

Hydropower Guidance Note: HGN 6 Nature Conservation, Heritage, Amenity and Landscapes

This guidance note is not intended as a statement of law. It should be read in combination with, and in the context of, the relevant enactments and EU obligations. Nothing in this guidance is intended to give Natural Resources Wales (NRW) power to do anything that it would not otherwise have power to do, or exercise any of its functions in a manner contrary to the provisions of any enactment or any EU obligation. In the event of any conflict between this guidance and enactments or EU obligations the latter takes precedence.

This Guidance Note has been prepared by NRW to provide applicants of impounding or abstraction licences for the purpose of hydropower with information on nature conservation, heritage, amenity and landscapes. It also contains advice with regard to these issues for planning consent purposes. Its content may be updated periodically and developers should ensure they read the most recent version, which is available on the NRW website.

Impoundment and abstraction licences form only part of the permission processes to allow hydro power developments to be built and operated. Among its functions NRW is the licensing body in respect of water impounding and abstracting licences and a consultee in the planning process. Planning matters are dealt with by the relevant planning authority with whom we encourage applicants to consult as early as possible. Whilst some environmental issues may be addressed in the NRW licensing process, NRW will often seek other environmental safeguards in connection with the development itself via other consenting regimes such as the relevant planning consenting process.

It is strongly recommended that applicants contact NRW as early as possible during the planning of their scheme so that the full range of potential matters across all NRW functions may be identified. Specific surveys may be necessary to inform a detailed evaluation of the likely impacts of a scheme. Applicants are likely to find it helpful to identify any requirements in this respect at an early stage.

This note seeks to offer broad guidance that is not restricted solely to NRW's licensing function but also to its other functions including that of consultee in the planning process.

Nature conservation and heritage

NRW has a number of roles in relation to hydropower developments. These include:

- issuing abstraction licences;
- issuing impoundment licences;
- providing advice to local planning authorities at the planning stage for any scheme likely to affect a Site of Special Scientific Interest (SSSI);
- competent authority for permits we issue at the Habitats Regulations Assessments stage for schemes concerning European sites and Ramsar sites;
- providing advice to competent authorities at the Habitats Regulations Assessment stage;
- issuing licences for protected species where NRW is the licensing authority in respect of development (E.g. European Protected Species, Badgers).

NRW is the statutory nature conservation advisor in respect of European sites (Special Areas of Conservation (SAC) and Special Protection Areas (SPA), Ramsar sites, and Sites of Special Scientific Interest). It is the licensing authority in respect of some protected species where development is concerned, and as a public authority as defined by the Natural Environment and Rural Communities (NERC) Act 2006, it has a duty to have regard to conserving biodiversity in the exercise of its functions.

We will therefore screen licence applications and planning consultations concerning hydropower developments under the following legislation:

- The Conservation of Habitats and Species Regulations 2010) (as amended);
- Wildlife and Countryside Act 1981 (as amended);
- The Environment Act 1995 Section 7 (1);
- The Natural Environment and Rural Communities Act (NERC) 2006
- Town and Country Planning Regulations;
- Environmental Impact Assessment (Town and Country Planning) Regulations 1999;

The heritage and nature conservation sites and protected species that we screen for include:

- European sites (Special Areas of Conservation (SACs), Special Protection Areas (SPAs), candidate Special Areas of Conservation (cSACs), potential Special Protection Areas (pSPAs), Marine Protection Areas (MPAs)) and Ramsar sites;
- Sites of special scientific interest (SSSI);
- European Protected Species;
- Nationally Protected Species;
- National Nature Reserves (NNR);
- Local Nature Reserves (LNR);
- National Parks (NP);
- Areas of Outstanding Natural Beauty (AONB);
- Landscapes listed on the Registers of Landscapes Outstanding and
- Special Historic Interest;
- Geological Conservation Review (GCR) sites;
- Marine Conservation Zones (MCZ);
- Heritage Coast;
- Local Wildlife Sites (LWS, SINC);
- Ancient Woodland.

Using a combination of desk-based information and screening tools, local knowledge of sites and professional expertise, we will provide advice on the matters listed above. For the purposes of this guidance note our principal areas of concern are: European sites, Ramsar sites, SSSIs, European Protected Species, Nationally Protected Species, National Parks, AONBs and Registered Historic Landscapes. Other competent authorities (e.g. local authorities) take the lead with respect to some matters, for example developments affecting local wildlife sites or local nature reserves. These are designations put forward by the local authority.

Designated Sites

For detailed information on designated sites, see the Designated Sites Guidance Note.

Protected Species

As with any development, we would strongly advise that hydropower developers assess the extent to which their proposals may affect protected species and include appropriate mitigation in their proposals as necessary. This is necessary to ascertain any protected species licences that may be required.

Information about the likely impacts of schemes on protected species and any mitigation required will be necessary to support any planning application that is required, but is not required for abstraction and impoundment licence applications.

We would recommend that developers engage the services of a suitably qualified, experienced and if necessary, licensed, ecologist to advise them in this respect, unless they have the skills, experience and if necessary the relevant licences to do so themselves.

Developers are strongly encouraged to discuss their proposals at an early stage with NRW for a variety of reasons, and should they choose to do so, we will include advice about protected species in our pre-application response.

Surveys for protected species may be required to inform an assessment of impacts and/or protected species licence applications, and developers should be aware that protected species surveys are time dependent, with optimum periods for surveying depending on the species being surveyed for and survey type. We recommend that the requirement for protected species surveys is established at an early stage so that they can be factored into design and submission timetables. There can be significant cost and time implications for a development if protected species are not adequately considered or are encountered at a late stage in a development.

Surveys should be undertaken in accordance with published guidance, where this exists. Detailed information about protected species and licensing is available on the NRW website together with published survey and mitigation guidance.

For further information, please refer to the following sections of the Natural Resources Wales website:

- Protected Species in Wales pages within the Policy, Advice and Guidance section and
- the Protected Species Licensing pages of the Apply, Buy, Report section

The presence of a protected species is a material consideration in the planning system (Planning Policy Wales Technical Advice Note 5). When consulted on a formal planning application, NRW will provide advice to the local planning authority in respect of protected species. Where European Protected Species are concerned, we will indicate whether we consider that the actions proposed will adversely affect the integrity of the site or species, and whether any mitigation proposed will be sufficient to maintain the population(s) of species concerned at a favourable conservation status – a key consideration for planners at the planning stage.

Impacts on river habitats

The three principal impacts of hydropower development on river ecosystems are:

- disruption of 'longitudinal connectivity' of the channel network (i.e. interfering with the movement of sediment and animals)
- modifications to physical habitat and channel morphology
- alterations to natural flow regimes

There may also be impacts associated with the construction phase of a scheme (see Monitoring Guidance Note). These are normally considered at planning consent stage. Catchment and river management schemes, including the regulatory regime, are focused on avoiding such impacts and restoring natural catchment processes. The need to restore and improve habitat connectivity is important for improving the resilience of river ecosystems in the face of climate change.

Through these impacts, hydropower schemes can adversely affect riverine and riparian habitats, both downstream and upstream of the installation, and associated flora and fauna, including fish, invertebrates, lower plants (mosses and liverworts) and higher plants (rooted, flowering).

Longitudinal connectivity

The natural movement through river channel networks of animals, plants, sediment and organic matter can be critical to the structure, function and resilience of river ecosystems. Maintaining and restoring longitudinal connectivity is a central goal of river restoration efforts in Wales. Hydropower development should not further disrupt, or prevent efforts to restore, longitudinal connectivity where it is a factor in maintaining resilience of river ecosystems.

Some species making long-distance migrations are more obviously affected by the loss of longitudinal connectivity caused by artificial obstructions. Examples include Atlantic salmon, sea trout, eels, river lamprey and Allis Shad. The cumulative effects of multiple obstructions can be pronounced for these species.

Many other wholly riverine fish species such as trout, grayling, barbel, chub, dace, and bream also make important migrations in river systems. These migrations can be critical for completing their life cycle and for maintaining healthy populations.

It is not only fish that move from reach to reach, many invertebrates which do not have a flying life stage are affected by obstructions to movement. Examples include crustaceans and molluscs.

The Habitats Directive lists and protects a number of species which can be critically affected by artificial obstructions to free movement (see Designated Sites Guidance Note). We take these factors into account when assessing the requirements to achieve and maintain Water Framework Directive (WFD) objectives (see WFD Guidance Note).

Lower plants

Many plants that grow in valleys where hydropower schemes are proposed require particular levels of humidity, spray, splash or inundation. These plants include some ferns and flowering plants but also a significant number of mosses, liverworts and lichens (collectively known as 'lower plants'). The humid environment required by these species limits the number of places where they can grow, and some are very rare in European or Global terms.

Reduced flows in a depleted reach can lead to reductions in spray experienced by plants growing close to waterfalls or rapids, or to reduced humidity within an entire reach. The increased frequency of dry conditions can make a valley unsuitable for the plants that currently grow there.

Certain lower plants grow on rocks that are covered by water when river levels are high, but exposed on low flows. Changes to flow levels in a depleted reach can leave streamside rocks drier for longer.

Humid valleys often support a particularly diverse range of mosses, liverworts and lichens. Depleted reaches in these areas have a high potential to damage river channel ecology. Some woodlands that are recognised as Special Areas of Conservation have outstandingly high lower plant abundance and diversity.

What you need to do

We encourage developers to talk to their Account Manager as soon as possible as part of our pre-application process. Early dialogue will help to identify specific issues associated with the proposed development. These discussions will help you determine if hydropower development is appropriate for the site and, if so, allow issues to be addressed before you make an application.

Certain ecological aspects of the site might need to be specifically investigated (see Monitoring Guidance Note). This is particularly likely on designated sites, supporting habitats for designated sites, and sites with sensitive protected features.

How can you do this?

You should use our pre-application process and associated Environmental Site Audit checklists to help identify the potential for environmental effects.

Developers will need to contribute to the assessment of their schemes by providing environmental reports which address the issues identified in pre-application discussions and in our guidance. You may need to employ suitably qualified ecologists and geomorphologists to carry out surveys and advise on design options and mitigation measures.

Amenity and Landscapes

NRW has a responsibility under article 5A of the NRW (Functions) Order 2013 to exercise its functions so as to further nature conservation and the conservation and enhancement of natural beauty and amenity. In particular, in carrying out its nature conservation functions, NRW is required to have regard to actual or possible ecological changes. We will work with developers to minimise and mitigate the adverse effects of hydropower schemes on landscapes and the amenities they provide.

The most sensitive landscapes are likely to be those with:

- high **naturalness** (distinct natural geomorphological and hydrological expression);
- high **historic expression** and features that are hard to replace if lost;
- high **scenic quality** (picturesque views) and **tranquillity** (general absence of visible development, noise, lighting);
- areas whose **cultural importance** closely relates to conserving the above as special qualities.

Developers may need to provide a Landscape and Visual Impact Assessment (LVIA) of their proposals to support a planning application; we recommend that the requirement for this should be ascertained at an early stage in the design of the proposals in conjunction with the local planning authority and NRW. Developers may need to engage the services of a qualified and experienced landscape architect to assist them with producing a LVIA

In general, assessment of impacts should follow the guidance in:

- the Landscape Institute's Guidelines for Landscape and Visual Impact Assessment (3rd Edition)
- Natural Resources Wales' LANDMAP guidance notes (E.g. LANDMAP and the Cultural Landscape, LANDMAP and Special Landscape Areas).

NRW can provide LANDMAP data to help developers assess the possible impact of their proposed scheme on landscape and amenity values, and may seek to agree relevant

viewpoints to use for LVIAs. Other sources of relevant information to inform assessments may include local knowledge, more detailed landscape assessments and any landscape management objectives, such as National Park or Areas of Outstanding Natural Beauty management plans. The absence of a management plan does not mean the landscape has no special qualities.

We recommend that developers engage with us at an early stage in the design of their proposals for a variety of reasons, and should they choose to do so, we may include landscape advice in our pre-application response letters.

Visual impacts are distinct from intrinsic landscape impacts in that they can only occur if visible to people. Locations where visual impacts might be important include:

- **where expectations of the landscape are high** as part of their enjoying the outdoors (e.g. tourist areas);
- **where many people gather to see the view** (e.g. from a hilltop or visitor destination);
- **where people enjoy the view for a long duration** (e.g. from people's homes).

As well as intrinsic and visual sensitivity of the landscape, the scale and design of development will also determine the level of impact. The siting, scale and design of a scheme will alter the magnitude of effects, so all these issues should be considered. The Tables below can help developers consider the effects a hydropower scheme might have on amenity and landscapes. Our staff can help by providing information (e.g. maps) and guidance on how to mitigate potential impacts.

Table 1. Potential landscape effects of hydropower schemes and their mitigation.

Type of change	Examples of effects	Examples of mitigation
Land form	<p>Landscape:</p> <ul style="list-style-type: none"> • Earthworks or changes to river course or flow including construction of dams, weirs, leats / races, and consequential changes to water flows in the river between abstraction and return points. <p>Visual:</p> <ul style="list-style-type: none"> • A natural or semi-natural appearance becomes engineered or incongruous in its landscape setting. 	<ul style="list-style-type: none"> • Work with the natural character and topography of the surrounding landscape as far as possible (e.g. route of leats / races). • Bury pipe runs if large/significant, avoiding disturbance of key habitats, peaty soils and archaeological features. • Dark / non-reflective colours to pipes not buried
Land cover:	<p>Landscape:</p> <ul style="list-style-type: none"> • Forest clearance or other large-scale removal of existing land cover that would change the landscape character. • Removal or alteration of historic built or archaeological features such as stone walls, barns. • Introduction of new elements or features that contrast with existing intrinsic natural or historic landscape character, e.g. new hard or straight edges to the landscape, new access tracks, storage compounds or buildings, hard-standing, fencing, signage, and cables. <p>Visual:</p> <ul style="list-style-type: none"> • Introduction of visually prominent new built features, large amounts of hard surfacing and imported 'clutter' 	<ul style="list-style-type: none"> • Restoring character of surrounding or semi-natural vegetation to areas disturbed during construction • Avoid disturbance to areas that are difficult to recreate (vegetation with a high maturity value, and areas with a high archaeological / historic value) • Design approach to buildings and structures (whether traditional or contemporary) should pick up on local character including scale, siting and materials / finishes. • Minimise ancillary clutter (fencing, signs, lighting, hard surfaces) and consider what can be concealed from wider view using traditional boundary types (stone walls, hedges) • Where appropriate, use planting to help integrate new

		<p>structures into the wider setting.</p> <ul style="list-style-type: none"> • Use a colour palette for painted surfaces related to the surrounding landscape.
Land Use:	<p>Landscape:</p> <ul style="list-style-type: none"> • Reduction in access for public amenity, either to abstraction or return points, or to areas for new reservoirs or weirs; • Changes to the flow in depleted reaches of river where the effects are sufficient to change the river character to the point where use (e.g. for swimming, canoeing or fishing) is affected. <p>Visual:</p> <ul style="list-style-type: none"> • Opening up or closing off views of the area that affect people's enjoyment of the countryside 	<ul style="list-style-type: none"> • Conserve, enhance and increase the quality and diversity of natural and cultural benefits and service provided by this landscape. • Avoid closing off areas to public access subject to safety or environmental management issues. • Introduce measures that increase people's enjoyment of the landscape, such as habitat management, screening unsightly structures, opening up new views, enhancing public access routes, and interpreting the hydropower station.
Special qualities:	<p>Landscape and/or visual:</p> <ul style="list-style-type: none"> • Changes to the extent and intactness of wild land qualities; • Changes to the sense of remoteness • The introduction of noise • The introduction of night lighting 	<ul style="list-style-type: none"> • A sensitive and iterative siting and design process with strong landscape principles and design objectives set out at the outset. • Design to protect special qualities (which are usually hard to recreate once lost). • Consider how the development can help move the landscape closer towards the management plan vision for that area

Table 2. Questions a developer should consider when assessing the impacts of a proposed scheme on amenity and landscapes.

<p>The receiving environment</p>	<p>What sensitive landscape receptors (elements, features or areas) are directly or indirectly affected?</p> <p>What are the sensitive visual receptors (key views and visual experience) are affected directly or indirectly?</p>
<p>The proposed changes</p>	<p>What are the key elements and features of the proposed development that could affect the sensitive landscape and visual receptors? (including ancillary works)</p> <p>Are there any cumulative issues?</p> <p>In addition to operational impacts, are there any construction or decommissioning impacts?</p> <p>What are the magnitudes of effects? Are any ‘adverse’ and ‘significant’?</p>
<p>Mitigation and design process</p>	<p>Could the scale, siting or design be altered or mitigated to reduce adverse effects and realise beneficial landscape and visual effects?</p>
<p>Policy context to inform judging acceptability of significant adverse impacts</p>	<p>Will the proposal help to achieve the landscape management plan vision for the area (where one exists) or make such a vision harder to achieve?</p> <p>Where no such plan exists, would the proposal help to conserve, enhance or erode the special qualities of the area?</p> <p>What weight should NRW attach in this case?</p>