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Wales**

A PLAN OF ACTION FOR SALMON AND SEA TROUT IN WALES – TACKLING THE ‘SALMONID EMERGENCY’



Natural Resources Wales

2nd April 2020

Foreword

This important plan of action describes, and then provides details of, the actions required if we are to restore healthy and more sustainable populations of our iconic Welsh salmon and sea trout.

I do not underestimate the impact of the changes that follow from the decision taken by the Minister for Environment, Energy and Rural Affairs to confirm the recent fishing byelaws. However, for maximum impact, these changes need to work alongside wider measures and action across Wales.

I have continued to emphasise the importance of working proactively with a wide range of partners. Despite the challenges involved in changing practices we must work collaboratively if our endeavours are to succeed. As well as working with partners across Wales to identify the ongoing pressures and seeking views on priorities for action, we will also be looking to deliver through others, reinforcing good working relationships to gain the positive outcomes for salmon and sea trout stocks.

I am therefore delighted to confirm that, working with Welsh Government and through our grant programme, we have identified significant new funds to support the delivery of this plan by working with partners across Wales. We will do all that we can during the coming year to ensure this work succeeds.

Alongside our grant programme, we will support work through our broader remit. This Plan therefore considers NRW's work on habitat and land management, water quality, and metal mine remediation, amongst many others, each of which has the potential to mitigate the challenges facing our fish populations. We need to work across the broadest possible remit if we are to achieve our goal of sustainable and resilient fish populations in future.

I look forward to working with all our partners to tackle the challenges and seize the opportunities associated with improving and sustaining resilient environments for our iconic fish populations for many years to come.

Clare Pillman

Chief Executive Officer, Natural Resources Wales

April 2020

NOTE - CORONAVIRUS

This Plan was compiled from the results of discussions with stakeholders in Autumn 2019 and following further debate with Welsh Government.

These both pre-date the unprecedented circumstances arising from the COVID19 pandemic. Some of the committed work referred to in this Plan will be affected by the instructions issued by the UK and Welsh Governments. Notably environmental monitoring, including fish stock monitoring, and fieldwork to support project delivery, amongst other activities, are likely to be affected for an uncertain period. This is also the case for at least some of our delivery partners.

NRW is adapting working arrangements due to the coronavirus pandemic.

For more information see [our main page on coronavirus.](#)

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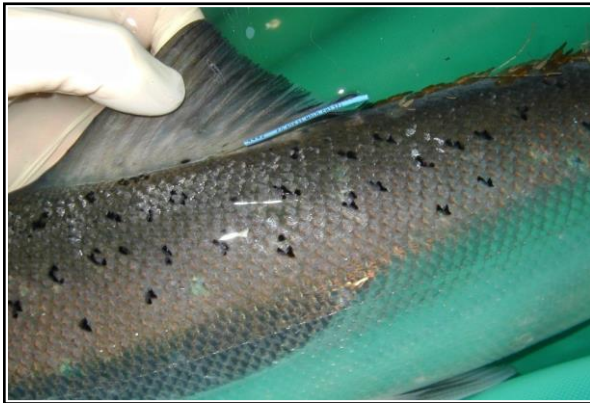
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Salmon captured in the index trapping operation on the River Dee, North Wales – a part of the Dee Salmon Assessment Programme.



Dee trap: floy tagged salmon and Visible Implant tagged sea trout.



Large sea trout, caught by an angler on the Afon Tywi (copyright Tim Hughes)



1. Purpose

This Plan sets out the actions to which Natural Resources Wales (NRW) commits in order to secure the protection and restoration of populations of salmon and sea trout in Welsh rivers.

Both are iconic species, requiring high quality freshwater habitats to thrive. They demonstrate to society the environmental quality of our catchments, whilst also providing important opportunities for healthy and valuable recreation.

In common with most other countries across the North Atlantic distribution of salmon and the European range of sea trout, populations have declined over the past few decades. This has been most evident for salmon, but recently a sharp decline in Welsh sea trout stocks has also occurred (Figure 1).

Our response to these declines has included two decades of investment in habitat restoration, working in partnership with the rivers trusts that have emerged in this time. However, this has been localised and constrained by availability of resources, whilst there is much still to do.

Together with anglers we have also ensured that more fish survive each year to spawn: this has been achieved by a transformation of angler practices to greatly increase the uptake of voluntary catch-and-release fishing. This has been welcomed but the serious declines, firstly in early-running 'spring salmon' and now by all sea age components of salmon and, more recently, sea trout has led to mandatory fishing controls. It has become increasingly important to protect the spawning resources each year, as other actions are underway. Today, all salmon caught by rods and nets in Wales and, in certain circumstances and locations, sea trout must be returned alive and well after capture.

In confirming the new protective byelaws for salmon and sea trout. The Minister for Environment, Energy and Rural Affairs required NRW to: -

"...take the lead on a Welsh specific Plan of Action for the protection of Salmon and Sea Trout, working with stakeholders. The Plan will need to pull together all the current work being taken forward by all relevant parties, as well as identify the gaps and actions to address these. I ask you to look in particular at the issues raised at the Inquiry. My officials will work with you to contribute to this, as I hope will anglers and supporters of angling, as well as others, with an interest in this issue."

This Plan is the result of work with our stakeholder groups across Wales. It sets out the measures and initiatives required to address known pressures on salmon and sea trout stocks in order to halt and reverse the declines.

2. Our vision for salmon and sea trout in Wales

NRW commends a shared vision for salmon and sea trout in Wales: -

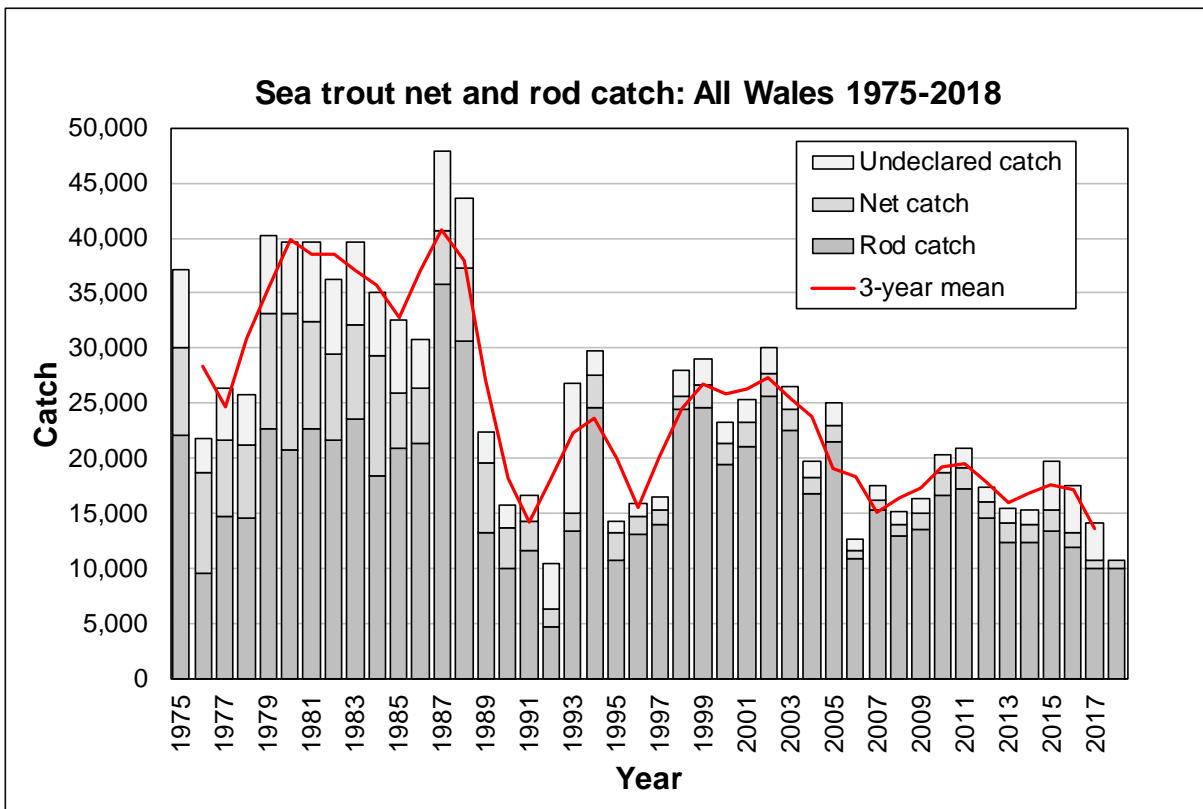
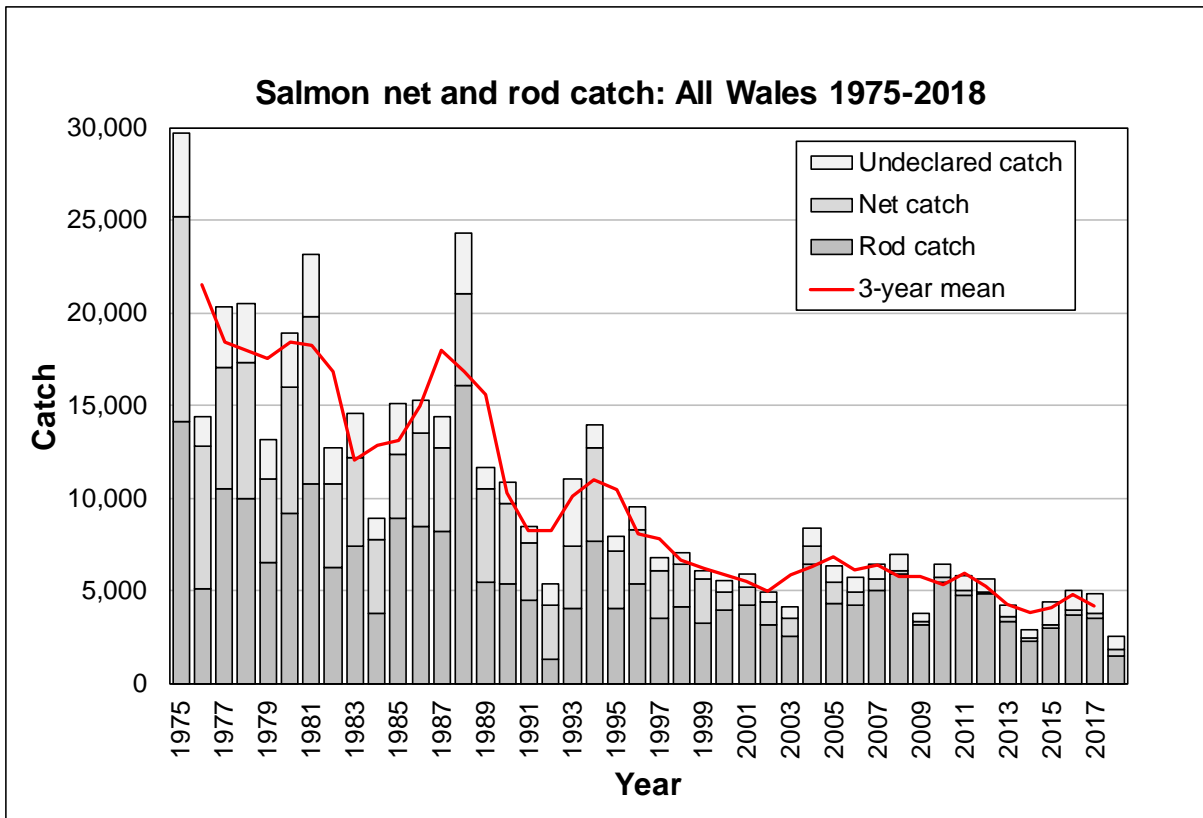
“To protect, through the application of best-practice science and management, the sustainability of our natural resource of wild salmon and sea trout stocks in Wales.”

Success will see our stocks flourish once again, achieving the targets we set for ourselves but importantly also contributing to better socioeconomic outcomes. We can contribute to achieving many of the wellbeing goals for Wales: -

- a resilient Wales with healthy functioning ecosystems that support social, economic and ecological resilience and the capacity to adapt to change. For example, climate change, which drives us to ensure that our sensitive upland streams are prepared to buffer the worst effects of a warming climate;
- a more prosperous Wales through increased uptake of valuable recreational angling;
- a healthy Wales with more people enjoying the opportunity to experience healthy populations of fish in our rivers.

We will achieve our vision and underlying objectives through deploying the resources available to us in order to fulfil our statutory duties, delivering against the statutory guidance that we receive from Welsh Government, whilst proactively seeking further opportunities to tackle the many challenges that exist to stock sustainability.

Figure 1. Trends in salmon and sea trout catches in Wales, 1975-2018



3. Introduction

Salmon and sea trout are important species to anglers and net fishers, not least because of the opportunity for healthy recreation and the socioeconomic value that arises from well-run fisheries. However, they are also important to society as a whole for whom the presence, or absence, of these iconic fish is widely regarded as a potent indicator of environmental health and quality.

In the past, stocks were more resilient to environmental challenges and were able to sustain significant mortality in rod and net fisheries. However, as the range of pressures has increased and new challenges have emerged, threatening the survival of fish in both the marine and freshwater environments, the status of stocks has progressively declined. Declines are generally ongoing, threatening the future of our populations of fish as never before.

The Plan indicates that Welsh Government, NRW and our partners and stakeholders understand the current severity of the status of salmon and sea trout stocks and the multiple factors affecting them, and that together we will take steps to address and resolve these.

NRW has sought and received contributions from all partners and relevant stakeholder groups who share our ambition for fish stocks and the fisheries they support. We will continue to work closely with Afonydd Cymru and the rivers trusts, fisheries non-government organisations (NGOs), Local Fisheries Groups (LFGs), and fishery owners and anglers to achieve the ambition of this Plan. We will continue to regularly communicate with them and all stakeholder groups across Wales in future, integrating working by all relevant bodies, and reporting on delivery of this Plan and development of a future longer-term Forward Delivery Plan.

The status and importance of salmon and sea trout in Wales

Both species are protected in law. Salmon are a species designated under the Habitats Directive, supporting classification of six rivers in Wales as Special Areas of Conservation, whilst sea trout and non-anadromous brown trout are recognised in the national Biodiversity Action Plan.

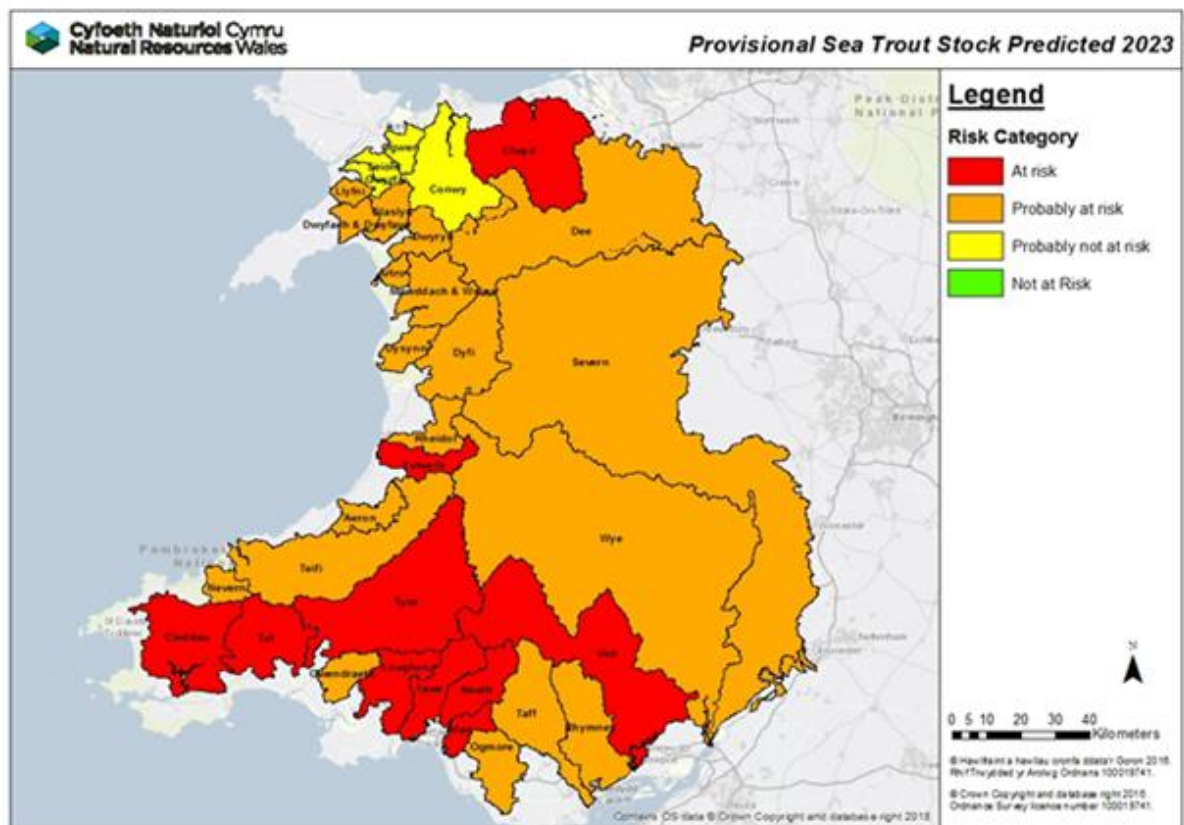
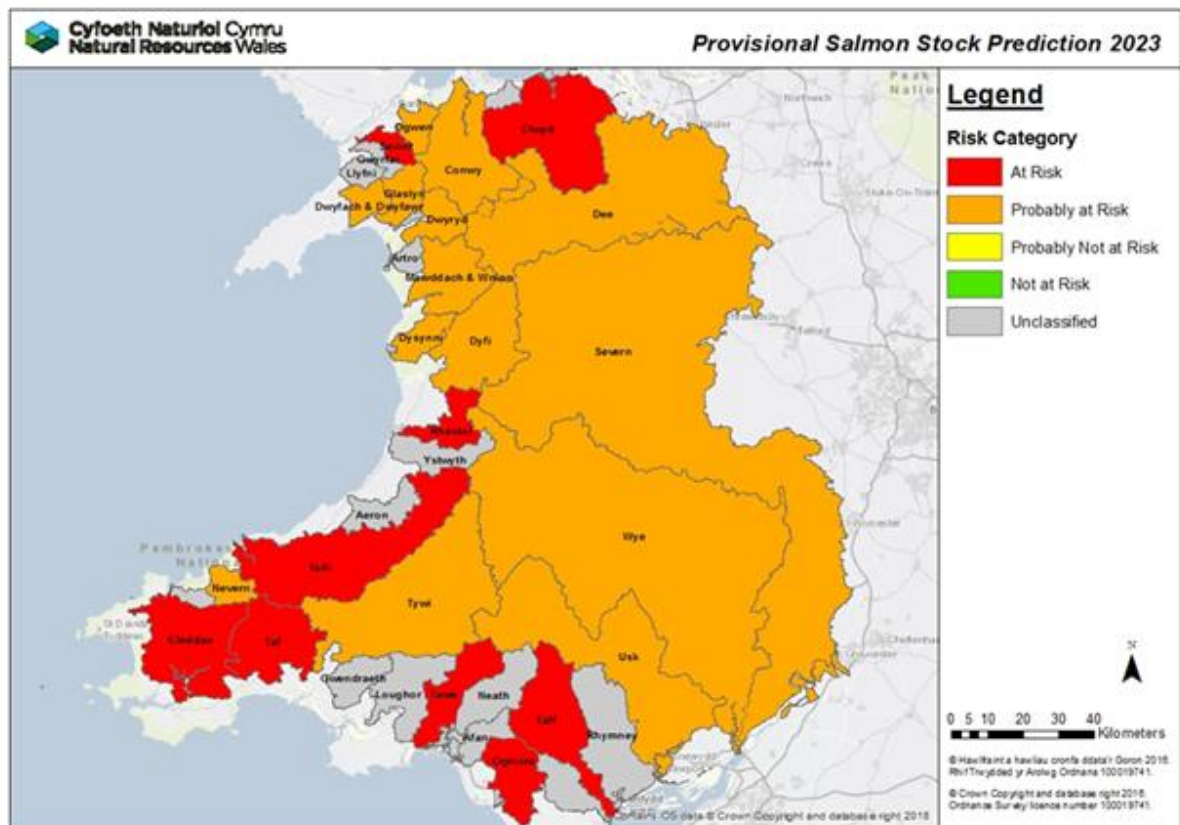
We assess the status of our stocks annually, and almost all river populations are performing poorly: all 23 salmon stocks in our 'principal salmon rivers' are either 'At Risk' or 'Probably at Risk' of failing to achieve their management targets until at least 2024. and most are in ongoing decline. Over two-thirds of our sea trout stocks are similarly classified (Figure 2).

Angling in Welsh rivers is economically important, currently supporting over 700 full-time equivalent jobs and producing an annual household income of about £20 million, with scope for more. There is therefore an opportunity to grow the angling economy back to former higher economic levels, providing greater health and wellbeing benefits, and therefore supporting our shared wellbeing goals.

Most of the actions previously taken to protect and restore fish populations, and many of those required in future, lead to broader environmental restoration and enhancement outcomes – they therefore represent an important investment in the sustainable management of natural resources.

Restoring our stocks to the abundance last seen 30-40 years ago will not happen overnight. Action is needed both to address the easily recognised pressures on stocks today, such as the adverse effects of inappropriate land-use, but also emerging and new pressures such as the impact of climate change on habitats. Some pressures may be outside our immediate control, but even there we need to exert what influence we can.

Figure 2. Provisional status of salmon and sea trout stocks, 2023



4. Diagnosing the problems

The current 'salmonid emergency' has arisen against the backdrop of current management practices across many sectors, and it is therefore important that we determine where those practices need to change and how we bring that about.

Partner workshops

Between October and December 2019 NRW hosted special meetings of the Wales Fisheries Forum and all Local Fisheries groups. The many pressures identified are reported separately ('Note on stakeholder engagement: identifying the pressures on stocks', available from NRW), however the principal pressures that damage habitats and fish populations identified by all stakeholder groups were: -

- the damage to many of our rivers arising from agricultural pollution;
- the poor status of habitats in our rivers that constrains fish distribution and survival; and
- the unsustainable predation on impoverished juvenile salmonid populations by predatory birds. It was noted that predation is a natural phenomenon, but that this must be sustainable and potentially controlled when stocks are in very poor condition, as many are now.

However, NRW recognises other constraints to stock resilience. The over-riding significance and implications of potential climate change in the marine and freshwater environments is clearly a major concern. There have been substantial reductions in the marine survival of salmon over the past two decades.

It is also inevitable that there will be synergies between some pressures, for example the impact of intensive agriculture and a warming climate.

It is of course noteworthy that, whilst river habitat restoration delivers for fish, it also contributes to the wellbeing of other flora and fauna that depend on good quality rivers. It is therefore an important investment in the sustainability of our natural aquatic resources and as such should be a valuable initiative for a range of other stakeholders.

5. The Plan of Action

This Plan is for the remediation of adverse pressures on salmon and sea trout stocks where it is in our direct capability to do so. But it will also influence actions on pressures arising outside our immediate jurisdiction that also threaten to damage our stocks. We will need to adapt our Plan and strategies as pressures change and as novel issues emerge.

This Plan summarises the ongoing and new actions needed to address the pressures affecting our fish populations. There is general agreement amongst partners and stakeholders on the identity and, in most cases, the nature of these pressures that – sometimes in isolation but often cumulatively - adversely impact upon our stocks. The wellbeing of our stocks depends on favourable conditions at sea and in our rivers. Together with our stakeholders, we have reviewed and identified the pressures damaging our stocks. It is clear that there is much to be done.

Together, we need to transform river quality so that it is optimised for fish survival and production. The fish saved by new fishing regulations must have the best chance of successful breeding and their progeny must survive to maximise smolt output. It is important to note that successful optimisation in this way will deliver multiple benefits such as ecosystem resilience, improved condition status of Natura 2000 features and WFD target outcomes.

Current actions by third parties

In addition to the work currently underway by NRW, many other partner organisations also undertake work that will deliver benefits for rivers and their flora and fauna. The environmental work of the water utilities was also noted. These relevant actions and initiatives already underway are summarised in a separate note ('Note on work undertaken by other parties', paper available from NRW).

Corporate actions - NRW

NRW is also currently engaged in important strategic initiatives that will support our shared aspirations for healthy and sustainable fish populations: -

NASCO Implementation Plan

NRW, together with the Environment Agency (EA) and Cefas (Centre for Environment, Fisheries and Aquaculture Science) are co-authors of the current NASCO (North Atlantic Salmon Conservation Organisation) 5-year Implementation Plan: -

[http://www.nasco.int/pdf/implementation_plans/Cycle3/IP\(19\)13rev_IP_EU-UK%20\(England%20and%20Wales\).pdf](http://www.nasco.int/pdf/implementation_plans/Cycle3/IP(19)13rev_IP_EU-UK%20(England%20and%20Wales).pdf)

This is an important commitment to deliver a range of outcomes for salmon and has been approved by Government ministers in Wales and England.

Water Framework Directive (WFD) River Basin Management Plans (RBMPs)

The third WFD cycle (2021-2027) plans will have greater ambition of scale and approach, prioritising whole catchments for action: -

<https://naturalresources.wales/evidence-and-data/research-and-reports/water-reports/river-basin-management-plans/river-basin-management-plans-published/?lang=en>

Area Statements and Opportunity Catchments

NRW will, following the requirements of the Wellbeing of Future Generations Act (2015) and the Environment (Wales) Act (2016), adopt a place-based method to deliver SMNR (the Sustainable Management of Natural Resources) in a suite of Opportunity Catchments (OCs) across Wales. In these catchments we will focus on supporting partnership delivery of multiple benefits for waterbodies and well-being. Our recommended list will represent the strongest mix of opportunities for integrated catchment management in each NRW operational area.

The Area Statements reference opportunities for catchment solutions: -

<https://naturalresources.wales/about-us/area-statements/?lang=en>

In Oct 2020 we will publish the list of OCs within the draft RBMP3 consultation. Marine and estuarine waterbodies will be included - a departure from the freshwater focus targeted waterbodies in RBMP2. Area Statements are to be live documents, and future iterations beyond March 2020 will refine the priorities for each catchment.

OCs are a vehicle to integrate RBMPs and Flood Risk Management Plans (FRMPs) by featuring in both plans. Opportunities for nature-based solutions and natural flood risk management will exist in some OCs, and whilst specific projects won't be detailed in the RBMPs and FRMPs such initiatives can be taken forward by place-based work programmes.

The Action Tables

It is important to recognise that the life-cycle of most salmon and many sea trout stock components is of four, or five, years duration. The Plan must therefore be regarded as a medium to long-term commitment and will be liable to change as outcomes arise and lessons are learned.

In the action tables below, we briefly describe the nature of the issues and the need for action. We have indicated: -

- Lead and partner organisations;
- the timescales and priority for each item;
- the work items that will continue under current baseline funding to NRW;
- the work items that will be progressed in 2020/21; and
- the work elements to be considered within a future 3-year 'Forward Delivery Plan'.

Resources

Resources are critical if we are to make a difference. NRW will continue to commit ongoing staff and project resources to fisheries work in 2020/21, however, the full range of the challenges recognised in this Plan must also be addressed.

Further resources have been provided by Welsh Government to implement a range of work in 2020/21 that will restore aquatic habitats and bring benefit to fish populations. These include investment in: -

- National Forest
- Natura 2000 Network Maintenance and Enhancement
- Metal Mines Programme
- National Peatland Restoration

- Water Quality Improvements – including fisheries habitat restoration programmes
- River Restoration

The total value of this investment is approximately £15 million, and the specific investment in the fisheries habitat programmes is approximately £2 million.

It is essential that we work with all stakeholders and relevant partners to identify and build on shared interests. Much work is already underway, and it is anticipated that this Plan will further raise the profile to encourage more timely action.

It is important to note that a range of work undertaken by other NRW business areas also delivers outcomes that also bring benefit to our fish populations. For example, remediation of the legacy of some polluting metal mines will improve water quality in tens of kilometres of upland rivers.

Addressing the gaps

This is a strategic Plan for Wales. It is also important that local detailed plans are developed with local stakeholders, drawing on the information in this paper. These Fish Habitat Restoration Plans are currently in production and will identify the ‘gaps’ between work that has and is currently being delivered by NRW and all partners, and those that are needed in coming years to address pressures and restore sustainability to our stocks.

The full set of catchment-based plans for Wales will be completed during 2020/21.

Existing known pressures, and those that are emerging, cannot be quickly resolved. Therefore, in addition to this Plan, a forward-looking plan will be required. This 3-year ‘Forward Delivery Plan’ must go beyond 2020/21, and production of this is a commitment made here.

Assessing outcomes

The outcome of investment in many of the proposed works must be assessed in order to learn what works and what does not, and to demonstrate progress. Existing fish monitoring and assessment work will generally suffice; however, some further work is required and is included in this Plan.

Partnerships and future stakeholder engagement and communication

NRW cannot deliver on the ambition of this Plan alone, and we therefore need to build on existing partnerships with Afonydd Cymru and their family of rivers trusts, the Wales Fisheries Forum, other fisheries bodies, fishery owners and water utilities amongst others.

A high priority during 2020, as Year 1 actions are implemented, will be the development of a 3-year ‘Forward Delivery Plan’ for 2021/22 – 2023/24 to continue work to deliver solutions to environmental pressures. This will cover, but not be restricted to, matters such as restoration of river habitats and tackling predation by fish-eating birds.

Delivery of the work described in the Action Tables and development of the future longer-term ‘Forward Delivery Plan’ will be the subject of ongoing engagement with our partners.

The Plan will be reviewed at each LFG meeting by NRW and our partners, notably the Wales Fisheries Forum. This will be a fully transparent process that will be shared with all stakeholder groups and partners.

We also need to identify and work with new partners who may also have an interest, and a stake in our river environments and the flora and fauna they sustain. We will work to establish these relationships.

ACTION TABLES

These tables set out actions on the critical matters that determine the wellbeing of our fish populations.

The issues covered are: -

1. Evidence – understanding the status of stocks
Understanding the status of stocks by delivery and regular review of cost-effective salmonid resource monitoring and modelling.
2. Managing exploitation:
Ensuring that stocks are not exploited unless they are sustainable, so that they may respond as soon as possible to the alleviation of other pressures.
3. Protecting stocks through effective enforcement
Deployment of resources to enforce fisheries legislation.
4. Tackling physical habitat constraints in the freshwater environment:
Understanding all habitat pressures and constraints to the performance of our rivers for fish, and plan for remediation as soon as practically possible.
5. Safeguarding water quality and quantity:
Providing optimum conditions of water quality and quantity through achieving the objectives of the Water Framework Directive.
6. Addressing land management, and associated risks to water quality:
Land management is the predominant factor that determines the quality of freshwater environments. Inappropriate land use by the agricultural sector has caused many pollution incidents in our rivers.
7. Addressing predation on salmonids: fish-eating birds and seals:
To understand the implications of predation, notably by fish-eating birds, and deliver against the report of NRW's external expert group.
8. Understanding marine Pressures
To understand and take action wherever possible to address pressures acting in the coastal and marine environment.
9. Understanding new and emerging potential pressures:
Remain vigilant in identifying and assessing new pressures that may threaten our fish populations.

Each table indicates:

- **current actions:**

work undertaken by NRW (and, where appropriate, partners) under its current funding scenario;

- **future requirements - committed:**

new work that will be prioritised and undertaken under current resource scenario;

- **future requirements – proposed:**

new work that is considered important and necessary but is not currently resourced.

The term “Forward Delivery Plan” is used here to refer to such future works – which currently remains subject to future annual budget discussions.

- **dates, resources and priorities**

This indicates the timescale of work, the resourcing of this under current scenarios (i.e. ‘committed’ or ‘proposed’) and the relative priority of the work.

1. Evidence – understanding the status of stocks

As an evidence-based organisation, NRW must make sure our decisions and actions are underpinned by high quality evidence. We need to ensure that our methods of monitoring, analysis and interpretation are robust, whilst keeping up-to-date with the latest research. We work closely with other organisations to collect and analyse data and constantly keep our environmental evidence base under review.

NRW implements stock assessment methodology designed to support the management of salmon stocks. The methodology for England and Wales was produced by a working group consisting of Cefas, the EA and NRW and the annual outputs are reviewed by DEFRA and WG prior to international evidence reporting to ICES. NRW has further designed and now implemented a similar methodology for sea trout stocks.

Current commitments include work to assess stocks based on juvenile monitoring data (1.4) and other potential fishery independent methods (1.5). These may be required in future should catch statistics become less reliable.

A full review of existing stock assessment methodology (1.6) is a commitment required in the Ministerial Direction that introduced Salmon Action Plans in 1998 and is reiterated in the current NASCO Implementation Plan.

It is an ambition of NRW to further develop the fish counter network in Wales that is currently limited to the rivers Dee, Teifi and Taff. This will provide catch-independent evidence of stock size together with evidence on migration timing and its relationship to environmental conditions.

1. EVIDENCE: UNDERSTANDING THE STATUS OF STOCKS	LEAD & PARTNERS	DATES, RESOURCES & PRIORITIES
ISSUE: Understanding the status of stocks by delivery, with regular review, of cost-effective salmonid resource monitoring.		
<p>CURRENT ACTIONS Monitoring of salmonid stocks:</p> <p>1.1 Undertake annual salmon and sea trout stock assessments to determine need for stock protection and scope for relaxing measures;</p> <p>1.2 Continue the Dee Salmonid Stock Assessment index monitoring programme and the Teifi fish counter to inform assessments of salmon and sea trout stocks across Wales;</p> <p>1.3 Continue to monitor juvenile spatial distribution and temporal change in all major rivers in Wales for multiple uses;</p> <p>FUTURE REQUIREMENTS - COMMITTED</p> <p>1.4 Consider new whole-catchment census approach to juvenile census;</p> <p>1.5 Consider future scope for fishery-independent stock assessments;</p> <p>1.6 Review adult stock assessments – as committed in the NASCO Implementation Plan;</p> <p>1.7 Maintain horizon-scanning of new and emerging techniques to address evidence gaps and pressures that threaten stocks.</p> <p>FUTURE REQUIREMENTS - PROPOSED</p> <p>1.8 Maintain and seek opportunities to expand fish counter network to provide further appropriate index monitoring.</p> <p>1.9 Work with WG on a Fisheries Evidence Plan</p>	<p>NRW</p> <p>NRW</p> <p>NRW</p> <p>NRW</p> <p>NRW; EA; CEFAS</p> <p>NRW</p> <p>NRW</p> <p>NRW</p> <p>WG; NRW</p>	<p>Ongoing - HIGH</p> <p>Ongoing: NRW and EU - HIGH</p> <p>Ongoing - HIGH</p> <p>2020 - MEDIUM</p> <p>2020 - MEDIUM</p> <p>2020 – 2024 - HIGH</p> <p>Ongoing - MEDIUM</p> <p>2020/21 – HIGH (Proposal in preparation)</p> <p>2020/21 - MEDIUM</p>

2. Managing exploitation

Exploitation is the term used to refer to the killing of fish by a rod or net fishing method. This is less relevant today as catch-and-release fishing has become firmly established in the rod fishery and is now also required in net fisheries. However, the term continues to be used to describe fish killed where this is permitted, and the residual unintentional mortality of returned fish.

Decision structures supported by the stock assessment methodology for both species are used as evidence to support exploitation management decisions. Although there has been an understandable driver for tightening of exploitation measures, the same methodological approach would be used in future for relaxing controls.

Certain net fishing methods in Wales are regarded as culturally significant. The significance of this and policy in terms of preserving such methods, at times of depleted fish stocks, needs to be considered.

The socio-economic value of recreational rod fishing in Welsh rivers has recently been estimated at £20 million per annum (Gross Value-Added – a measure of household income) and to support more than 700 full-time jobs. This could be higher, and it is important that NRW considers optimising the benefits that could arise from the fisheries.

2. MANAGING EXPLOITATION	LEAD & PARTNERS	DATES, RESOURCES & PRIORITIES
ISSUE: Maximise spawning escapement by ensuring exploitation does not damage stock recovery prospects		
<p>CURRENT ACTIONS</p> <p>2.1 Carry out annual reviews of adult stock assessments for salmon and for sea trout to determine need for future management interventions (tightening or relaxation of controls);</p> <p>2.2 Implement new fishing byelaws (the ‘all Wales’ rod and net fishing byelaws; the cross-border Dee and Wye byelaws; the Welsh Severn emergency byelaws), integrating these into the full suite of fishing byelaws in Wales;</p> <p>FUTURE REQUIREMENTS - COMMITTED</p> <p>2.3 Carry out preparatory liaison, followed by statutory consultation, into new rod fishing byelaws on the Severn in Wales;</p> <p>2.4 Carry out review of rod fishing byelaws for the Wye and Usk prior to their expiry in December 2021;</p> <p>2.5 Carry out mid-term review of new rod and net fishing byelaws in Wales;</p> <p>2.6 Adopt risk-based approach to any resumption of catch-and-take fisheries;</p> <p>FUTURE REQUIREMENTS - PROPOSED</p> <p>2.7 Review cultural significance and socio-economics of net and rod fisheries in Wales and recommend new policy.</p>	<p>NRW</p> <p>NRW (EA in the English cross-border catchments)</p> <p>NRW</p> <p>NRW</p> <p>NRW; LFGs; RIVERS TRUSTS</p> <p>NRW</p> <p>NRW; WG</p>	<p>Ongoing - HIGH</p> <p>Ongoing - HIGH</p> <p>2020 - HIGH</p> <p>2020 – HIGH</p> <p>2025 – HIGH</p> <p>ONGOING - HIGH</p> <p>2020/21 MEDIUM</p>

3. Protecting stocks through effective enforcement

Effective fisheries enforcement today is both ‘intelligence-led’ and risk-based. To best use our resources to deter, prevent and detect offending, we are guided by real-time incident reports to support our own intelligence. We therefore continue to rely partly on timely reports and information by members of the public.

NRW is developing new approaches to increase the reporting of incidents of significance to the fisheries resource, and to demonstrate the effectiveness of responses to incidents.

3. PROTECTING STOCKS THROUGH EFFECTIVE ENFORCEMENT	LEAD & PARTNERS	DATES, RESOURCES & PRIORITIES
ISSUE: Effective enforcement of all legislation for fisheries		
<p>CURRENT ACTIONS</p> <p>3.1 Respond effectively to prioritised pollution and fisheries incidents.</p> <p>3.2 Enforcement of all fisheries byelaws</p> <p>3.3 Implement risk-based enforcement to protect fish in vulnerable locations:</p> <ul style="list-style-type: none"> • estuaries and coasts: <ul style="list-style-type: none"> ○ develop local work plans; ○ engage with WG marine fisheries on joint approaches. • In-river barriers and spawning sites: <ul style="list-style-type: none"> ○ Review risks associated with locations across Wales; ○ Prioritise patrols at sensitive times of year and river conditions; <p>FUTURE REQUIREMENTS - COMMITTED</p> <p>3.4 Review of fisheries enforcement priorities and resources;</p> <p>3.5 Review risk associated with disturbance to spawning fish caused by recreational access;</p> <p>3.6 Review potential blocks to supply by the public of timely evidence on fisheries incidents</p> <p>3.7 Develop new resources for collection of intelligence on illegal threats to fish stocks:</p>	<p>NRW</p> <p>NRW</p> <p>NRW; WG</p> <p>NRW</p> <p>NRW</p> <p>NRW</p> <p>NRW</p> <p>NRW</p> <p>NRW</p>	<p>Ongoing HIGH</p> <p>Ongoing HIGH</p> <p>Ongoing HIGH</p> <p>2020 HIGH</p> <p>2020/21 HIGH</p> <p>2020/21 HIGH</p> <p>2020/21 HIGH</p> <p>2020 - HIGH</p>

<ul style="list-style-type: none"> • Develop and implement training of all NRW field staff for expansion of intelligence gathering; • Share intelligence and conduct joint patrols with other enforcement agencies: <ul style="list-style-type: none"> ▪ with the EA on shared cross-border rivers; ▪ with WG on estuarine and coastal waters 	<p>NRW</p> <p>NRW; EA</p> <p>NRW; WG</p>	<p>2020 - HIGH</p> <p>2020 - HIGH</p> <p>2020 - HIGH</p>
<p>FUTURE REQUIREMENTS - PROPOSED</p> <p>3.8 Refine proposals for River Guardian initiative, identifying partners for catchment-based initiative.</p>	<p>NRW</p>	<p>2020/21 – MEDIUM</p>
<p>3.9 Explore development of a smartphone App for the reporting of fisheries incidents, including pollution incidents.</p>	<p>NRW</p>	<p>2020/21 - MEDIUM</p>

4. Tackling physical habitat constraints in the freshwater environment

The quality of freshwater habitats determines the performance of the ecosystems they support. The characteristics of water flow and quality, and the physical structure of the rivers in terms of connectivity barriers and riparian zone quality are therefore critical to the wellbeing of fish populations.

Good habitat for salmonid fish (e.g. Figure 3) consists of: -

- natural hydromorphological condition, with networks of runs, riffles and pools;
- an absence of manmade constraints such as barriers to the free movement of fish and sediments;
- un-modified channels and un-damaged riparian zones;
- water quality and quantity unaffected by any impacts of man-made activities.

Figure 3. Example of good salmonid habitat, River Mawddach.



Many factors, including impounding structures for purposes including water abstraction and stream-crossings that create barriers, and modification of banks and unsympathetic local land-use have cumulatively impacted upon good condition of streams over many years. This has damaged their performance as salmonid spawning and nursery areas. Today there are few rivers that have escaped damage caused by combinations of these factors.

The need for restoration of constraints to salmonid stocks in the freshwater environment has become well understood. Work has been underway in Wales by NRW, its predecessors and by Afonydd Cymru and the family of rivers trusts, for several years to restore good physical condition. Between us, over a hundred fish passes have been built ranging from large civil-engineered structures to smaller less-formal arrangements, and many barriers have been removed completely (Figure 4). This has improved connectivity for migrating fish enabling free movement of adults upstream and smolts downstream. Improved access or, in some cases, new access to upland stream

areas provide greater quantities of habitat, sometimes in higher altitude areas where cooler stream water temperatures prevail. Tens of kilometres of river banks have been fenced to exclude trampling livestock and reduce the delivery of soils into rivers (Figure 4, f).

Some have questioned the benefits of stream habitat restoration. However, when there are clear physical constraints to the free migration of fish and to the optimum condition of streams used by salmonids for spawning and for production of parr and smolts, it is difficult to draw any conclusion other than habitat restoration is a relevant and important activity. This also delivers broader benefits for flora and fauna.

Figure 4. Technical fish pass constructed on refurbished weir (a); Merthyr Vale Weir removal (b and c); resolving a barrier to migration caused by a forestry track culvert (d and e); damaged riparian habitat with no vegetation and showing signs of bank erosion. New fence to resolve these matters recently installed (f); recently-discovered barrier (g).

a) New technical 'Larinier' fish pass, River Afan



b) Merthyr Vale Weir - May 2018



c) Site of Merthyr Vale Weir – removed in summer 2018



d) Typical forestry track culvert, pre-remediation, showing constraint to free fish passage



e) Forestry culvert post-remediation



f) Stream damaged by loss of riparian vegetation and shade, and with evidence of bank erosion due to livestock access. A new fence to address these pressures recently installed.



- g) Recently identified old river crossing (River Afan) causing complete barrier to fish.



All parties agree that much remains to be done if we are to optimise river environments. Together we need to invest, and then maintain features such as fish passes and riparian zones, so that the maximum number of wild smolts may be sustained and migrate safely to sea.

However, repairing a century or more of inappropriate development cannot be achieved overnight.

NRW has commissioned Fisheries Habitat Restoration Plans for all important migratory salmonid rivers in Wales. These reports compile catchment-scale information on physical constraints to fish population status. We will complete these for 33 rivers (principal salmon rivers and further main sea trout rivers) by March 2021. These will then represent an evidence base for a 'Forward Plan' document that will explain how we propose to resolve physical habitat constraints in Wales.

We will seek future funding to prioritise and resolve known constraints and deliver solutions. When delivery is complete, then all known physical constraints to achieving Good Ecological Status, and to remove constraints on fish populations, will have been resolved.

4. TACKLING PHYSICAL HABITAT CONSTRAINTS IN THE FRESHWATER ENVIRONMENT	LEAD & PARTNERS	DATES, RESOURCES & PRIORITIES
ISSUE: Sub-optimum freshwater habitats:		
CURRENT ACTIONS		
<p>4.1 Continue work on:</p> <ul style="list-style-type: none"> • 10 catchment-based Fisheries Habitat Restoration Plans; • 9 WFD catchment plans; • River restoration plan for the Cleddau SAC. <p>4.2 Implement 2020/21 capital programme of work for delivery of project work to resolve habitat constraints: Improve physical habitat in rivers by:</p> <ul style="list-style-type: none"> • Reducing barriers to river connectivity to restore river functioning and fish migration (upstream and downstream): <ul style="list-style-type: none"> ○ Construction of 5 technical fish passes, and design of future schemes ○ Programme of 30 fish passage solutions • Restore and maintain effective riparian zone management in approximately 100km of stream to: <ul style="list-style-type: none"> ○ Exclude livestock from rivers ○ Intercept and reduce soil delivery to rivers; ○ Provide buffering from solar radiation (Keeping Rivers Cool); ○ Restore delivery of riparian tree carbon supply (leaf and other organic litter) to upland nutrient-poor streams. <p>4.3 Deliver prioritised Sustainable Fisheries Programme, following principles agreed with WG.</p> <p>4.4 Devolve Alternative Mitigation budgets to Afonydd Cymru and rivers trusts to deliver resolution of agreed habitat constraints in the targeted river catchments.</p>	<p>NRW (AC as contractor)</p> <p>NRW NRW</p> <p>NRW with rivers trusts</p> <p>NRW and partners</p> <p>NRW</p> <p>NRW; AC (and rivers trusts)</p> <p>NRW; AC (and rivers trusts)</p> <p>NRW</p> <p>NRW and rivers trusts (North Wales, Dee and SE Wales)</p>	<p>Ongoing. To be delivered by summer 2020 - HIGH</p> <p>Ongoing - HIGH Ongoing - HIGH</p> <p>2020/21 – HIGH</p> <p>} } } Delivery of 2020/21 capital work programme - HIGH }</p> <p>Delivery of 2020/21 capital work programme - HIGH</p> <p>Ongoing - HIGH</p> <p>Ongoing - HIGH</p>

FUTURE COMMITTED		
4.5 Commission final Fisheries Habitat Restoration Plans, to complete coverage for Wales, setting out and quantifying: - <ul style="list-style-type: none"> • Remaining connectivity challenges to be resolved through combination of fish passes and barrier removal; • riparian habitat pressures 	NRW (AC as contractor)	2020/21 - HIGH
4.6 Compile and prioritise full inventory of habitat constraints in Wales;	NRW, WFF, LFGs, rivers trusts	2020/21 - HIGH
4.7 Continue development of strategic river restoration programme;	NRW	2020/21
4.8 Develop and publish 3-year “Delivery Plan” setting out delivery of prioritised solutions to physical habitat constraints in Wales and identifying funding and delivery requirements;	NRW	2021/22 - HIGH
4.9 Seek new Fish Passage Regulations, through collaborative work with DEFRA, to secure appropriate powers to require resolution of fish passage at barriers to migration;	WG; NRW	2020/21 - HIGH
4.10 Delivery of £6.8 million LIFE partnership project on the River Dee catchment, delivering significant benefits for migratory fish through: <ul style="list-style-type: none"> • fish passes and barrier removals at 10 major sites; • improved habitat connectivity; • restoration of in-river habitats; and • improvements to land management and forestry practices. 	NRW; Dŵr Cymru Welsh Water; Snowdonia National Park; Environment Agency	2020 – 2024 Funding: NRW, WG, EU HIGH
FUTURE PROPOSED		
4.11 Review the relative impact of pressures on river quality and, therefore fish populations.	NRW	2021 - MEDIUM
4.12 NRW to be lead partner in a National Lottery Heritage Fund project ‘Back from the Brink’ that, subject to confirmation, would include actions to: <ul style="list-style-type: none"> • improve river habitats including resolution of habitat connectivity; • inspire people to discover, value and act for Wales’ threatened species. 	NRW	2020 - ongoing

5. Safeguarding water quality and quantity

Natural conditions of water quality and quantity, together with un-modified physical habitats have the potential to support optimum ecological conditions. These are the conditions in which salmonid and other aquatic fauna developed and, in these conditions, we might expect optimum abundance and range of fish populations. However, the influence of society, including the need for water supplies and the management of land for matters such as agriculture and forestry means that today there are few natural habitats in our rivers.

The current condition of our watercourses and our ambitions for the future are set out in the package of work under the EU Water Framework Directive.

Natural Resources Wales is the Competent Authority for implementation of the Water Framework Directive (WFD) in Wales. We have responsibility for leading on and publishing the River Basin Management Plans (RBMPs) for the Western Wales and Dee River Basin Districts (RBDs) - working in partnership with a wide range of public, private and voluntary organisations (including water companies, local authorities, eNGOs, business & industry). The Environment Agency lead on publishing the Severn RBMP. We work closely with the Environment Agency and partners on the cross-border aspects of the Severn and the Dee River Basin Districts.

In each RBD, we have a Liaison Panel made up representatives of key sectors. This provides an open forum for co-deliverers to discuss and influence the development of the RBMPs and assist with implementation. RBMPs are produced and updated every six years. The updated plans are now published.

RBMPs are strategic plans which gives everyone concerned with the RBD a measure of certainty about the future of water management in that district. It includes objectives for each water body and a summary of the programme of measures necessary to reach those objectives.

The current RBMPs cover the period 2015 – 2021 and are made up of several documents and supporting data. For the Western Wales and Dee RBMPs these are presented, together with all supporting documents and the required statutory assessments, on the NRW website: -

<https://naturalresources.wales/evidence-and-data/research-and-reports/water-reports/river-basin-management-plans/river-basin-management-plans-published/?lang=en>

The corresponding information for the Severn RBMP can be found on the GOV.UK web site: -

<https://www.gov.uk/government/publications/severn-river-basin-district-river-basin-management-plan>

The overall ambition of the WFD is to restore all surface waters, including transitional waters (estuaries) and groundwater to 'Good Ecological Status' (GES). This is the WFD default objective for all water bodies and is defined as representing only a slight variation from undisturbed conditions. The elements that make up ecological status include:

- biological elements (consisting of measures for fish, macro-invertebrates, macrophytes and diatoms); and
- supporting elements (made up of hydromorphology, ammonia, pH, phosphates, dissolved oxygen and 18 pollutants including some heavy metals and pesticides).

Each of these elements contributes to the overall ecological status. The lowest common denominator rule ('one-out, all-out') is applied to the elements, so the lowest scoring element

denotes the overall status of the water body. For example, if a biological quality element was at moderate and other quality elements were at good, it would be concluded that the water body as a whole is at moderate status.

NRW and the EA design and implement investigations programmes to explore why any water body fails to achieve GES and to contribute to plans to address this.

Water quality:

NRW and predecessor bodies have monitored, and continue to monitor, the quality of our rivers and carries out a range of consenting and permitting activities to ensure that ongoing and new activities should not harm the aquatic environment.

In addition to the range of water utility and industrial discharges, NRW regulates the agricultural sector. In each case it does so through consenting, permitting and licencing regimes developed to accommodate all requirements to protect water quality in all surface water, groundwater and transitional waters.

Agriculture and pollution incidents arising from some activities is currently a very high profile matter in many parts of Wales. This and matters related to forestry are considered in Action Table 5.

Across Wales, abandoned mines present significant sources of land contamination and water pollution and are the main reason why Welsh water bodies are unable to achieve 'GES' under the WFD. NRW has awarded a contract to the Coal Authority as part of our work to clean up metal-polluted rivers across Wales. Feasibility studies to address problems at priority metal mine sites are being undertaken in addition to other mine-related assessments. The contract also includes developing a long-term metal mine remediation programme for Wales.

Water quantity:

The quantity of water in our streams and rivers and the maintenance of near-natural hydrological conditions is a key factor determining the wellbeing of our fish stocks and fisheries. This is balanced against societal requirements for supply of wholesome water for domestic and industrial consumption and the disposal of waste materials. Effective regulation of these regimes is important if natural resources are to be protected and sustained.

The routine 5-yearly water company price review process enables NRW to influence their investment plans and priorities. These can bring critical benefits to the water environment across Wales ('Note on stakeholder engagement: identifying the pressures on stocks', available from NRW).

5. SAFEGUARDING WATER QUALITY AND QUANTITY		
ISSUE: Providing optimum conditions of water quality and quantity through achieving the objectives of the Water Framework Directive.		
<p>CURRENT AND FUTURE ACTIONS – WATER QUALITY</p> <p>5.1 Continue to implement work programmes delivering action on the Water Framework Directive;</p> <p>5.2 Reduce risks to water quality through effective permitting and regulation of all relevant discharges to land and water.</p> <p>CURRENT ACTIONS – WATER QUALITY (METAL MINES)</p> <p>5.3 Address impact of relict metal mines by implementing the Metal Mines Strategy for Wales to deliver remediation of prioritised legacy metal mines;</p> <p>5.4 development and delivery of 2020 capital work programme for remediation.</p> <p>FUTURE COMMITTED – WATER QUALITY (METAL MINES)</p> <p>5.5 Development of 15-year programme of works, to include development of proposals for:</p> <ul style="list-style-type: none"> • Dylife - the main source of metals in the Dyfi catchment, impacting over 35km of watercourse; • Remediation at Frongoch-Wemyss to improve 32 km of watercourse; • Mine water from the Cwmystwyth mine complex, impacting 33km of the Afon Ystwyth; • Cwm Rheidol min, located in the Rheidol Valley with impacts of the mine water extending to the coast at Aberystwyth; • Parys Mountain, one of the most polluting metal mines in the UK. <p>CURRENT AND FUTURE ACTIONS – WATER QUANTITY Address issues affecting flows and hydrology:</p> <p>5.6 Continue to implement the Restoring Sustainable Abstraction Programme;</p> <p>5.7 Implement review of time-limited abstraction licences;</p> <p>5.8 Introduce regulation of previously exempt abstractions;</p>	<p>NRW</p> <p>NRW</p> <p>NRW; WG</p> <p>NRW; WG</p> <p>NRW; WG</p> <p>NRW</p> <p>NRW</p> <p>NRW</p> <p>NRW</p>	<p>Ongoing - HIGH</p> <p>Ongoing - HIGH</p> <p>Ongoing - HIGH</p> <p>Ongoing – HIGH</p> <p>Development of project plan - HIGH</p> <p>All ongoing - HIGH</p>

<p>5.9 Secure environmental improvements through the water company price review process;</p>	<p>NRW; WATER UTILITIES</p>	
<p>5.10 Continue effective engagement with water utilities on water resource and drought plans;</p>	<p>NRW</p>	
<p>5.11 Ensure permitting of hydropower schemes (including marine tidal energy) does not harm fish populations.</p>	<p>NRW</p>	
<p>FUTURE COMMITTED – WATER QUANTITY</p>		
<p>5.12 Work with water utilities to ensure delivery of future Asset Management Plans.</p>	<p>NRW; water utilities;</p>	<p>2020 – 2025 - HIGH</p>

6. Addressing land management, and associated risks to water quality

Catchment land use is a predominant factor influencing the quality of freshwaters. Poor and inappropriate land-use can result in the run-off and delivery of eroding soils into rivers together with surplus nutrients and chemicals that may have been applied to the land.

Increased agricultural intensification and the spreading of agricultural slurries has caused many pollution incidents and resulted in the mortality of large numbers of fish.

Past forestry management did not achieve the higher standards now specified in forestry standards and in the Forest Water Guidelines and has resulted in damage to the environment through rapid drainage and erosion. The guidelines include specification of tree species mixes, drainage and the protection of stream quality. Afforestation provides opportunity to retain water in the uplands for multiple benefits downstream including buffering of river temperatures and contributing to flood resilience.

Restoring and protecting upland peatlands offers the chance to store water preventing rapid run-off, with associated risk of stream erosion, and providing some resilience to increasing water temperature.

NRW delivers against all statutory requirements of the Environment Permitting Regulations – specifically as they affect land management issues of agriculture and forestry. Strong environmental protection is critical if river quality is to be restored and preserved.

6. ADDRESSING LAND MANAGEMENT AND ASSOCIATED RISKS TO WATER QUALITY	LEAD & PARTNERS	DATES, RESOURCES & PRIORITIES
<p>ISSUE: Sub-optimum freshwater habitats: poor land use results in damage to rivers.</p> <ul style="list-style-type: none"> • Catchment land-use: • agriculture, forestry 		
<p><u>Agriculture</u></p> <p>6.1 Develop and implement improved agricultural regulation regime;</p> <p>6.2 Work with farmers, their representatives and all other relevant partners to protect river environments, including the prevention of soil loss to rivers;</p> <p>6.3 Maintain contribution to Wales Land Management Forum and sub-group to influence land-use matters to significance to fish populations;</p> <p>6.4 Continue existing programme of dairy farm inspections to improve routine management in order to eliminate risk to surface water quality;</p>	<p>WG; NRW</p> <p>NRW; FARMERS & Unions; AC</p> <p>NRW and Forum members</p> <p>NRW; WG</p>	<p>Ongoing – HIGH (announcement on new agricultural regulations anticipated shortly)</p> <p>As above</p> <p>Ongoing</p> <p>Ongoing</p>

<u>Forestry & Upland Land Management</u>		
6.5 Application of best-practice approach to forest management, as set out in the Glastir Woodland Restoration programme and adhering in full to the current Forest Water Guidelines;	NRW; WG; PRIVATE FORESTRY;	Ongoing – details to be included in future ‘Forward Delivery Plan’
6.6 Contribute to WG Woodlands For Wales Strategy, including opportunity to create new woodlands;	NRW; WG	Ongoing – development inf ‘Forward Delivery Plan’
<u>Peatlands</u>		
6.7 Contribute to peatland protection and restoration.	NRW	Ongoing
6.8 Progress the LIFE Welsh Raised Bog Project, restoring 4 square miles of raised bog (peatlands) within Special Areas of Conservation.	NRW; WG; Snowdonia National Park	2019 – 2024 Funding: NRW, WG, EU HIGH

7. Addressing predation on salmonids: fish-eating birds and seals

Predation on fish is a natural phenomenon that does not normally threaten stock sustainability. Population feedback mechanisms often compensate for losses through density-dependent regulation in which the remaining fish survive at higher rates. However migratory fish past the age of smoltification have no such compensatory mechanism and any loss due to predation then is a net loss to the population.

The extension in range of goosander southwards and the frequent movement inland by cormorants to feed both represent relatively recent increased pressures on fish populations, including those of migratory salmonids. This has led to growing concern. Wild birds are protected by law however there are systems in place for the licencing of control measures, including lethal controls, where certain criteria are met, including damage to fisheries. Both bird species are known to prey on a range of fish species, including salmonids, however there is some evidence that goosanders demonstrate a preference for salmonids.

Salmon and some other species (bullhead, lampreys) are species designated under annex 2 of the EU Habitats Directive. In their current poor status, there is concern that salmon cannot sustain ongoing predation by birds. Fish-eating birds feeding in our rivers on relatively abundant non-salmonids may encounter and predate some of the failing stocks of salmonids. Resolution of the growing conflict between legally protected birds predateding legally protected fish species which are in a depleted state requires new policy. It is important that the current imbalance is addressed so that predation is within sustainable limits.

NRW commissioned an external expert group to consider matters relating to FEBs and the resulting paper and recommendations were approved by the NRW Board before submission to WG. This Group will be re-commissioned now to implement the recommendations for a full Policy review: -

Scope of Review

To help deliver the policy framework as outlined above the scope of the WFEB Policy Group will develop 8 themes:

- Theme 1** **Appraise** the effectiveness, where practically possible, of non-lethal and lethal control of fish-eating birds in preventing serious damage to natural and stocked fisheries.
- Theme 2** **Determine** population estimates and trends for wintering cormorant and goosander at national and/or Area Statement scale and/or Important Salmonid Catchments.
- Theme 3** **Determine** how to interpret population estimates for salmon and sea trout and fish-eating birds at national and/or Area Statement scale.
- Theme 4** **Determine** whether a cormorant population-based model, similar to models adopted in England and Scotland, is required for Wales.
- Theme 5** **Assess** the need for a goosander population-based model for Wales.
- Theme 6** **Assess** the need for a regional (i.e. NRW Statement Areas) and/or catchment-based licencing approach in Wales.

- Theme 7** **Develop** a fit-for purpose NRW licensing policy.
- Theme 8** **Develop** a communication strategy (including practical advice and guidance) for fisheries and fishery managers, conservation organisations and general public.

A Phased Approach

A five-phase approach is recommended:

- Phase 1:** Establish a Wales FEB Policy Group with the mandate to lead an evidence-led review to help develop new policy in relation to controlling the impact of predation (including the threat of serious damage to designated wild fish stocks) on all inland fisheries from cormorant and goosander.
- Phase 2:** Evidence and data gathering
- Phase 3:** Analysis and assessment (including advice to NRW Board and Welsh Minister for Environment as whether evidence indicates public consultation is appropriate).
- Phase 4:** Public consultation (if required based on outputs of Phase 3).
- Phase 5:** Final reporting and policy recommendation to NRW Board and the Welsh Minister for Environment.

Timeframe

An indicative timetable for the work plan is provided below. Though, this is dependent on: i) the date when the Wales FEB Policy Group is established and their agreed approach ii) the time taken to gather the evidence (ie survey data and population estimates, and; iii) whether a public consultation is required.

March 2020 (Phase 1)

- Convene the 1st meeting of Wales Fish-eating Birds Policy Group (May 2020);
- Agree WFEBPG work programme (using work streams outlined in the NRW FEB Advisory Group Report to NRW Board) and Terms of Reference.

April 2020 (Phase 2)

- Convene the 2nd meeting of Wales Fish-eating Birds Policy Group (June 2020);
- Draft contracts specifications and invitation to quote for the following contracts:
 - Appraisal of the effectiveness of lethal control and non-lethal measures;
 - Winter surveys of goosander and cormorant on Important Salmonid Catchments in Wales;
 - National population modelling and population estimates of goosander and cormorant;
 - Appraisal of catchment approach to licensing;
 - Appraisal of the current licensing process as administered by NRW;

- Development of a communication strategy to fisheries and others.

April 2021 (Phase 3)

- Analysis and Assessment (including advice to NRW Board and WG as to whether evidence indicates public consultation is appropriate).

June 2021 (Phase 4)

- 12-week Public Consultation (if necessary).

October 2021 (Phase 5)

- Policy developed and reported to NRW Board and Welsh Government (November 2021);
- Following agreement by NRW and WG an announcement of the outcome of the review will be anticipated December 2021.

Outputs

- A report to NRW Board and WG will be produced by the WFEB Policy Group detailing draft Policy;
- Regular updates of the work of the WFEB Policy Group will be provided on a dedicated area of the NRW website, including links to papers, information etc. NRW will also give update reports to NRW Board, the Wales Fisheries Forum, Local Fisheries Groups etc.

Resource and Roles

Appointment of an Independent Chair.

It is suggested representatives from the following organisations, and/or subject experts, would form the Wales FEB Policy Group:

- NRW (likely to include: Senior Ornithologist; Principal Fisheries Advisor and Permitting Manager);
- Welsh Government;
- Natural England (for cross-border rivers);
- RSPB;
- BTO;
- Angling Trust;
- Salmon and Trout Conservation Cymru;
- Afonydd Cymru;
- Independent advisors on fish and fish-eating bird population dynamics;
- Social scientist Communications expert.

There are also concerns, largely geographically limited, of predation on adult salmonids by seals in some river estuaries (Cleddau, Dee, Teifi, Tywi and Wye) and at some barriers to river entry by adult salmonids (Tawe and Taff barrages).

7. ADDRESSING PREDATION ON SALMONIDS: FISH-EATING BIRDS AND SEALS	LEAD & PARTNERS	DATES, RESOURCES & PRIORITIES
ISSUE: unsustainable depredation of depleted and vulnerable salmonid stocks by predatory birds.		
<u>CURRENT ACTIONS</u>		
<p>7.1 Review position on predation on salmonids by fish-eating birds (FEBs) by:</p> <ul style="list-style-type: none"> • Implementing in full the recommendations of the NRW external advisory group on FEBs leading to development of new policy on FEBs. This will concentrate on addressing the balance of conservation designations and legal protections; • Review and improve current system of licencing for control of FEBs taking account of expert group recommendations; • Review and confirm a ‘fit-for-purpose’ bird census methodology, and implement in prioritised rivers; • Implement agreed initiatives to map sensitive locations where predation (FEBs and seals) occurs; 	<p>NRW AND RANGE OF PARTNERS</p> <p>NRW with advisory group</p> <p>NRW with advisory group and fishery groups</p> <p>NRW; rivers trusts</p>	<p>2020 – 2021 - HIGH</p> <p>2020/21 - HIGH</p> <p>2020 – HIGH</p> <p>2020 – HIGH</p>
<u>FUTURE COMMITMENTS</u>		
<p>7.2 Exchange best practice with public bodies in England and Scotland to benefit from emerging learning and practices regarding FEBs;</p>	<p>NRW; EA; MARINE SCOTLAND</p>	<p>2020/21 - MEDIUM</p>
<p>7.3 Where there is evidence of unsustainable harm, deliver reduction in damaging impact of predation on depleted stocks of salmonids.</p>	<p>NRW; RIVERS TRUSTS</p>	<p>Subject to outcomes above - HIGH</p>

8. Understanding marine pressures

The marine life of salmon and sea trout begins when smolts leave the river to enter estuaries and, from there, coastal waters and the high seas.

During the 1960s and 1970s the locations of salmon marine feeding areas became well known and this led to high catches. Through national and international partnerships these came under increasing scrutiny and have now ended as NASCO negotiated, set and administered catch quotas. These are currently set at zero in the Faroe Islands and Greenland (the latter has a limited subsistence quota only).

Over the past few decades there has been a marked increase in the mortality of salmon at sea. This has been demonstrated at index monitoring rivers across Europe and beyond. Today, the rate of mortality is at the highest yet recorded. It is reasonable to assume that similar pressures, albeit presumably less severe, are impacting on Welsh sea trout.

However marine survival continues to fall. There have been suggestions that salmonids may feature as inadvertent bycatch in commercial marine fishing operations, however the evidence for or against this is currently almost non-existent. There have also been concerns about possible illegal catch, probably by-catch, of returning adult salmonids in coastal waters but again the evidence for this is weak.

Pronounced climate changes have occurred in the North Atlantic since the 1970s, and these are demonstrated by rapid loss of Arctic sea ice, large-scale ocean warming and also to changes in ocean acidity and salinity. The principle drivers for this appears to be marked changes in the North Atlantic Oscillation and the outcome for the marine environment is postulated to be changes in the distribution of productivity of the oceans. This appears to have led to changes in the distribution and abundance of some marine fish species, and the widely reported declines in successful seabird breeding. This is also postulated to be driving the changes in marine survival of salmonids and, potentially, the differential effect on grilse and multi-sea-winter salmon runs.

Climate change is expected to impact salmon in the Atlantic Ocean, although the precise mechanisms, scale and details remain poorly understood. There is no such evidence for sea trout, however it may be that marine survival of this species will also be impacted.

We must maintain our engagement to better understand all elements contributing to mortality at sea. Estimates from index rivers, including the Dee in North Wales, include all losses occurring between the release of tagged smolts close to the head-of-tide and the recapture of marked adults in subsequent years. As such, calculated mortality rates include factors such as predation in estuaries to pelagic fishery bycatch, from damage to feeding areas arising from climate warming and intensive fishing for prey species. It is important that we are able to understand the relative impacts of these so that we may prioritise actions, influencing appropriate bodies where we can in order to ameliorate them.

8. UNDERSTANDING MARINE PRESSURES	LEAD & PARTNERS	DATES, RESOURCES & PRIORITIES
ISSUE: Major reduction in marine survival of salmon.		
<u>CURRENT ACTIONS</u>		
<p>8.1 Maintain engagement with NASCO to:</p> <ul style="list-style-type: none"> ensure no resumption in marine harvest of salmon; commit to engage on future research initiatives eg climate effects; location of marine feeding areas and migration routes; bycatch of salmonids in commercial fisheries; Commit to deliver all obligations in the 5-year Implementation Plan. <p>8.2 Protect salmonid survival in estuaries and coastal waters to the 6-mile limit:</p> <ul style="list-style-type: none"> effective and precautionary permitting of developments, including ports, power stations and tidal energy proposals; 	<p>NRW; CEFAS; EA; WG; DEFRA</p> <p>NRW & partners; WG</p> <p>NRW; EA</p> <p>NRW; WG</p> <p>NRW</p>	<p>Ongoing - HIGH</p> <p>Ongoing - HIGH</p> <p>Ongoing - HIGH</p> <p>Ongoing - HIGH</p> <p>Ongoing - HIGH</p>
<u>FUTURE COMMITTED</u>		
8.3 Review potential marine exploitation of salmonids:	NRW; WG	Ongoing – MEDIUM
8.4 assess scope for by-catch and illegal fishing of salmonids at sea;	NRW; WG	Ongoing – MEDIUM
<p>8.5 Maintain role on Marine Climate Change Impacts Partnership, assessing the scope for environmental change to influence salmonids at sea.</p> <p>http://www.mccip.org.uk/media/1999/mccip-report-card-2020_webversion.pdf</p>	NRW amongst multiple partners	Ongoing - MEDIUM
<u>FUTURE PROPOSALS</u>		
8.6 Develop proposals to research salmonid behaviours in key coastal locations to facilitate permitting;	NRW; WG; (other potential partners include EA; DEFRA)	Ongoing - HIGH
8.7 Review outcomes of Cefas summary of marine stressors affecting salmonids, specifically including those within the 6 mile coastal zone, to assess significance for Wales;	NRW	Ongoing - MEDIUM

8.8 Develop proposals to assess potential impact of climate effects on estuarine migrations.	NRW	2020/21 – MEDIUM
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9. Understanding new and emerging potential pressures

It is important that NRW continues to consider new information on matters that may act in future to damage our fish populations. This is a difficult area to define and quantify, however the 'horizon-scanning' approach is recognised as vital if new pressures are to be considered, understood and, where necessary, acted upon.

By their nature it is not easy to define pressures and quantify what needs to be done. However, recent examples include the recognition of pyrethroid sheep dips and their damaging effect on stream ecology, oestrogenic mimics, and the potential impacts of other agricultural and forestry pesticides, herbicides and pharmaceutical products.

The best-known example of a future threat to stream ecology and to fish populations is that of climate change in the salmonid environment. Salmon and sea trout are vulnerable to the implications of climate change in both the freshwater and marine environments, and in the transitions between the two. This is because a warming climate has the potential to damage habitats for salmonids in freshwaters and at sea and to interfere with their reproductive biology. Modified flows may lead to difficulties in downstream seaward migration of smolts and in the re-entry to rivers of adult fish.

NRW has evidence of harm, implicating warm winter conditions, arising from the spawning season 2015/16 and this acts as a clear warning of future potential harm. We therefore need to understand the mechanisms that may harm salmonids, and measures that might be used to ameliorate these.

9. UNDERSTANDING NEW AND EMERGING POTENTIAL PRESSURES	LEAD & PARTNERS	DATES, RESOURCES & PRIORITIES
ISSUE: Need for vigilance to identify new pressures		
<p>CURRENT ACTIONS – CLIMATE CHANGE</p> <p>9.1 Continue research into potential adaptations to threats of climate change:</p> <ul style="list-style-type: none"> • Ongoing support to existing PhD research on climate effects on salmonids in freshwaters: <ul style="list-style-type: none"> ○ Mapping of future safe thermal habitats across Wales; <p>FUTURE PROPOSED – CLIMATE CHANGE</p> <p>9.2 Review range of habitat adaptations to buffer streams from warming climate in summer and winter;</p> <p>9.3 Prioritise, design and implement appropriate riparian improvements and upland water retention initiatives in targeted water bodies;</p> <p>CURRENT ACTIONS - OTHER</p> <p>9.4 Review and consider emerging factors that may damage salmonid populations, including impact of agricultural biocides and pharmaceuticals and their possible synergistic effects, and microplastics;</p>	<p>CARDIFF UNIVERSITY; NRW</p> <p>NRW; CARDIFF UNIVERSITY</p> <p>NRW</p> <p>NRW</p>	<p>2018-2021 NRW; university studentship – HIGH</p> <p>2021/22 – HIGH</p> <p>2021/22 – HIGH</p> <p>Ongoing - MEDIUM</p>

<p>9.5 Review and consider emerging threats from fish diseases and parasites, including review of studies on <i>Gyrodactylus salaris</i> and <i>Saprolegnia</i> and the NRW and WG contingency plans:</p> <ul style="list-style-type: none"> • Commission trial of G.salaris survey. 	<p>NRW; WG</p>	<p>2020 - MEDIUM</p>
	<p>NRW</p>	<p>2019/20 - MEDIUM</p>
<p>9.6 Continue horizon-scanning work to identify new pressures and understand their potential significance.</p>	<p>NRW</p>	<p>Ongoing - MEDIUM</p>

GLOSSARY

AC	Afonydd Cymru
AS	Area Statements
Cefas	Centre for Environment, Fisheries and Aquatic Sciences
EA	Environment Agency
EU	European Union
FEB	Fish eating birds
DEFRA	Department for Environment, Food and Rural Affairs
FRMPs	Flood Risk Management Plans
ICES	International Council for the Exploration of the Seas
LFG	Local Fisheries Group
NASCO	North Atlantic Salmon Conservation Organisation
NGO	Non-Government Organisation
NRW	Natural Resources Wales
OCs	Opportunity Catchments
WFD	Water Framework Directive
RBMP	River Basin Management Plans
RBD	River Basin District
SMNR	Sustainable Management of Natural Resources