NRW B B 40.15 Annex 2
TECHNICAL REPORT: MANAGEMENT OPTIONS TO ADDRESS THE DECLINE IN STOCKS OF SALMON AND SOME SEA TROUT IN WALES

Summary

1. This paper sets out the current status of salmon and sea trout stocks in Wales.

2. It identifies the poor and declining state of the salmon resource, and local concerns about some of our sea trout stocks.

3. The paper considers the issues that might influence our future options. We believe that a balanced approach to management is required, including further exploitation controls (byelaws for catch and release fishing, NLOs and, potentially, privately-brokered net buy-back arrangements), fishing method controls, and continued support for habitat restoration and protection through natural resource management and targeted investment in river habitat improvement.

4. Marine survival of salmon is currently at a very low level and this affects stocks throughout the North Atlantic. It is important that we address issues within our rivers to ensure that they produce the optimum number of young salmon and sea trout.

5. We will consult on all options at an early stage to seek views and priorities of our stakeholders.

6. We will develop a communications plan so that all f our fisheries work is more visible and open to our stakeholders.

Introduction

7. Salmon and sea trout are iconic and important species in our rivers. They support recreational fisheries that bring economic benefit (in excess of £74 million annual expenditure in Wales, supporting around 1,500 Welsh jobs and £32 million in household income, Mawle and Peirson, 2009), often to rural communities, and are widely recognised as indicators of good environmental quality. Salmon support the designation of six rivers designated as Special Areas of Conservation. These are the SAC rivers, as designated under the Habitats Directive (Council Directive 92/43/EEC) in Wales. The salmon is also a feature of the Severn Estuary European Marine site (a SAC, and a site also designated as a Special Protection Area under the Birds Directive and a Ramsar site).

8. Welsh Government has set objectives for NRW to contribute to objectives for freshwater fisheries management, broadly by promotion of the conservation and maintenance of the diversity of migratory and freshwater fish, and by enhancing the contribution that migratory and freshwater fisheries make to the economy, particularly in remote rural areas and in areas with low levels of income. NRW also has statutory duties for fisheries under the Environment Act (1995), and obligations as set out in the UK Governments responsibilities to NASCO (the North Atlantic Conservation Organisation) to which the EC is a signatory.

9. Under the Habitats Directive (HD) and Water Framework Directive (WFD) there are important objectives to restore sites to favourable condition, to achieve Good Ecological Status and to prevent deterioration. To assess performance against these targets we monitor juvenile salmon populations prior to emigration to sea, and the returning adult stock in terms of catch and spawning escapement. National objectives for the salmon feature of *N2K* sites include management to achieve annual conservation limits (CL) and 5-year management targets (MT).

10. Our strategy for sea trout and salmon for 2008-2021 aims to deliver:-

    - Self-sustaining salmon in abundance in more rivers;
    - Economic and social benefits optimised for salmon fisheries; and
    - Widespread and positive partnership working.

    These objectives are commensurate with objectives under the HD and WFD.

Issues

11. This paper presents information on the status of our salmon and sea trout stocks and actions now required to address their poor and generally declining status.

12. Stocks in all 23 principal **salmon** rivers in Wales, including those in the seven *Natura 2000* sites (including the network of sites designated under the HD) where the species is a feature, are classified as either 'At Risk' or 'Probably at Risk' of failing to achieve stock targets in 2014, and all but one are predicted to remain so in 2019.

13. Stocks in approximately 40% of our 33 principal **sea trout** rivers are also classified as 'At Risk' or 'Probably at Risk'.

14. Salmon stock exploitation is managed according to a Decision Structure for fishing controls that is agreed with WG and DEFRA. This requires action to be taken to reduce the numbers of fish being killed by anglers and netsmen, whilst taking into account socio-economic factors where possible.

15. The same principle should be applied to sea trout exploitation.

16. New regulations – byelaws and Net Limitation Orders – are part of our proposed response to address stock declines. These will require substantial staff resource in preparing technical consultation documents and managing the consultation process. The extent of this depends on the option adopted.

17. The measures will inevitably be unpopular with some stakeholders. It is important to be clear that whilst the underlying basis for poor stock performance is almost certainly not angling or netting, immediate reductions in fishing mortality to increase spawning stocks are required.

Background

Salmon

18. Each year we assess the status of our salmon stocks in the 23 principal salmon rivers in Wales by comparing spawning escapement estimates in each river to the respective stock targets.

19. Stocks in all of our rivers are now assessed as either 'At Risk' or 'Probably at Risk' of failing to achieve stock targets in 2014 and all but one will remain so in 2019, which is as far ahead as our procedures can predict. Only 2 of the rivers showed a positive trend in egg deposition estimates over the last decade.

Performance of the 23 principal salmon rivers in Wales

RIVER	% ROD RELEASED				COMPLIANCE		TREND
	2011	2012	2013	2014	CURRENT	PREDICTED	
Severn	61.2	74.3	68.6	78.7	Prob at risk	Prob at risk	--
Wye	92.5	100	100	100	At risk	Prob at risk	-
Usk	64.2	68.1	70.5	77.4	Prob at risk	Prob at risk	--
Taff/Ely	87.3	97.6	100	100	At risk	Prob at risk	++
Ogmore	77.6	58.1	62.5	96.4	At risk	Prob at risk	-
Tawe	33.9	36.9	35.6	55.6	At risk	At risk	---
Tywi	44.4	39.5	51.7	58.3	At risk	At risk	---
Taf	33.3	30.0	30.0	69.0	Prob at risk	Prob at risk	--
Cleddau	45.7	47.4	71.8	56.8	At risk	Prob at risk	-
Teifi	46.4	46.9	59.8	72.1	Prob at risk	Prob at risk	--
Rheidol	58.1	31.8	72.7	100	At risk	Prob at risk	--
Nevern	31.8	36.4	60.6	96.8	Prob at risk	Prob at risk	+
Dyfi	42.5	34.8	52.3	72.0	At risk	At risk	---
Dysinni	100	75.0	80.0	100	Prob at risk	Prob at risk	-
Mawddach	55.6	60.7	44.4	71.8	Prob at risk	Prob at risk	-
Dwyryd	0	0	25.0	75.0	Prob at risk	Prob at risk	--
Glaslyn	62.1	73.1	53.2	66.7	Prob at risk	Prob not at risk	++
Dwyfawr	43.8	20.0	66.7	55.6	At risk	Prob at risk	-
Seiont	47.4	34.5	37.5	100	At risk	At risk	---
Ogwen	29.8	34.6	22.9	53.8	At risk	At risk	---
Conwy	51.7	53.9	57.7	45.2	Prob at risk	Prob at risk	---
Clwyd	71.9	73.7	80.0	71.4	Prob at risk	Prob at risk	--
Dee	54.2	74.4	81.2	87.6	Prob at risk	Prob at risk	-

Note: statutory catch and release byelaws are already in place on the rivers Wye and Taff & Ely
Trend: the symbols relate to the probability of upward or downward trend ton stock status
P < 0.10 ---
0.10 <=p <0.30 --
0.30<=p<0.50 -

0.70=>p>0.50 +
0.90=>p>0.70 ++
p>0.90 +++

20. These measures are also used in part to determine the condition of salmon as a feature of the N2K sites, and consequently these sites are not achieving their conservation objectives.

Site	Special Area of Conservation – salmon as:		Ramsar Site with salmon as feature
	Primary Feature	Qualifying Feature	
Afon Eden - Cors Goch Trawsfynydd		√	
Afon Gwyrfai a Llyn Cwellyn	√		
Afon Teifi/ River Teifi	√		
River Dee and Bala Lake/ Afon Dyfrdwy a Llyn Tegid	√		
River Usk/ Afon Wysg	√		
River Wye/ Afon Gwy	√		
Severn Estuary European Marine Site			√

21. It is widely recognised that salmon stocks are under severe pressure. Over the past few decades there has been a general pattern of stock decline that is reflected by the performance of salmon rivers on a wide geographic scale. This is recognised by all agencies involved with international salmon stock management. It is recognised that the major factor causing this is the decline in marine survival of fish, which is probably related to environmental change in the north Atlantic.

22. Although there is seemingly little that can be done to reduce the mortality of salmon at sea, there is work that can be done to restore and improve freshwater habitats. Whilst this is underway it is now more important than ever that the number of salmon surviving to spawn each year is maximised by ending the killing of fish in rod and net fisheries.

Sea Trout

23. The assessment process for sea trout is not as sophisticated, and consequently does not provide results with the same certainty as those for salmon. This is largely because of the complex interactions between sea trout and brown trout stocks and consequently the lack of any biological reference points such as egg deposition targets.

24. The current assessment is that about 40% of the stocks in our principal sea trout rivers are either 'At Risk' or 'Probably at Risk' indicating that catch per unit effort in these rivers is declining. We do not have a predictive capacity for sea trout populations.

Performance of the 33 principal sea trout rivers in Wales

			%Rod released:					At risk' status:	
Number		River	2010	2011	2012	2013	2014	2014	2013
33		Severn	80.0	82.6	83.3	88.2	82.4	Prob not at risk	Not at risk
34		Wye	68.0	93.1	94.4	95.1	89.7	At risk	Prob not at risk
35	P	Usk	69.7	80.5	84.1	64.9	89.9	At risk	At risk
36	P	Taff	90.7	95.7	99.2	100.0	52.2	Prob at risk	Not at risk
36.1		Rhymney	85.0	100.0	75.0	100.0	66.7	Prob not at risk	Prob at risk
37	P	Ogmore	79.7	88.7	85.6	89.1	89.6	Not at risk	Not at risk
38	P	Afan	85.7	83.8	77.7	56.9	66.7	Prob at risk	Prob not at risk
39	P	Neath	82.6	82.7	73.0	81.9	92.1	Not at risk	Prob not at risk
40	P	Tawe	79.1	77.0	73.4	65.1	90.9	Prob at risk	Prob at risk
41	P	Loughor	53.8	49.0	60.3	54.2	66.9	At risk	At risk
42	P*	Gwendraeth Fawr and Fach	75.8	80.6	64.0	50.0	71.9	Prob at risk	Prob at risk
43	P	Tywi	61.8	65.2	58.4	69.4	72.5	At risk	At risk
44	P	Taf	41.7	71.0	40.8	42.2	60.2	At risk	At risk
45	P	E&W Cleddau	63.5	68.1	65.7	84.1	72.8	At risk	At risk
46	P	Nevern	33.5	32.6	52.5	44.3	56.4	Prob not at risk	Prob at risk
47	P	Teifi	69.2	71.8	70.0	74.4	79.9	Prob not at risk	Prob not at risk
48	P	Aeron	34.1	34.7	32.6	43.3	46.8	Prob at risk	Prob at risk
49	P	Ystwyth	71.9	74.7	75.4	68.0	81.7	At risk	Prob at risk
50	P	Rheidol	50.8	82.2	85.5	89.0	88.7	Not at risk	Prob not at risk
51	P	Dyfi	75.1	75.5	75.4	76.2	78.3	Not at risk	Not at risk
52	P	Dysynni	84.6	84.3	83.8	88.1	89.0	Prob not at risk	Not at risk
53	P	Mawddach	86.6	84.4	78.4	78.3	86.3	Prob not at risk	Not at risk
54		Artro	39.3	70.6	71.4	62.5	56.0	Prob not at risk	Prob not at risk
55	P	Dwyryd	57.7	44.0	55.9	21.6	78.2	Prob not at risk	Prob at risk
56	P	Glaslyn	59.8	60.7	63.3	75.9	80.0	Prob not at risk	Not at risk
57	P	Dwyfawr (and Dwyfawr)	68.6	69.4	63.8	82.7	58.9	Not at risk	Prob not at risk
58	P	Llyfni	34.3	82.1	72.9	76.3	74.8	Not at risk	Not at risk
59		Gwyrfai	40.0	57.1	40.0	60.0	57.1	Prob not at risk	Prob not at risk
60	P	Seiont	66.2	72.3	45.5	45.5	63.2	Prob at risk	Prob at risk
61	P	Ogwen	65.5	56.3	63.4	57.3	67.5	Not at risk	Not at risk
62	P	Conwy	75.5	72.2	78.6	83.5	78.0	Prob not at risk	Prob at risk
63	P	Clwyd	86.4	85.1	83.0	85.1	84.5	Not at risk	Not at risk
64	P	Dee	80.3	77.9	83.1	95.4	83.2	Not at risk	Not at risk

Where;
P = Principal sea trout rivers where long-term (1994-2013) average rod catch >50 fish.
* = New (2013) addition to list of principal rivers.

25. Sea trout stocks are generally more variable than salmon, hence the different performance of populations around Wales with populations in North and West Wales performing rather better than those of South West Wales. Rivers in South East Wales are generally not regarded as significant sea trout fisheries.

26. The outcomes of the recent Celtic Sea Trout Project support the theory that Welsh sea trout appear to remain within the Irish Sea and coastal waters rather than entering the Atlantic Ocean. It may therefore be that they are not exposed to the environmental change that appears to be adversely affecting our salmon stocks.

27. Sea trout have been identified as supporting greater economic value in Wales than salmon, and are widely regarded as an important attraction to visiting anglers.

Exploitation by Rods and Nets

28. Salmon and sea trout are caught by anglers in most Welsh rivers, and also in 12 net fisheries operating in transitional waters around Wales. It is a statutory requirement for anglers and netsmen to submit catch returns, and the rod catch data is used to assess the status of stocks of both species.

29. Fishing in both sectors is regulated by byelaw. The majority of the net fisheries are public fisheries and are currently also regulated through Net Limitation Orders (NLOs) that set the number of licences issued. NLOs are generally set for a 10 year period after which they either expire or are renewed.

30. There are some existing statutory requirements for catch-and-release (C&R) fishing for salmon. All salmon caught anywhere in Wales prior to the 1st of June and the16th of June by netsmen and anglers respectively must be returned alive to the water. Full C&R fishing byelaws are in place on the rivers Wye and Taff/Ely and require all salmon and sea trout to be returned.

31. There have been great advances in the uptake of voluntary catch-and-release (C&R) fishing by anglers across Wales, moving from close to zero two decades ago to a declared Welsh national average in 2014 of about 78% for salmon and sea trout.

32. The control measures introduced by byelaw and NLO are set according to the outcomes of a technical case that reviews the status of the exploited stocks, and are informed by the outcome of a public consultation exercise. This takes significant staff resource and time.

33. The process has just been completed for the Dee NLO, and we are currently awaiting confirmation by the WG and DEFRA ministers. We will shortly commence work on the aggregated ‘all Wales’ NLO that covers 9 net fisheries in south west, west and north Wales.

34. This paper does not consider the imminent NLO review, as the outcome of this is very unlikely to deliver the immediate control measures that are required.

35. Associated to possible future changes to net regulation is a potential option for catch control based on net licence ‘buy-back’ which would necessarily be based on third-party negotiations with netsmen. Precedent for this has been set in public net fisheries in Wales, for example on the River Dee where the Dee Fisheries Association financed the cessation of estuary netting and EAW subsequently introduced a NLO of zero.

36. This matters be explored further in due course.

Options for management

Salmon

37. The decision structure for development of fishing controls for salmon in England and Wales (see Annex to attached report) represents an important part of our salmon stock management system that has been recognised by WG and DEFRA and is used in our international reporting commitment for the species.

38. The decision structure provides the following advice for exploitation control:-

Rivers judged to be ‘At Risk’ or ‘Probably at Risk’ (declining):

- Identify range of options to urgently achieve zero exploitation by both rods and nets – (include 100% C&R) – look to maintain socio-economic benefits where possible.

- NRW has applied a ‘3 year rule’ in which further regulatory action is not taken until stocks have been in this condition for 3 years, thus accounting for stocks regularly slipping in and out of this condition.

Rivers ‘Probably at Risk’ (improving):

- Identify range of options to ensure sufficient spawning escapement to move to <50% probability of failure within five years – look to maintain socio-economic benefits where possible.

- This approved procedure therefore requires us to initiate action now to improve the status of our salmon stocks.

39. The decision structure is currently not applied to:-

    - rivers where the voluntary C&R rate is greater than 90%, as it has been felt that the extra benefit on any individual river does not warrant the costs of pursuing statutory control. Consequently we have, over the past few years, promoted the voluntary uptake of C&R fishing leading to an average rate across Wales of about 70%.

    - rivers where the mean annual catch is below a threshold of 20 fish, as these are deemed not to be significant salmon stocks.

40. The decision structure does not explicitly provide advice for the achievement of targets under the Habitats Directive.

41. In Wales, NRW has also unilaterally applied a principle that a period of three consecutive years ‘At Risk’ or ‘Probably at Risk’ (declining) can be applied to any stock prior to developing

statutory fishing controls. This allows time to improve beyond 90% the uptake of voluntary C&R fishing.

42. In response to the very poor stock assessments, and in consideration of the decision structure, we have developed the following options, which are explained further in the Annex:-

Option 1 — Proceed with current principles of control.

This would trigger the immediate development of byelaws requiring full C&R fishing for 10 rivers:-

Rivers 'At Risk':	Seiont, Rheidol, Tywi**, Tawe
Rivers 'Probably at Risk':	Usk*, Teifi*, Mawddach*, Dee*, Severn
Other N2K rivers:	Gwyrfai (not a principal salmon river),

** N2K river (salmon not a feature)
* N2K rivers (salmon as feature)

This option represents:- the minimum that we need to do under the terms of our current management system, taking account of the NRW '3-year rule'.
the level of intervention required to protect and restore N2K rivers.

Option 2 — Extend measures to all rivers currently 'At Risk' or 'Probably at Risk' and declining.

This would extend the number of rivers where C&R measures will be developed to include 7 more of the 23 principal salmon rivers:-

Rivers 'At Risk':	Ogwen, Dyfi,
Rivers 'Probably at Risk':	Ogmore, Taf, E&W Cleddau, Conwy, Clwyd.

This option would be fully compliant with the decision structure.

Option 3 — Extend the C&R measures to all rivers in Wales.

This would extend the measures to the 5 principal rivers not included above:

Rivers 'Probably at Risk':	Nevern, Dysinni, Dwyrd, Dwyfawr,
Rivers 'Probably Not at Risk':	Glaslyn

This would also extend the measures to all other rivers in Wales that have a salmon population.

43. This extraordinary option would diverge from the requirements of the decision structure. However it only brings in 5 more principal rivers, 3 of which are very small, whilst making the legal definition of geographical extent much simpler and avoiding angler confusion.

This option recognises and addresses the global pressure on salmon stocks.

44. For any option where mandatory measures are introduced, it is proposed that these would be for a period of 10 years (allowing 2 full generations of recovery time). In line with our current management system, measures could be removed from individual rivers where an improvement in the status of that stock allows us to do so.

Summary of Options for Salmon

Option1 **current approach** **a) decision structure** **b) N2K rivers**	**Option 2** **options 1 plus** **immediate response to** **AR and PAR (declining)**	**Option 3** **byelaw for all rivers in Wales** **#**
Wye (N2K) *	Wye (N2K) *	Wye (N2K) *
Taff / Ely *	Taff / Ely *	Taff / Ely *
Dee (N2K)***	Dee (N2K)	Dee (N2K)
Seiont **	Seiont **	Seiont **
Rheidol **	Rheidol **	Rheidol **
Tywi (N2K)	Tywi (N2K)	Tywi (N2K)
Tawe	Tawe	Tawe
Severn ***	Severn ***	Severn ***
	Gwyrfai (N2K)~	Gwyrfai (N2K)~
Gwyrfai (N2K) ~	Mawddach (N2K)	Mawddach (N2K)
Mawddach (N2K)	Usk (N2K)	Usk (N2K)
Usk (N2K)	Teifi (N2K)	Teifi (N2K)
Teifi (N2K)		
	Clwyd	Clwyd
	Ogwen	Ogwen
	Conwy	Conwy
	Dyfi	Dyfi
	E & W Cleddau	E & W Cleddau
	Taf	Taf
	Ogmore **	Ogmore **
		Glaslyn
		Dwyfawr +
		Dwyrd +
		Dysinni ** +
		Nevern **
		All other non-principal salmon rivers

*	full C&R byelaws already in place
**	90% C&R achieved by voluntary means in 2014
***	Dependent on liaison with Environment Agency
+	average (1994-2013) annual catch < 20 fish
~	non-principal salmon river
#	other non-principal rivers will be included, eg Rhymney

45. For the rivers Dee and Severn there is an important requirement to consult with the Environment Agency and DEFRA.

Options for management

Sea trout

46. We do not currently have a decision structure for sea trout. This is because we have no comparable method to set egg deposition targets or to assess compliance with any such target. Instead the sea trout assessment tool uses recent trends in catch per unit effort to determine the status of stocks and their temporal trends. Catch over the most recent 3-year period is compared to a reference period of the previous 10 years and categories of risk are assigned depending on the performance of the fishery.

47. The purpose of this catch assessment is to provide an indicator of stock performance that may be used to inform management actions.

48. In response to the assessments we have prepared the following options for sea trout:-

<u>Option 1</u> <u>Proceed with current controls</u>
Ongoing encouragement of voluntary C&R fishing.
Promotion focussed on those rivers assessed to be at risk, or probably at risk.
This would not address localised concern for sea trout stocks.

<u>Option 2</u> <u>Apply time-limited control measures to protect sea trout stocks in those rivers deemed to be:-</u>

<u>A) 'At Risk'.</u>
The details of controls would be informed by the consultation process, but would consider C&R fishing in the rod and net fisheries.
This would require the preparation of rod byelaws for the rivers Usk and Loughor and byelaws for rod and net fishing for the rivers Tywi, Taf and Cleddau.
We wish to consult local interests on details around matters such as shortened net fishing seasons, consolidation of fishing season start and end, and concomitant rod restrictions.

<u>B) Rivers 'At Risk' and those assessed as 'Probably at Risk'</u>.

This would require the additional preparation of byelaws for the rivers Afan, Tawe, Gwendraeth Fawr and Fach, Aeron, and Seiont.

<u>Option 3</u> <u>Apply C&R to the full season in:-</u>

A) all 'At Risk' rivers

B) all rivers assessed as 'At Risk' and 'Probably at Risk'.
This would include all rivers in options 2 and 3 above.

<u>Option 4</u> <u>Extend full C&R fishing to the whole of Wales.</u>
This is a significant step forward from other options and not one that is currently commended.

Fishing method controls

49. Each C&R option would need to include new controls on fishing method and equipment so that the probability of fish survival is maximised and the objectives of the measures are achieved. This would be likely to include controls on hooks, hook sizes, barbless hooks and fishing methods and baits.

50. We hope that best practice approaches to fishing would be adopted in association with any C&R fishing, whether voluntary or when required by byelaw.

Other options for fishing controls

51. We have considered, but rejected, other options and matters:-

Fishery closure:

this option would deliver most to maximise the number of fish surviving to spawn, however it would also represent a significant impact on local socio-economic benefit. In most cases it would also mean that we have no insight into salmon abundance.

Catch conditions:

this option would require the identification of an acceptable level of mortality, probably regulated by a licence to kill fish and a carcasse tagging system. There are several difficulties here, however the reality is that there are few rivers where there is an acceptable level of killing.

Automatic triggering of controls:

This option would use the decision structure, and regulatory measures linked to this, to automatically trigger fishing controls. The *vires* for this and the method by which measures would be defined and regulated requires further work.

Review of old inappropriate byelaws

52. We also propose to review some other relevant byelaws that we believe are no longer relevant or appropriate, notably:-

- The bag limit byelaw in west Wales, setting maximum permissible daily catch of salmon and sea trout that is clearly now inappropriate. We will consult on possible repeal of this.

- The existing Wye and Taff/Ely C&R byelaws for possible addition of fishing method controls such as single-hook lures. We will consult on issues around adding these method controls as part of an overall consultation.

- An old byelaw that requires coarse fishermen on the Wye to apply for a dispensation allowing them to use maggot as bait. We believe this is no longer relevant and we will consult on possible repeal of this.

Management of the process

53. NRW now needs to debate the issues arising from the stock assessment and the options to address these so that we can agree which option we will pursue. This will include a public consultation so that we can gather the views and evidence from anglers, netsmen, partners and all stakeholders. We will then use these responses to identify the option we will pursue.

54. This is a difficult issue because of the radical nature of the measures proposed, and it will be unpopular. However it should be noted that other jurisdictions, including Ireland, Scotland and Canada are dealing with this matter in a similar way, and England is urgently considering its options.

55. Under the preferred option we will need to initiate the process to develop and introduce new fishing byelaws in the set of rivers covered by each option:-

56. The process for promotion of byelaws includes:-

- Construction of a technical case in support of the proposals, including options to achieve the stated objectives
- A requirement for consultation with all interested stakeholders, including anglers, netsmen and WG
- A report on the case and the consultation together with a recommendation to the Minister
- Public advertising of the proposals.
- Engaging with those who maintain opposition to the proposals.
- A final report to the Minister seeking approval.
- Implementation and future regulation.

57. Past experience of byelaws and Net Limitation Orders is that this process requires significant staff resource. We need to be clear in particular on the means of consulting and communicating with stakeholders, in light of the negative feedback received following the hatchery and stocking consultation (and the nature of submission to the scrutiny Committee).

58. For the rivers Dee and Severn there would be a requirement to consult with the Environment Agency and DEFRA.

Staff resources

59. Option 1 represents the minimum required under our current salmon stock management system. The resource requirement for this, based on previous experience with the introduction of the Wye byelaws, will be:-

Technical Fisheries	area fisheries staff who would prepare technical cases and lead local stakeholder engagement. **Estimate: no less than 0.25 FTE p.a. from each area (more from N and SW) = at least 1 FTE p.a.**
Legal	preparation of legal instruments. **Estimate 0.2 FTE in years 1 and 2, less thereafter.**
Communications	consultation management. **Estimate 0.5 FTE p.a. in years 1 and 2, less thereafter.**
Management	stakeholder management; management oversight. **Estimate 0.1 FTE p.a. from each area and from KSP = 0.5 FTE p.a.**

Total resource estimate = 2.2 FTE p.a.

60. If one of the more radical options (3 and 4) is adopted, the resources required from NRW will be more significant, and approximately double those itemised above.

    Option 2 will require an intermediate level of resource.

61. These resource estimates are on the assumption that new measures will be developed promptly and in time for the 2016 fishing season. This is the best approach however extending the timescale for development may reduce peak resource requirements.

    There will be an ongoing resource demand as the duration of the byelaws, up to 10 years, proceeds and as any ongoing requirements for review and extension become clear.

62. We will need to consider what extra or re-aligned enforcement resource would be required for any of the new options.

<u>River restoration and habitat improvement programmes</u>

63. NRW and predecessors, together with partner organisations, have been engaged in habitat restoration programmes for many years, however much remains to be done. Achievements are measured by performance of stream fish populations, and by compliance with WFD objectives.

64. Our work has been funded through rod licence project funds, the Sustainable Fisheries Programme and associated external funding sources, and most recently through the 'alternative mitigations' work (re-investment of funds following the cessation of stocking), and by JWP/COMP funding.

65. Virtually all of this work has also supported outcomes required by the WFD and, in the case of designated sites, the Habitats Directive. We will continue to seek to maximise funds available to deliver this work.

Conclusions

a. The poor status of all salmon stocks and some sea trout stocks in Wales requires urgent action to be taken, following the guidance of the decision structure for fishing controls.

b. NRW must also consider measures to promote restoration of the salmon feature of 6 N2K sites in Wales.

c. Options are presented for debate. Each requires substantial resource mainly, but not entirely, from technical fisheries staff.

d. Depending on the resources committed, new measures could feasibly be in place for the 2016 fishing season.

e. We do not consider that angling or netting in our coastal waters is the cause of the decline in salmon stocks, however restraint here is required to increase the spawning stocks whilst habitat repair and improvements works, following the principle of natural resource management, proceed.

f. Further restrictions on fishing will be unpopular with most and we need a strategy to deal with this.

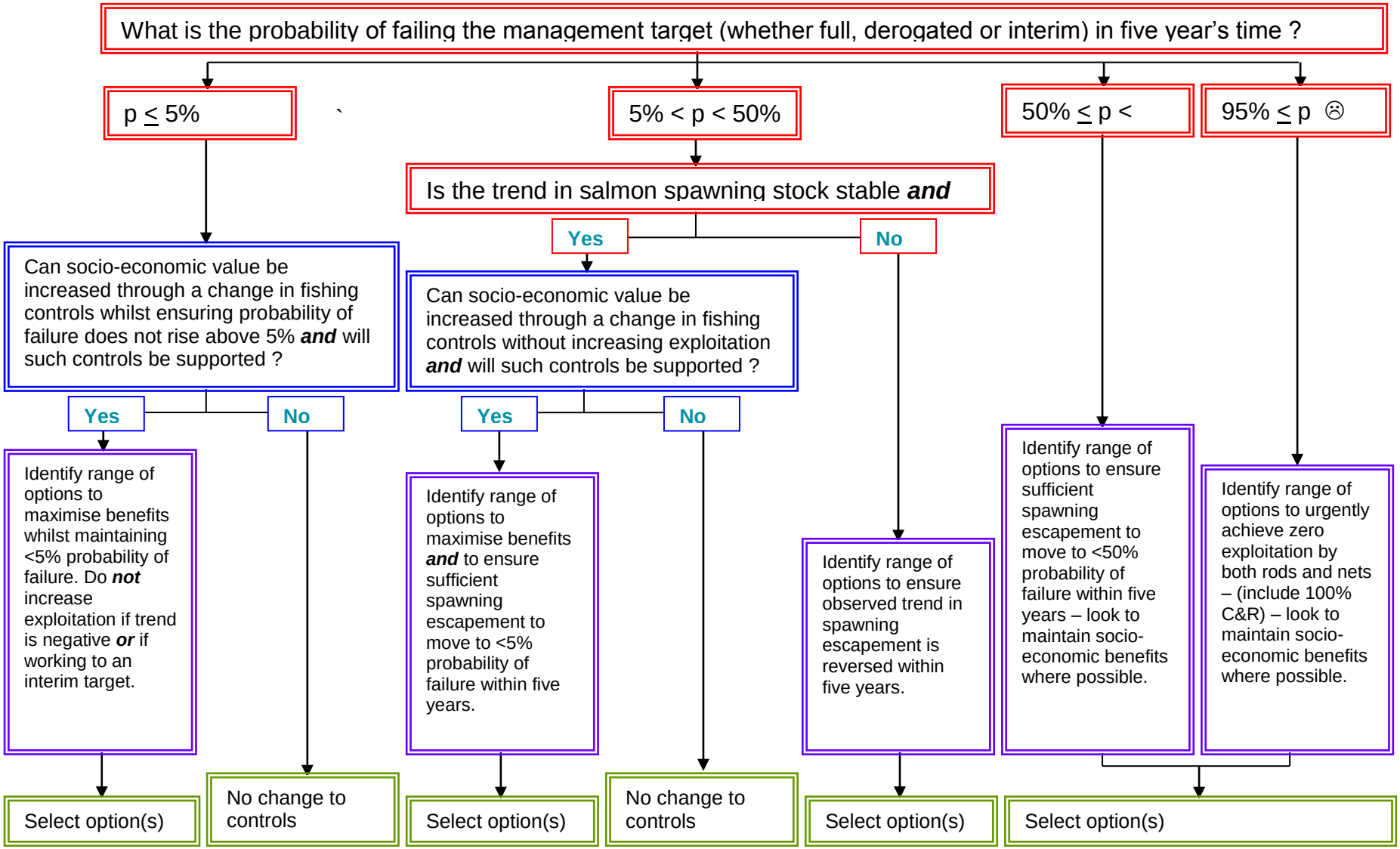
g. We propose, subject to resources and priority, to explore a number of issues to improve our ability to manage the fishery resource in future:-

- Comparative assessments of adult stock assessments and juvenile monitoring data used in WFD assessments.
- Current procedures used in Ireland, where more rapid response to stock trends is achieved
- Current and future improvements to stock assessments and compliance monitoring
- Relative socio-economic benefit from rod and net fisheries
- Automatic triggers for fishing controls

Reference

Mawle,G.W. and Peirson,G. (2009). Economic evaluation of inland fisheries. Managers report from science project SC050026/SR2. Environment Agency Science Project. Product Code: SCHO0109BPGI-E-P.

Annex. Developing fishing controls for salmon fisheries in England & Wales ("The Decision Structure")



Notes to accompany the 'Decision Structure'
INITIAL STAGE - STOCK ASSESSMENT - red boxes

Assessing compliance with the management objective

- The management objective is for spawning escapement (in terms of egg deposition) to exceed the spawning target (the Conservation Limit.) four years out of five.
- Compliance assessments are based on a Bayesian analysis which is used to estimate the probability that spawning escapement (in terms of egg deposition) will exceed the Conservation Limit for 80% of the time by a specified target date.

SECOND STAGE – INITIAL SCREENING FOR POTENTIAL OPTIONS - blue boxes

This stage screens options appropriate to those rivers that have a **<50% probability of failing the management objective** taking into consideration socio-economic concerns and stakeholder support. Management options that would not be supported by stakeholders can be ruled out. One of the possible options is to 'do nothing'.

For rivers where there is **>50% probability of failing the management objective**, all options must be carried through to the next (evaluation) stage.

THIRD STAGE - OPTION EVALUATION - purple boxes
The purpose of this stage is to set out and evaluate options to realise the required changes in exploitation.

For rivers where 50%≤p<95% (where p= probability of failing the management objective) **and the trend is down** and with an annual catch of >20 salmon and C&R rate < 90%, then voluntary C&R will promoted for 1 year. If this fails to significantly improve C&R rates, mandatory C&R or closure of the fishery will be considered. Protected rivers such as SACs (Special Areas of Conservation) are given particular emphasis

For rivers where the above criteria apply, except that the annual mean salmon catch is <20 salmon, voluntary measures will be promoted

For rivers where p>95% (i.e. the management objective is clearly being failed) and with an annual catch of >20 salmon and a C&R rate < 90%, then voluntary C&R will promoted for 1 year. If this fails to significantly improve C&R, mandatory C&R or closure of the fishery will be considered.

For rivers where p≤95% for 5 consecutive years (i.e. the management objective is clearly being met), the possibility of relaxing controls including on nets will be considered if stakeholders agree

FINAL STAGE – SELECTION AND IMPLEMENTATION - green boxes

The final stage of the decision structure (green boxes) represents the final selection and implementation stage