UK Technical Advisory Group on the Water Framework Directive

Criteria and Guidance Principles for the designation of heavily modified water bodies

This Guidance Paper is a working draft defined by the UKTAG. It documents the principles to be adopted by agencies responsible for implementing the Water Framework Directive (WFD) in the UK. This method will evolve as it is tested, with this working draft amended accordingly.

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		Revised	March 2008

Purpose

This paper sets out a rapid screening methodology that can be used to help identify those water bodies for which the case for designation as heavily modified can be made **without the need for detailed site-specific studies.**

Introduction

Water bodies identified as being at significant risk of failing to achieve good ecological status because of modifications to their hydromorphological characteristics resulting from past engineering works, including impounding works, were provisionally identified as heavily modified for the Article 5 report. These are recorded as modified on the WFD characterisation database and there are currently 476 such water bodies in Scotland, and 3301 in England and Wales. In order for a water body to be designated heavily modified evidence is required to show that the water body would not achieve good status without measures being applied in relation to the modifications that have been made to the hydromorphological characteristics. This paper outlines principles for the methodologies the UK will use to identify which of these bodies can be designated without the need for detailed site-specific studies.

It must be noted that, due to variations in organisational structure and data sets available the exact methodologies will differ between SEPA, Environment and Heritage Service and

the Environment Agency, but the principles outlined in this paper remain the same for the organisations.

To make the case for designation, evidence is required that:

(a) Making the hydromorphological improvements necessary to achieve good status would have a significant adverse effect on the wider environment or on a specified water use;

AND

(b) For reasons of technical feasibility or disproportionate cost, there is no significantly better environmental option to reasonably achieve the benefits provided by the modifications.

If both criteria are met then the water body should be designated heavily modified.

The criteria outlined below should be applied to **each relevant water body provisionally identified as heavily modified** on the WFD characterisation database. The work will be led and by national Environment Agency, SEPA and EHS staff with input from the relevant local Environmental Agency staff. The criteria should enable the rapid assessment of those water bodies that are clearly heavily modified.

Methodology

This paper covers four areas to be considered when determining whether a water body should be heavily modified:

- the wider environment
- the purposes for which water is stored
- the functioning of ports or harbours
- urban residential and commercial land uses.

This list is not exhaustive. There will be other uses for which designation as heavily modified is justified. For some of these other uses, such as flood defence schemes and land drainage schemes in rural areas, site specific studies may be needed to determine whether the designation tests are met. If the use which relies upon the modifications to the hydromorphological characteristics is not covered in this paper, this should be recorded along with the use.

Criteria to be met for each use covered in this paper are given in the sections below along with practical advice on applying the criteria. Only the criteria that are relevant to the water body should

be applied. It is unlikely that the criteria for all four uses will be relevant to a single water body.

The water body should be designated heavily modified if the criteria associated with any of the water uses are met.

There are two parts to the criteria; significant adverse effect on the wider environment or purpose and secondly whether there is a significantly better environmental option (figure 1). If restoration of the water body to good status by making the necessary hydromorphological improvements will have a **significant adverse effect** on a specified water use or the wider environment **and** there is **no significantly better environmental option** for delivering the benefits served by the modifications, the water body can be identified as heavily modified without further studies.

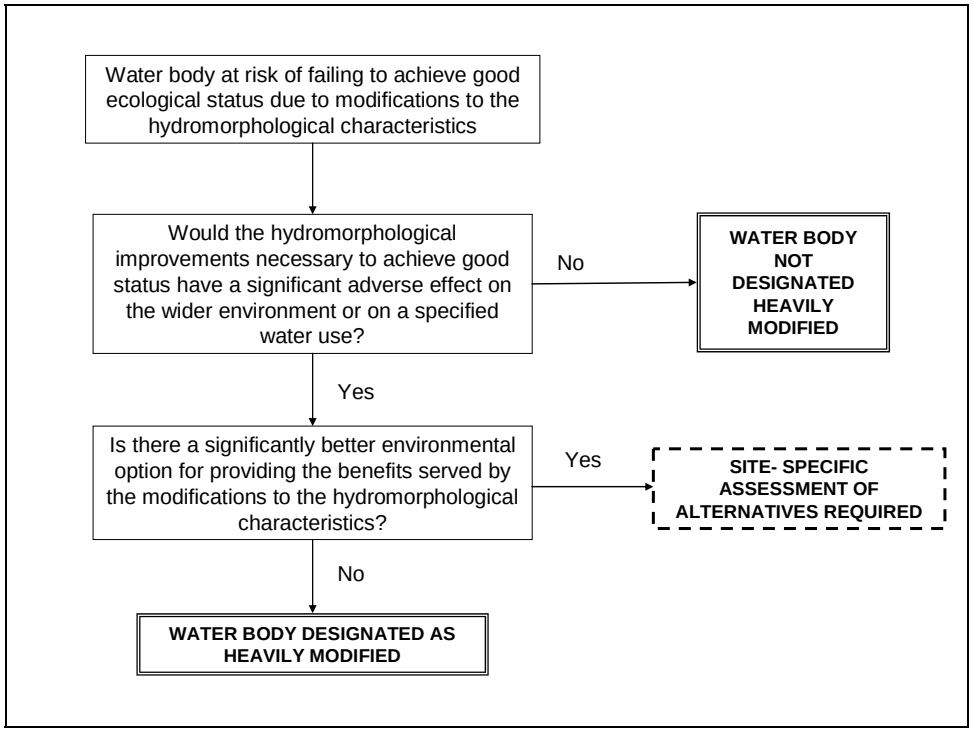

Figure 1. Stages for determining whether a water body is heavily modified.

Not part of screening tool

The screening methodology does not deal with situations in which there is a significantly better option for providing the benefits served by the modifications. Where there is such an option, further assessments will be needed to decide if the option is technically infeasible or disproportionately expensive in the particular circumstances before designation can be considered.

Output

From the application of the criteria set out in the following sections of this document water bodies should be assigned to one of four categories:

- Heavily modified
- Site-specific study required to assess whether there is a significantly better environmental option that is not technically unfeasible or disproportionately expensive.
- Not heavily modified (according to purposes addressed in this screening tool).
- Other e.g. insufficient information available, reason for heavily modified designation not covered in this screening tool.

Spreadsheets have been developed to record the decision making process along with any justifications. This will act as a record of the reasons why water bodies have or have not been designated heavily modified.

Significant adverse effects on the wider environment

This section should be applied to water bodies that have an international or national conservation objective associated with them.

The UK TAG view is that there is no significantly better environmental option for achieving an international or national conservation objective other than by maintaining the modified hydromorphological characteristics on which the conservation interests depend.

Therefore if improvements to the hydromorphological characteristics of a water body that are necessary to achieve good ecological status would compromise the achievement of an international or national conservation objective, this is considered to be a significant adverse effect on the wider environment and therefore the water body should be designated heavily modified.

Impacts on local conservation objectives may also represent a significant adverse effect on the wider environment. However, information on risks to local conservation interests is less readily obtained. The screening approach is therefore focused on nationally and internationally designated sites.

Designation Criteria

Figure 2 outlines the criteria for determining whether a water body should be designated heavily modified due to significant adverse effects on the wider environment.

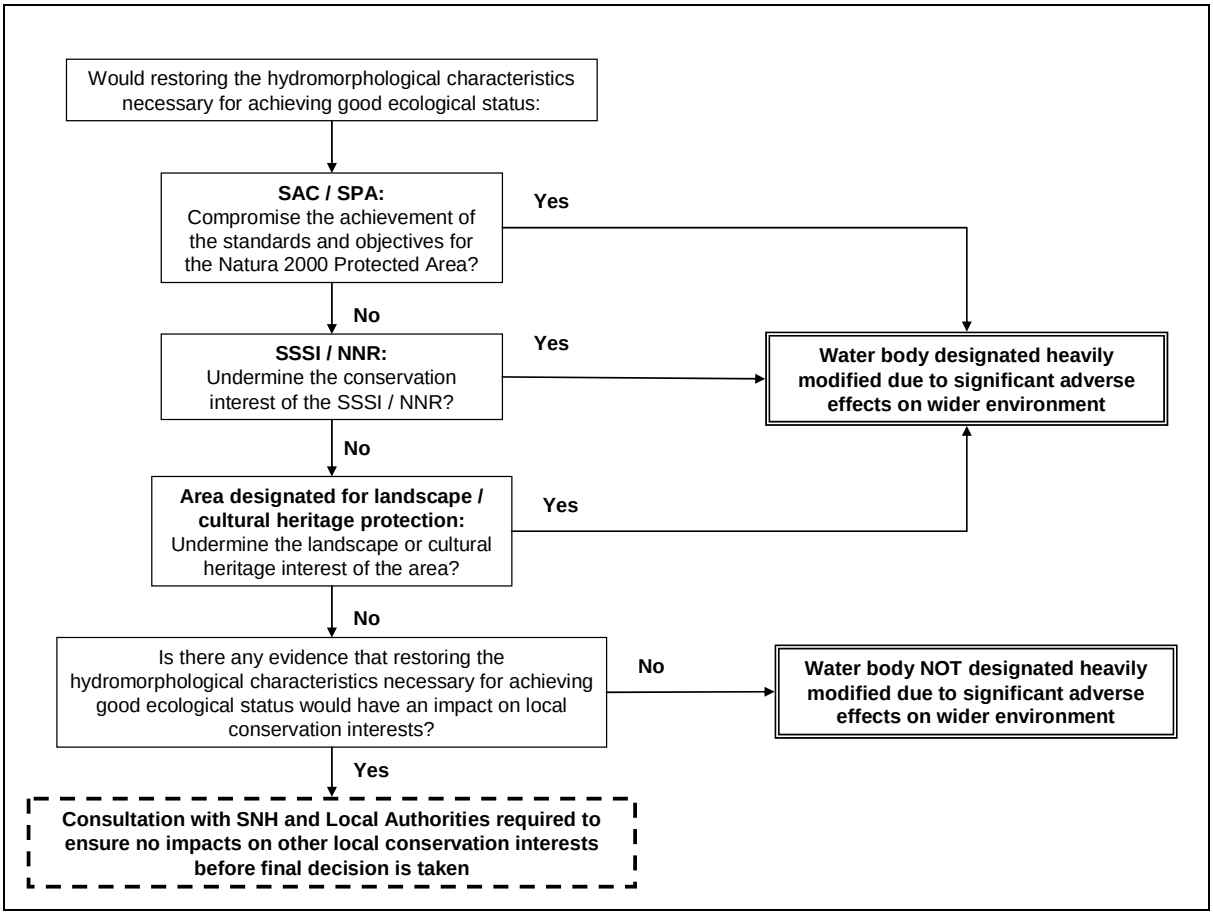

Figure 2. Decision tree for determining whether a water body should be designated as heavily modified due to significant adverse effects on the wider environment.

Example

A redundant reservoir has become an important roosting site for wildfowl. This has led to its designation as a Special Protection Area under the Birds Directive. **Removing the impounding works would drain the reservoir and hence undermine the conservation interest of the site.**

Once this screening tool has been applied to all relevant water bodies where possible SNH, Natural England, CCW will be consulted (in England & Wales this consultation will be undertaken via the River Basin District Liaison Panels. In Northern Ireland consultation will carried out internally within EHS) to ensure that they agree with the assessment. It should be noted on the recording form if there is uncertainty regarding whether restoration to good ecological status would compromise the achievement of an international or national conservation objective. In such cases SNH, Natural England and CCW will be consulted to confirm that restoration of the hydromorphological characteristics would have an adverse impact before a final decision is taken. Further advice will be sought on all water bodies where it is identified that restoration to good ecological status might pose a risk to local conservation interests.

Sources of information

- Advice from SNH/NE or SEPA /Environment Agency/EHS Biodiversity Officers.
- The WFD database shows whether there is a water dependent Protected Area associated with the water body (NNRs associated with water bodies are not included on the WFD database).
- SEPA , Environment Agency, EHS GIS layers showing SACs, SPAs, SSSIs and NNRs.
- PASTMAP can be used to search for areas designated for landscape/cultural heritage protection. To use PASTMAP go to http://jura.rcahms.gov.uk/PASTMAP/start.jsp and register (Scotland only).

PASTMAP is a separate website, produced jointly by Historic Scotland, Scottish Natural Heritage and RCAHMS which brings together four main databases: Canmore, Scheduled Ancient Monuments, Listed Buildings and Designed Landscapes and Gardens. PASTMAP is updated every two weeks.
PASTMAP displays the location of:
• listed buildings
• the boundaries of legally protected ('scheduled') ancient monuments
• the boundaries of designed landscapes and gardens
• every site, building, maritime feature or find recorded in Canmore

Significant adverse effects on the purposes for which water is stored

This section should be applied to water bodies that are being used for water storage purposes (e.g. reservoirs) and in order to achieve good status an impounding works would have to be removed.

Designation criteria

The water being stored must be used for a purpose, such as drinking water supply; hydropower generation; flood risk management; recreation; etc.

If the water is no longer being stored for a purpose that depends upon the modified characteristics, the water body cannot be considered for designation as heavily modified due to water storage purposes unless achieving good status would have a significant adverse effect on the wider environment (see section 2).

Storage for drinking water supply and hydropower generation are considered in this section. Criteria for other uses such as flood risk management and recreation (including Commercial Fishery Enterprises) will be developed at a later date.

If the water body used for water storage is upstream of the water body being assessed then the criteria relevant to the upstream water body should be applied.

Drinking water supply

Figure 3 outlines the criteria to be applied to water bodies used for drinking water supply.

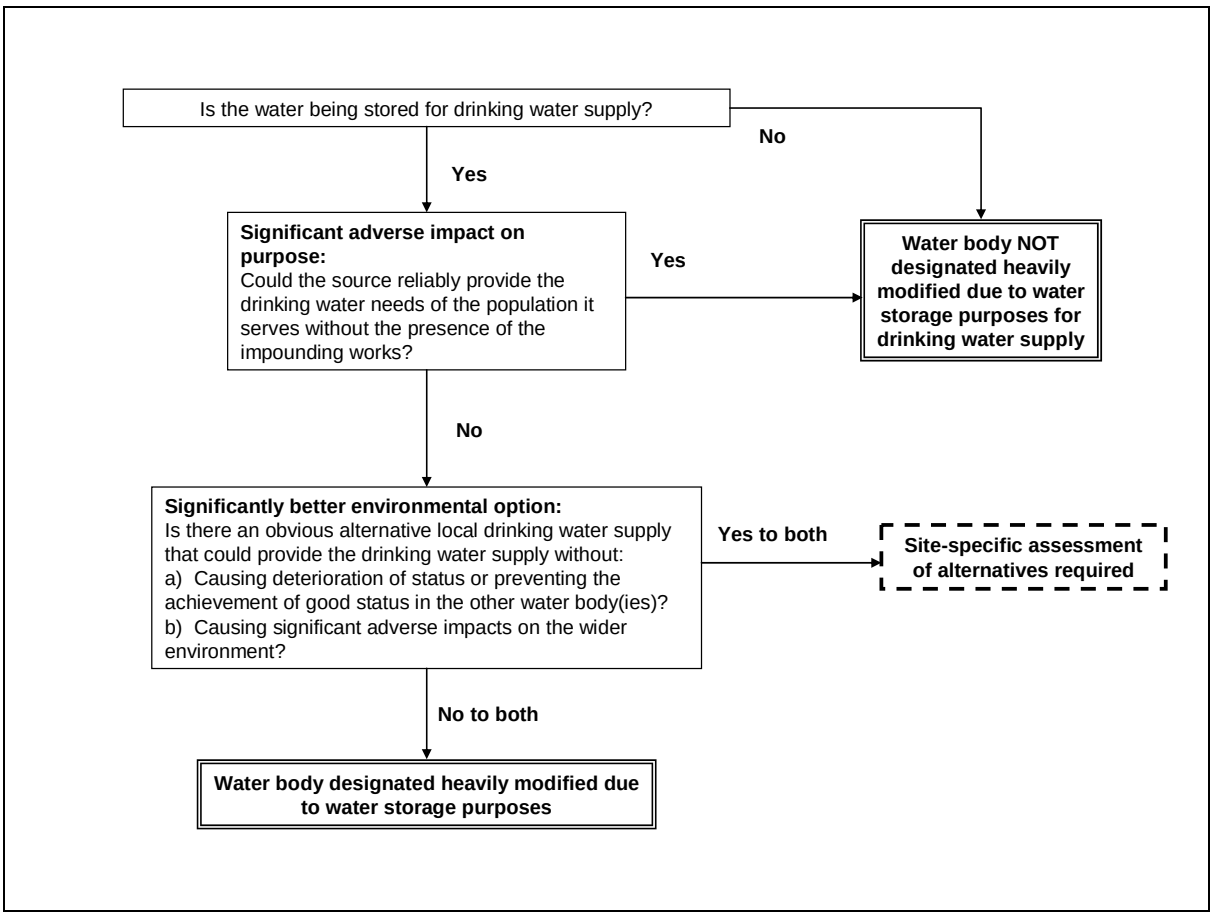

Figure 3. Decision tree for determining whether a water body should be designated as heavily modified due to significant adverse effects on the storage of drinking water.

Significant adverse effect on purpose

If removal of the impounding works would not have a significant adverse effect on drinking water supply the water body should **not** be designated heavily modified. This is because the water body could continue to provide the same quantity and reliability of supply following its restoration to good status.

Example

The height of a loch/lake outflow has been artificially raised by a small impounding works. Water is abstracted from the loch/lake to provide a drinking water supply. The impounding works were built with the intention of supplying a far greater volume of water than is currently supplied by the loch/lake. The effects of the impounding works are sufficient to prevent the loch/lake achieving good ecological status.

The removal of the impounding works would not have a significant adverse impact on drinking water supply. **This is because the natural volume of water in the loch/lake would be able to meet the supply demands placed on it.**

However if the removal of the impounding works would result in the drinking water needs of the population not being met, significantly better environmental options should be considered.

Significantly better environmental option

It is assumed that there is no significantly better environmental option unless there is an obvious alternative under-exploited local source that would be capable of providing the supply with much less impact on the water environment. This is very unlikely to be the case unless the candidate HMWB serves only a small population and has particularly significant adverse effects on the water environment compared with other similar scale reservoirs. If there is no significantly better environmental option for providing the water supply the water body **should** be designated heavily modified. If there is a significantly better environmental option a **site-specific assessment of the alternatives** will be required. This will be undertaken as part of the authorisation review process.

Hydropower generation

The criteria to be applied to a water body used for hydropower generation are outlined in figure 4.

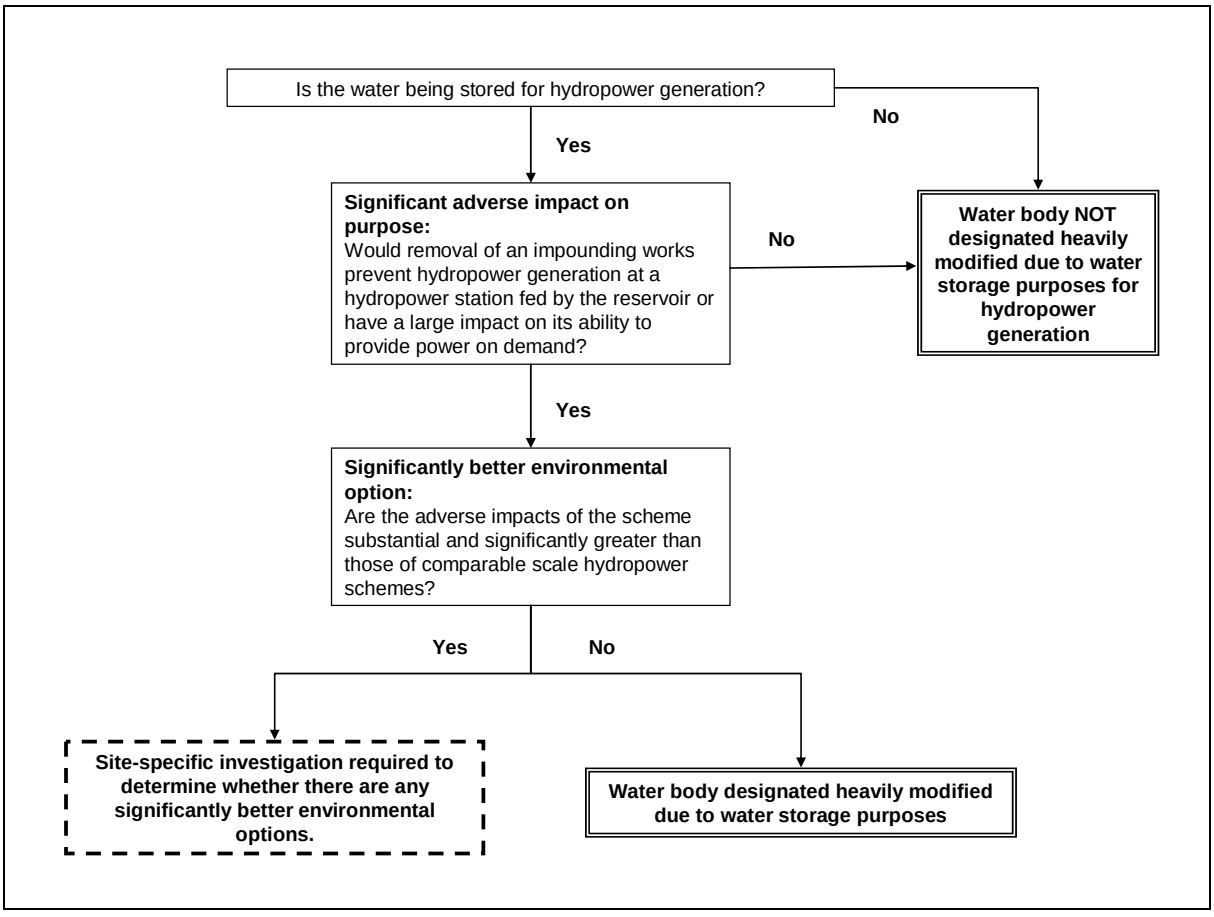

Figure 4. Decision tree for determining whether a water body should be designated as heavily modified due to significant adverse effects on hydropower generation.

Significant adverse effect on purpose

If removal of the impounding works would **not** have a significant adverse effect on hydro-electricity generation by preventing hydropower generation or have a large impact on its ability to provide power on demand, the water body should **not** be designated as heavily modified. If there would be a significant adverse effect on the purpose, any significantly better environmental options should be considered.

Significantly better environmental option

The Scottish Parliament has set the policy objective of increasing renewable energy generation capacity in Scotland. Accordingly, SEPA will not normally consider the closure of an existing hydropower scheme and its replacement with an alternative comparable renewable energy scheme as a significantly better environmental option.

However, if the adverse impacts of the hydropower scheme are substantial and obviously much greater than those of hydropower schemes of a comparable scale then a **site-specific assessment of alternatives** will be required. This will be undertaken during the authorisation review process.

Sources of information

- Knowledge of local SEPA, EHS & Environment Agency teams
- Knowledge of SEPA, EHS & Environment Agency water resources staff

Significant adverse effects on the functioning of ports or harbours

The criteria in this section should be applied to transitional and coastal water bodies that:

(a) Are being used as ports or harbours;

and

(b) To achieve good status, would require measures, such as the replacement of quays, piers, jetties and breakwaters with more natural shore zone habitats; or the cessation or reduction of dredging works to facilitate the restoration of more natural seabed characteristics.

Designation Criteria

The criteria to apply to water bodies with ports or harbours are given in figure 5.

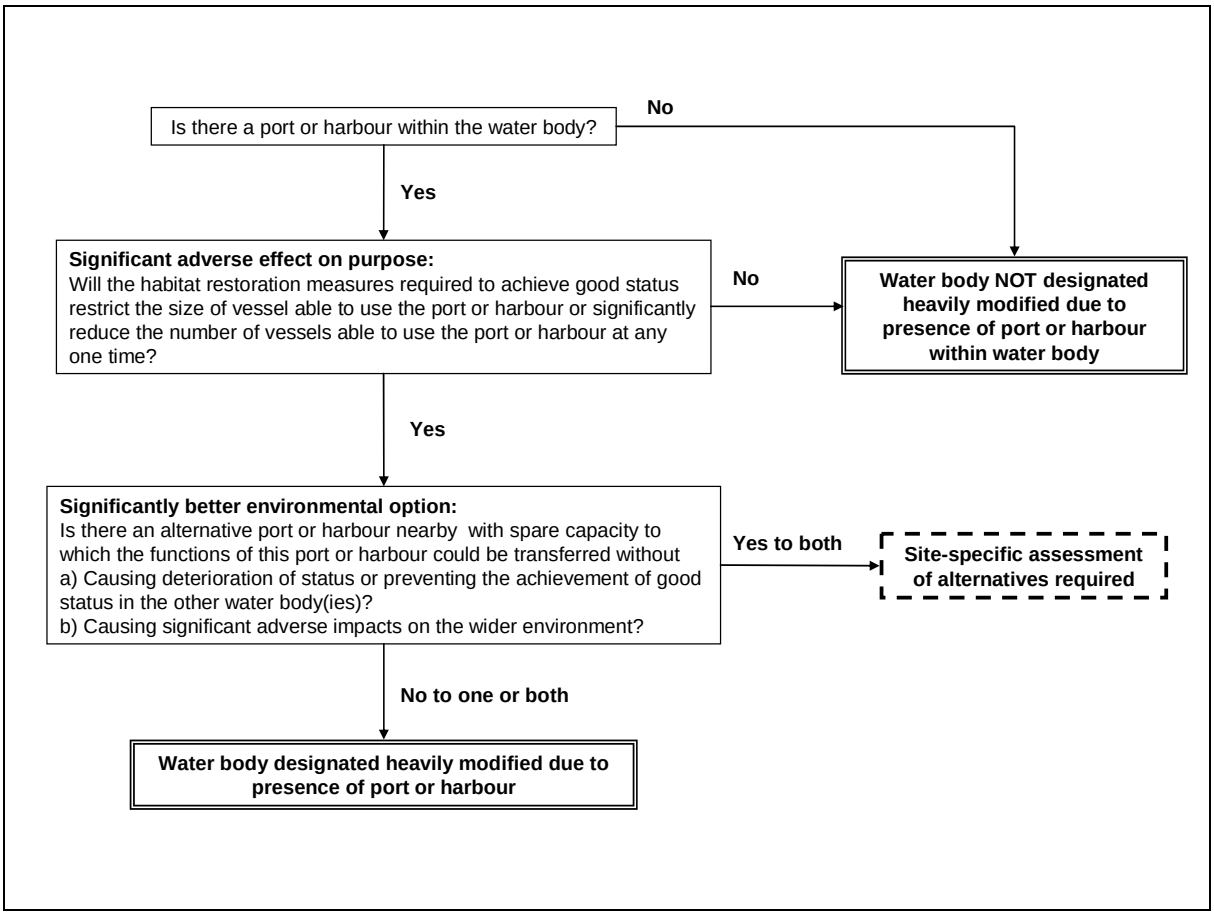

Figure 5. Decision tree for determining whether a water body should be designated as heavily modified due to significant adverse effects on the functioning of ports or harbours.

Significant adverse effect

If the habitat restoration measures required to achieve good status would **not** reduce the size of vessel able to use the port or harbour, or the number of vessels able to use the port or harbour at any one time, the water body should **not** be designated heavily modified. Otherwise significantly better environmental options must be considered.

> Example
> A water body is failing to achieve good status because part of its intertidal zone has been replaced with concrete quays. The quays provide berths for container ships and other vessels. The vessels load and unload their cargoes at the quays. The restoration of the intertidal zone would require the removal of the quays and their replacement with a more natural intertidal zone. **Such measures would have a significant adverse effect on the functioning of the port by preventing the loading and unloading of the vessels.**

Significantly better environmental option

The availability of an alternative port/harbour nearby with spare capacity should be considered. However this would only be a significantly better environmental option if the transfer of functions would not cause deterioration in status or prevent achievement of good status in another water body(ies) or cause a significant adverse effect on the wider environment. This is unlikely to be the case unless the port/harbour has a very low level of use compared to the scale of its impact on the water environment and other local ports/harbour have spare capacity to take on the other port/harbours uses.

Other options for the transport of goods and passengers by rail, road or air are not considered to be significantly better environmental options due to the energy consumption and air emissions produced.

If significantly better environmental options are identified a **site-specific assessment of the alternatives** will be required at a later date to determine whether the options are technically unfeasible or disproportionately expensive.

<u>Sources of information:</u>

- Port authority web sites
- Knowledge of local SEPA, EHS and Environment Agency staff
- Seek input from FRS. Scottish Government is to start discussions with FRS on the regulation of engineering activities in coastal waters. Input from FRS should be obtained at some point in the process in order to try to get a collaborative approach to HMWBs and over-riding public

interest for engineering schemes. This should be undertaken nationally once this initial screening tool has been completed.

Significant adverse effects on the protection of urban areas from flooding and subsidence

This section should only be applied to water bodies where the hydromorphological characteristics have been modified so that the surrounding land can be used for intensive urban land uses.

Water bodies in many towns and cities have been modified to facilitate land drainage and reduce flood and subsidence risks. These modifications have enabled urban development on land adjacent to rivers, estuaries and coasts and continue to safeguard that development from flooding and subsidence. For example, many stretches of rivers and burns in urban areas have been straightened and deepened for land drainage and flood protection and their banks and riparian zones strengthened to prevent lateral erosion.

Designation criteria

The criteria in figure 6 should be applied to water bodies where the hydromorphological characteristics have been substantially modified in order to enable the land immediately surrounding the water body to be used for intensive urban land use purposes.

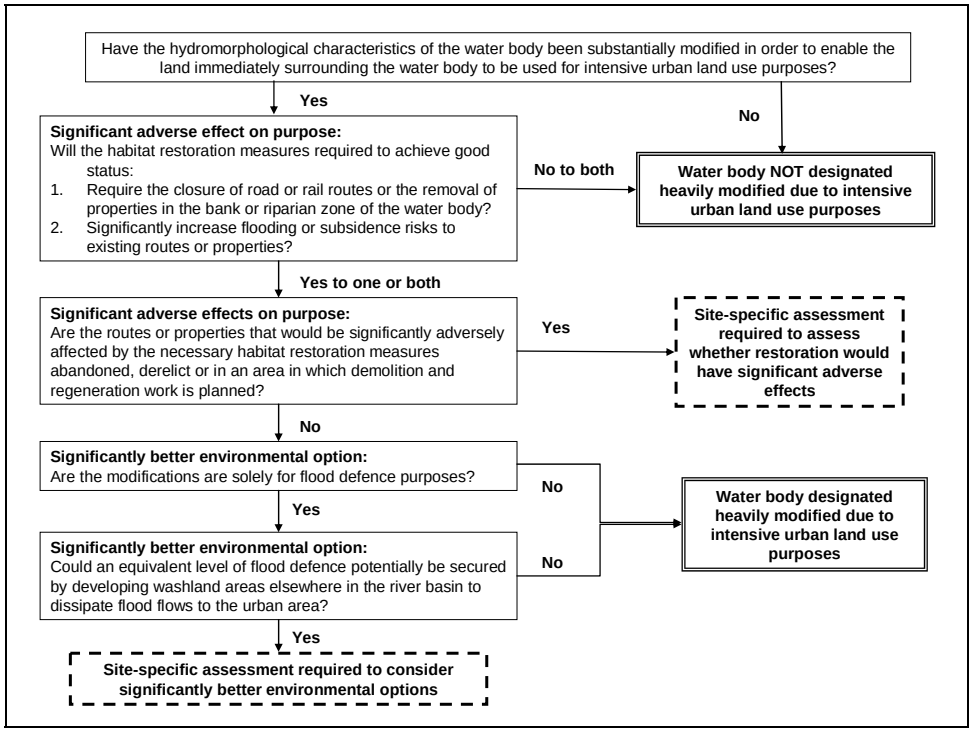

Figure 6. Decision tree for determining whether a water body should be designated as heavily modified due to significant adverse effects on urban residential and commercial land uses.

Significant adverse effects

If the routes or properties that would be affected by restoration to good status are abandoned, derelict or in an area in which demolition and regeneration work is planned, then the water body should not be designated without further site specific assessment of whether restoration would have a significant adverse impact on urban residential and commercial land uses.

Significantly better environmental option

If the modifications preventing the achievement of good status are solely for flood defence purposes and there are no washland areas within the basin that could be used to dissipate future flood flows to the urban area then the water body **should** be designated heavily modified. This is likely to be the case in major conurbations with a history of major flooding.

If there are potential washland areas that could potentially secure an equivalent level of flood defence then a **site-specific assessment of the alternatives** will be undertaken at a later date.

If the modifications are not solely for flood defence purposes the water body should be designated heavily modified.

Sources of information

- SEPA, EHS and Environment Agency GIS layers
- Flood protection maps
- Input from local environmental agency hydrologists