

River Findhorn Fishery Management Plan (3rd Draft)
2009 - 2014

R. Laughton
Spey Research Trust Report 02/09

Prepared for

Findhorn Fishery Board
c/o Altyre Estate Office, Altyre, Forres, Morayshire.
www.riverfindhorn.org.uk

and

Findhorn, Nairn and Lossie Fisheries Trust,
Fisheries Office, Logie Steading, Forres, IV36 2QN

November 2009

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Contents

Section	Page
1. Scope of the Plan	3
2. Findhorn Catchment	4
3. Fish and Fisheries Management in the River Findhorn	7
4. Fisheries Research in the River Findhorn	9
5. The Fisheries Management Plan 2009-2014	20
6. Duration and Review	32
7. Consultation	32
8. Acknowledgments	33
9. Glossary of Acronyms	33

River Findhorn Fishery Management Plan 2009 – 2014.

R. Laughton.

Spey Research Trust, SFB Research Office, 1 Nether Borlum Cottage, Knockando, Morayshire, AB38 7SD. Tel 01340 810841, email research@speyfisheryboard.com
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1. Scope of the Plan

This Fishery Research and Management Plan aims to facilitate the proper management of all fish species in the Findhorn Fishery Board District. It provides a framework within which the Findhorn Fishery Board can identify target areas for research and apply specific funding.

Inherent in the drive towards a scientific approach to the management of the Findhorn's fish species on a catchment wide basis is the integrated nature of the research and management. There is a limited knowledge base available for the Findhorn and much of the applied research proposed in this plan seeks to increase the data available for fish populations within the catchment. Where data does exist (Redgewell and Laughton, 2008) the Plan seeks to build on existing monitoring routines allowing management decisions to be improved further.

The fish and their habitats are affected by many factors and so an integrated catchment management approach is desirable for their effective management. It also recognizes and incorporates new requirements and commitments developed from the Water Framework Directive (WFD), and A Strategic Framework for Scottish Freshwater Fisheries (Scottish Government 2008). Currently the river has no additional nature conservation status for any of its fish species this Plan seeks to encourage close liaison with other management bodies such as SEPA, SNH and local councils to promote more awareness and effective management of the River Findhorn's fish stocks.

2. Findhorn Catchment

The River Findhorn has a catchment area of over 1,300km² and a stream network length of about 1,500km, of which the main river comprises 90km. The catchment is split between two Local Authority administrations, which are the Highland and Moray Councils (Figure 1).

The Findhorn Fishery District (Figure 2) includes the River Findhorn and its tributaries plus 35km of coastline in the Moray Firth, from Burghead to the east of the Findhorn estuary to The Bar in the west. The District extends 3 nautical miles out to sea (Figure 2). The Muckle, Mosset, Kinloss and Burgie Burns are also included within the District.

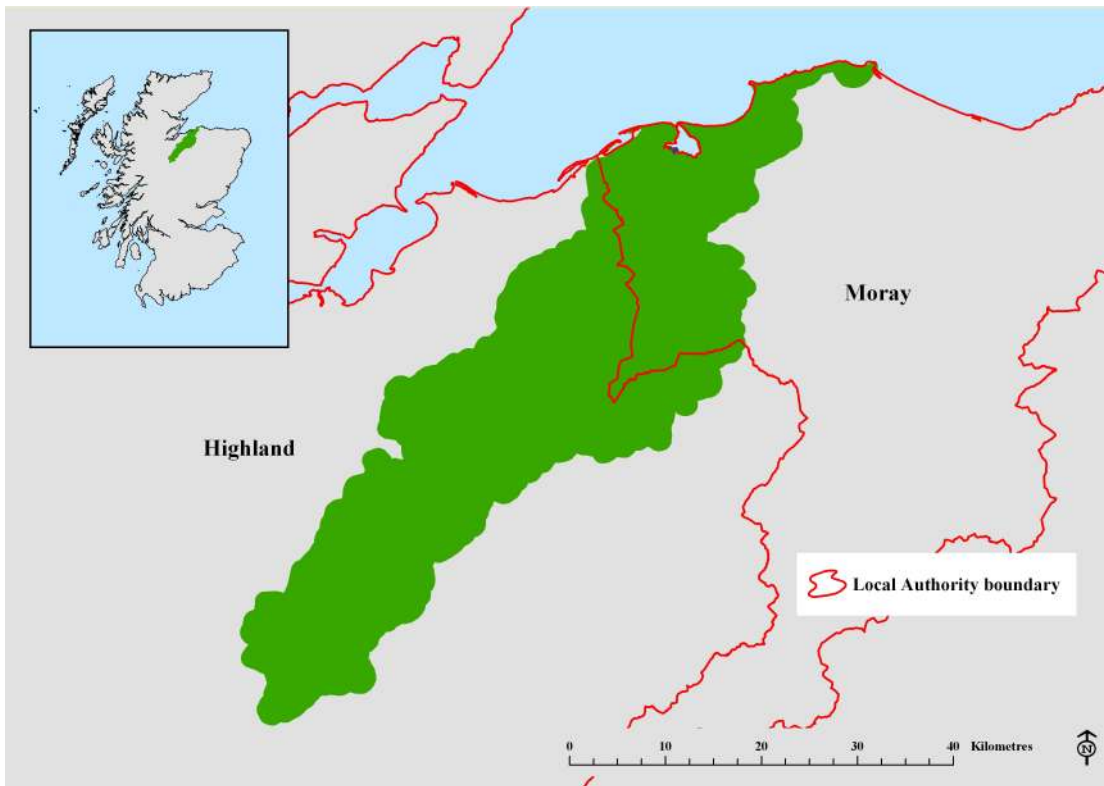


Figure 1. Findhorn catchment Local Authority boundaries

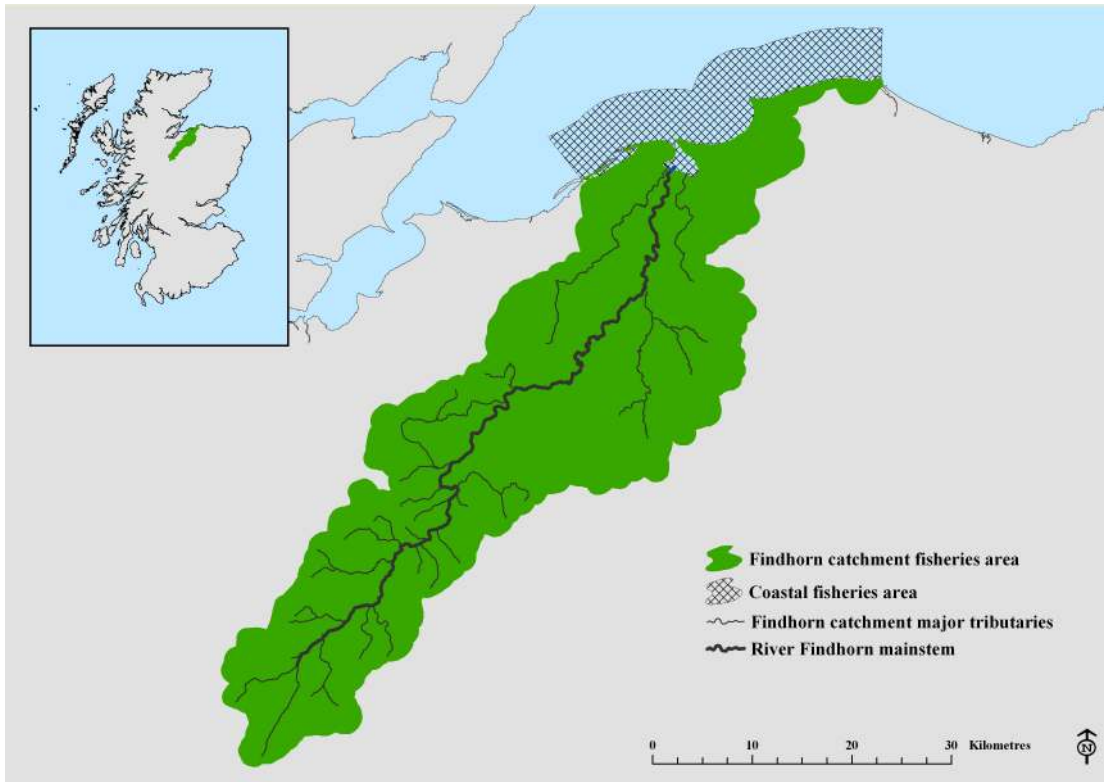


Figure 2. Findhorn mainstem and major tributaries

The source of the River Findhorn lies in the heart of the Monadhliath Mountains. Much of the Findhorn catchment's is dominated by Palaeozoic metamorphic crystalline rocks and granitic intrusions, while the Moray Firth coastal plain has been cut in conglomerate and sandstones of the Old Red Sandstone series solid geology (Figure 3). Glaciation and sequences of vertical movements in base level produced a distinctive combination of incised valleys and remnant plateau surfaces. Most of the lower valleys are filled with outwash terraces. The coastal plain contains raised beach shingle bar formations.

The land in the upper catchment is used mainly for sporting purposes and is primarily managed for deer and grouse, with some limited sheep farming. There are commercial forestry plantations in areas of the lower ground. In common with the upper catchments of many Highland river systems the riparian tree cover is rather sparse, in poor condition, or absent. In some cases the riparian zone may have been without trees for several centuries while in others the woodland has deteriorated more recently. In the middle and lower reaches sporting estates give way to forestry with occasional livestock or crop farming.

The Findhorn catchment area can be classed as a low population density area. The major area of habitation is the coastal plain where there is one major town, two minor towns and a number of small villages Forres, which is situated on the coastal plain close to Findhorn Bay, is the largest town within the catchment with a population of less than 15,000 people. Findhorn (pop. c.800) and Kinloss (pop. c.1000) are the only other sizeable towns. Most of the other land in both the upper and lower Findhorn catchments is held by private landowners.

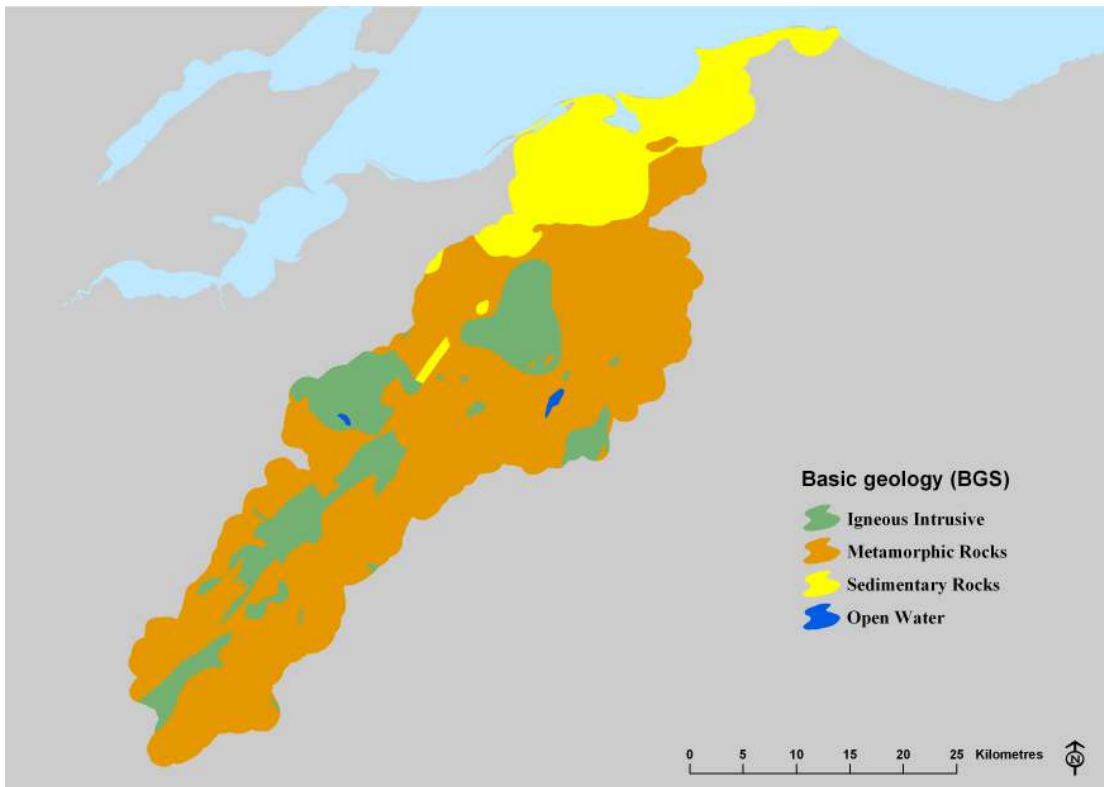


Figure 3. Findhorn catchment basic geology

Although the Findhorn has a relatively modest in drainage area the highly elongate basin of the River Findhorn is ideally configured to maximize flood runoff. The river is renowned locally for its ability to rise quickly which has surprised many visiting anglers over the years leading to a number of close calls and rescues! The 'Muckle Spate' on August 4th 1829 was the most extreme historic flood recorded in Scotland, with a regional footprint that extended from Inverness (in the north) to Montrose (on the east

coast). The 16th August 1970 flood of $2,406\text{m}^3\text{s}^{-1}$ on the lower Findhorn is the highest gauged flow ever recorded in the UK.

3. Fish and Fisheries Management in the River Findhorn

3.1 Fish species occurring in the Findhorn catchment

i. Native species

Atlantic salmon (*Salmo salar*); Brown/sea trout (*Salmo trutta*); Eel (*Anguilla anguilla*); Three-spined stickleback (*Gasterosteus aculeatus*); River lamprey (*Lampetra fluviatilis*); Brook lamprey (*Lampetra planeri*); Sea lamprey (*Petromyzon marinus*); Flounder (*Platichthys flesus*).

ii. Non-native species (Historical Introductions)

Rainbow trout (*Oncorhynchus mykiss*); Northern pike (*Esox lucius*); Minnow (*Phoxinus phoxinus*).

Thus the Findhorn is similar to many Highland rivers supporting only a limited range of fish species and the preservation of this limited fish fauna should be a key management target rather than attempting to broaden the species list through introductions of non-natives.

3.2 Fisheries Management in the Findhorn

Fisheries management within the River Findhorn catchment is the responsibility of the Findhorn District Salmon Fishery Board (FFB). The FFB was established under the 1860s Salmon Fisheries legislation as subsequently amended and stated in the Salmon Act 1986 and the Salmon Conservation (Scotland) Act 2001. This legislation has recently been streamlined into the Salmon and Freshwater Fisheries (Consolidation) (Scotland) Act 2003. It is empowered under the legislation to take such acts as considered expedient for the protection, enhancement and conservation of Atlantic salmon and sea trout stocks and fisheries.

Statutory responsibilities of the Findhorn Fishery Board are to:

1. provide fisheries protection
2. set salmon rod fishery season (currently 11th February – 30th September)
3. set sea trout rod fishery season (currently 15th March – 30th September)
4. set weekly rod fishery close times (midnight Saturday – midnight Sunday)
5. police the purchase and sale of illegally-caught or unseasonable fish
6. ensure fish passage over obstructions to migration
7. protect juvenile fish and spawning redds
8. regulate the movement and introduction of adults, juveniles and ova

The Findhorn, is split into a variety of fishing beats, 24 in total along the mainstem from the mouth to upstream of Tomatin with arguable the best fishing is in the lower 40km. The majority of the angling is operated by private estates but there is one angling association on the lower Findhorn, the Forres Angling Association. Angling is also available on the Muckle Burn, primarily for sea trout, and occasionally a fish can be caught on the Mosset.

Commercial salmon netting within the Findhorn District was practiced for well over one hundred years before ceasing in the early 1990s.

There are some loch based fisheries available within the Findhorn catchment and details are presented in Table 1. Currently there are no commercial 'put and take' fisheries present in the Findhorn catchment.

The Findhorn Fishery Board is a member of the Association of Salmon Fisheries Board and the Scottish Fisheries Co-ordination Centre (SFCC). The Board and the Forres Angling Association are also represented on the steering committee for the Findhorn, Nairn and Lossie Fishery Trust.

4. Fisheries Research in the River Findhorn

4.1 *Salmon and Trout Populations and Distribution*

The Spey Research Trust (SRT) has conducted a range of fisheries surveys and research primarily to support the management decisions of the Findhorn Fishery Board since 1997. Some additional data is also available from other sources and a full outline can be found in Redgewell and Laughton (2008). Juvenile surveys have been carried out to SFCC methodology and in summary the Findhorn and tributaries have indicated that salmon are distributed throughout the catchment. Densities vary throughout the river and tributaries such as the Mazeran, Kyllachie, Dorback and Divie for example indicate good populations. Similarly where suitable habitat is present good juvenile densities have been found. There are weaker areas and the upper tributaries such as the Cro, Eskin and Elrick produce only low densities. These are at the extreme upper end of the catchment and also appear to have limited spawning opportunities for adults. Maintaining a juvenile survey program will provide a valuable barometer on the distribution and densities of salmon stocks within the river. Adding additional sampling in the mainstem would also improve the dataset further.

Trout are also present but distribution is more limited. Key areas for trout are the Dorback and Divie catchments. There are also some smaller burns such as the Muckle which harbour reasonable populations. However, some additional surveys more specifically designed to examine trout populations would improve the current dataset.

Currently no data on salmon or trout smolt output from the Findhorn or its tributaries exist. Smolt output data is arguably the best measure of the strength of a population however it is difficult to gain this data without substantial investment in fish traps and staff to run them.

Adult salmon and sea trout catch data is available from 1952 onwards. Data from before 1952 may exist in older catch books and there should also be catch records for the river and coastal nets. It is important to source this data if possible and digitise it. If sufficient historical data can be obtained longer term trends in the rivers stocks may be determined.

Salmon is the key species within the river and data from fish catches indicate that the adult population is predominantly summer salmon (multi-sea-winter fish) and grilse (one-sea-winter fish). There is also a spring running salmon population. The late 1990s saw a considerable change in the approach of anglers to their sport with catch and release beginning to take root. The Findhorn Board have embraced this change and implemented a conservation policy which included catch and release at its heart as a result release rates for salmon have risen to nearly 70% each year. A key management target is to ensure that the remnant spring population is preserved and that existing runs of later salmon and grilse continue. Encouraging catch and release policies can help achieve this.

Recent declines in the catch rates of sea trout have worried anglers, ghillies, and proprietors alike. The decline has not been unique to the Findhorn with similar reports arising from other Moray Firth rivers and further afield. Sea trout catches in the Findhorn indicate that only a limited number of sea trout ascend the river and juvenile surveys indicate that the distribution of trout within the Findhorn is limited mainly to the Dorback, Divie and smaller burns in the lower catchment. However, it is likely that Findhorn Bay is an important area for sea trout and finnock and so more data on this important aspect of the sea trout lifecycle would be welcome. The Moray Firth Sea Trout project has been started to address the problem of sea trout decline and the Board supports the initiative.

4.2 Salmon Hatchery and Stocking Practice

The Findhorn have run a small hatchery on the Lethen Estate for a number of years and a second hatchery at Dalmigarry was also added in the late 1990s. Combined capacity is around 400,000 eggs. Target stocking areas are identified from the juvenile surveys and as far as is possible broodstock is being collected from area close to the target stocking area during late Autumn. However, in some of the upper tributaries where few adult salmon are available stock from further downstream has been used. The eggs are raised in the hatchery until around April the following year the fry are then fed for a short time before release generally in May.

Following release of the hatchery fry monitoring using electro-fishing has also taken place and some encouraging improvements in the stocks of the upper tributaries such as the Cro and Elrick have been determined.

There is a need to review the hatchery policy on the Findhorn given that there has been new legislation regarding the introductions and transfers of fish (Aquaculture and Fisheries Act 2007). This seeks to tighten up on fish introductions and transfers and although salmon hatcheries and stocking are not extensively covered in this legislation the ASFB-RAFTS have produced more robust guidelines for salmon stocking. A recent Fisheries Research Services report on "Hatcheries and Stocking Guidance" along with other literature has also provided additional guidance. So using these sources combined a revised policy for salmon stocking could be developed. In addition continued monitoring through juvenile surveys is recommended.

4.3 Population Structure

Recent advances in genetic analysis techniques can now provide a greater understanding of the salmon population structure within a river. It is likely that the salmon stocks within the Findhorn are distinct genetically from those of the nearby Spey, Lossie and Nairn. However, it is also likely that within the river sub-populations of salmon will be evident. For example the salmon in the Dorback and Divie may well be genetically different from those in the Mazeran. Gaining a greater understanding of the population structure within a river is fundamental to its future management. For example stocking salmon from one tributary to another may be very wasteful if these salmon are not suitable for the target tributary and worse still could lead to significant losses of the population.

Currently there is a major project (SALGEN and FASMOP) underway across Scotland to examine the population structure of salmon populations from river to river and also within each river. The project is being managed through RAFTS and FRS Pitlochry. To determine the structure of the salmon populations in each river tissue samples from the juvenile fish are required from throughout the catchment. During the 2008 juvenile survey tissue samples were collected from each survey site. However, additional samples may be required from other areas of the river to fully examine the structure of the

Findhorn's salmon population. Thus a review of the collected samples and plan for collecting the additional samples is required. A number of the samples should be analysed to provide data on the Findhorn for the SALGEN study and thereafter discussions need to be held with RAFTS and FRS to determine further analysis of the tissue samples to determine the sub-populations within the river. Fund raising will also be required to meet the costs of this additional analysis.

4.4 Lochs

Data for the fish populations within the lochs of the Findhorn catchment is patchy. Table 1 was compiled from discussions with proprietors and anglers and provides an insight into what is currently present. Loch Moy is interesting in that Arctic Charr are confirmed as present there (*pers com, Peter Maitland, Fish Conservation Centre*) and there are also *ad hoc* reports of pike being present. Neither two species have been reported elsewhere in the catchment. Loch Tutach is another interesting one with suggestions that some coarse fish had been stocked there and into the nearby Lochans but no detailed survey has been completed to confirm this. Rainbow trout were stocked into Tutach a few years ago. The Loch has no outflow so threats of escape are low. Rainbow trout are regularly stocked into Blairs Loch by Moray Council to support the fishery and although a few brown trout are still caught they now appear to be rare in the loch. In addition Rainbow trout were stocked into Loch Mhic Leoid but this practice was stopped around 2002. Today only brown trout are stocked into the loch.

Occasionally an unusual fish appears. Photo 1 illustrates a "Tiger" trout caught on the



Lethen beat during June 2007. This is thought to be a hybrid between a Rainbow and Brook trout. Its origin remains unknown.

It is clear that additional information on the fish fauna within the lochs is required. In particular data for those that are fished regularly would assist and help guide future management.

Table 1: Location and fishery information for a selection of larger lochs in the Findhorn catchment.

Loch	OS	Species present	Access to Salmon/ Sea Trout	Stocked /Species	Fishery Notes	Methods
Loch Moy	277500, 834500	Brown Trout, Pike, Arctic Charr	Yes	No	Occasionally fished	Fly or Spinner
Lochindorb	297000, 836000	Brown Trout	Yes	No	Regularly fished	Fly or Spinner
Loch an t-Sidein	297400, 832100	Brown Trout	Yes	No	Unknown	
Loch Ille Mhor	393500, 393500	Brown Trout	No	Yes Brown Trout from Lochindorb	Occasionally Fished	
Loch Tutach and Lochans	298500, 840500	Brown Trout	No	Yes Rainbows	Occasionally Fished	
Loch Mhic Leoid	300900, 834800	Brown Trout	No	Yes Brown Trout	Regularly Fished	Fly or Spinner
Loch Kirkady	296200, 841800	Unknown	No	Unknown	Unknown	
Loch Dallas	309200, 847500	Brown Trout	No	No	Occasionally Fished	
Loch Noir	309400, 545300	Brown Trout	No	No	Occasionally Fished	
Loch Belvat	395300, 847000	Brown Trout	No	Yes Brown Trout	Regularly Fished	Fly Only
Blairs Loch	302300, 855600	Brown Trout Rainbow Trout	No	Yes Rainbow Trout	Regularly Fished	Fly or Spinner
Sanquhar Pond	304100, 858100	Brown Trout	Yes	No	Regularly Fished	Fly/ Spinner/Bait

4.5 *Other Fish Populations*

Data on eels and lampreys has been collected through juvenile surveys but to date there is little data regarding the presence of other fish species present within the catchment. Minnows have been captured during electro-fishing surveys notably near Lochindorb, and their presence has probably been the result of trout anglers discarding bait while using the “drop minnow” technique. No formal management structure is in place to collect data on these species and so effective management remains a considerable challenge. Surveys to establish the current status of the fish population would aid this considerably.

4.6 *Threats to the Native Fish Populations*

A major challenge is to maintain the current fish fauna free from non-native introductions or potential escapes from ornamental ponds and to ensure that any trout stocking is carefully managed to avoid compromising native stock.

Perhaps a more serious threat is the American signal crayfish, which are well established in the neighbouring River Nairn. The removal of this destructive animal is proving difficult and the most effective control is to ensure it doesn't enter the catchment. All possible efforts to raise awareness of the crayfish and its potential routes into the catchment must be pursued. Control methods such as disinfecting fishing kit when moving from one catchment to the other should also be implemented. In addition attempts to eradicate the species from the Nairn should be discussed with the Nairn Fishery Board and others and if possible implemented.

Gyrodactylus salaris remain a constant threat. Raising awareness of the threats posed by this parasites and implementing preventative measures are key for safeguarding the Findhorn for the future.

4.7 *Habitat Management*

4.7.1 Obstructions to Salmon and Sea Trout Passage

Baseline habitat surveys have been completed on several tributaries of the Findhorn using SFCC methodology. In general surveys indicated few restrictions to fish access within the catchment. Natural waterfalls and a small number of man-made obstructions were documented and these have been mapped using GIS. Two problematic man-made obstructions were identified which would be problematic for fish passage, gabion weirs on the Allt na Frith near Tomatin and a raised concrete ford at Dallasbraughty on the Berry Burn. The Mosset Burn also produced several weirs along its length. The obstructions on the Allt na Frith and Berry Burn would be well worth addressing to assist fish passage and financial assistance may be possible through the SEPA restoration fund for example. Further surveys of other burns in the catchment may also turn up more obstructions. In addition developing and improving liaison with the local Councils and any other road builders (Forestry Commission, landowners etc) would be useful. Poorly build road culverts can lead to obstructions being created for fish passage. This can easily be avoided at the planning stage and usually saves money by avoiding expensive modifications in the future. It is recommended that the Findhorn Board build a strong working relationship with these parties and advise on good practice for culvert and bridge construction.

4.7.2 Riparian Vegetation

In general instream habitat was found to be typical of a highland stream offering range of varied substrates and flow conditions suitable for juvenile salmonids. The surveys did indicate that the vegetation in the riparian zone around the burns was often limited particularly in the upper tributaries. This can be due to several factors not least over grazing by sheep or deer. Further assessment and development of remedial strategies should be considered.

4.7.3 Land Management

The Findhorn is affected by a variety of land use activities within the catchment. Forestry, agriculture and upland land management activities can impinge upon the water quality and quantity of the catchment. For the most part these activities are controlled through a wealth of guidelines and regulations. However, it is important that The Board maintain close liaison with bodies such as the Forestry Commission, National Farmers Union, SEPA, SNH and Local Authorities and also local proprietors to raise awareness of the requirements for maintaining healthy fish populations and prevent damaging practices.

4.7.4 Distilleries

Four distilleries, Tomatin, Ben Romach, Glenburgie and Dallas Dhu are present within the catchment. The latter is no longer operational but remains open to the public as a visitor centre. However, Tomatin, Ben Romach and Glenburgie are operational and require large volumes of water for their operations in particular for cooling water to condense the distillate. The warm water produced after cooling the distillate is discharged to nearby burns the Allt na Frith, Mosset and Burgie, respectively. This can affect the growth of fish downstream of the distillery and may affect the overall production of the burn. Under the Water Framework Directive regulations are being developed to control the abstraction and discharge of water for example the abstracted water must be returned to the burn of origin. In addition EC Directive (78/659/EEC) indicates that industries discharging warm water "thermal pollutants" into a watercourse should not raise the ambient temperature by more than 1.5°C and temperatures of the receiving water body must not be raised to higher than 21.5°C in general and no greater than 10°C during the salmonid breeding season. However, this is currently under review and new guidelines will be issued shortly. All three distilleries are currently being monitored regarding their temperature uplift by the Spey Research Trust as part of the Thermal Discharge Expert Group and Malt Distillers monitoring programme. Results will be available in due course. In general monitoring of distillery activities is conducted by SEPA and the FFB should maintain close liaison regarding these activities.

4.7.5 Non Native Species

An additional challenge for riparian management is the increasing abundance of non-native plants such as Giant Hogweed, Japanese Knotweed and Himalayan Balsam.

While the plants do not directly affect fish populations they do choke out the native riparian vegetation. This may in turn reduce the range of leaf matter and invertebrates entering the river and so affect the food supplies for juvenile fish. All three are now well established in the lower reaches of the Findhorn and although there is some limited control in place an accurate map of their distribution leading to an organised and concerted effort to eradicate the plants is required. There are potential sources of funding to achieve this through SEPA restoration scheme. However, given the density of hogweed infestation eradication will be costly. An initial step to deal with non native plants and fish introductions is to develop a "Biosecurity Plan". This concentrates on reviewing the current level of non native species within the catchment and developing practical strategies for their control and removal. It also develops methodology for preventing new unwanted species entering the catchment. Given that many of the problems are also present on neighbouring rivers a Moray Firth based approach may be worth considering.

4.7.6 Wind Farms and Flood Alleviation schemes

There are two new proposed developments which may affect the fish populations and their habitats within the Findhorn. These are windfarm developments and flood alleviation schemes.

Windfarm developments have the potential to impact on hydrology, hydrochemistry and sediment transport by altering runoff processes and so developments of this kind may be detrimental to juvenile fish numbers within the tributaries. In addition river crossings can be problematic for fish passage if not carefully considered and an appropriate design implemented. To ensure fish and fishery interests are protected the Board should discuss the windfarm plan at the earliest stage possible and seek to develop an appropriate monitoring and mitigation plan. Development of close liaison with the windfarm developers should ensure that the effects of a single development are minimal on the river and its fish stocks. However, given that numerous windfarms are proposed for the Findhorn catchment there is a need to address the cumulative effects of these developments.

A major flood alleviation scheme is already under construction on the Mosset Burn and in general fish passage and habitat has been addressed within the scheme. A large scheme is proposed for the Findhorn to protect the lower lying areas around Forres. Initial indications are that this scheme will require substantial river engineering. This could affect salmonid populations at all life stages and the associated rod fishery particularly in the lower Forres Angling Association area. There is a clear requirement to develop a close liaison with the Flood Alleviation scheme developers to ensure fish and fishery interests are maintained.

4.8 Predation

Predation on fish by sawbill ducks (goosander and merganser) and cormorants is an issue that concerns many fishery owners and anglers. The smolts provide a valuable food source for sawbills and cormorants. These birds are afforded protection under wildlife legislation and indiscriminate culling is not permissible. Although some counts are conducted the impact of predatory birds on fish stocks has not been accurately quantified within the Findhorn catchment so more information is needed to develop a sensible management approach to the problem. In essence better bird count data is required along with better data on their dietary habits. There is a developing Moray Firth approach to managing sawbill ducks and cormorants and participation in this process would be beneficial.

Both common and grey seals predate on salmon and trout within the Findhorn coastal fishery area. Indeed Findhorn Bay and the nearby coast is a well known area for viewing large numbers of seals throughout the year. The Moray Firth Seal Management Plan was implemented in 2005 with the aim of protecting salmon and sea trout stocks while also maintaining the conservation status of the Dornoch Firth SAC for common seals. The scheme introduced the approach of managing seals and salmon over a large geographical area, the training of nominated marksmen to an agreed standard, and the accurate reporting of all seals shot. The Plan allowed for specific quotas of seals to be culled within river reaches. The Moray Firth Seal Management Plan continued throughout 2008 and it seems likely that this type of approach will be favoured in the future. However, similar to sawbills there is a need for improving data on the presence of seals within and around the Findhorn through initiation of a structured counting scheme.

Further information regarding their dietary intake from the Findhorn area would also be welcome.

American mink (*Mustela vison*) is present in the Findhorn catchment and on Mosset and Muckle Burns. Mink spread by migration and kill water fowl, small mammals and juvenile salmon and trout. Mink are closely linked to the decline of water voles. A mink eradication project is now underway in the Cairngorms area and this is already producing some success. Exploring ways of extending this approach to the Findhorn catchment is recommended.

4.9 *Sea Survival*

In recent years the low abundance of Atlantic salmon appears to be related to poor survival at sea. For some monitored stocks, marine mortality is currently twice as high as in the 1970s. Many factors may affect marine mortality of salmon including environmental changes, diseases and parasites, predation, competition, availability of food, exploitation (including by-catch in pelagic fisheries targeting other species) and factors operating in fresh water which subsequently influence survival in the sea. However, there is a lack of understanding of the marine phase of the salmon's life-cycle due, in part, to the expense of conducting research at sea. This is largely out with local control although the FFB should where possible support larger National and International initiatives aimed at improving the understanding marine phase of the salmon and sea trout.

4.10 *Education and Publicity*

To date the FFB haven't pursued an active education role. Many other Boards and Trusts in Scotland see this as an essential element of the management and promotion of the river. "Salmon Go To School" initiatives have taken a very positive role in promoting awareness of the importance of the salmon resource to the local primary schools and coupled with options such as river visits, fly tying and fishing days provide local children with a chance to experience the ecology of the river and try the delights of angling. However, to fully promote these tasks requires staff and funding. The establishment of

the Findhorn, Nairn and Lossie Trust working with local anglers and Angling Associations may provide an appropriate route to develop these initiatives.

The FFB produce annual reports and operate a web site www.riverfindhorn.org.uk.

5. The Fisheries Management Plan 2009-2014.

1. The Environment

Factor	Summary of Issue(s)	Management Aims and Strategy	Action Proposed
1.1 Marine Environment	Currently marine survival for both salmon and sea trout is low leading to poor adult return rates.	FFB has supported mixed stock netting buy-outs and marine research programmes operated through Atlantic Salmon Trust and other organisations.	Where possible and of benefit to the Findhorn consider support for mixed stock netting fishery buy outs. Maintain liaison with AST, FRS, NASCO regarding marine research programmes.
1.2 Freshwater Environment	Water quality is generally good within the Findhorn catchment. However, some discharges from distilleries, sewage treatment works, etc., may affect the river and its fish populations.	Seek to minimise any reduction in water quality or quantity within the Findhorn catchment To ensure that future developments have a minimal negative impact on the river flow and water quality.	Develop close contacts with local Authorities, SEPA, SNH, Distillers to ensure the requirements for fish populations are fully recognised and protected within the Findhorn. Provide expert advice on the requirements of fish with respect to water quantity and quality.

Factor	Summary of Issue(s)	Management Aims and Strategy	Action Proposed
1.3 Land Use	<p>Physical riverworks such as bank repairs, bridge and culvert construction or repair, drainage channels can all affect fish populations.</p> <p>The Findhorn has remained largely free from large scale developments. However, recent wind farm proposals have raised concerns regarding run-off.</p> <p>Forestry and agriculture practices can potentially affect the quality and quantity of water entering the Findhorn.</p> <p>A significant flood alleviation scheme is planned for the lower Findhorn.</p>	<p>To ensure that future developments have a minimal negative impact on the riverine and riparian habitat.</p> <p>To strengthen links with SNH, SEPA and Local Authorities and ensure that future developments have a minimal negative impact on the river flow, water quality and fish populations.</p> <p>To improve understanding of how riverworks impact on fish and fish habitats.</p>	<p>Develop close liaison with SEPA and SNH and other statutory bodies regarding developments which may affect the river and fish populations</p> <p>Provide expert advice to SNH, SEPA and Local Authorities during the planning of developments which may affect riverine habitat and fish populations.</p> <p>Provide best practice advice to organisations involved in engineering works.</p> <p>Develop monitoring plans with developers.</p>

2. Adult Salmon and Trout Stocks

Factor	Summary of Issue(s)	Management Aims and Strategy	Action Proposed
<p>2.1 Adult Salmon and Trout Escapement, Exploitation And Conservation.</p>	<p>Encourage and promote sustainable angling for salmon and trout in the Findhorn catchment.</p> <p>Maintaining sufficient numbers of adults escape to maximise egg deposition.</p> <p>Poor data on exploitation rates for salmon and particularly trout.</p>	<p>Continue to raise awareness of the importance of salmon and sea trout fisheries and highlight the need for stringent conservation practices.</p> <p>Regularly review and if necessary implement conservation policies for salmon and sea trout.</p> <p>Maximise the numbers of adult salmon and trout reaching spawning areas and increase egg deposition.</p> <p>Improve data on exploitation rates for adult salmon and trout</p> <p>Improve data on adult salmonid spawning distribution in the Findhorn catchment</p>	<p>Ensure catch and release reaches minimum target of 50% release rate. And regularly re-assess conservation policies.</p> <p>Identify and map all man-made obstacles. Source funding and develop a plan to remove or improve fish access through the obstacle. .</p> <p>Continue and improve monitoring programmes for adult salmonids using catch data.</p> <p>Explore potential for installation of adult fish counters.</p> <p>Establish project to identify the sub-population structure of the salmon and trout using genetic marker techniques.</p> <p>Develop project on exploitation rates of salmon and sea trout.</p> <p>Develop survey programme to determine spawning distribution of adult salmonids within the Findhorn.</p>

2. Juvenile Salmon and Trout Stocks

Factor	Summary of Issue(s)	Management Aims and Strategy	Action Proposed
3.1 Juvenile Salmon and Trout distribution and abundance	<p>Data on juvenile salmon and trout distribution is required.</p> <p>Data on juvenile salmon and trout abundance is required.</p>	<p>Survey Findhorn and tributaries to determine yearly distribution and abundance of juvenile salmon and trout. Identify problem areas and target for enhancement.</p>	<p>Re-structure electro-fishing surveys to provide better distribution data for salmon and trout.</p> <p>Establish core EF survey sites to provide abundance data and repeat these yearly.</p> <p>Continue assessment of long term EF datasets.</p> <p>Identify areas where juvenile salmon are absent.</p>
3.2 Salmon and Trout Smolt Production	<p>No data is available for smolt production.</p>	<p>To provide better measure of the salmon and trout output from the River Findhorn</p>	<p>Explore funding possibilities for establishing a smolt trap(s) on the Findhorn catchment.</p>

3. Protection of Salmon and Trout Stocks

Factor	Summary of Issue(s)	Management Aims and Strategy	Action Proposed
4.1 Predation of salmon and trout by sawbill ducks, cormorants, seals, mink and other animals is often perceived as a problem by anglers and fishery owners.	<p>Determine the effects of bird and seal predation on salmon and sea trout stocks and develop acceptable control methods.</p> <p>Mink predation on juvenile salmonids is reducing smolt output.</p>	Work within the Moray Firth predator management framework, to develop sustainable strategies for managing the impact of predators upon salmonids.	<p>Improve sawbill duck, cormorant and seal counts.</p> <p>Contribute to the development of Moray Firth Sawbill Duck and Cormorant Management Program.</p> <p>Continue participation in the Moray Firth Seal Management Programme.</p> <p>Consider establishment of a mink eradication project.</p> <p>Develop alternative data sources on predation such as fish damage photos etc.</p>

Factor	Summary of Issue(s)	Management Aims and Strategy	Action Proposed
4.2 Non Native species	<p>Apart from minnows and isolated stocking with Rainow Trout the Findhorn appears relatively free from introductions of non-native fish.</p> <p>Riparian non-native plant species are becoming more abundant and leading loss of native vegetation particularly in the lower catchment.</p>	<p>Removal of non native fish and plants from the Findhorn catchment.</p> <p>Prevention of non-native fish species being introduced to the catchment</p> <p>Prevention of further non-native plant species entering the catchment.</p>	<p>Support the introduction of better controls on the transfer of fish within Scotland to curb the spread of unwanted species and reduce risks to valuable native populations.</p> <p>Identify and map existing Rainbow trout stocking sites.</p> <p>Encourage anglers to report any sightings of alien fish species and retain any non-native fish captures..</p> <p>Map non native plant species distributions and liaise with relevant partner organisations to develop plans eradication.</p> <p>Develop Biosecurity Plan to prevent the further introductions of non-native plants or animals to the Findhorn catchment.</p> <p>Develop an eradication strategy for the removal of the non-native invasive plants such as Giant hogweed, Japanese knotweed, Himalayan Balsam, from the catchment.</p>

Factor	Summary of Issue(s)	Management Aims and Strategy	Action Proposed
4.2 Gyrodactylus salaris introduction.	The threat of GS introduction is ever present and strategies need to be put in place to prevent its accidental introduction into the system.	To prevent the arrival of GS within the Findhorn catchment.	<p>Raise awareness of the GS threat and inform anglers and fisheries of the methods for preventing GS infection within Scottish waters</p> <p>Educate and advise anglers and fishery staff through newsletters and distribution of Code of Practice.</p> <p>Encourage stronger controls on anglers including the disinfection of tackle, clothing, etc when they visit Findhorn fishing locations.</p>
4.3 Fish Disease Outbreaks	No major outbreak of fish disease has occurred in recent years but it has happened in the past and no thought has been given with regards to damage limitation.	Improve awareness of fish diseases among proprietors, ghillies and anglers.	Source and distribute relevant literature on fish diseases to proprietors, ghillies and anglers.

Factor	Summary of Issue(s)	Management Aims and Strategy	Action Proposed
4.4 Illegal Fishing (Poaching)	<p>Illegal fishing for salmon and sea trout is still practised particularly on the coastal areas of the Findhorn district.</p> <p>Anglers do occasionally fish the Findhorn without permission or appropriate fishing permit.</p>	To reduce and if possible eliminate illegal fishing for salmon and sea trout.	<p>Maintain well trained bailiff(s)</p> <p>Maintain close links with other Fishery Boards.</p> <p>Maintain close liaison with the Police, particularly Wildlife Crime officers.</p> <p>Where sufficient evidence is collected, pursue convictions of captured poachers.</p>

4. Enhancement of Salmon and Trout Stocks

Factor	Summary of Issue(s)	Management Aims and Strategy	Action Proposed
5.1 Habitat Management and Enhancement	<p>In general the fish habitat within the Findhorn is very good however, a certain level of salmonid habitat loss and degradation over time due to poor land management practices.</p> <p>Some baseline habitat surveys have been completed for the Findhorn but better data is required for spawning distribution, parr habitat etc.</p> <p>Habitat improvement schemes have ameliorated problems in certain areas, but there is scope for further improvements.</p>	<p>To maintain the high quality habitat that is present in most areas of the Findhorn catchment</p> <p>Identify river reaches where fish habitat is degraded and implement improvements.</p> <p>Improved the numbers of juvenile salmonids across the age classes and smolt output.</p>	<p>Conduct a suitable habitat survey over the range of Findhorn tributaries to identify key fish features (spawning beds, degraded areas etc).</p> <p>Prepare a detailed map of key fish habitat features and degraded areas potentially requiring remedial action for the catchment.</p> <p>Identify instream habitats which require improving (e.g. canalisation, side-channels) and draw up plans for habitat improvement projects.</p> <p>Encourage best practice, e.g. exclusion zones to prevent access to instream and riparian areas by grazing animals.</p> <p>Initiate new habitat improvement projects in partnership with proprietors, farmers and external organisations.</p> <p>Maintain established habitat improvement areas such as the Moy Burn.</p>

Factor	Summary of Issue(s)	Management Aims and Strategy	Action Proposed
5.2 Salmon Enhancement through Hatchery Stocking	<p>Supplementing natural production by releasing hatchery salmon into accessible areas where they are absent.</p> <p>Broodstock are captured from as close as possible to the target area for stocking however, salmon populations are likely to be highly structured and operation may affect the genetic integrity of stocks.</p> <p>Surveys indicate positive benefits in some areas with juveniles surviving well, benefits unclear in others.</p> <p>No data to show benefit or otherwise to the rod fishery.</p>	To refine hatchery stocking activities to benefit the River Findhorn.	<p>Develop and continually review salmon stocking policy.</p> <p>Develop map of Findhorn identifying areas where salmon stocking may be appropriate.</p> <p>Maintain good records of stocking events and locations.</p> <p>Improve monitoring of the hatchery stock after release into tributaries.</p> <p>Re-examine hatchery operations when genetics project has determined Findhorn salmon sub-population structure.</p>

5.3 Brown Trout Stocking	<p>Brown trout are stocked regularly into a number of lochs within the Findhorn catchment</p> <p>Brown trout are not always of Findhorn origin.</p>	To review brown trout stocking activities and ensure they are not detrimental to the Findhorn.	<p>Establish the numbers and the locations of stocked brown trout.</p> <p>Seek ways of stopping the use of brown trout stock from out with the Findhorn since these may introduce disease/parasites and threaten genetic integrity of existing stocks.</p>
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5. Management of Other Fish Species

Factor	Summary of Issue(s)	Management Aims and Strategy	Action Proposed
6.1 Other Native Fish Species	Lack of data on other fish species within the catchment	To improve data on other native fish species and develop more robust management.	<p>Promote further surveys of native fish species.</p> <p>Promote projects to examine the ecology and importance of native fish species.</p>

6. Education and Publicity

Factor	Summary of Issue(s)	Management Aims and Strategy	Action Proposed
7.1 To educate and publicise fisheries management on the Findhorn.	<p>Declining interest in younger people regarding fishing and countryside management.</p> <p>General lack of understanding fisheries management across a wide cross section of the community.</p>	<p>To publicise fisheries research and management on the River Findhorn.</p> <p>To provide educational opportunities for various age classes of students to study and understand aspects of fisheries management.</p>	<p>Promote the fisheries research and management on the Findhorn through regular publications such as annual reports and web site.</p> <p>Consider developing fisheries education projects with local schools.</p>
7.2 To contribute to wider National Fisheries Management	Need to improve fisheries management within Scotland.	Seek to improve fisheries management across Scotland through contributing to National management organisations.	<p>Maintain membership and continue to contribute to National Fishery organizations such as RAFTS, SFCC, ASFB and others.</p> <p>Continue to maintain strong links with FRS, SNH and SEPA. In particular continue to contribute to Area Advisory Groups and development of Basin Management Plans.</p> <p>Continue to develop links with Local Authorities and other relevant Agencies.</p>

6. Duration and Review

The lifespan of this plan is six years, commencing 1st January 2009 and ending 31st December 2014. During this time the plan will be regularly reviewed yearly by the Findhorn Fisheries Board and the Findhorn, Nairn and Lossie Research Trust. Regular updates will be presented through the Findhorn Fishery Board Annual Reports.

7. Consultation

Draft versions of the Findhorn Fisheries Management Plan were circulated to the following organisations and the author is grateful for their useful comments,

TBA

8. Acknowledgements

The development of this Plan was supported by funding from Scottish Government through the Rivers and Fisheries Trusts Scotland.

I am grateful to Callum Sinclair (RAFTS) for his support, encouragement and patience during the production of the plan. Thanks also to the members of the Findhorn Fishery Board and Seymour Munro (Findhorn, Nairn and Lossie Fisheries Trust) for their helpful comments.

9. Glossary of Acronyms

ASFB	Association of Salmon Fishery Boards
CAR	Controlled Activities Regulations
FFB	Findhorn Fishery Board
FRS	Fisheries Research Services
GIS	Geographic Information System
RAFTS	Rivers and Fisheries Trusts, Scotland
SEPA	Scottish Environment Protection Agency
SFCC	Scottish Fisheries Co-Ordination Centre
SNH	Scottish Natural Heritage
SRDP	Scottish Rural Development Plan
SRT	Spey Research Trust
WFD	Water Framework Directive