

RIVER WYE (UPPER WYE) SITE OF SPECIAL SCIENTIFIC INTEREST



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YOUR SPECIAL SITE AND ITS FUTURE

‘Your Special Site and its Future’ is part of our commitment to improve the way we work with Site of Special Scientific Interest (SSSI) owners and occupiers. In it, we explain what is special about the wildlife and geology on your site, and what care is needed to look after its wildlife and geology into the future.

All SSSIs are considered to be of national importance and we recognise the crucial role that owners and occupiers play in their management and protection. We need you to share your views and knowledge of this site with us, to help safeguard it.

We hope that you will find ‘Your Special Site and its Future’ interesting and helpful. Please contact us if there is anything about the site and its management that you would like to discuss.

What is 'special' about the wildlife within the River Wye (Upper Wye) SSSI?

The upper Wye has a large number of special features, including:

- The rocky sections are an excellent example of a medium sized to large **river with moderate nutrient status**, including stands of vegetation dominated by **water crowfoot**, with acidic, nutrient-poor headwaters upstream.
- The lower sections are an excellent example of a medium sized to large **river with higher nutrient status**, including stands of vegetation dominated by **water crowfoot**.
- The riverside rocks support a **variety of rare and scarce plants**, including:
 - An important population of the endangered **rock cinquefoil**.
 - An important population of **wild chives**, a rare plant in Wales.
- In the river itself, **whorled water-milfoil**, a rare plant in Wales.
- A variety of **rare and scarce mosses and liverworts**, living on riverside rocks and tree bases in the flood zone, including:
 - The scarce **gravel grimmia** *Grimmia lisae*, which is threatened in Europe.
 - The Scarce **Spruce's bristle moss** *Orthotrichum sprucei*, which is threatened in Europe.
- A variety of **rare and scarce aquatic and riverside lichens**, including:
 - An important population of the rare **river-jelly lichen**.
 - The rare aquatic lichen *Porocyphus kenmorensis*.
 - The rare aquatic lichen *Pterigiopsis lacustris*.
- The site forms the core range of an extensive **otter** population that inhabits the Wye river system.
- The site, together with the lower Wye, is an important **wintering area for goosander**, holding more than 1% of the British population.
- The site is an important area for spawning and juvenile **Atlantic salmon**.
- The site supports spawning and juvenile **twaite shad**.

- The site supports spawning and juvenile **sea lamprey**.
- The site supports populations of **brook lamprey**.
- The site supports spawning and juvenile **river lamprey**.
- The site supports resident populations of **bullhead**.
- The site supports an exceptional variety of **aquatic invertebrates**, including:
 - The rare mayfly *Potamanthus luteus*.
- The site supports an exceptional variety of **shingle dwelling invertebrates**.

Most of the rare and scarce aquatic invertebrates, including mayflies, stoneflies, caddis flies and riffle beetles, inhabit the middle reaches of the river that are not too acidic or nutrient-rich. The large shingle banks downstream of Glasbury support many rare and scarce beetles, flies and spiders, which are particularly associated with river shingle, both above and below the water line.

The River Wye system is a site of European importance for otters, Atlantic salmon, twaite and allis shad, sea, river and brook lampreys, bullhead and white-clawed crayfish, and also the water-crowfoot dominated sections of river.

As well as the features listed above, the upper Wye has other habitats that contribute to the special wildlife interest. These include broadleaved woodland, scrub, acid and marshy grassland, tall weeds, acid bog, swamp and marginal vegetation, ponds in old river channels and river gravel. This diversity of habitats similarly supports a wide range of species, including breeding birds, bats and terrestrial plants and invertebrates. These too are a key component of the special interest of the site. Unless it is specified below, management of this site should aim to look after these habitats and species as well as the listed features of interest.

What do we want the River Wye (Upper Wye) SSSI to look like?

The following is a description of how we would like to see the each of the features within the site:

There are diverse aquatic plant communities present on the upper Wye each depending on the particular geology and physical characteristics of the bed and banks and the amount of sunlight reaching the channel. Together they reflect a gradual transition from nutrient poor to naturally nutrient rich waters moving downstream. The aquatic plant communities are not only attractive, but provide a good indication of the overall quality of the environment. They contain the variety and abundance of species expected for each river type in conditions of suitably

clean water and bed substrate combined with a relatively stable flow regime. In places, there are extensive patches of white-flowered water-crowfoots. In the more shaded reaches, aquatic plants may be scarce, consisting mainly of mosses and liverworts.

Above Llangurig, the headwaters of the Wye are relatively nutrient-poor and acidic. Fish are relatively scarce, although a few salmon spawn in these reaches. The headwaters typically flow through moorland and upland pasture and so the plants growing on the banks consist of heathland, bog, acidic and marshy grassland species. Rocky and shady or wooded sections support a range of mosses and liverworts found in western upland situations, such as claw brook-moss, flagellate feather-moss, yellow fringe-moss and water earwort.

Between Llangurig and Rhayader the acidity of the water decreases. Water plants, such as intermediate water-starwort, water-mosses and the lichen *Dermatocarpon luridum*, become more noticeable. Aquatic insects and fish, including juvenile salmon and brown trout, are more numerous. Tree cover on the banks increases. Here this consists mainly of sessile oak and alder, with some downy birch and willow scrub.

The river gorge sections above Rhayader support a luxuriant growth of mosses, liverworts and lichens on the rocks and boulders in the flood zone, including Curnow's pocket moss, the scarce river pocket-moss, Holt's mouse-tail moss, river grimmia, fox-tail feather-moss, delicate tamarisk moss, St. Winifrid's moss, western pouncewort, overleaf pellia, lesser featherwort and *Verrucaria* lichens. The rare lichen *Pterygiopsis lacustris* may be found on rocks in the flood zone at Marteg bridge. Dippers and grey wagtails nest along this part of the river.

Between Rhayader and Builth Wells, aquatic and marginal plants, such as water mosses, large brown algae, water crowfoot, common spike-rush, hemlock water-dropwort, reed canary-grass, meadowsweet, water mint and marsh marigold become more prominent. Aquatic insects are abundant and the river supports a greater variety of fish, including large numbers of juvenile salmon, brown trout, grayling, stone loach, minnow and bullhead. Pockets of silt on this section support juvenile brook, river and sea lampreys. The banks are often shaded by alder, oak and ash and support a well-developed woodland flora with ferns, mosses, including the scarce awl-leaved swan-neck moss, liverworts and lichens. The banks provide good cover for otters and common sandpipers and the locally rare red-breasted merganser breed along this section of the river.

Below Builth Wells the Wye valley narrows and the river downstream to Boughrood is generally rocky and well shaded by ash and alder woodland along its banks. This part of the river supports a rich variety of plant and animal life. In the channel there are beds of water crowfoot, water-mosses and filamentous algae along with alternate water-milfoil, curled pondweed and the locally rare whorled water-milfoil. Submerged rocks in this section support important populations of river-jelly lichen and the rare lichen *Porocyphus kenmorensis*. Marginal plants include reed canary-grass, hemlock water-dropwort, marsh marigold, slender tufted-sedge, common spike-rush, yellow loosestrife, bittersweet, brookside feather-moss, smaller lattice-moss, long-beaked water feather-moss, great scented

liverwort, the scarce beck pocket-moss, Arnell's apple-moss and pinnate scalewort, and the scarce lichens Bacidea carneoglauca and Dermatocarpon mieophyllum. Otters are abundant and large numbers of twaite shad spawn in this section of the Wye in April to June, one of the most favoured locations being at the Afon Irfon confluence.

Between Pen-ddol Rocks and Boughrood there are a series of locations where there are large areas of relatively nutrient-rich rocks in the channel and on the rivers-edge. Some specialist plants that can withstand drought and periodic flooding are found on these rocks, including English stonecrop, lesser meadow-rue, the scarce wild chives, rock stonecrop and the lichen Dermatocarpon leptophyllodes, the rare flat-rock grimmia moss, the scarce gravel grimmia and a thriving population of the endangered rock cinquefoil. There are an exceptional variety of aquatic insects here, including mayflies, stoneflies, caddis flies, riffle beetles and a few Atlantic stream crayfish. This indicates that the water is moderately rich in nutrients and generally free from pollution. Sea lampreys spawn at Boughrood bridge and other suitable locations along the river.

Downstream of Boughrood the river enters a broad alluvial flood plain and forms a series of large meanders. The banks are more open here, although there are still patches of alder and willow woodland and dense osier scrub, particularly where there are old river channels that still flood in winter. This part of the river carries more silt and dissolved nutrients and the channel supports luxuriant beds of water crowfoot in the summer. These weed beds provide shelter for fish, crayfish and a variety of aquatic insects including the rare mayfly Potamanthus luteus, that occurs sporadically between Erwood and Hay-on-Wye. There are well-developed patches of marginal plants, such as common spike-rush, water mint, slender tufted-sedge and branched bur-reed, where the riverbed is less stony. The banks are generally covered by tall vegetation, including meadowsweet, great willowherb, nettles, thistles and hogweed. Vertical earth banks provide nest holes for kingfishers, yellow wagtails and large colonies of sand martins. Tree bases in the flood zone trap silt from the water and this provides a home for a variety of mosses including the scarce Spruce's bristle-moss.

There are a number of large shingle banks and gravel islands on this part of the river. The more stable examples are covered with osier scrub and other tall vegetation if they are not grazed, providing cover for otters, breeding birds, such as reed buntings and sedge warblers, and a variety of insects, including the locally uncommon white-legged damselfly. Where the shingle banks are grazed, or scoured by the current in winter, the vegetation is sparse, consisting of plants such as reed canary-grass, creeping yellow-cress, redshank, tansy, water chickweed, field pansy and sharp-leaved fluellen. These areas support a range of specialised invertebrates, including the rare empid fly Tachydromia acklandii, the scarce wolf spider Arctosa cinerea and a variety of beetles, including rare species, such as the click beetle Negastrius sabulicola, Scopaeus gracilis and the five-spot ladybird. These open shingle banks also provide breeding sites for little ringed plovers and oystercatchers.

Where the river cuts through a few rock sections between Glasbury and Hay-on-Wye, submerged rocks support large filamentous algae and colonies of the rare

river-jelly lichen and a variety of mosses grow in the flood-zone. There is a relict colony of freshwater pearl mussels on the riverbed. This part of the river provides spawning areas for migratory twaite shad, sea and river lampreys and there are a wide variety of coarse fish too, including chub, pike and bullhead.



River Lamprey © CCW

Aquatic plants that indicate high nutrient levels, such as blanket-weed, may be prominent in places downstream of Boughrood but they do not dominate large sections of river. Stands of Himalayan balsam and other invasive alien plants, such as Japanese knotweed are rare. The site overall includes a mixture of shady and open habitats, round 60% of the riverbanks having some tree cover. There are active and stable sections reflecting the variable and dynamic character of a natural river system.

Otters are present throughout the site at their maximum potential abundance and there is evidence of breeding. There is adequate good quality habitat to support a thriving population in the long term. This includes places to shelter and a good supply of suitable prey. All the factors that affect the species, or its habitat, are under control.

The upper Wye regularly hosts around 100 goosanders in winter. Many of these birds breed on the upper reaches and tributaries above Builth Wells.

Atlantic salmon spawn on gravel shoals on the main river above Erwood and also on the tributaries. These areas support thriving populations of juvenile salmon at densities that are typical of a near natural river system. The upper river is also used by spawning brook lamprey and supports a good population of juveniles. Sea lamprey spawn at suitable gravel beds between Rhayader and Hay-on-Wye and river lampreys use gravels in the middle sections of the river and on the major tributaries. Twaite shad spawn on suitable gravels as far upstream as the River Ithon confluence and there are good numbers of juveniles of these migratory fish

species downstream of the spawning areas. Bullhead are common downstream of Rhayader where the riverbed provides suitable habitat. All the factors that affect these fish, or their habitats, are under control. This includes barriers to migration and other factors affecting migratory species outside of the upper Wye, including river levels in the Wye and exploitation of adult salmon at sea and in the lower river.

Rare and scarce aquatic invertebrates may be found at suitable locations downstream of Builth Wells. Sufficient good quality habitat is available to support these species in the long term. This includes places to shelter and a good supply of suitable food. All the factors that affect these species, or their habitats, are under control. The large stable shingle banks below Glasbury are largely free from human interference and disturbance that might harm rare and scarce invertebrates and breeding birds.

The water quality is of generally high standard throughout the upper Wye and levels of potentially harmful pollutants, arising from farming operations, sewage treatment plants and other sources, do not exceed the limits where they may harmful to the naturally occurring aquatic plants and animals.

What management is needed on the River Wye (Upper) SSSI and why?

Although the upper Wye is an excellent place for wildlife, it will only remain so if the necessary management continues. CCW's priority is to work with you to ensure that this management is carried out.

What does this mean in practice?

There are a number of different factors that could damage the special features of the upper Wye if they are not properly managed. These are the ones we regard as most important:

- **Water quality**

High water quality is an important factor in maintaining the aquatic habitats and species of the upper Wye.

Nutrient enrichment and fine sediment (silt) loads are significant adverse factors affecting water quality. Nutrients (nitrogen and phosphorus) affect sensitive aquatic plants, which are displaced by the vigorous growth of nutrient-demanding plants such as filamentous algae. Especially at times of low flow and high water temperature this can also lead to oxygen depletion, to which juvenile salmon are particularly sensitive. Sediments containing high phosphate levels can cause heavy mortality to salmon at the egg stage by causing oxygen depletion within spawning gravels. In the upper Wye catchment, the most significant sources of this diffuse pollution are from agriculture, including fertiliser run-off, livestock manure, silage effluent and soil erosion from ploughed land. The most intensively used areas such as heavily trampled gateways and tracks can be especially significant sources of

polluting run-off. Preventative measures can include surfacing of tracks and gateways, moving feeding areas, and separating clean and dirty water in farmyards. Farm operations should avoid ploughing land which is vulnerable to soil erosion or leaving such areas without crop cover during the winter.

Among toxic pollutants, sheep dip and silage effluent present a particular threat to aquatic animals in this predominantly rural area. Contamination by synthetic pyrethroid sheep dips, which are extremely toxic to aquatic invertebrates, has a devastating impact on crayfish populations and can deprive fish populations of food over large stretches of river. These impacts can arise if recently dipped sheep are allowed access to a stream or hard standing area, which drains into a watercourse. Pollution from organophosphate sheep dips and silage effluent can be very damaging locally. Pollution from slurry and other agricultural and industrial chemicals, including fuels, can kill all forms of aquatic life. All sheep dips and silage, fuel and chemical storage areas should be sited away from watercourses or bunded to contain leakage. Recently dipped sheep should be kept off stream banks. Used dip should be disposed of strictly in accordance with Environment Agency Regulations and guidelines. Statutory and voluntary agencies should work closely with landowners and occupiers to minimise the risk of any pollution incidents and enforce existing regulations.

Discharges from sewage treatment works, urban drainage, engineering works such as road improvement schemes, and other domestic and industrial sources can also be significant sources of pollution, and must be managed appropriately. Current consents for discharges entering, or likely to impact upon the site should be monitored, reviewed and altered, if necessary.

Measures to control diffuse pollution in the water environment, including 'Catchment Sensitive Farming', may be implemented as a result of the Water Framework Directive and, along with existing agri-environment schemes, will help to achieve the conservation objectives for the SSSI.

- **Water quantity**

River flow (level and variability) determines a range of habitat factors of critical importance to the features of the SSSI, including current velocity, water depth, wetted area, substrate quality, dissolved oxygen levels and water temperature. The maintenance of both higher flows ('spates' or 'freshets') and base-flows is essential. Maintenance of a naturally fluctuating water level is important for many plants and animals. Sustained high or low water conditions could lead to loss of sensitive species, such as scarce plants, mosses and liverworts, aquatic and shingle invertebrates and breeding birds. Near-natural flow conditions should be maintained as far as possible.

There are several public water supply abstractions in the upper Wye, the most important being from the Elan Valley reservoirs. The flow in the upper Wye is regulated by releases from these reservoirs, which can both reduce high flows and reduce the occurrence of naturally low flows. Reservoir compensation releases should be adequate to allow the survival of the SSSI features within affected reaches, by minimising the negative effects on flow level and

variation. During peak migration periods (April-June and September-October) there may be additional flow requirements associated with the requirements of migratory fish.

In times of drought and low summer flows, oxygen stress and high water temperatures can affect fish and invertebrate populations. High levels of nutrients or other pollutants can aggravate these affects and also damage aquatic plant communities. Demand for water may also be higher during these periods. Impacts from abstractions at times of low flow should be avoided through the use and enforcement of 'hand-off' flow conditions on licences.

- **Obstructions to migration**

Fish can be subject to obstructions to their upstream or downstream migrations or in the case of the resident species, when dispersing within the river system. The size of barrier that is significant, varies between species, for example salmon may sometimes cross barriers up to several metres in height while bullhead dispersal can be prevented by a barrier only 30cm high. Barriers can also take the form of polluted reaches or reaches subject to noise disturbance. Shad are especially sensitive to noise and vibration. The main impacts on downstream migration result from entrainment or impingement in water intakes associated with water supply abstractions. Low flows at the critical migration period between April and June can limit access to spawning areas in the upper catchment.

In-channel engineering works and other activities with the potential to create obstructions should be carefully assessed and potential impacts mitigated taking into account their location, scale and timing. Removal or modification of barriers such as weirs and bridge footings, and appropriate screening on water intakes, may be required to restore features to a favourable conservation status.

Otters are also subject to obstructions to movement and dispersal around the river system, especially by bridges but also potentially by noise and visual disturbance such as artificial lighting close to the river. Bridges should be designed to allow movement of otters by incorporating ledges or tunnels as appropriate, and excessive disturbance to the river channel should be avoided in developments.

- **Management of riverbanks**

Riparian habitats, including bank sides and habitats on adjacent land, are an integral part of the river ecosystem. Diverse and high quality riparian habitats have a vital role in maintaining aquatic habitats and species. The type and condition of riparian vegetation influences shade and water temperature, nutrient run-off from adjacent land, the availability of woody debris to the channel and inputs of leaf litter and invertebrates to support in-stream consumers. Light, temperature and nutrient levels influence in-stream plant production and habitat suitability for the features. Woody debris is very important as it provides refuge areas from predators, traps sediment to create

spawning and juvenile habitat and forms the base of an important aquatic food chain. It is important that appropriate amounts of tree cover, tall vegetation and other semi-natural habitats are maintained on the riverbanks and in adjacent areas, and that they are properly managed to support the SSSI features.

Intensive or inappropriate grazing of the waterside by stock may result in a reduction in the diversity of plants and a lack of opportunity for natural tree regeneration. Riverbanks that are heavily trampled tend to be prone to erosion, increasing sediment levels in the river and siltation of fish spawning sites. Stock watering points can also cause excessive localised siltation that can affect fish and aquatic invertebrates. Trampling by livestock can affect breeding birds. Conversely, heavy growth of marginal vegetation, particularly on some of the stable shingle banks, may result in a reduction in biodiversity, as the plants and animals that live there require extensive open areas to survive. Stock grazing should be maintained in areas where it is necessary to prevent the growth of tall vegetation, trees and shrubs. Other areas should be kept stock-free to provide cover for riverine animals, protect sensitive plants and to allow trees and shrubs to regenerate.

Landowners and occupiers in selected areas of the upper Wye catchment should be encouraged to enter partnerships, where appropriate, to manage bank side habitat through the creation of buffer zones and other stock control measures.

- **Engineering works/gravel extraction**

Engineering works, such as highways maintenance, bridge repairs, flood defence works and the maintenance of fishing croys and boat launching areas can also have a significant impact on the habitats and species of interest. Such activities can damage or destroy river and bank side habitats, cause sedimentation, chemical and noise pollution, create obstructions to fish and otter movement and introduce or spread invasive weeds. These effects would be particularly serious for in-stream works.

All such schemes should be properly assessed and designed so as to minimise the impact on the special features of the site. The use of “soft engineering”, such as natural revetments, will be encouraged where appropriate.

The removal of gravel and shingle from within the river channel can lead to the loss of suitable spawning sites for fish and release sediment that could damage aquatic plants and invertebrate populations. Removal of gravel from the more stable shoals may also have a serious impact on the specialised plants and animals that live there and this practice should be generally avoided.

It may be necessary to remove shoals from bridges and other flood defence structures on a regular basis but this should be done sensitively. It may also be acceptable to remove small quantities of gravel for agricultural use but this should only be taken from dry shoals that are regularly replenished. Disturbance to the wetted river channel should be avoided between 15 October

and 30 June annually, as damage to spawning sites and loss of fish eggs and juveniles could occur during this period. Sites used by nesting birds should not be disturbed during the breeding season (March to July inclusive).

Residential and urban development on riverbanks can also lead to cumulative loss of important riparian habitat and pollution. Such development should be confined to the zones identified by development plans, suitable planning conditions should be applied to prevent damage and disturbance and buffer strips of semi-natural vegetation should be maintained.

The following actions will help to prevent significant impacts arising from channel and bank works:

- All minor in-channel operations and engineering works must meet good practice guidelines (such as EA Environmental Specification Notes and Pollution Prevention Guidelines) and all medium or large projects must involve detailed appraisal and consultation with CCW at an early stage.
- Development of guidance for use by statutory agencies when undertaking/consenting shoal/gravel removal. All work must conform to good practice guidance.
- Retention of buffer strips/riparian corridor habitat and/or enhancement in developments next to the river, including control of artificial lighting.
- **Fishery management**

Fishery interests manage the river habitat and exert control on fishing levels. Fishing should be maintained within naturally sustainable limits with positive management used to ensure that healthy, natural populations of fish exist.

Introductions should be avoided because of hybridisation, disease and competition. Where necessary they must be of native species, reared from local stock with timing of release, size and numbers determined so as to avoid competition and predation of natural fish populations. It should also be remembered that introduced fish will impact on and become part of a wider food chain with indirect effects on other features.

Fishery management, including control of invasive species, tree management and fencing, should be undertaken in a fashion that is sympathetic to needs of otters, birds and other river animals and plants.

Any control measures proposed in order to reduce predation impacts from fish-eating birds should not have a significant impact on the wintering goosander population on the river.

The following actions will help to prevent significant impacts arising from fishery management:

- Ensure that all exploitation of fish, including species that are an important food source for otters (e.g. eels), is sustainable by developing voluntary agreements and adjust fishery regulations as appropriate.
- Implement the Wye Salmon Action Plan and update as appropriate.
- Do not permit non-native fish introductions to sites within the Wye catchment that are connected to the river system or to closed sites if there is a risk of escape.
- Assess all stocking with native species to prevent the spread of disease and other undesirable impacts, including genetic modification.

- **Invasive alien species**

The American signal crayfish is present in the Wye catchment and poses a very serious threat to the continued existence of the native white-clawed crayfish in the site and in Wales. Native crayfish are unable to co-exist where signal crayfish are present, due to the latter's superior competitive ability and a disease, crayfish plague, which it carries but to which native crayfish have no immunity. Signal crayfish are also extremely harmful to fish communities and the overall ecology of the river. It is illegal to release non-native crayfish into the wild, to keep live crayfish in Wales or to trap crayfish without a licence from the Environment Agency. The regulations on the keeping, release and trapping of non-native crayfish in Wales should be strictly enforced. The signal crayfish eradication programme implemented by the statutory bodies and partner organisations should be continued.

Japanese knotweed and Himalayan balsam are non-native plants, which can form dense stands, displacing native plants and reducing wildlife interest. They provide a poor habitat for insects, birds and most mammals and the risk of riverbank erosion is increased when they die back in the autumn. These alien species may need to be controlled and removed from sites; however, they are difficult to control and easily spread. Special care needs to be taken when civil engineering works are taking place as they can cause alien species to be introduced and spread. Statutory and voluntary bodies, owners and occupiers should co-operate to implement a co-ordinated Japanese knotweed control programme.

- **Disturbance**

Disturbance to the features can take many forms and have a range of impacts from relatively minor to extremely serious. Disturbance of the features is most critical at breeding, feeding and resting locations. It can also be important at

other times. For example, shad are sensitive to low frequency sounds (below 400Hz), which can prevent them moving up river to their spawning sites.

Disturbance to otters at their breeding sites should be minimised. A suitable number of secure breeding and resting sites should be available within each otter's home range to ensure freedom from excessive disturbance.

- **Recreation**

Increased recreational pressure could affect the river plants and animals through physical damage to habitats and increased disturbance. Recreational uses include canoeing, rafting, fishing, swimming and walking.

The statutory and voluntary bodies, owners and occupiers should co-operate to manage recreational use so as to minimise the impact of recreation on wildlife.

- **Alder disease**

As alder is a prominent tree along the banks of the upper Wye, alder disease is potentially a serious threat to both habitats and species. Many riverside plants require shade and fish and otters need trees for cover. Tree roots also contribute to riverbank stability.

If alder disease proves to be widespread, diseased trees may need management to prolong their lives or alternative native species may need to be planted.

- **Catchment management**

The cover of semi-natural habitats such as woodland, scrub, fen and marshy grassland within the surrounding catchment area is important in determining the run-off response and hydrological regime of the river. These habitats retain water because of the high organic matter content in their soils and lack of artificial drainage. The River Wye is a 'flashy' river, and would be expected to show a considerably damped run-off response, and hence lower flood peaks, were the catchment to have a higher cover of semi-natural woodland. Increased semi-natural habitat cover should be promoted through the Catchment Flood Management Plan and other appropriate policy drivers.

Urban development in the catchment increases the run-off rate by creating impermeable surfaces and piped flows into watercourses. Sustainable Drainage Systems (SUDS) such as balancing ponds, swales and permeable pavements should be implemented wherever possible in new and existing developments to attenuate run-off, reduce flood peaks downstream and improve water quality.

Fertilizer application to land adjacent to watercourses in the wider river catchment may result in nutrient run-off and enrichment of the river system, which can have a detrimental impact upon aquatic plants and animals.

Growing crops such as potatoes in fields next to the river can cause particularly serious run-off problems and wide buffer strips should be maintained to prevent nutrients, chemicals and silt reaching the river.

The quality and extent of adjacent woodland cover, and other semi-natural habitats, is an important factor in determining the availability of secure otter breeding sites, and hence the achievement of the conservation objectives for otters in the SSSI. A sufficient proportion of the woodland close to the river should have a dense understorey of shrubs and bramble to provide cover for otters to breed at natural densities. This should be achieved through management agreements with the landowners where necessary.

Finally

Our knowledge of wildlife is far from complete. It is possible that new issues may arise in the future, whilst other issues may disappear. This statement is written with the best information we have now, but may have to change in the future as our understanding improves. Any information you can provide on the wildlife of your site and its conservation would be much appreciated.

If you would like to discuss any aspect of your SSSI, or have any concerns about your SSSI, please contact your local CCW office.

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