Other man-made obstructions	no	yes	local	local	local	minor	chronic	local
Predation by fish	yes	yes	**?major**	medium	no	unknown	ephisodic	**widespread**
Fish-eating birds	yes	yes	medium	medium	minor	no	ephisodic	local
Otters	no	yes	medium	minor	minor	minor	ephisodic	local
Poaching and illegal fishing	yes	yes	?medium	?medium	medium	no	ephisodic	local
Overexploitation by anglers	yes	yes	minor	minor	local	no	ephisodic	local
Genetic introgression	no	yes	**major**	medium	medium	no	chronic	?local
Stocking	no	yes	medium	medium	medium	no	ephisodic	local
Escaped farmed fish	yes	yes	**major**	minor	no	minor	ephisodic	local
Non-native & alien species	no	yes	medium	medium	medium	?possibly	chronic	**widespread**
Parasites (excluding sea lice)	yes	yes	medium	medium	local	minor	ephisodic	local
Ecosystem malfunction	yes	yes	**major**	**major**	medium	unknown	chronic	**widespread**
Inadequate knowledge & understanding	yes	yes	medium	medium	medium	medium	ephisodic	**widespread**
Inadequate knowledge of loch fishes	yes	yes	medium	**major**	medium	**charr**	chronic	**widespread**
Inadequate knowledge of marine ecosystem	yes	yes	medium	medium	no	eel	chronic	**widespread**
Communication & information exchange	yes	yes	medium	medium	medium	medium	chronic	**widespread**
Lack of awareness (by anglers)	yes	yes	medium	medium	**major**	medium	chronic	**widespread**

View from Meall a' Ghubhais towards Kinlochewe. Levels of production of fish and other wildlife in Wester Ross are limited by a lack of nutrients, particularly phosphorus. Soils are degraded and thin (as here in Beinn Eighe N'N'R). Ecosystems based on the recycling of nutrients from vegetation to herbivores to large predators and back into the soil are dysfunctional. Many catchment areas (like this one) are unnaturally barren as a result of decades of deforestation, loss of top predators, overgrazing, moor-burn and a lack of awareness and understanding of the potential to restore and rebuild more productive, biodiverse and vibrant ecosystems. Can the Scottish Government through agencies SNH and SEPA help to develop and demonstrate soil and fertility restoration methods on reserves like Beinn Eighe and thereby play a leading role in an increasingly vital global challenge or will visitors still be looking across barren, manmade rockscapes (scenically attractive though they may be to some) in another 50 years time?

5.3 Proposed aims and objectives

The fisheries management plan will address major problems that affect wild fish populations. The proposed aims of the fisheries management plan are as follows:

Aim 1: To conserve the genetic diversity and structure of wild fish populations and the habitats that support them within the WRFT area. The main species of fisheries importance are Atlantic salmon and Brown trout (including sea trout). Some river systems support several discrete populations of salmon or trout. Wester Ross is also a stronghold for arctic charr with at least 20 poorly known populations within the WRFT area.

Returning an electro-fishing survey sample of juvenile salmon and trout to the Torridon River.

Aim 2: Fisheries are sustainably managed to maximise productivity. There is a need to ensure that stocks are not exploited to levels at which there are inadequate numbers of spawning fish. The 'catch and release' policy is a means of minimising mortality, and has been recommended and adopted by many salmon and sea trout fisheries and some brown trout fisheries in the area.

Aim 3: There are wider benefits for other wildlife, biodiversity, ecology and the amenity of the area. Many other special animals, including Otter, Black-throated diver, White-tailed eagle, Osprey, many smaller birds, and insects (including carrion beetles, and in-stream invertebrates) will benefit from increasing returns of salmon and sea trout. Habitat restoration activities and possible trials to restore stream fertility should not adversely affect other vulnerable species, such as Freshwater pearl mussels.

Objectives

To achieve the aims outlined above, ten 'objectives' were outlined in the submission to FRS, together with a string of actions considered to be of 'high' priority to achieve the stated objectives. Many 'actions' are on-going WRFT activities, including juvenile fish surveys, sea lice monitoring, management projects, education and awareness raising events; others are aspirational and depend upon future funding.

Objective 1: **Conserve wild salmon populations**
Wild, locally adapted, salmon populations are the fundamental genetic units upon which the salmon fisheries of the WRFT are based. To maximise the likelihood of populations surviving and remaining productive (i.e. able to produce a harvestable surplus), population units should be identified for management purposes. This means genetic screening. If particularly vulnerable (i.e. small) populations are identified, they should be given special protection.

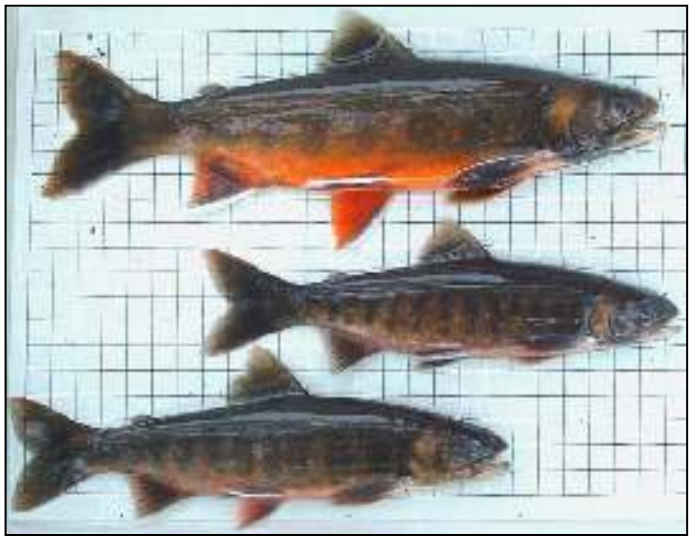
Objective 2: **Restore the Loch Maree Sea trout population and fishery**
The Loch Maree sea trout fishery was and remains potentially the most important freshwater fishery within the WRFT area. Restoration of the sea trout population(s) would be of greater benefit to the local economy and wildlife (Loch Maree is an SPA for breeding Black-throated diver) than restoration of any other fishery.

Objective 3: **Restore & enhance wild salmon production in areas where stocks have been lost to support fisheries**

Juvenile salmon populations have been lost from the accessible headwaters of some river systems. In parts of other rivers, juvenile salmon densities and growth rates are low. Actions aimed at restoring salmon production within the WRFT area are currently required for the following rivers (in order of priority): upper Bruachaig (Ewe), upper Gruinard, upper Glenmore River, Glenbeag River, Rhidorroch River (Ullapool), Balgy River, River Elchaig. These may include both habitat restoration and supplementary stocking.

Objective 4: **Restore sea trout production to support fisheries**

There are many rivers where sea trout production could be enhanced. These include the following river systems: Kanaird, Broom, Gruinard, Second Coast, Slaggan Burn, Allt Beith, Tournaig, other parts of the Ewe system, Sguod, Strath mill (Gairloch), Torridon, Balgy, Shieldaig, Cuaig, Applecross, Carron, Elchaig, Croe, Shiel, Glenmore and Glenbeag.'



Male Arctic charr from a stream spawning site in the River Ewe catchment area. There are historic records of net fisheries for charr in Loch Maree and Loch Kernsary.

Objective 5: **Develop opportunities for sustainable wildlife-friendly wild trout fishing**

A series of recommendations were presented in the 'The Wester Ross Wild Trout Project Report for 2006 – 2007'. These remain valid for the purposes of the current FMP (see WRFT Review, May 2007).

Objective 6: **Assess options for developing a sustainable Arctic charr fishery**

Before Arctic charr can responsibly be promoted as a species of fisheries interest within the WRFT area, information about the size and status of charr populations within the area is required.

Objective 7: **Lamprey and eel conservation**

Of the other freshwater fishes in the WRFT area, only eels are known to have been exploited in the past. Actions in Wester Ross should contribute to wider efforts to conserve these species.

Objective 8: **Sea fish monitoring**

Monitoring of sea fish is normally out with the remit of WRFT. However, for many inshore fish species of local interest, there is little other monitoring. Salmon and sea trout require a healthy marine environment with abundant food items (including juvenile herring, sandeels, and other fish). With an office located at Gairloch Harbour adjacent to wildlife tour operators, WRFT is in a good position to offer support to other local groups or agencies that also wish to gather information on the status of locally important fish stocks.

Objective 9: **Raise awareness of wild fisheries and their management needs**

WRFT has just launched its new website www.wrft.org.uk where newsletters, reports and the annual review can be found. WRFT also attends public open days to extend awareness of wild fish populations, the problems they face and opportunities for restorative action.

Objective 10: **Monitor and review progress**

The status of fish populations and problems that they face are constantly changing. Fisheries management is as much about being able to respond to unforeseen events and opportunities as sticking rigidly to preconceived work programmes. WRFT will continue to support fisheries managers and provide management guidance based upon the latest available information and best available scientific advice.

Part 6 **Ecosystem fertility and salmon smolt production in Wester Ross workshop**

Supported by The Highland Council and Landfill Tax Credit Scheme

Introduction

As a species, the Atlantic salmon *Salmo salar* has been around for millions of years. Salmon evolved as part of an environment and ecosystem that is different from that which we see nowadays. Because adult salmon generally home back to where they came from, the number of adult fish that return to a river is proportional to the number of juvenile fish (known as 'smolts') that go to sea.

Salmon are adaptable, able to colonise vacant habitat and to proliferate. It's only 10,000 years since salmon first recolonised the rivers of Wester Ross at the end of the last period of glaciations. Much has changed since then with the development then loss of forest cover and the loss of large predatory animals such as bears. Over the last few hundred years, human activities have done much to change river catchment areas. Until 200 years ago, cattle were grazed over much of the Highlands during the summer time. Then sheep were introduced, followed by the development of sporting estates[1].

Are the rivers of Wester Ross as productive as they once were? Should they be described as 'natural'? Should actions be taken to restore and enhance levels of fertility and the production of young salmon from our rivers (and thereby, the numbers of adult fish returning)? The main aim of this workshop which took place in Gairloch on 30th November 2007 was to learn more about production of *juvenile* salmon from the rivers of Wester Ross in relation to the fertility of the ecosystems of which they are a part.

Smolt production, salmon carcasses and predators

Dr John Armstrong (Freshwater Ecology Group leader, FRS Freshwater Laboratory) outlined factors which limit smolt production from oligotrophic streams. Until recently it was thought that the territorial behaviour of juvenile salmon determined the number of juvenile fish a stream is able to support ('carrying capacity'). However, it is now known from PIT [Passive Integrated Transponder] tagging studies that although some salmon may aggressively defend small territories of less than $1m^2$, others may range over distances of 12m or more, and their territories or ranges may overlap with those of other fish. Some fish are very aggressive; others are more cautious and opportunistic. Like people, it seems there are lots of different 'personalities'. It has even been shown that juvenile salmon are able to recognise and act less aggressively towards kin than to non-related individuals.

From stock-recruitment curves produced from field data, it has be shown that above a given level of egg deposition within a stream, the level of production of juvenile salmon does not increase [this is something that WRFT is investigating at Tournaig]. The relationship between egg deposition and the production of smolts is a little more complex than this: the distribution of nests is important. As fish grow they require more space. If nests and eggs are concentrated in a small part of a stream, hatchlings and fry may be too crowded together in some areas when in other areas there is vacant habitat. As juvenile salmon grow larger they require more space and the carrying capacity falls. Where fish grow quickly and evenly, there is little overlap in the size lengths of fish of different year classes (ages) and little inter-year class competition. However, where juvenile salmon grow slowly, some of the younger fish may be as large as the older fish and there may be competition between year classes for shelter and food, reducing the production of smolts.

[1] The grazing history of the N. Highlands is summarised in an article by Reay Clark (1995) 'The land of northern Scotland: 200 years of sheep – 1795 -1995' which appeared in the Heather Trust's Annual Report 1995.

Dr Keith Williams, Biologist for the Ness and Beauly Fisheries Trust, described studies in the River Bran near Achnasheen. In one of his experiments, salmon carcasses were manually set into the stream bed in wire cages with rocks holding them in position to prevent them from being removed by scavengers (otter, mink) or from being washed downstream, to investigate how the release of nutrients / food from the carcasses would affect juvenile salmon populations. This experiment demonstrated that salmon carcasses can increase juvenile salmon biomass in streams. The contribution from carcasses to juvenile production was likely to be small but significant at local levels. However, nutrients are very important in salmon production and Keith stressed that they should be the focus of more attention in the future. Rather than assuming that less nutrient is always the more desirable, 'more natural' state, we (and environment agencies such as SEPA) should ask 'what is the appropriate level of nutrient?' for any particular stream.

Peter Cunningham (WRFT Biologist) described how the growth of juvenile salmon in streams in Wester Ross clearly varies according to the availability of food per fish, using examples from Tournaig, the Little Gruinard electro-fishing survey (see WRFT Review May 2007), and the upper Gruinard catchment.

Sheneval bothy (left) at the foot of An Teallach is popular with hillwalkers. Adjacent soils are rich in earthworms and support a mole population. The stream is green and mossy: juvenile salmon in Allt Sheneval (below) grow faster than in the Abhainn Strath na Sealga nearby.

By removing salmon carcasses from the water, otters provide other animals within the riparian area with a marine derived food source; nutrients are recycled into soils via droppings of fox, badger, pine marten, and various birds and invertebrates, ultimately contributing via a complex nutrient web to an enhanced food supply for juvenile fish. In the most dramatic presentation, acclaimed wildlife photographer Peter Cairns (www.toothandclaw.org.uk) considered the importance and value of predators within healthy ecosystems and asked: can we [people] learn to understand and learn to live with predators?

Soils and catchment management

The afternoon session included presentations by Dr James Merryweather (www.merryweather.me.uk) on ***mycorhiza*** and soil management; John Parrott (www.scottishnativewoods.org.uk) on the importance of riparian vegetation; Eric McVicar on how the river morphology can be engineered to trap nutrients such as leaf litter and woody debris, and Dr Keith Marshall (www.macaulay.ac.uk). Keith stressed the need for a collaborative approach to developing catchment scale management options for restoring fertility.

Participants agreed that Wester Ross is not a pristine natural environment, as purported by some. There was also general agreement that levels of catchment and stream fertility had fallen over the years and that restorative actions were needed. Carefully controlled trials are required to find ways of enhancing fertility levels for wildlife (including fisheries) production. Thank you to all contributors and participants for supporting this event.

Part 7 **Alien Species in Wester Ross**

Habitat surveys were supported by the Landfill Tax Credit Scheme

7.1 Introduction

Alien species are plants and animals which have been introduced to the British Isles from other parts of the world. Many garden plants, including flowers, fruit trees and vegetables are of foreign origin. Many garden plants are valuable sources of pollen and nectar for insects and provide food for other animals. Some animals have been introduced to the country. Rabbits were introduced by the Romans. Rabbits are regarded as a pest species when their numbers are too high, but when kept in check they can be a vital food source for eagles, buzzards, fox and wildcat. Rabbit burrows provide nesting places for puffins and shelduck. The majority of alien species cause few problems for other wildlife; some are beneficial for native wildlife, sometimes slotting into 'vacant' niches within ecosystems. However, a few alien species which occur in Wester Ross are highly disruptive and represent a significant threat to native wildlife.

So far as wild fish populations are concerned, there are only two alien plants which are of concern to wild fish populations and fisheries *Rhododendron ponticum* and to a lesser extent Japanese knotweed *Reynoutria japonica*. Several non-native animal species of concern to fisheries are also present in the area: the Minnow *Phoxinus phoxinus* (see WRFT Review, May 2006), New Zealand flatworm *Arthurdendyus triangulates* and the American mink *Mustela vison.* There is increasing interest in the NZ flatworm, which has virtually cleared populations of native earthworms from croftland soils and riparian soils in some areas, to the detriment of many birds, badgers and particularly mole populations. A summary of WRFT NZ flatworm and mole survey records in the area will be reported in the next WRFT Annual Review.

7.2 *Rhododendron ponticum*

As elsewhere in Scotland, *R. ponticum* has escaped from gardens and the policies of larger houses where it was planted sometimes over 100 years ago and has spread to colonise large tracts of nearby ground. *R. ponticum* leaves are toxic to wild animals. Although *R. ponticum* flowers look magnificent in the spring, their nectar also carries the toxin, so honey produced in areas where there are extensive areas of *R. ponticum* can also be toxic during the early months of the year.

R. ponticum is invasive because toxins in the leaf litter beneath *R. ponticum* bushes inhibit growth of other plants. *R. ponticum* is well suited to the damp, mild climate of Wester Ross and is able to live anywhere that other ericaceous plants (e.g. heathers) are found, establishing mycorhiza with the same fungi that support heathers.

The occurrence of *R. ponticum* plants has been noted by WRFT during habitat surveys. In the Ullapool River catchment areas it is found on the north shore of Loch Achall. In the River Broom catchment it has colonized large parts of the hill side above Braemore, The National Trust for Scotland has cleared the plant from Corrieshalloch Gorge area, though a continuous effort will be required to prevent its regrowth from seed sources nearby. A control programme is also underway around NTS Inverewe gardens.

SNH, with support from Scottish Countryside Volunteers, are attempting to remove the plant from the River Kerry SAC catchment area. In the River Ewe catchment, the plant has spread from gardens at Inveran and around Kinlochewe. On Coulin Estate at the head of the system, the plant has been removed from large areas beneath native Scots pine trees. Further south, the plant has spread to create dense understory on the south side of Loch Torridon, though is found by the Torridon River only along the lower reaches. The plant is also found along the River Carron around Achnashellach.

It was interesting to find high densities of juvenile trout in a tributary of the Kinlochhourn River beneath a canopy of *R. ponticum* and Japanese knotweed. More research is required to learn about the decomposition of *R. ponticum* leaves in water: when toxins have leached and been flushed away from fallen leaves, are bacteria, fungi and ultimately invertebrate larvae able to exploit them as a source of food?

Rhododendron ponticum can create dense shade over streams, excluding light from the stream bed thereby limiting in-stream production of food for juvenile fish.

The riparian zone along this stream (left) near Kinlochhourn was dominated by R. ponticum and Japanese knotweed. Nevertheless, high densities of fast growing trout were recorded. [It should be noted that a septic tank discharge was located at the top of the section . . . !]

A strategic approach is required to control the plant. Grant funding should be provided only if there is commitment to eradicate the plant from an area; retaining a few bushes as 'pheasant cover' or for amenity can only accelerate the recolonisation of cleared areas by new seed. There are many other non-invasive shrubs and trees, including holly, juniper and Scots pines, which if planted in fertile soil can provide windbreaks and good cover. For further information on control, please go to: www.forestresearch.gov.uk and follow links to *R. ponticum* pages.

7.3 Mink

The status of mink within the WRFT area is unclear. Over the past few years, mink have been recorded near Loch Maree, at Attadale (near Loch Carron) and in several other areas. However, population densities to date appear to have remained low, relative to those in other parts of Scotland and the Western Isles. Why are mink not more abundant in Wester Ross?

Mink can be a direct threat to juvenile fish populations. In the Western Isles, densities of juvenile fish (including trout and salmon) were much lower in streams where mink were present. Mink are also a major threat to ground nesting birds (especially waders on the Western Isles) and their ability to swim has enabled them to reach and devastate tern colonies on offshore islands. Mink are a particular threat to the water vole populations. WRFT field teams have recorded water voles in several areas, notably within the Little Gruinard River catchment area around the Fionn and Dubh lochs.

At the time of writing, SNH and fisheries trusts are about to launch a monitoring and trapping programme to learn more about mink occurrence within the area. Of particular interest to the WRFT biologist is the association between mink and pine marten *Martes martes*. The pine marten is a native, protected animal, and is widespread within the WRFT area. Elsewhere in the country it appears that mink densities are only high where pine marten densities are low (see The Mammal Society website www.abdn.ac.uk/mammal/), suggesting that the pine marten is able to 'fend off' mink or at least limit its spread. It should be noted that pine martens also raid birds' nests, can swim across open water to islands where birds nest, and eat fish carrion. They are not, however, known for being able to catch live fish in natural situations.

Please contact the WRFT Biologist or Kenny Nelson, SNH Kinlochewe office (01445 760 254) if you can help with the mink monitoring and trapping programme.

Part 8 **Education and Awareness**

8.1 Loch Maree Family Day 2007

Wester Ross Fisheries Trust attends a series of local public events each year to provide opportunities for people to find out more about the fish and freshwater wildlife of the area, and of the work of the fisheries trust. The WRFT Loch Maree Family Day takes place in October each year and a variety of fish catching, wildlife spotting and investigation activities are organised. The Loch Maree Hotel kindly provides the boat shed for the day with an unrivalled view over the loch and the wooded Talladale shore.

In 2007 we were very pleased to have support from Lindsey Duncan, the Highland Council Countryside Ranger. Lindsey helped with guided walks and making bird cake (cake *for* birds rather than cake for those with avivorous tendencies). A range of fishes including minnow, small trout, larger trout, eels, juvenile salmon and sticklebacks were caught using varies contraptions. Some were temporarily housed in aquaria to enable closer scrutiny by people large and small prior to release; none were too much the worse for their ordeal at the end of the day. Other attractions included: slow-worm, palmate newts, the burger bbq, and a dung beetle that under microscopic examination provided several boys with much delight (especially when they discovered that it was carrying parasitic mites). Many thanks to Mark Vincent and the Loch Maree Hotel, all helpers and to The Highland Council for support.

8.2 Salmon in the Classroom (Poolewe Primary School)

At the request of head teacher Margaret Young and with support from Angus Morrison of Inveran Estate and River Ewe ghillie Ray Dingwall, WRFT returned to Poolewe Primary school to set up a classroom hatchery in February 2008, four years after running the 'Salmon and Trout in the Classroom Project' at the school for the first time.

Ray Dingwall helping children release their little fish into the Tollie Burn in March 2008.

200 eyed salmon eggs of River Ewe origin were carefully transferred into the classroom hatchery, progeny of salmon caught in the river nearby in November 2007 and reared initially by Bob Kindness. Some of the Primary 7 boys and girls were already experienced at looking after the eggs and helped the younger children learn about the project and life cycle of salmon. The children were very enthusiastic, and did an excellent job. Over 178 fry were subsequently stocked into the Tollie Burn just before the Easter Holidays.

Special thanks to Miss Darlington for all her help and to Ray Dingwall and Angus Morrison of Inveran Estate.

8.3 WRFT Website (www.wrft.org.uk)

The redeveloped WRFT website should be on line by the time you read this. The website has been designed to provide information about the fishes and fisheries of Wester Ross and to provide an outline of the work of the Trust, with links to reports, current activities and other information, and how to get involved if you are in the area. Please visit the site and let us know what you think. Thank you to Scottish Natural Heritage for a grant towards the cost of setting up this website.

Part 9 **Project Update**

9.1 Bruachaig Salmon Restoration project

Supported until the end of financial year 2007-08 by the Scottish Government via the Tripartite Working Group as part of the Loch Ewe AMG work programme.

In June 2008, the first batch of approximately 6000 salmon fry, progeny of rod caught salmon caught near Kinlochewe in 2006 and reared at Coulin Estate hatchery, were stocked into the Bruachaig River, above the falls between Incheril and the Heights of Kinlochewe. This section of river is prime habitat for juvenile salmon; wild salmon have not been recorded above the falls since the 1990s and the aim of the project is to re-establish juvenile salmon production by stocking with salmon of local genetic origin, in the hope that adult salmon will ascend the falls and return to the upper Bruachaig to spawn in future years. This upper Bruachaig was formerly the most important 'spring salmon' producing area within the River Ewe system. Since the Bruachaig juvenile salmon population collapsed, very few salmon have been taken in the River Ewe system before May.

In 2008 over 10,000 salmon fry will be stocked into the same areas (following an initial electro-fishing survey). Once again, these fry are being reared at the Coulin Estate Hatchery and are progeny of salmon taken by angers at the end of 2007. The objective is to continue stocking this section of river each year using the most appropriate (in terms of genetic origin) fish until such time as wild salmon return to spawn above the falls.

Thank you to Philip Smith, Neil Morrison, Simon Stewart and Coulin Estate for their continuing support for this project.

9.2 Loch Maree Wild trout Project

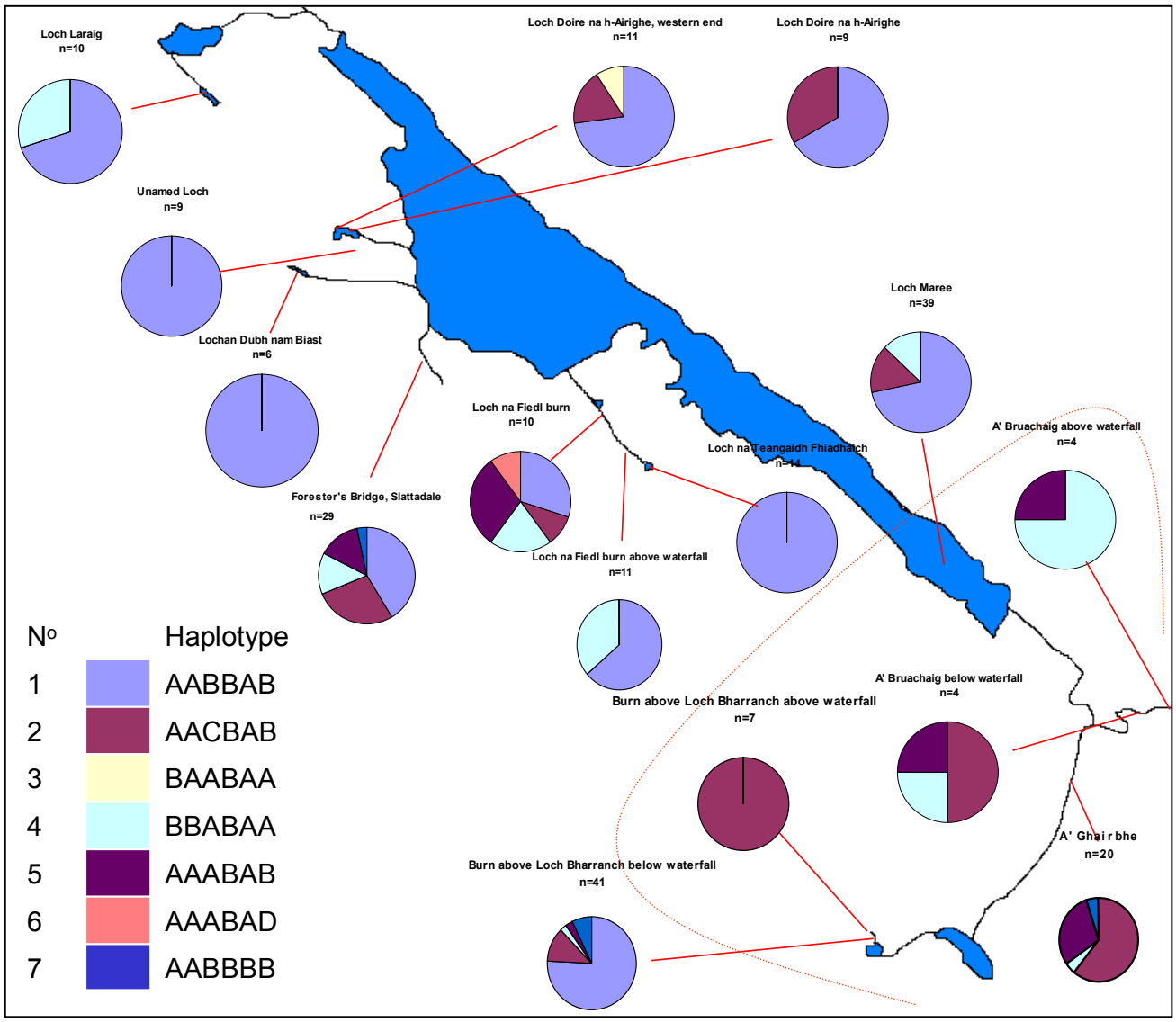
Supported by The Wild Trout Trust and The Highland Council

This project was set up in collaboration with Dr Steve Kett of Middlesex University and Dr Eric Verspoor of the Scottish Government's Fisheries Research Services and is investigating the biodiversity of brown trout and sea trout within the River Ewe – Loch Maree catchment. There are many forms of trout in Loch Maree including sea trout and ferox. Trout populations above impassable waterfalls are genetically isolated from those in downstream areas. In some of the larger lochs, two or more types of trout may live together for most of the year only to separate into geographically and genetically discrete spawning populations in the autumn.

In May 2007 the project was formally launched at the Loch Maree hotel. Following presentations by Alastair Thorne on 'ferox' trout in Scotland, Dr Steve Kett presented the initial results from mitochondrial DNA [mtDNA] analyses of samples collected in 2006. Mitachondrial DNA is found in the mitochondria of animal cells and is maternally inherited and haploid. This makes analyses of mitochondrial DNA particularly useful for investigating evolutionary lineages of animals. MtDNA analyses identifies the 'haplotype' of the animal. and is a bit like geneology where surnames can be traced back through successive generations in a family tree. Surnames (in western culture) are passed from fathers to their children; haplotypes are passed from mothers to their progeny.

PhD student Calum Button assisted with the analyses of the first 270+ trout samples. From these 7 haplotypes were identified of which 6 have been previously recorded in Scotland. Although sample sizes were small, early results are consistent with there being genetic variation in trout populations within the study area. The occurrence and relative frequency of different haplotypes appears to vary from east to west and above and below waterfalls (Figure 9.1).

Figure 8.1 Distribution of trout haplotypes within the River Ewe - Loch Maree catchment area from mtDNA analyses of initial samples (S. Kett).



In July 2007 Dr Steve Kett returned to the area to assist with further sample collection including an expedition to Loch Garbhaig (left) in search of wild trout. Many thanks to Letterewe Estate for permission to sample trout in this part of the catchment area, The Loch Maree hotel for provision of a boat, and Prof Peter Maguire for enthusiastic assistance.

Dr Steve Kett and Peter Cunningham by Loch Garbhaig, with Slioch behind, in July 2007 (Peter Maguire)

Part 10 **Financial Statement**

For the year ended 31 March 2008

		Unrestricted Funds	Restricted Funds	2008	2007 Audited
Incoming resources from generated funds		£	£	£	£
	Voluntary income				
	WRASFB	22000		22000	23256
	Membership	490		490	880
	Sub Total	**22490**		**22490**	**24136**
	Activities for generated funds	1488		1488	650
	Investment Income	1675		1675	536
	Gift Aid	4341		4341	
	Sub Total	**7504**		**7504**	**1186**
	Incoming resources from charitable activities				
	Fish Farms	4725			4500
	Orrin Trust	2000			1000
	Kinloch Woodland Trust	1000			1000
	Coulin Estate	2000			
	Southern River Proprietors	4806			4245
	Rafts Highland Council	1667			1666
	Rafts Whitley Animal Protection trust	2698			2111
	Bill Woodrow	0			1500
	Individual donations	568			692
	Sales	70			146
	Other	0			1553
	Sub Total	**19534**	**0**	**19534**	**18413**
	Total Voluntary rincoming resources	**49528**	**0**	**49528**	**43735**
	Incoming resources from charitable				
	activities Restricted.				
	Salmon & Trout in the classroom				**1920**
	AMA Seerad	**37727**			**18997**
	FRS Contract	**13000**			**13000**
	Life in Lochans	**5309**			**2217**
	Loch Maree Gill Net survey				**1000**
	Arctic Charr week				**2520**
	Wild trout project				**2000**
	SNH Website	**1400**			
	Mayfly &Stonefly workshop	**800**			
	Sub Total	**58236**	0	**58236**	**41654**
	Total Donations	**107764**		**107764**	**85389**
	Figures shown in Book keeping	107765		107765	

		2008	2008	2008	2007
		Direct	Support		Audited
		Costs	Costs		Total
Resources expended		£	£	£	£
	Costs of generating funds				
	Fundraising trading cost of goods sold				
	Charitable activities				77057
Total resources expended		**0**	**0**		**77057**
Costs of activities in furtherance of charity's objectives					
	Support Costs				
	Wages & Contract labour	14269			16301
	Insurance	1320			1536
	Telephone	897			891
	Heat & Light	498			371
	Subscriptions	2017			2046
	Training expenses	760			359
	Printing/Post / Stationery	2373			2620
	Sundry expenses	1507			622
	Comp equipment	630			
	Sub Total	**24271**	**0**	**24271**	**24746**
Charitable activities direct costs					
	Publishing		86		278
	Motor vehicle travel & subsistance expenses		4742		5172
	Wages ,Soc Security , Pension		37250		40954
	Equipment / Hire		236		2360
	Governance costs		1528		1992
	Depreciation				1499
	FRS Commission		650		
	Sundry		509		56
	Sub Total	**0**	**45001**	**45001**	**52311**
Charitable activities total costs		**24271**	**45001**	**69272**	**77057**
	Figures as shown in book keeping			**69271**	
IMPORTANT NOTICE					
The 2008 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.					
Please also note the layout of this financial statement has been ammended to come into line with the autidor's layout of accounts.					

Acknowledgements

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

Many thanks go to:

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Bob Kindness
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Colin Bean (SNH)
Colin Macdonald
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David Hay (FRS)
David Stewart (FRS)
Donald Macleod
Emma Hatfield (FRS)
Eoghain Maclean
Eric McVicar
Eric Verspoor (FRS)
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George Hamilton
Gerard Lucas
Gilpin Bradley
Gonzalo Zelaya
Greg Jeffries
Hugh Richards
James Merryweather
Jim Raffell
John Armstrong (FRS)
John Comloquoy (SEPA)
John Corbyn
John Macpherson
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Keith Marshall (MLURI)
Ken Williamson
Kenny Nelson (SNH)
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Lloyd Gudgeon
Lorna Brown
Maj Gen Seymour Monro
Marcus Simpson
Maria Hillenkamp (Edinburgh University)
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Mark Williams and family
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Nick Benge (Watergems)
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Dr Steve Kett (Middlesex University)
Tim Fison
Willie Hardy

…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 2006 – 2007 includes excursions to sample trout lochs and streams, electro-fishing surveys of many of the rivers between Ullapool and Knoydart, sea life surveys, and an arctic charr discovery week, 'Open 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, IV21 2BQ
Tel: 01445 712 899 **Email: info@wrft.org.uk**

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 / /