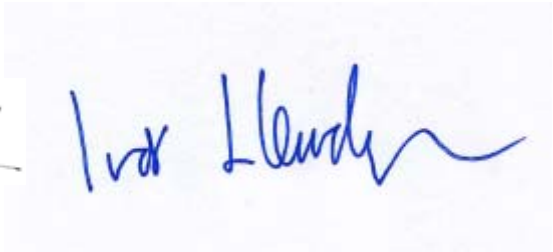
South Coast Sea Trout Action Plan

A typical rod caught Sussex sea trout

Foreword

The South Coast Sea Trout Action Plan has been developed by the Environment Agency, Wild Trout Trust and Atlantic Salmon Trust with the common goal of improving sea trout stocks on the south coast. It sits alongside the EU funded Atlantic Aquatic Resource Conservation Project and together they promote action to safeguard sea trout throughout southern and south-west England. All three organisations in this partnership have strategic aims to improve sea trout stocks with the Environment Agency's Sea Trout and Salmon Strategy (published 2008) and the Atlantic Salmon Trust's and Wild Trout Trust's published strategies and charitable aims. The partnership has signed up to this action plan and will support its delivery through commitment of resources, both financial and professional.

The key word here is 'action'. The South Coast Sea Trout A*ction* Plan aims to deliver on the ground habitat improvement to rivers and streams that are critical for sea trout spawning and juvenile life stages. We will address obstructions to fish passage, improve river habitat, protect vulnerable spawning grounds and learn more about the behaviour, lifecycle and genetics of this enigmatic species and in doing so contribute to River Basin Management Plan delivery under the Water Framework Directive. We will work with fishing clubs, businesses, landowners, local authorities and NGOs to conserve this iconic species for future generations.



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1. Introduction

The First International Sea Trout Symposium, which was held in Cardiff in 2004, highlighted the comparative neglect of research into sea trout and the wide gaps in our knowledge. It stressed that this made it more difficult to protect and conserve sea trout stocks and manage them in sustainable ways for future generations - a difficulty made more serious by the decline in sea trout abundance in recent years. It therefore identified a need for 'long-term, integrated ecosystem-based freshwater and marine studies, incorporating ecology and genetics, to improve understanding of the sea-going migratory habit in trout.' In 2008 the Environment Agency published its strategy “Better Sea Trout and Salmon Fisheries 2008 -2021”, setting out specific goals aimed at securing more sea trout in more rivers, and linking the time frame for actions with the River Basin Management Plans as set out under the Water Framework Directive. It is well understood that many of the major issues impacting sea trout (*Salmo trutta*) and salmon (*Salmo salar*) stocks can only be properly addressed through a wide ranging plan that tackles catchment level problems associated with water quality, water quantity, land-use and diffuse pollution as well as addressing problems associated with connectivity of habitats - a critical factor in achieving the goals set out in the new strategy.

The concept of a South Coast Sea Trout Action Plan was raised in late 2008 when the Environment Agency, the Wild Trout Trust and the Atlantic Salmon Trust discussed the idea of a coordinated project. Phase 1 of the project pulled together existing information held by the Environment Agency and others in order to identify gaps in our knowledge, research opportunities and some early actions on the ground that could be taken to further protect and enhance sea trout stocks along the south coast.

A workshop was organised by the Wild Trout Trust with the Environment Agency and options for taking the project forward were discussed. It was agreed that the production of a South Coast Sea Trout Action Plan was a priority and a first step to identifying issues, opportunities and actions designed to improve stocks.

2. Action Plan Contents

The actions in this document, which are designed to focus effort on key actions to protect and improve sea trout populations fall into two groups:

- Those that are relatively low cost habitat focused actions that can be led by the Wild Trout Trust and the Rivers Trusts, which will improve the success rate for spawning and juvenile life stages of the south coast sea trout population.
- More complex and challenging issues, such as addressing major obstructions to fish passage, improving water quality, undertaking large scale habitat restoration and addressing the impact of abstraction, which require a co-ordinated approach from the Environment Agency working in partnership with other bodies.

As background to these actions, this document now summarises local data and information on the current status of sea trout fisheries across Hampshire, Sussex and Kent. It highlights some of the known problems and issues affecting access for migrating fish as well as impacts to habitat quality and availability. It seeks to identify where rod fisheries currently exist and evaluates exploitation pressures. Where there are significant gaps in our knowledge, the Action Plan suggests areas for research.

3. Background

A feasibility study looking into the status of sea trout stocks in and around East Anglia was commissioned by the Environment Agency and the Wild Trout Trust in early 2008 (Pawson 2008). Pawson describes some key facts about sea trout which are equally applicable to the south coast and which must be clearly understood if a management programme for sea trout stocks is to be effective. In his report Pawson describes sea trout as follows:

"Sea trout are widely distributed throughout the UK, and are recognised as being of major economic, social and recreational importance (Harris, 2006). It is important to recognise that, whilst some sea trout populations exhibit complete anadromy, i.e. they have juvenile stages in freshwater, but migrate as smolts to grow and mature in the sea before returning as adults to freshwater to spawn, most are considered to be freely interbreeding fractions of a single trout population. This population will include both anadromous ("sea trout") and freshwater-resident ("brown trout") components. Progeny of sea trout and brown trout have been shown to become both forms (Frost & Brown, 1967; Jonsson, 1985; Walker, 1990) and, while genetic differences have been reported between trout populations both within and between catchments, no study of neutral markers has provided conclusive evidence of genetic divergence between brown trout and sea trout living in the same river (Ferguson *et al.*, 1995). Furthermore, the tendency to become anadromous often differs between the sexes, as evidenced by the female-biased sex ratios of sea trout during their spawning migrations (Le Cren, 1985; Solomon, 2006), although the ratios at spawning may approach unity when maturing brown trout are included (Sambrook, cited in Solomon, 1995)."

A conclusion from the review of literature by the Anglian Sea Trout Project suggests that the East Anglian population is strongly linked with the productive sea trout rivers entering the North Sea in North Yorkshire, Northumberland and East Scotland. There is, however, very little scientific information available to link the sea trout stocks that currently run the Kent, Sussex and Hampshire Rivers to those of the North Sea. In fact the local, phenotypic characteristics associated with fish running Sussex and Kent rivers in particular, seems to suggest a very individual stock, possibly with closer links to populations running the rivers of northern France and the English Channel rather than one strongly linked to the North or Celtic Sea. Hampshire stocks however, may well prove to be closely related to Wessex and South West populations dating back to a time, post ice age, when the Avon, Test and Itchen were all part of the same freshwater system.

The rapidly evolving science of fish genetics will enable some of these fundamental questions to be answered, hopefully within the next few years. Currently three proposed projects may provide some much needed information. The Living North Sea Project, the Celtic Sea Trout Project and the Atlantic Aquatic Resource Conservation (AARC) Project, which are all seeking to answer questions about the provenance of sea trout stocks. If successful, the projects will be able to unravel the identification of mixed populations both in terms of natal river systems and potentially to common marine feeding locations. This should provide important data for the future management and protection of sea trout stocks in England and Wales.

4. Sea trout fisheries in Hampshire, Sussex and Kent

Apart from a handful of well known fisheries located below major impoundments, sea trout fisheries in Hampshire, Sussex and Kent are considered to be peripheral to the main network of established coarse and brown trout fisheries. Even the salmon fisheries, which are largely restricted to the lower reaches of the rivers Test and Itchen, have a much higher profile than those where migratory trout could be expected. Salmon fisheries have consequently attracted significant investment compared to the systems where sea trout run.

Despite the fact that sea trout attempt to enter most of the south coast's rivers, comparatively few are caught, or even targeted by anglers. Some are captured and mistaken as resident browns and on many rivers large numbers of sea trout enter the river after the end of the rod season, which has been confirmed by counter data. The declared rod catch may therefore be a significant underestimate of the size of the resource running the south coast's rivers.

They are however, a critically important component of the region's biodiversity and are undoubtedly responsible for sustaining many wild trout populations in numerous headwaters, side-streams and tributaries found right across Hampshire, Sussex and Kent.

Fig.(1) A sea trout in spawning mode on the River Meon in Hampshire.

Legal exploitation of south coast sea trout stocks is primarily restricted to rod fisheries. One licensed net operates in the far west of the region on the Beaulieu River. This net fishery is owned and managed by the Beaulieu Estate who also lease a rod fishery on the same water. It operates on less than five named dates per year and takes only a

modest number of fish for the estate household. It is now the only licensed net permitted to operate under the recently reviewed Environment Agency Net Limitation Order. The historic and current levels of sea trout exploitation carried out by the Beaulieu net fishery are not thought to be damaging local sea trout populations.

Sea trout can and do run into virtually every river and stream that flows into the Solent or wider English Channel, with the proviso that they have sufficient water, good water quality and some habitat capable of supporting brown trout. Many migrating fish are thwarted by impassable structures or by chemical barriers. Nevertheless, the entrance to virtually every water course will be explored by sea trout and many highly unlikely streams support small runs of migratory trout.

Declared rod catches for sea trout across Hampshire, Sussex and Kent reflect the wide distribution of the species. The region as a whole does not, however, enjoy a national reputation for supporting productive sea trout fisheries. Catches from the Test, Itchen and occasionally the Sussex Ouse are reported but catch returns and anecdotal information from local anglers also suggest sea trout are present in a wide range of south coast rivers.

A summary of the status of sea trout in Hampshire, Sussex and Kent rivers is set out in section 5 below. This list of rivers and streams, which are known to support sea trout, is by no means comprehensive and there are numerous small streams that occasionally support sea trout that are not listed below.

Fig.(2) John Hall with a superb fly caught sea trout from the River Itchen.

5.0 The south coast's principal sea trout rivers

Significant rod fisheries for sea trout exist on the Beaulieu and Lymington in the New Forest, the Test and Itchen in Hampshire, Western Rother, Adur and Ouse in Sussex and the Stour in Kent. The Hamble, Meon and Medway may well have potential for further development as sea trout rod fisheries. The last ten years of declared rod catch data for some of these rivers is set out in Appendix (1) of this plan.

Nationally 71 principal sea trout rivers have been identified on the basis of having an annual rod catch consistently greater than 50 fish or having a reasonable expectation of achieving this figure. Within Hampshire, Sussex and Kent the principal sea trout rivers are the:

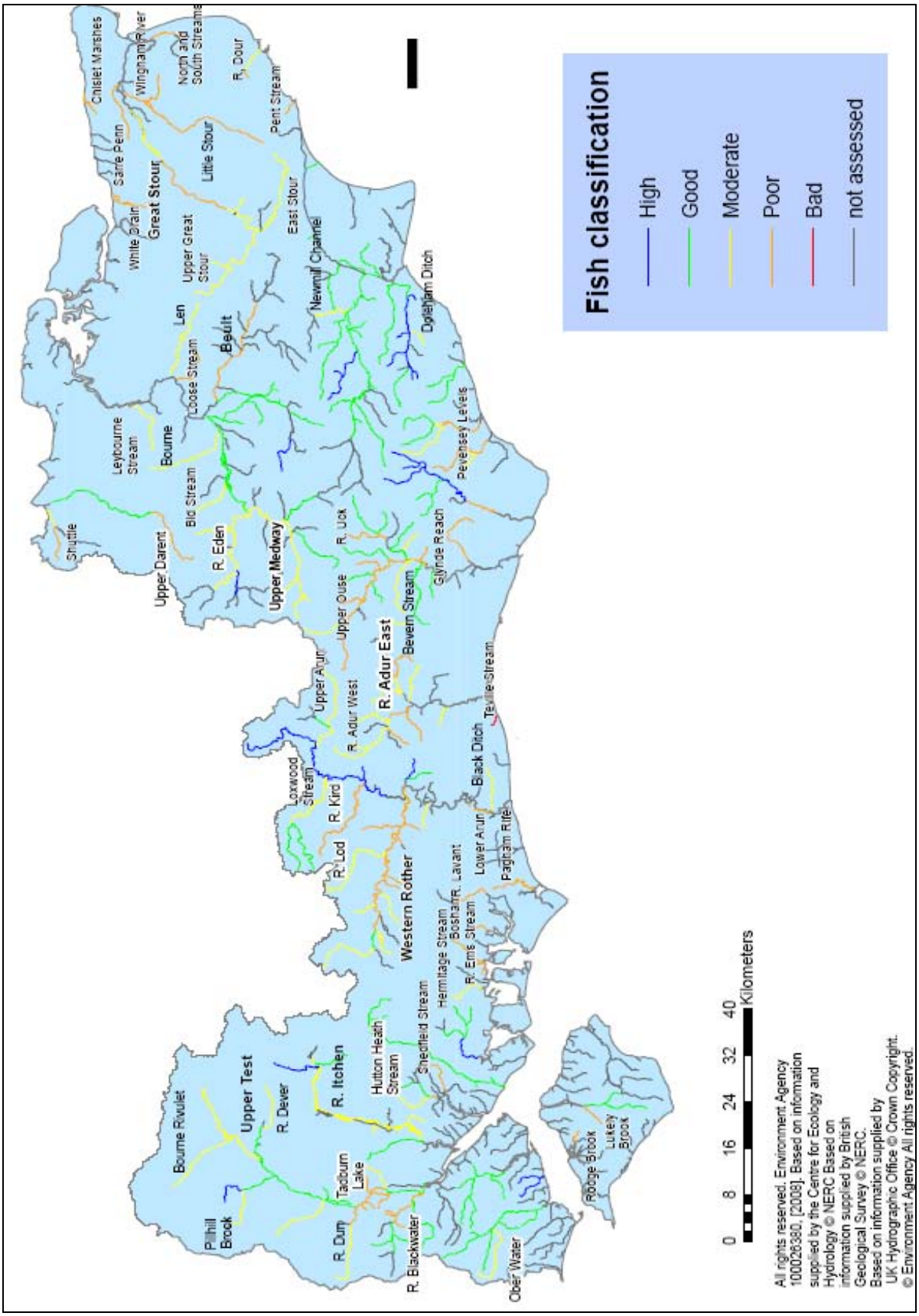
Lymington
Beaulieu
Test
Itchen
Sussex Ouse.

5.1 Sea trout and River Basin Management Plans

Sea trout are an important component of the fish assemblage on many of the south coast's rivers. The status of fish populations forms a key part of how the health of rivers is gauged in terms of its ecological status in Rivers Basin Management Plans under the Water Framework Directive. Overall 43.9% of rivers within the South East River Basin Management Plan are classified as good or high status for fish populations, Fig.(3).

The South East River Basin Management Plan identifies actions that are required to improve overall ecological status for fish populations, which includes improving water quality, addressing the impact of abstraction, restoring river habitat and overcoming obstructions to fish passage. The actions promoted by this plan will contribute to delivering these improvements, for actions to enhance sea trout benefits a wide spectrum of aquatic ecology.

Fig.(3) Water Framework Directive fish classification, Hampshire, Isle of Wight, Sussex and Kent.



5.2 New Forest streams

Significant numbers of sea trout are known to run all of the New Forest streams which include the Lymington River, Beaulieu, Avon Water, Dark Water and the Danes Stream. The upper tidal and lower fluvial reaches of the Beaulieu and Lymington River both support viable sea trout fisheries.

Fig.(4) Headwaters of the Lymington River.

The Blackwater, which drains the north eastern section of the Forest, joins the Test just upstream of the tidal pool at Testwood and is thought to be the premier spawning site for sea trout running the Test. Some historic fish counter data is available from the Lymington River.

5.3 Test

The tidal and lower freshwater fishery at Testwood and Nursling supports an extremely productive and economically valuable salmon and sea trout fishery. Sea trout are also captured further upstream from the Nursling Fishery, including the parallel running “Little River Test” as well as from the Broadlands fishery upstream of the M27 road crossing.

Other than in the tidal pool at Testwood, most rod caught sea trout from the Test are taken by day time fly fishing methods, mainly targeted at salmon. As stated above, most sea trout running the Test are thought to spawn in the Blackwater but the significant numbers of fish taken from above the Blackwater confluence would suggest that these fish also spawn in the main stem of the Test further upstream, or possibly even on some

of the other Test tributaries, particularly those joining from the west such as the Dun and the Wallop Brook.

Some fish counter data for sea trout is available from the Test counters located on the main channel and on the Little River at Nursling. These counters are, however above the Blackwater confluence and will miss many of the fish exploited at Testwood Pool. Testwood Pool, and the comparable tidal pool on the Itchen at Woodmill, are the two most productive sea trout fisheries in the region.

Fig.(5) River Test, Hampshire.

5.4 Itchen

Woodmill Pool is at the head of the tidal Itchen and is a local authority owned and managed fishery. It is by far the most productive sea trout fishery on the system. Above Woodmill, exploitation of sea trout is very patchy but significant numbers of fish are captured every season as far upstream as Bishopstoke on the main river. It is thought however, that many sea trout entering the Itchen are either destined to spawn in the Monks Brook, which joins the Itchen at Woodmill, or that they possibly drop out of the Itchen altogether and eventually run one of the nearby New Forest streams. Excellent quality fish counter data is available from the Gaters Mill site, located above the Monks Brook confluence, and this confirms that some fish do run the main river. Little reliable information is available as to exactly where these fish spawn. This fundamental question is discussed in more detail in the recommendations section. The Monks Brook is very much an urban stream and habitat quality is severely impacted by flood risk management constraints. The Monks Brook and other non chalk stream tributaries tend to be the preferred spawning destinations for migrating Itchen sea trout, rather than the main stem or chalk derived tributaries. This preference for spawning in minor side

streams running over mixed clays and gravels rather than the groundwater fed chalk streams is a common theme with sea trout across Hampshire, Sussex and Kent.

5.5 Hamble

The Hamble has always supported sea trout in the tidal reaches below Botley Mill. In 2009 the Environment Agency completed the construction of a “bypass channel” type fish pass which will now allow fish to migrate past the mill impoundment and explore the 15km of habitat upstream. It is understood that there are other structures further upstream, which will require easements to ensure that the whole catchment is available to migratory fish. The upper reaches of this river provide good quality spawning and nursery habitat for brown trout and it is thought that this population may have contributed smolts to the system - this explains why sea trout were always found trying to access the river despite very few making it into the river to spawn. Further targeted work on a number of small impoundments is required to ensure that this population reaches its full potential.

5.6 Meon

The small declared rod catch from the Meon belies the significant numbers of fish that actually run and spawn in this river. Historically the tidal “Haven” at the river mouth, supported an extremely productive rod fishery with an annual declared catch running into hundreds of fish. The Haven is now managed as a nature reserve and fishing is no longer permitted. Most of the sea trout spawning activity takes place on the lower half of river, where it passes over geology of alluvial sands, gravels and clay. In a wet year some fish do occasionally migrate as far upstream as Warnford to spawn. Recruitment of brown trout stocks on the Meon compared to other local chalk rivers is considered to be excellent and the combination of a comparatively steep gradient and an active

Fig.(6) River Meon, Hampshire.

morphology creates some superb habitats for both resident and migratory trout. Nevertheless, Solomon (2008) identified over 25 significant obstructions on the Meon that impact on fish passage and habitat quality.

5.7 Wallington

Like the Hamble, the upper reaches of the Wallington provide some good habitat for brown trout. Sea trout run the Wallington every year but can be vulnerable during low flow years when they tend to congregate in the heavily modified section of channel running through Wallington village. These man-made pools only provide limited cover for fish and they are often illegally targeted by poachers. Better quality holding habitat and easier access to the more rural sections of stream found above the M27 road crossing are required.

5.8 Ems

The Ems is a small chalkstream that enters the Solent at Emsworth. The Ems is heavily impacted by abstraction. Access for migrating fish is hampered by tidal gates that form a network of old milling impoundments. Access for migratory salmonids is difficult but possible following prolonged rainfall when modest numbers of fish can access the river via a long culvert system. Some options for improving access for migratory trout are currently being evaluated by the Environment Agency.

5.9 Arun and Western Rother

Sea trout stocks are known to run and spawn in many tributaries that feed into the River Arun. Occasional rod caught fish are declared from the tidal Arun but most fish reported by anglers tend to be from the Western Rother where they are caught from the confluence at Hardham up to Iping Mill above Midhurst.

The upper reaches of the Western Rother and many of the small tributaries are more akin to classic upland spate streams rather than rich, productive lowland systems. It is quite possible that the populations of juvenile trout identified in survey programmes on headwaters of the Rother are also putting significant numbers of trout smolts to sea each year.

5.10 Adur

Sea trout that run the Sussex Adur have a small but passionate following of local anglers. Like the Arun, any small tributary including those that discharge into the long tidal reaches, will at times support sea trout. There is a theory that some fish inhabit the tidal reach for long periods in the summer and late autumn and rush into small freshwater tributaries as late as February in some years to immediately spawn and drop back to the estuary. The physical nature of the Adur, with its long tidal reach and heavily engineered channel means that the river does not generally provide opportunities for classic sea trout fly fishing. The comparatively turbid water running from the Sussex Wield means that most fish are taken by spinning in daylight hours.

Several initiatives designed to improve sea trout access and spawning have been undertaken by the Environment Agency and the local River Adur Conservation Society. The River Adur Conservation Society secured Defra funding via a national budget administered by the Association of Rivers Trusts for a number of projects to improve both fish passage and river habitat. The Environment Agency working with the Sussex Wildlife Trust, restored half a kilometre of river habitat and improved fish passage on Woodsmill Stream, which has opened up several kilometres of spawning and nursery habitat.

5.11 Sussex Ouse

Sea trout running the Sussex Ouse are among the largest average sized fish to be found on any system in England or Wales. Modest numbers of large individual specimens are annually taken, particularly from the productive Barcombe Mill Fishery which lies at the head of the tidal system. Ouse fish are very distinctive in terms of their large average size and also their phenotypic characteristics. An interesting hypothesis is based on the observation that very few smolts appear to emigrate from the freshwater streams in the spring. It is possible that large numbers of 0+ trout drop out of the system and take up refuge in the estuary before eventually moving out to sea. Recent studies of salmon populations on Wessex rivers have identified strong autumn parr migrations and estuarine survival (*Pinder et al 2007*) and perhaps this is an area for further research on the Ouse and possibly Adur estuaries.

The proactive Sussex Ouse Conservation Society have taken a very close interest in the management and protection of Ouse sea trout and have been involved in both collecting data as well as lobbying for improvements to habitat and water quality for many years. Several projects to improve access are currently in the pipeline. Potential threats to the ecology of the river remain. A local group wish to restore the river to a full working navigation, which will potentially threaten sea trout habitat and restrict the river from reaching its full ecological potential. Some excellent information relating to Ouse sea trout stocks can be found on the Sussex Ouse Conservation Society website at www.sussex-ouse.org.uk.

5.12 Cuckmere

Sea trout are regularly seen and occasionally caught in the tidal Cuckmere. Access into the Cuckmere and hence into any of the headwaters areas capable of sustaining spawning is severely restricted by the presence of a large Environment Agency owned impoundment near Arlington. It is thought this structure may have been originally installed either to provide a head of water or to restrict tidal influences for abstraction purposes.

5.13 Eastern Rother

The Eastern Rother is another system severely impacted by channel modification and impoundment. The tidal gates at Scots Float are a barrier to summer migration for sea trout up and into the Rother system as is the tidal sluice on the Tillingham and to a lesser extent the lock gates on the Brede. Following high tides and spate conditions reasonable numbers of sea trout do run into the Rother and are thought to spawn in the upper reaches of most tributaries. There is no recognised fishery for sea trout on this system largely because of the turbid nature of the river and as a result of the majority of

the run being outside the fishing season. It is thought that some of the fish recorded as being taken from the Rother in the Environment Agency catch returns are fish caught from the Western Rother.

5.14 Dour

The Dour is a small chalk river that supports a surprisingly strong resident brown trout population. The Dour enters the sea via a culvert into Dover Harbour where sea trout are known to congregate. However, the river has poor access for upstream migration through the heavily built urban environment and there have been no records of sea trout running or spawning in the Dour. The Environment Agency has restored a number of reaches of the river and is currently investigating potential obstructions to sea trout migration, within and around the culvert at Dover Harbour.

5.15 Stour

Significant numbers of fish are known to run the river and annual catches are recorded by anglers targeting them on the lower reaches. The Great Stour would appear to have substantial potential for sea trout, particularly given recent investment to improve sewage treatment works' discharges, though there is more that needs to be done, both on point and diffuse pollution sources. Habitat quality on many reaches is comparatively good and a move away from stocking large numbers of fertile farm reared trout may enable Stour sea trout stocks to fare better in the future. There is some evidence (Ferguson, 2009, pers. comm.) that introgression of fertile, farm-strain brown trout can negatively impact on sea trout smolt output.

Fig.(7) Chartham Corn Mill, River Stour, Kent.

5.16 Medway

Prospects for migratory trout on the Medway system look very bright. A recent initiative by the Environment Agency to construct a series of fish passes adjacent to lock and weir sites on the Medway Navigation will facilitate improved access for fish to tributaries like

the Teise and the Bourne. Sea trout are reported coming from the Medway every year and the Teise and Bourne both sustain good habitat quality capable of significant wild trout production. The upper Medway and tributaries such as the Len, Loose and Eridge may also be contributing smolts to the system.

Fig.(8) River Medway.

5.17 Darent and Cray

The Darent has some potential to support sea trout. However, until the large tidal gates near the bottom of the system are modified to allow fish migration, there will be very little scope for immigration of adult or emigration of juvenile sea trout. Both rivers have numerous structures and on-line still waters which isolate sections of reasonable habitat and fragment fish populations. Both of these rivers therefore currently represent low priorities for restoring or improving runs of migratory trout.

6.0 Illegal exploitation

Illegal exploitation of sea trout stocks remains a concern and the Environment Agency has taken a number of successful prosecutions in recent years for illegal netting both in freshwater and within the six mile limit.

Notably vulnerable waters include river mouths and New Forest streams in which large shoals of fish can congregate in relatively small pools waiting for river flows to increase to migrate to their spawning grounds. Once on their spawning beds, which are often in very small and shallow tributaries, they again can be targeted by poachers.

Fig.(9) Anti-poaching surveillance.

There are ongoing concerns over illegal by-catch by inshore fishermen netting for bass and mullet. To combat this, the Environment Agency works closely with the Kent and Essex, Sussex and Southern Inshore Fisheries and Conservation Authorities, sharing intelligence and undertaking joint marine patrols.

In a bid to reduce demand for illegally caught sea trout, fish dealers and retailers are routinely checked. All legally net caught sea trout in England and Wales offered up for sale are now required to be carcass tagged. It is illegal to sell rod caught sea trout.

Given the status of sea trout populations across the south coast, it is essential that an active enforcement presence is maintained to combat both marine and freshwater poaching.

7.0 Overview of previous sea trout actions

Work undertaken to improve sea trout stocks over the past 30 years has been somewhat mixed in terms of quantifiable success. Some of the more expensive fish passes located on main rivers have undoubtedly helped to extend access to spawning sites and will have contributed towards spawning escapement. Not all have been an unqualified success for sea trout and there are some fish passes that have been poorly designed and located.

Attempts to monitor sea trout runs with counters located on rivers across the region have also returned mixed results. Counters primarily set up to monitor salmon runs on the Rivers Test and Itchen have in reality been the only consistently reliable sources of data for returning sea trout and both of these sites are upstream of significant spawning tributaries. Counters are notoriously difficult to “get right”. They potentially swallow large

amounts of resource that might otherwise be ploughed into improving access or habitat for migrating trout.

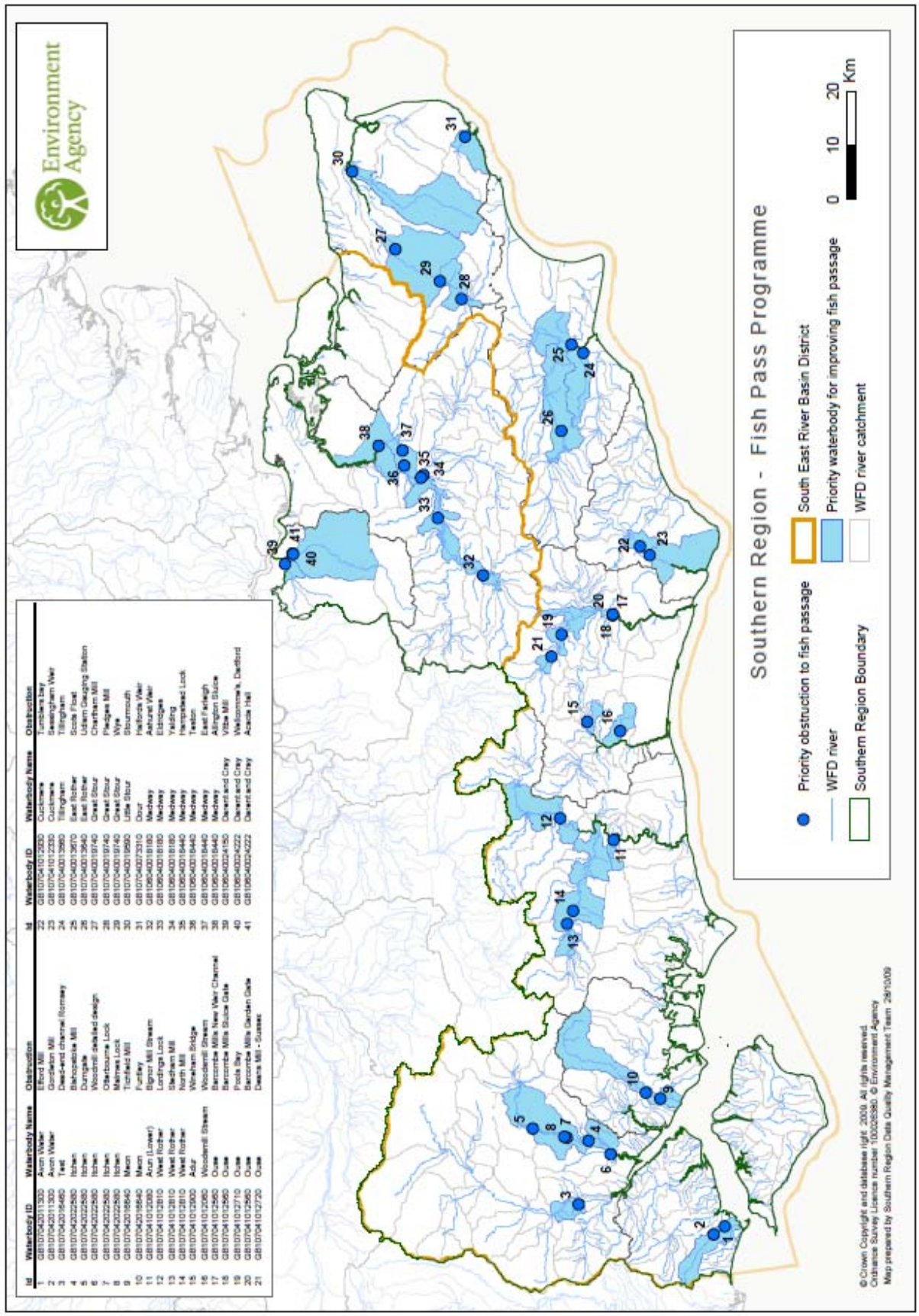
In the past attempts were also made in Sussex and Kent to boost numbers of migratory trout via a hatchery scheme with eggs hatched and fry grown on at Bewl Bridge in Kent. Like many of these schemes tried elsewhere, results were inconclusive and poorly monitored, with the likelihood of any significant benefit impossible to quantify. There is the risk that progeny from wild returning broodstock were stocked out into a variety of different catchments. A Meon project using egg incubator boxes populated with sea trout eggs taken from local broodstock was also tried for one year. Again any benefit associated with this scheme was impossible to assess.

Advances in our understanding of the genetic makeup and fitness of trout stocks would suggest that these programmes were inappropriate. It is likely that, following the cessation of these stocking activities, natural selection processes will once again dictate the makeup of the various strains and populations that inhabit the south coast's rivers. We do know that sea trout are great explorers and may run into some rivers only to drop back and run into others for spawning purposes. Hopefully a better understanding of the provenance of various sea trout stocks will be achieved following the completion of the various genetic sea trout studies already described in section 3.

8.0 Improving sea trout fisheries in Hampshire, Sussex and Kent

Many of the significant tidal gates, large weirs and impoundments that severely limit access for migratory salmonids have been identified by the Environment Agency and highlighted for possible action. In the South East River Basin Management Plan, structures and fragmentation of habitats are highlighted as one of the major obstacles preventing rivers achieving good ecological condition, Fig.(10).

Fig.(10) Priority fish obstructions across Hampshire, Isle of Wight, Sussex and Kent.



The South Coast Sea Trout Action Plan will help provide further momentum for resolving some of these priority sites. However, there are also numerous issues and opportunities

for improvement on the plethora of small side streams and tributaries that could potentially provide critical spawning and nursery habitat for migrating trout. Some of these small streams have been overlooked because there is no perceived direct fishery benefit; or they have been used simply as drains or irrigation ditches and therefore have no perceived ecological value. Many of these streams are not designated as “main river water courses” and have little or no statutory protection from inappropriate land drainage works. Hundreds of kilometres of potential trout habitat have been fragmented by weirs, culverts and on-line lakes. Some have very little scope for rehabilitation but many have huge potential for providing additional spawning and nursery habitat for resident and migratory trout as well as other important migratory species such as eel and lamprey.

A programme that identifies opportunities on small side streams and tributaries and resolving migration issues with a range of simple and cheap prescriptions, could lead to a significant increase in the size and the resilience of local sea trout stocks.

Some excellent work has already been delivered with, for example, the Environment Agency working closely with the Forestry Commission to resolve migration problems on New Forest streams where culverts and ‘Irish fords’ have been a particular problem for sea trout. Simple, cheap easements constructed from locally won tree trunks have been successfully used to open up many kilometres of good quality spawning habitat, Fig.(11).

Fig.(11) A K dam on the Bratley Water (Lymington) constructed to help ease fish through an ‘Irish ford’.

The River Adur Conservation Society and Sussex Ouse Conservation Society working closely with the Wild Trout Trust and Environment Agency has recently carried out work to improve fish passage and improve spawning habitat, Fig.(12).

Fig.(12) River Ouse fish passage improvement by Ouse River Trust.

Large scale improvements on the Medway are particularly exciting and have been successful in tapping into resources that would be difficult to justify purely on fishery grounds. Here, a multifunctional approach to fish pass design has resulted in a product that can be used by canoeists and provide for multi-species fish passage, Fig.(13).

Fig.(13) Porters Lock fish and canoe pass on the River Medway.

On the Hamble a bypass channel has been created using a 'diamond tombstone' arrangement made from rock, which has opened up the catchment to sea trout for the first time in several hundreds of years, Fig.(14).

When tackling obstructions, all species fish passage should be aimed for with ideally the structure being removed, bypassed or modified so as to re-establish a more natural river.

Fig.(14) The Botley Mill fish pass has opened up the River Hamble for the first time in hundreds of years.

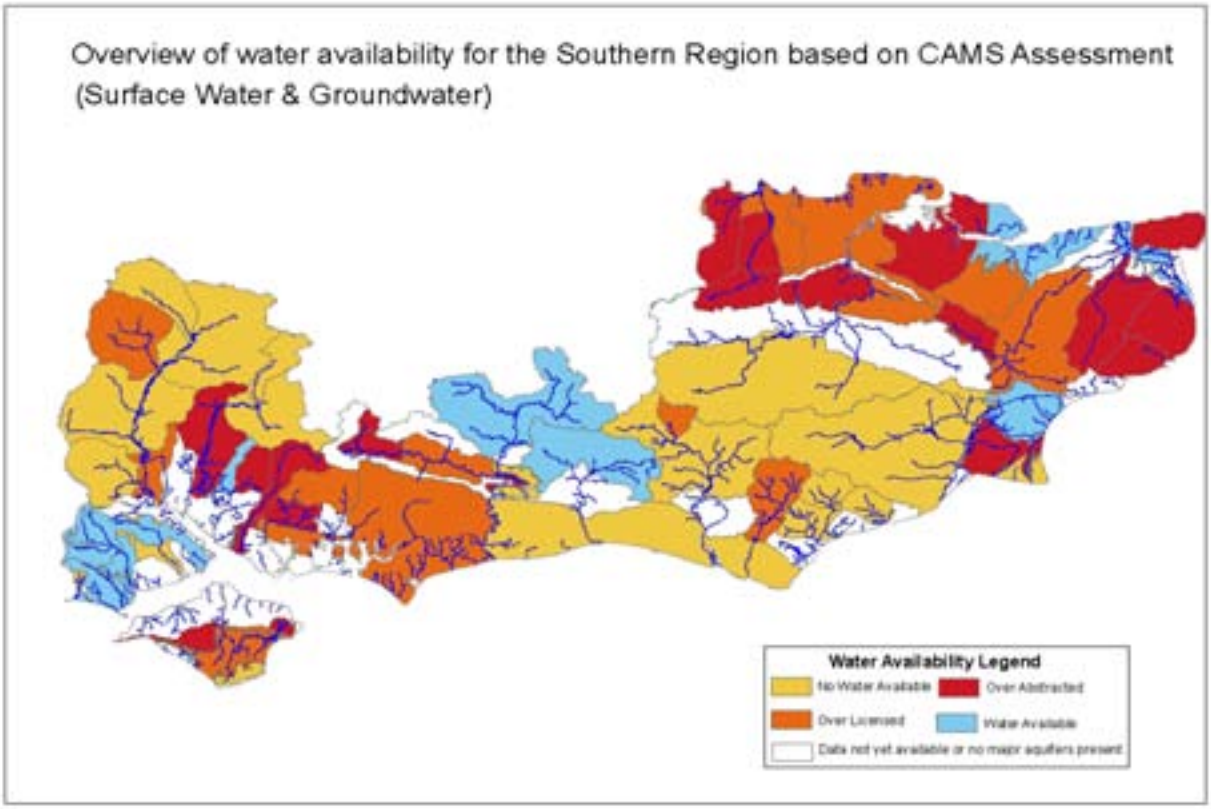
Ensuring that the south coast's rivers have sufficient water quantity and good water quality is essential for maintaining and improving sea trout populations.

Overall the south coast's rivers are in a water stressed part of the country. Notably, rivers that were identified as over abstracted under the Environment Agency Catchment Abstraction Management Strategies that were published between 2004 and 2008, included the: Itchen, Hamble, Meon, upper Western Rother, Darent, Cray, Little Stour and Dour, all of which support sea trout, Fig.(15). Under the Environment Agency's Restoring Sustainable Abstraction programme, abstraction licences have been reviewed and modified or are in the process of being modified on the Darent, Cray, Dour and Itchen. Licences have or are being reviewed on the Little Stour, Hamble and Meon.

In protecting the interests of sea trout, it is not only important to safeguard summer flows but also to ensure flood flow conditions are maintained, as these are essential for sea trout to reach their preferred spawning grounds. Particularly vulnerable to the impact of abstraction are these small tributaries that are so critical for spawning and nursery

habitat. One key objective of this plan is to identify these critical areas, which are invariably not main river and often neglected.

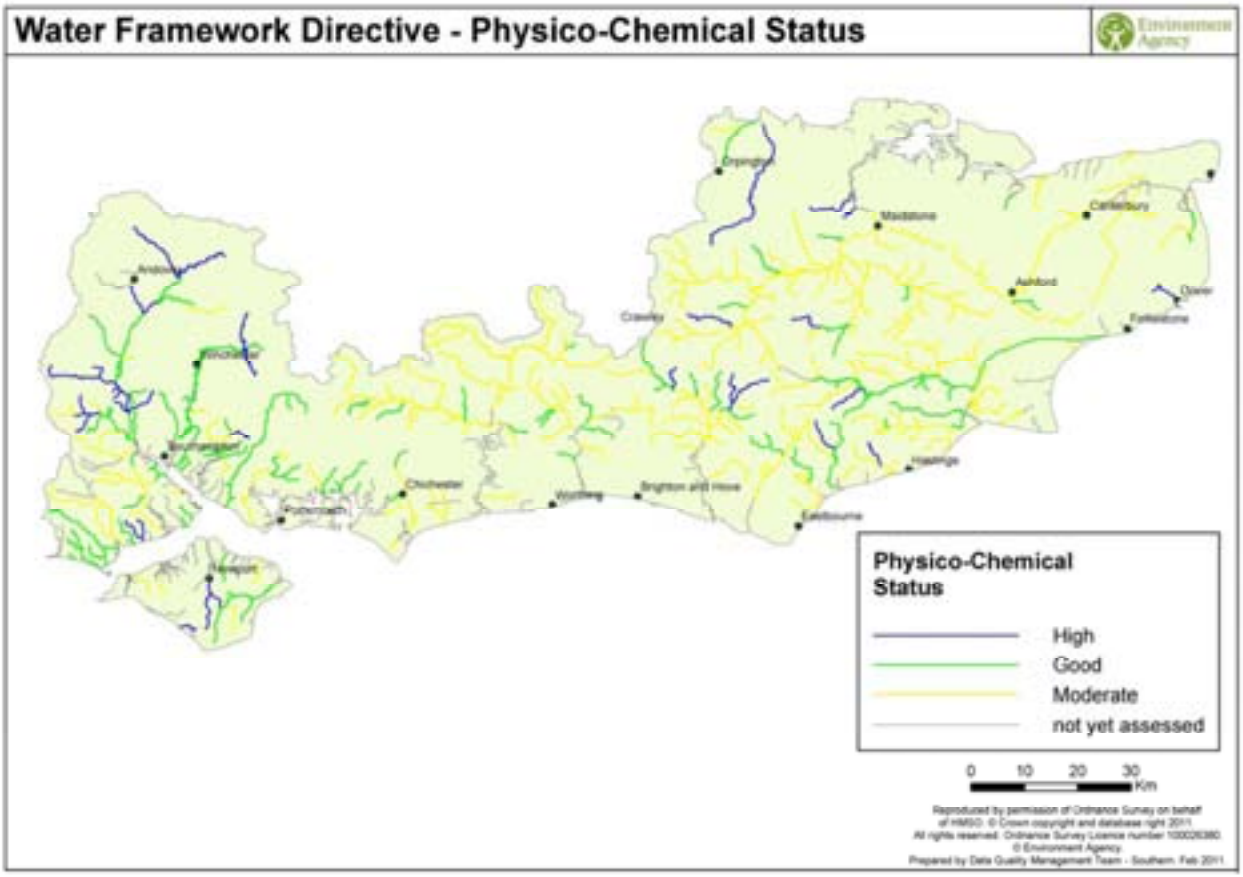
Fig.(15) Overview of water availability across Hampshire, Sussex and Kent.



The Environment Agency's assessment of water quality against Water Framework Directive standards, indicates that a number of rivers along the South coast, which support sea trout, are not meeting good status for 'physico-chemical parameters (dissolved oxygen, ammonia, phosphate and pH), Fig.(16). These failures are caused by both point and diffuse pollution. In tackling point sources the water company's investment programme (PRO9) will see £550 million invested between 2009-14 to ensure compliance with water quality legislation and fulfil water management obligations. In addressing diffuse agricultural sources, Catchment Sensitive Farming schemes operate across the Test, Itchen, Arun, Western Rother, Eastern Rother, Pevensey Levels, Beult, and the Stour. In addition there are partner led initiatives, which include the Downs and Harbours Clean Water Partnership and Isle of Wight Landcare Project.

These initiatives and investment will improve river water quality, however concerns remain. Excessive silt is a particular threat as it can smother eggs in their spawning grounds. These critical headwater streams, which are often outside the Environment Agency water quality monitoring network, are inherently vulnerable to pollution. Sea trout are also vulnerable during low flow years, when water quality can be at its poorest.

Fig.(16) Water Framework Directive water quality status.



Climate change predictions suggest that summer river flows may reduce by as much as 30-50%, river temperatures will rise with surface fed rivers being particularly at risk. Acton to safeguard south coast sea trout needs to take climate change into account and wherever possible mitigate impacts, through actions such as easing fish passage, protecting flows, improving water quality and shading water courses.

Progress is being made and the South Coast Sea Trout Action Plan dovetails well into the overall objectives identified in the River Basin Management Plans.

It will be crucial that these plans drive action to ensure that the south coast's rivers have sufficient water resource, water quality, habitat and unobstructed fish passage to support healthy sea trout populations.

Uniquely though, this plan highlights the importance of the many apparently insignificant but highly valuable side streams and tributaries; the impact of the multitude of minor obstructions and the need to develop a strong scientific understanding of sea trout population dynamics to underpin decision making and deliver sustained improvements.

To enhance sea trout populations will require a concerted effort from many players, which includes the Environment Agency, Wild Trout Trust, Atlantic Salmon Trust, Rivers Trusts, Wildlife Trusts, local authorities, angling clubs and individual land owners amongst others, working together to identify the bottlenecks and blocks and taking action so that sea trout population along the south coast can reach their full potential.

9.0 Required research

There is a need to better understand the provenance of south coast sea trout to help drive the focus for future programmes. Under the Atlantic Aquatic Resource Conservation Project, the Environment Agency is working with the West Country Rivers Trust to gain a greater understanding of the origins and interactions between south coast sea trout through undertaking genetic studies. A considerable number of samples have been collected from both rod caught sea trout and resident brown trout stocks for micro-chemical analysis to ascertain their freshwater origin and marine distribution.

Further research is needed to understand behavioural aspects such as the triggers for adult migration and critical flow requirements for different life stages; the timing of smolt runs; and whether estuaries play a crucial role in both juvenile and adult life stages.

A better understanding of the relationships between nursery habitats on small, sometimes ephemeral side streams and the location of overwintering fry, as well as timing of seaward migrations may help to provide critical protection from certain licensed activities as well as any proposed future development.

Exploitation and predation pressures are difficult to quantify and therefore must remain a potential source of concern. A better estimate of by-catch from local in shore fishing activity is required, as is any changes in estuary fishing pressure, both legal and illegal.

Changes in the balance of predators such as mink and otter, cormorant, heron and egret need to be clearly understood. These are pressures that are often focused on by some groups with a poor understanding of predator prey relationships but having the answers to questions when raised will help with the design of improvement schemes and may also help to allay any unhelpful deviation from tackling the big issues impacting trout stocks.

Further understanding is required on the impacts of climate change and options to mitigate its impact.

10.0 What needs to be done

Given the peripheral interest in sea trout fisheries that there has historically been across the south coast when compared to trout, coarse and salmon fisheries, it is surprising just how much has been achieved. Recent improved understanding of the important contribution that sea trout make to resident trout populations may help to influence land and fishery owners of the importance of future protection and enhancement of areas not previously thought to be important. Effective communication to landowners and fishery owners of the role of sea trout and the importance of managing habitat to support spawning and juvenile life stages is important, even where the fishery is unlikely to exploit sea trout as a target species. Many riparian owners on the south coast are unaware of the presence of sea trout, but are delighted when they realise they are in their rivers. This ‘wow’ factor should be used to encourage good management practice and work to support this enigmatic species.

Delivery of the programme of actions set out in the South East and Thames River Basin Management Plans under the Water Framework Directive will be crucial to see continued progress in improving connectivity, habitat, water resources and water quality. It is then essential that full advantage is taken of improved main stem access by working to enhance and protect small side streams and tributaries. The Wild Trout Trust, local Rivers Trusts, landowners amongst others are well placed to tackle these smaller works, deliver practical projects on the ground and promote best practice habitat management, which are central planks of the South Coast Sea Trout Action Plan.

11.0 Key Actions

11.1 Improve fish passage and habitat connectivity

No.	Action	Delivery	Estimated capital cost	Timescale	Priority
1.	Address 25 priority River Basin Management Plan obstructions to fish passage.	Environment Agency, Wild Trout Trust, Rivers Trusts, NGOs, fisheries, landowners	£2.5 million	2011-15	H
2.	Tackle 15 significant small scale obstructions to fish passage using low cost approaches	Wild Trout Trust, Rivers Trusts, NGOs, fisheries, landowners	£150,000	2011-15	H
3.	Inspect and review the region's fish passage network to ensure that they remain effective and are appropriately maintained.	Environment Agency	-	2011-15	H

Here are three examples of sites that we want to improve:

Fig.(17) Obstructions to fish passage at Barcombe on the Ouse

Fig.(18) A structure on the Cuckmere near Arlington is a significant block to migrating trout

Fig.(19) A culvert on the Plumpton Mill Stream is a priority on the Ouse

11.2 Spawning habitat improvement

No.	Action	Delivery	Estimated cost	Timescale	Priority
1.	Identify critical spawning and nursery reaches	Environment Agency, Wild Trout Trust, Rivers Trusts, fisheries, landowners	-	2011-12	H
2.	Deliver 15 practical sea trout habitat enhancement projects together with promoting improved habitat management.	Environment Agency, Rivers Trusts, NGOs, fisheries, landowners. The Wild Trout Trust to use its Advisory Visit programme to deliver sea trout enhancements.	£100,000	2011-15	H
3.	Wild Trout Trust with the Environment Agency maintain a prioritised list of potential habitat improvement projects.	Environment Agency and Wild Trout Trust	-	2011-15	M

Target areas include:

Fig.(20) The straightened section of the Cadnam River in the New Forest

11.3 Protection of sea trout stocks

No.	Action	Delivery	Estimated cost	Timescale	Priority
1.	Undertake targeted, intelligence led marine enforcement patrols and up-river anti-poaching operations at vulnerable locations. Work closely with Inshore Fisheries and Conservation Authorities, Marine Management Organisation, Police wildlife crime officers.	Environment Agency, Inshore Fisheries and Conservation Authorities	-	2011-15	H
2.	Encourage fishing clubs to move away from stocking fertile brown trout in line with the objectives set out in the Environment Agency's National Trout and Grayling Fisheries Strategy.	Action Environment Agency and Wild Trout Trust	-	2011-15	M
3.	Widely promote the proven benefits of catch and release to rod fisheries.	Action Environment Agency and Wild Trout Trust	-	2011-15	M

Actions include:

Fig.(21) Promoting catch and release. A sea trout is returned at Woodmill on the River Itchen.

Fig.(22) Joint intelligence based patrols by the Environment Agency and Inshore Fisheries and Conservation Authorities.

11.4 Protect and improve water resources and water quality

No.	Action	Delivery	Estimated cost	Timescale	Priority
1.	Deliver actions set out in the South East and Thames River Basin Management Plans ensuring that they meet the needs of sea trout.	Environment Agency working in partnership with water companies, local authorities, land owners etc	-	2011-15	H
2.	Inform and influence the Environment Agency's Restoring Sustainable Abstraction Programme, Drought Management Plans and Pollution Prevention Plans highlighting vulnerability during low flows and sensitive spawning and nursery areas.	Environment Agency, Atlantic Salmon Trust and Wild Trout Trust	-	2011-15	H
3.	Inform and influence the next round of water company investment (PR14)	Environment Agency, Atlantic Salmon Trust and Wild Trout Trust		2011-15	H
4.	Inform and influence Catchment Sensitive Farming	Environment Agency, Atlantic		2011-15	H

	actions to reduce siltation of spawning and nursery areas.	Salmon Trust and Wild Trout Trust			

11.5 Mitigate the impact of climate change

No.	Action	Delivery	Estimated cost	Timescale	Priority
1.	Identify at risk areas from the impacts of climate change.	Environment Agency, Atlantic Salmon Trust and Wild Trout Trust	-	2011-12	M
2.	Identify options for mitigating the impacts of climate change.	Environment Agency, Atlantic Salmon Trust and Wild Trout Trust	-	2011-12	M

11.6 Improve understanding of sea trout

No.	Action	Delivery	Estimated cost	Timescale	Priority
1.	Support the AARC project to better understand the genetic characteristics and lifecycle of south coast sea trout.	Environment Agency, Rivers Trusts, West Country Rivers Trust	-	2011	H
2.	Identify and commission further research aimed at informing future management actions. Priorities: • Pull together existing grey literature • Use of ephemeral streams for spawning • Impacts of drought • Timing of smolt run • Importance of estuaries in supporting different life stages • Triggers for migration • Critical flow requirements for different life stages • Climate change mitigation options	Environment Agency, Atlantic Salmon Trust and Wild Trout Trust	-	2011-15	M
3.	Ensure that the South Coast Sea Trout Action Plan works closely with the Living North Sea Project and the Celtic Sea Trout Project to help answer questions about the provenance of sea trout stocks.	Environment Agency, Atlantic Salmon Trust and Wild Trout Trust	-	2011-15	M

11.7 Raise awareness

No.	Action	Delivery	Estimated cost	Timescale	Priority
1.	Publicise and communicate the importance of sea trout and best practice sea trout habitat management.	Environment Agency, Atlantic Salmon Trust and Wild Trout Trust	-	2011-15	H

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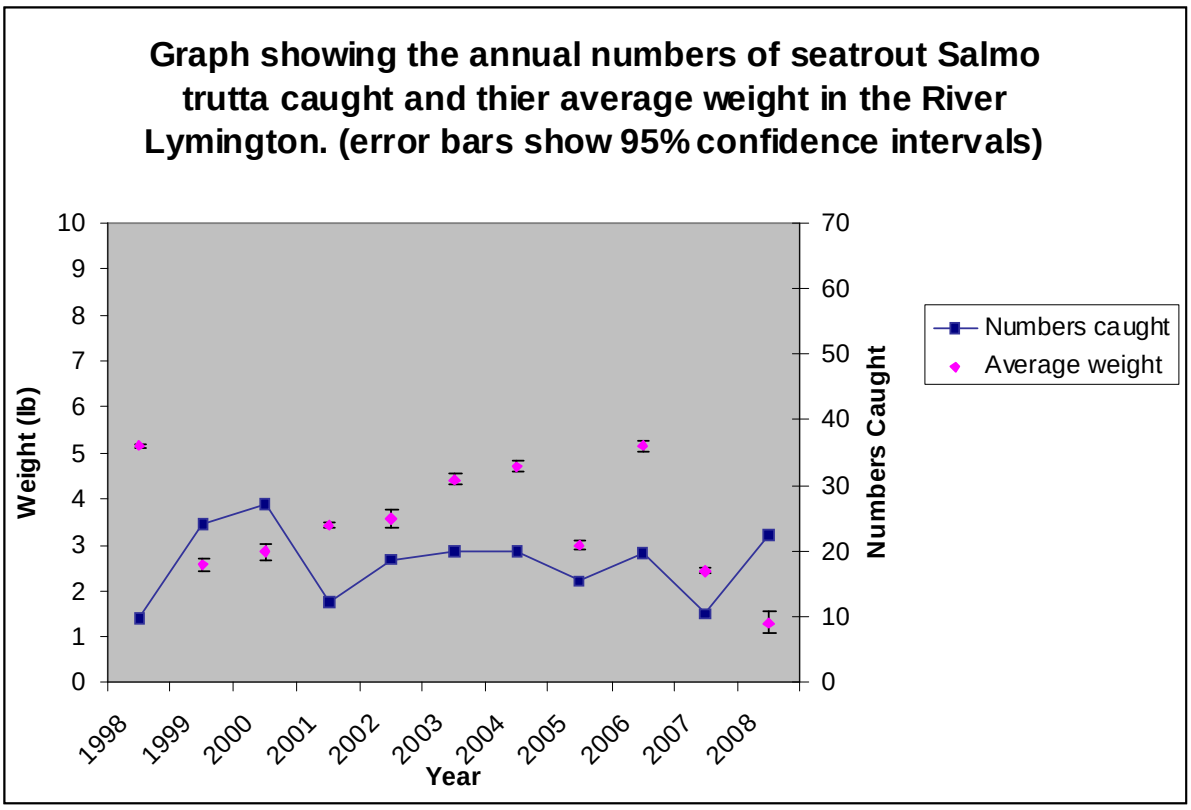
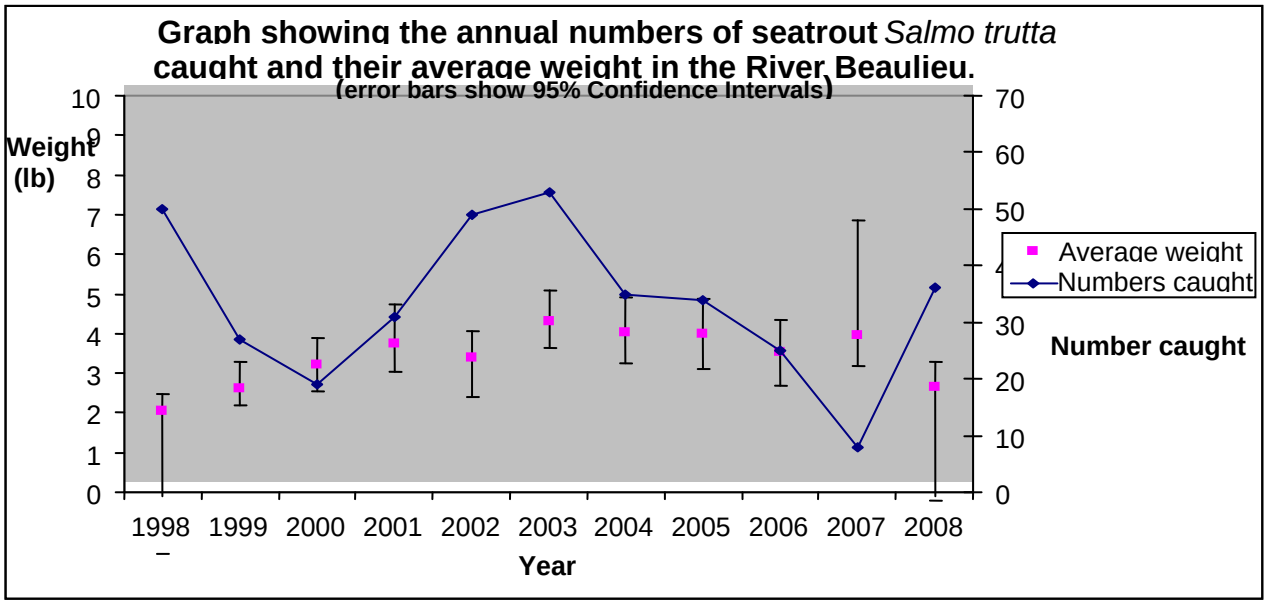
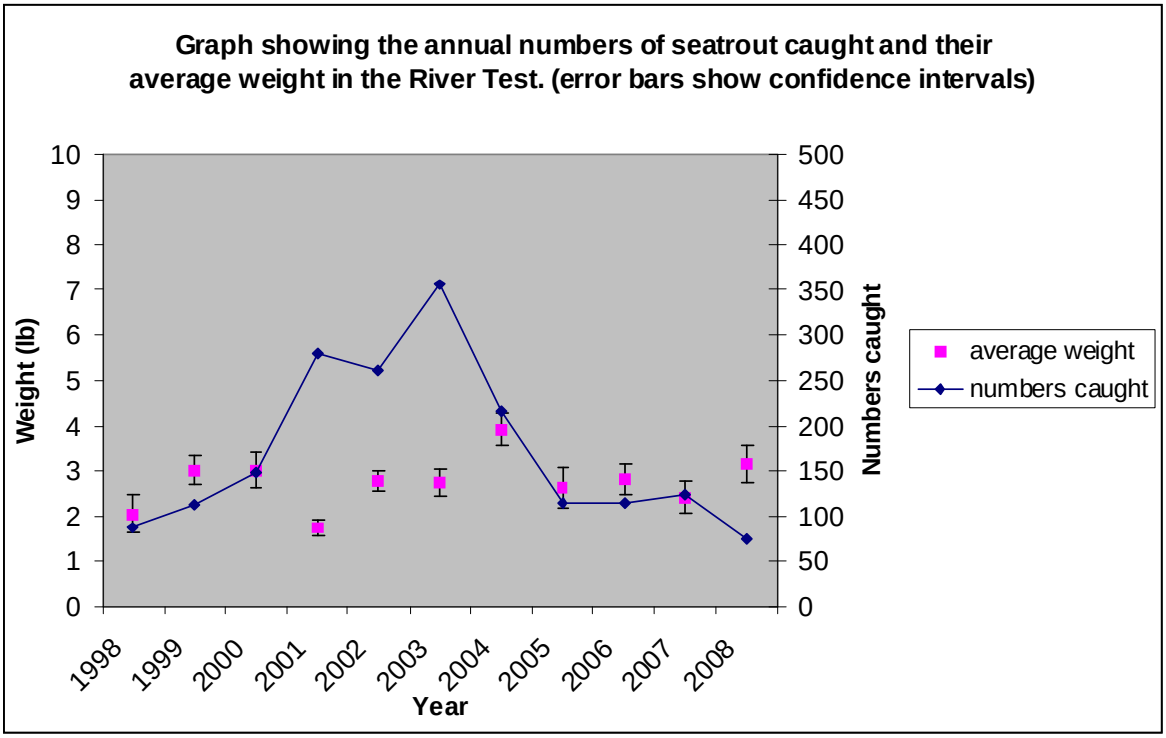
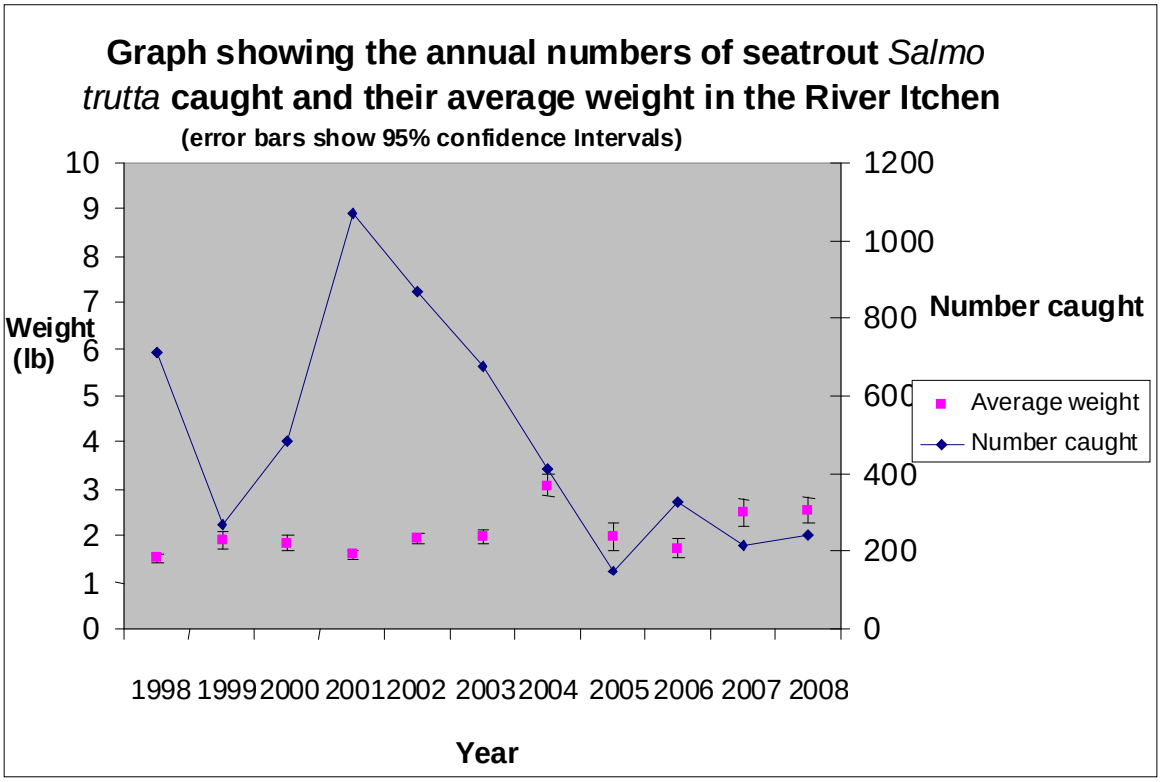
Appendix 1 Declared sea trout rod catch data by river 1998 – 2008

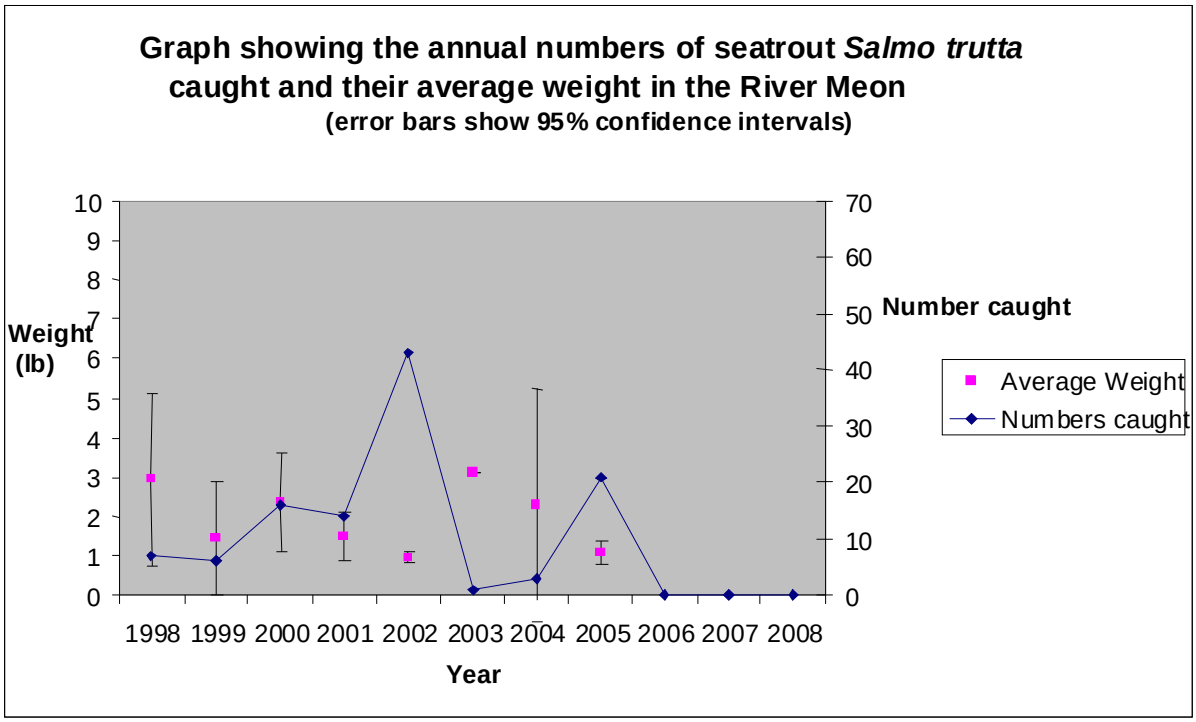
The following declared sea trout rod catches only provide a partial indication of the sea trout runs, as catch returns are notoriously inaccurate. Issues that affect this include failure to declare catches, a lack of angling effort and sea trout entering rivers after the end of the fishing season, which is affected by low flows.

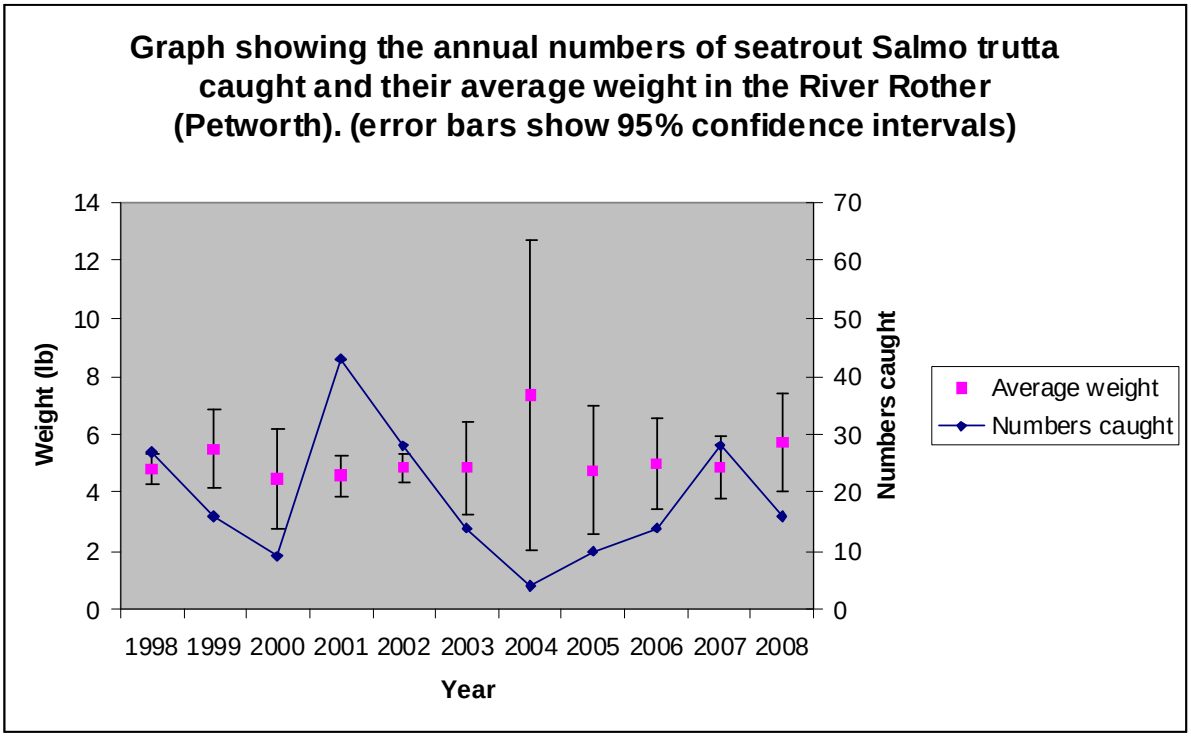


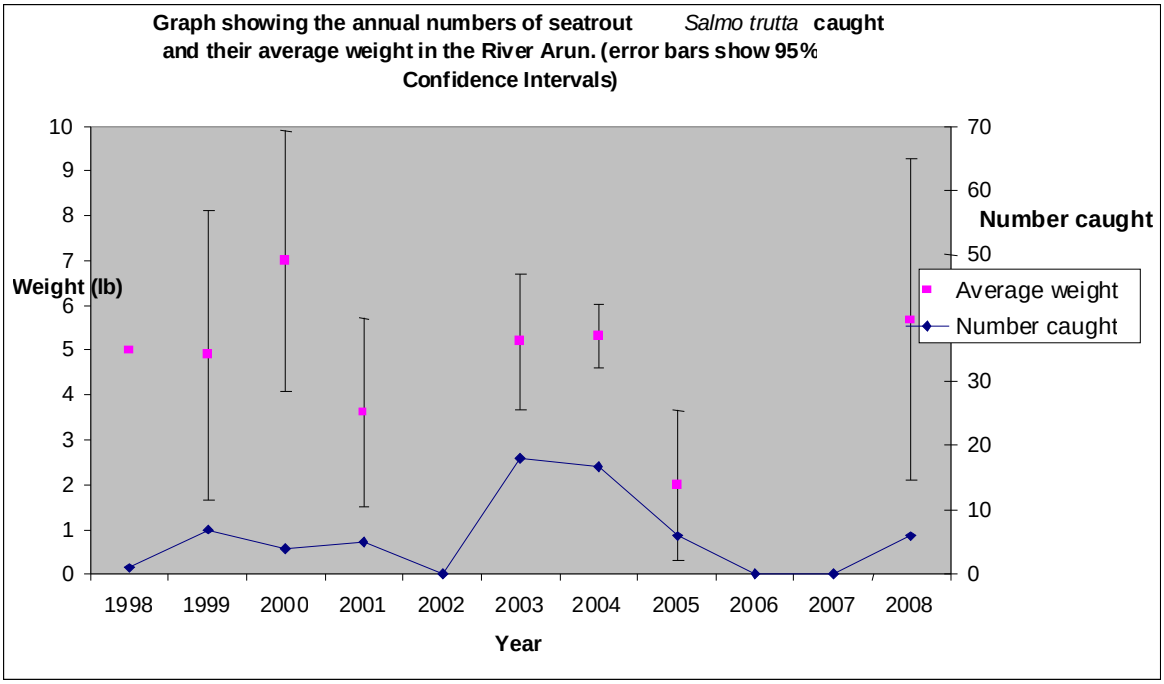


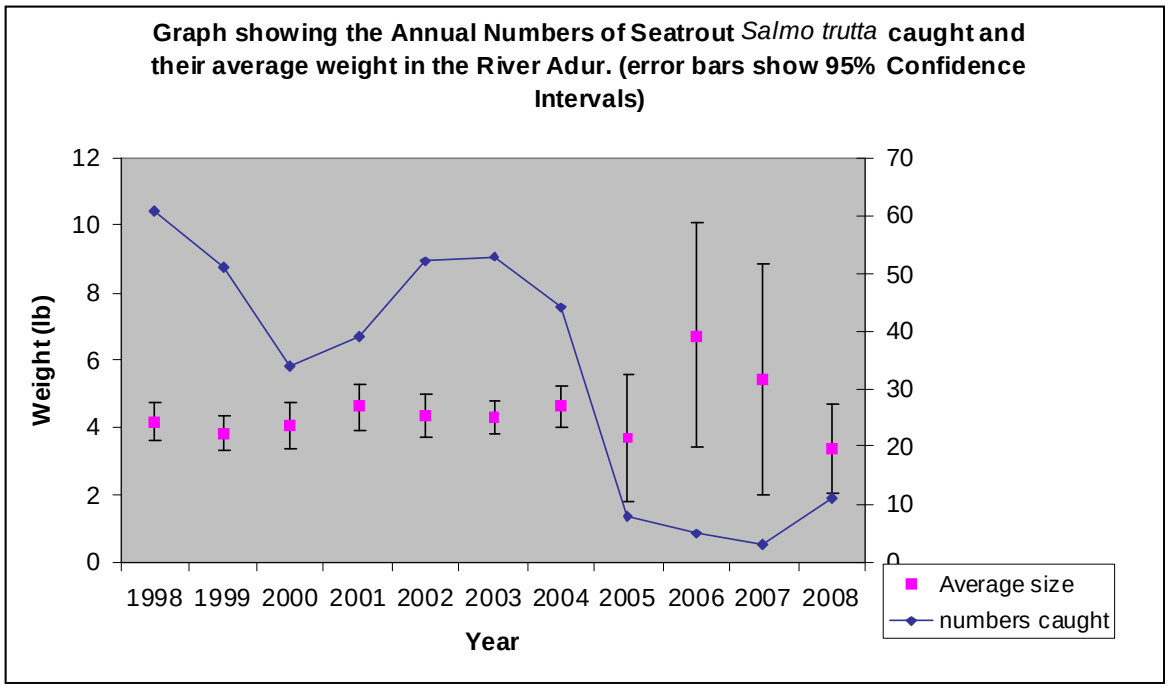

Graph showing the annual numbers of seatrout caught and their average weight in the River Test. (error bars show confidence intervals)
Weight (lb)
Numbers caught
Year
average weight
numbers caught
0
1
2
3
4
5
6
7
8
9
10
0
50
100
150
200
250
300
350
400
450
500
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008

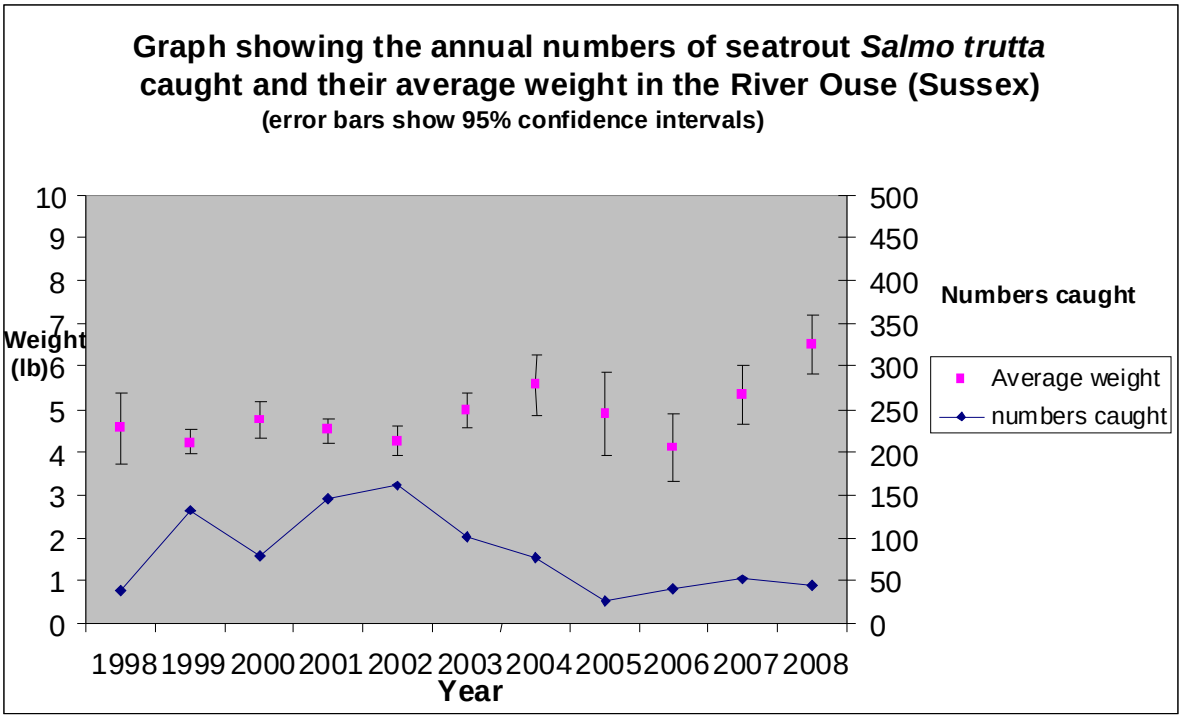

Graph showing the annual numbers of seatrout *Salmo trutta* caught and their average weight in the River Itchen
(error bars show 95% confidence Intervals)
Weight (lb)
Number caught
Year
Average weight
Number caught
0
1
2
3
4
5
6
7
8
9
10
0
200
400
600
800
1000
1200
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008

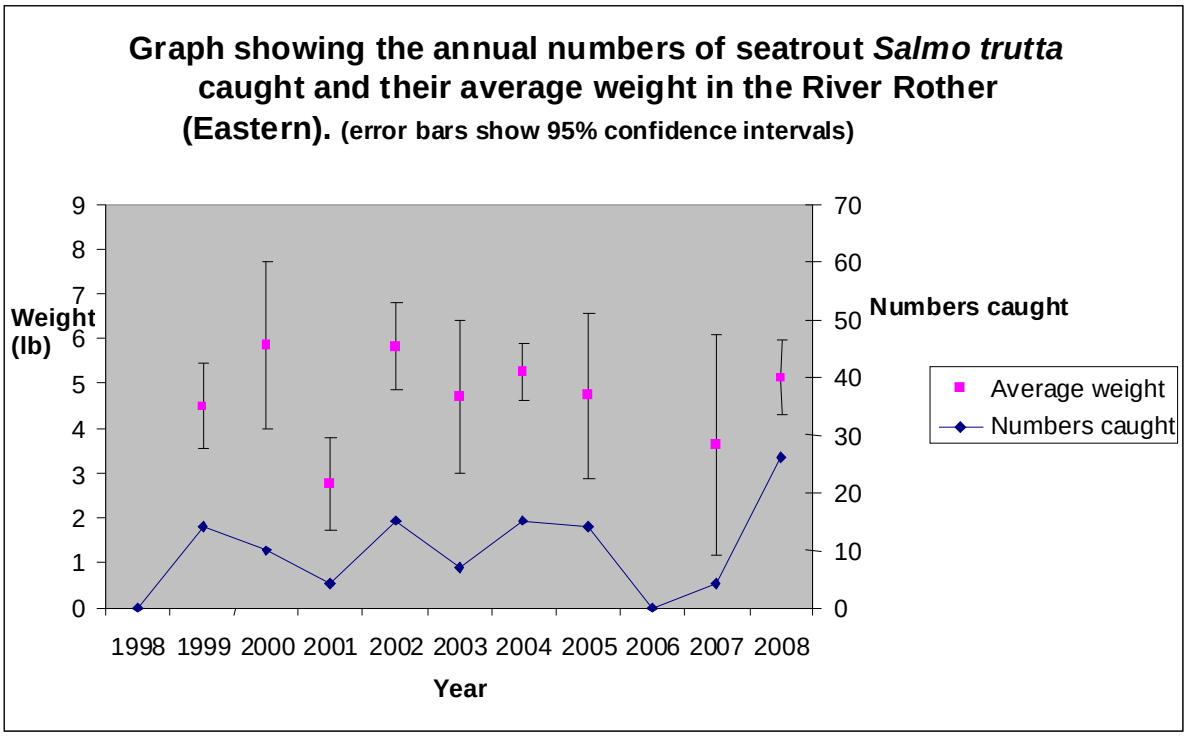

Graph showing the annual numbers of seatrout *Salmo trutta* caught and their average weight in the River Meon
(error bars show 95% confidence intervals)
Weight (lb)
Number caught
Average Weight
Numbers caught
Year
0
1
2
3
4
5
6
7
8
9
10
0
10
20
30
40
50
60
70
1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008


Graph showing the annual numbers of seatrout Salmo trutta caught and their average weight in the River Rother (Petworth). (error bars show 95% confidence intervals)
Weight (lb)
Numbers caught
Average weight
Numbers caught
Year
0
2
4
6
8
10
12
14
0
10
20
30
40
50
60
70
1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008


Graph showing the annual numbers of seatrout *Salmo trutta* caught and their average weight in the River Arun. (error bars show 95% Confidence Intervals)
Weight (lb)
Number caught
Year
Average weight
Number caught
0
1
2
3
4
5
6
7
8
9
10
0
10
20
30
40
50
60
70
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008


Graph showing the Annual Numbers of Seatrout *Salmo trutta* caught and their average weight in the River Adur. (error bars show 95% Confidence Intervals)
Weight (lb)
Year
Average size
numbers caught
0
2
4
6
8
10
12
0
10
20
30
40
50
60
70
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008


Graph showing the annual numbers of seatrout *Salmo trutta* caught and their average weight in the River Ouse (Sussex)
(error bars show 95% confidence intervals)
Weight (lb)
Numbers caught
Average weight
numbers caught
Year
0
1
2
3
4
5
6
7
8
9
10
0
50
100
150
200
250
300
350
400
450
500
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008


Graph showing the annual numbers of seatrout *Salmo trutta* caught and their average weight in the River Rother (Eastern). (error bars show 95% confidence intervals)
Weight (lb)
Numbers caught
Average weight
Numbers caught
Year
0
1
2
3
4
5
6
7
8
9
0
10
20
30
40
50
60
70
1998
1999
2000
2001
2002
2003
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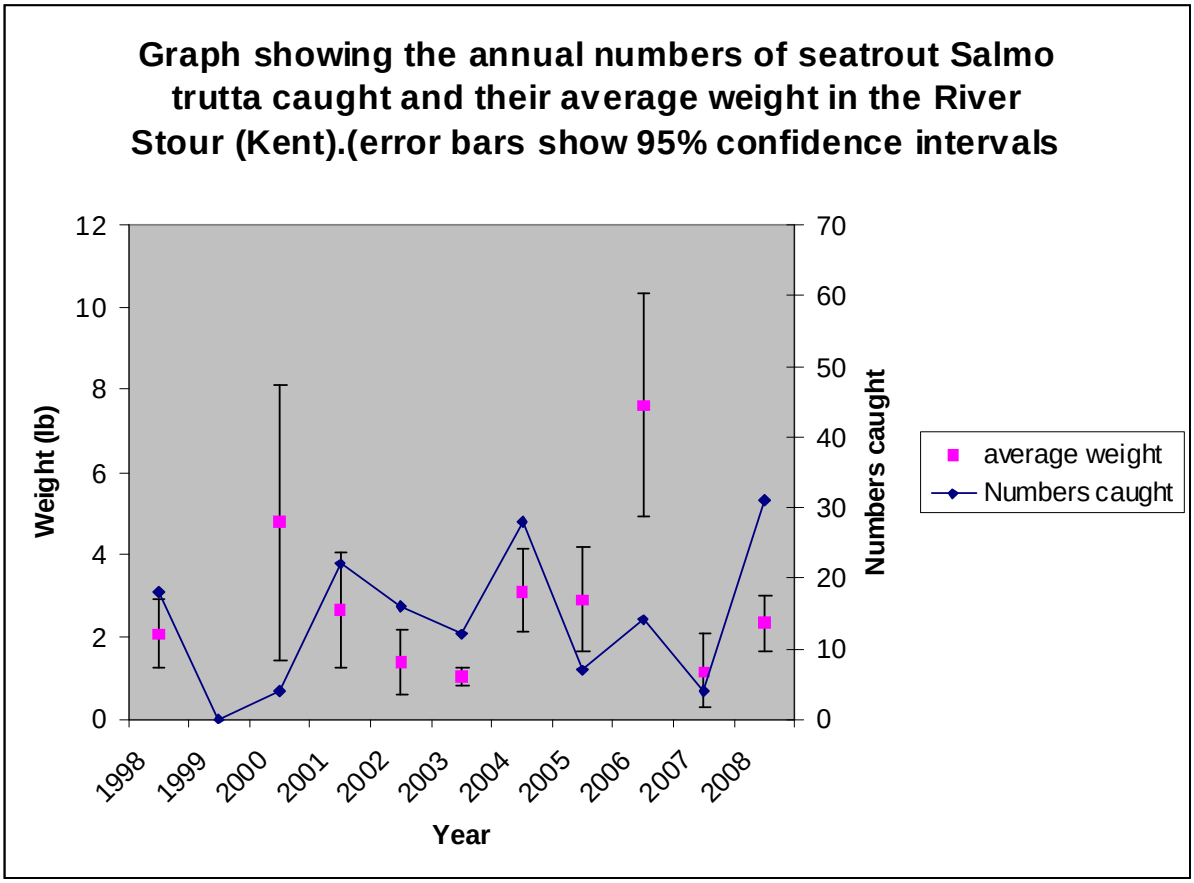
Graph showing the annual numbers of seatrout Salmo trutta caught and their average weight in the River Stour (Kent).(error bars show 95% confidence intervals
Weight (lb)
Numbers caught
Year
average weight
Numbers caught
0
2
4
6
8
10
12
0
10
20
30
40
50
60
70
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008