Ayrshire Rivers Trust

Annual Report 2009

Ninth Annual Report

for the year ending 31st January 2010

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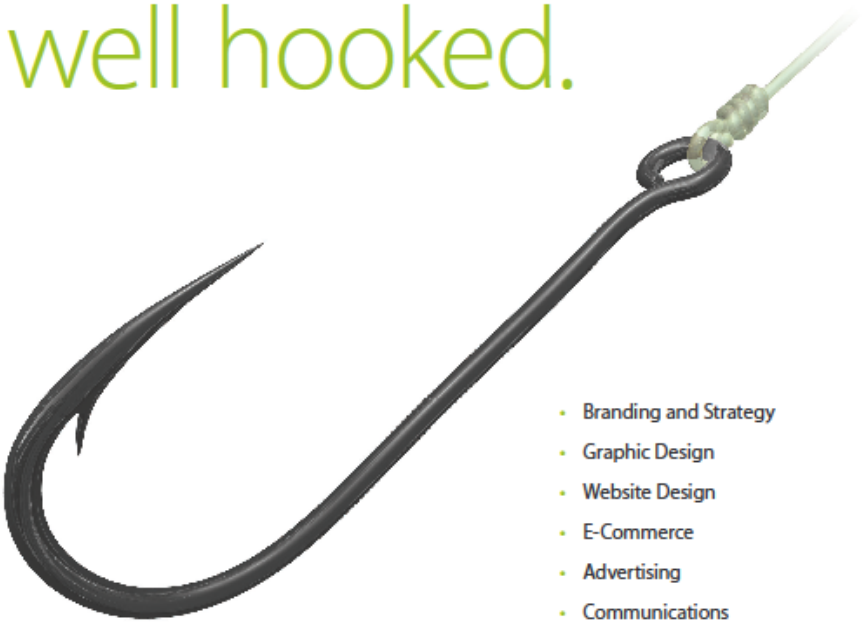

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Mission Statement

"To preserve a valuable part of our natural heritage for the enjoyment of current and future generations, through the conservation, enhancement and development of our freshwater habitats and the fisheries they support."

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Main Cover Photo: A heron on Nethermills Weir
Courtesy of Stuart Brabbs

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Ayrshire Rivers Trust

Chairman's Introduction

The workload of the Trust continues to increase every year, and the year to 31st January 2010 was no exception and, to that end, we added a member of staff. Gillian Murray worked on a temporary contract last year and she has subsequently been taken on full time and has been busy with both field work and Salmon in the Classroom.

You will see that we have been busy with Invasive Weeds (page 7) and Water Voles (page 16). Both of these have given high prominence in the UK - as I write, Invasive Weeds were covered twice in one evening on BBC Television. In our efforts to organise an efficient programme of eradication of this menace to our river banks, we need your help. Both landowners and fishermen can help us spray them (we can organise training) and you can let us know of occurrences of these weeds which we may have missed on our survey.

We have embarked on new work looking at the Hyporheic Zone. This is the area of the river bed below the gravel where the salmon spawn. This work involved checking oxygen levels at various depths to see if it gave us a clue to egg survival (see page 17).

The Income and Expenditure Account at the back of this report shows net income of £17. Lower Fund Raising was due mainly to not holding a Country Fair which only made money due to kind sponsorship but also took up too much staff time. Grants were up by some £50,000 but a large proportion of this is for work to be carried out in 2010/11. Expenditure showed little change other than the inevitable rise in employment costs. The Balance Sheet remains reasonably strong and we decided to invest £20,000 in Investment Trusts to produce substantially better income compared to the miserable rate we received on our cash deposits.

My thanks as always to our hard working staff ably led by Brian Shaw and to the dedicated band of my fellow Trustees. If you know of someone who might like to become a Trustee please contact Brian or myself. Thank you also to all those who have supported us last year.

The years ahead, with budget cuts looming, may make it harder to raise funds but we are in good financial state and have plenty of work to do.

PETER KENNEDY
Chairman

Biologist's Summary

In addition to our surveying and monitoring activities, the main issues in 2009 were biosecurity, invasive non native species and renewables.

In 2009 we produced the Ayrshire Catchments Biodiversity Plan which may help to control the spread and introduction of invasive non native species. The Trust's focus on invasive weeds over the last two years has been very timely, and the extent of the invasive weeds problem in Ayrshire is now apparent. There has been a gaping chasm regarding the coordinated control of invasive species such as Giant Hogweed, and until now there has been no single organisation interested in strategic management on a catchment basis.

As our experience in this field has increased it is clear that the limiting issues regarding control and eradication are resource and commitment related rather than technical. The techniques for controlling Giant Hogweed, Japanese Knotweed and Himalayan Balsam are known but the task can appear overwhelming. However we have learnt that the first years of control are the most difficult, but effective treatment will soon show results as can be seen in the upper River Ayr.

The Scottish Government's drive to increase the nations' production of renewable energy has seen renewed interest in hydro power. A few years ago it looked as if all Scotland's potentially viable hydro sites had been developed. However the payments available for micro renewable projects have stimulated renewed interest in the energy potential of the smallest burn or redundant weir. There are many locations in Ayrshire where small scale hydro schemes could be developed with little concern, others will be much more controversial.

Looking to the future we look forward to a greater focus on more fishy work with the deployment of a smolt trap in the River Ayr in spring 2010.

BRIAN SHAW
Senior Biologist

Ayrshire Rivers Trust Staff Profiles

Brian Shaw, Senior Biologist

Brian Shaw was born in Grantown on Spey, although brought up from the age of eight in Easter Ross. In 1984 he graduated from Stirling University with a BSc (Hons.) in Biology, with final year specialisation in Aquatic Biology. After graduation, a 20 year career in aquaculture followed involving mussels, rainbow trout and salmon. His main interest was always fisheries, so in 2004, after serving as a Trustee with the Western Isles Fisheries Trust, he applied for, and secured, the senior biologist position with Ayrshire Rivers Trust. Brian and his family live in Ayr where they enjoy the varied weather and scenery on offer. Brian is responsible for the running of the Trust as well as biological and fishery management issues.

Stuart Brabbs, Catchment Officer.

Stuart Brabbs was born and bred in Ayrshire and lives in Mauchline with his 9 year old daughter. Formerly running a local contracting business in Ayrshire for 14 years, he decided to change career path completely at the age of 40. Following 4 years of full time study he graduated with a BSc (Hons.) in Sustainable Environmental Management during which he focused on soil science, catchment management, ecology and diffuse pollution from agriculture. Volunteering with the Trust during summer holidays he finally became a full time member of staff in 2008. Stuart is a lifelong salmon angler but can often be found in pursuit of ferox trout which he finds challenging and possibly more frustrating! He is also a keen photographer. Stuart is involved with all aspects of the Trust's work but leads on invasive species, biodiversity and landuse management.

Gillian Murray, Assistant Biologist

Gillian Murray was born and bred in Coylton in Ayrshire, until recently moving to Ayr by the harbour. In 2009 she graduated from Edinburgh Napier University with a BSc (Hons.) in Marine and Freshwater Biology. Gillian started with the Trust in June 2009, originally with a summer contract, which was then extended. A non-angler, she enjoys more worthwhile pursuits such as swimming and cycling. Gillian assists with all aspects of the Trusts work and has rapidly become our technical and GIS mapping expert.

Janette Galbraith, Administrator

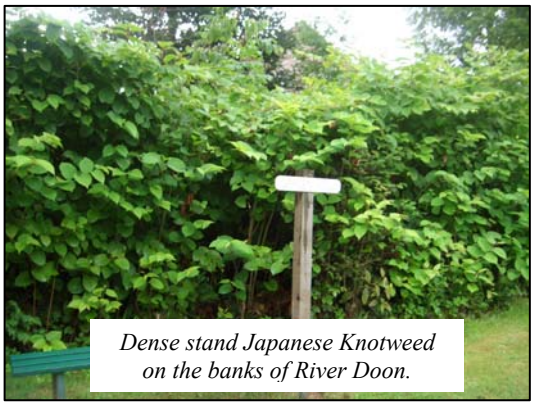
Janette Galbraith lives in Darvel, not too far from her home town of Galston. She has worked for various companies throughout Ayrshire such as the Clydesdale Bank and Digital Equipment. She joined the Trust in 2006, and has enjoyed the challenge of working in a predominantly scientific atmosphere (she dropped science after 1st year at Loudoun Academy)! Janette is married to Billy, who is a very keen angler, and whilst would not class herself as an angler she nonetheless caught a salmon on the River Spey on a first (mis)cast. Her hobbies include visiting auction houses looking for bargains, reading, and supporting her local football team, who just escaped relegation this season. Janette runs the Trust office, and is responsible for admin duties such as bookkeeping, membership and events.

Invasive Weeds Project 2009

Invasive species such as Giant hogweed and Japanese knotweed have received a great deal of media coverage recently. There is a growing realisation action needs to be taken if we are to control these highly invasive weeds. Parts of Ayrshire rivers are becoming no go areas for access with Giant hogweed being a particular problem due to its public health risk. In 2008, with funding secured for a two year project from Esmée Fairbairn Foundation, SAWET, Barr Environmental and SNH, ART commenced surveys recording the occurrence and distribution of invasive weeds on the main Ayrshire watercourses, with all surveys completed by the end of 2009. The surveys aimed to identify the distribution and abundance of three plant invasive non native species (INNS); Giant Hogweed (GHW), Japanese Knotweed (JK) and Himalayan Balsam (HB). All of these species are highly invasive weeds and are particularly effective at colonising and dominating riverbanks with rivers allowing rapid spread downstream from their original location.

Giant Hogweed (GHW) is perhaps the single most problematic species. This plant is capable of reaching 15 feet high and can form dense stands, to the exclusion of native plants. The sap produced by GHW leads to painful and recurring blisters on contact with human skin. The tall growing stems are capable of producing flowers with up to 50,000 seeds per plant.

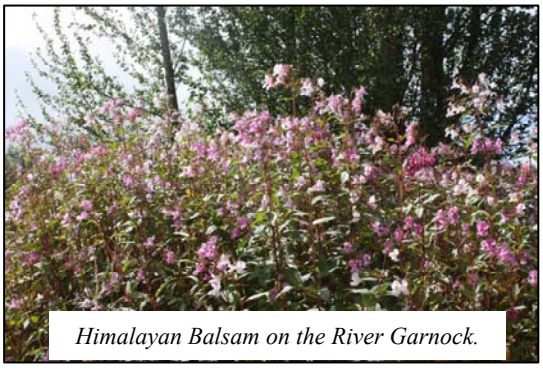
Giant Hogweed on River Ayr



Dense stand Japanese Knotweed on the banks of River Doon.

Japanese Knotweed (JK) has a fearsome reputation due to its ability to penetrate foundations and break tarmacadam and consequently, has serious implications for land values and development. This plant, which was originally introduced as a garden plant is very competitive forming dense impenetrable stands. JK does not produce seeds in the UK but it can spread rapidly from fragments of root or shoot.

Himalayan Balsam (HB) is an invasive annual plant which flowers from mid June to late summer with flowers varying in colour from purple to pale pink. Seed pods form on the plant that 'explode' with a 'crack' during late summer, spreading the seeds in a radius of up to 7 metres. It too leaves riparian soils exposed during winter, contributing to erosion and diffuse pollution.



Himalayan Balsam on the River Garnock.

More information on each of the three Invasive Weeds can be found on our website www.ayrshireriverstrust.org/invasive-weeds.htm

2009 Survey results

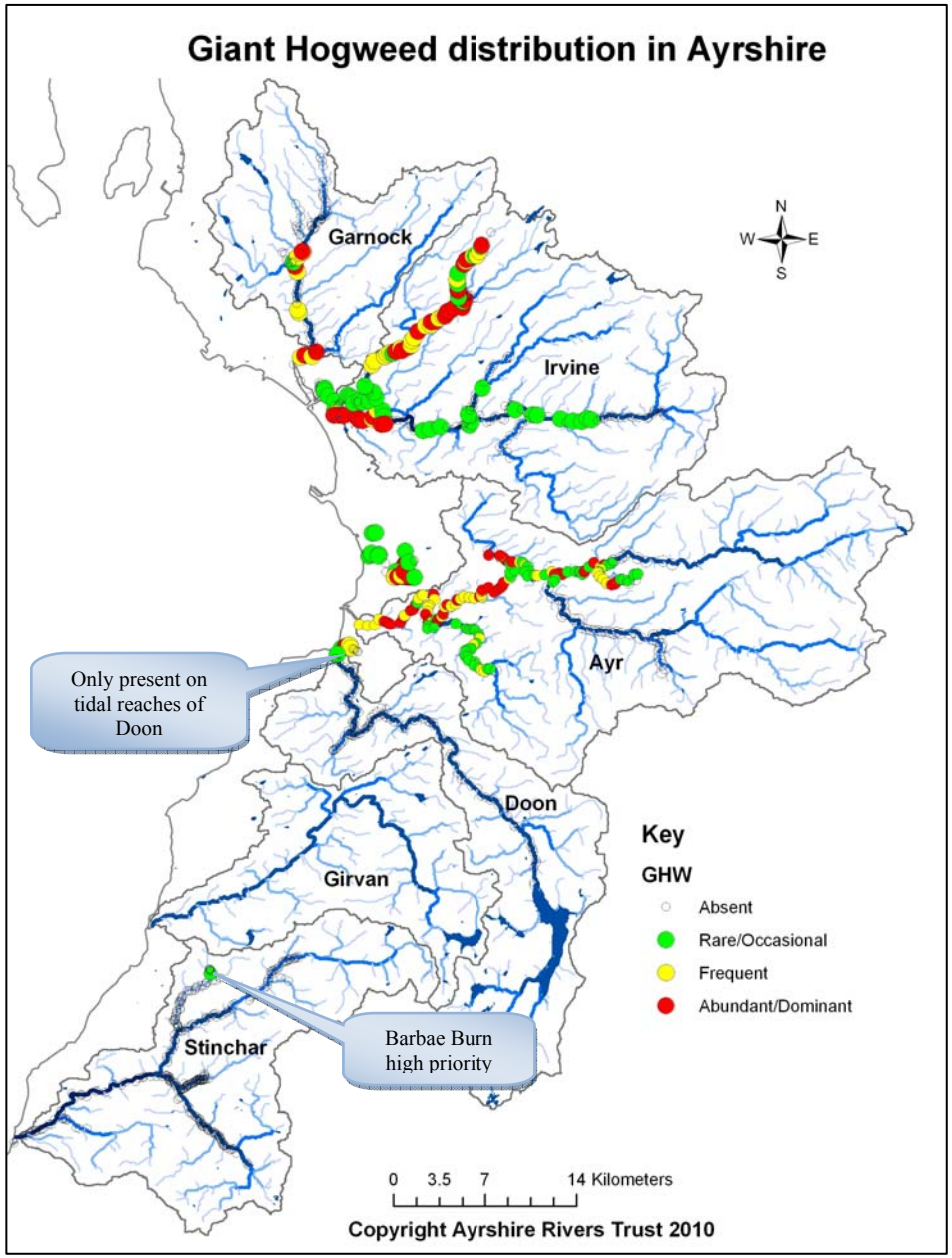
ART surveyed the Rivers Doon, Stinchar and Garnock including their tributaries during 2009. The three target species were recorded using the DAFOR scale (**D**ominant, **A**bundant, **F**requent, **O**ccasional, **R**are) enabling comparisons to be made between catchments and other areas. Working from their estuaries, rivers were surveyed in an upstream direction until at least 1 km of invasive weed free banking was recorded. The results were then plotted on GIS generated maps to illustrate the distribution of each species and are presented opposite.

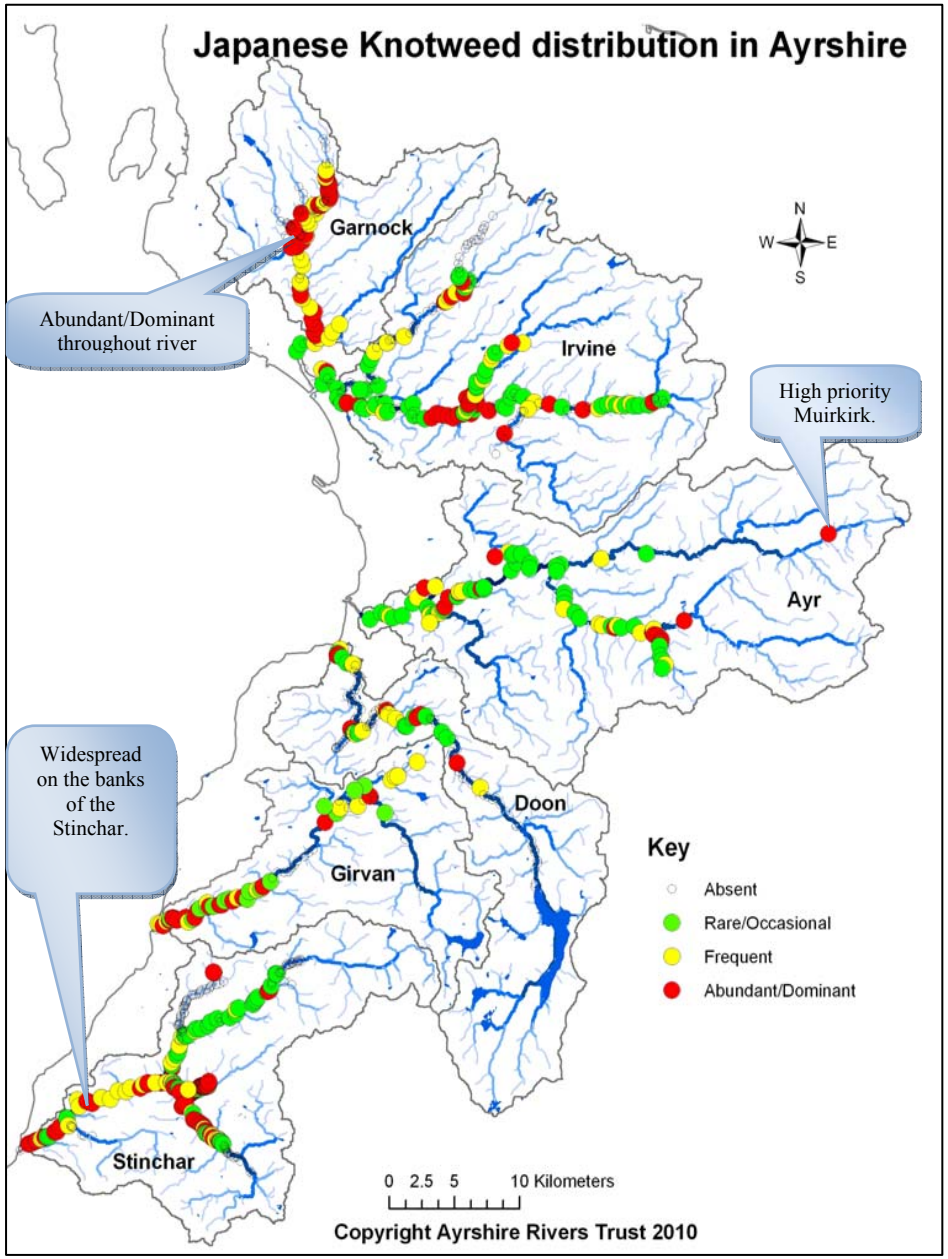
We were grateful when a member of the public used the feedback form on our website to reported the presence of GHW on the Slaphouse Burn. The Slaphouse Burn, and the Pow Burn were also surveyed in 2009.

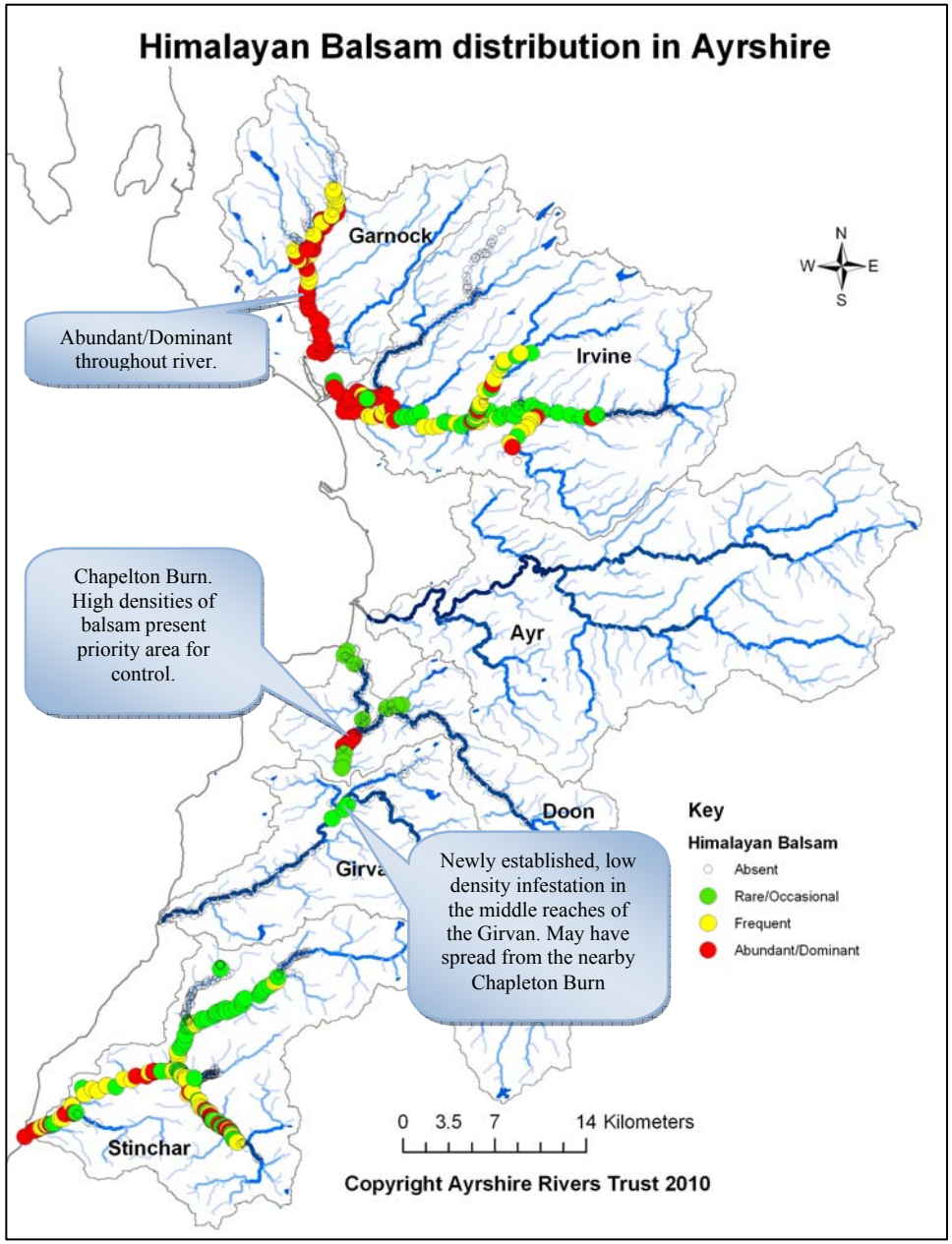
GHW was found on only one site in the Stinchar catchment, next to the Barbae Burn, a tributary of Water of Assel. Control at this site is high priority as it is essential that it does not spread further within the catchment. JK and HB are well established on the banks of the Stinchar and tributaries.

The River Garnock has extremely high densities of both JK and HB from Kilbirnie downstream with GHW present intermittently.

The River Doon is currently the river least affected by invasive weeds and ART consider that it may be possible to eradicate all three species from the catchment. We are currently working on an eradication strategy with the Doon District Salmon Fishery Board. GHW is only present on the tidal stretches, where it could have arrived by coastal currents from the River Ayr or Slaphouse Burn. The Chapelton Burn is of high priority due to the density of HB. Cross contamination from this site e.g. via bird droppings, may explain the relatively new occurrence in the Girvan catchment.




Japanese Knotweed distribution in Ayrshire
Garnock
Irvine
Ayr
Doon
Girvan
Stinchar
N
W
E
S
Abundant/Dominant throughout river
High priority Muirkirk.
Widespread on the banks of the Stinchar.
Key
Absent
Rare/Occasional
Frequent
Abundant/Dominant
0 2.5 5 10 Kilometers
Copyright Ayrshire Rivers Trust 2010


Himalayan Balsam distribution in Ayrshire
Garnock
Irvine
Ayr
Doon
Girva
Stinchar
N
W
E
S
Abundant/Dominant throughout river.
Chapelton Burn. High densities of balsam present priority area for control.
Newly established, low density infestation in the middle reaches of the Girvan. May have spread from the nearby Chapleton Burn
Key
Himalayan Balsam
Absent
Rare/Occasional
Frequent
Abundant/Dominant
0 3.5 7 14 Kilometers
Copyright Ayrshire Rivers Trust 2010

Giant Hogweed Control

The funding secured for the surveys also included a two year control project for GHW on the upper River Ayr. The control site runs from Stair Bridge to the upper most limit of GHW in the Catrine area. Control is achieved by using Roundup Pro-Bioactive, which is a weed killer licenced for use near and around water courses although it can only be used by certified persons.

After two years of control there has been a significant reduction in the number of mature, flowering GHW plants. However as the seeds can lie dormant in the ground for almost 10 years there was a higher density of smaller immature plants in the second year (2009). Full access was achieved to the Bogend Burn, which joins the Ayr at Catrine in 2009, allowing comprehensive upper catchment control. If funding can be secured, contractors will continue to be used during this control process for future years until full control of all Giant Hogweed on the upper River Ayr is achieved.

The Trust is seeking additional funding to enable the control of Giant Hogweed across Ayrshire.

The photos below show before and after control on the banks of the River Ayr.

Before

After

Every effort was made to accurately record the distribution of invasive weeds during the surveys. Due to the constant spread of these species we have added an interactive facility to our web site (www.ayrshireriverstrust.org/invasive-weeds.htm) which will allow the public to report any unrecorded occurrences. Please let us know of any weeds not shown on our maps.

Biosecurity Plan

Mink photo courtesy of Mary Fran

Giant Hogweed

American Signal Crayfish

In light of ever increasing threats to native biodiversity, and the implications this has to the Scottish and local economies, the Scottish Government funded production of Biosecurity Plans across the country through Rivers and Fisheries Trusts of Scotland (RAFTS), whose members were commissioned to produce local plans in at least 23 areas. By the time of completion, the majority of Scotland's rivers will be covered by local plans. Ayrshire's first Biosecurity Plan was developed and produced by ART staff during 2009 and distributed for public consultation early in 2010. This was one of the first completed plans in the country.

Biosecurity planning aims to establish a sustainable framework which will prevent, detect, control and eradicate non native invasive species that threaten our native flora and fauna. Ayrshire's plan identifies some 29 species of which 9 already occur within the district. The plan details the level of risk and response that each of these invasive species poses or should command if they arrive in the area. For those species already present, management actions and responsibilities are included along with details of local distribution.

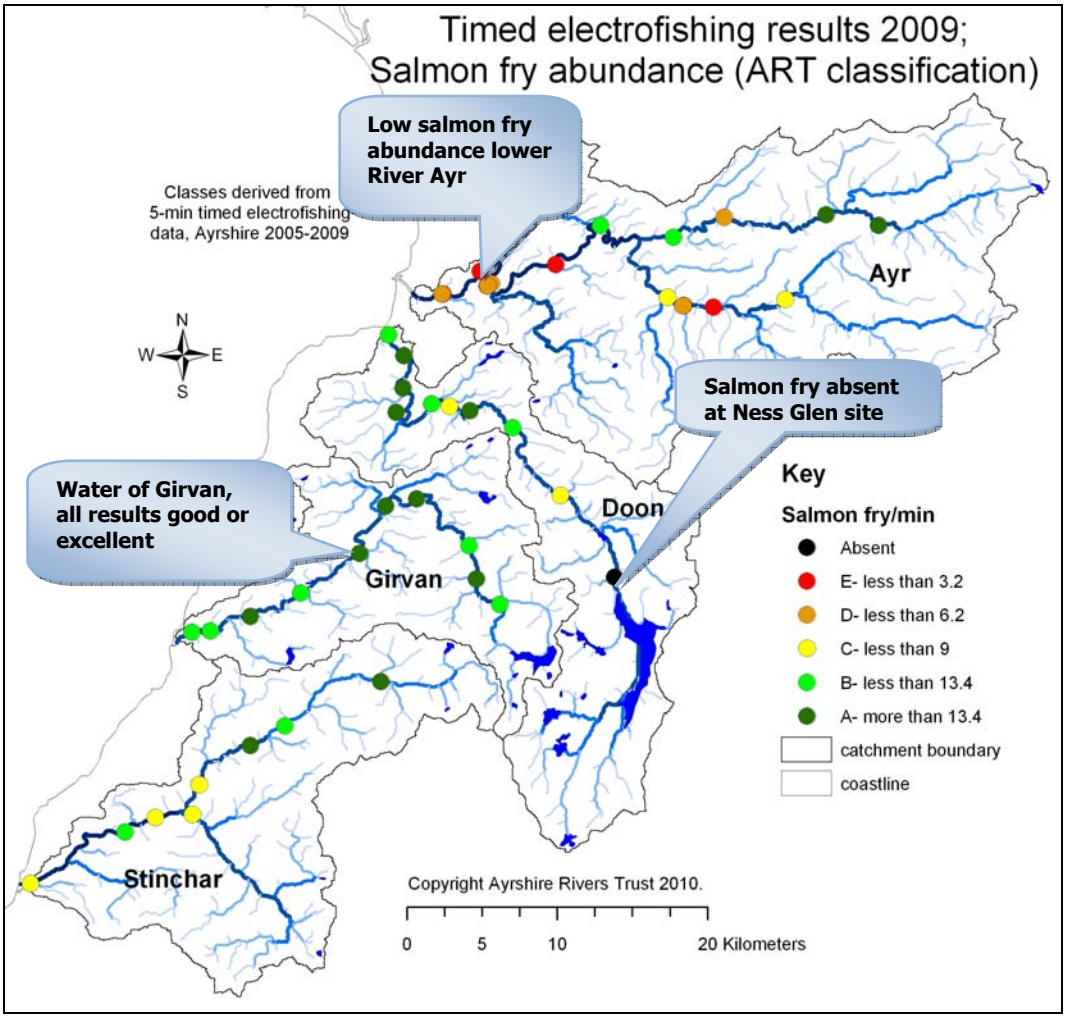
For those species that threaten but are not yet present, their level of risk and likelyhood of introduction along with ingress routes and pathways are highlighted. Response and control strategies are presented along with stakeholders and responsible government agencies. Species such as the fish parasite *Gyrodactylus salaris,* which could wipe out salmon stocks, are well known especially amongst anglers but less well known species may be more familiar to bird watchers or garden pond enthusiasts, e.g. Ruddy Ducks (*Oxyura jamaicensis*), Orfe (*Leuciscus idus*) and Fanwort *(Cabomba caroliniana).*

The Ayrshire Biosecurity plan is available on ART's website and will be updated to include consultation responses & amendments in due course. As this is intended as a working document, it is likely to alter throughout its lifetime as and when distribution changes occur.

http://www.ayrshireriverstrust.org/uploads/Biosecurity%20plan%20Consultation%20Document.pdf

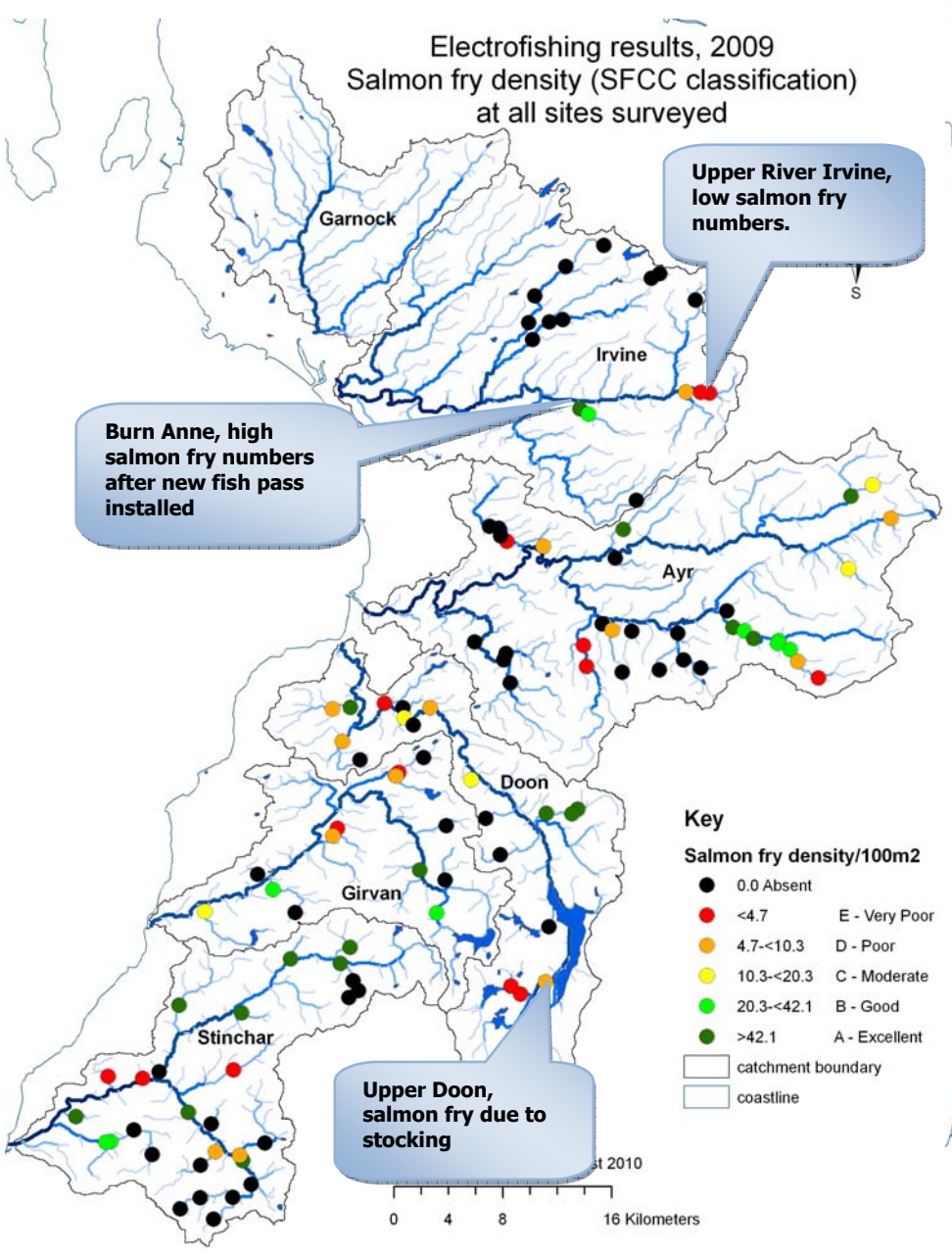
Electrofishing 2009

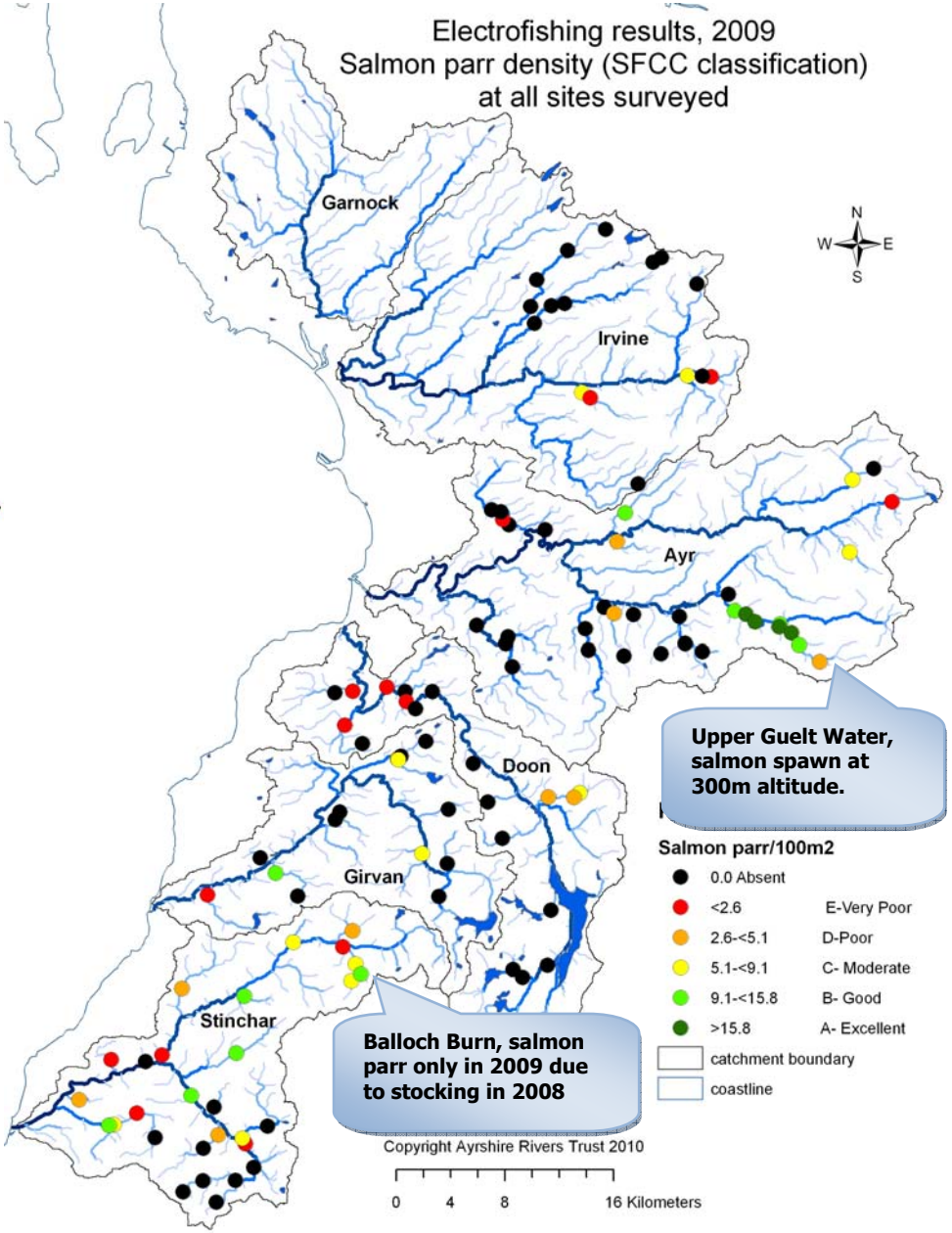
The timed electrofishing results are based on a quintile split of timed survey results in Ayrshire over the last five years. Most of the sites we surveyed in 2009 have been surveyed for a number of years and we now have a long monitoring data series. The 2009 monitoring produced some good results and the mean fry numbers from the Doon and Girvan were the best since 2002 with all the Girvan sites in the A (excellent) or B (good) classes, a first in Ayrshire. On both rivers 2008 was an excellent angling season; the Girvan rod catch was the second best recorded since 1952. The rod catch is the only indicator we have for total stock abundance during the year. If there is a correlation between rod catch and total stock then it may be fair to assume that numbers of spawning fish were also up in 2008/9. We have started to try and correlate salmon spawning abundance with salmon fry in the following year but it will be a few years before we have any worthwhile data.

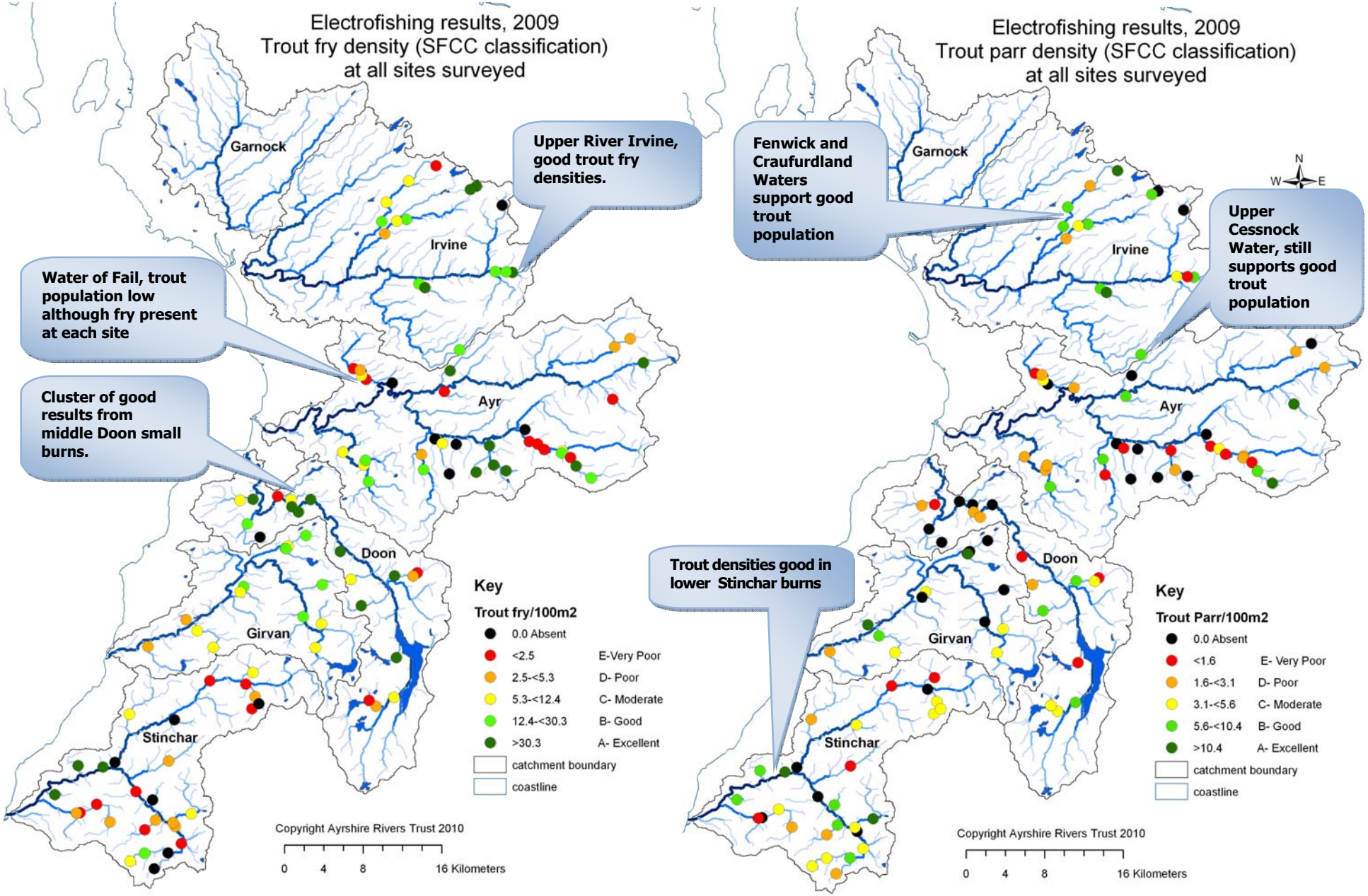


The upper site in the Doon, at the foot of Ness Glen, was the only timed electrofishing site where no salmon fry were recorded. Low fry numbers at this site have been a consistent finding, although the salmon parr numbers are often the highest of all the Doon sites. We intend to investigate egg hatching success in this part of the river in 2010 to establish whether this is a limiting factor.

Once again the results from the lower River Ayr were mixed, with all results downstream of the Water of Fail confluence being either E (very poor) or D (poor). This report contains a section on work we carried out into hyporheic oxygen levels in 2009. The findings of this work may help explain the consistently poor salmon fry numbers in the lower Ayr.


Electrofishing results, 2009
Salmon fry density (SFCC classification)
at all sites surveyed
Upper River Irvine, low salmon fry numbers.
Burn Anne, high salmon fry numbers after new fish pass installed
Upper Doon, salmon fry due to stocking
Garnock
Irvine
Ayr
Doon
Girvan
Stinchar
S
Key
Salmon fry density/100m2
0.0 Absent
<4.7 E - Very Poor
4.7-<10.3 D - Poor
10.3-<20.3 C - Moderate
20.3-<42.1 B - Good
>42.1 A - Excellent
catchment boundary
coastline
0 4 8 16 Kilometers


Electrofishing results, 2009
Salmon parr density (SFCC classification)
at all sites surveyed
Upper Guelt Water, salmon spawn at 300m altitude.
Balloch Burn, salmon parr only in 2009 due to stocking in 2008
Garnock
Irvine
Ayr
Doon
Girvan
Stinchar
N
W E
S
Salmon parr/100m2
0.0 Absent
<2.6 E-Very Poor
2.6-<5.1 D-Poor
5.1-<9.1 C- Moderate
9.1-<15.8 B- Good
>15.8 A- Excellent
catchment boundary
coastline
Copyright Ayrshire Rivers Trust 2010
0 4 8 16 Kilometers


Electrofishing results, 2009
Trout fry density (SFCC classification)
at all sites surveyed
Upper River Irvine, good trout fry densities.
Water of Fail, trout population low although fry present at each site
Cluster of good results from middle Doon small burns.
Garnock
Irvine
Ayr
Doon
Girvan
Stinchar
Key
Trout fry/100m2
0.0 Absent
<2.5 E-Very Poor
2.5-<5.3 D- Poor
5.3-<12.4 C- Moderate
12.4-<30.3 B- Good
>30.3 A- Excellent
catchment boundary
coastline
Copyright Ayrshire Rivers Trust 2010
0 4 8 16 Kilometers
Electrofishing results, 2009
Trout parr density (SFCC classification)
at all sites surveyed
Fenwick and Craufurdland Waters support good trout population
Upper Cessnock Water, still supports good trout population
Trout densities good in lower Stinchar burns
N
W E
Garnock
Irvine
Ayr
Doon
Girvan
Stinchar
Key
Trout Parr/100m2
0.0 Absent
<1.6 E- Very Poor
1.6-<3.1 D- Poor
3.1-<5.6 C- Moderate
5.6-<10.4 B- Good
>10.4 A- Excellent
catchment boundary
coastline
Copyright Ayrshire Rivers Trust 2010
0 4 8 16 Kilometers

Renewable energy

The Scottish Government has ambitious targets for renewable energy production. The target for renewable sources as a percentage of gross consumption is 50% by 2020, with an interim target of 31% by 2011. At the end of 2008 renewables were responsible for 22% of gross consumption with an 81% rise in renewable production since 2000. Electricity production by windfarms has been the biggest growth area in recent years, and anyone living in Ayrshire can't have failed to notice the ever increasing number of wind turbines, with many more potential developments in the planning process.

Prior to the development of modern wind turbines, Ayrshire's rivers and burns were a valuable source of energy for the many mills and works that developed alongside. Dams and weirs were constructed to allow these industries to divert water along lades to power machinery. With the advent of mains electricity, the need for the less controllable or predictable water power reduced. Maintenance cost of weirs was prohibitive for what had often become a redundant feature, and many fell into disrepair eventually collapsing and allowing the river to flow more naturally again. However, many weirs remain as monuments to our industrial heritage and some are being viewed with renewed interest for small scale hydro schemes. The recently revised Government tariffs for small scale renewable schemes has stimulated interest in micro hydro projects even further.

Ayrshire Rivers Trust's involvement with renewables has increased dramatically in recent years. The Trust's role includes providing informal comments to potential developers, responding formally to consultation documents submitted with planning applications, provision of data on fish population from Trust archives, and surveying of watercourses potentially impacted by developments.


Whitelee Windfarm

During the course of 2009 we carried out monitoring or investigative surveys at six windfarm sites, and we have been involved in discussions with a similar number of small scale hydro developments. In Ayrshire most of the windfarms have been on hill tops previously planted with commercial conifer plantations. In these locations a windfarm development can often hasten the restructuring of plantations in a positive way. Our windfarm monitoring to date has found little or no adverse impact on freshwater ecology although we have seen few developments in the more pristine moorland locations, where the potential for impact may be greater.

With its direct use of water, hydro developments have the potential for significant impact on river ecology. The main concerns are issues such as fish migration (upstream and downstream) through any affected stretch, smolt screening, loss of wetted area and fish passage at weirs. Combined with increasing interest in new small or medium scale hydro developments the River Doon was also subject to a great deal of media interest in 2009 when the campaign group www.SavetheDoon.com was established to increase public awareness regarding the proposal to divert more water from the Doon catchment into the Kirkcudbrightshire Dee.

Brian Shaw is the RAFTS representative on the Fish and Fisheries Advisory group which was established by SEPA in 2009. The remit of this group is wide although meeting agendas have been dominated by hydro issues so far. ART will continue to keep abreast of renewable developments within Ayrshire to ensure that our rivers, and the habitats they support, are safeguarded.
(http://www.sepa.org.uk/water/river_basin_planning/fish_and_fisheries_ag.aspx)

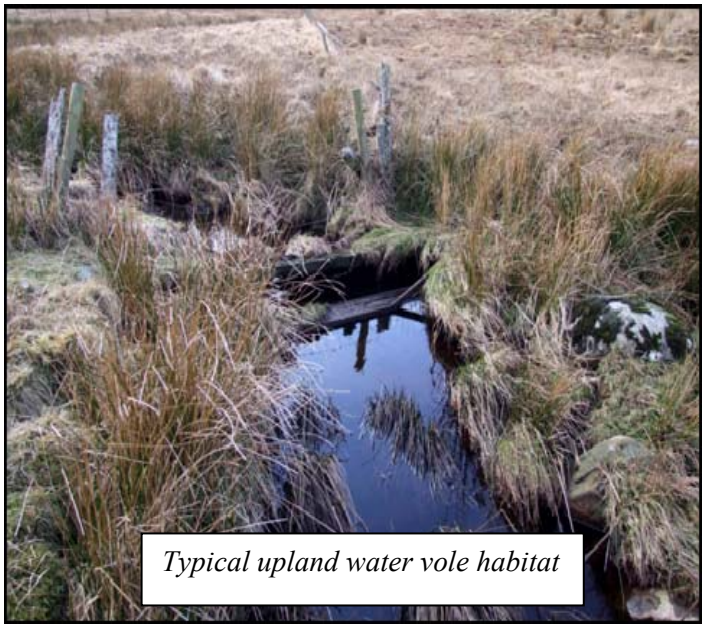
Ayrshire Biodiversity Action Plan (BAP) and Water Voles

ART continue as lead partners for Water Voles on the Ayrshire BAP. Despite a few setbacks along the way, the year finished on a high with a substantial award being granted by South Ayrshire Waste Environment Trust for a water vole project that will be delivered by ART between 2010 and 2012. Further contributions were made by The Nature Save Trust and South Ayrshire Council.

ART secured the grant to deliver a captive breeding and reintroduction trial aimed at assessing the effectiveness of restocking water voles on two South Ayrshire burns that previously supported good populations. This strategy was decided upon following the loss of water voles from the last known surviving lowland population in 2008. The project will assess the ability of water voles to recolonise the two burns following removal of mink from their habitat. Mink predation is considered to be one of the main factors responsible for the decline of water voles. Both burns are located outwith major river catchments and have few access points for mink, which may at least, in part, explain why the species survived at Darley Burn, Troon for so long after surrounding water voles were lost. The other burn is the Slaphouse Burn at Belleisle where water voles were once a regular feature. Both locations are owned by South Ayrshire Council who are very supportive of our project, and have been throughout its development.

ART staff will monitor the success and development of the released animals, and research growth and dispersal rates. There have been similar trials elsewhere but never in lowland Scotland. The success and results of this project may be highly instrumental for future restocking strategies which may be developed on the back of this project. Needless to say, time will tell, and ART will report progress in following annual reports. Interim details will be available through the water voles page on our web site.

With the continued interest in wind farm development in South Ayrshire, we are fortunate to receive Environmental Surveys that often have located evidence of recent water vole activity. Undoubtedly water voles remain in some isolated areas and responsible development will ensure their continued survival. ART always highlights the need to protect the species in consultation responses. We are now in possession of a considerable amount of data that we will be uploading to NBN (National Biodiversity Network) Gateway for the Ayrshire Biological Records Group in 2010. This will be the most comprehensive record of water voles available within Ayrshire.



Typical upland water vole habitat

The future direction of the Ayrshire BAP is under review at present. The BAP process has found it difficult to deliver concrete improvements for biodiversity across Scotland. This is largely due to the reliance of partners to deliver objectives over and above their core business whilst receiving no funding directly for their efforts. This situation is likely to recur unless efforts are concentrated on areas where local partner organisations have the capability and capacity to deliver projects.

Hyporheic Zone – under the river bed

Scientists at Marine Scotland, and others, have been conducting research into the habitat quality of the most important phases of salmonid life; the gravel in which the adult salmon lay their eggs. The river bed under the surface of the gravel is known as the hyporheic zone. This is a zone characterized by variable exchange between surface water from the river above and groundwater upwelling from below.

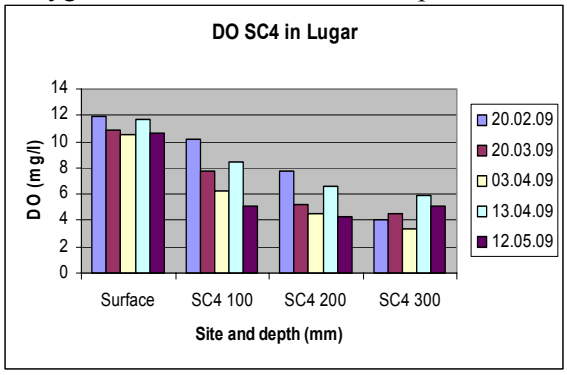
Groundwater tends to be low in oxygen and gravels where there is a high proportion of upwelling groundwater may not provide good incubation conditions for eggs. The work done by Marine Scotland scientists suggest that even in pristine upland burns such as the Girnock Burn, River Dee, some of the most favoured spawning gravels suffer from low hyporheic oxygen levels due to groundwater influences.

So if groundwater is often low in oxygen, surely then the surface water will be fully saturated? Of course this isn't always the case as any level of biological oxygen demand from organic materials within the water, such as sewage, can lead to low surface oxygen levels particularly at night when oxygen production by instream plants or algae through photosynthesis stops. Under the gravel the situation can be a lot worse as silt or other debris accumulates in the gravel, where water exchange rates are much lower than in the surface water above. Intrusion of silt and organic matter can depress hyporheic oxygen levels by two mechanisms, a) decomposition of settled material, b) capping of gravel preventing exchange of water from the river above. Female salmon do an excellent job preparing the gravel during the creation of a redd, and whilst eggs are often deposited into clean gravel, the parental contribution by the adult fish ends at that point. In waters with a high silt loading the quality of the in-redd environment can often deteriorate rapidly post spawning.

Over the years the Trust have build up a considerable database of timed electrofishing surveys and a consistent finding in the lower River Ayr and Lugar Water have been low salmon fry numbers, even in areas where large numbers of salmon are known to spawn. In order to try and assess hyporheic oxygen levels we carried out a project in 2009 in conjunction with The University of the West of Scotland. Duncan Shaw, a third year student at the university worked with ART on a project on the Lugar Water and the upper River Ayr. Probes with sampling tubes 100, 200 and 300mm below the gravel surface were driven into the river bed in an array (*photo left*). Water samples were taken at regular intervals, and oxygen and conductivity readings recorded.

Hyporheic sampling probe

The graph below shows the oxygen levels recorded over time at one of the Lugar Water sites. Surface oxygen levels were stable. Hyporheic oxygen declined over time and depth below the gravel surface. The oxygen levels recorded even at 100mm are likely to compromise egg incubation. The results from this preliminary study suggest that environmental conditions within the spawning gravels may be a factor limiting salmonid production.



Rail crash pollution

On the 27th January 2009, a freight train derailed when a bridge it was crossing collapsed. This led to over 220,000 litres of kerosene and diesel fuel oil escaping, and a large quantity of this ended up in the Garrier Burn, a very small tributary of the River Irvine. Trace amounts also reached the Annick, but fortunately at such low volumes that there was no recorded impact to the ecology of the river, and no remedial action was required.

The Garrier Burn was severely impacted by the spill. ART's biologists recorded seven different species of dead and dying fish including trout and salmon. The invertebrate population within the burn was decimated, and downstream on the Carmel water invertebrates were significantly affected as were fish species. It appears that by the time the pollution reached the Irvine itself, the impact on fish and invertebrates was limited. Following an extensive clean up by Network Rail, four months after the event, fish were again recorded in the burn and recovery appeared to be underway despite traces of oil still emerging from the stream bed.

Above. *Trout and salmon killed by the pollution.*
Below. *Thick oil in the Garrier Burn.*

It is fortunate that this incident occurred on a small lowland burn, which was already seriously impacted by diffuse pollution pressures. Had an event of this scale taken place on the main-stem of any river, or a higher quality burn, the impact would undoubtedly have been much more serious.

Ayrshire Fishery Management Plan Projects

In 2008 Ayrshire Rivers Trust published its Ayrshire Fishery Management Plan. This is funded by a Scottish Government grant awarded to trusts and fishery boards across Scotland. In recognition of the excellent work delivered by the Trusts, the Scottish Government continued its support by providing match funding for projects arising from the Fishery Management Plans.

In 2009 Ayrshire Rivers Trust submitted a range of projects including an expansion of the Salmon in the Classroom project, salmon redd counting, a targeted diffuse pollution project, co-ordinated fish-eating bird counts across neighbouring catchments, Lugar Water assessment, River Ayr smolt trap and the Water of Fail Steering Group. Some of these projects are reported in detail elsewhere in this annual report. The continued support from the Scottish Government has enabled the Trust to bring in substantial match funding from a range of sources, and provided resources to enable Trust staff to implement projects related to priorities identified in the Ayrshire Fishery Management Plan.

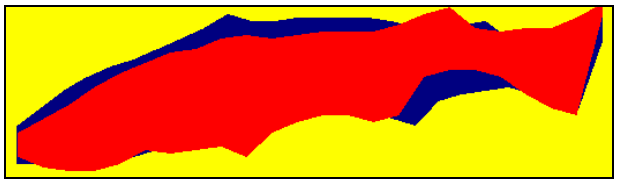
VAKI – Loch Doon fish counter

Ayrshire Rivers Trust (ART) monitors the VAKI fish counter at Loch Doon for Scottish Power. This allows for fish movements to be recorded between the River Doon and the loch. The fish counter data provides invaluable information on fish populations in this part of the Doon catchment.

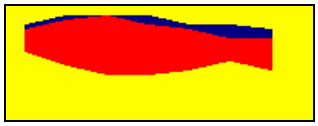
The VAKI fish counter is situated on the fish pass at the dam and records silhouette images of fish or other objects passing through using infra-red sensors. The infra-red sensors generate two silhouettes of any objects passing through the frame, so it is usually possible to reject counts generated by debris or turbulence. A cable relays data from the infra-red sensors on the frame to a control panel housed in a building next to the Loch Doon dam. The control panel is housed in a wall-mounted box inside the building, from which the power supply for the counter is provided. The control panel is set to display the total upstream versus downstream movements, water temperature and time.

Below are a few images produced by the counter in 2009, the first image is obviously a salmon, with a clear profile of the fish from both sides. Many are less clear but can either be accepted or rejected as fish based on an assessment of each image, including features such as image shape, swimming direction and speed. Silhouettes from larger fish such as salmon can usually be identified with a higher degree of confidence than those from smaller fish, e.g. trout, as features such as fins are larger and are often visible on the silhouettes.

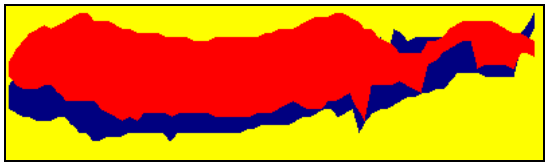
Images



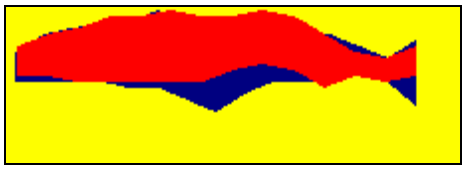
26/10/2009 11:32 88cm 1.52 m/s SALMON UP



23/06/2009 14:04 29cm 1.9m/s
TROUT UP



20/05/2009 66cm 1.04m/s Indistinct but possibly an OTTER going upstream



02/11/2009 14:55 36cm 1.66m/s MEDIUM UP
Probably a large brown or sea trout

Results 2009

Predominant species	Up	Down	Total upstream
Trout	63	29	22
Salmon	19	3	16
Total	82	32	50

From the above table it can be seen that a total of 16 salmon swam upstream into Loch Doon. This shows a slight increase from 2008 as only 12 salmon were recorded going upstream. An image qualifies to be a salmon if the fish is 50cm or above in length.

Many years of electrofishing monitoring in the Loch Doon tributaries has found the presence of naturally spawned salmon fry in only one of the inflowing burns, the Garpel Burn. Although it is relatively small the Garpel Burn is less subject to the effects of acidification than the more southern tributaries as the underlying geology consists of Ordovician sedimentary rocks, with a higher buffering capacity than Devonian granite found at the south end of Loch Doon. However, no salmon fry were found in the Garpel Burn surveys in 2008/9 indicating that the Loch Doon salmon population is in a precarious state.

Water of Fail Steering Group

During spring 2009, ART applied for funding from the Scottish Government to assist with establishing a steering group for the Water of Fail aimed at improving water quality and fish populations on this heavily impacted tributary of the River Ayr. As no significant improvements to water quality were predicted within the Scotland River Basin Management Plan before 2027, ART felt that a novel and dynamic approach was required. The Water of Fail steering group was established in July 2009 and included members from the local community, agriculture, South Ayrshire Council, Scottish Government Rural Inspectorate Payments Department, Tarbolton Angling Club, The River Ayr DSFB, Ayrshire Rivers Trust and Scottish Environment Protection Agency. With such an array of interested parties, there are high hopes that real benefit can be achieved.

The Fail has a long history of poor water quality, pollution and river modifications and 2009 was no different. In 1956, the Ayrshire River Purification Board stated *"The Fail discharges with depressing effect on the River Ayr below Failford"*. Despite CAR (Controlled Activities Regulations) illegal ditching and channel dredging occurred within the catchment. These activities are aimed at improving drainage but in such a low gradient system, poor drainage is inevitable. The effectiveness of this drainage is at best short lived whilst the impact of erosion to bare and re-profiled banks may be evident for years to come. Much of the middle catchment is a drained wetland which will always naturally revert to this status. Electrofishing surveys of the Fail in 2009 revealed very low fish densities, however it was encouraging to find salmon, trout and grayling amongst other species.

Juvenile grayling caught electrofishing during 2009

It has long been suspected that reduced productivity in the lower Ayr may be attributed at least, in part, to the effects of inputs from enriched burns and ditches. During spate conditions, the Fail carries high sediment loads, and these are deposited downstream on the River Ayr coating the bed and reducing water flow through the substrate. Spawning gravel oxygen level investigation is required and this may be linked to research planned for the Fail during winter 2010.

The Steering group meets regularly, and has already identified a project that may be instrumental in delivering improvements. A footpath linking the villages of Failford and Tarbolton has been proposed, and this will be developed over the coming months. Constructing such a route will encourage the public to walk the river and raise awareness of the status of the water course. Additionally, by providing a fenced path, cattle access to the water will be restricted and buffers created thus leading to water quality improvement. There are many obstacles to overcome but the group feel this is a worthwhile strategy that will raise considerable interest in the district. By the time of the next annual report, hopefully ART will be able to confirm that this project and others will have been implemented, and real improvements to water quality are improving fish stocks on the burn.

Freshwater pearl mussels in Ayrshire

In 2009 the Trust continued its research into the status of freshwater pearl mussels (FWPMs) in Ayrshire. In 2009 a number of previously surveyed sites in the River Doon were revisited and a more comprehensive survey of the Water of Girvan completed. The Doon 2009 survey found that the population appears to be stable in the short term with no evidence of the active mortality event noted in 2009. The size distribution of the mussels on the Doon is indicative of an aging population with no recent recruitment. Detailed sediment sample studies in 2009 failed to find any evidence of juvenile mussels. The 2009 Girvan survey found that the distribution of FWPMs in the river appeared to be restricted to a limited stretch in the middle river, with no live mussels found in the upper reaches.

After three years of research into the freshwater pearl mussels populations in Ayrshire the Trust felt that sufficient data and experience had been gained to enable an estimate of the mussel population size on the Doon and Girvan. Based on the survey results from 2009 and 2007/8 ART considers that the adult FWPM population size in the River Doon is likely to be towards the lower end of the range 1,000-10,000, based on the length of habitat available in the lower river where mussels can be found with some degree of confidence in suitable habitat, and the typical population density found in suitable habitat.

FWPMs were found in a restricted area of the Water of Girvan and it is likely that the population size is under 1000. It should be noted that at no survey site, either on the Doon or the Girvan did the number of live FWPMs exceed the rare abundance category (1-50 per 50m transect) used in the standard FWPM surveying protocols. A report on the survey findings and potential conservation and restoration strategies for FWPMs in Ayrshire has been submitted to SNH (Scottish Natural Heritage). We are grateful to SNH and Scottish Power Energy Wholesale for funding this research.

Salmon in the classroom

In 2009 we expanded the Salmon in the Classroom (SITC) project with 19 schools participating. Additional help was required so Dr Nick Martin, a retired teacher and lecturer, was enlisted to help deliver day one of the projects. This proved to be an excellent move and once again the project received very positive feedback from pupils and teachers alike.

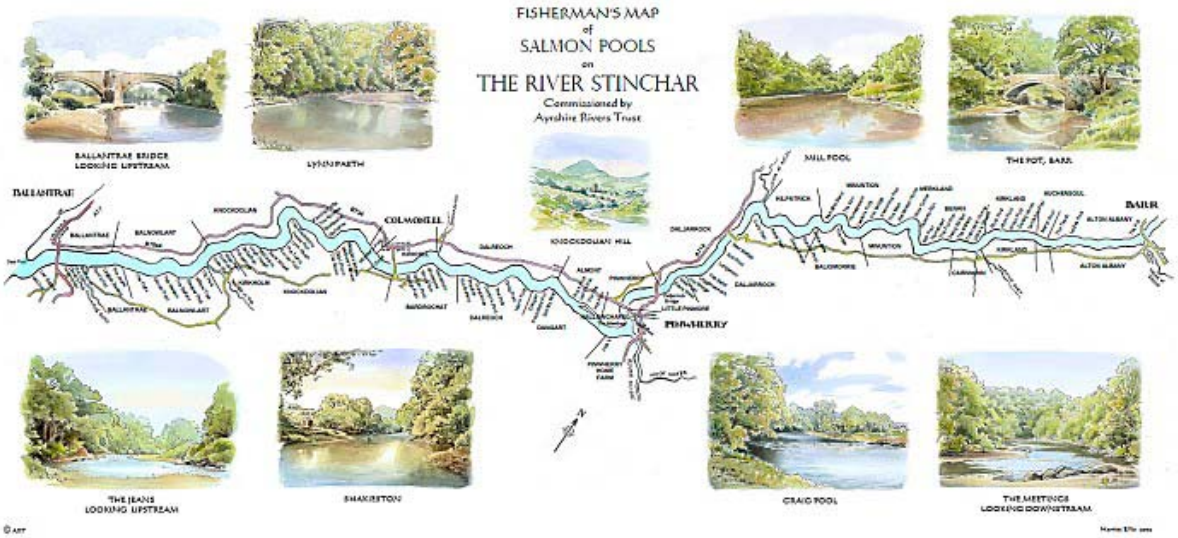
A new addition to the project in 2009 was the development of the Salmon in the Classroom ruler. This ruler was developed by Ayrshire Rivers Trust and sponsored by Straid Farms, Lendalfoot. The upper side of the ruler depicted the salmon lifecycle with images of each life stage in both the freshwater and marine phases. The ruler obviously made an impact as pupils had no difficulty in remembering the names of the various life stages. The reverse showed images of the salmon rivers of Ayrshire. The ruler proved to be very popular, and the initial run of 1000 rulers was soon used up. If you would like to sponsor the Ayrshire Rivers Trust Salmon in the Classroom project in the future please let the Trust know.

Ayrshire Rivers Trust Salmon in the Classroom ruler

Funding for SITC 2009 was provided by the following organisations: Hadyard Hill Community Benefit Fund Limited, East Ayrshire Council, Scottish Natural Heritage, Spirit Aerosystems, William Grant and Sons Educational Fund Group, North Ayrshire Council, Wellington School, Minerals Trust and Straid Farms. We are very grateful for the continued financial support provided by the funders.

River Stinchar Fisherman's Map

In 2009 ART commissioned Harriet Ellis, who lives on the banks of the Stinchar, to produce the artwork for a Fishermans map of the river. The result was excellent, with high quality detailed drawings of landscapes from the river combined with beat and pool names providing a source of reference and reminiscence material for all who love this beautiful and productive river. We intend to commission maps of the other Ayrshire rivers with the Doon planned for 2010. Prints of the map can be purchased for £20 through the ART website http://www.ayrshireriverstrust.org/river-map.htm .



Events

Fisherman's Supper - The Ivy Rooms, Ayr - Friday 6th November 2009

Our Annual Fishermans Supper took place at the Ivy Rooms Hotel (formerly the Cariston) in Ayr, where Mr Ian McGregor, seemingly the only ex bank manager in demand in Scotland, once more presided over the event in his own inimitable way. The other top table guests were our two speakers, Mr Crawford Little and Mr Gerard McDade along with Jim Stevens, Vice Chairman of ART and Brian Shaw, ART Senior Biologist.

Crawford Little (left) enjoys Gerry McDade's joke

In his speech, Crawford Little, a well known author of books such as "The Great Salmon Beats", reminisced about his angling life, and provided some profound insights into his views on the current state of salmon fishing in Scotland, a mild desperation mixed with a scintilla of optimism. Gerry McDade however, left us in no doubt as to our state of mind at the end of the evening, bringing the house down with his own brand of comedy genius. After being primed beforehand by an ART mole, he proceeded to select a few victims to orally slaughter in a fashion seldom seen at a Fishermans Supper, but in such a hilarious way that he was instantly forgiven!

Brian Shaw, our Senior Biologist, gave an excellent overview of the Trust's work over the year, and was extremely upbeat about the future. Jim Stevens proposed the vote of thanks, especially thanking the Ivy Rooms for the wonderful meal.

A raffle and mini auction were held and the event realised a profit of £1074, and the Trust would like to thank everyone who donated Raffle Prizes and Auction Lots.

The 2010 Fisherman's Supper will be on Friday 12th November – check our website www.ayrshireriverstrust.org nearer the time for venue, speakers and ticket information.

Catrine Festival – Saturday 5th June 2009

Brian Shaw looks slightly bemused by the seagull invasion in the ART stand!

On a beautiful sunny day we took the ART gazebo to the Annual Catrine Festival, held on the Green in the centre of the historic village. Catrine was designed by Claude Alexander and David Dale (founder of New Lanark), as a model village based around one of the first ever cotton mills in Scotland, and the Festival is now firmly established as a means of celebrating its illustrious past whilst looking to its future. With the kind permission of Catrine Angling Club we organised a Duck Race, with plastic ducks being released into the River Ayr upstream of the Green, and raised £317 which was shared with the Festival organisers.

We also attended the "Celebrate Ayrshire" event at Culzean Castle on the 14th June, and the Wildlife Awareness Day at Dean Castle, Kilmarnock on the 15th August.

Membership of the Trust

Membership of the Trust is growing steadily, year on year, despite the economic downturn. In 2008 we had 182 members and we now have 218 members, a 19% increase. We have kept the price of membership steady over the last couple of years at £15 for Ordinary Membership, £5 for Juniors (under 16), £60 for Corporate Members, and £220 for a Life Membership. So, for less than the price of a days fishing on many Scottish rivers, you can become a member, thus ensuring that the vital work of the Trust continues to flourish.

If you are interested in joining the Trust you can either complete the membership form on our Website www.ayrshireriverstrust.org or phone 01292 525142.

Ayrshire Rivers Trust website

We continue to develop our website, and in February 2009 a completely revised site was launched. The site contains a huge amount of reference material including maps showing the distribution of invasive weeds in Ayrshire. Any website needs to be continually updated to keep it fresh, and although this can be difficult when the staff are busy with field work etc. the new website does allows the staff to insert new material relatively quick and easy.

A new feature on the website in 2009 was the addition of a blog. The Trust staff often see interesting events whilst working by the river, and the blog provides a good platform for sharing with others http://www.ayrshireriverstrust.org/blog .

AYRSHIRE RIVERS TRUST
INCOME AND EXPENDITURE FOR THE YEAR ENDED 31 JANUARY 2010

	Year to 31 January 2010		Year to 31 January 2009	
	£	£	£	£
Income				
Fund raising (net of direct expenses)				
Country fair	-		4207	
Fisherman's supper	1073		901	
Raffle	1647		1371	
Merchandising	591		61	
Annual report advertising	1275		1285	
Gift Aid tax reclaim	1359		607	
SITC Ruler sponsorship	-		1890	
		5945		10322
Membership				
Ordinary	1705		1340	
Corporate	1070		1070	
Life	880		440	
		3655		2850
Other income				
Donations	3361		5415	
River Board subscriptions (Doon, Girvan, Ayr & Stinchar)	10000		9600	
Grants received	113331		61178	
Consultancy fees	27747		30714	
Interest received	347		2109	
		154786		109016
		164386		122188
Expenses				
Employment costs	82135		70501	
Trustees' expenses	1200		1200	
Printing, stationery and postage	4144		2986	
Professional fees	1715		1578	
Training fees	351		275	
Telephone	1326		2082	
Motor expenses	4298		5078	
Subsistence	606		872	
Subscriptions	2148		2081	
Insurance	3117		2943	
Office rent	3530		2442	
Loan interest	-		11	
General expenses	1434		422	
Depreciation	4245		3040	
Biologists' equipment	2491		4499	
		(112740)		(100010)
Net income/expenses		51646		22178
Less: carried forward as restricted funds		(51130)		(13995)
Other gains and losses on investments		(499)		-
Net surplus - unrestricted funds		17		8183

AYRSHIRE RIVERS TRUST
BALANCE SHEET
AS AT 31 JANUARY 2010

	As at 31 January 2010		As at 31 January 2009	
	£	£	£	£
Fixed Assets				
Motor vehicles	8201		4582	
Equipment	3023		4535	
Investments	19501		-	
		30725		9117
Current Assets				
Bank current accounts	1037		5550	
High interest bank accounts	98631		71009	
Debtors	9540		2497	
Stock	244		287	
		109452		79343
Current Liabilities				
Accrued charges	6388		5818	
		(6388)		(5818)
		133789		82642
Represented by:-				
Restricted Fund *		65125		13995
Unrestricted Fund		68664		68647

* Note. Restricted Funds consists mainly of funds for work which is yet to be carried out

This information is extracted from the Statement of Financial Activities and the Balance Sheet included in the financial statements. The statutory financial statements have been independently examined and the examiners' report was unqualified. Statutory financial statements can be obtained by writing to the charity at the Donald Hendrie Building, Auchincruive, Ayr, KA6 5HW.

In an effort to reduce costs and our carbon footprint, please let us know if you would like us to email the Annual Report to you in future. You can either write to us or send an email to info@ayrshireriverstrust.org with your details.

Thanks to…

Whitley Animal Protection Trust

Straid Farms Ltd

Ayr, Doon, Girvan and Stinchar District Salmon Fishery Boards
River Irvine Angling Improvement Association

Barnshean Fishing Club
Barr Angling Club
Carrick Angling Club
Catrine Angling Club
Colmonell Angling Club
Cumnock & District Angling Association
Dailly Angling Club
Dalry Garnock Angling Club
Darvel Angling Club
Dreghorn Angling Club
Galston Angling Club
Hurlford & Crookedholm Angling Club
Kilbirnie Angling Club
Kilmarnock Angling Club
Kilmaurs Angling Club
Kirkmichael Angling Club
Ladykirk Angling Club
Mauchline & Ballochmyle Angling Club
The Smithston Fishings Club

And to all our private donors, members and friends for their support

www.ayrshireriverstrust.org
Scottish registered charity No: 030426