



Advice note
**Linking River and Floodplain
Management**





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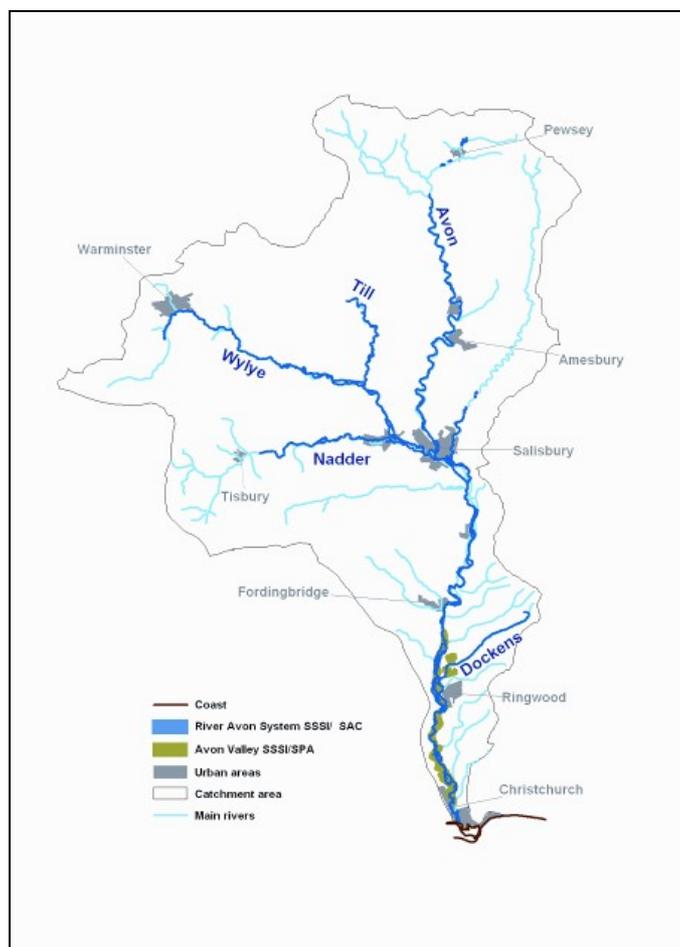
Demonstrating **ST**rategic **RE**storation **And** **M**anagement (STREAM) is a £1 million four-year conservation project centred on the River Avon and the Avon Valley in Wiltshire and Hampshire, Southern England. The STREAM project is supported financially by the European Commission's LIFE-Nature programme.

STREAM has worked to address two key issues: the need for a strategic approach to large-scale river restoration, and the need to integrate the management of the river and valley. It is part of a broader initiative that encompasses restoration of designated sites, wider biodiversity work and a programme of community engagement.

This advice note summarises the STREAM project's experience of linking river and floodplain management. It is one of three STREAM advice notes, covering planning and delivery of river restoration and linking river and floodplain management. For more information visit www.streamlife.co.uk

Background

The River Avon and its main tributaries are designated as a Special Area of Conservation (SAC), and the lower Avon Valley is designated as a Special Protection Area (SPA) for birds.



Past drainage activity has resulted in many parts of the river channels being widened, deepened and natural bed material removed, resulting in

- Destruction of habitats, channels too wide and deep for natural river flows
- Damaged vegetation communities
- Silting up of naturally clean river gravels, reducing habitat for fish, plants and insects
- Disconnection of the river from the floodplain, resulting in loss of wetland habitat

Within the River Avon SAC, STREAM has undertaken strategic river restoration activities and linked management of the river and valley to benefit the river habitat including water crowfoot and populations of Atlantic salmon, brook and sea lamprey, bullhead, Desmoulin's whorl snail, gadwall and Bewick's swan.

Between 2006 and 2009, the STREAM Project restored a total of seven kilometres of river at six sites on the Avon, Nadder, Wylde and the Dockens Water.

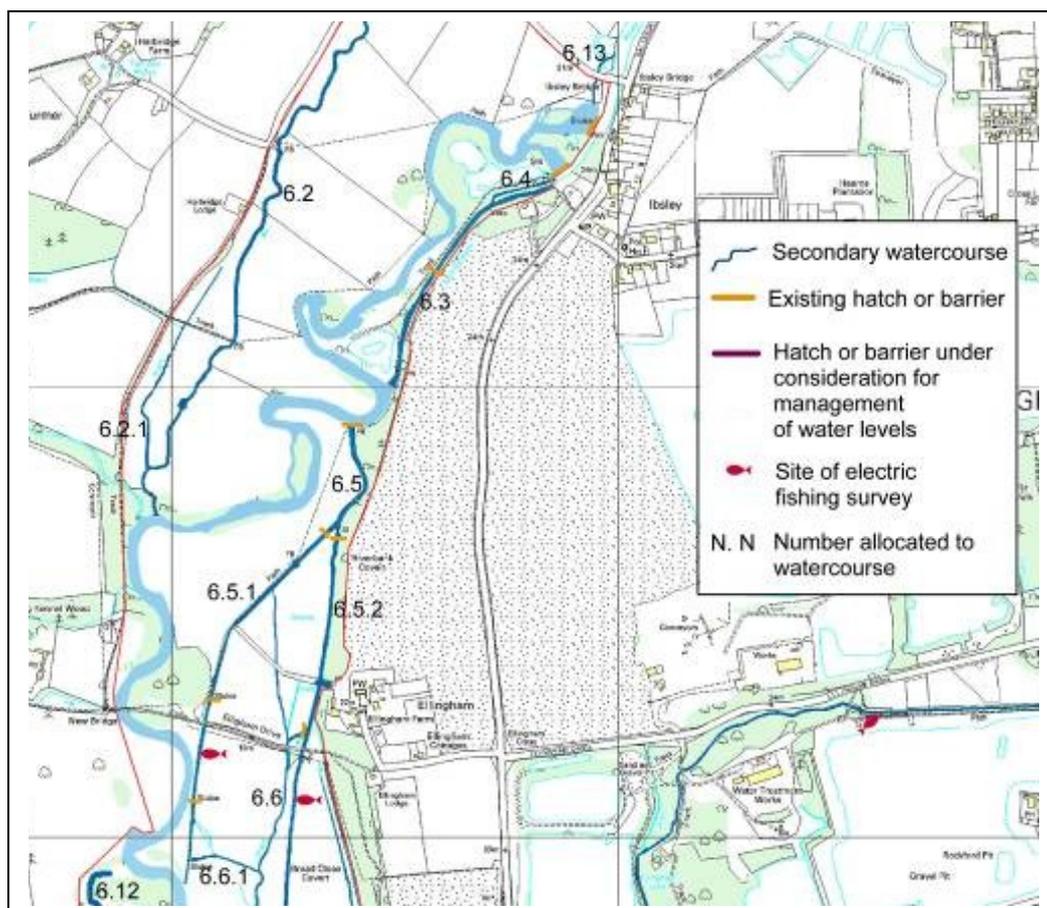
Minimising potential conflicts between fisheries and floodplain restoration

The Avon Valley SPA is currently in unfavourable condition, largely due to neglect of the watercourse network and inappropriate water level management. Re-creating suitable conditions for SPA interests requires rehabilitation of the secondary channels and ditch network, tree & scrub removal, and restoration or installation of sluices or other water control structures for retention of water on the floodplain at key times of year. All these activities potentially affect fish populations (including SAC species) within the main river and floodplain watercourses.

Methods have been identified by which fish can be excluded, or migration facilitated when water is to be diverted and/or retained within the floodplain. A methodology for strategic planning of ditch restoration was created, which can be used to minimise the potential impacts of floodplain restoration on fish populations. Full details are contained in the report "[Method for prioritising fisheries in floodplain restoration](#)" (Solomon D., 2007)

Classification of channels for fishery interests

Step 1: Identify all channels of potential fishery interest within the potential floodplain restoration area. The channel should be labelled using a hierarchical numbering system, and existing and proposed barriers to fish movement and sites of existing fishery data identified and mapped.



Mapping of secondary watercourses of existing or potential fisheries interest. Crown Copyright. All rights reserved Environment Agency, 100026380,2006

Step 2: Drawing on the existing fishery data, site visits and local knowledge, classify channels according to their fishery attributes, so that appropriate steps can be taken to protect those features when considering floodplain restoration actions. Initially the channels can be broadly categorized as follows:

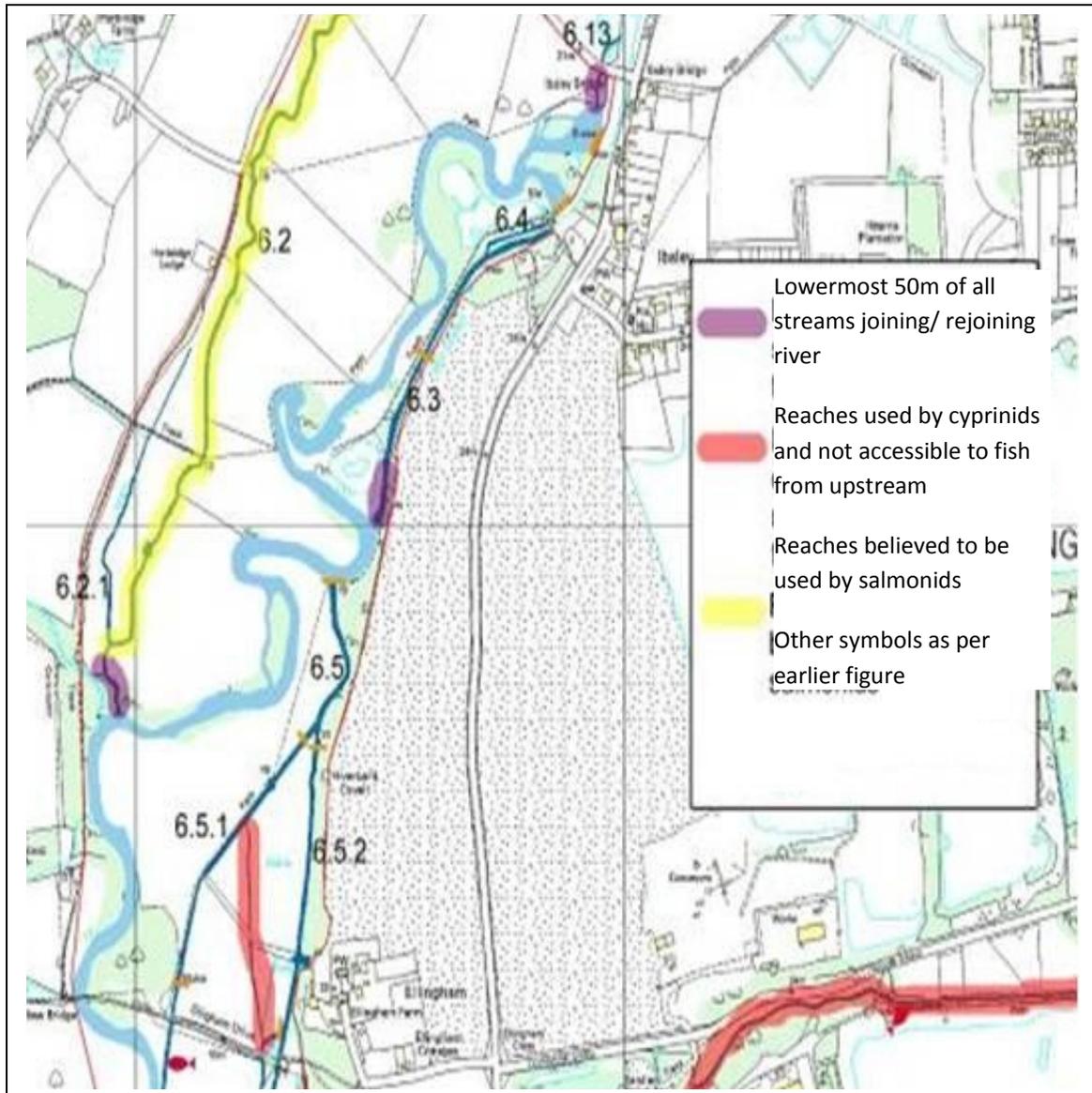
- Watercourses that are key to restoration of favourable condition within the floodplain SPA, and can be restored without detrimental fishery impact;
- Watercourses where wetland restoration can accommodate or enhance fishery interests;
- Watercourses of particular importance for SAC fish species;
- Watercourses of particular importance to other, non-SAC fish species.

It should be kept in mind however that while some watercourses are clearly more important or more vulnerable than others for fish stocks, all play an important and integral role in some aspect of fish life history.

Step 3: Colour-code channels according to the sensitivity of the fish populations likely to be using them to obstruction to passage by head-retaining structures. The colour coding of channels is summarised below.

Colour	Description	Importance	Optimal situation
Purple 	Lowermost 50 m of all channels joining or rejoining main river	Shelter for all species and sizes of fish from flood conditions on main river	No head-retaining structures
Red 	Lengths of stream that are utilised by older cyprinids and into which access is not possible from the main river from upstream	Spawning and rearing area for cyprinids.	Head retaining structures limited to head of 25 cm where possible, not drowning-out any riffles
Yellow 	Areas believed to be frequented by spawning salmonids, and which are accessible from upstream for colonisation by cyprinids	Spawning and rearing areas for salmonids and cyprinids	Head-retaining structures passable to adult salmon and trout, not drowning out any riffles
Not colour coded	Areas which can be colonised by cyprinids from upstream, and not utilised by salmonids	Spawning and rearing areas for cyprinids	Not drowning-out any riffles

The maps produced at step 1, and broad channel categorizations are overlain with the colour coding, and the results mapped as shown overleaf.



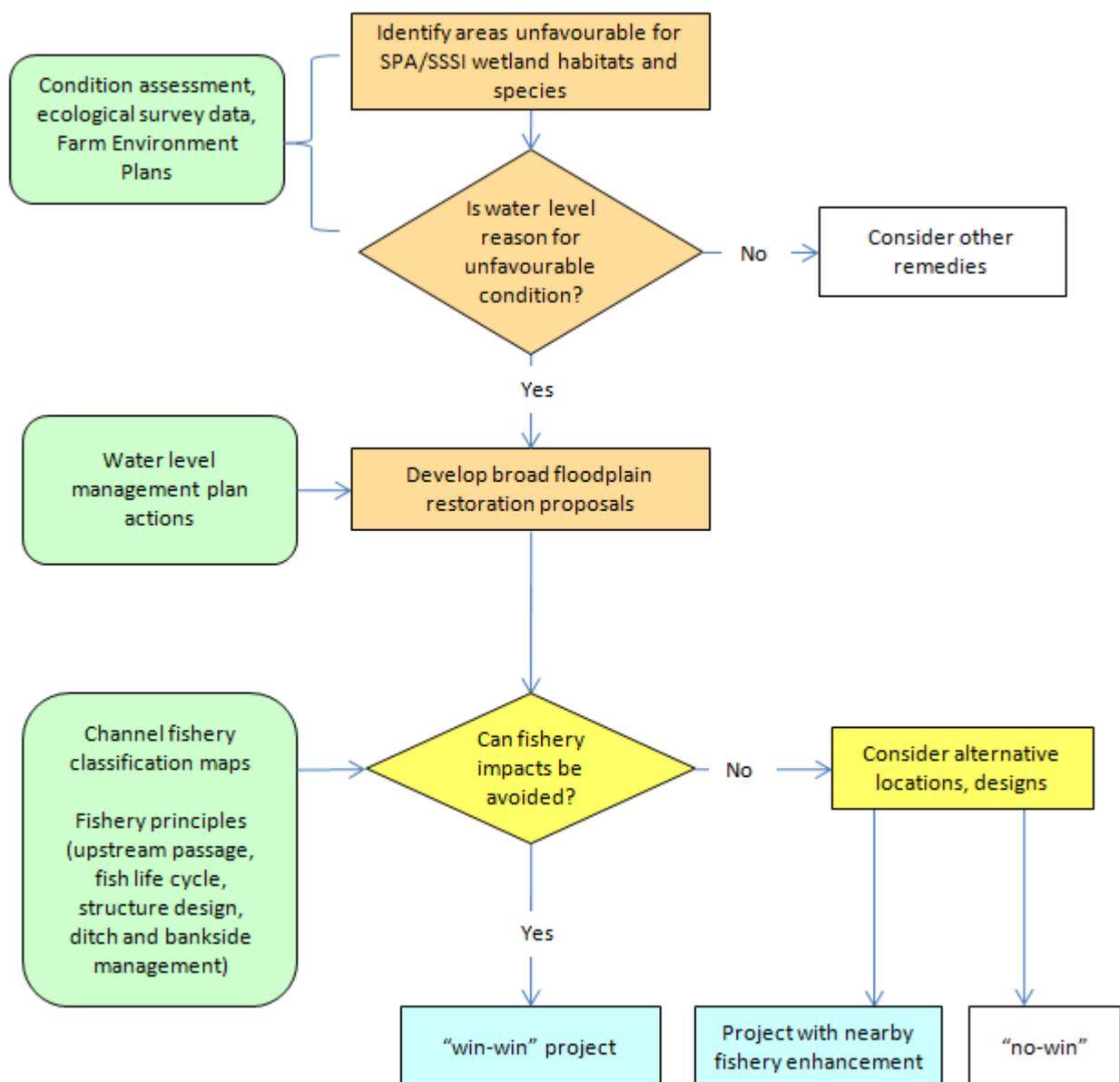
Secondary watercourses classified according to their fisheries sensitivity to the impact of head retaining structures. Crown Copyright. All rights reserved Environment Agency, 100026380,2006

Assessing impact of floodplain enhancement proposals on fisheries

The potential negative impacts of floodplain restoration works on fisheries include reduced access up and downstream, “drowning-out” of spawning areas, stranding in meadows, loss of cover and increases in water temperature. Principles to be considered when planning floodplain restoration works therefore relate to upstream fish passage, fish life cycle requirements, design of structures, ditch and bankside management.

Proposals to restore or enhance the floodplain should be considered in the context of the classified channels described above in order to minimise any potential negative impacts on fisheries. To ensure that all interests are considered at the appropriate time there is a need for an assessment process. This needs to be agreed between all the relevant parties (EA, NE and possibly others).

The flow chart below outlines a process for assessing and minimising the impact of floodplain enhancement works on fisheries. Occasionally there is no “win-win” option and compromise will be needed. The process considers fish and bird interests only, and wider interests will have to be considered at the detailed design stage.



Developing structure operating protocols

Sluice and hatch operation is a key factor in managing water levels throughout many river systems. It is crucial that an integrated approach to structures is adopted to enable control of water levels for the benefit of the river and adjacent floodplain, and to reflect the many different functions of the river. Currently, many water level control structures are in private ownership in the River Avon SAC and hatch operators have no clear guidance on best practice.

The aim of a hatch operating protocol (HOP) is to set clear objectives for a structure and to provide guidance on meeting these objectives through appropriate operation. Although the protocol is not a legally binding document, the idea is that by reaching agreement with all parties involved, it will be in the stakeholder's best interests to operate the structure according to the protocol. Where formal abstraction or impoundment licence conditions, and fish passage requirements under the Salmon and Freshwater fisheries Act apply, the HOP should clearly reflect them.

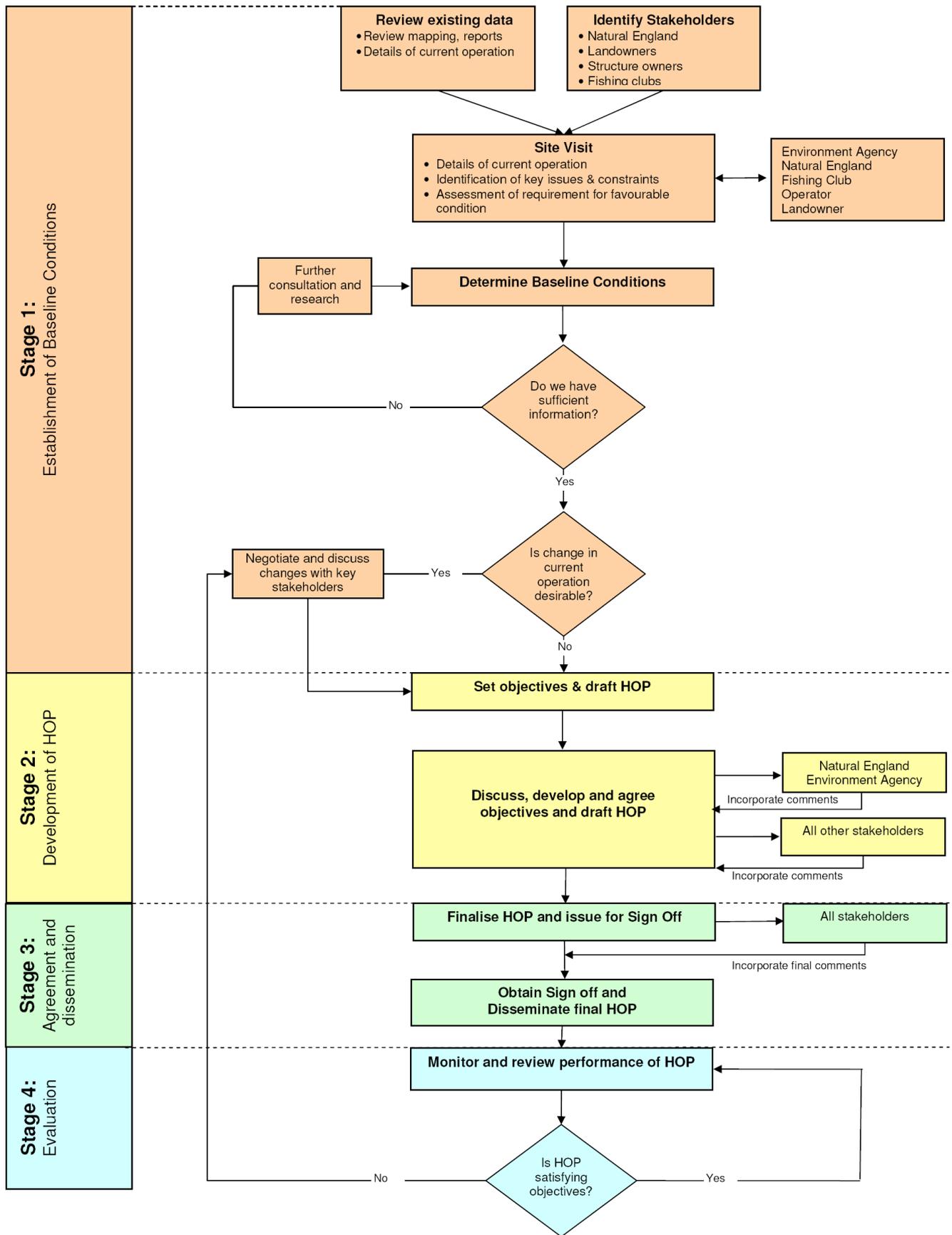
The flow chart overleaf summarises the process of developing operating protocols, and a brief description is given below. Full details are given in ["Guidance on developing structure operating protocols"](#) (Haskoning UK, 2009).

Issues encountered in HOP development

There are a number of issues that may be encountered in HOP development, these can often take time to resolve and delay the development of HOPs. Our experience of the main considerations and issues are summarised below.

Consideration/issues	Comment
Allow plenty of time to build consensus	It is crucial that plenty of time is put aside for consultation and discussion of the HOP aims, objectives and content – as it is a voluntary document it will fail unless all parties agree on the content.
Difficulties identifying all the relevant landowners and other stakeholders.	Extensive consultation with Environment Agency and known stakeholders.
Lack of information on fish spawning and migratory habits	Contact FRB team within the Environment Agency for further information on nature of fish habits, timing of migrations for both salmonid and cyprinid species.
Delays caused by lack of stakeholder engagement	Proactive approach to consultation using face-to-face meetings where possible. Still likely to have problems in obtaining busy landowners.
Establishing the function of the structure.	Contact Operations Delivery within the Environment Agency or landowner and obtain the original structure design document if available. This contains information describing the factors taken into consideration in designing the structure.
HOP is voluntary, but certain aspects are legal requirements .	Ensure that mandatory legal requirements are clearly identified separately from voluntary aspects of the HOP

Templates for collecting and recording baseline data and the final HOP document, and detailed guidance on developing HOPs are available on the STREAM website.



More information

Haskoning UK Ltd. (2009). Water level control structure baseline report

<http://www.streamlife.org.uk/resources/publications/>

Haskoning UK Ltd. (2009). Guidance on developing structure operating protocols

<http://www.streamlife.org.uk/resources/publications/>

Solomon. D (2007) Method for prioritising fisheries in floodplain restoration

http://www.streamlife.org.uk/pdf/Method_for_prioritising_fisheries_in_floodplain_restoration.pdf

The Living River Project (2009) River restoration and interpretation through public engagement

<http://www.livingriver.org.uk>



The STREAM project has demonstrated restoration work on the River Avon tributaries, and linked the management of the river and its floodplain.



The River Avon System and Avon Valley are home to some of the most rare or threatened wildlife in Europe. They are protected as Natura 2000 sites.



STREAM is supported by the LIFE Nature fund, Natural England, the Environment Agency, Wiltshire Wildlife Trust, Hampshire and the Isle of Wight Wildlife Trust and Wessex Water.



STREAM works closely with the Living Project, which increases local people's awareness and appreciation of the Avon System.

To find out more

The experiences of the STREAM project can inform river restoration and floodplain management across Europe. Information on all aspects of the project, including guidance notes and technical reports are available on the STREAM website.