

# Environmental site audit checklist for hydropower schemes



Please read through these guidance notes carefully before you fill in the checklist.

This checklist will take you through the main environmental considerations relating to your hydroelectric-power scheme.

Read our Guidance for run-of-river hydropower development and the set of advice notes on our [website](#) or from our National Customer Contact Centre by telephoning 03708 506506.

Fill in this checklist to help you understand what information you need to send to us and how to get that information.

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- 1 Water abstraction and flow management
- 2 Conservation
- 3 Water quality
- 4 Biodiversity and fisheries
- 5 Managing flood risk
- 6 Navigation

## Filling in the checklist

You should work through all six sections of the checklist:

- 1 Water abstraction and flow management (physical characteristics, such as size, shape and structure of a channel, its sediment, and the flow and quantity of water)
- 2 Conservation
- 3 Water quality (relating to both physical and chemical characteristics)
- 4 Biodiversity and fisheries
- 5 Managing flood risk
- 6 Navigation

You should complete as much of the checklist as you can. If you are just filling Part A of the pre-application form, we do not expect you to be carrying out detailed investigations at this stage. The checklist sets out the information that we are likely to need as your application progresses.

If you tick a red box, refer to the guidance note on the extra work you may need to carry out.

### What we will do

Once we receive your pre-application form and checklist we will assign an Account Manager to your scheme.

We will assess your proposal and offer initial advice. We may need to ask you for extra information to help us understand your proposal.

We will then tell you:

- what additional work you will need to carry out, based on our guidance and the notes within the checklist
- how to make a formal application
- what information you will need to provide in an environmental report to support your application.

In some cases, we may advise you against making a formal application, based on the information you have provided. We will explain why we have made this assessment.

Complete all sections of the checklist and send it to us with your pre-application form and any supporting information that the notes indicate.

Please give your name, contact details, the site name and the name of the watercourse below.

Title (Mr, Mrs, Miss and so on) \_\_\_\_\_

First name \_\_\_\_\_

Last name \_\_\_\_\_

Name of company or organisation (if appropriate) \_\_\_\_\_

Address \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Postcode \_\_\_\_\_

\_\_\_\_\_

Phone \_\_\_\_\_

\_\_\_\_\_

Email \_\_\_\_\_

\_\_\_\_\_

Site name and name of watercourse \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Send the checklist with your hydropower scheme pre-application form to:

Permitting Support Centre  
Water Resources Team  
Quadrant 2  
99 Parkway Avenue  
Parkway Business Park  
Sheffield  
S9 4WF

Or you can email them to us at  
[PSC-WaterResources@environment-agency.gov.uk](mailto:PSC-WaterResources@environment-agency.gov.uk)

## 1 Water abstraction and flow management

Our approach to abstraction and flow management for hydropower recognises three types of scheme:

- schemes on or around an existing weir
- low head schemes, which create a depleted reach and typically use an existing weir or river barrier
- high head schemes, which typically divert water through pipes to a remote turbine house some distance downhill from the point of abstraction.

This checklist will help you to identify the key features that you need to consider for your type of scheme. For further details of the abstraction and flows that we may permit for each type of scheme, see our advice on [Flow and abstraction management](#).

	Yes	No
Will the scheme affect the flow of water over an existing weir? (See note 1a)		
Will the scheme create a stretch where the flow is depleted (a depleted reach)? (See note 1b)		
Will the scheme create a new impoundment or raise the height of, or change the operation of, an existing weir in a way that creates or increases the length of an impoundment (water held back behind a dam)? (See note 1c)		
Have you made an assessment of the existing hydrology of the site, which includes analysing how your scheme would affect the volume of water flow or the water level in all the rivers and channels affected? (See note 1d and question 2 in the hydropower pre-application form)		
Are the river conditions around the proposed site likely to make the water more turbid (cloudy with suspended matter) during the operation of the scheme? (See note 1e)		
Do you have a right of access to the abstraction locations of the scheme? (See note 1f)		

### Notes

- 1a If the water is abstracted immediately before a weir and returned immediately after it into the weir pool, the weir will have a depleted flow. This may affect the appearance of the weir, the characteristics and ecology of the weir pool and fish passage. We will ask for an assessment of these effects. See our advice notes on [Flow and abstraction management](#) and [Geomorphology \(including weir pools\)](#).
- 1b If your scheme abstracts water from the river and releases it downstream of the weir pool, this will create a depleted reach. This includes schemes which divert water through a channel or pipe that is physically separate from the watercourse. You will need to provide an assessment of the extent and effects of the reduced flow. This should include the effects on its hydrology, biodiversity, ecology, fisheries, geomorphology and flood risk. We will need detailed drawings of the proposed hydropower scheme, including the abstraction and discharge point.
- The ecological value of the depleted reach is important in determining the proportion of flow that can be used for generating power. We are likely to need information on the physical characteristics of the river in order to determine how it will be affected by the abstraction. Schemes that significantly reduce the wetted area at the side of a river (by reducing flow in rivers with shallow banks) at low flows are most sensitive. This information will guide the flow conditions we may need to set in any licence we issue.
- 1c If you alter an existing weir or build a new weir, you will need an impoundment licence. Changing an existing impoundment, or creating a new impoundment, may change the characteristics of the river, such as the pattern of erosion and how sediment is carried and deposited. You will need to provide a geomorphological assessment.
- See our advice notes on [Geomorphology \(including weir pools\)](#) and [Impoundments](#) for further information on our requirements. In all cases, you will need to tell us:
- the nature of the change (extra height of impoundment or change in operation and so on);
  - the length of impounded water (in metres) associated with the existing structure;
  - the extra length of impounded water (in metres) that will be created as a result of the new scheme; and
  - for a new impoundment, the cumulative effects from the new impoundment together with those from any existing impoundments.
- You may also need an environmental permit or flood defence consent for the proposed construction. You will probably need planning permission for the turbine, any structure enclosing it and any new access road. You may also need to provide a flood risk assessment to support your applications for flood defence consent and planning permission. See our advice note on [Flood risk](#).
- 1d We will ask for this information at an early stage in the process. We will always try to make the information we request appropriate to the site and the proposed scheme. However, if the potential effects of the proposal mean that we need a more detailed assessment (for example, if the scheme lies within a national or European conservation site, there are significant fishery or biodiversity features or there are other interests on or around the river banks) you may need to provide extra information. We may ask you to carry out a comprehensive flow survey of the site, including measuring the current over a range of flows. We will try to let you know what we need as early as possible.

We may be able to give you hydrometric information to help with your assessment. We manage a national network of river flow, river level and rainfall monitoring stations and the information from these is available to the public. Ask your Account Manager if we can provide you with data from our flow gauging stations. Or you can look for information on our website [here](#).

1e River beds with high percentages of silt or fine material are likely to become more turbid when the hydropower scheme is in operation. The design of the scheme is also likely to be important. For example, where the abstracted water is released will affect the extent to which it disturbs the river bed. We may ask for an assessment of any likely changes in how turbid the river will become based upon these factors. Also, we may have to set licence conditions that make sure the scheme keeps to relevant laws on suspended solids (such as the Water Framework Directive). See our advice note on [Water Framework Directive, nature conservation and heritage](#).

1f You must have access to the locations where water is abstracted. So you must:

- have a right of access or a prospective right of access; or
- own or occupy the land.

Evidence of your right of access may include:

- a deed of grant or lease of rights;
- a conveyance, lease, tenancy agreement or personal rights; or
- a compulsory purchase order.

We will not accept a copy of a letter from the landholder as proof of a right of access. It must be something that creates or leads to a legal right or an interest in the land and is legally binding. You must be able to prove that your right of access continues for 12 months after any abstraction or impoundment licence is issued, unless you only need the licence for a period of less than 12 months.

## 2 Conservation

For further information, see our advice note on:

[Water Framework Directive, nature conservation and heritage](#)

	Yes	No
Is the scheme within, or likely to affect, a Site of Special Scientific Interest (SSSI)? (See note 2a)		
Is the scheme within, or likely to affect, a Special Area of Conservation (SAC)? (See note 2b)		
Is the scheme within, or likely to affect, a Special Protected Area (SPA)? (See note 2c)		
Is the scheme within, or likely to affect, a national nature reserve? (See note 2d)		
Is the scheme within, or likely to affect, a local nature reserve? (See note 2d)		
Is the scheme within an Area of Outstanding Natural Beauty (AONB)? (See note 2e)		
Is the scheme within a national park? (See note 2f)		
Is the scheme likely to affect any waterfall, public footpath, heritage feature or conservation area? (See note 2g)		
Have formal ecological surveys been carried out on the site? (See note 2h)		
Does the scheme take account of protected species that may live at the site or nearby? (See note 2i)		

### Notes

2a You can get a map of the Sites of Special Scientific interest (SSSI).

If your scheme is likely to affect a Site of Special Scientific Interest we will need to find out whether the proposal is likely to damage the site, considering why it was designated as a Site of Special Scientific Interest. Natural England (NE) must be formally told about any work that may damage a Site of Special Scientific Interest.

2b There is more information on all Special Areas of Conservation in the UK [here](#). Your scheme is likely to affect a Special Area of Conservation if it would remove or change the vulnerable natural habitats the site was designated for. If your scheme is likely to affect a Special Area of Conservation, we will formally consult Natural England or Natural Resources Wales. We will need to make sure there will be no damaging effect on the Special Area of Conservation.

- 2c There is a list of all Special Protected Areas in the UK [here](#). Your scheme is likely to affect a Special Protected Area if it removes or changes natural habitats that are important to the rare and vulnerable birds the site was classified for. If your scheme is likely to affect a Special Protected Area, we will formally consult Natural England or Natural Resources Wales. We will need to make sure that there will be no damaging effect on the Special Protected Area.
- 2d You can get a map of all national and local nature reserves [here](#). The reserves are managed by different authorities, including local councils. Your scheme might affect a reserve if it is in one or it alters the river flow through one. We may contact the relevant authority, or Local Records Centre, to find out whether your scheme is likely to affect a reserve.
- 2e You can get a map of English Areas of Outstanding Natural Beauty from the Natural England [website](#). We may contact the relevant authority to find out whether your scheme is likely to affect an Area of Outstanding Natural Beauty. We will need to make sure that the scheme meets the landscape protection objectives.
- 2f You can get a map of national parks [here](#). Each national park has its own authority (which also acts as the planning authority). You may need approval from the national park authority. You may need to get advice from the authority to find out whether your scheme is likely to cause a problem.
- 2g We may ask for an assessment of any effect your scheme may have on popular features such as waterfalls, public footpaths and heritage features. We may need to consider these when making a decision on your application for a licence.
- Listed buildings (including structures such as weirs) are designated by central government. Conservation Areas are designated by local authorities and approved by the Government. You may need Listed Building Consent and Conservation Area Consent from your local planning authority. Local circumstances may affect the design of the scheme and have a 'knock-on' effect on our permission. For example, some old weirs are listed structures that need Listed Building Consent as well as planning permission, and you may need to make changes to the design of your hydropower scheme to get permission from English Heritage.
- 2h We are likely to need ecological surveys on schemes in designated rivers or where designated species or habitats may be affected. The potential risks to those species and habitats will need to be considered. The exact requirements of any survey will depend on the specific site and the proposed scheme, the amount of existing information, and whether any vital information is missing.
- 2i You can get information on protected species in England [here](#). If a European protected species is likely to be affected by your scheme, you may need to get a protected species licence from Natural England before making your formal application. We will discuss this with you when we receive your pre-application form.

### 3 Water quality

	Yes	No
Will the scheme discharge all of the abstracted flow back into the same watercourse? (See note 3a)		
Is there potential for pollutants to be discharged into the river while the scheme is being built or operated? (See note 3b)		
Are there existing licensed pollutant discharges into the depleted reach of the watercourse? (See note 3c)		
Will your scheme affect the thermal, oxygenation, salinity, acidification or nutrient conditions within the river? (See note 3d)		
Will the scheme reduce the depth of water in the channel and the time that water takes to flow through the depleted reach? (See note 3e)		

#### Notes

- 3a If flow is not returned to the watercourse it was abstracted from, you will need to assess the effect the lower flows will have on the physical and chemical water quality in the depleted reach of water. You should give us a copy of your assessment.
- 3b You must not use toxic chemicals for maintaining the scheme, and should prevent spillages. You must not discharge silt and other waste.
- 3c If you are not sure whether there are any existing discharges of pollutant in the depleted reach, we will help you to get this information once we have received your pre-application. It is important to find out whether there are any existing discharges as a reduction in dilution in the depleted reach is likely to have a negative effect on the water quality. In this case we may need the volume of water you are allowed to abstract to be reduced in order to protect the water quality in the depleted reach.
- 3d If your scheme reduces the river flow in a reach it is possible that some of the thermal, oxygenation, salinity, acidification or nutrient conditions in the river will change. This could happen in a number of situations (for example, where the depleted reach of water receives an effluent discharge or other polluting input), with conditions changing as a result of reduced dilution of the effluent. In this situation we will need to find out whether this is acceptable within the parameters specified in the relevant law (Water Framework Directive). We may need you to carry out further surveys or provide extra information. See our advice note on [Water Framework Directive, nature conservation and heritage](#).
- 3e Use your hydrological assessment to help you find whether changing the depth and how long it takes for water to flow through the depleted reach (known as the hydraulic residence time) will have an effect. Changes in the depth and the hydraulic residence time may lead to increased algae growth. If this is likely, we may reduce the volume of water you are allowed to abstract in order to protect the ecological requirements under laws such as the Water Framework Directive. We may need you to carry out further surveys or provide extra information.

## 4 Biodiversity and fisheries

For further information see our advice notes on:

[Fish passage](#)

[Screening requirements](#)

[Water Framework Directive, nature conservation and heritage](#)

	Yes	No
Are planned changes in the river flow likely to cause a significant change to the composition and abundance of any mosses and liverworts along the watercourse? (See note 4a)		
Are planned changes in the river flow likely to cause a significant change to the composition and abundance of other aquatic vegetation? (See note 4b)		
Are planned changes in river flow or water level likely to cause a significant change to the composition and abundance of macro-invertebrates living on or in the bed of the watercourse? (See note 4c)		
Are there migratory salmon or sea trout in the river? (See note 4d)		
Are there lamprey species, shad species or eels in the river? (See note 4d)		
Are there coarse fish or non-migratory trout in the river? (See note 4d)		
Is there an existing upstream fish pass? (See note 4d)		
Are the provisions for upstream fish passage satisfactory? (See note 4e)		
Are the provisions for screening fish and associated bywash for your scheme satisfactory? (See note 4e)		
Will the scheme affect either the upstream or downstream passage of fish in the river? (See note 4e)		
Will the scheme affect any spawning or nursery areas? (See note 4f)		
Will the scheme affect any river stretch used for angling? (See note 4g)		
Are planned changes in river flow likely to cause a change to the composition and abundance of fish populations? (See note 4h)		

### Notes

- 4a You may be able to get survey information on mosses and liverworts from your local Environment Agency office. We will discuss this with you once we have received your pre-application. If survey information is not available, you may need to carry out a survey to find out whether the scheme will reduce or prevent good ecological status. Mosses and liverworts may also be protected in some areas such as Sites of Special Scientific Interest. Schemes that significantly reduce the wetted area at the side of a river (by reducing flow in rivers with shallow banks) are most likely to affect mosses and liverworts.
- 4b You may be able to get survey information on aquatic vegetation from your local Environment Agency office. We will discuss this with you once we have received your pre-application. If survey information is not available, you may need to carry out a survey to find out whether the scheme will reduce or prevent good ecological status. Schemes must avoid significant changes in aquatic vegetation. Such changes could occur where schemes significantly alter the water level or speed of a river. This would be likely to change their habitats and so cause changes in species or composition which would prevent you from getting permission for your scheme. We may ask you to provide an analysis which indicates how you will make the effects of those changes less severe in macrophyte and diatom communities (for example by avoiding significant changes in water level, the speed of flow or other factors that could change habitats).
- 4c You may be able to get information on the macro-invertebrates present in the affected waterbody (stretch of river) from your local Environment Agency office. We will discuss this with you once we have received your pre-application. If information on these ecological elements is not available, you may have to carry out a survey to make sure that the ecological status of the waterbody will not be damaged as a result of the scheme. Schemes must avoid significant changes in macro-invertebrate communities. Such changes could arise where schemes significantly alter the water level, speed of flow, surface of the river bed substrate or turbidity (cloudiness) of a river. This would be likely to modify their habitats, and so cause changes in the types and range of species present, which would prevent you from getting permission for your scheme. We may ask you to demonstrate how you will

make the effects of any changes less severe on macro-invertebrate populations (for example, by avoiding significant changes in water level, the speed of flow or other factors that could change habitats).

- 4d You may be able to get information on species of fish present in the affected waterbody (stretch of river) from your local Environment Agency office. We will discuss this with you once we have received your pre-application. If Atlantic salmon (*Salmo salar*) and sea trout (*Salmo trutta*) are present, or there is an aim to reintroduce them to the river, you will normally need an upstream fish pass under the Salmon and Freshwater Fisheries Act of 1975, Section 9. Screening (SAFFA, S14) must be put in place unless we agree otherwise. We can ask you to provide a fish pass around the structure in the future.

To meet the requirements of the Water Framework Directive you need to consider passage not only for other major migratory species such as lamprey, eels and shad, but also for brown trout, grayling and coarse fish.

Some species such as lampreys, shad and bullhead are protected by the European Habitats Directive.

The European eel management plan requires specific improvements to obstructions to help the eels migrate. Eels are particularly vulnerable on their downstream migration and so you need to have adequate screens in place.

If Salmon Action Plans, River Basin Management Plans, Fisheries Action Plans or Eel Management Plans are available, you must consider them in your hydropower scheme proposal.

- 4e Fish passage and screening are dealt with in our advice notes available on our [website](#). The effectiveness and efficiency of any existing fish pass will need to be maintained or even improved for a scheme to get the necessary permissions.
- 4f The quality and extent of spawning and nursery areas are significant in providing future adult populations. You will need to consider whether your scheme will affect these areas.
- 4g We have a legal duty to maintain, improve and develop salmon, trout, freshwater and eel fisheries. Schemes should be designed so they do not affect associated fisheries.
- 4h You may be able to get information relating to fish in the affected waterbody (stretch of river) from your local Environment Agency office. We will discuss this with you once we have received your pre-application. If this information is not available, you may need to carry out a survey to make sure the ecological status of the waterbody will not be prevented from reaching good ecological status or worsen as a result of the scheme. Changes to fish populations may happen where schemes alter the water level, flow variability, speed of flow, surface of the river bed or turbidity (cloudiness) of a river. This would be likely to change habitats and so cause changes in the type and range of species present, which may prevent you from getting permission for your scheme. We may ask you to demonstrate how you will reduce the effect of changes in fish populations (for example, by avoiding significant changes in water level, flow variability, speed of flow or other factors that could change habitats).

## 5 Managing flood risk

For further information, see our advice note on [Flood risk](#)

	Yes	No
Will the proposed scheme increase flood risk, either by reducing the cross section or by slowing flows? (See note 5a)		
Does your scheme propose any alterations to structures, or building new structures in the river (such as weirs, dams, culverts or outfalls), or affect existing flood defences (such as embankments or walls)? (See note 5a)		
Does the scheme create new channels or change the flow path in any way? (See note 5a)		
Does the scheme propose to deepen any existing channels? (See note 5a)		
Is the scheme in the floodplain as shown on the Environment Agency's flood map? (See notes 5a and 5b)		
Will the scheme change the available access to the river or neighbouring flood defences for maintenance (for example, by building fences or walls around new structures, or installing overhead cables)? (See note 5c)		
Does the scheme reduce the available floodplain area or block potential routes of floods over land? (See note 5c)		
Does the scheme create a new raised reservoir with the capacity of 25,000 cubic metres or more? (See note 5d)		
Could the cumulative effect of your proposal along with other proposals increase flood risk or have a negative effect on land drainage? (See note 5a)		

### Notes

- 5a You are likely to need formal written consent (flood defence consent) for these activities. See our advice note on [Flood risk](#). To make sure there is no increased risk of flooding in the area, you will probably need to carry out a flood-risk assessment to show that the effects of your proposal can be managed satisfactorily. Some construction activities may also need planning permission,

and you should get the views of the local planning authority. Our booklet 'Living On The Edge' (available free from our customer contact centre, or on our [website](#)) provides more information.

5b You can find out where your scheme is on our [flood map](#) by visiting our website.

5c Operating authorities (including us) on main rivers, Internal Drainage Boards, and local authorities, have responsibilities to maintain watercourses to reduce the risk of flood. This is particularly important at river-control structures which may need to be maintained and cleared of debris. For this reason, vehicles need to be able to get access to these structures, and people need to be able to work safely around them.

5d Structures of this size will qualify as statutory reservoirs, and need to be designed and inspected as such. See our [website](#) for more details.

## 6 Navigation

	Yes	No
Is the proposed scheme in an inland waterway that is open to navigation (passage of boats) and is managed by a UK navigation authority? (See note 6a)		
Could the scheme affect water levels upstream or downstream of the structure? (See note 6b)		
Could the scheme affect access for any recreational users of the waterway (for example, canoeists, walkers, anglers)? (See note 6c)		
Could the scheme reduce how much water is available for boats passing through locks during low flows? (See note 6d)		
Could the scheme affect a waterway used for navigation in any other way? (See note 6e)		

### Notes

6a Inland waterways are navigable channels, rivers and lakes, and all associated land (for example towpaths). There is a list of the main inland waterways in England and Wales, and their navigation authorities, on the Inland Waterways Association [website](#).

6b Some waterways have water levels that are set in law or by service levels. You need to check with the navigation authority, as early as possible, to see if your scheme could affect water levels.

6c You need to check with the navigation authority to see if your scheme will affect recreational users of a waterway.

6d Some waterways have a public right of navigation, set by law. You need to check with the navigation authority, as early as possible, to see if your scheme could affect this.

6e You may need permission from the navigation authority if your scheme affects a waterway. For example, the location of your turbine could cause unacceptable cross-flow in the navigation channel. You need to check with the navigation authority as early as possible.

Thank you for filling in this checklist.