Skye Fisheries Management Plan

March 2010

Skye Fisheries Trust

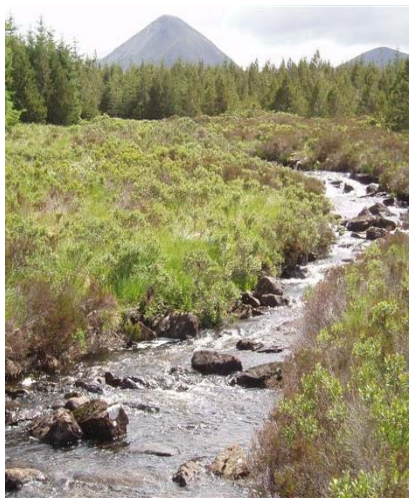


Table of Contents **Page**

CHAIRMAN'S FOREWORD

I welcome this long awaited and significant document, which is Skye's first Fishery Management Plan. It forms the basis for the restoration of Skye's rivers and fisheries during the next five years. Built upon solid, scientific foundations it will help the Trust and fishery managers to take forward the most important projects in the most effective manner and it will provide a benchmark against which to measure success.

For the first time we have a clear vision and understanding of what needs to be done to restore our rivers and fisheries to their former glory. From the casual angler to the river owner this plan will greatly assist in ensuring the sustainable enjoyment and long-term prosperity of our fish, rivers and fisheries.

Chairman,
Skye Fisheries Trust
March 2010

Acknowledgements
It would have been impossible to produce this important Fishery Management Plan without a significant amount of preparatory work initiated by the Skye District Salmon Fisheries Board and promulgated by the newly formed Skye Fisheries Trust.

A huge effort by numerous volunteers, supported by a variety grant funding providers and assisted by committed biologists has equipped us with four significant reports: The Skye Juvenile Salmonid Population Survey, the Skye Habitat Survey and the Skye Invertebrate Study reports all of which led to this the Skye Fisheries Management Plan.

We wish to thank especially the following for their support and assistance:

Jon Watt and Lorna Brown of Waterside Ecology (www.watersideecolgy.co.uk)
Derek Dowsett (www.SkyeSalmon.co.uk)
The Skye District Salmon Fisheries Board (www.SkyeDSFB.org.uk)
Scottish Natural Heritage (www.snh.org.uk)
The Nineveh Trust (www.ninevehtrust.org.uk)
The Highland Council (www.highland.gov.uk)
Marine Scotland (www.scotland.gov.uk/About/Directorates/Wealthier-and-Fairer/marine-scotland)
The Whitley Animal Protection Trust (www.whitleyaward.org)
The Wild Trout Trust (www.wildtrout.org)
Marine Harvest Scotland (www.marineharvest.com)
RAFTS (Rivers and Fisheries Trusts Scotland) (www.rafts.org.uk)

Skye Fisheries Trust
The Hatchery
Skeabost Bridge
Isle of Skye
IV51 9NP
Tel: 01470 532 512
sft01@btconnect.com

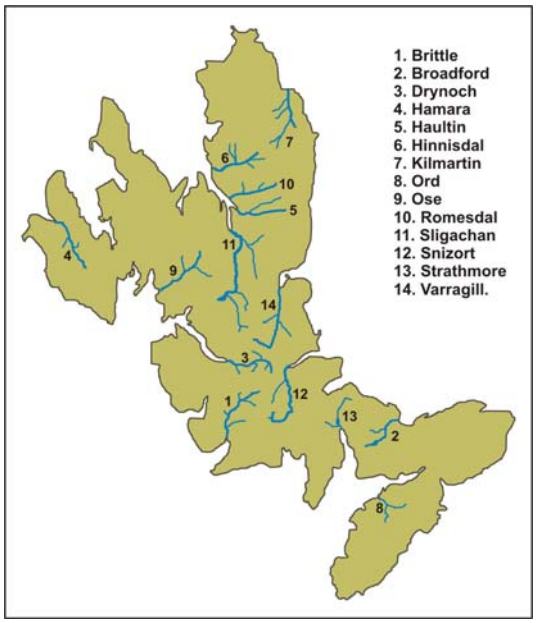
1 INTRODUCTION

The rivers and lochs of Skye have the potential to provide productive fisheries for salmon, sea trout and brown trout. In common with much of the west Highlands, stocks declined dramatically through the 1980s and 1990s. In 1996 five new Fisheries Trusts were set up covering the western seaboard of mainland Scotland and the Outer Isles. The purpose of setting up these Trusts was to develop an understanding of the factors responsible for stock declines and to identify the required actions to reverse them. Since then the network of Trusts has grown to cover most of Scotland and it is now supported by the umbrella organisation, River and Fisheries Trusts of Scotland (RAFTS). The Skye Fisheries Trust (SFT) is one of the newest Trusts, formed in 2009. This Fishery Management Plan is intended to guide its work.

Like the other Trusts, the broad aim of the SFT is to improve our understanding of the factors affecting fish populations on and to use this knowledge to promote their recovery. Its mission statement is clear:

> *"To advance for public benefit environmental protection and improvement by conserving and enhancing all species of freshwater fish, bi-valves, invertebrates, other freshwater aquatic species and fauna and their environments primarily but not limited to the inland and coastal waters of Skye, Raasay, Rona, Scalpay, Soay, Rum, Eigg, Muck, Canna and the Small Isles".*

The Trust has developed this Fisheries Management Plan (FMP) as a template for a work programme to achieve this task. The development and delivery of the plan will involve close liaison with the Skye District Salmon Fishery Board (SDSFB), fisheries owners, fisheries tenants, anglers, riparian landowners, volunteer groups and government. The plan seeks to link to other plans and policies, such as the Water Framework Directive and the local Biodiversity Action Plan. It is hoped that this will encourage greater cooperation and coordination in the management of the freshwater environment.



The Skye FMP has been developed following the Scottish Fisheries Co-ordination Centre template and has been financially supported by the Scottish Government via RAFTS. As noted above, the SFT is a new organisation and, unlike the longer established Trusts, has access to limited data on rivers and fish populations. This Plan is based mainly on four major data sources: (i) a survey of fish populations in fourteen rivers carried out in 2005 (ii) a survey of river habitats carried out in 2008 (iii) a survey of aquatic invertebrates, also carried out in 2008 and (iv) catch data provided by fisheries proprietors and SGRPID (Scottish Government Rural Payments & Inspections Directorate).

The Trust aims to ensure that all relevant parties participate in the development of the plan. If the plan is to success then shared ownership and widespread support is essential. At this stage no commitment from those consulted is implied for the delivery of the actions, but rather the consultation process identifies that there is a common interest and a wealth of relevant knowledge and experience. The plan is currently in draft form, on the first full round of consultation, and completion of the final draft is expected by the end of March. However, a full round of consultation on individual river plans has already taken place and a great deal of additional information has been added from fishery owners, tenants, angling clubs and individual anglers during face to face meetings. It is hoped and expected that the FMP will improve and evolve throughout the continuing consultation period.

2 AIMS AND OBJECTIVES

This plan aims to provide a framework for the restoration and development of Skye's main freshwater fisheries resources incorporating current scientific knowledge and best practice. The predominant focus of the plan is the economically important salmon and trout fisheries within fourteen rivers for which information are currently available. Other fish species and other river systems are identified only for future consideration beyond the present FMP (see also section 23). It is hoped that the fish populations and aquatic habitats of these other rivers and lochs will be investigated and brought into the Trust's work programme as the Trust consolidates its position.

The specific aims of the present plan are to:

- Aid fisheries managers in the restoration and conservation of salmon and trout populations
- Aid relevant parties in the restoration and protection of the habitats which support these fisheries
- Improve and share knowledge of native fish species, local biodiversity and freshwater habitats
- Ensure the genetic integrity of the local fish populations is maintained.

Although the plan concentrates on fish species, the actions will also deliver benefits to the wider biodiversity within the riparian habitats. Freshwater pearl mussels, for example, depend on a healthy population of young salmonids to complete their lifecycle and can thrive only in clean, silt-free water. It is hoped that the plan will be used as a tool to facilitate collaborative work between fisheries interests and those living in the local community, providing economic opportunities and allowing local children to explore their wildlife heritage.

To achieve these aims, the key objectives of the FMP are as follows:

- Provide background information on the fishery resources and factors affecting productivity (sections 3-6)
- Highlight issues affecting Skye fisheries at the regional level (section 7)
- Highlight issues affecting the individual river fisheries (sections 8 to 21)
- Develop a prioritised management programme to tackle these issues (sections 7, 8 to 21 and 22)
- Identify knowledge gaps and plan a long term survey programme accordingly (sections 7, 8 to 21 and 22)
- Explore opportunities for environmental education and management workshops.

The Plan has been drawn up on the basis that the SFT staff will be entirely responsible for planning and running some of the tasks identified herein. In other cases, the lead role may not fall to the Trust, but to Fishery Board, river owners or local angling groups. In such cases it is hoped that the Trust will be on hand to provide support through objective advice, based on its work, and assistance with funding applications or identification of resources.

In the delivery of this Plan the SFT encourages a precautionary approach, utilising all information available at the planning stage to ensure that management actions do not produce undesirable outcomes. Fisheries management should be based on objective information, so throughout the Plan we refer to current sources of best practice advice on issues ranging from bank restoration to stocking.

The present plan has been developed to run over a five-year period. At the time of writing funding opportunities are beginning to be explored. It is foreseen that the plan will evolve as future science-based investigations provide the Trust with more current information and as new funding opportunities arise. The SFT management group will review the plan annually and it is envisaged that an updated five-year plan will be developed in 2015.

3 THE ISLAND OF SKYE

3.1 The catchments

As stated in the Aims, the plan focuses on fourteen selected rivers. Land use, riparian and instream habitat is described in detail at the beginning of each individual river section. This section therefore describes the characteristics of Skye in general terms.

In the future SFT hope to access digital map data from the Scottish Fisheries Co-ordination Centre (SFCC). For the present time the following subsections were written accessing information from sources such as the SNH online publication Skye, Landscape Fashioned by Geology (http://www.snh.org.uk/publications/on-line/geology/skye/default.asp) and the Scottish Geology website (http://www.scottishgeology.com).

3.2 Topography and geology

Skye is a diverse and dramatic landscape, with a large variety of habitats from the mountain plateaus to the croftlands and varied coastline. The geology of Skye consists of some of the oldest and youngest rocks in Scotland and its landscape has been strongly influenced by its volcanic past.

The oldest rocks on Skye can be seen in the gneiss formations of Sleat peninsula in the south of Skye. Here too sand, mud and gravel were deposited, forming Torridonian sandstone. A large proportion of northern and western Skye is composed of basaltic lava flows which erupted during an early phase of volcanic activity and created features such as MacLeod's Tables.

The Cuillin Hills dominate the landscape of Skye. Composed of gabbro (the Black Cuillins) and granite (the Red Cuillins), these mountains are the remains of a volcanic centre. Ice further shaped this landscape during the last Ice Age, forming dramatic corries and ridges. As the Skye glacier melted the land slowly rose, creating the raised beaches seen around the coastline.

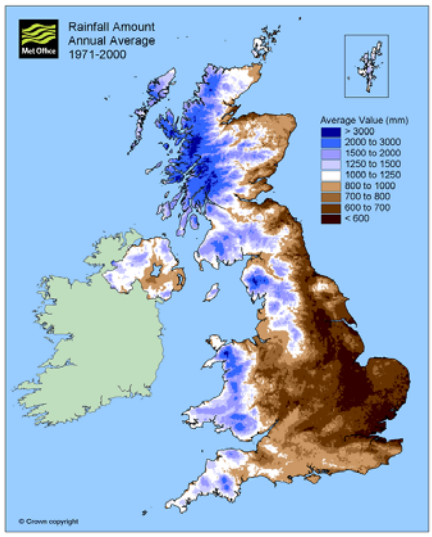
3.3 Land use

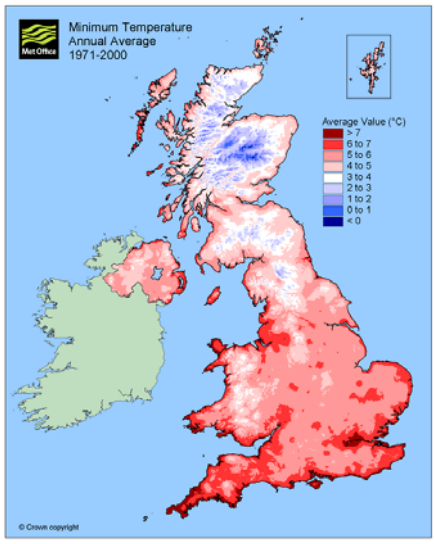
Underlying geology and climatic conditions influence the development of soil and on Skye waterlogged peaty soils are common.

Today much of Skye is composed of undeveloped moorland, classified as open dwarf shrub heath or dwarf shrub heath. Large areas of coniferous plantation extend across the centre of northern Skye, planted after native woodlands were felled for timber in the nineteenth and early twentieth century. Areas of improved grassland are scattered around the coastal areas, being most prevalent in the north east of the island. Sheep are still the dominant livestock in the crofting landscape, although numbers have diminished in recent years. The influences of forestry and grazing practices are examined in each individual river management section.

3.4 Climate

The climate of the Isle of Skye is strongly influenced by the Gulf Stream, having high annual rainfall, strong westerly winds and relatively mild winters. The mountainous Cuillin region receives the highest rainfall locally, averaging over 3000mm a year (Metoffice website, http://www.metoffice.gov.uk/climate/uk/averages/ukmapavge.html#).





3.5 Water Quality and Flow

Macro-invertebrates are a diverse group with a wide range of environmental tolerances and preferences and can be used as biological indicators to assess the quality of freshwater burns and rivers. In 2009 SDSFB commissioned a water quality and invertebrate community survey, which found that the fourteen surveyed rivers were clean and well oxygenated. On certain geologies acid flushes can impact on salmon and trout be reducing the survival of eggs and some other life stages. The Aquaterra report found that acid sensitive species were present at most sites in the 14 rivers surveyed and concluded that they were generally free from acidification (Aquaterra, 2008). Invertebrate populations are considered further in each river plan.

Due to the combination of mountainous landscapes and high rainfall many of the rivers on Skye are relatively short and prone to rapid fluctuations in water levels. This has consequences for the invertebrate communities and the fish species that rely upon them. In some rivers, mainly those draining the Cuillin hills, substrates are unstable and this may restrict fishery performance due to low productivity, lack of stable fish cover and loss of ova due to redd washout. The 2008 habitat surveys suggest that such problems are unlikely to be widespread. SEPA gauge data is available for one catchment, the Snizort, where the mean flow is recorded as 5.40 m^3s^{-1} and the Q95 (low water flow) as 0.398 m^3s^{-1}. Further information is available at http://www.nwl.ac.uk/ih/nrfa/station_summaries/105/001.html.

4 FISH POPULATIONS

Background information on the distribution of fish species on Skye is limited, being based on one electrofishing survey, focusing on juvenile salmonids, carried out in the fourteen named rivers in 2005 (Watt 2006). During this survey, a total of seven species were identified, including the minnow, possibly introduced through live bait fishing. Brook lampreys *Lampetra planeri* are recorded in the Broadford River. Unidentified adult lampreys have been reported in the lower River Snizort but surveys found no evidence of breeding (Watt & Ravenscroft 2005). Lamprey populations are uncommon on the Scottish islands and all three species found in the UK are protected under the EU

Habitat and Species Directive. The distribution of all seven species is tabulated below. The National Biodiversity Network (http://data.nbn.org.uk) records Arctic Charr *Salvelinus alpinus* have been recorded as occurring in Loch Mealt as well as in Loch an Uachdair on Raasay. Charr are also known from Loch na Dubhraichean in south Skye. Skye lacks the common introduced fish species such as rainbow trout *Oncorhynchus mykiss*, perch *Perca fluviatilis* and pike *Esox lucius*.

Brook lampreys are present in the Broadford River

The occurrence of fish species within the survey rivers, 2005.

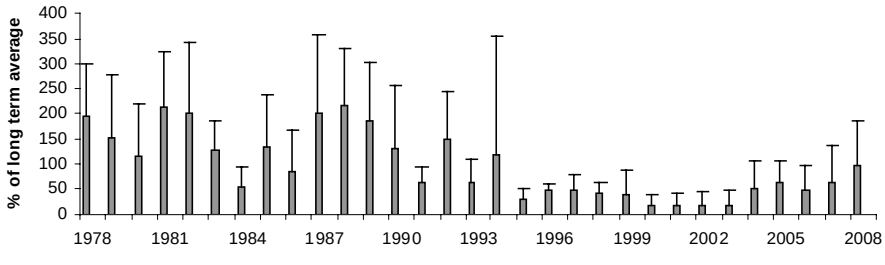
Species	Occurrence
Salmon *Salmo salar*	Brittle, Broadford, Drynoch, Hamara, Hinnisdal, Kilmartin, Ose, Sligachan, Snizort, Abhainn an t-Stratha Mhoir and Varragill.
Trout *Salmo trutta*	Present in all14 rivers surveyed
Brook Lamprey *Lampetra planeri*	Broadford
Eel *Anguilla anguilla*	Brittle, Broadford, Drynoch, Hamara, Haultin, Ord, Ose, Sligachan, Snizort, Varragill
Minnow *Phoxinus phoxinus*	Snizort
Three-spined stickleback *Gasterosteus aculeatus*	Broadford
Flounder *Platichthys flesus*	Brittle, Broadford, Varragill

4.1 Status of salmonid stocks

4.1.1 Salmon

Fishery catch returns can give an indication of historic trends in fish numbers. Intuitively, a higher level of consistency in both angling effort and recording of catch returns leads to a higher degree of accuracy in reflecting the true trends. In order to assess these broad trends in salmon and sea trout numbers from currently available data, rod catches from fisheries with the most complete series of catch records were combined. The average rod catch of salmon and from six fisheries[1] was expressed as percent of the average for the period 1978 to 2008.

Trends in salmon catch from six Skye rivers (combined data)



Percentages were used in preference to number of fish, in order that equal weighting is given to all fisheries. These combined data series suggest a long-term decline in salmon catches since the late 1980s. By the year 2000 the average salmon catch on the six fisheries had declined to 16% of the long-term average figure. Over the past five to seven years there are indications of a sustained recovery. Data for individual rivers and fisheries are provided in Section B of this report.

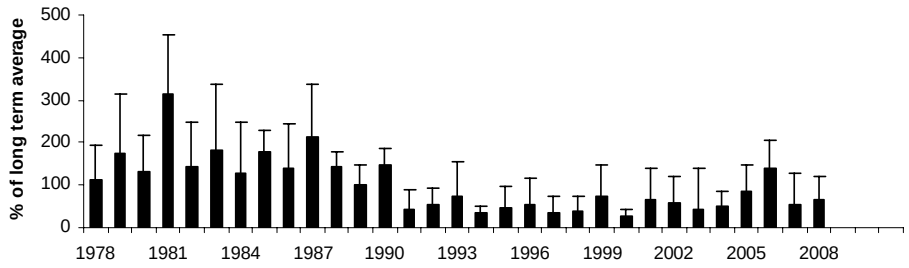
[1] Ullinish (River Ose), Drynoch & Borline (R. Drynoch and L. Gobhain, Hinnisdal & Uig (R. Hinnisdal), Staffin, Flodigarry & Duntulm Fishings (Rivers Kilmartin, Kilmaluag & Lealt), Kilbride Fishings (Lochs Cill Chriosd & Lonachan & part River Broadford), Skeabost, Three Esses Ltd. (R. Snizort) and River Varragill. Snizort sea trout data are omitted as data are patchy.

In 2005 juvenile salmon were found in 11 of 14 rivers surveyed (Watt 2006). Juvenile salmon abundance was poor in many rivers (National Rivers Authority classifications, National Rivers Authority 1994), with low densities and/or patchy distribution. No missing year classes were identified, but due to low abundance several populations were considered vulnerable. Most parr were aged 1+ and 2+ parr were always scarce. This suggests that most Skye salmon smolt and migrate to sea at age 2+, having spent two winters in their natal river. It should be noted that with the exception of the Varragill, no stocking has taken place in recent years in any river, and salmon in all other rivers were assumed to be of wild, or possibly farm escape, origin.

4.1.2 Trout

Declines in sea trout catches followed a broadly similar pattern to salmon, with the most rapid period of decline in the late 1980s and early 1990s. There has been no sustained recovery of sea trout stocks since then.

Trends in sea trout catch from six Skye rivers (combined data)



Sea trout and brown trout are the same species but differ in their life strategies; sea trout having a marine phase while brown trout remain in freshwater throughout their lives. Electric fishing surveys of juvenile fish cannot distinguish between juvenile sea trout and brown trout and therefore. Therefore such surveys determine the presence and abundance of trout overall. Juvenile trout were present in thirteen rivers in 2005. One river was only surveyed at one site in typical salmon habitat and it is likely that juvenile trout were present elsewhere in the river. Abundance was moderate in most, judged by national standards, but poor in others.

Juvenile trout (top) and salmon (bottom)

Each individual river plan contains further information on the status of salmonids within the catchment.

5 FISHERIES

5.1 Exploitation

Fisheries management within the SFT area is delivered by individual proprietors, syndicates, fishing tenants and Angling Associations. Five individuals gain direct employment through fisheries on Skye. Publicly accessible permits are available for eleven of the fourteen fisheries considered in this Plan, while fishing is restricted to angling club members or tenants on three of these rivers.

Catch and release is increasingly practiced within the Skye fisheries. Fishery practice is examined in more detail within the individual river plans.

Further migratory fisheries are covered by the District Valuation role, including the Camasunary River in the south of Skye, the Conon in the west and the Lealt in the north. It is intended that the Trust will gather information on these fisheries in the future.

Of the 12 coastal commercial fisheries, one on the east coast is currently exploited (from NG4410 77550 to NG4908 3105). A combination of atypical weather conditions, seal predation and economic factors has impacted on the running of these fisheries and the current owner feels the net fishery may not be viable in the long term (Donald Matheson, pers comm.). A number of netting rights are owned by fisheries proprietors who plan to keep the netting stations closed indefinitely.

Accessibility of Skye Fisheries

River	Fisheries Managers at the time of writing	Permits available	Catch and release
Brittle	MacLeod Estates	Yes	Not at present
Broadford	Varied	To hotel guests	Encouraged
Drynoch	Drynoch and Borline Sport	Not advertised	No
Hamara	Glendale Estate – owned and fished by crofting community	Not at present	Not at present
Haultin	P&B Kinloch, Charles MacDonald	Yes	Yes
Hinnisdal	P&B Kinloch, Cuidrach Sporting Syndicate	Yes	Yes
Kilmartin	Portree Angling Association	Yes	Encouraged
Ord	Fearann Eilean Iarmain Estate	Yes – rarely fished	Encouraged
Ose	Portree Angling Association	Yes	Encouraged
Romesdal	P&B Kinloch	Yes	Yes
Sligachan	Varied	Yes	
Strathmore	John Muir Trust	Yes	Yes
Snizort	Three Esses Limited, Portree Angling Associate	Yes	Yes/Encouraged
Varragill	C. Leslie	No	Yes

5.2 Fish propagation and stocking

Only two proprietors carry out stocking at the current time. Five thousand native River Snizort salmon fry are stocked into the lower end of the Snizort annually. A stocking programme commenced on the River Varragill in 2004. At the current time 5000 non-native salmon and sea trout are stocked annually from Wester Ross.

6 FACTORS AFFECTING FISH POPULATIONS

Many factors can have an impact on the productivity of a fish population and some, such as climate change, are outwith the remit of this FMP. Others are natural, such as impassable falls, and will have been regulating fish populations for generations. However, many are caused by human activity and can potentially be controlled. Factors likely to be affecting fish populations in target rivers are summed up below. Factors likely to be important to determining the productivity of Skye's fisheries were identified from (i) direct consultation with fisheries proprietors (Watt 2006) (ii) wider consultation with the angling community (iii) an analysis of existing data on fish populations (iv) an analysis of data on fish habitats (Watt 2009) (v) literature sources, especially those presenting information on fish populations in the Highland and Islands.

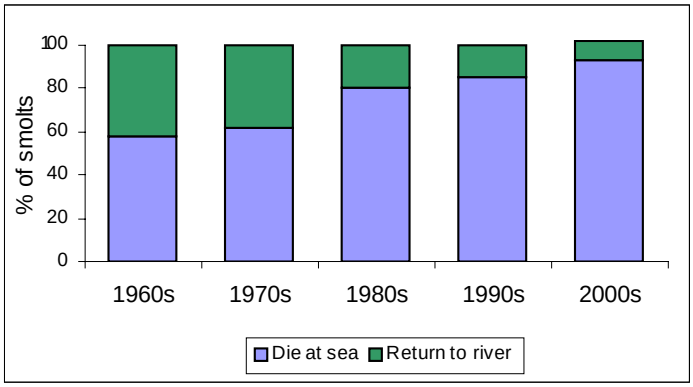
Management actions to tackle the factors set out above are presented for Skye as a whole in section 7 and for individual rivers in sections 8 to 21.

6.1 Marine

Mortality at sea is undoubtedly the single most important factor underlying the decline of European salmon stocks. Overall mortality has increased greatly since the 1960s. This means that for every one hundred salmon smolts leaving our rivers, far fewer now return as adults to breed than was once the case. It is likely that this trend is a consequence of large-scale hydro biological changes (O' Maoileidigh 2002), as similar trends are evident throughout Europe and North America.

Increasing marine mortality has important implications for fisheries management. In the past, it is probable that the overall number of returning adults available to catch was dictated largely by a river's ability to produce smolts. Now, the main controlling factor is likely to be the number of adults. As fewer and fewer adults return from sea, it becomes increasingly important that management is focused on ensuring that enough spawners remain to replenish the rivers with eggs.

Trends in marine survival of salmon



Stock declines of sea trout both in the west Highlands and west of Ireland have also been linked with reduced marine survival (Butler & Walker 2006; Walker 1994; Gargan *et al* 2006; Poole *et al* 2006). In Ireland marine survival historically ranged from 11% to about 30%, but fell as low as 1.5% during the collapse. It has not fully recovered. Fewer historic Scottish are available, but research in Wester Ross showed that annual marine survival between 1999 and 2005 varied between 1.5% and 5% (Raffell *et al* 2007). Increases were evident during 2006, but have not been sustained.

Declines in both Scotland and Ireland have been linked to sea lice infestations linked to the salmon farming industry (Butler 2002; Butler & Watt, 2003; Gargan *et al* 2003; ICES 1997; Tully *et al* 1993), although other factors such as food availability, predation and human exploitation may also play a part. While the factors affecting the marine survival of salmon are largely outwith the control of fishery managers, those affecting sea trout may not be. Sea trout are a coastal species and improved management may ameliorate some of the factors affecting their sea survival, including impacts of aquaculture.

6.2 Freshwater

6.2.1 Fisheries exploitation and management

Fish mortality occurs both from legal and illegal fishing. In rivers where the population is functioning far below its carrying capacity any form of exploitation is unsustainable and can have a serious impact on the health of the river. Catch and release fisheries in association with effective bailiffs can be of great benefit in these situations. Allowing even small numbers of fish to spawn can have a great impact on the number of smolts going to sea. Many proprietors now operate a voluntary catch and release policy, however poaching is still thought to be a significant factor in reducing the number of spawning fish in several Skye rivers.

Actions intended to be benign may also have unwanted outcomes. Experience in other areas is that collection of broodstock for stocking can impact on fisheries if there is high mortality in the hatchery. This is not the case on Skye where the only operating hatchery has very low mortality rates. Any new hatchery operations that may be developed in future must adopt best practice and ensure adequate staff training to ensure positive outcomes. Inappropriate stocking with non-native salmon or trout may also reduce the productivity of a river in the short term and create the risk of long-term reduction

in the fitness of stocks. In the past discarding of excess minnows after their use in live bait fishing has allowed this species to become established and increased competition for limited resources may reduce the productivity of the native fish stock.

Escapes from both marine and freshwater fish farms can affect the genetic integrity of the local salmon population.

Gill net removed from the Kilmartin River in 2008

6.2.2 Water quality and water flow

Water quality can be affected by both diffuse and point source pollution from industrial, forestry and agricultural activities. Construction activities such as the development of new roads or wind turbines can also influence water quality, as can inappropriate use and/or disposal of sheep dip. At present, Skye's rivers seem broadly healthy. A survey during 2009 found that freshwater invertebrate populations indicated that there were no serious water quality issues in any of the fourteen rivers surveyed (see also section 4.5 above and individual river plans below).

Abstraction for hydropower, domestic supply, irrigation and aquaculture can seriously reduce water flow within a catchment. Low flows may prevent upstream migration of spawning fish, having a negative effect on utilisation of uppermost spawning habitats and increase predation risk within the deeper areas of the river. Loss of wetted area may occur at key times e.g. when fry are dispersing and establishing territories in shallow areas. Higher water temperatures may increase the mortality risks. SEPA provide guidance to developers on ensuring suitable flows where new abstractions are proposed. They are currently consulting on new guidance for hydro electric developments.

6.2.3 Obstructions to migration

Natural obstructions such as waterfalls are prevalent in the Skye rivers and will have had a long term influence on the evolution of the indigenous fish populations. Although the passage of migratory fish can also be obstructed by constructions such as hydroelectric dams, road culvert and weirs, few of these man made obstacles were recorded during the 2008 habitat survey (Watt 2009).

6.2.4 Riparian management

Vegetation in the riparian zone may play an important role in the ecology of a river and hence the habitat it provides for fish. Vegetation provides shade, reducing extremes of temperature in summer. It also provides energy through leaf fall, insect drop and dissolved nutrients; fish cover via roots and overhanging boughs and stabilises the stream banks and channel from erosion (Wesche *et al* 1987; Summers *et al* 2005). Rivers are dynamic by nature and a degree of erosion and change is entirely normal. Indeed, the downstream movement of gravel and pebble is important to maintaining spawning and nursery habitats for fish. However, unnaturally high or low levels of erosion or sediment transport can have serious consequences for fish and their habitat.

The impact on streams of grazing by domestic livestock can be extreme and grazing impacts are recognised as a serious threat to Scottish freshwaters (SEPA 2006). This mainly occurs due to damage to riparian vegetation. A direct effect of this is loss of fish cover in the form of draped branches and leaves. Often however the indirect effects may be more serious, these include damage to banks leading to widening and shallowing of the channel, siltation and destabilisation.

Forestry practice can also have significant impacts on watercourses. Newly ploughed and clear-felled areas are susceptible to erosion, which can cause sedimentation of watercourses and damage to fish habitat. Heavy shading from densely planted woodland can reduce stream productivity and increase erosion through the loss of the ground vegetation, which normally helps maintain bank stability. Conifer woodlands also have the potential to change the level of acidity in soils, reducing the pH in streams and therefore affecting salmonid populations (Harriman & Morrison 1982; Puhr *et al* 2000). In recent decades, forestry practice around rivers and streams has been guided by the Forest and Water Guidelines (see Forestry Commission 2003 for current guidelines). A public consultation on the revised Guidelines was recently carried out (see http://www.forestry.gov.uk/ukfs).

Grazing impacts were recorded widely on Skye during the habitat surveys of target rivers and have undoubtedly affected riparian habitats and the structure of some rivers. These impacts are unlikely to be new as grazing has been a traditional landuse for centuries, and they probably do not explain more recent changes in fish abundance. Nevertheless, river habitat improvement may be beneficial in the longer term and will have wider benefits to biodiversity. Localized impacts of forestry were also recorded, although less widely. These impacts and actions to mitigate them are covered in detail in the individual river sections.

Invasive non-native plants such as Japanese knotweed *Fallopia japonica* can cause a reduction in the biodiversity of the riparian zone eventually effecting the fish population. Fortunately few were recorded along the riverbanks during the habitat survey in 2008.

6.2.5 Instream habitat

The nature of instream habitat has a major influence on its productivity. Steep rivers with unstable substrates or large areas of bedrock will hold few fish. Rivers with varied flows and abundant, stable fish cover in boulders and cobbles will likely be productive. Ideally, a river will provide a variety of habitat - holding pools for adults, quality spawning areas and suitable habitats for juveniles. Maps showing the distribution of these instream habitat types have been prepared for all rivers and will be a valuable tool for guiding management.

Trampling of a small spawning stream. This kind of damage can cause high egg mortality.

Siltation and compaction of spawning gravels, sometimes as a consequence of some of the land management practises addressed above, can have a serious impact on salmonids spawning success. Compaction can make it difficult or impossible for salmon or trout to excavate redds. High egg mortality occurs when excessive siltation smothers eggs preventing oxygenation. When adult fish are scarce, it is important to ensure that eggs survival is maximized.

Siltation and compaction can also reduce the habitat and food available for small salmonids. Gravel extraction can also have a significant local effect within a river, impacting most seriously on spawning areas.

6.2.6 Predators

In the riverine habitat fish are the natural prey item for many native predatory species such as otter, mergansers and goosanders. Where rivers are healthy predation on the young salmonids may have very little effect on the population. Although seals are fundamentally marine animals, the impact of seals is thought to be highest where seals are active in the estuary and lower river environment (Butler *et al* 2008). The non-native North American mink also consumes young fish. As part of a programme to protect ground nesting birds, the systematic removal of mink on the Outer Hebrides led to an increase in fish numbers (Outer Hebrides Fisheries Management Plan). In the 2005 questionnaire fisheries managers on six rivers perceived predation to be a local issue.

6.2.7 Biosecurity, parasites and disease

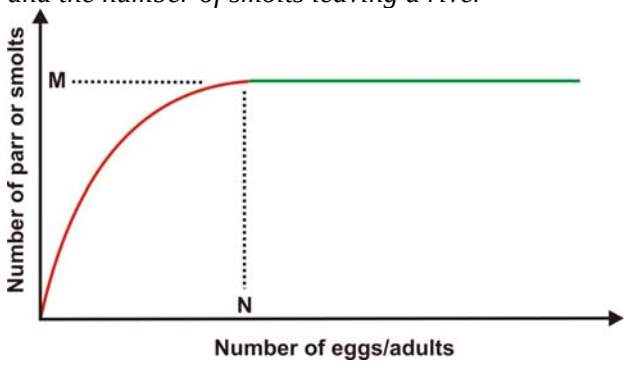
Many non-native species have been introduced to the UK freshwaters and riparian habitats, the consequences are greater for some than for others. Although not currently present in the UK, *Gyrodactylus salaris* presents one of the greatest threats to the salmon population in the UK. This freshwater parasitic flatworm was introduced to Norway via transfer on infected farmed fish and unfortunately entire river systems have to be poisoned to eradicate these parasites. Many control measures are in place to ensure that this parasite is not does not arrive during the movement of life fish, however wet clothing, angling equipment and canoes from infected waters could also transfer the parasite.

6.3 Opportunities and Constraints

6.3.1 Constraints

The probable constraints on fisheries production on Skye were summarised above. The most pressing is almost certainly a lack of adult fish returning to spawn. In this respect Skye is not unique, most rivers in the west Highlands no longer enjoy the runs of adults they once did, due in the main to poor marine survival. But what does this mean for management? The graph shows a very simple version of a 'stock-recruitment curve'. The concept of the curve is simple – the more adults that come back the more eggs are deposited and the higher the resulting smolt run - all quite intuitive. However, the shape of the curve is important and there are two things to notice:

Simplified relationship between number of adult fish and the number of smolts leaving a river



(i) The curve flattens off and beyond a certain number of adults **N** the smolt run does not increase beyond a maximum level **M**. This is because as egg deposition increases there eventually ceases to be additional space or resources for any more young fish; the carrying capacity has been reached. The magnitude of **M** i.e. the maximum smolt run, is determined by the quantity and quality of habitat in the river.

(ii) The left side of the curve is very steep. This is because when adult fish are scarce and very few eggs are deposited, the young fish have little competition and survive well. So when fish are scarce, a small increase in the number of adults can make a big difference to the number of smolts. **N** is the number of adults needed to totally fill up the available habitat, so that the maximum smolt run is achieved. **N** can be thought of as the target number of spawners for management purposes.

Although data from Skye's rivers are few, all point to the same conclusion – there are simply not enough adult fish to stock available habitats. On the curve above, most rivers are probably near the left side, in the red and in trouble. From a management perspective this tells us the following:

- The top priority is ensuring that more adults get a chance to spawn. From this it follows that actions to reduce mortality of smolts, post-smolts and adults must be the main targets for the first phase of the fishery management plan.
- Actions to improve habitats are only likely to produce significant fishery benefits if adult numbers can also be increased. Looking at the above graph, it is clear there is little point in moving the green line upwards (increasing the carrying capacity of the river), if the number of adults is still far less than what is needed to fill the habitats already available.

6.3.2 Opportunities

6.3.2.1 Environmental quality

The rivers themselves represent a fisheries resource with considerable potential. While habitats in most could be improved almost all are already capable of supporting many more fish than they currently do. Water quality is good, as identified by the study of stream invertebrates and habitats suited to spawning and to young fish are still present. Fisheries interests must seek to protect and conserve this resource. If improvements can be made that will increase egg to smolt survival, this may assist in improving runs. Examples of such work might be prevention of siltation, so that egg mortality is reduced. Habitat improvements that do not increase egg to smolt survival will not make any appreciable difference to the fisheries in the short term. Nevertheless such action can be viewed as an investment in the longer term and may produce wider environmental benefits, fostering interest in the rivers and the wildlife - including fish - they support. Where opportunities arise, habitat restoration or improvement should be encouraged.

6.3.2.2 Fish

Further opportunities lie in the biological resources of the remaining fish populations. Salmon and sea trout are still present in most rivers, albeit in low numbers. This points to two opportunities. First, experience throughout Britain and Europe is that if existing stocks can be protected and some of the factors impacting on them can be removed, salmon and trout populations have great capacity for sustained, natural recovery. Identifying and minimising the factors responsible for mortality of smolts, post-smolts and adults is a high priority for management and research. Second, as native stocks are present in all or most rivers, potential exists for using captive breeding and careful hatchery work to boost numbers of juveniles and adults where appropriate.

6.3.2.3 People

It became clear during the consultation process that there is broad support for improving Skye's fisheries. The Trust, in particular, may be able to tap into this through offering opportunities for anglers and proprietors to get involved in delivering this management plan. Opportunities also exist to draw the wider community into taking a greater interest in the aquatic environment through education and outreach.

6.3.2.4 Common interest and complementary plans

The work set out in the FMP will complement the aims of a number of other plans and guidelines relating to the water environment. Scottish Environment Protection Agency (SEPA) has prepared an assessment of the pressures on Scotland's water environment as part of its work under the EU Water Framework Directive. These assessments underpin the preparation of river basin management plans, which can be viewed at http://www.sepa.org.uk/water/river_basin_planning.aspx. The plans includes national, regional and local measures aimed at protecting and improving the quality of Scotland' rivers and lochs. Potential exists for the SFT to assist in delivery of these measures. In some

instances, grant aid for measures that will improve ecological status may be available e.g. through SEPA's restoration fund http://www.sepa.org.uk/water/restoration_fund.aspx.

The Skye and Lochalsh Biodiversity Action Plan identifies salmon, sea trout, brown trout, arctic charr and lampreys as local priority species. It identifies several objectives that complement this FMP. These include (i) promotion of integrated catchment management (ii) promoting advice on sympathetic management of freshwaters (iii) raising awareness of freshwater biodiversity among children, communities and user groups (iv) promoting best practice for freshwater management (v) encouraging user groups such as anglers to record and monitor locally important species. The Skye Fisheries Trust has the opportunity to play a central role in the delivery of these objectives. A number of grant schemes and organisations fund biodiversity related projects. The Biodiversity Action Plan is available at http://www.highlandbiodiversity.com/htm/counties/skye_lochalsh/skye_lochalsh.pdf.

A number of the Skye river systems flow through, or are in close proximity to, legally protected areas designated to conserve important habitats and species e.g. the Sligachan Peatland Special Area of Conservation (SAC), Cuillin Hills NSA and Trotternish NSA. The Skye and Lochalsh Biodiversity Action Plan includes an exhaustive list of Nature Conservation Designations and Local Natural Heritage Sites.

7 REGIONAL MANAGEMENT

7.1 Management structures

7.1.1 Skye Fisheries Trust

The Skye Fisheries Trust obtained charitable status in 2008. It is a member of River and Fisheries Trusts of Scotland (RAFTS). At the time of writing the Trust has had no full-time employees, and has used ecological consultants on a contract to contact basis to carry out the data collection underpinning the development of this FMP. It is anticipated that the Trust will employ a biologist to take forward its work of information collection and dissemination, delivery of educational programmes and other actions within the FMP.

Funding will be a significant issue for the SFT. Most Trusts within the RAFTS network gain a significant amount of core funding from their associated District Salmon Fishery Board. The rateable value of Skye's fisheries is low and this is reflected in a low income to the SDSFB. The SDSFB pays some membership fees for the Trust, but the Trust cannot rely on any significant further core funding from this source. While it falls outwith the remit of this document, it is clear that the first task for the Trust will be to identify and access funding to take the Plan forward. Limited funding can be accessed through RAFTS, but this will be task-specific, subject to an application process and any money received will have to be match-funded.

At the present time a number of potential sources of funding/matched funding opportunities have been identified. These have not been examined in detail to determine which would be most appropriate for specific projects. They include:

- Scottish Rural Development Programme grants
- Crofting Counties Agricultural Grant Scheme (CCAGS)
- Scottish Natural Heritage grants
- Skye & Lochalsh Enterprise
- Scottish Environmental Protection Agency's River Restoration Fund
- Forestry Commission's Scottish Forestry Grant Scheme
- Leader + programmes
- Lottery Fund

- New Opportunities Fund
- Local businesses, including tourism based business and aquaculture

Once the Trust has a biologist in position, it is expected that they will take the lead role in initiating, managing and delivering many of the tasks identified in the FMP. It is likely that they will also take a role in seeking funding. Given the predicted lack of core local funding, an element staff time will have to be incorporated into project costs when these are presented to potential funders.

7.1.2 Skye District Salmon Fishery Board

The SDSFB has very broad representation including Upper and Lower Proprietors, the Portree Angling Association, Scottish Natural Heritage, SGRPID (Scottish Government Rural Payments & Inspections Directorate), the Forestry Commission, the John Muir Trust and local Fish Farmers. It has a number of statutory powers and responsibilities under the Salmon and Freshwater Fisheries (Consolidation) (Scotland) Act 2003 (http://www.opsi.gov.uk/legislation/scotland/acts2003). Its legal duties are limited and including maintaining a list of fisheries proprietors in the Board district and appointing a clerk. In practice however Boards may take on a wide range of tasks to protect and improve stocks. Its powers include stock protection, control over stocking of migratory salmonids, the collection of financial assessments and the appointment of bailiffs. Boards are empowered to undertake works and incur expenses for the protection and improvement of the salmon and sea trout fisheries. Fishery Boards are statutory consultees on many planning applications and the Board is likely to be contacted over many issues that might affect rivers and streams including abstractions, building works, hydroelectric schemes and wind farms.

Boards cannot make legal restrictions on fishing on their own. However they can ask Ministers to make regulatory measures for their district, if the Board deems it appropriate. Government makes national regulations, for example concerning legal methods of taking salmon, ensuring free passage in rivers and setting close time for fishing. With the passing of the Salmon Conservation (Scotland) Act 2001, [now consolidated into the Salmon and Freshwater Fisheries (Consolidation) (Scotland) Act 2003], Boards can make applications to Ministers for further statutory measures to allow them to manage and conserve the fish and fisheries in their district.

From a statutory view many of the action points identified in the FMP fall within the Board's remit. At the present time the Board relies on the voluntary input from board members, having no paid staff members. The Board's income comes from levying a rate on proprietors. The total rateable value of all Skye fisheries is £7,055 (2005 value), greatly limiting the Board's potential income and ability to core fund the SFT. The Trust may have greater ability than the Board to raise external funds and it is anticipated that the Board will seek to devolve much of the development of the FMP to the SFT. The Board and Trust will provide a joint response to consultations.

7.1.3 Skye Angling Development Group

The purpose of this group is to promote angling on Skye (www.skyeangling.org.uk). The Trust will provide the group with advice and information.

7.2 Regional management priorities

7.2.1 Stock protection

Stock protection is a high priority in circumstances where adult numbers are already low due to high marine mortality. Recovery will not happen unless adult fish are allowed to spawn in sufficient numbers to boost future smolt runs.

7.2.1.1 Bailiffs and Northern Constabulary Wildlife Protection Officers

Poaching is considered to be a significant problem on a number of the rivers in Skye. Historically there has been little control of poaching and recently the SDSFB have been in close liaison with the local Northern Constabulary Police Wildlife Liaison Officer for Skye and Lochalsh to determine the most appropriate action. The SDSFB will be applying for Partnership Against Wildlife Crime funding to train and insure 4 voluntary bailiffs in 2010.

7.2.1.2 Roles of anglings clubs & proprietors

The SFT aims to promote sustainable management of fisheries, encouraging exploitation control. Many of the Skye fisheries are currently thought to be functioning below the carrying capacity and the fisheries managers involved in the development of this FMP have show a willingness to encourage catch and release until such times as fisheries stocks have recovered to a level at which a managed quota will not impact on the fishery.

Poaching

A young angler releases his first salmon

7.2.1.3 Legal and illegal coastal netting

At the present time little legal coastal netting occurs. As a conservation measure the proprietor of the only active net fishery on Skye has agreed to a quota limit through the Skye Area Management Agreement. The SDSFB has recently been in communication with both the Fisheries Protection Agency and the Northern Constabulary regarding illegal coastal netting.

7.2.2 Aquaculture

7.2.2.1 Rationale

Sea lice, emanating from marine cage salmon farms, can cause high mortality of sea trout post smolts in some circumstances. Lice infestations can also cause post-smolt sea trout to return early to freshwater. This reduces their growth and hence the number of eggs that will be deposited at spawning time. High mortality and low growth due to lice infestations are strongly implicated in sea trout declines and population collapses in Scotland, Ireland and Norway. On Skye, marine fish farms are situated in proximity to several river estuaries. The 2005 questionnaire to fisheries managers identified sea lice as the most common concern in relation to Skye's migratory fish stocks (Watt 2006).

Sea trout badly infected with sea lice

Only one commercial freshwater hatchery is currently operating on Skye.

7.2.2.2 Area Management

The Skye District Salmon Fishery Board (SDSFB) became involved in the Tripartite Working Group (TWG) Area Management Agreement process during 2005. Since then an Area Management Agreement (AMA) has been negotiated for Skye covering the marine waters surrounding the Isle of Skye and the adjacent islands of Rona, Raasay, Scalpay, Soay, Canna, Rum, Eigg and Muck. The AMA also encompasses the catchment areas for the freshwater rivers flowing directly or indirectly into the sea around Skye. The Area Management Group (AMG) brings together wild fishery proprietors, the fish farming industry and other interested parties. The aim is:

> *'to develop and promote the implementation of measures for the restoration and maintenance of healthy stocks of wild salmonid and farmed finfish, whilst ensuring the protection of the natural environment and the other stakeholders who use that environment'.*

A part time Regional Development Officer is employed to facilitate the process, developing working relationships between the partners. The role of this officer includes:

- Farm visits to identify sea lice levels
- Promotion of synchronisation of management techniques between farms
- Provide secretariat services to the (AMG)
- Liaise with the TWG Project Manager
- Report to the Regional Steering Committee and the TWG Plenary and Management Groups
- Liaise with other RDOs in relation to common problems and potential solutions
- Manage the AMA budget
- Post smolt monitoring of wild fish

7.2.2.3 Priority actions

The measures most likely to be effective in protecting wild post-smolts from sea lice infections are (i) co-coordinated spring treatment of lice on farms to minimize infective pressure on recently emigrated post-smolts (ii) coordinated fallowing of farm sites within management areas, preferably in late winter/early spring where possible. It is not clear if these or similar measures are currently being implemented.

Escapes pose a threat to the genetic composition of wild stocks and interbreeding of farmed and wild stocks may lead to long-term damage to wild populations. Robust escapes reporting and contingency plans for recapture of farmed escapes should be developed.

Input to the AMG from a qualified Trust biologist would provide benefits to wild fish by (i) ensuring that the AMG had access to the most recent research on sea lice interactions e.g. from the work at Shieldaig (ii) increased negotiating strength through science-based input. Any future Trust biologist should have a role in monitoring of sea lice on sea trout post-smolts to identify (i) the scale of any problem (ii) regional patterns of lice infection (iii) the success of any lice management measures undertaken as a result of the AMA process.

7.2.3 Predation

Recent assessments suggest that seals frequenting river mouths are likely to have a significant impact on the migrating salmon (Butler *et al* 2008). SFT hope to develop a monitoring protocol that would allow information gathered by anglers to be used to help determine the impact of seals on migratory salmonids.

7.2.4 Bio security: invasive species and disease

The new RAFTS Invasive Species and Biosecurity Programme website states that "Invasive non native species and fish diseases damage our environment, the economy, our health and the way we live. They already cost the Scottish economy and therefore us upwards of £500 million per year and the UK economy £2-£6 billion per year." Species, distributions impacts and management strategies are identified in this comprehensive website (http://www.invasivespeciesscotland.org.uk). A number of Fisheries Trusts have already developed detailed Biosecurity Plans. SFT hope to develop a Biosecurity Plan in the future but at the present time have focused on some of the more problematic species. The Trust will raise awareness of the comprehensive RAFTS website to relevant parties. Only one small area of invasive riparian Japanese Knotweed was identified in the 2008 Habitat Survey (Watt 2009) and this is addressed in the appropriate river action plan.

The potential threat of the introduction of *Gyrodactylus salaris* to UK waters has been addresses in the national Home and Dry information campaign (see the Government website http://www.infoscotland.com/gsbug). SFT will liaise with individuals and organisations promoting angling on Skye to raise awareness of the possible risks. Communication will also be developed with water sports interests, such as local canoe clubs.

Mink are present on Skye and mink control is highlighted as a priority in the Skye and Lochalsh Biodiversity Action Plan. SNH are currently developing a Skye-wide approach for monitoring the distribution of Mink. SFT will help to facilitate this development where possible.

7.2.5 Stocking

7.2.5.1 Rationale

The 2005 juvenile survey indicated that juvenile stocks were very weak in some rivers. Careful stocking and/or supportive breeding programmes using native salmon and sea trout may be able to play a role in promoting population recovery. Stocking and supportive breeding (such as captive rearing wild smolts) may have potential to mitigate some of the effects of high marine mortality, although there are likely to be significant benefits only as part of a wilder plan that tackles other factors, such as illegal exploitation, that impact on stocks.

7.2.5.2 Developing stocking programmes

Current juvenile data are four years old and not adequate to provide detailed advice for development of stocking programmes. Catch data suggest that some natural recovery may have started in some rivers. The collection of up to date juvenile data is fundamental to developing any stocking plans.

Several studies show that stocked native salmon show better survival to adulthood than non-natives (e.g. Crozier *et al* 1997; Einum & Fleming 2001; McGinnity *et al* 2003; McGinnity *et al* 2004). McGinnity *et al* (2004) showed that lifetime success (egg to adult) of non-native salmon was only 35% that of natives during stocking experiments. Native fry would therefore be expected to provide greater benefit to any local fishery, with a higher proportion returning as adults. In addition to immediate fishery benefits, the use of native fry for stocking would reduce the risk of long-term damage to the fitness of stocks. Similarly, work at Shieldaig in Wester Ross consistently shows higher marine survival for wild than non-native sea trout (Raffell *et al* 2007). The stocking of non-native sea trout has been suspended in favour of native stocking at Shieldaig, for this reason. If stocking programmes are to be developed on any of Skye's rivers, one of the greatest challenges will be sourcing local broodstock.

7.2.5.3 Priority actions

During consultations with fisheries proprietors and tenants it became apparent that a small number of fisheries managers would consider developing a stocking programme if it was appropriate for their

fishery. Stocking of salmon or sea trout can only take place legally with the written permission of the SDSFB. In order that the Board can meet its legal obligations while ensuring that proprietors are aware of current best practice it has adopted the ASFB/RAFTS 2008 Stocking Policy (http://www.asfb.org.uk/publications/briefings_and_policy_papers.asp). The Board should also develop a pro-forma stocking application form setting out the rationale for, and proposed method of stocking as well as areas to be stocked and proposed numbers and source of fish. In addition, a stocking report form should be submitted after fish have been stocked out.

The SFT should advise the Board on its stocking policy and should assist river managers in developing stocking programmes that are appropriate to their river. In addition, the Trust should be copied into stocking returns in order that stocked and unstocked areas can be distinguished in any future juvenile surveys.

At the time of writing, one fishery is completing a stocking programme that was developed before the implementation of the ASFB Stocking Policy, purchasing non-native fish from outwith the island. The management has shown a willingness to use native stock should it become practical to do so. No further non-native stocking programmes for salmon or sea trout will be permitted.

7.2.6 Consultations

In the future it is likely that the SDSFB will be consulted for fisheries advice for planning issues such as road developments, bridge upgrades, renewable energy developments, water abstraction and CAR applications for gravel extraction. As the Board will gain scientific advice from the SFT it is likely that all responses will be joint responses.

7.2.7 Education and publicity

Recently RAFTS contracted out a review of all the member Trusts' educational work, with a view to enhancing and expanding the educational activities of the Trusts throughout Scotland. SFT will await the outcome of this review and develop an educational programme based on the best practice highlighted in the review. It is anticipated that the popular Salmon in the Classroom (http://www.snh.org.uk/salmonintheclassroom/index.shtml) programme will continue and that SFT will participate in 2011. This project introduces primary aged pupils to the local biodiversity and promotes links between schools and local fisheries interests such as hatcheries and fisheries.

In its first year, the Trust should also consider wider outreach initiatives where this can be achieved efficiently. This might include e.g. press releases, training local angers in practical tasks and monitoring, and public presentations.

7.3 Information needs

Restoring and developing sustainable fisheries requires continued assessment of the current health of the population and an ongoing understanding of factors affecting fish numbers. Only with this background information can managers make informed decisions regarding issues such as habitat improvement, stocking and setting conservation catch limits.

7.3.1.1 Develop catch recording system

Currently individual fishery catch return data is collated by the SDSFB. In recent years there has been an encouraging increase in the percentage of fisheries providing the Board with data. For this information to provide an accurate representation of trends within the fisheries it must be collected rigorously. The Board will develop a new recording system which:

- Is river specific
- Includes angling effort
- Accurately records all species caught
- Identifies the number of fish released

The SDSFB has the power to gather information on (a) number (b) species (c) description and weight; and (d) method and date of capture through The Conservation of Salmon (Collection of Statistics) (Scotland) Regulations 2006. http://www.opsi.gov.uk/legislation/scotland/ssi2006/20060572.htm.

7.3.1.2 Juvenile surveys

As identified above, the collection of information on the distribution and abundance of juvenile salmonids is critical in the development of long-term strategies to manage fisheries in a sustainable manner. An early task for the SFT should be to repeat juvenile surveys of the 14 target rivers. Surveys should be based on the previous survey in 2005. Watt (2009) makes specific recommendations for a small number of additional sites targeted to key habitats.

7.3.1.3 Redd counting

Redd counts can provide valuable information on the density and distribution of spawning salmonids with a river system. This is highlighted in a number of individual river sections. A practical training day would give local anglers the opportunity to gain confidence in their identification of redds, providing SFT with a potential team to monitor redds using a standardised technique. This would provide information on fish numbers and key spawning sites.

7.3.1.4 Sea lice counts

Monitoring of early return of sea trout smolts and the associated lice burdens is a priority for understanding impacts of lice and the success of any measures taken under the AMA process.

7.3.1.5 Predators

In the 2005 questionnaire fisheries managers on six rivers perceived predation to be a local issue. Recent research has shown that seals frequenting river mouths are likely to have a significant impact on the migrating salmon (Butler et al 2008). SFT hope to develop a monitoring protocol to investigate the impact of seals on migratory salmonids with the Skye area.

7.3.1.6 Landuse and geological information

It is hoped that SFT will have access to a GIS system through the purchase of Arcview software and SFCC data. This will allow the Trust staff members to create fish distribution and density maps, linking fish data to background information such as landuse and topography.

The following tables set out Regional management issues and priorities in more detail and suggest which partners have responsibility for taking them forward.

7.4 Regional management plan

MANAGEMENT

Issue	*Actions*	*Benefits*	*Responsibility (**Lead**/other)*	*Guidelines*	*Priority*	*Notes*
Stock protection						
Poaching	Appoint bailiffs and develop stock protection procedures	Reduce illegal exploitation. Raise awareness of implications of long-term impacts on stocks.	**SDSFB**, proprietors, angling clubs, police	Salmon and Freshwater Fisheries Act 2003 (Powers of Bailiffs)	High	1.1
Poaching	Develop links to Rural Watch	Raises awareness of implications of poaching, reduce illegal exploitation of fish stocks in the longer term	**SDSFB,** bailiffs		Low	1.2
Angler exploitation	Promote catch and release until stocks are no longer vulnerable	Develop sustainable fisheries	**SDSFB**, SFT, fisheries managers	Salmon and Freshwater Fisheries Act 2003. FRS (2005)(note 1.3)	High	1.3
Illegal coastal netting	Board to liase with Scottish Fisheries Protection Agency	Discourage illegal netting	**Scottish Fisheries Protection,** SDSFB		Moderate	1.4
Seal predation	Obtain data (see Information table)	Allows some measure of the extent of the problem	**SFT**	Moray Firth Seal Management Plan	Moderate	1.5
Sea lice and aquaculture						
Representation	Any SFT biologist to have access to AMG	Scientific input to area management on behalf of wild fish	**SFT/AMG**		High	
Sea lice in coastal waters	Spring treatments for lice other than during fallow periods	Preventative measure	**Aquaculture**, SDSFB, SFT, RDO	Skye AMA	High	
Synchronisation and escapes	Promote best practise. Develop robust escapes contingency plans.	Improved fish health	**SFT**, **RDO**, SDSFB, TWG, aquaculture	ISA Joint Working group Report.	High	1.6
Bio security						
G. salaris	Raise awareness in angling and water sports communities	Ensure the risks remains high profile and introduction is less likely	**SFT**, **SDSFB**, angling clubs, tourism, water sports	Home & Dry Campaign	High	1.7
Possible introduction of non-native species	Raise awareness of RAFTS website and Skye and Lochalsh Biodiversity Action Plan	Lower risk of introduction and spread of non- native invasive species.	**SFT, SDSFB,** proprietors, anglers, wildlife groups	RAFTS Invasive Species and Biosecurity Programme	Moderate	1.8
Mink	Obtain data (see Information Table)	May lead to an effective control programme in the long term	**SFT, volunteers(?)**		Moderate	

Issue	*Actions*	*Benefits*	*Responsibility (**Lead**/other)*	*Guidelines*	*Priority*	*Notes*
Stocking						
Non-native stocking	Prohibit use of non-native salmon or sea trout for stocking. Encourage best practice in stocking native fish.	Reduce risk of genetic dilution of population	**SDSFB, SFT,** proprietors, fishery managers	FRS Hatchery Work in Support of Salmon Fisheries 2007	High	1.9
Stocking control	Stocking application and return forms	Control over stocking, full records of what is stocked where	**SDSFB,** proprietors, fishery managers	Salmon and Freshwater Fisheries (Consolidation) (Scotland) Act 2003	High	
Stocking plans	Develop plans for stocking and supportive breeding where biologically justified.	Increase juvenile numbers (stocking) or adult numbers (supportive breeding)	**SFT, proprietors**, SDSFB	Restoration Guidance for West Coast Salmon and Sea Trout Fisheries	Unknown – further data required	1.10
Consultations						
Communication	Provide relevant statutory organisations with contact details	Ensure SDSFB and SFT are consulted during the scoping stage of developments	**SDSFB,** SFT, statutory bodies		High	
Road and housing development	Partnership work to ensure fishery interests are covered	Ensure no new man-made obstacles are created	**SDSFB**, SFT, SEPA, Council	SEPA 2005 Culverting of Watercourses	High (ongoing core work)	
Renewable energy developments	Early consultation and input to planning stages.	Ensures that important fisheries habitat is not lost or damaged during construction or daily operation.	**SDSFB**, SFT, SNH, SEPA, developers	Controlled Activities Regulations 2005 SEPA	High (ongoing core work)	1.11
New domestic water abstraction	Partnerships to ensure site selections are appropriate and fishery interests are covered during CAR application.	Ensures that important fisheries habitat is not lost or damaged during construction or daily operation.	**SDSFB**, SFT, SNH, SEPA, Scottish Water	Controlled Activities Regulations 2005 SEPA	High (ongoing core work)	1.12
Education & publicity						
Educational outreach	Participate in Salmon in the Classroom	Local children gain wider knowledge of local biodiversity.	**SFT**, primary schools	As recommended by RAFTS review	High - 2011	1.13

Notes

1.1 Funding application to be lodged with Partnership Against Wildlife Crime to cover training and insurance for 4 voluntary bailiffs.

1.2 Rural Watch information at http://www.nhw.wa.gov.au/Rural+Watch/default.aspx

1.3 Guidance at http://www.marlab.ac.uk/FRS.Web/Uploads/Documents/FW25Catch%20FH10.pdf

1.4 Information at http://www.sfpa.gov.uk/index.asp

1.5 Plan available at http://www.speyfisheryboard.com/the-river/seals.html

1.6 ISA Joint Working Group Report http://www.marlab.ac.uk/Uploads/Documents/JGIWGReport.pdf What to do in the Event of an Escape from a Fish Farm http://www.scotland.gov.uk/Resource/Doc/1062/0000275.pdf

1.7 Government *G. salaris* Contingency Plan http://www.scotland.gov.uk/Resource/Doc/1062/0058772.pdf, Home & Dry campaign http://www.infoscotland.com/gsbug

1.8 http://www.invasivespeciesscotland.org.uk/biosecurity_programme/rafts_biosecurity_programme.asp

1.9 Hatchery Guidelines at http://www.frs-scotland.gov.uk/FRS.Web/Uploads/Documents/SFRR_65.pdf; http://www.marlab.ac.uk/Uploads/Documents/FW13Scotlands.pdf

1.10 Restoration Guidance for West Coast Salmon and Sea Trout Fisheries. http://www.fishandflyuk.com/downloads/TWGJune2009.pdf

1.11 The Water Environment Controlled Activities Regulations (CAR) 2005. Guidance for applicants on supporting information requirements for hydropower applications. SEPA and the Salmon and Freshwater Fisheries (Consolidation) (Scotland) Act 2003 Planning Policy

1.12 The Water Environment Controlled Activities Regulations (CAR) 2005. (http://www.opsi.gov.uk/legislation/scotland/ssi2005/20050348.htm?lang=_e)
1.13 Information at http://www.snh.org.uk/salmonintheclassroom/

INFORMATION NEEDS

Issue	***Actions***	***Benefits***	***Responsibility (Lead/other)***	***Guidelines***	***Priority***	***Notes***
Stock assessment						
Catch returns	Develop and implement recording system	Improved ability to advise fisheries managers	**SDSFB,** SFT, fisheries managers	Salmon and Freshwater Fisheries Act 2003	High	1.1
Lack of recent juvenile data	Repeat 2005 juvenile survey	Ensure management action is appropriate and can be monitored	**SFT**		High	1.2
Surveys of other rivers	Link new surveys to management actions	Ensure management action is appropriate and can be monitored	**SFT**		Moderate	
Brown trout	Identify main fisheries and any concerns over stock status		**SFT**, anglers		Low	1.3
Legal coastal netting	Monitor numbers of fish taken	Ensure management action is appropriate and can be monitored	**SDSFB,** netting operators	Salmon and Freshwater Fisheries Act 2003	High	1.1
Redd counts						
Lack of redd information	Redd count training day	Creates a team able to carry out standardised redd counts	**SFT**, anglers, other volunteers		High	1.4
Start surveys	Monitor priority rivers	Improved ability to advise fisheries managers	**SFT**, anglers, other volunteers		High	
Sea lice and aquaculture						
Sea lice in coastal waters	Monitor lice abundance on wild post smolts	Improves knowledge of lice pressure on local sea trout stocks	**SFT, RDO,** AMG		High	
Predators						
Seal activity	Develop monitoring programme based on Moray Firth Seal Management Plan	Develop greater local understanding of potential impacts of seals on the migrating fish	**SFT, fisheries interests**	Moray Firth Seal Management Plan	Moderate	1.5
Mink distribution	Liaise with SNH to aid improved knowledge of mink distribution	may lead to an effective control programme in the long term	**SFT, fisheries interests**		Moderate	1.6

Notes
1.1 ASFB Briefing on Catch Returns at http://www.asfb.org.uk/publications/briefings_and_policy_papers.asp
1.2 Details of survey work specified in each individual river plan. 2005 survey at http://www.tripartiteworkinggroup.com/article/uploaded/Skyefisheriesassessment1.pdf
1.3 It is intended that issues relating to brown trout be identified in later iterations of the FMP. Some preparatory work may be useful to identify main fisheries and issues.
1.4 See http://www.marlab.ac.uk/FRS.Web/Uploads/Documents/Redd%20counting_.pdf for background on redd counting.
1.5 Plan available at http://www.speyfisheryboard.com/the-river/seals.html
1.6 Information on Hebridean Mink Programme at http://www.snh.org.uk/Scottish/wisles/minknews.asp

8 RIVER BRITTLE

8.1 Background

The River Brittle drains the west side of the main Black Cuillin ridge and flows into the head of Loch Brittle at NG406208. Rapid runoff from the steep corries of the Cuillins causes rapid fluctuations in water levels. The river is approximately 9.4km in length. The two largest tributaries are Allt Coire na Banachdich (NG407215) and Allt a Choire Ghreadaidh (NG405225).

The water quality of the River Brittle was excellent overall and there was no evidence of acidification (Aquaterra 2009). The riffles of the River Brittle were relatively unproductive and both abundance and biomass of freshwater invertebrates low.

A full walkover survey of the accessible catchment was carried out during 2008 (Watt 2009). No obstacles to migration were identified in the lower 6km of river. A two-tier waterfall at NG42252517 in section 25 presents a major obstacle to upstream migration and is considered to be the normal upper limit for migratory salmonids. A further clearly impassable waterfall is present in section 29. Substrates in the lower 4km of the River Brittle are dominated by pebble, gravel and small, round cobbles providing very little cover for parr. Above this more in-stream cover from boulders provides a better environment for salmon parr. Due to high current speed and lack of cover along the banks, habitats scored poorly for trout parr. Habitat quality for salmon and trout in the lower reaches of the larger tributaries was reasonably good, although many sections were unstable.

The outflows of many of the pools and glides in the lower 4km of river provide abundant spawning habitat. In total it was estimated that 2,465m^2 of spawning habitat are present in this area. Further upstream, spawning habitat is scarcer and no spawning habitat suitable for salmon was identified upstream from section 21. Most spawning habitat was judged of moderate or good quality, the sole concern being potential washout during spates due to substrate instability.

Both the larger tributaries, Allt Coire na Banachdich and Allt a Choire Ghreadaidh, contained patches of habitat that would permit spawning by trout and salmon.

In all but two survey sections, bankside cover for fish was scored as poor for both sides of the channel. Riparian trees, the roots of which might help stabilise riverbanks and provide cover for fish, are generally lacking. Draped vegetation is lacking, since in most survey sections the bank top vegetation is cropped short and the bank faces are bare. Throughout much of the survey reach the bank faces are eroding and slumping, resulting in widening of the channel and further preventing growth of vegetation along bank faces.

No data has been received on trends in adult numbers and juvenile survey data are limited to ten sites surveyed in 2005 (Watt 2006). Average salmon abundance was poor to fair, with highest densities in the lower river. Salmon density appeared to be strongly related to the presence of stable cover. For instance, at site 6, almost all the salmon were found close to the right bank where overhanging heather created refuge; the rest of site 6 was a rather featureless expanse of pebble and small cobble, lacking in both three dimensional structure and fish.

Average juvenile trout populations were classified as fair. However this categorisation was elevated by high densities at two sites with bank cover. Trout were scarce in most sites in the main river.

The entire length of the River Brittle runs through MacLeod Estates. Consultations with Estate representatives identified poaching as an issue and the owners may be disinclined to invest significant funds in fishery improvement unless this problem can be reduced. Day permits for angling are sold through the Glenbrittle Campsite.

8.2 Assessment

Overall, electric fishing data gave mean densities of salmon fry and parr lower than the estimates of carrying capacity made during the habitat survey. This is most likely due to a lack of spawning adult salmon. Loss of ova due to redd washout cannot be discounted and may contribute to poor fish numbers. Protection of existing stocks is therefore the highest management priority.

Once there are enough adults to fully stock the river, it is likely that habitat for parr will become limiting. Plenty of salmon fry habitat is present, but cover for parr is very poor through much of the river. Whether the poor quality of parr habitats is currently a problem is difficult to ascertain and more up to date electric fishing data would be useful to determine this. If ratios of fry to parr remain high this would suggest that improvements in parr habitat might be worthwhile. Even where lack of adults places an upper limit on production, increasing fry to parr and over-winter survival may attain improved smolt output. It is possible that improving the quality and availability of (i) cover for parr (ii) over-winter refuges would increase juvenile survival to the benefit of the fishery.

8.3 Management

Aims and objectives

Management priorities should be to:

1 Maximise spawning escapement
2 Enhance aspects of habitat that might increase egg to smolt survival
3 Protect existing habitats.

Information needs

Priorities for information collection include:

1 Catch return data – accurate returns and a measure of fishing effort
2 Juvenile surveys – used to determine current stock status, vital information if a stocking plan is to be developed.
3 Redd counts - used to assess approx no. of adults and ascertain uptake of potential spawning opportunities. It is also possible to use subsequent electric fishing to determine if redd washout is a problem in unstable parts of the lower river.

Stocking and hatchery

If future juvenile surveys find low densities in the better quality habitat in the middle and upper reaches, stocking might play a role in population recovery. If any stocking is to be carried out it is recommended that only salmon or sea trout or stocks that are native to the river should be used. However, if adult numbers are low the risks of removing these fish from the river may be high. As with any stocking exercise, a full assessment of potential costs and benefits should be carried out and a suitable hatchery identified.

8.4 River Brittle Action Plan

1 MAXIMISE SPAWNING ESCAPEMENT

Issue	*Actions*	*Benefits*	*Responsibility* (***Lead****/other)*	*Guidelines*	*Priority*	*Notes*
Legal exploitation (angling)	Ensure catch and release of all migratory species	Increase abundance of spawners and egg deposition	**Proprietors**, SDSFB	FRS 2005 (note 1.2) Freshwater Fisheries (Consolidation) (Scotland) Act 2003	High	1.1, 1.2
Poaching	Appoint bailiffs. Check main pools when fish present	Deter poaching activity	**SDSFB**, proprietors, police	ASFB, IFM	High	1.3

Notes

1.1 Financial cost of this measure is low or zero (cost of enforcement). Freshwater Fisheries (Consolidation) (Scotland) Act 2003 (http://www.opsi.gov.uk/legislation/scotland/acts2003)

1.2 Guidance on catch and release for anglers at http://www.marlab.ac.uk/FRS.Web/Uploads/Documents/FW25Catch%20FH10.pdf

1.3 ASFB IFM Information available at http://www.asfb.org.uk/training/bailiff_training.asp. Grant may be available for training. Exams take place in spring.

2 MAXIMISE PRODUCTION

Issue	*Actions*	*Benefits*	*Responsibility* (**Lead**/other)	*Guidelines*	*Priority*	*Notes*
2.1 Instream habitats						
Lack of parr cover in lower and middle reaches	Explore options for improving cover – due to unstable nature of river any instream work will require great care and professional advice.	Improve: (i) carrying capacity for parr (ii) fry to parr and over-winter survival	**SFT**, proprietors	Hoey *et al* 1995 Soulsby (2002)	Low (may increase to moderate subject to electric fishing)	2.1.1
2.2 Riparian habitats						
Channel widening due to erosion of bends.	Limit bank erosion using log and conifer tops or similar – see habitat report for sections	Provide cover improving carrying capacity and inter-stage survival	**SFT, proprietors**	SEPA Managing River Habitats for Fisheries handbook	Moderate	2.2.1
Lack of bankside vegetation exacerbating erosion.	Identify areas for fencing, encourage shrubs and riparian woodland. Slow growing species should be planted well back from river at erosion points.	Improved egg to smolt survival and carrying capacity	**SFT**, proprietors	PEPFAA Code RSPB, NRA & RSNC 2001	Moderate	2.2.2

Notes

2.1.1. May be appropriate to trial this in one river system and use results to develop plan for other catchments.

2.2.1 SEPA guidelines at http://www.sepa.org.uk/water/habitat_enhancement/best_practice_guidance.aspx#Managing

2.2.2. PEPFAA Codes at http://www.scotland.gov.uk/Publications/2005/03/20613/51366.

3 INFORMATION NEEDS

Data	Purpose	Timescale	Priority	Notes
Juvenile surveys	Up to date survey required to: (i) determine current stock status (ii) define stocking plan	2010-1011	High	3.1
Catch data	Provide ongoing record of fish numbers and indicative measures of effort	2010	High	3.2
Redd counts	Can be used to (i) Provide indication of spawning escapement (ii) Underpin stocking plan (e.g. area to be left un-stocked) (iii) In conjunction with electric fishing, determine any redd washout problems in lower river.	Winter 2011	Moderate	3.3

Notes

3.1 Re-survey of 10 sites as recommended by Watt (2009) estimated at 2 days (2 x £400) plus 1 day report (1 x £230) = £1030 plus expenses. Further long term monitoring sites should be created between sites 3 and 5 and between sites 5 and 6 if a stocking programme is developed in the future.

3.2 Catch data collection carries no cost other than an element of time. Recording should be initiated as soon as possible. SDSFB legislative role under The Conservation of Salmon (Collection of Statistics) (Scotland) Regulations 2006. http://www.opsi.gov.uk/legislation/scotland/ssi2006/20060572.htm

3.3 See http://www.marlab.ac.uk/FRS.Web/Uploads/Documents/Redd%20counting_.pdf for background on redd counting.

9 BROADFORD RIVER

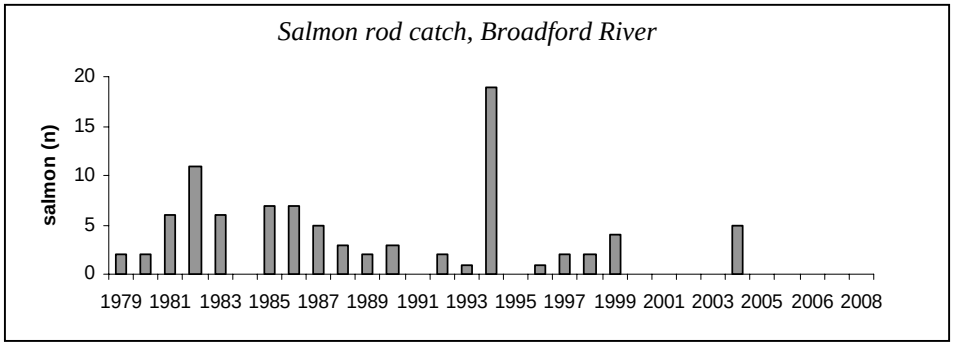
9.1 Background

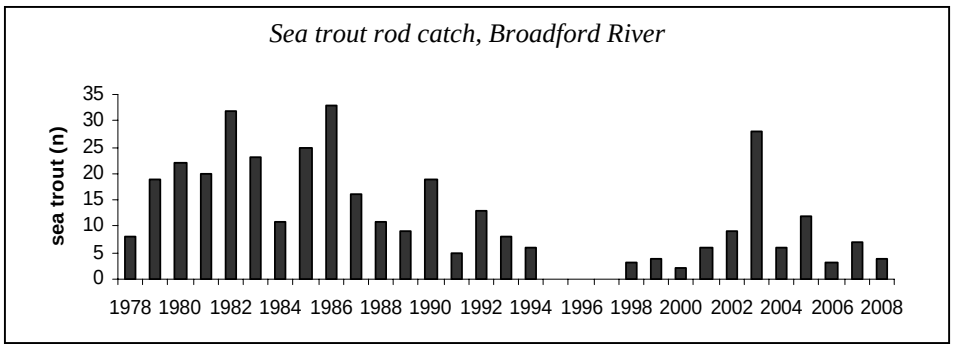
The Broadford River flows from the shallow, limestone-rich basin of Loch Cill Chriosd to the sea at Broadford Bay, a distance of approximately 4.5km. The largest tributary, Allt Beinn Deirge (NG623226) drains the high corries of Beinn Deirg Mhor and is steep, with unstable substrates and rapid erosion evident in the lower reaches. The river supports the only known population of brook lampreys *Lampetra planeri* on Skye.

The water quality of the Broadford River and the Allt Beinn Dearge is excellent with no evidence of acidification (Aquaterra 2009). The alkalinity of the River Broadford was the highest recorded in the survey reflecting the bedrock of Durness Limestone within the catchment.

A full walkover survey of the accessible catchment found that a high proportion of the Broadford River provides suitable habitat for rearing salmon and trout. Faster flowing riffle and run sequences provide good habitat for salmon while the slower glides are well suited to trout. Loch Cill Chriosd provides further rearing habitat and may provide many additional trout smolts. Spawning habitat totalling 450m^2 is widespread through the river and most of the spawning habitat was judged to be of good or moderate quality, although some siltation was noted. Cover for fish alongside the banks is moderately abundant through the forested reaches with heather, bog myrtle, bilberry and gorse growing from the bank faces. Further upstream, grazers have access to the riverbanks and cover is poor with bare, eroding bank faces and cropped grass along the bank tops. This is also the case in the lower reaches of Allt Beinne Deirge. There are currently no major problems associated with grazing in the upper reaches.

Catch data show that salmon numbers declined during the 1980s, with a slight recovery in the late 1990s. The bumper year is 1994 is unexplained. No salmon have been reported in eight of the past nine years. Sea trout numbers show a parallel decline to salmon in the 1980s. Sea trout have been caught ever year in the last ten years, with a peak in 2003.





Juvenile salmonids were surveyed by Watt (2006), who found that salmon and trout were present throughout the mainstem of the river and in the lower reaches of Allt Beinn Deirge. Salmon fry and parr abundance categories were fair and fair/poor respectively. Densities of salmon fry were relatively high in the main stem of the river, between the loch and the forested area. Parr densities were lower than might be expected, given habitat quality. Trout populations were also lower than expected from the quality of habitat.

The Broadford River is split into four fisheries. Guests at the Broadford Hotel can access a day permit for the Hotel beat and the Hotel has recently given access to the Portree Angling Association. An individual proprietor uses one beat and one beat has not been fished for a number of years. A syndicate holds the tenancy for the four beat. Catch and release is encouraged. There is anecdotal evidence of serious poaching of adult fish.

9.2 Assessment

Overall, a high proportion of the Broadford River provides suitable habitat for rearing salmon and trout. Faster flowing riffle and run sequences provide good habitat for salmon while the slower glides – often with good bank cover - are well suited to trout. Loch Cill Chriosd provides further rearing habitat and may provide many additional trout smolts. The 2005 electric fishing survey found average salmon fry and parr densities of 18.8 and 6.0 fish.100m^{-2} respectively. The data collected in 2008 suggest that the carrying capacity of juvenile habitat is likely to be greater than this, and it is unlikely that habitat quality, habitat availability or water quality currently limit juvenile numbers. Juvenile numbers and smolt output may currently be limited by a lack of adult spawners and highest priority should be given to ensuring adequate spawning escapement.

9.3 Management

Aims and objectives

Management priorities should be to:

1 Maximise spawning escapement
2 Enhance aspects of habitat that might increase egg to smolt survival
3 Protect existing habitats

Should fish numbers increase in future, it is possible that habitat availability may become limiting. Should this situation be attained, enhancement of carrying capacity may be worthwhile.

Information needs

Priorities for information collection include:

1 Catch return data – accurate returns and a measure of fishing effort
2 Juvenile surveys – used to determine current stock status
3 Redd counts - used to assess approx no. of adults and ascertain uptake of potential spawning opportunities. It is also possible to use subsequent electric fishing to determine if egg-fry survival is unusually low

NOTE: Marine issues related e.g. to fish farming are addressed in the Regional Management Plan.

9.4 Broadford River Action Plan

1 MAXIMISE SPAWNING ESCAPEMENT

Issue	*Actions*	*Benefits*	*Responsibility (**Lead**/other)*	*Guidelines*	*Priority*	*Notes*
Legal exploitation (angling)	Encourage catch and release of all migratory species	Increase abundance of spawners and egg deposition	**Proprietors**, SDSFB	FRS 2005 (note 1.2) Freshwater Fisheries (Consolidation) (Scotland) Act 2003	High	1.1
Poaching	Appoint bailiffs. Check main pools when fish present	Deter poaching activity	**SDSFB**, proprietors, police	ASFB, IFM	High	1.2

Notes

1.1 Financial cost of this measure is low or zero (cost of enforcement). Freshwater Fisheries (Consolidation) (Scotland) Act 2003 (http://www.opsi.gov.uk/legislation/scotland/acts2003)

1.2 Guidance on catch and release for anglers at http://www.marlab.ac.uk/FRS.Web/Uploads/Documents/FW25Catch%20FH10.pdf

1.2 Information available at http://www.asfb.org.uk/training/bailiff_training.asp. Grant may be available for training. Exams take place in spring

2 MAXIMISE PRODUCTION

Issue	*Actions*	*Benefits*	*Responsibility* (**Lead**/other)	*Guidelines*	*Priority*	*Notes*
2.1 Instream habitats						
Degraded spawning habitat	Inspect and clean spawning areas in section 19	Localised improved egg survival	**SFT**, proprietors	Hendry & Cragg-Hine 1997	Moderate	2.1.1
Lack of parr cover in parts of lower river	Trial placement of logs/random boulder placement in section 9	Improved carrying capacity for parr	**SFT**, proprietors	Hoey *et al* 1995 Soulsby (2002)	Low	2.1.2
2.2 Riparian habitats						
Trampling and erosion	Stock fencing middle reaches (esp. BF10 to BF12 where there are spawning habitats).	Improved egg survival and carrying capacity	**SFT**, proprietors, graziers	PEPFAA Code	Moderate	2.2.1
2.3 Obstacles						
Low flow obstacles	Easing of low flow obstacles in sections BF15 and 22	Allow fish to gain refuge in Loch Cill Chriosd (potentially reduce losses of adults)	**SFT**, proprietors	SEPA Managing River Habitats for Fisheries handbook	Low	2.3.1

Maximise Production Notes
2.1.1. Low cost.
2.1.2. May be appropriate to trial this in one river system and use results to develop plan for other catchments.
2.2.1. PEPFAA Codes at http://www.scotland.gov.uk/Publications/2005/03/20613/513662.2.1
2.3.1. SEPA guidelines at http://www.sepa.org.uk/water/habitat_enhancement/best_practice_guidance.aspx#Managing

3 INFORMATION NEEDS

Data	Purpose	Timescale	Priority	Notes
Juvenile surveys	Up to date survey required to determine current stock status	2010-1011	High	3.1
Catch data	Provide ongoing record of fish numbers and indicative measures of effort	2010	Moderate	3.2
Redd counts	Can be used (i) to provide indication of spawning escapement (ii) In conjunction with electric fishing, determine any egg survival problems (section 19).	Winter 2010 and 2011	High	

Notes
3.1 Single day re-survey of 6 sites plus additional 2 as recommended by Watt (2009) estimated at 1.5 days (1.5 x £400) plus 1 day report (1 x £230) = £830 plus expenses.
3.2 Catch data collection carries no cost other than an element of time. SDSFB legislative role under The Conservation of Salmon (Collection of Statistics) (Scotland) Regulations 2006. http://www.opsi.gov.uk/legislation/scotland/ssi2006/20060572.htm

10 RIVER DRYNOCH

10.1 Background

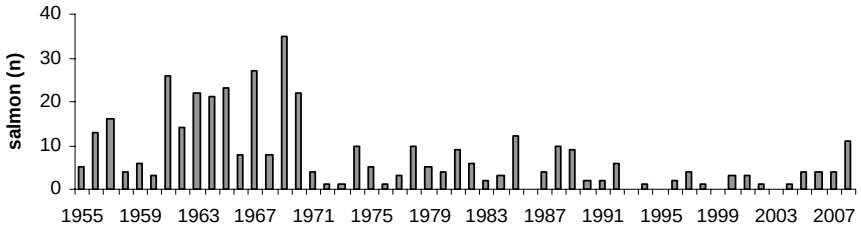
The River Drynoch drains the low hills to the northwest of the main Black Cuillin massif, flowing west for some 9km and entering the sea at the head of Loch Harport. There are no major tributaries, but numerous small, steep feeder streams enter the river along Glen Drynoch. These are accessible only in their lower reaches.

Aquaterra (2009) found that the water quality of the River Drynoch was excellent overall and there was no evidence of acidification. Both abundance and biomass of invertebrates were moderate. A high proportion of the river provides suitable habitat for rearing salmon and trout (Watt 2009). There are no impassable obstacles to migration. The river has moderate to swift flows throughout its course, with alternating riffle, run and glide/pool sequences. In most reaches boulders provide fish cover and a high proportion of the wetted area was categorised as typical juvenile salmon habitat. The narrow upper reaches also provide excellent habitat for young trout. A total of 51m^2 of spawning habitat was identified, mainly judged to be of moderate or good quality for salmon, but rather poor for trout due to the large grain size. Very few areas of stable pebble, gravel and coarse sand were identified that would provide optimal spawning habitat for smaller trout.

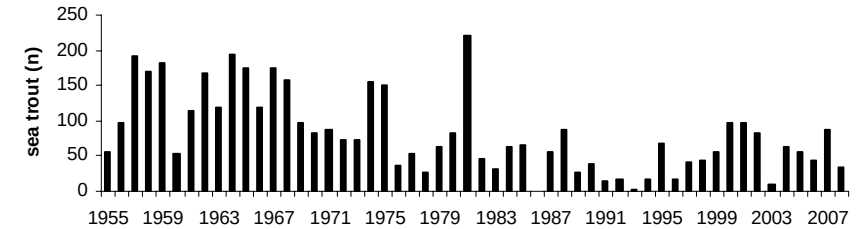
The benefits of fencing are seen throughout the lower and middle reaches of the river, with a healthy sward of vegetation along much of the river margin. This stabilises banks, provides food for young fish in the form of terrestrial insects and increases bankside cover. The narrow upper reaches have excellent bankside cover in the form of draped vegetation and undercuts.

Proprietors provided rod catch data going back to 1955. The data show a sudden decline in salmon catches in 1971. Catches increased somewhat through the 1980s but were followed by further declines. A slight increase is evident in the last four years, although catches remain well below historic level.

Salmon rod catch, River Drynoch, 1955-2008



Sea trout rod catch, River Drynoch, 1955-2008



The 1971 decline is less apparent in sea trout catches. Catches reached a low in the early 1990s, but have recovered to some degree since. 2003 was a very poor year, with only 9 sea trout caught.

It is thought that fishing effort declined very significantly between 40 and 20 years ago and that it has continued to decline slightly in more recent years.

A juvenile survey in 2005 found salmon at all sites with the exception of one in the upper reaches (Watt 2006). Salmon fry abundance was fair. Salmon parr were present at five sites, but abundance was low which may reflect a poor run in 2003, when no salmon were caught.

Trout were scarce in the middle and lower reaches. This may reflect (i) the nature of the habitat, which is better suited to young salmon and, (ii) survey site selection (mainly riffle). Trout abundance was highest at the two top sites and sea trout may choose to spawn in these higher reaches.

The fishery is owned by SGRPID who lease the tenancy to the Drynoch and Borline syndicate. A small number of permits are sold annually and a small number of syndicate members fish the river. There is no bag limit stipulated in the tenancy agreement or stated on the permit, although all undersized or spent fish are returned.

10.2 Assessment

Overall, a very high proportion of the River Drynoch provides suitable habitat for rearing salmon and trout. The middle reaches in particular provide classic salmon fry and parr habitat while the upper catchment is well suited to juvenile trout. The apparently high quality of habitat suggests that the river is capable of sustaining higher densities juveniles than were found in 2005. Juvenile numbers and smolt output of both sea trout and salmon may be limited by a lack of spawners and high priority should be given to ensuring adequate spawning escapement.

Some compaction of potential spawning gravel was recorded in the upper reaches and spawning areas for trout are limited in extent. Most of the spawning habitat identified was judged to be most suitable for salmon, as a result of large grain size. Large sea trout could probably use these habitats. However, few sea trout now grow to a large size due to high marine mortality, and so fewer of the spawning sites are usable. Improving the availability and quality of trout spawning habitat in the forested upper reaches and some of the tributary streams may be beneficial to trout. This may be a longer-term aim since so long as few mature trout return from sea the benefits may be very limited.

Deep holding pools for adult salmon are relatively scarce, and make up only a small proportion of total habitat in the middle reaches of the river where the majority of juvenile salmon habitats are present. This may limit uptake of spawning opportunities in these reaches, particularly when fish numbers are low.

10.3 Management

Aims and objectives

Management priorities should be to:

1 Maximise spawning escapement
2 Enhance aspects of habitat that might increase egg to smolt survival
3 Protect existing habitats

Should fish numbers increase in future, it is possible that habitat availability may become limiting. Should this situation be attained, enhancement or improvement of carrying capacity may be worthwhile.

Marine issues related to predation and fish farming are addressed in the Regional Section.

Information needs

Priorities for information collection include:

1 Catch return data – accurate returns for each river and a measure of effort
2 Juvenile surveys – used to determine current stock status.
3 Redd counts - used to assess approx no. of adults and ascertain uptake of potential spawning opportunities. It is also possible to use subsequent electric fishing to determine if egg-fry survival unusually low.

10.4 River Drynoch Action Plan

1 MAXIMISE SPAWNING ESCAPEMENT

Issue	*Actions*	*Benefits*	*Responsibility (**Lead**/other)*	*Guidelines*	*Priority*	*Notes*
Legal exploitation (angling)	Promote conservation measures limiting exploitation (catch & release/reduce angling pressure)	Increase abundance of spawners and egg deposition	FRS 2005 (note 1.2)	FRS 2005 (note 1.1). Freshwater Fisheries (Consolidation) (Scotland) Act 2003	High	1.1
Poaching	Appoint bailiff. Check main pools when fish present	Deter poaching activity	**SDSFB**, proprietors, police	ASFB, IFM	High	1.2
Illegal coastal exploitation (nets)	Continued liaison with SFPA (now part of Marine Scotland).	Deter poaching activity	**SDSFB**, proprietors, police		High ongoing	

Notes
1.1 Guidance on catch and release for anglers at http://www.marlab.ac.uk/FRS.Web/Uploads/Documents/FW25Catch%20FH10.pdf
1.2 Information available at http://www.asfb.org.uk/training/bailiff_training.asp. Grant may be available for training. Exams take place in spring.

2 MAXIMISE PRODUCTION

Issue	*Actions*	*Benefits*	*Responsibility* (**Lead**/other)	*Guidelines*	*Priority*	*Notes*
2.1 Instream habitats						
Lack of adult holding pools	Create holding pool(s) in middle or upper reaches. This would have to be done with professional advice	May increase uptake of spawning opportunities within this area	**SFT**, proprietors		Low	2.1.1
Some compaction of spawning gravel in upper reaches	Inspect and clean spawning areas in sections 20, 27 and 32	Localised improved egg survival	**SFT**, proprietors	Hendry & Cragg-Hine 1997	Low	2.1.2
Gravel extraction	Ensure future extraction conforms to CAR regulation		**SEPA**, SDSFB			2.1.3
2.2 Riparian habitats						
Potential for future erosion	Maintain stock fencing, fixing breaks in section 16, right bank (40m), possibly moving it back from river to prevent flood damage	Prevent erosion and encourages the riparian growth already developing	**SFT**, proprietors	PEPFAA Code	Low	2.2.1

Notes
2.1.1. Redd counts and future juvenile surveys will determine whether this is an appropriate approach.
2.1.2. Redd counts will ascertain whether these areas are already in use.
2.1.3. Code of Practice at http://www.snh.org.uk/salmonLIFEproject/pdf/A246750.pdf . Gravel extraction now requires a Controlled Activities Regulation Licence from SEPA.

2.2.1. Low priority as levels of erosion are acceptable but could be easily achieved. PEPFAA Codes at http://www.scotland.gov.uk/Publications/2005/03/20613/51366

3 INFORMATION NEEDS

Data	Purpose	Timescale	Priority	Notes
Juvenile surveys	Up to date survey required to determine current stock status	2010-1011	High	3.1
Catch data	Provide ongoing record of fish numbers and indicative measures of effort	2010	Moderate	3.2
Redd counts	Can be used to (i) Provide indication of spawning escapement (ii) In conjunction with electric fishing, determine any egg survival problems in sections 20, 27, 32	Winter 2011	Moderate	

Notes

3.1 Single day re-survey of 7 sites- estimated at 1 days (1 x £400) plus 1 day report (1 x £230) = £630 plus expenses.

3.2 SDSFB legislative role under The Conservation of Salmon (Collection of Statistics) (Scotland) Regulations 2006. http://www.opsi.gov.uk/legislation/scotland/ssi2006/20060572.htm

11 HAMARA RIVER

11.1 Background

The Hamara River drains the corries to the west of McLeod's tables and flows northwest to enter the sea in Loch Pooltiel at NG169 499. The river is approximately 9km in length and has one major tributary, the Allt Dearg. The river is abstracted in its upper reaches, providing the public water supply for the community of Glen Dale. The water quality of the Hamara River is excellent overall and there was no evidence of acidification (Aquaterra 2009).

Upstream from the Allt na Banachaig confluence the river is dominated by bedrock and waterfalls, providing very poor habitat for juvenile salmonids. Downstream the gradient eases and juvenile habitats are quite suitable for parr. A waterfall at NG189476, about 4.5km from the sea, appears impassable to upstream migrating salmon. From here to 1.2km above the tidal limit the river contains long reaches of good juvenile salmonid habitat. The lower 1.2km is slow flowing and meandering although some good habitat for salmon fry is present. 537m^2 of spawning habitat were identified during the survey of which 490m^2 were accessible to migratory species. Of this, 89% is in the lower 1.5km of river. Most of the better juvenile habitat is further upstream, so spawning habitat distribution may limit occupancy of juvenile habitats. Most spawning habitat was classified as being of moderate quality, with some evidence of siltation in the lower river.

Bankside cover is poor throughout the majority of the survey area. In the upper river the sole cover tends to be from occasional patches of draped, mature heather. Further downstream, the lack of bank cover appears to be result from grazing sheep preventing the growth of riparian vegetation. Livestock have access to almost all riverbanks. Fences, where present, are often ineffective with evidence of grazing and well-worn sheep tracks between fences and the river. Rapid bank erosion is evident in the lower 1.2km of the river. Several of these eroding areas are adjacent to spawning habitats and may cause periodic siltation and egg mortality.

No data on fish populations have been made available. It has been suggested that well over 100 salmon were taken annually from the river in past years. If true, this level of exploitation cannot have been sustainable based on available habitat.

The only juvenile survey data available was gathered in 2005 (Watt 2006). Salmon numbers were extremely low and the population is clearly highly vulnerable. No salmon were found at two sites in habitat accessible to migratory salmonids. Trout populations were moderate or poor. It should be noted that due to the very low catches of salmon, surveyors concentrated effort on the best available habitat. Densities in most habitats are likely to be even lower than those reported.

Water is abstracted at NG19645 to provide for a public water supply. The Skye DSFB has challenged both the current level of abstraction and a recent application by Scottish Water Solutions to increase this level. Around 3.5km^2 of the catchment is upstream of the abstraction point. This represents about 17% of total catchment area (estimated at around 21km^2). As most of the productive habitat is distributed through the middle and lower river, the impact of the abstraction will be ameliorated to some degree by flows from tributary streams, in particular the Allt Banachaig, Sunagil Burn and Allt Dearg, all of which flow into the river upstream from the main areas of smolt production. Approximately 20% of the water removed is also returned to the system 2km downstream. It is not possible with data currently available to determine exact impacts of abstraction, but it is reasonable to suppose that some reduction in mean wetted area will result and that this effect will be greatest in the uppermost accessible habitats. Scottish Water is in the process of developing a new single Regional Supply for the area as a whole and at this point the abstraction on the Hamara should cease.

At the current time fishing is accessible to all members of the Glendale Estate, but is not publicly accessible. There is no bag limit at the time of writing and no formalised method of catch recording. A trial run of selling permits via the local shop was stopped in 2008, as it was not considered to be

economically viable. During consultation, the crofting committee indicated that it would be keen to let the tenancy of the fishery.

11.2 Assessment

To develop the fisheries potential of the Hamara River it is clear that an accurate recording system is necessary, until such times as catch numbers are recorded it is unlikely that the proprietors will secure a fishing tenant.

Currently there is no realistic control over exploitation and it is unlikely that any fish, once caught, are returned to the river. Juvenile numbers and smolt output are likely to be limited by a lack of adult spawners. Highest priority should be given to ensuring adequate spawning escapement. Allowing even a small number of adults to spawn will have a significant impact on the number of smolts produced. Implementing full catch and release fishery will help to develop a sustainable fishery for the future.

The Hamara River can be divided into three sections, based on habitat type: (i) the lower reaches consisting of meandering glides with plentiful spawning (ii) the middle reaches containing the bulk of the better juvenile habitat and (iii) the upper reaches that are unlikely to be accessible to migratory fish and are bedrock-dominated. The focus for any future habitat management should be the middle and lower river, which contain the bulk of better habitat and are accessible to migratory salmonids. Instream cover is lacking in the lower sections and provision of bankside cover in the form of draped vegetation, roots or large woody debris might be expected to increase carrying capacity for young salmonids. Rapid erosion in the lower reaches may cause deterioration of spawning habitats.

11.3 Management

Aims and objectives

Management priorities should be to:

1 Maximise spawning escapement
2 Enhance aspects of habitat that might increase egg to smolt survival
3 Protect existing habitats.

Should fish numbers increase in future, it is possible that habitat availability may become limiting. Should this situation be attained, enhancement or improvement of carrying capacity may be worthwhile.

Information needs

Priorities for information collection include:

1 Catch return data – accurate returns and a measure of fishing effort;
2 Juvenile surveys – used to determine current stock status, vital information as the 2005 survey showed the salmon vulnerable to extinction;
3 Egg survival (egg box) – used to assess impacts of siltation and low flows on spawning sites;
4 Redd counts - used to assess approx number of adults and ascertain uptake of spawning opportunities in relation to juvenile habitat quality
5 Monitoring flow.

Stocking and hatchery

It is possible that stocking might be able to play a role in population recovery. Further electric fishing surveys will help to determine whether low juvenile densities are still occurring in the better quality habitat within the middle stretches. If any stocking is to be carried out it is recommended that only salmon or sea trout or stocks that are native to the river should be used. However, if adult numbers are low the risks of removing these fish from the river may be high. See section 7.2.5.2.

11.4 Hamara River Action Plan

1 MAXIMISE SPAWNING ESCAPEMENT

Issue	*Actions*	*Benefits*	*Responsibility (**Lead**/other)*	*Guidelines*	*Priority*	*Notes*
Legal exploitation (angling)	Encourage catch and release of all migratory species	Increase abundance of spawners and egg deposition	**Proprietors**, SDSFB	FRS 2009, Freshwater Fisheries (Consolidation) (Scotland) Act 2003	High	1.1, 1.2
Poaching	Appoint bailiffs. Check main pools when fish present	Deter poaching activity	**SDSFB**, proprietors, police	ASFB, IFM	High	1.3

Notes

1.1 Financial cost of this measure is low or zero (cost of enforcement). Freshwater Fisheries (Consolidation) (Scotland) Act 2003 (http://www.opsi.gov.uk/legislation/scotland/acts2003)

1.2 Guidance on catch and release for anglers at http://www.marlab.ac.uk/FRS.Web/Uploads/Documents/FW25Catch%20FH10.pdf

1.3 Information available at http://www.asfb.org.uk/training/bailiff_training.asp. Grant may be available for training. Exams take place in spring.

2 MAXIMISE PRODUCTION

Issue	*Actions*	*Benefits*	*Responsibility* (**Lead**/other)	*Guidelines*	*Priority*	*Notes*
2.1 Instream habitats						
Lack of parr cover in parts of lower river	Trial placement of logs/random boulder placement in lower river	Improved carrying capacity for parr	**SFT**, proprietors	Hoey *et al* 1995 Soulsby (2002)	Low	2.1.1
2.2 Riparian habitats						
Trampling and erosion	New stock fencing especially in lower river and repairs in sections 12 and 14 in the middle reaches	Improved egg survival and carrying capacity	**SFT**, proprietors, graziers	PEPFAA Code	Moderate	2.2.1
Bank collapse – upstream spawning section 7	Repair bank using log and conifer tops or similar lower river	Prevent further erosion and provide cover for juveniles	**SFT**, proprietors		Low	
2.3 Water management - abstraction						
Water abstraction	Monitor situation and press for minimum possible abstraction. Review if Regional Supply is not developed	If abstraction ceases it could increase wetted area for juveniles. Possible improvement in upstream migration	**SDSFB**, proprietors, SWS		Moderate	2.3.1

Notes

2.1.1. May be appropriate to trial this in one river system and use results to develop plan for other catchments.

2.2.1. PEPFAA Codes at http://www.scotland.gov.uk/Publications/2005/03/20613/51366

2.3.1. Electric fishing data (2005) showed few fish. Habitat (including water abstraction) very unlikely to be limiting production at present.

3 INFORMATION NEEDS

Data	Purpose	Timescale	Priority	Notes
Juvenile surveys	Up to date survey required to: (i) determine current stock status (ii) define possible future stocking plan	2010-2011	High	3.1
Catch data	Provide ongoing record of fish numbers and indicative measures of effort	2010	High	3.2
Egg survival	Assess impacts of siltation and low flows on spawning sites in lower reaches	2012	Moderate	3.3
Redd count	Ascertain whether spawning is only occurring in the poor quality lower river – would help to determine use of hatchery in redistributing fry to upper areas			3.4
Water flow	Quantitative data on flows	2010	Moderate	
Seal monitoring	To determine possible impact of seals on fishery		Moderate	3.4

Notes
3.1 Single day re-survey of 5 sites plus additional 2 as recommended by Watt (2009) estimated at 1.5 days (1.5 x £400) plus 1 day report (1 x £230) = £830 plus expenses.
3.2 Catch data collection carries no cost other than an element of time. Recording should be initiated as soon as possible.
3.3 Egg box technique, Harris 2006.
3.4 Volunteers could do this work, after appropriate training.

12 RIVER HAULTIN

12.1 Background

The River Haultin drains the south west flanks of the Trotternish hills and flows almost due west into Loch Snizort Beag. It is approximately 9km in length and has one major tributary, the Lon Mor, itself 6km long. The water quality of the River Haultin catchment is good to excellent (Aquaterra 2009) with no evidence of acidification. Abundance of invertebrates was at the low end of moderate and biomass was moderate.

Much of the River Haultin is characterised by bedrock and short rapids and there are several obstacles to migration within the surveyed area. The upper limit of migration is difficult to determine, but it seems probable that salmon and sea trout can access the lower 2.5km. The lower 1.5km of river contains large areas of fair or good quality mixed juvenile habitat. Only $30m^2$ of typical spawning habitat was identified during the survey, mainly in the lower reaches of Lon Charisgill. It is probable that salmon could create 'spot redds' in patches of smaller substrate among cobbles in the lower reaches of the river, although many of these were unstable and egg survival may be rather poor. Small patches of pebble and gravel were noted in pools throughout the river, which would provide patches of potential spawning for trout. Overall however, spawning habitat is scarce

The lower Lon Mor is dominated by bedrock habitats. The middle reaches provide some good quality mixed juvenile salmon habitat but are inaccessible due to impassable waterfalls.

The banks of the River Haultin and Lon Mor are in good condition and also support some good quality riparian woodland. Japanese knotweed *Reynoutria japonica* was identified at NG4342 5142, on the left (east) bank of the small tributary stream, immediately upstream from the track.

Watt (2006) conducted limited electric fishing on the mainstem of the river. Salmon were absent. Trout densities were fair or good.

Very little fishing occurs on the Haultin and fishing is not available on the south bank. Catch and release fly fishing is available on the north bank through Skyeangling and Skyeghillies websites. Local consultation suggests that the river was never a significant fishery.

12.2 Assessment

Lack of spawning suggests maximum smolt output could, in all probability, only be attained by stocking of the river. Poaching is clearly a current problem. A rope has been stretched across the river to aid poaching activities at the pool below the first waterfall.

12.3 Management

Aims and objectives

Management priorities should be to:

1 Maximise spawning escapement
2 Protect existing habitats.

Information needs

Priorities for information collection include:

1 Catch return data – accurate returns and a measure of fishing effort
2 Juvenile surveys – used to determine current stock status.

12.4 River Haultin Action Plan

1 MAXIMISE SPAWNING ESCAPEMENT

Issue	*Actions*	*Benefits*	*Responsibility (**Lead**/other)*	*Guidelines*	*Priority*	*Notes*
Legal exploitation (angling)	Encourage catch and release of all migratory species	Increase abundance of spawners and egg deposition	**Proprietors**, SDSFB	FRS 2009, Freshwater Fisheries (Consolidation) (Scotland) Act 2003	High	1.1, 1.2
Legal exploitation (nets)	Coastal netting rights owned by river proprietor who chooses not to operate them.		**Proprietors**, SDSFB			
Known poaching activity	Appoint bailiffs. Check main pools when fish present	Deter poaching activity	**SDSFB**, proprietors, police	ASFB, IFM	High	1.3

Notes

1.1 Financial cost of this measure is low or zero (cost of enforcement). Freshwater Fisheries (Consolidation) (Scotland) Act 2003 (http://www.opsi.gov.uk/legislation/scotland/acts2003)

1.2 Guidance on catch and release for anglers at http://www.marlab.ac.uk/FRS.Web/Uploads/Documents/FW25Catch%20FH10.pdf

1.3 Information available at http://www.asfb.org.uk/training/bailiff_training.asp. Grant may be available for training. Exams take place in spring.

2 MAXIMISE PRODUCTION

Issue	*Actions*	*Benefits*	*Responsibility* (**Lead**/other)	*Guidelines*	*Priority*	*Notes*
2.1 Instream habitats						
Lack of spawning habitat	Explore approaches regarding creation of spawning habitat or stocking programme	May increase salmon and sea trout production	**SFT**, proprietors	Hendry & Cragg-Hine 1997	Low	2.1.1
2.2 Riparian habitats						
Livestock access downstream of road bridge	Livestock access does not appear to be influencing instream habitat, monitor situation	Prevent erosion and protect instream habitat	**SFT**, proprietors	PEPFAA Code	Low	2.2.1
Livestock access in section LM5	Repair broken fence	May help regeneration	**Proprietor, graziers**	PEPFAA Code	Low	2.2.2
2.3 Biosecurity						
Japanese knotweed	Remove Japanese knotweed at NG4342 5142	Allow natural bankside vegetation to regenerate	**SFT**, proprietors, SNH, SEPA, Skye and Lochalsh Environment Forum	SEPA 2008	Moderate	2.3.1

Issue	*Actions*	*Benefits*	*Responsibility* (**Lead**/other)	*Guidelines*	*Priority*	*Notes*
2.4 Water Quality						
Possible pollution from septic tank leading directly into river at Rinetra	Contact SEPA about septic tank outflow and testing of water quality downstream	Preserve water quality for fish and invertebrates	**SFT**, proprietors, SEPA		Moderate	

Notes

2.1.1. May be difficult and costly. Resources may best be targeted at other rivers with (i) greater potential (ii) a history of having provided significant fisheries.

2.2.1. Erosion is not a current problem. PEPFAA Codes at http://www.scotland.gov.uk/Publications/2005/03/20613/51366

2.2.2. The banks are naturally bare and repairing the fencing will not benefit the fisheries but may help regeneration and therefore have wider biodiversity benefits.

2.3.1. This is a very small area of knotweed that would be easily removed at minimal cost. A Skye-wide control and eradication programme will be developed as part of the Regional Management Plan. Guidance on knotweed control at: http://www.sepa.org.uk/waste/waste_regulation/guidance__position_statements.aspx . Skye and Lochalsh Environment Forum Knotweed Control Programme at http://www.slef.org.uk/knotweed.html.

3 INFORMATION NEEDS

Data	**Purpose**	**Timescale**	**Priority**	**Notes**
Juvenile surveys	Up to date survey required to: (i) determine current stock status (ii) assess obstacles	2011	Moderate	3.1
Catch data	Provide ongoing record of fish numbers and indicative measures of effort	2010	Moderate	3.2
Upper limit of migration (local knowledge)	Access reliable local knowledge to determine historical accessibility of obstacles	Ongoing liaison	Moderate	

Notes

3.1 Five to ten minute timed surveys in sections H2, H4, H7, H11, H15 and possible additional presence absence surveys - Single day re-survey of 5 sites estimated at 1 days (1 x £400) plus 1 day report (1 x £230) = £630 plus expenses.

3.2 Catch data collection carries no cost other than an element of time. SDSFB legislative role under The Conservation of Salmon (Collection of Statistics) (Scotland) Regulations 2006. http://www.opsi.gov.uk/legislation/scotland/ssi2006/20060572.htm

13 RIVER HINNISDAL

13.1 Background

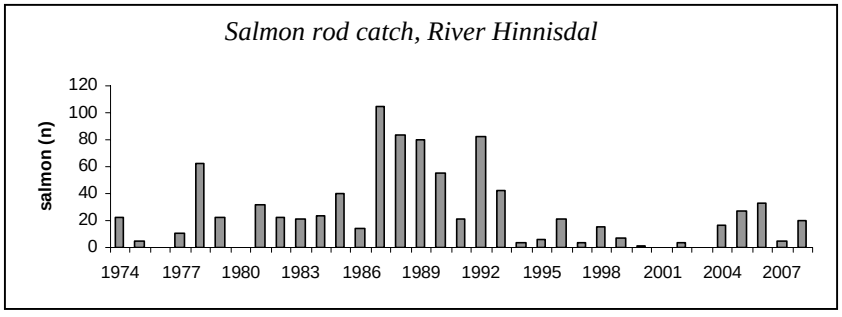
The River Hinnisdal is approximately 11km in length and has two major tributaries, the Allt Ruadh from the south and the Lon Coire Chaiplin from the northeast. The river was once quite a prolific salmon fishery. The water quality of the Hinnisdal catchment is excellent and invertebrate studies found no evidence of acidification (Aquaterra 2009). Invertebrate abundance was moderate but biomass high reflecting the numbers of large species such as the stonefly *Perla bipunctata* and lumbricid earthworms. The presence of caddis larvae in Lon Ruadh indicated stable substrates.

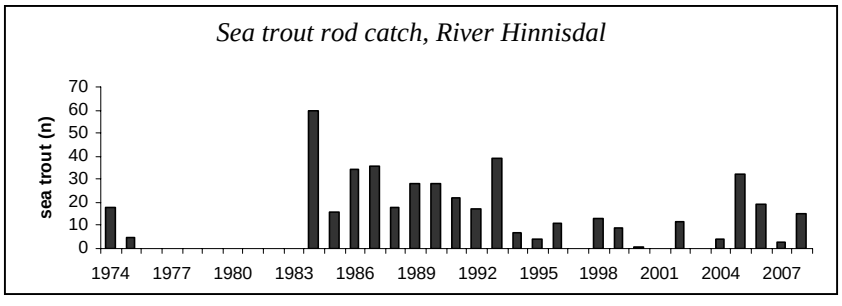
The lower 6.2km of river is accessible to migratory salmonids. The lower 1.5km of river is meandering with large areas of good quality juvenile habitat with some excellent adult holding pools. Above this a 1km long gorge contains several obstacles, but all are passable to salmon. Upstream from the gorge there is approximately 3km of good quality juvenile salmonid habitat. The inaccessible upper reaches provide good habitat for brown trout. A total of 298m^2 of potential spawning habitat was identified, of which 95% is accessible to migratory salmonids. Spawning is most abundant and of highest quality below the gorge.

The Lon Ruadh provides good quality juvenile salmonid habitat throughout its length, with plentiful spawning habitat. The small Lon Ruadh north is also a potentially a good trout spawning stream. Both streams were silted at the time of survey and this would be expected to reduce egg survival.

Catchment landuse is mainly as sheep and cattle grazing, with some coniferous forestry. Some areas of conifer have not been planted in accordance with guidance, but felling is in progress. Gaps in fences in the middle reaches give livestock access to the river. However grazing is not likely to be a significant issue restricting fish abundance at present. The lower reaches of the Lon Ruadh are heavily trampled by cattle and spawning habitat is degraded by silt. Restricting livestock access may be beneficial. Further trampling damage was noted at the confluence of Lon Ruadh and Cam Lon.

Catch data for the north bank are reproduced below. These are the most complete records for the river. Salmon catches peaked at around 80 fish per year between the 1987 and 1992, after which they declined rapidly. There has been a slight, but patchy, recovery since 2004. Sea trout figures show very similar trends. Data are missing for the period 1976 to 1983, but in the mid 1980s and early 1990s catches were high. Like those for salmon, they decrease rapidly in the 1990s but have shown some recovery since 2005. The temporal coincidence of high sea trout and salmon catches in the late 1980s and early 1990s may indicate high fishing effort during this period or an abundance of fish.





Given that it was once a productive salmon fishery, juvenile salmon numbers in the Hinnisdal were disappointingly low in the 2005 survey (Watt 2006). Furthermore, it was evident that salmon were absent from large areas of suitable habitat in the middle reaches of the river. Only at

the lower two sites were reasonable numbers present. Trout populations were relatively healthy, with good densities of both fry and parr throughout the middle and upper reaches.

Permits for catch and release fly fishing are available for the fisheries on both banks of the river via Skyeangling and Skyeghillies websites and local retail outlets.

13.2 Assessment

The Hinnisdal was a productive salmon fishery in past years, although it is questionable if rod catches of up to 100 salmon from one bank, with few returned, ever represented sustainable exploitation.

The River Hinnisdal provides good quality rearing habitat for young salmon and trout. It is possible that a lack of spawning habitat upstream from the gorge limits the use by salmon and sea trout of some areas of good habitat. Some degradation has occurred due to poor forestry practice, but this is limited in extent. Similarly while some erosion, possibly exacerbated by grazing, is present along the mainstem this does not seem to have created significant damage to instream habitats. Gravel extraction around NG413577 should be monitored to determine if key habitats are being damaged.

Poaching is an ongoing concern and poaching equipment has been found in recent years. The gorge above the road and the isolated lower reaches offer ample poaching opportunity and remaining adult population are highly vulnerable. Since juvenile numbers and smolt output are likely to be limited by a lack of adult spawners, high priority should be given to ensuring adequate spawning escapement

The Allt Ruadh is potentially a very productive stream. This stream is being damaged by grazing and consequent siltation. Electric fishing surveys are required as no data are available for the Allt Ruadh. Given the difficult access for small sea trout through the gorge, the Allt Ruadh, which is easily accessible, may be particularly valuable to sea trout. Similarly, the Allt Ruadh North, a small stream flowing into the R. Hinnisdal from the west, contains spawning opportunities for trout, which could potentially be improved.

13.3 Management

Aims and objectives

Management priorities should be to:

1 Maximise spawning escapement (throughout)
2 Enhance aspects of habitat that might increase egg to smolt survival (especially Allt Ruadh and Allt Ruadh North)
3 Protect existing habitats.

Information needs

Priorities for information collection include:

1 Catch return data – accurate returns and a measure of fishing effort
2 Juvenile surveys – used to determine current stock status
3 Redd counts - used to assess approx no. of adults and ascertain uptake of potential spawning opportunities. It is also possible to use subsequent electric fishing to determine if egg-fry survival is unusually low

Stocking and hatchery

It is possible that stocking may be used in the future to redistribute juveniles to good habitat above the gorge where spawning is lacking. Further electric fishing surveys will help to determine whether low juvenile densities are still occurring in this area. See Section 7.2.5.2.

NOTE: Marine issues related to fish farming are addressed in the Regional Section.

13.4 River Hinnisdal Action Plan

1 MAXIMISE SPAWNING ESCAPEMENT

Issue	*Actions*	*Benefits*	*Responsibility* (***Lead****/other)*	*Guidelines*	*Priority*	*Notes*
Legal exploitation (angling)	Ensure catch and release of all migratory species	Increase abundance of spawners and egg deposition	**Proprietors**, SDSFB	FRS 2009	High	1.1, 1.2
Legal exploitation (nets)	Coastal netting rights owned by river proprietor who chooses not to operate them.		**Proprietor**, SDSFB			
Poaching	Appoint bailiffs. Check main pools when fish present	Deter poaching activity	**SDSFB**, proprietors, police	ASFB, IFM	High	1.3

Notes

1.1 Financial cost of this measure is low or zero (cost of enforcement). Freshwater Fisheries (Consolidation) (Scotland) Act 2003 (http://www.opsi.gov.uk/legislation/scotland/acts2003)

1.2 Guidance on catch and release for anglers at http://www.marlab.ac.uk/FRS.Web/Uploads/Documents/FW25Catch%20FH10.pdf

1.3 Information available at http://www.asfb.org.uk/training/bailiff_training.asp. Grant may be available for training. Exams take place in spring.

2 MAXIMISE PRODUCTION

Issue	*Actions*	*Benefits*	*Responsibility* (**Lead**/other)	*Guidelines*	*Priority*	*Notes*
2.1 Instream habitats						
Limited spawning in mid reaches of Hinnisdal	Creation of spawning sites or selective stocking after electrofishing surveys	May increase salmon and sea trout production in mid river	**SFT**, proprietors	Hendry & Cragg-Hine 1997	Low. Electric fishing required	2.1.1
Siltation of spawning sites Allt Ruadh & Cam Lon	Inspect and clean spawning areas in Allt Ruadh section 1 and Carn Lon section 2. (See also riparian habitat).	Localised improved egg survival	**SFT**, proprietors	Hendry & Cragg-Hine 1997	High? (electric fishing required)	2.1.2
Siltation Allt Ruadh North	(i) Clean fines (manually) (ii) Increase flow over gravels to maintain clean gravels. (iii) Selective cutting of scrub to improve flows	Localised improved trout egg survival	**SFT**, proprietors	Hendry & Cragg-Hine 1997	Moderate	2.1.3
Gravel extraction at location NG 413 577	Assess damage and prevent future occurrences	Protect instream habitat	**Proprietors, SEPA**	SEPA 2008.	Moderate	2.1.4
2.2 Riparian habitats						
Grazing impacts on banks of Hinnisdal	Consider repairs (sections 18, 21, 22) or improvements and livestock access	May improve egg survival and carrying capacity, however is not a sever problem at the present time	**SFT**, proprietors, crofters	PEPFAA Code	Low	2.2.2

Issue	*Actions*	*Benefits*	*Responsibility* (**Lead**/other)	*Guidelines*	*Priority*	*Notes*
2.2 Riparian habitats						
Trampling and erosion	Liaison with graziers regarding fencing and livestock access lower Allt Ruadh and Cam Lon	Improved egg survival and carrying capacity	**SFT**, proprietors, crofters	PEPFAA Code	Moderate	
Scrub growth closing over channel	Selective cutting back of scrub on Allt Ruadh North	Increase speed of water flow and reduce risk of siltation	**SFT**, proprietors	PEPFAA Code	Low	
2.3 Obstacles						
Access to upper Cam Lon prevented by culvert	Deepen pool below culvert explore means of creating deeper flow in culvert (such as baffles)	Allow fish to gain access to good habitat above obstacle	**SFT**, proprietors	Scottish Executive 2000	Low	2.3.1

Notes
2.1.1. May be expensive.
2.1.2. Low cost if there is volunteer involvement
2.1.3. e.g. log placement at pool tails.
2.1.4. Gravel extraction is a controlled activity. Guide to regulations at http://www.sepa.org.uk/water/idoc.ashx?docid=2a4b7ea0-ccf7-48b5-a85b-1404de0f58ea&version=-1
Code of Practice at http://www.snh.org.uk/salmonLIFEproject/pdf/A246750.pdf
2.2.1. The recommended buffer strip width for a river the size of the Hinnisdal is 20m on either side. Forest and Water Guidelines at http://www.forestry.gov.uk/pdf/FCGL002.pdf/$FILE/FCGL002.pdf
2.2.2. PEPFAA Codes at http://www.scotland.gov.uk/Publications/2005/03/20613/51366
2.3.1 Limited area of habitat upstream, but some good trout spawning habitat is present. Scottish Executive 2000. River Crossings and Migratory Fish: Design Guidance - http://www.scotland.gov.uk/consultations/transport/rcmf-05.asp

3 INFORMATION NEEDS

Data	**Purpose**	**Timescale**	**Priority**	**Notes**
Juvenile surveys	Up to date survey required to: (i) determine current stock status (ii) define stocking potential	2010-1011	High	3.1
Catch data	Provide ongoing record of fish numbers and indicative measures of effort	2010	Moderate	3.2
Redd counts	Can be used to (i) Provide indication of spawning escapement (ii) determine current use of middle reaches	Winter 2010 and 2011	High	

Notes
3.1 Re-survey of 8 sites plus additional sites on the Lon Ruadh, Cam Lon and Lon Ruadh North as recommended by Watt (2009) estimated at 2 days (2 x £400) plus 1 day report (1 x £230) = £1030 plus expenses.
3.2 Catch data collection carries no cost other than an element of time- fisheries managers on the Hinnisdal feel catch returns are good when fish are caught but do no show fishing effort. SDSFB legislative role under The Conservation of Salmon (Collection of Statistics) (Scotland) Regulations 2006. http://www.opsi.gov.uk/legislation/scotland/ssi2006/20060572.htm

14 KILMARTIN RIVER

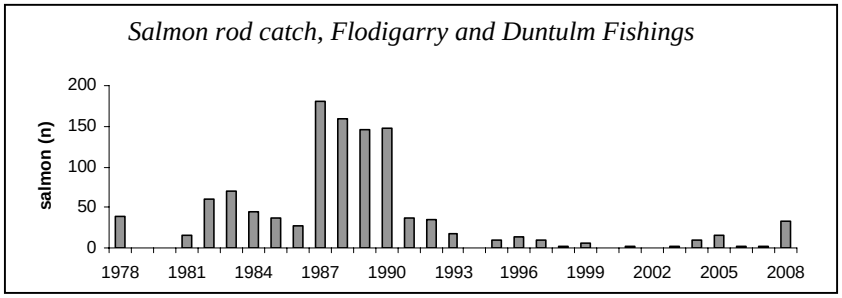
14.1 Background

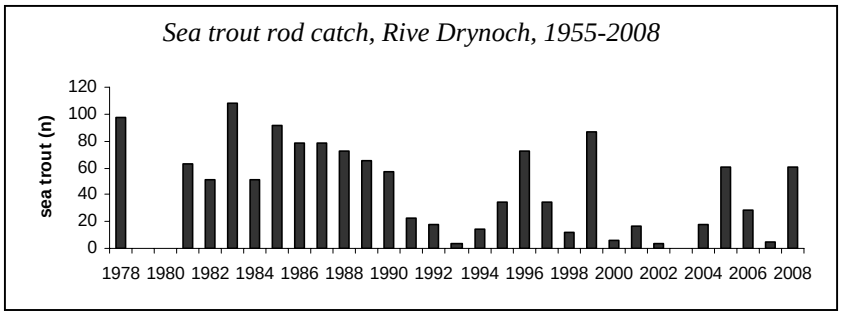
The Kilmartin River drains the steep, east side of the Trotternish ridge. For most of its course it flows over flat moorland before dropping to the sea through a 1km long gorge by the village of Staffin. The catchment contains well over 20km of accessible watercourse. The largest tributaries are the Abhainn Gremiscaig, Suarbie Burn and Lon/Cleap/Lon a Mhuillin.

The water quality of the Kilmartin catchment was excellent overall and there was no evidence of acidification. The invertebrate productivity of the Kilmartin catchment was amongst the highest on Skye with both high abundance and high biomass (Aquaterra 2009). Juvenile habitats are abundant and widely distributed through the river and tributaries (Watt 2008). No major obstacles to migration are present. In total, 960m^2 of spawning habitat was identified. In the lower river spawning areas were present in sections containing high quality juvenile habitat. The spawning sites in some of these sections were becoming silted and compacted, perhaps due in part to lack of use. In the upper river spawning opportunities for salmon was limited to 'spot redd' in small patches of cobble, pebble and gravel among larger substrates. Good quality spawning habitat for salmon and trout was present in the lower reaches of the Suarbie Burn and the Abhainn Gremiscaig.

With the exception of the lower gorge, landuse is grazing over rough pasture and moorland. Some parts of the lower river are fenced, but the fences are not effective in keeping livestock off the banks. Impacts of livestock are evident in the lack of bankside vegetation. Trampling, erosion and slumping of banks are present in lower river and inputs of fine sediment may be damaging spawning gravels. In the longer term livestock exclusion might be expected to be beneficial to instream habitat. However, local consultation suggests that the river has changed little over the decades.

The fishings form part of SGRPID's Staffin, Flodigarry and Duntulm Fishings, which include the rivers Kilmartin, Kilmaluag & Lealt. No data were obtained which can confidently be assigned to the Kilmartin River. The rivers are fished by the Portree Angling Association. Salmon catches show a very major peak in the late 1980s, with a seven-fold increase between 1986 and 1987. These high catches were maintained for a four years, before an equally rapid decline in 1991. Catches remained in single figures throughout much of the 1990s, increasing in 2005 and 2008.





Sea trout catches from the three rivers have a long term average of around 60 fish. The typical late 1980s decline is evident, but some good catches were made in subsequent years. The years 2000 to 2004 were poor, but the catch improved markedly in 2005 and 2008.

Juvenile salmon were scarce during the 2005 survey and clearly well below the carrying capacity of the river. No salmon fry and only one parr were found at the upper two sites, despite the presence of good quality spawning and juvenile habitats. They were also absent from the lower two sites, which

again were in suitable habitat. Reasonable densities of fry and parr were found at one site only. Trout numbers were rather better, with fair fry numbers and fair-poor parr densities. Very few redds were identified during a catchment-wide survey in January 2009, suggesting a grave lack of spawning adult salmon.

SGRPID owns the fishing and leases them to Portree Angling Association (PAA). Fishing is available to PAA members. Non-members can purchase day tickets from an outlet in Portree. Catch and release is encouraged. Anecdotal evidence suggests that poaching is a major and ongoing issue.

14.2 Assessment

As a result of its large wetted area, habitat quality, moderate gradient and ease of access for migratory fish the Kilmartin River has great fishery potential, on Skye second only to the River Snizort. No major fish habitat issues were identified that would explain the decline of adult stocks of salmon and sea trout, or the lack of juveniles identified during the 2005 survey. It is probable that a combination of high marine mortality and over-exploitation in the river has resulted in a lack of spawning adults. The very small number of redds identified during the 2008-09 survey is consistent with this, as is the discovery of a net in the holding pool adjacent to one of the main spawning areas. Juvenile numbers and smolt output will therefore be limited by a lack of adult spawners and highest priority should be given to ensuring adequate spawning escapement.

Some minor degradation of habitats has occurred as a result of grazing and associated erosion, but these are minor and localised, and overall habitat quality is unlikely to have changed greatly during recent decades.

14.3 Management

Aims and objectives

Management priorities should be to:

1 Maximise spawning escapement
2 Enhance aspects of habitat that might increase egg to smolt survival
3 Protect existing habitats.

Only if fish numbers increase will habitat availability become limiting. Should this situation be attained, enhancement or improvement of carrying capacity may be worthwhile. Some pre-spawning assessment of siltation in spawning areas in the lower river may be worthwhile.

Information needs

Priorities for information collection include:

1 Catch return data – accurate returns and a measure of fishing effort
2 Juvenile surveys – used to determine current stock status, vital information if a stocking plan is to be developed. Surveys need to be extended upstream and into major tributaries
3 Redd counts - assess approximate number of adults and ascertain uptake of potential spawning opportunities. Link to electric fishing to identify egg survival issues.

Stocking and hatchery

Stocking might be able to play a role in population recovery where adult numbers are low and marine survival is poor. Further electric fishing surveys are needed to determine current juvenile densities. If any stocking is to be carried out it is recommended that only salmon or sea trout or stocks that are native to the river should be used. As with any stocking exercise, a full assessment of potential costs and benefits should be carried out. Any stocking should be accompanied by improved protection of adult stocks.

14.4 Kilmartin River Action Plan

1 MAXIMISE SPAWNING ESCAPEMENT

Issue	*Actions*	*Benefits*	*Responsibility (**Lead**/other)*	*Guidelines*	*Priority*	*Notes*
Legal exploitation (angling)	Encourage catch and release of all migratory species	Increase abundance of spawners and egg deposition	**Proprietors**, SDSFB	FRS 2005. Freshwater Fisheries (Consolidation) (Scotland) Act 2003	High	1.1, 1.2
Poaching	Bailiffs to check main pools when fish present	Deter poaching activity	**SDSFB**, proprietors, police	ASFB, IFM	High	1.3

Notes
1.1 Freshwater Fisheries (Consolidation) (Scotland) Act 2003 (http://www.opsi.gov.uk/legislation/scotland/acts2003)
1.2 Guidance on catch and release for anglers at http://www.marlab.ac.uk/FRS.Web/Uploads/Documents/FW25Catch%20FH10.pdf
1.2 Information available at http://www.asfb.org.uk/training/bailiff_training.asp. Grant may be available for training. Exams take place in spring.

2 MAXIMISE PRODUCTION

Issue	*Actions*	*Benefits*	*Responsibility* (**Lead**/other)	*Guidelines*	*Priority*	*Notes*
2.1 Instream habitats						
Some compaction of spawning habitat	Inspect and clean spawning areas in sections 14 to 20 on the main river	Localised improved egg survival	**SFT**, proprietors	Hendry & Cragg-Hine 1997	Moderate? (see information needs)	2.1.1
Lack of spawning in upper Suarbie Burn	After an electric fishing survey consider creation of spawning habitat middle/upper reaches	Increase potential habitat use	**SFT**, proprietors	Hoey *et al* 1995; Soulsby (2002)	Low	2.1.2
2.2 Riparian habitats						
Trampling, slumping & erosion, Kilmartin River	Grazing reduction, fencing and or bank reinforcement	Improved egg survival and carrying capacity	**SFT**, proprietors	PEPFAA Code	Low	2.2.1
Erosion on lower Suarbie	Grazing reduction, fencing and or bank reinforcement	Improved egg survival and carrying capacity	**SFT**, proprietors	PEPFAA Code	Low	2.2.1
2.3 Stocking						
Lack of adult fish	Consider stocking options	Potential to increase juvenile abundance	**Proprietor/SDSFB**	FRS 2007	Moderate/low	2.3.1

Notes
2.1.1. Low cost.
2.2.1. Habitat is not currently limiting fish production so low priority. PEPFAA Codes at http://www.scotland.gov.uk/Publications/2005/03/20613/51366
2.3.1 Stocking may only be worthwhile if illegal exploitation can be minimised. Options can only be properly considered when more recent population data become available.

3 INFORMATION NEEDS

Data	Purpose	Timescale	Priority	Notes
Juvenile surveys	Up to date survey required to: (i) determine current stock status (ii) determine a possible role for stocking within the management of the river	2010-1011	High	3.1 3.2
Catch data	Provide ongoing record of fish numbers and indicative measures of effort	2010	High	3.3
Redd counts	Can be used to (i) Provide indication of spawning escapement (ii) Underpin stocking plan (e.g. area to be left un-stocked) (iii) In conjunction with electric fishing, determine any egg survival problems	Winter 2011	Moderate	
Egg survival	Assess impacts of siltation and low flows on spawning sites in lower reaches	2012	Moderate	3.4

Notes

3.1 Single day re-survey of 6 sites plus additional sites as recommended by Watt (2009) estimated at 2 days (2 x £400) plus 1 day report (1 x £230) = £1030 plus expenses. Development of stocking plan requires recent data.

3.3 Ways to improve data collection being taken considered by PAA . SDSFB legislative role under The Conservation of Salmon (Collection of Statistics) (Scotland) Regulations 2006. http://www.opsi.gov.uk/legislation/scotland/ssi2006/20060572.htm

3.4 Egg box technique, Harris 2006.

15 ORD RIVER

15.1 Background

The Ord River is a small catchment on the west side of Sleat, entering the sea at the mouth of Loch Eishort. Water quality is excellent overall and there is no evidence of significant acidification although scores on both acidity indices were lower than most rivers on Skye (Aquaterra 2009). Abundance and biomass of invertebrate are low.

The upper catchment is steep with much bedrock. A waterfall approximately 3.5 km upstream from the sea appears impassable. Downstream of this there is suitable habitat for fry and patches suitable for parr. The middle reaches are low gradient, meandering and best suited to trout parr and fry. Much of the better juvenile salmonid habitat is found where the river enters the woodland, 1.2km up from the sea. Little spawning habitat was noted in the lower 1.5km of river, although it is likely that trout could create small 'spot redds' in some areas. The main spawning areas are along the meanders in the middle reaches although many of the sites identified as potentially suitable for spawning were silted. This is sufficiently serious that egg survival is likely to be affected.

The lower river is wooded, with a mix of native broadleaved trees creating heavy shading. Livestock appear to have downstream access into the woodland. Trampling and erosion impact the grazed middle section of the stream. Inputs of fine sediment resulting from trampling undoubtedly contribute to the siltation of substrates, including spawning sites. The upper river is wooded and the riparian area is ungrazed. Bankside fish cover was mainly recorded as poor. Where present, cover was mainly in the form of undercuts, mostly through the meandering middle reaches

Watt (2006) found that juvenile salmon were absent. It is not known if salmon have ever been present in significant numbers in the River Ord. Trout fry densities were good, increasing steadily between site 1 at the bottom of the river and site 5 near the top. Parr densities were fair and also highest at the top survey site.

The river does not support a significant fishery.

15.2 Assessment

The river is small and is unlikely ever to have supported a sustainable salmon population. Suitable habitat for trout is present throughout. The main impacts on habitat result from grazing and trampling, which have resulted in sedimentation of spawning and juvenile habitats in the middle reaches. Bankside fish cover is mainly poor. Where present, cover was mainly in the form of undercuts, mostly through the meandering middle reaches.

15.3 Management

Aims and objectives

Management priorities should be to:

1 Enhance aspects of habitat that might increase egg to smolt survival (mainly middle reaches)
2 Maximise spawning escapement
3 Protect existing habitats.

Information needs

Priorities for information collection include:

1 Juvenile surveys – used to update current stock status
2 Egg survival – egg box experiment is used to determine whether sedimentation is causing low egg survival.

15.4 Ord River Action Plan

1 MAXIMISE SPAWNING ESCAPEMENT

Issue	*Actions*	*Benefits*	*Responsibility (**Lead**/other)*	*Guidelines*	*Priority*	*Notes*
Legal exploitation (angling)	Ensure catch and release of all migratory species	Increase abundance of spawners and egg deposition	**Proprietors**, SDSFB	FRS 2005.	Unknown (little angling?)	1.1
Poaching	Bailiffs to check estuary when fish present	Deter poaching activity	**SDSFB**, proprietors, police	ASFB, IFM	Low	1.2

Notes

1.1 Financial cost of this measure is low or zero (cost of enforcement). Freshwater Fisheries (Consolidation) (Scotland) Act 2003 (http://www.opsi.gov.uk/legislation/scotland/acts2003)

1.2 No information available, but the small size of the river suggests it will not be a target for poaching.

2 MAXIMISE PRODUCTION

Issue	*Actions*	*Benefits*	*Responsibility* (**Lead**/other)	*Guidelines*	*Priority*	*Notes*
2.1 Instream habitats						
Sedimentation of spawning habitat	Grazing reduction or fencing to exclude grazers from spawning areas	Localised improved egg survival	**SFT**, proprietors	PEPFAA Code	Moderate	2.1.1
2.2 Riparian habitats						
Trampling and erosion (middle reaches)	Grazing reduction or fencing to exclude grazers	Improved egg survival and carrying capacity	**SFT**, proprietors	PEPFAA Code	Moderate	2.1.1

Notes

2.1.1. PEPFAA Codes at http://www.scotland.gov.uk/Publications/2005/03/20613/51366

3 INFORMATION NEEDS

Data	**Purpose**	**Timescale**	**Priority**	**Notes**
Juvenile surveys	Up to date survey required to determine current stock status	2010-1011	Moderate	3.1
Egg survival	Assess impacts of siltation and low flows on spawning sites in lower reaches	2013	Moderate	3.3

Notes

3.1 Single day re-survey of 5 sites plus additional 2 as recommended by Watt (2009) estimated at 1.5 days (1.5 x £400) plus 1 day report (1 x £230) = £830 plus expenses.

3.2 Catch data collection carries no cost other than an element of time. All fish caught should be recorded, no matter how few. SDSFB legislative role under The Conservation of Salmon (Collection of Statistics) (Scotland) Regulations 2006. http://www.opsi.gov.uk/legislation/scotland/ssi2006/20060572.htm

3.3 Egg box technique, Harris 2006.

16 RIVER OSE

16.1 Background

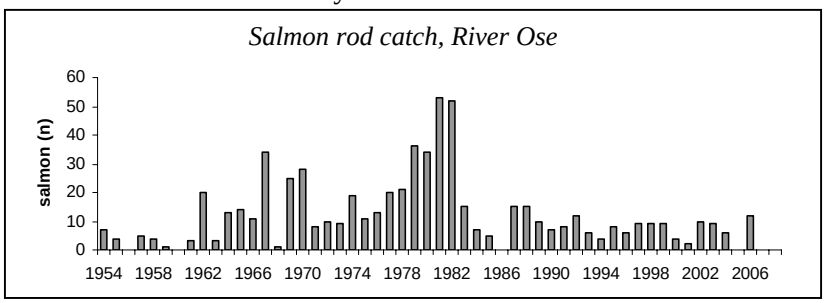
The River Ose arises in Loch Connan and drains the low hills surrounding Glen Vic Askill (NG360443). It flows west for approximately 10.5km, entering Loch Bracadale at NG408534. The largest tributary is the Allt Ruaridh, which enters from the north, upstream of Glen Ullinish. Aquaterra (2009) found high invertebrate abundance and the species present indicated excellent water quality, with no evidence of acidification. Migratory salmonids have access to approximately 7.8km of the mainstem (Watt 2009). A waterfall 2.7km upstream from the sea is passable at higher flows but will prevent upstream migration during periods of low flow. Below this waterfall there a good mix of flow and substrate types providing large areas of habitat suited to juvenile salmon and trout. The middle reaches, for about 2.7km upstream of the waterfall are meandering and rather slow flowing with small substrates. Salmon parr habitat is almost entirely lacking in these reaches, although spawning habitat is plentiful in accelerating flows at the tails of glides and pools. Further upstream, there are long reaches of good fry and parr habitat.

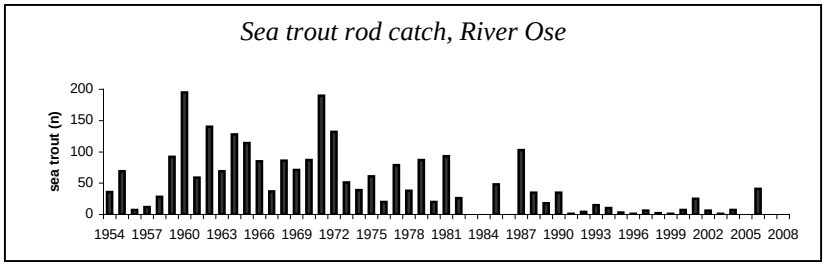
Spawning habitat totalling 412m^2 is present. Most of the spawning is in the middle reaches and is of good quality, with patches suitable for both salmon and trout. Small patches of poor quality spawning habitat are present in the lower reaches, below the waterfall. Juvenile habitat is relatively abundant in these lower reaches, but fish densities in this part of the river may be limited by lack of spawning.

The upper survey area consists of grazed moorland heath with little sign of grazing pressure. The meandering middle reaches are quite heavily grazed and a stock fence in the Glen Vic Askill area does not prevent grazing by sheep. Some of the steeper bank faces in this area are eroding and collapsing and cover for fish along the banks is poor. The lower 2.5km of the river flow mainly through pasture, sheep generally have access to the river despite areas of fencing. However the banks were hard and stony, with little erosion.

The lower 2km of the right bank of the Allt Ruairidh is planted with conifers, mainly well back from the stream with a buffer strip of broadleaf trees. Bankside cover is plentiful.

The Ose fisheries are owned by SGRPID, who provided the catch data reproduced below. Reported salmon catches rose steadily between 1954 and 1982. Whether this represents an increase in fish abundance, an increase in angler effort, or improved reporting is unknown. The 1981 and '82 peak catches of over 50 salmon were followed by a rapid decline. Since the late 1980s catches have averaged less than 12 salmon per year. No data are available for 1986, 2005 or 2007.





Between the mid 1970s and mid 1980s, sea trout catches underwent sustained decline, a near-opposite trend to that for salmon. This tends to suggest that these trends are not simply a reflection of angling pressure. Catches improved slightly in the late 1980s before further collapse in 1991. In 2006, 40 finnock and 1 sea trout were recorded. No data are available for 1986, 2005 or 2007.

A very limited electric fishing survey covering three sites found salmon present at poor densities in all sites (Watt 2006). Salmon fry were absent from site 1, despite the presence of good habitat and spawning opportunities. Trout fry densities were fair, but numbers of trout parr were poor.

The river is owned by SGRPID. The current tenant sublets to the Portree Angling Association (PAA). Fishing on the Ose is available to PAA members or by the purchase of a day ticket from one outlet in Portree. Catch and release is encouraged.

Scottish Water Solutions have proposed abstracting water from the Ose, at NG330420, some 2.8km up from the sea. The location is slightly upstream from the first significant areas of spawning habitat in the river. Impacts on thee habitats are a concern. It may also reduce wetted area in some of the better parr habitat, which is downstream from the abstraction point. Finally, the effect of abstraction on the permeability of the lower waterfall must be considered.

16.2 Assessment

The distribution of spawning habitat in the River Ose probably has a major bearing on juvenile distribution and overall productivity. Little spawning habitat is present in the lower 2.5km of the river, although this area does contain large areas of juvenile habitat. The meandering middle reaches support large areas of spawning habitat, as do the upper parts of the survey area. Throughout the low gradient middle reaches, the banktops are heavily grazed and some of the steeper bank faces are eroding and collapsing. Low-lying banks are mainly relatively stable. Although some minor habitat issues were identified during the survey, stream habitats appear capable of supporting significantly higher fish densities than were identified during the 2005 survey and protection of the remaining stock should be a priority. A full electric fishing survey is required.

16.3 Management

Aims and objectives

Management priorities should be to:

1 Maximise spawning escapement
2 Enhance aspects of habitat that might increase egg to smolt survival
3 Protect existing habitats

Should fish numbers increase in future, it is possible that habitat availability may become limiting. Should this situation be attained, enhancement or improvement of spawning (lower reaches) and carrying (middle reaches) capacity may be worthwhile.

Information needs

Priorities for information collection include:

1 Catch return data – accurate returns and a measure of fishing effort
2 Juvenile surveys – used to determine current stock status and potential for stocking
3 Redd counts - used to assess approx no. of adults and ascertain uptake of potential spawning opportunities. It is also possible to use subsequent electric fishing to determine if egg-fry survival is unusually low

Stocking and hatchery

It is possible that stocking might be able to play a role in population recovery by redistributing fry to the better juvenile habitat where spawning is lacking. Further electric fishing surveys will help to determine whether low juvenile densities are still occurring in the areas of good juvenile habitat in the lower river. See section 7.2.5.2.

NOTE: Marine issues related to fish farming are addressed in the Regional Section.

16.4 River Ose Action Plan

1 MAXIMISE SPAWNING ESCAPEMENT

Issue	*Actions*	*Benefits*	*Responsibility* (***Lead****/other)*	*Guidelines*	*Priority*	*Notes*
Legal exploitation (angling)	Encourage catch and release of all migratory species	Increase abundance of spawners and egg deposition	**Proprietors**, SDSFB	FRS 2005, Freshwater Fisheries Act 2003	High	1.1, 1.2
Poaching	Bailiffs to check main pools when fish present	Deter poaching activity	**SDSFB**, proprietors, police	ASFB, IFM	High	1.3

Notes

1.1 Freshwater Fisheries (Consolidation) (Scotland) Act 2003 (http://www.opsi.gov.uk/legislation/scotland/acts2003)

1.2 Guidance on catch and release for anglers at http://www.marlab.ac.uk/FRS.Web/Uploads/Documents/FW25Catch%20FH10.pdf

1.3 Information available at http://www.asfb.org.uk/training/bailiff_training.asp. Grant may be available for training. Exams take place in spring.

2 MAXIMISE PRODUCTION

Issue	*Actions*	*Benefits*	*Responsibility* (**Lead**/other)	*Guidelines*	*Priority*	*Notes*
2.1 Instream habitats						
Sedimentation of spawning habitat	Inspect and clean spawning areas (See Watt , 2009)	Localised improved egg survival	**SFT**, proprietors	Hendry & Cragg-Hine 1997	Moderate/Low	2.1.1
Abstraction	Consultation and representation	Ensure appropriate flows for fish	**SDSFB**, SEPA, SFT		High	
2.2 Riparian habitats						
Erosion and slumping	Grazing reduction or stock exclusion.	Improved egg survival and carrying capacity	**SFT**, proprietors	PEPFAA Code	Moderate	2.2.1
Lack of juvenile cover mid reaches	Encourage trees and scrub middle reaches.	Provide cover in form of roots and woody debris	**SFT**, proprietors		Low	

Notes

2.1.1. Low cost, volunteers?

2.2.1. PEPFAA Codes at http://www.scotland.gov.uk/Publications/2005/03/20613/51366

3 INFORMATION NEEDS

Data	**Purpose**	**Timescale**	**Priority**	**Notes**
Juvenile surveys	Up to date survey required to determine current stock status and any future stocking opportunities	2010-1011	High	3.1
Catch data	Provide ongoing record of fish numbers and indicative measures of effort	2010	Moderate	3.2
Redd counts	Can be used (i) to provide indication of spawning escapement (ii) In conjunction with electric fishing, determine any egg survival problems	Winter 2011	Moderate	

Notes

3.1 Nine timed sites as recommended by Watt (2009) estimated at 1.5 days (1.5 x £400) plus 1 day report (1 x £230) = £830 plus expenses.

3.2 Ways to improve data collection being taken considered by PAA . SDSFB legislative role at http://www.opsi.gov.uk/legislation/scotland/ssi2006/20060572.htm

17 RIVER ROMESDAL

17.1 Background

The River Romesdal drains the southwest flanks of the Trotternish ridge and flows almost due west into Loch Snizort Beag. It is approximately 9km in length. There are no major tributaries, although numerous small streams enter from the north and south along its length. The water quality is excellent with no evidence of acidification (Aquaterra 2009). Watt (2006) conducted very limited electric fishing on this river. Only one site was surveyed, approximately 300m upstream from the main road bridge. Salmon were absent and trout were present at low density. A full walkover survey of the accessible catchment was carried out during 2008 (Watt 2009). The river has numerous waterfalls, sloping bedrock shelves and rapids along its length and access for migratory species is restricted to the lower 1km of river. Juvenile salmonid habitat is widespread in the inaccessible upper reaches and trout are present. The lower, accessible 1km of river is steep and gorge-like, with rapids, waterfalls and a few deeper pools. The gorge ends 300m upstream from the sea and patches of mixed juvenile habitat, interspersed with bedrock, are present all the way down to the tidal limit. Spawning habitat totalling 136m^2 was identified during the survey, all of it inaccessible to migratory species. Additional small patches of gravel are present in some of the more boulder-strewn areas that might provide excavation of small, single redds among otherwise unsuitable habitat.

Land use in the lower 1km of the survey reach is a mixture of improved grazing and broadleaved riparian woodland. The middle and upper reaches of the river are moorland heat/rough pasture, grazed by sheep. Almost the entire right bank of the river is stock-fenced, some sections of which require minor attention and sheep can access across the river. Nevertheless, the riverbanks are stable along most of the survey reach and the steeper sections are well vegetated with trees or shrubs. In the lower gradient areas the bank tops are quite heavily grazed and erosion of banks is evident. This erosion is not considered deleterious to the trout population as it provides a source of smaller substrates, which might otherwise be in short supply for maintenance of spawning habitats.

Catch and release fly fishing is available through Skyeangling (www.skyeangling.org.uk) and Skyeghillies (www.**skyeghillie**flyfishing.co.uk) websites, although very little fishing occurs, occasional salmon and sea trout are caught in the lower river.

17.2 Assessment

Access for salmon and sea trout limited to the lower few hundred metres of river by a waterfall. It is probable that insufficient accessible habitat is present to provide for a sustainable salmon population. Trout are present throughout the survey area (Watt *pers. obs*) and are likely to be exclusively non-migratory brown trout. Instream and riverbank habitats are mainly of good quality. Clearly, habitat quality is not limiting populations of migratory fish.

Due to the presence of waterfalls, a salmon or sea trout fishery could only be established through enhancement stocking. The fishery would be confined to the lower reaches and would not be biologically sustainable. Any action relating to habitat management for fishery purposes will be determined by decisions made around enhancement stocking. No action is required at present to protect the trout population in the upper reaches. It is possible that these trout populations may have been isolated for many thousands of years.

17.3 Management

Aims and objectives

No biologically sustainable fishery is possible for salmon or sea trout. Proprietors have no long-term plans to stock the river with migratory fish and the river will remain as a brown trout fishery. No catchment-specific actions are recommended. Regional issues are dealt with elsewhere.

18 RIVER SLIGACHAN

18.1 Background

Glen Sligachan divides the main Black Cuillin ridge from the Red Hills. The upper drainage is high and steep and runoff is rapid. Aquaterra (2009) classified water quality as good, lower than other Skye rivers. Unstable substrates due to violent spates may cause low diversity of invertebrates. It was considered that genuine evidence of acidification was absent. Low invertebrate abundance and biomass may be limit fish production. Habitat for juvenile salmon is widespread (Watt 2009) but a high proportion is unstable. The likely limit of upstream migration is a cascade at NG479231, some 10.3km upstream from the tidal limit. Three tributaries were included in the survey. Allt na Measarroch is accessible for approximately 0.8km and provides some areas of good quality habitat,. Allt Dearg Mor is accessible only for a few hundred metres and contains little juvenile habitat. In comparison, Allt Dear Beag is relatively low gradient with good quality juvenile habitat. 599m^2 of potential spawning habitat was identified during the survey, mainly in the lower gradient middle reaches of the river. Further upstream, spawning habitat is present mainly as small unstable patches. Grazing pressure along most of the river appeared to be light, with a sward of grasses, sedges and heather encroaching up the riverbanks. Overall, the light grazing levels are likely to be beneficial to the river and the condition of the riverbanks gives no cause for concern.

There is insufficient data to adequate to assess population trends of adult stocks. Juvenile salmon were found as far upstream as the Bloody Stone in Harta Corrie (Watt 2006). This site is less than 1km below the upper limit, indicating that salmon were still widespread in the system during 2005. Densities were extremely low, but the data considered unreliable due to survey timing. Juvenile trout were similarly widespread and were more abundant in upper reaches than were salmon.

Angling on the Sligachan is available for some beats while others are accessible to proprietors and angling club members only. Catch and release is compulsory for one fishery.

18.2 Assessment

Suitable habitat for juvenile salmon is distributed throughout the river and makes up a high proportion of wetted area. These habitats are not high quality, due mainly to instability. The banks are mainly well vegetated, reflecting light grazing levels. The lack of reliable juvenile survey data limits recommendations and this must be addressed as a matter of urgency if a management plan is to be developed. Poaching was considered to be a problem in the past (Watt 2005) and it is possible that low numbers of spawning adults along with habitat instability may currently limit fish populations.

18.3 Management

Aims and objectives

Subject to collection of additional data, draft management priorities are likely to be to:

1 Maximise spawning escapement
2 Enhance aspects of habitat that might increase egg to smolt survival
3 Protect existing habitats.

Information needs

Collection of additional data on fish populations is a high priority. Requirements are::

1 Up to date juvenile survey – determine current stock status.
2 Catch return data – accurate returns and a measure of fishing effort.
3 Redd counts - used to assess approximate adult numbers and ascertain uptake of potential spawning opportunities.

NOTE: Marine issues related to fish farming are addressed in the Regional Section.

18.4 River Sligachan Action Plan

1 MAXIMISE SPAWNING ESCAPEMENT

Issue	*Actions*	*Benefits*	*Responsibility* (***Lead****/other)*	*Guidelines*	*Priority*	*Notes*
Legal exploitation (angling)	Ensure catch and release of all migratory species	Increase abundance of spawners and egg deposition	**Proprietors**, SDSFB	FRS 2009, Freshwater Fisheries (Consolidation) (Scotland) Act 2003	High	1.1, 1.2
Poaching	Bailiffs to check main pools when fish present	Deter poaching activity	**SDSFB**, proprietors, police	ASFB, IFM	Moderate	1.3

Notes

1.1 Financial cost of this measure is low or zero (cost of enforcement). Freshwater Fisheries (Consolidation) (Scotland) Act 2003 (http://www.opsi.gov.uk/legislation/scotland/acts2003)

1.2 Guidance on catch and release for anglers at http://www.marlab.ac.uk/FRS.Web/Uploads/Documents/FW25Catch%20FH10.pdf

1.3 Information available at http://www.asfb.org.uk/training/bailiff_training.asp. Grant may be available for training. Exams take place in spring.

2 MAXIMISE PRODUCTION

Issue	*Actions*	*Benefits*	*Responsibility* (**Lead**/other)	*Guidelines*	*Priority*	*Notes*
2.1 Riparian habitats						
Banks well vegetated but trees and scrub are lacking	Examine possible means of promoting greater riparian habitat diversity	Habitat unlikely to be limiting fish production, riparian trees or scrub would however provide diversity and potentially enhance fish habitat	**SFT**, proprietors	PEPFAA Code	Low	2.2.1

Notes

2.1.1. The banks are generally stable and well-vegetated reflecting the low grazing pressure. PEPFAA Codes at http://www.scotland.gov.uk/Publications/2005/03/20613/51366

3 INFORMATION NEEDS

Data	**Purpose**	**Timescale**	**Priority**	**Notes**
Juvenile surveys	Up to date survey required to determine current stock status	2010-1011	High	3.1
Catch data	Provide ongoing record of fish numbers and indicative measures of effort	2010	Moderate	3.2
Redd counts	Provide indication of spawning escapement	Winter 2011	High	

Notes

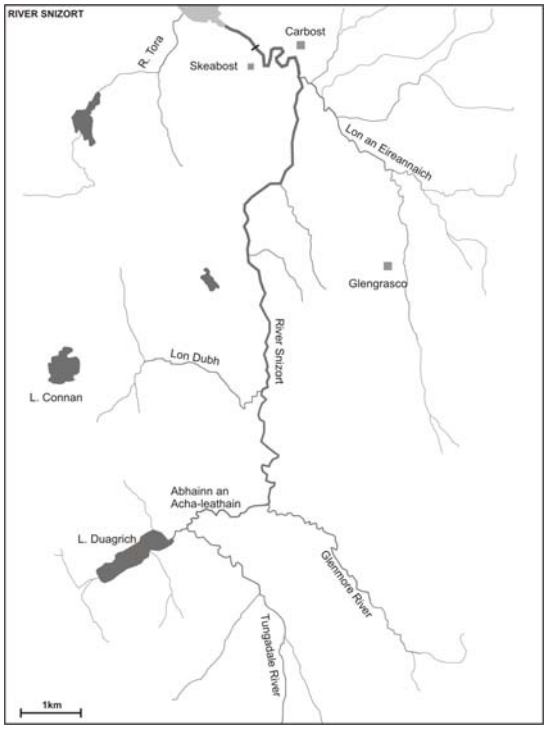
3.1 High Priority due to nature of previous survey. Re-survey of 12 sites, change of one site, plus additional 3 as recommended by Watt (2009) estimated at 2.5 days (2.5 x £400) plus 1 day report (1 x £230) = £1230 plus expenses.

3.2 Catch data collection carries no cost other than an element of time. SDSFB legislative role under The Conservation of Salmon (Collection of Statistics) (Scotland) Regulations 2006. http://www.opsi.gov.uk/legislation/scotland/ssi2006/20060572.htm

19 RIVER SNIZORT

19.1 Background

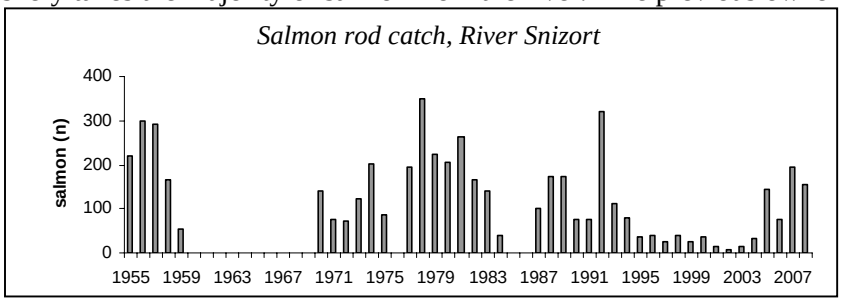
The Snizort is the largest river on Skye. It has a number of significant tributaries including the Tungadale River, Glenmore River, Lon Dubh and Lon an Eireannaich. The catchment is mainly low lying and relatively low gradient. The mainstem and above tributaries provide some 38 linear km of accessible habitat for migratory salmonids. Invertebrate surveys indicate that the water quality within the catchment is excellent (Aquaterra 2009).

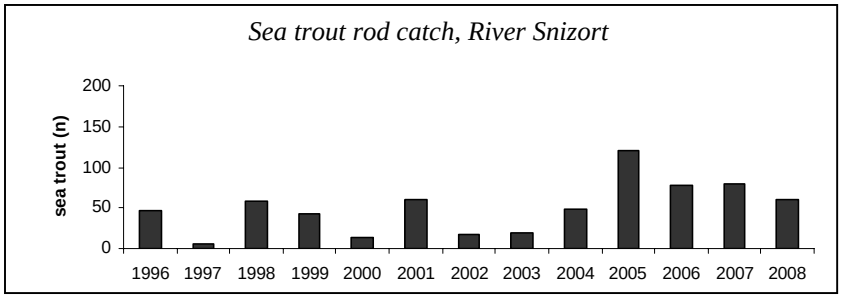


A walkover survey of the main accessible reaches was carried out during 2008 (Watt 2009). Over 60% of mixed juvenile habitat in the catchment is in the mainstem as well as nearly 90% of habitat categorised as deep juvenile. The Lon an Eireannaich was estimated to contain a further 13.9% of mixed and 5.5% of deep juvenile. Availability of parr habitat in the Lon Dubh, Glenmore River and Tungadal River are less, but still 5-10% of catchment total in all cases.

A number of potential spawning areas in the River Snizort, Lon an Eireannaich, Lon Dubh and Glenmore River have become degraded with silt. On the Glenmore River and Lon an Eireannaich this was associated with heavy grazing pressure. Livestock have access to 96% of riverbanks in the catchment and although fences are present in some areas these are largely ineffective in keeping livestock off the riverbanks. Impacts on cover due to loss of bankside vegetation were most apparent along the low gradient reaches of Lon an Eireannaich, Glenmore River and Lon Dubh. Slumping of banks in the upper reaches of the River Snizort may also have been exacerbated by grazing pressure.

Salmon catch data going back to 1955 were provided by the current owner of the Skeabost fishery, who took over in 2005. This fishery takes the majority of salmon from the river. The previous owner retained some fishing and these fish are included in the data. Data from 1960 to 1970 are missing. The figures show a major decline in salmon catches during the mid 1980s followed by a recovery and further declines through the 1990s. A significant increase in the catch has occurred since 2005. Although effort may have increased somewhat under new ownership, it is agreed by those who fish the river regularly that the salmon runs have been better in recent years. Sea trout





catch data were provided for the last 10 years for Skeabost. Over 60 fish have been caught each season in recent years with a high of 120 in 2005, possibly linked to fishing effort.

Watt (2006) provides electric fishing data. Salmon were present at all 16 survey sites. Average densities of fry and parr were categorised as fair. Greatest salmon abundance was found at sites in the main-stem of the River Snizort and in the Tungadale River. Given its large size, the main-stem is likely to be the main producer or smolts for the catchment, at present. Juvenile trout numbers were categorised as fair and poor for fry and parr respectively. SEPA surveyed a site in section SN12 during 2008, identifying densities of 73 salmon fry and 37 salmon parr per 100 square metres. By national standards this is an excellent parr density, suggesting that carrying capacity in the better habitats is high.

The lower beat is owned by Skeabost Hotel and Three Esses Ltd. is the current tenant. Catch and release fly fishing permits are available via the internet. Portree Angling Association members are able to purchase session tickets for this beat and have access when beats are available. The tenancy agreement states that the tenant must stock 5000 locally sourced fry a year. At present this limited stocking, using native Snizort salmon, is targeted to the lower river.

Fishing in the upper Snizort catchment is managed by PAA, as tenants to both SGRPID and Forestry Commission. The Forestry tenancy states that fishing is compulsory catch and release.

A hatchery is present on the lower river. Currently two 2m-diameter hex hatch tanks, each with a 60 thousand egg capacity, are available. Larger, 5m diameter tanks are also available but are not currently operational. The facilities could be expanded allowing larger scale stocking or supportive breeding programmes to be developed in future.

19.2 Assessment

The 2005 electric fishing survey found that salmon fry numbers were fair, but parr numbers rather poor. It was noted that rod catches were increasing. Both observations are consistent with recovery of the salmon population. The very high densities of fry and parr subsequently found by SEPA are consistent with continuing recovery, but further electric fishing data are needed to confirm this.

Poaching is clearly an issue in the catchment. Five nets were removed from the river during 2005. Spawning areas in Glenmore are also though to be heavily poached. Maintaining adequate spawning escapement is essential to continued, sustainable recovery.

An exploration of potential limiting factors (Watt 2009) suggests that the quantities of fry and parr habitat on the River Snizort are in good balance and that there is plenty of spawning habitat, other than in the middle reaches. Spawning habitat appears to be lacking in the middle reaches of the River Snizort. If so, the hatchery may be used to increase juvenile density in the better habitats. Additional electric fishing and redd counts would be useful to identify current use of habitat in the middle reaches and any stocking should be monitored to ensure that it is having the desired effect.

In the Lon Dubh, Glenmore River and Tungadal River it seems probable that the limiting habitat factor for salmon smolt production may be the availability and quality of habitats for parr. Actions to improve parr carrying capacity may be beneficial in these streams. Some potentially productive reaches of the Glenmore River have been planted over with conifers, resulting in heavy shading and degradation of banks and instream habitat. A buffer strip should be created.

Siltation of potential spawning habitat was recorded in several parts of the catchment, often associated with heavy grazing pressure. If egg to fry survival in the wild is unacceptably low, due e.g. to heavy silt loads, the hatchery may be used to increase survival of eggs. This option might be attractive if data suggest poor egg survival.

Supportive breeding may be a future option, using the hatchery to artificially increase the number of adults. This could be achieved by e.g. capturing and retaining a small number (100 – 150) of smolts to be raised in captivity to adulthood. These fish would be stripped and eggs or fry returned to the river. This option is labour intensive and involves a year-round commitment. In a scenario of stock recovery it may be unattractive for this reason. However, were there sufficient interest, a programme might be set up covering several different rivers, spreading costs and benefits more widely. This kind of supportive breeding is possible for either sea trout or salmon.

19.3 Management

Aims and objectives

Management priorities should be to:

1 Maximise spawning escapement
2 Enhance aspects of habitat that might increase egg to smolt survival, including protection of banks and reduction in grazing pressure
3 Protect existing habitats.

NOTE: Marine issues related to predation are addressed in the Regional Section.

Information needs

Priorities for information collection include:

1 Juvenile surveys – used to determine current stock status and develop hatchery options.
2 Catch return data – accurate returns and a measure of fishing effort.
3 Redd counts - used to assess uptake of potential spawning opportunities. Follow-on electric fishing should be used to determine if egg survival in silted areas is unacceptably low.

19.4 River Snizort Action Plan

1 MAXIMISE SPAWNING ESCAPEMENT

Issue	*Actions*	*Benefits*	*Responsibility* (***Lead***/*other*)	*Guidelines*	*Priority*	*Notes*
Legal exploitation (angling)	Encourage catch and release of all migratory species	Increase abundance of spawners and egg deposition	**Proprietors**, SDSFB	FRS 2009, Freshwater Fisheries (Consolidation) (Scotland) Act 2003	High	1.1
Poaching	Appoint bailiffs. Check main pools when fish present	Deter poaching activity	**SDSFB**, proprietors, police	ASFB, IFM	High	1.2

Notes
1.1 Freshwater Fisheries (Consolidation) (Scotland) Act 2003 (http://www.opsi.gov.uk/legislation/scotland/acts2003)
1.2 Information available at http://www.asfb.org.uk/training/bailiff_training.asp. Grant may be available for training. Exams take place in spring.

2 MAXIMISE PRODUCTION - MAINSTEM

Issue	*Actions*	*Benefits*	*Responsibility* (**Lead**/other)	*Guidelines*	*Priority*	*Notes*
2.1 Instream habitats						
Sedimentation of spawning habitat	Inspect and clean spawning areas in upper river	Localised improved egg survival	**SFT**, proprietors	Hendry & Cragg-Hine 1997	Moderate	2.1.1
Lack of spawning in mid river (section S13 to S33)	Use electric fishing and red counts to determine need for action and options (e.g. no action, spawning habitat creation or mitigation stocking)	Increase juvenile density in mid-river habitats	**SFT**, proprietors	Hoey *et al* 1995; Soulsby (2002) (habitat), Youngson 2007 (stocking)	Moderate	2.1.2
2.2 Riparian habitats						
Some erosion and slumping	Fencing repairs in section SN17	Improved egg survival and carrying capacity	**SFT**, proprietors, graziers	PEPFAA Code	Low	2.2.1

Notes
2.1.1. Low cost. Cleaning of spawning habitats in section S34 may be particularly beneficial as juvenile habitat is plentiful downstream. Consideration should also be given to removing silt in sections 37, 43 and 50-53.
2.1.2. If it is not possible to increase spawning habitat, consider mitigation stocking.
2.2.1. PEPFAA Codes at http://www.scotland.gov.uk/Publications/2005/03/20613/51366

3 MAXIMISE PRODUCTION –LON AN EIREANNAICH

Issue	*Actions*	*Benefits*	*Responsibility* (**Lead**/other)	*Guidelines*	*Priority*	*Notes*
3.1 Instream habitats						
Sedimentation of spawning habitat	Inspect (and if required clean) spawning areas in LE8 to 16	Localised improved egg survival	**SFT**, proprietors	Hendry & Cragg-Hine 1997	Low	
Lack of parr cover in LE 2, 3, 4 and 6	Trial placement of logs/random boulder placement	Improved carrying capacity for parr	**SFT**, proprietors	Hoey *et al* 1995; Soulsby (2002)	Low	3.1.1
3.2 Riparian habitats						
Some erosion and slumping	(i) Fencing and Watergate repairs in section LE6 (ii) Bank protection LE13 to 17 at spawning (iii) Stock exclusion and possibly logs and conifer top bank work – LE2 to 5	Improved egg survival and carrying capacity for parr. At present, inputs of fine materials reduce cover. Carrying capacity for parr and over-winter survival are likely to suffer.	**SFT**, proprietors, graziers	PEPFAA Code Hoey *et al* 1995 Soulsby (2002)	Moderate	2.2.1

Notes
3.1.1. Possibly test this in one site
2.2.1. PEPFAA Codes at http://www.scotland.gov.uk/Publications/2005/03/20613/51366

4 MAXIMISE PRODUCTION –GLENMORE RIVER

Issue	*Actions*	*Benefits*	*Responsibility* (**Lead**/other)	*Guidelines*	*Priority*	*Notes*
4.1 Instream habitats						
Sedimentation of spawning habitat	Inspect and clean spawning areas and long term protection of banks see below	Localised improved egg survival	**SFT**, proprietors	Hendry & Cragg-Hine 1997	Low	4.1.1.
Poor juvenile habitat	Trial placement of logs/random boulder placement	Improved carrying capacity for parr	**SFT**, proprietors	Hoey *et al* 1995	Low	4.1.2
4.2 Riparian habitats						
Erosion and slumping	Fence river banks, concentrating initially on sections below forestry	Improved egg survival and carrying capacity	**SFT**, proprietors	PEPFAA Code	Moderate	4.2.1
Over shading from forestry	Cut back conifers and plant scattered broadleaves	Remove shading, improve bank stability	**Proprietor, foresters**	Forest and Water Guidelines	High	4.2.2

Notes
4.1.1. Low cost.
4.1.2. Possibly test this in one river first
4.2.1. PEPFAA Codes at http://www.scotland.gov.uk/Publications/2005/03/20613/51366
4.2.2. Forest and Water Guidelines at http://www.forestry.gov.uk/pdf/FCGL002.pdf/$FILE/FCGL002.pdf

5 MAXIMISE PRODUCTION –TUNGADAL RIVER

Issue	*Actions*	*Benefits*	*Responsibility* (**Lead**/other)	*Guidelines*	*Priority*	*Notes*
5.1 Instream habitats						
Sedimentation of spawning habitat	Inspect and clean of some spawning areas and long term protection of banks see below	Localised improved egg survival	**SFT**, proprietors	Hendry & Cragg-Hine 1997	Low	5.1.1.
Poor juvenile habitat	Trial placement of large woody debris/random boulder placement	Improved carrying capacity for parr	**SFT**, proprietors	Hoey *et al* 1995 Soulsby (2002)	Low	5.1.2
5.2 Riparian habitats						
Some erosion and slumping	Reduce grazing access, some conifer top and log, encourage riparian trees	Improved egg survival and carrying capacity	**SFT**, proprietors, graziers	PEPFAA Code	Low	5.2.1

Notes
5.1.1. Low priority – spawning habitat is not limiting
5.1.2. Possibly test this in one river first
5.2.1. PEPFAA Codes at http://www.scotland.gov.uk/Publications/2005/03/20613/51366

6 MAXIMISE PRODUCTION –LON DUBH

Issue	*Actions*	*Benefits*	*Responsibility* (**Lead**/other)	*Guidelines*	*Priority*	*Notes*
6.1 Instream habitats						
Siltation and compaction of spawning habitat	Inspect and clean of some spawning areas and long term protection of banks see below	Localised improved egg survival	**SFT**, proprietors	Hendry & Cragg-Hine 1997	Low	6.1.1.
6.2 Riparian habitats						
Livestock access	Repair fence at LD10	Reduce erosion	**SFT**, proprietors, graziers	PEPFAA Code	Moderate	6.2.1

Notes
6.1.1. Low priority – spawning habitat is not limiting
6.2.1. PEPFAA Codes at http://www.scotland.gov.uk/Publications/2005/03/20613/51366

3 INFORMATION NEEDS

Data	Purpose	Timescale	Priority	Notes
Juvenile surveys	Up to date survey required to determine current stock status	2010-1011	High	3.1
Catch data	Provide ongoing record of fish numbers and indicative measures of effort	2010	High	3.2
Redd counts	Can be used (i) to provide indication of spawning escapement (especially mainstem 12 -33). (ii) Use in conjunction with electric fishing to help determine any egg survival problems	Winter 2010 and 2011	Moderate	
Egg box	Test impacts of silt in Glenmore River, Tungadal River, Lon Dubh	2013	Moderate	
Determine permeability of old bridge on Lon Dubh (obstacle)	Target electric fishing above old road bridge on Lon Dubh	2010	High	

Notes

3.1 Re-survey including 13 additional sites – see Watt (2008) ~ 4 days

3.2 Catch data collection carries no cost other than an element of time. SDSFB legislative role under The Conservation of Salmon (Collection of Statistics) (Scotland) Regulations 2006. http://www.opsi.gov.uk/legislation/scotland/ssi2006/20060572.htm

20 ABHAINN AN T-STRATHA MHOIR (STRATHMORE)

20.1 Background

The Abhainn an t-Stratha Mhoir flows into the head of Loch Slapin, west of the village of Torrin. Water quality was found to be good to excellent (Aquaterra 2008), although the abundance and biomass of invertebrates were low, potentially limiting fish populations. There are extensive areas of fry habitat downstream from Loch Na Sguabaidh but habitat quality is very poor due to instability (Watt 2009). The reaches between Loch na Scuabaidh and Lochain Stratha Mhoir provide fair habitat for juvenile salmonids in stable habitat. Upstream from Lochan Stratha Mhoir the substrates are less stable and instream cover is limited, although draped bankside vegetation provides some cover. A shallow braided channel at NG568276 is a potential obstacle to migration. Spawning habitat totalling 639m^2 was identified. Due to the elevated flow at the time of survey this area will be reduced at low flow. Spawning habitat in the lower river is very unstable. Between Lochain na Scuabaidh and Lochain Stratha Mhoir there are large expanses of spawning habitat for both for trout and salmon. Many areas of potential spawning habitat are present upstream from Lochan Stratha Mhoir, mainly of moderate quality for salmon, but largely too coarse to be of use to trout. Patches of trout spawning habitat are present in the smaller channels in the upper reaches.

The catchment lies within estates owned and managed the John Muir Trust. The Trust has undertaken a programme of native tree planting, but at present this is limited in extent and does not include the riparian area, from which trees are largely absent. Growth of heather along the banks increases cover for fish in many places and may be important where other instream cover is poor. The John Muir Trust is currently developing a Fishing Policy to cover all the Trust properties. Under this policy fishing permits will become available for the Strathmore. Fishing will be on a catch and release basis.

No catch data are available. Watt (2006) investigated a single site on the lower river an ad hoc basis in order to check for the presence of salmon. Salmon fry and parr were present at low density.

20.2 Assessment

Suitable juvenile habitat for salmon and trout is distributed throughout the survey reach and the two lochs are likely to provide additional rearing habitat, as well as resting areas for adult salmon and trout. There are few holding pools suitable for adult salmon in the main river. Juvenile survey data are inadequate for the development of a fisheries management plan and a full survey of the distribution and abundance of salmon and trout is required. Until data are available a precautionary approach to management is encouraged.

20.3 Management

Aims and objectives

Management priorities should be to:

1 Maximise spawning escapement
3 Protect existing habitats.

Information needs

Priorities for information collection include:

1 Juvenile surveys – urgently required to determine current stock status
2 Catch return data – accurate returns and a measure of fishing effort.

NOTE: Marine issues related to fish farming are addressed in the Regional Section.

20.4 Abhainn an t-Stratha Mhoir Action Plan

1 MAXIMISE SPAWNING ESCAPEMENT

Issue	*Actions*	*Benefits*	*Responsibility (**Lead**/other)*	*Guidelines*	*Priority*	*Notes*
Legal exploitation (angling)	Ensure catch and release of all migratory species	Increase abundance of spawners and egg deposition	**Proprietors**, SDSFB	FRS 2005, Freshwater Fisheries (Consolidation) (Scotland) Act 2003	High	1.1, 1.2
Poaching	Bailiffs to check main pools when fish present	Deter poaching activity	**SDSFB**, proprietors, police	ASFB, IFM	Unknown	1.3

Notes

1.1 Financial cost of this measure is low or zero (cost of enforcement). Freshwater Fisheries (Consolidation) (Scotland) Act 2003 (http://www.opsi.gov.uk/legislation/scotland/acts2003)

1.2 Guidance on catch and release for anglers at http://www.marlab.ac.uk/FRS.Web/Uploads/Documents/FW25Catch%20FH10.pdf

1.3 Information available at http://www.asfb.org.uk/training/bailiff_training.asp. Grant may be available for training. Exams take place in spring.

2 MAXIMISE PRODUCTION

Issue	*Actions*	*Benefits*	*Responsibility* (**Lead**/other)	*Guidelines*	*Priority*	*Notes*
2.1 Riparian habitats						
Lack of cover for juveniles	Encouragement of trees and scrub	Provide increased cover from roots and woody debris	**SFT**, proprietors	PEPFAA Code	Low	2.1
2.3 Obstacles						
Braided area may hinder access to spawning sites	Assess fry distribution then determine appropriate action, if any	Allow trout to gain access to spawning habitat	**SFT**, proprietors		Low	2.2

Notes

2.1. The unstable area below Loch na Sguabaidh is probably a largely natural feature although likely to be exacerbated by intense grazing.

2.2 See Information needs below

3 INFORMATION NEEDS

Data	**Purpose**	**Timescale**	**Priority**	**Notes**
Juvenile surveys	Up to date survey required to (i) determine current stock status and (ii) determine distribution of trout fry in relating to obstacle	2010-1011	High	3.1
Catch data	Provide ongoing record of fish numbers and indicative measures of effort	2010	High	3.2

Notes

3.1 Single day survey of 8 sites as recommended by Watt (2009) estimated at 1 days (1 x £400) plus 1 day report (1 x £230) = £630 plus expenses.

3.2 Catch data collection carries no cost other than an element of time and should be initiated as soon as fishing permits are available. SDSFB legislative role under The Conservation of Salmon (Collection of Statistics) (Scotland) Regulations 2006. http://www.opsi.gov.uk/legislation/scotland/ssi2006/20060572.htm

21 VARRAGILL RIVER

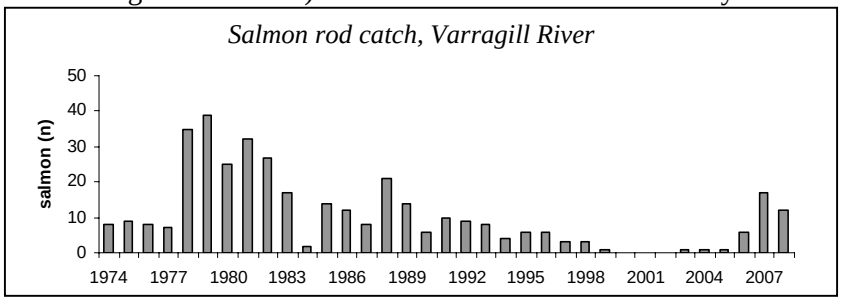
21.1 Background

The Varragill River enters the sea at the head of Loch Portree. The largest tributaries are the Eas na Coile and Varragill Burn. The water quality of the Varragill River is excellent with no evidence of acidification (Aquaterra 2008). Invertebrate abundance and biomass was moderate.

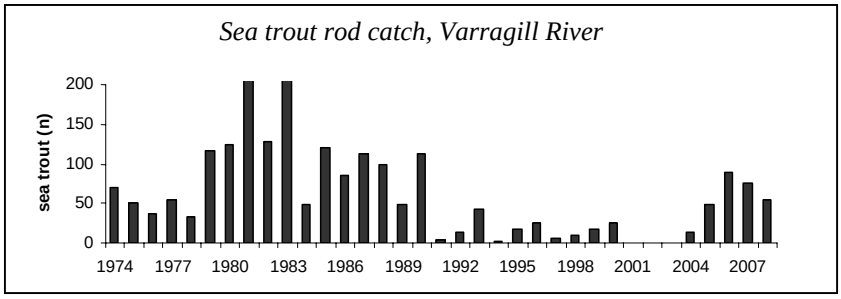
The upper and middle reaches of the Varragill River are moderate to fast flowing with boulder, cobble, pebble and gravel (Watt 2009). Short sections of bedrock, gorge-type habitats are present in the lower reaches, but most of the river is well suited to juvenile salmon and trout. Spawning habitat in the lower 3km of river is limited. There were numerous patches of potential spawning habitat between 3km and 7km from the sea, mainly suited to salmon. The largest areas of spawning habitat are in survey sections 30 to 32, approximately 7.1km from the sea. Some siltation was evident. Further spawning habitat is present in the upper accessible reaches. The lower reaches of Eas na Coille provide some good spawning opportunities for trout and salmon. The Lon na Airigh and Lon Chaorach also contain small pockets of gravel that might provide spawning for trout.

Catchment landuse is a mixture of commercial forestry and livestock grazing. Much of the conifer forest in sections 19 to 31 has been planted too close to the river. However, at present there are few areas where this is clearly causing problems. When the current crop of trees is felled damage to the riverbanks should be avoided and any replanting should include a buffer strip. Livestock have access to most of the lower and middle reaches as fences, where present, are ineffective. Current grazing levels in these reaches are not problematic and banks are stable and well vegetated with scattered broadleaves. Further upstream bank erosion is more evident, especially around the sheep fank near the bridge in section 31. This is an important spawning area and consideration should be given to reducing grazing pressure at this location. From section V38 upstream the river is fully accessible to livestock and bank erosion and collapse is more evident. The Varragill Burn and Allt Airigh Meall Beathaig are intensively grazed along both banks.

The river receives small numbers of non-native salmon annually (Forsa origin in 2004 and 2005 and Carron origin from 2008). From 2006 Carron sea trout fry were also stocked. These are mainly stocked in the reaches upstream from the new bridge in section 32. It is intended that the current stocking programme run until 2014.



Rod catch data going back to 1955 were supplied, but data from 1957 to 1973 were absent. Catches in 1955 and 1956 averaged 20 salmon and 80 sea trout. It is thought that catches between 1957 and 1973 averaged 30 to 40 salmon and 200 sea trout, but this requires confirmation. Catch data from 1974 onward suggest long term declines in the abundance of salmon, beginning in the early 1980s. It is though that the sudden increase in catches in the late 1970s may be a result of increased access to the fishery, via the Portree Angling Association (M. Leslie pers. com.). Catches have shown an increase in the last three



years, in common with a number of other rivers. Sea trout catches also show a rise in the late 1970s. Catches were relatively stable, perhaps with slight declines, until 1991 when they collapsed. Some recovery is evident in recent years.

An electric fishing survey was conducted during 2005 (Watt 2006). Juvenile salmon were present at all sites and abundance was fair for both fry and parr, with reasonable densities of fry at sites in the lower, middle and upper reaches. Salmon parr were absent from three sites despite the presence of suitable habitat. Trout fry numbers were poor, but parr densities fair. Trout fry were absent from five of eleven sites and parr from six. As 5000 salmon fry have been stocked into the Varragill in both 2004 and 2005, the surveys probably sampled both stocked and wild fish at two electric fishing sites.

Angling is available to Portree Angling Association members on a fly only, catch and release basis. The proprietor also fishes the river. Illegal netting has been reported from the river and estuary. A snorkel survey of the Varragill in 2002 counted only seven adult salmon (M. Leslie, pers. com.).

21.2 Assessment

The Varragill River provides large areas of good quality rearing habitat for juvenile salmonids, spread through 12km of accessible river. Holding pools are present all the way up to section, ~7.5km from the sea. Further upstream, the pools are shallow and only likely to hold adult salmon at elevated flows. Overall, it is unlikely that the quantity or quality of available habitat is limiting fish numbers. Low rod catches and count of adults suggest that spawning escapement is likely to be inadequate to populate available habitat. Highest priority should be given to ensuring adequate escapement.

Grazing pressure in the immediate vicinity of some spawning areas is high and bank collapse may be adding to the siltation noted during surveys. Exposed soil around the bridge may also require stabilisation.

Given the apparent lack of adults and abundance of juvenile habitat, stocking is a reasonable management response. If stocking is to be continued in the longer term, or if the number stocked fry were to be significantly increased, a Varragill broodstock should be established. The owner would be prepared to use native stock should this become a practical option.

The owners have agreed to survey section 33 to 38 un-stocked for at least one year to allow current natural production from spawning habitats to be assessed by electric fishing. If fry are present in reasonable number, stocked fish may better be targeted elsewhere. In particular, electric fishing is needed in sections 15 to 26 where juvenile habitat is of good quality but spawning appears lacking. If these areas are under-utilised they may provide good alternative options for future stocking.

<u>Aims and objectives</u>

Management priorities should be to:

1 Maximise spawning escapement
2 Develop stocking programme based on native stock
3 Protect and enhance habitat in spawning areas

NOTE: Marine issues e.g. fish farming and predation are addressed in the Regional Section.

<u>Information needs</u>

Priorities for information collection include:

1 Catch return data – accurate returns and a measure of fishing effort
2 Juvenile surveys – used to determine current stock status and develop stocking programme
3 Redd counts – especially in main spawning areas. These should be used on conjunction with electric fishing to help identify any egg survival problems.

21.3 Varragill River Action Plan

1 MAXIMISE SPAWNING ESCAPEMENT

Issue	*Actions*	*Benefits*	*Responsibility* (***Lead****/other)*	*Guidelines*	*Priority*	*Notes*
Legal exploitation (angling)	Ensure catch and release of all migratory species	Increase abundance of spawners and egg deposition	**Proprietors**, SDSFB	FRS 2005, Freshwater Fisheries (Consolidation) (Scotland) Act 2003	High	1.1, 1.2
Poaching	Bailiffs to check main pools when fish present	Deter poaching activity	**SDSFB**, proprietors, police	ASFB, IFM	High	1.3

Notes

1.1 Financial cost of this measure is low or zero (cost of enforcement). Freshwater Fisheries (Consolidation) (Scotland) Act 2003 (http://www.opsi.gov.uk/legislation/scotland/acts2003)

1.2 Guidance on catch and release for anglers at http://www.marlab.ac.uk/FRS.Web/Uploads/Documents/FW25Catch%20FH10.pdf

1.3 Information available at http://www.asfb.org.uk/training/bailiff_training.asp. Grant may be available for training. Exams take place in spring.

2 MAXIMISE PRODUCTION

Issue	*Actions*	*Benefits*	*Responsibility* (**Lead**/other)	*Guidelines*	*Priority*	*Notes*
2.1 Instream habitats						
Sedimentation of spawning habitat	Inspect and, if necessary, clean spawning areas in section 32	Potential for localised improved egg survival	**SFT**, proprietors	Hendry & Cragg-Hine 1997	Low	2.1.1
Deterioration of spawning habitat	Prevent vehicle access into river by new bridge. Check bank stability at new bridge and identify remedial action if required.	Localised improved egg survival	**SFT**, proprietors (forestry interests)		High	2.1.2
2.2 Riparian habitats						
Erosion and slumping sections 29-32 and 38-39	Grazing reduction/stock exclusion. Explore possibility of fank relocation if use is resumed in the future.	Potential to improved egg survival and carrying capacity	**SFT**, proprietors	PEPFAA Code	Moderate	2.2.1
Livestock access to riverbank	Repair watergate in section 32a1. Repair fencing in sections 16 and 17	Prevent onset of bank erosion	**SFT**, proprietors		Moderate	
Conifer planted close to river	(i) Ensure riverbank does not get damaged during felling (ii) Ensure future planting has appropriate buffer strip	Prevent onset of bank erosion	**SFT**, proprietors, forestry	Forest and Water Guidelines	Low	2.2.2

Issue	*Actions*	*Benefits*	*Responsibility* (**Lead**/other)	*Guidelines*	*Priority*	*Notes*
2.3 Stocking						
Source of broodstock	Facilitate native broodstock and/or stocking progarmme	Protect genetic stock and maximise population fitness.	**Proprietor/SDSFB**	FRS 2007	High	2.3.1
Areas to be stocked	Identify areas that are under producing and target stocking to these	Reduced competition with wild fish. Improved survival of stocked fish.	**SFT**, proprietor		High	

Notes
2.1.1 Link this to redd counts.
2.1.2 Exposed soil at new bridge was evident in 2008. Unless stabilised may wash into river during floods, damaging spawning habitat immediately downstream.
2.2.1 PEPFAA Codes at http://www.scotland.gov.uk/Publications/2005/03/20613/51366
2.2.2 Forest and Water Guidelines at http://www.forestry.gov.uk/pdf/FCGL002.pdf/$FILE/FCGL002.pdf
2.3.1 FRS (2007) Hatchery Work in Support of Salmon Fisheries http://www.frs-scotland.gov.uk/FRS.Web/Uploads/Documents/SFRR_65.pdf

4 INFORMATION NEEDS

Data	**Purpose**	**Timescale**	**Priority**	**Notes**
Juvenile surveys	Up to date survey required to: (i) determine current stock status (ii) define stocking plan	2010-1011	High	3.1
Catch data	Provide ongoing record of fish numbers and indicative measures of effort	2010	Moderate	3.2
Redd counts	Can be used (i) to provide indication of spawning escapement (ii) to provide distribution of spawning effort	Winter 2010 and 2011	High	
Adult counts	Identify approximate numbers of adults using snorkelling	Late October – November annually	Moderate	3.3

Notes
3.1 Re-survey of 11 sites plus additional 3 as recommended by Watt (2009) estimated at 1.5 days (1.5 x £400) plus 1 day report (1 x £230) = £830 plus expenses.
3.2 Catch data collection carries no cost other than an element of time. SDSFB legislative role under The Conservation of Salmon (Collection of Statistics) (Scotland) Regulations 2006. http://www.opsi.gov.uk/legislation/scotland/ssi2006/20060572.htm
3.3 Low, clear water is needed and this may not be possible in all years. However, repeatable counts would be useful to determine approximate size of adult stock.

22 PRIORITISING ISSUES BETWEEN RIVERS

In each of the river specific action plans presented above, priorities for each action were set purely in the context of the individual river. In the table overleaf, generic issues are examined and differing priorities across all rivers are indicated e.g. poaching may be a higher priority in one river than another due to threatened stocks or value of fishery. It is intended that these tables be used to aid in the development of future work programmes for the SFT. It is accepted that some low priority issues, particularly livestock exclusion and riverbank improvements may be taken forward quickly where opportunities arise through partnerships. This is to be encouraged due to the wider environmental benefits and the longer-term protection of river and riparian habitat.

23 FUTURE EXPANSION IN THE WORK OF SFT

Extending the work of the Trust to cover rivers not included in the current plan represents an essential part of future Trust development, as are explorations of factors affecting other fish species. In particular, we are aware of the importance of migratory fisheries in catchments such as Camasunary, Coruisk, Kilmaluag and Amar to name but a few. It is intended that these and other fisheries be considered in future iterations of the FMP.

Populations of fish other than salmon and sea trout are central to the Trust's role and the value of brown trout, as a recreational resource, cannot be underestimated. These and other fish will gain higher profile as the Trust matures. Eel populations are currently in rapid decline throughout the Atlantic region the European eel stock is outside safe biological limits. In September 2007 the European Union issued regulations (Council Regulation (EC) No 1100/2007) to underpin recovery of the eel. Eels are now protected by the Freshwater Fish Conservation (Prohibition on Fishing for Eels) (Scotland) Regulations 2008. Little is known of the eel populations within Skye's rivers and this too will have to be addressed in the future. Lamprey and Artic charr are both of considerable conservation interest and should also be included in long-term aims of the Trust.

24 CONSULTATION

Many proprietors and tenants participated in discussions during the development of this FMP and we would like to thank them for their time and invaluable comments. Those who assisted in developing the Plan include: Borve and Annishadder Trust, C. Leslie, C. MacDonald, Cuidrach Sporting Syndicate, Drynoch and Borline Sport, Fearann Eilean Iarmain Estate, Forestry Commission, Glendale Estate, Highfield Forestry, J. Geisher, John Muir Trust, MacLeod Estates, MacLeod Hotels, Oxford Hotels and Inns, P&B Kinloch, Portree Angling Association, Three Esses Ltd., SGRPID, Sligachan Hotel, Shillofad Ltd.

A copy of the draft plan was delivered to Marine Scotland Freshwater Laboratory, SNH, SEPA and RAFTS. Many thanks to Ross Gardiner of Marine Scotland Freshwater Laboratory for his helpful comments on an earlier draft.

The Nineveh Trust provided funding to allow the SFT to extend the consultation to the wider communities living and working within the fourteen river catchments.

Suggested priorities for actions across all rivers

RIVER	STOCK PROTECTION		INSTREAM HABITATS						RIVER BANKS					INFORMATION			
	Poaching	Reduce legal exploitation	Lack of spawning	Lack of parr cover	Lack of holding pools	Sedimentation of spawning gravel	Obstacles	Abstraction	Stock exclusion	Bank repairs	Remove conifers (buffer strip)	Woodland development	Invasive plants	Improved catch data	Electric fishing data	Redd counts & spawning habitat	Egg survival (egg boxes)
Brittle	1	1		3					2	2		3		1	1	2	
Broadford	1	1		3		1	3		2					1	1	1	
Drynoch	2	1			3	3			3						1	2	
Hamara	?	1		3				2	2	1				1	1	1	2
Haultin	1	2											1		2	3	
Hinnisdal River	1	1	?								2			3	1	2	
Hinnisdal tributaries						1?	3		1						1	2	
Kilmartin	1	1	?			2			2					1	1	1	2
Ord	3	3							1						2	3	2
Ose	1	1							2?					2	1	2	
Romesdal	3	2							3						3	3	
Sligichan	?	?							3			3		1	1	2	
Snizort, River Snizort	1	2	?			2			2						1	2	2
Snizort, Lon an E.	?	?		2		3			1	2					1	2	2
Snizort, Lon Dubh	?	?				3	?		2						1	3	2
Snizort, Glenmore	1	1		2		1			1		1			2	1	1	1
Snizort, Tungadal	?	?		2		2			2						1	1	2
Strathmore	?	?					?		3			3		1	1	2	
Varragill	2	1							2		3				1	1	

1 = High priority to be dealt with within current plan
2 = Moderate priority, expected to become higher priority in future plans if fish stocks improve
3 = Low priority in current plan, mainly long–term objectives
? = Information/data required

25 REFERENCES

Aquaterra. 2009. Skye freshwater invertebrate survey. Report to Skye District Salmon Fishery Board. Aquaterra Ecology, Huntly.

Crozier, W.W., Moffett, I.J.J. & Kennedy, G.J.A. 1997. Comparative performance of native and non-native strains of Atlantic salmon (*Salmo salar* L.) ranched from the River Bush, Northern Ireland. Fisheries Research 32(1), 81-88.

Einum, S & Fleming, I.A. 2001. Implications of stocking: ecological interactions between wild and released salmonids. Nordic Journal of Freshwater Research, 75, 56-70.

Freshwater Fish Conservation (Prohibition on Fishing for Eels) (Scotland) Regulations 2008. (http://www.uk-legislation.hmso.gov.uk/legislation/scotland/ssi2008/ssi_20080419_en_1)

FRS. 2005. Catch and release: A Guide to Best Practice. Available at http://www.marlab.ac.uk/FRS.Web/Uploads/Documents/FW25Catch%20FH10.pdf

Species and Habitats Directive (http://ec.europa.eu/environment/nature/legislation).

Harris, G. 2006. A simple egg box planting technique for estimating the survival of eggs deposited in stream gravel. Journal of Fish Biology, 5, 85-88.

Hendry, K. & Cragg-Hine, D. 1997. Restoration of Riverine salmon habitats. Fisheries Technical Manual 4, Environment Agency, Bristol.

Hoey, T.B., Smart, D.W.J, Pender, G. & Metcalfe, N. 1995. Alternative Methods of River Management for Scottish Rivers. Report to Scottish Natural Heritage (SNH/045/95 ESB).

McGinnity, P., Prodöhl, P., Ó Maoiléidigh, N., Hynes, R., Cotter, D., Baker, N., O'Hea, B. & Ferguson, A. 2004. Differential lifetime success and performance of native and non-native Atlantic salmon examined under communal natural conditions. Journal of Fish Biology 65 (Supplement A): 173-187.

McGinnity, P, P. Prodhol, A. Fergusson, R. Hynes, N. O'Maoileidigh, N. Baker, D. Cotter, B. O'Hea, D. Cooke, G. Rogan, J. Taggart & T. Cross. 2003. Fitness reduction and potential extinction of wild populations of Atlantic salmon, *Salmo salar*, as a result of interactions with escaped farmed salmon. Proceedings of the Royal Society of London B, 270: 2443-2450.

National Rivers Authority. 1994. The NRA National Fisheries Classification Scheme: a users guide. R & D Note 206, NRA, Bristol.

Raffell, J, Buttle, S. & Hay, D. 2007. Seventh Annual Report of the Shieldaig Sea Trout Project. Fisheries Research Services.

RSPB, NRA & RSNC. 2001. The New River & Wildlife Handbook. RSPB, Sandy. 426pp.

Scottish Geology website (http://www.scottishgeology.com).

SEPA. 2008a. The Water Environment (Controlled Activities) (Scotland) Regulations 2005: A Practical Guide. Scottish Environment Protection Agency. (Accessible at http://www.netregs.gov.uk/netregs/legislation/current/63590.aspx).

SEPA. 2008b. SEPA Technical Guidance Note: On-site management of Japanese knotweed and associated contaminated soils. Scottish Environment Protection Agency (http://www.sepa.org.uk/waste/waste_regulation/guidance_and_position_statemen.aspx).

Skye, Landscape Fashioned by Geology (http://www.snh.org.uk/publications/on-line/geology/skye/default.asp)

Soulsby, C. 2002. Managing River Habitats for Fisheries: A Guide to Best Practice. Scottish Environment Protection Agency..

Watt, J. 2006. An assessment of the Salmon and Trout Populations of the Isle of Skye. Commissioned report to Skye District Salmon Fishery Board. Era Report 57.

Watt, J. 2009. Skye Rivers Salmonid Habitat Survey. Final Report to Skye District Salmon Fishery Board, October 2009

Youngson, A. 2007. Hatchery Work in Support of Salmon Fisheries. Scottish Fisheries research Report No. 65 (ISSN: 0308 8022).

Appendix 1. Areas identified as potentially benefiting from stock fencing (from Watt 2009)

River	Watercourse	Priority sections for fencing	Priority	Number of sections		Approx length (m)	Notes
				Single bank	*Double bank*		
Brittle	Brittle	10 to 20	1	11	2	3000	Fencing of upstream areas would be a good start, protecting spawning/juvenile habitat. Installing watergates in this spate river (and others) may be challenging.
Brittle	Brittle	11 to 20	2	8	2	2400	Watergate already present in section 3. Some right bank fencing throughout river, requires repair in places, but right bank mainly fenced. Left bank fencing required throughout. This would require watergates at feeder streams (n=5?).
Broadford	Broadford	11, 12	1	1	1	950	Fences in section 10 also need repair.
Broadford	Broadford	17-19	2		3	1680	Banks mainly ok. Not a pressing need.
Drynoch	Drynoch		1				Repair section 16 fence right bank. Remainder of river mainly fenced.
Hamara	Hamara	2-7, 10	1	5	2	1800	Lower reaches 2 to 5 may also benefit from log and xmas tree at worst erosion points. Log and xmas tree 70m of bank in section 7 (priority). Repair eroding corner in section 10.
Hamara	Hamara	8-17	2				Repair fencing throughout sections 8 to 17 (would require fence survey to cost them fully).
Haultin	Haultin						Fencing not a priority action for fishery development
Hinnisdal	Hinnisdal	19-22 (repair only)	2	NA	NA	NA	Mainly needs spurs to river to prevent sheep getting inside fences. Marked as priority as minimal cost.
Hinnisdal	Lon Ruadh	LR2 - LR3	2	0	3	3922	Stock fencing required throughout
Hinnisdal	Lon Ruadh	LR1 & confluence area in LR2	1	0	1	2000	Best spawning in section LR1. Further action may be needed to trap silt runoff from trampled field right bank. Rapid erosion at confluence in LR2
Kilmartin	Kilmartin	8-13	3	6		1470	Much good juvenile habitat. May improve carrying capacity.
Kilmartin	Kilmartin	21 - 26	2		6	2960	Spawning areas are in these sections. Some erosion and slumping.
Kilmartin	Kilmartin	14-20	1		7	3420	Spawning areas are in these sections. Some erosion and slumping.
Kilmartin	Suarbie Burn	S5 to S7	3		3	1580	Eroding peat may contribute to compaction.
Note - fencing is generally not a high priority in the Kilmartin river. Stock protection is. Manual cleaning of gravel at some spawning sites may be appropriate with fencing as longer term option to (I) reduce siltation (ii) improve nutrient bank cover and nutrient input.							
Ord	Ord	11-13	1		3	1520	This encompasses main spawning areas.
Ord	Ord	5-10	2		6	3060	Grazing and trampling present
Ose	Ose	13-22	1	0	10	4860	Collapsing on bends throughout. Much spawning habitat in these reaches.
Ose	Ose	7-12	2	6		1500	Patchy collapsing and erosion. Some single bank fencing but access for livestock across river is easy.
Note - fencing is not an immediate priority in the Ose. Stock protection is. Habitat is probably not currently limiting fish production so relatively low priority overall.							

River	Watercourse	Priority sections for fencing	Priority	Number of sections		Approx length (m)	Notes
				Single bank	*Double bank*		
Romesdal	Romesdal			NA	NA	0	Fencing not a priority action for fishery development
Sligachan	Sligachan			NA	NA	0	Fencing not identified as a priority issue.
Snizort	Snizort	17, 40, 41, 47 and various others	2				Repairs only
Snizort	Snizort	40-43 and 50-53	2	5	3	2020	Erosion and slumping around spawning areas. Single bank fencing mainly present but ineffective in places - repairs needed.
Snizort	Snizort	5-12	2	8	repair		Most sections have one fenced bank, but often in poor repair. Erosion and slumping causing some siltation to spawning and juvenile areas. Increased vegetation may improve cover and reduce impact on spawning areas.
Snizort	Glenmore River	9-14	1	4	2	2000	
Snizort	Glenmore River	1-13	2	4	9		
Snizort	Lon an Eireannaich	8-18	1		11	5600	Much good juvenile and spawning habitat in areas of heavy grazing and serious bank erosion.
Snizort	Lon an Eireannaich	1-5	2		5	2600	Massive erosion but habitat may remain rather poor even when banks stabilised due to predominance of small substrates. Fencing unlikely to prevent erosion without further intervention (log & tree etc).
Snizort	Lon Dubh	4-11	1	NA	NA	NA	Repair forest fence and install & maintain watergates to keep grazers off banks
Snizort	Lon Dubh	1-3	2	3	0	820	Single bank with links across to forest fence on left bank.
Snizort	Tungadale River	1-8	1	NA?	NA?	NA	Much of forest is fenced but sheep get access. Determine location of access points - repair only?
Strathmore	Strathmore						Fencing not currently a priority action for fishery development
Varragill	Varragill	V30-V32	1		3	1500	Main spawning areas. Bank collapse below bridge and around fank. Watergates may be difficult to place in this area, requiring fence extended up or downstream.
Varragill	Varragill	V33-V40	2	3	5	3250	Heavily grazed.
Varragill	Varragill Burn	V16a1 - 16a3	2		3	1300	Heavily grazed.
Varragill		repair watergate at V32a1	1				This and other fence repairs e.g. at V16 (see main habitat spreadsheet) would maintain existing stock exclusions while fence plan is developed.

1: Priorities are assessed on a river by river basis i.e. a priority 1 on the River Brittle is higher than a priority 2 on the Brittle but may be lower than a priority 1 on another river (see section 22).

2: Other areas may also benefit from fencing should opportunities arise. The table lists areas highlighted during the habitat survey as clearly suffering heavy grazing. Increasing riparian vegetation in many smaller streams may also be beneficial, especially to trout.