

Lower Severn Internal Drainage Board Biodiversity Action Plan Review

Objectives for 2022 - 2025

Approved under minute 3340

February 2022

Foreword

This Biodiversity Action Plan review has been prepared on behalf of the Lower Severn Internal Drainage Board (LSIDB) in accordance with the commitment in the Implementation Plan of the DEFRA Internal Drainage Board Review for IDBs to produce their own Biodiversity Action Plans and to keep them under review.

It also demonstrates the Board's commitment to fulfilling its duty as a public body under the Natural Environment and Rural Communities Act 2006 to conserve biodiversity.

Many of the Board's activities have benefits for biodiversity. It is hoped that this Biodiversity Action Plan will help the Board to maximise the biodiversity benefits from its activities and demonstrate its contribution to the Government's UK Biodiversity Action Plan targets. The Board has adopted the Biodiversity Action Plan as one of its policies and is committed to its implementation.

It will review the plan periodically and update it as appropriate.

Date 2nd February 2022

Matthew Riddle
Chairman of the Board

This Biodiversity Action Plan is a public statement by the Board of its biodiversity objectives and the methods by which it intends to achieve them.

We would welcome appropriate involvement in the delivery of the Plan from interested organisations, companies, and individuals.

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Further information is available on the Board's web site: <http://www.lowersevernidb.org.uk/>

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Introduction

The IDB has updated its biodiversity audit of the district and identified those habitats and species that would benefit from particular management or actions by the IDB. Using this information, which is presented in later sections, the IDB's Biodiversity Action Plan has been reviewed. The Plan identifies objectives for the conservation and enhancement of biodiversity within the drainage district, and goes on to describe targets and actions that will hopefully deliver these objectives. The intention is to integrate, as appropriate, biodiversity into the Board's activities, such as annual maintenance programmes and capital works projects.

The action plan will help to safeguard the biodiversity of the drainage district now and for future generations. In particular, it is hoped that implementing the plan will contribute to the achievement of local and national targets for UK BAP priority species and habitats. Species and habitats which are not listed in the UK BAP but may be locally significant for a variety of reasons have also been considered.

The Plan is an evolving document that will be reviewed and updated on a regular basis. The objectives cover the entire drainage district of the IDB but the detailed actions currently only relate to Gloucestershire – the bulk of the IDB's rural geographic area. Decisions on implementation of proposals in this plan will always be made following flood risk assessments.

What is Biodiversity?

Biodiversity can be defined simply as the variety of life on Earth and encompasses the whole spectrum of living organisms, including plants, birds, mammals, and insects. It includes both common and rare species, as well as the genetic diversity within species. Biodiversity also refers to the habitats and ecosystems that support these species.

The Convention on Biodiversity was originally agreed at the Earth Summit in Rio de Janeiro in 1992. The term "biodiversity" came into common usage at this point and subsequent actions and initiatives to conserve and reverse the decline of biodiversity globally have stemmed from this convention. The UK government was one of the first countries in the world to develop its Biodiversity Action Plan (BAP) as legally required under the convention and county level BAPs appeared across the UK in the late 1990s and early 2000's. The IDB Biodiversity Action Plan is part of this much larger biodiversity framework that encompasses international, national and local levels of biodiversity action planning and conservation.

The Importance of Conserving Biodiversity

Biodiversity is a vital resource and it is essential to acknowledge the benefits which the functioning of healthy ecosystems provides for human well-being.

- Supply of ecosystem services – water supply and flood attenuation, nutrient recycling, climate regulation, pollination, etc.
- Life resources – food, medicine, energy and raw materials
- Improved health and well-being
- Landscape and cultural distinctiveness
- Direct economic benefits from biodiversity resources and 'added value' through local economic activity and tourism
- Educational, recreational and amenity resources

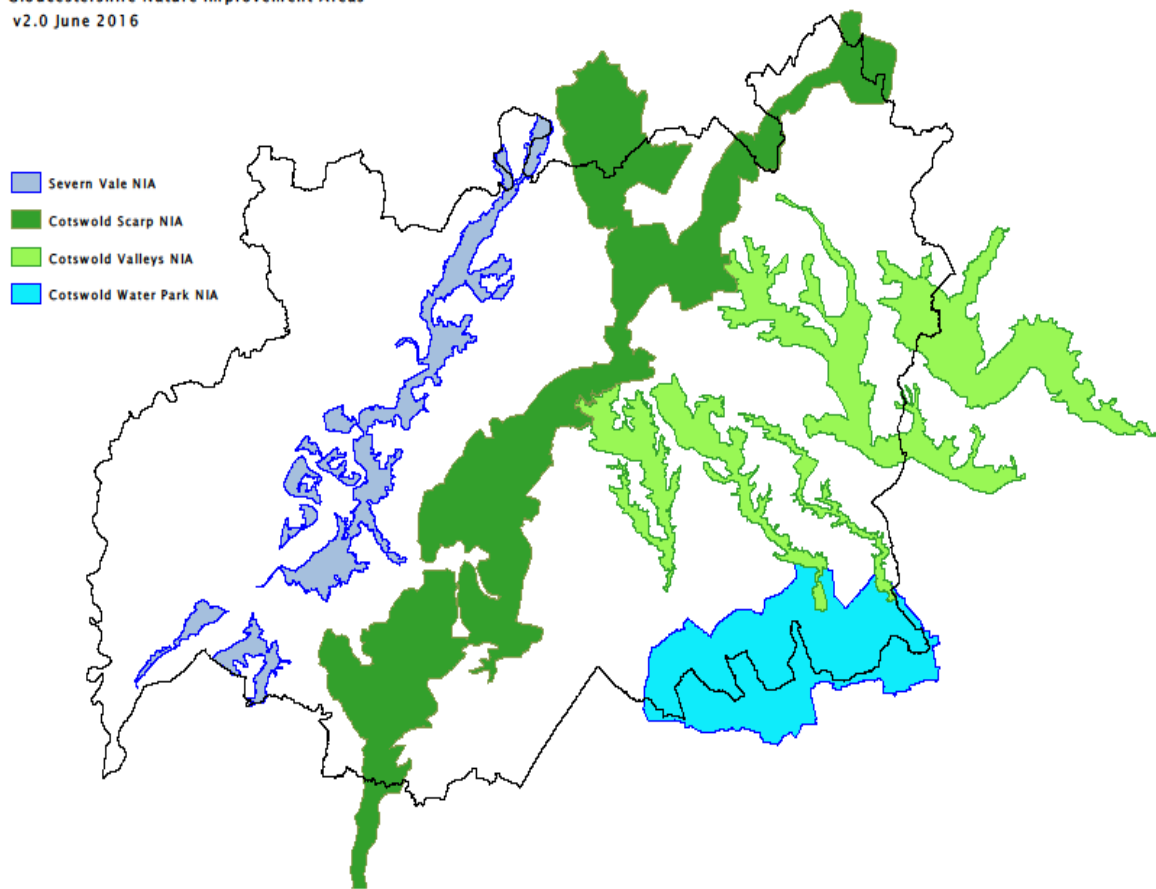
The Landscape Scale approach and Nature Improvement Areas (NIAs)

Since the publication of the UK and county-level BAPs there has been a gradual shift in emphasis on how biodiversity conservation should be delivered. Rather than concentrating on specific habitats and species the overarching approach is now to address issues at a landscape scale. Landscape scale partnership projects have sprung up across the country, including the Wildlife Trust's Living Landscapes initiative and the RSPB's Futurescapes. In 2011 – with the launch of the Government's Natural Environment White Paper – the concept was formalised with the identification of 12 Nature Improvement Areas (NIAs) which were funded to trial the approach. Defra's agri-environment schemes – which fund environmentally friendly farming in target areas – are also designed with the landscape scale approach in mind.

Defra – which also oversees NIAs – allowed Local Nature Partnerships (LNP) to identify their own local landscapes which could benefit from this approach and in Gloucestershire the LNP has identified and adopted four NIAs, including the Severn Vale which covers much of the IDB area in Gloucestershire- see Map 1. The Gloucestershire Biodiversity Partnership – which preceded the LNP – did a considerable amount of work on characterising the area which now forms the Severn Vale NIA the details of which can be found here:

<http://www.gloucestershirenature.org.uk/actionplan/imap.php>

Within the landscape scale approach traditional Habitat and Species Action Plans are still relevant and contain much useful information to guide action. The IDB BAP produced here identifies actions for various habitats and species but now does this in the context of the Severn Vale Nature Improvement Area.



Map 1. Nature Improvement Areas in Gloucestershire

Internal Drainage Boards and Biodiversity

The Natural Environment and Rural Communities Act 2006 places a duty on IDBs to conserve biodiversity. As a public body, every IDB must have regard in exercising its functions, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity. The Act states that conserving biodiversity includes restoring or enhancing a population or habitat. In so doing, an IDB should have regard to the list published by the Secretary of State of living organisms and types of habitat that are of principal importance for the purpose of conserving biodiversity. In effect, this list comprises the Biodiversity Action Plan priority species and habitats for England.

In 2007, the Government's IDB Review Implementation Plan established a commitment that IDBs should produce their own Biodiversity Action Plans. This IDB Biodiversity Action Plan has been produced and now reviewed to help fulfil these requirements and seeks to set out targets and actions that complement the UK Biodiversity Action Plan and Local Biodiversity Action Plans.

The Aims of the IDB Biodiversity Action Plan

The aims of this IDB BAP, in the context of the Severn Vale NIA, are:

- To ensure that habitat and species targets from the UK Biodiversity Action Plan and the local LBAP are translated into effective action within the drainage district where it is relevant to do so.
- To identify targets for other habitats and species of local importance within the drainage district influenced by its work
- To engage with effective local landscape scale partnerships in the IDB area and to contribute where possible to joint objectives
- To raise awareness within the IDB and locally of the need for biodiversity conservation
- To ensure that opportunities for conservation and enhancement of biodiversity are fully considered throughout the IDB's operations, and
- To monitor and report on progress in biodiversity conservation.

The Biodiversity Audit

To review this IDB Biodiversity Action Plan, information on the habitats and species present in the district area first collated in 2008 was updated April 2016. This "Biodiversity Audit" involved the collation of existing data held by the Gloucestershire Centre for Environmental Records (GCER).

Evaluating and Prioritising Habitats and Species

The Biodiversity Audit identified those priority habitats and species in the UK Biodiversity Action Plan and the Local Biodiversity Action Plan that can be found in the drainage district. Additional non-BAP habitats and species deemed to be important within the drainage district were also identified. Further habitats and species, together with additional targets and actions, may be added in the future, as knowledge is improved and delivery of the IDB BAP is reviewed. A range of criteria was then used to select those species and habitats that are of particular importance to the IDB – that is to say, those habitats and species that might benefit from IDB actions. The criteria used included their national and local status, the opportunities for effective IDB action and the resources available.

Setting Objectives, Targets and Indicators

For each habitat and species identified as being important to the IDB, conservation objectives and targets have been drawn up and set out in the Plan. The objectives express the IDB's broad aims for benefiting a particular habitat or species. The related targets have been set to focus IDB programmes of action and to identify outcomes that can be monitored to measure achievement. For each target an indicator has been set – a measurable feature of the target that, when monitored over time, allows delivery to be assessed. In order for this BAP to be as effective as possible the targets and actions have been devised to be SMART (Specific, Measurable, Achievable, Relevant and Time-limited). The targets are ambitious, but are also considered to be proportionate and practicable given the resources available.

Procedural targets and actions have also been considered. These are targets that the Board will use to measure the way in which it considers and incorporates biodiversity across the whole range of its operations. These may involve changes to administrative, management and operating procedures.

Implementation

Once targets have been set for habitats and species, it is important that the actions to deliver the Biodiversity Action Plan are described. The Plan sets out how the Board intends to implement the actions in the plan, often in partnership with other organisations or individuals. Implementation will always have to be assessed against the flood risk that implementation might incur.

Monitoring

Achievement of the Plan targets will be measured by a programme of monitoring which the Board will undertake, in some instances with assistance from its partners, and the methods to be used are described in the Plan.

Reporting and Reviewing Progress

It is important to review the implementation of the BAP, assess changes in the status of habitats and species and the overall feasibility of objectives and targets. In addition, it is vital that the successful achievement of targets is recorded and the gains for biodiversity registered in the public domain. The Plan sets out the methods the IDB will be using to review the delivery of targets and to communicate progress to partner organisations and the public.

THE BIODIVERSITY AUDIT

Introduction

The following Sections 4, 5 and 6 summarise the results of the Biodiversity Audit, undertaken in 2008. Section 4 provides information about the drainage district and a list of the nature conservation sites that occur within or bordering its boundaries. Sections 5 and 6 list respectively the habitats and species occurring within the district that are of potential importance to the IDB.

Local Biodiversity Action Plans

The Gloucestershire Local Biodiversity Action Plan covers the bulk of the IDB's drainage district:

Statutory Nature Conservation Sites

Table 1. INTERNATIONAL DESIGNATIONS - Special Areas of Conservation (SACs) and Special Protection Areas (SPAs)
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Severn Estuary

Walmore Common

Table 2. NATIONAL DESIGNATIONS – Sites of Special Scientific Interest(SSSIs)
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Ashleworth Ham

Upper Severn Estuary

Chaceley Meadows

Walmore Common

Garden Cliff

Severn Estuary

Non-statutory Local Sites

Table 3. LOCAL DESIGNATIONS – Key Wildlife Sites (KWS)
Lydney Town Marsh & Sidings KWS
Oakle Street Pond KWS
Whitcliff Park KWS
Tintock Wood (inc Pitbrook Brake & Penny Grove) KWS
Bushy Grove KWS
Groundless Pool KWS
Gloucester & Sharpness Canal KWS
Gannicox Toad Pond KWS
River Frome (SO80) KWS
Berkeley Heath Water Meadows KWS
Wickster's Brook and Ditch (part) KWS
Oakworth KWS
Vell Mill Daffodill Meadow KWS
Herridges Wood KWS
Shatford Grove KWS
Red Wood KWS
River Frome (SO70) KWS
Hereford & Gloucester Canal KWS
Church Covert KWS
Princehill Wood KWS
River Leadon Meadows KWS
Blaisdon Railway Line KWS
Cambridge Old Canal KWS
Corseleas Brake KWS
Forthampton Oaks KWS
Maisemore Roughett KWS
Sud Meadow KWS
Alvington & Aylburton Meadow KWS
Ell Brook Meadows KWS
Darkham Wood KWS
Bond's Mill Bank KWS
Lock Meadow KWS
Saul Gravel Pits KWS
Poulton Wood KWS
Broadstone Meadow KWS
Callow Farm Daffodil Meadows KWS

HABITAT AUDIT

Table 5. Summary of Priority Habitats in the Board's area

UK BAP Priority Habitat	Local Biodiversity Action Plan Habitat	Habitat of Importance for LSDB	Location of Habitat of Importance for LSDB	IDB Potential for Maintaining, Restoring or Expanding Habitat
Saltmarsh Mudflats	Estuaries, Saltmarsh and Mudflats	None	None	None
Coastal and Floodplain Grazing Marsh	Lowland Wet Grassland	Watercourses associated with grazing marshes and their banks	Throughout the IDB area	Adjusted management at specified sites to retain marginal vegetation
	Rivers and Streams	Water courses and banks	Throughout the IDB area	Adjusted management at specified sites to retain marginal vegetation
Canals	Canals	None	None	None
Reedbeds	Reedbeds	Reedbed	None	Support any projects in area to recreate reedbeds
Eutrophic Standing Waters	Standing Open Water	Ponds	Throughout the IDB area	Opportunities to enhance and create new ponds
Fen, Marsh and Swamp		Fen, Marsh and Swamp	Walmore Common, Ashleworth Ham	Ensure water level management enhances target habitat
Lowland Hay Meadows	Unimproved Neutral Grassland	Watercourses adjoining neutral grassland sites	NB Chaceley Meadow	Ensure watercourse management enhances target habitat
Wet Woodland	Woodlands (Wet Woodland)	None	None	None
Traditional Orchards	Old Orchards	None	None	None

Habitats of Importance for the IDB

1. Lowland Wet Grassland

Description

This habitat, (also known as Floodplain Grazing Marsh in the Gloucestershire LBAP), forms part of the UK BAP habitat of Coastal and Floodplain Grassland. It is described as periodically inundated grassland managed for grazing or fodder. It is usually divided up by a system of drainage ditches that affect the water levels on the marshes. Floodplain grassland usually has two major habitat components: the grasslands themselves and the aquatic habitat within the grasslands – the rhines. Watercourses are important for their aquatic populations, while the grasslands tend to support drier or marshy habitats. However, the juxtaposition of the ditches can be essential for supporting some of the populations that inhabit the grasslands. For example breeding waders that nest in the grasslands may rely on the damp soil alongside ditches to provide them with food when the soil water table drops and the grasslands dry up as summer progresses. Though lowland wet grassland falls under “improved” grassland as a general habitat type, it is “unimproved” floodplain grassland that has the higher conservation value. Such grasslands are usually extensively managed for grazing and grass and often receive little or no fertilizer; nutrient inputs resulting from seasonal flooding.

National and Local Status

Unimproved lowland wet grassland is a continually diminishing resource in the UK. If flooding can be controlled, and particularly if the water table can be dropped, the land is particularly valuable for agricultural improvement. This is what has happened widely on the floodplains in the Severn Vale.

The bulk of the Board's area lies within the floodplain of the Severn Vale and its tributaries where Lowland Wet Grassland is the dominant habitat. Many other areas of grassland still occur on the floodplain, but have been agriculturally improved or become fragmented by arable farming and have lost much of their intrinsic conservation value. The Severn Vale grassland habitat is important for its bird populations, particularly for breeding waders like snipe, curlew, redshank and lapwing, as well as wintering wildfowl including whooper and Bewick's swans. It is also important for its plants, including false fox sedge and greater burnet.

Potential improvements:

Although widespread in the Board's area the IDB has little influence on the management of the grasslands themselves, although its main activity is the maintenance of the ditch system which runs through them. Channel management might be able to help by limiting conveyance rates of floodwater, thus reducing the speed at which the soil water levels fall after flooding, but this is only likely to be compatible with the aim of draining farmland in a few target areas.

Action	Partners	Date	Outcome
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Engage with partnership projects in the Severn Vale NIA and identify opportunities to contribute to wet grassland targets	Caba/ Wetlands West partners	On-going	Engagement with projects conserving lowland wet grassland
Seek to alter where appropriate, and in conjunction with the landowner, the management of IDB water courses that affect water levels and conditions on lowland wet grassland in the Board's area.	GWT/NE/WWT/ landowners	On-going	Water levels on wet grassland habitat secured as a result of Board activity

Rivers and Streams

Description

Rivers and streams pass through much of the Board's area as tributaries of the River Severn. Most if not all have been significantly modified by human activity and all are sluiced at their confluence with the River Severn as a way of controlling flooding. This has a major impact on the natural functioning of such watercourses and the wildlife they support and in particular present a significant barrier for migratory fish (i.e. European eel).

National and local status:

The River Severn and its estuary is the most important biodiversity feature within the Board's area and are covered by national and international designations. The ecological condition of the rivers which flow into it through the Board's area are relevant to the overall integrity of the wider river system but they are currently negatively impacted by flood banks, sluices and agricultural run-off.

Potential improvements

Changes in watercourse management might be used to try to offset some of the adverse effects of agriculture on the river systems, particularly in sediment trapping closer to source and before it reaches the main rivers. There may be opportunities to modify channel management to increase fish and some invertebrate populations within the watercourse system, but the success of this would be limited by factors outside the Board's control, namely farming practices in the floodplain and their effect on water quality. Riparian management can be modified to benefit a wide variety of species associated with river systems.

Action	Partners	Date	Outcome
Look for opportunities to enhance watercourses and their margins within the Board's area of operation.	EA/Severn Rivers Trust/CART	On-going	Engagement with projects conserving rivers and streams

Rhines and Drainage Board Watercourses

Description

Outside the natural watercourses in the Board's area, there are many man-made rhines which are the focus of IDB activity and are actively managed to a greater or lesser extent - to try to control the flood risk on developed or agricultural land on the floodplain. In some areas water courses are heavily managed to help flood water conveyance. The process of removing vegetation from rhines annually – known as ridding – is probably having an unknown impact (positive and negative) on a range of species which depend on them. Due to the intensity of agricultural systems on and adjoining the Board's district there are problems with diffuse and point-source water pollution. Though these are not caused by the Board's activities, the Board's management of the water courses can allow transmission of diffuse water pollution (dwp) downstream to the main rivers, adversely affecting their ecological systems.

National and local status

The network of watercourses throughout the Board's area is important for wildlife for a number of reasons. They affect the water level in the surrounding agricultural land which supports wetland habitats; they are habitat for a range of species including water vole and reed bunting and they act as wildlife corridors through a landscape which in some areas is intensively managed for agriculture.

Potential improvements

Work could be carried out to reduce sedimentation; address the problem of diffuse water pollution and improve the management of vegetation, both in channel and bankside.

Action	Partners	Date	Outcome
Identify to what extent sedimentation is a problem in the Board's area and seek to establish methods of sediment control in selected IDB watercourses	EA	On-going	The problem of sedimentation alleviated as a result of Board activity
Establish modified channel management in up to 10% of watercourses, particularly to benefit aquatic species.	GWT/WWT	August 2017	10% of IDB's watercourse better for wildlife as a result of changes in management regime

Reedbed

Description

Reedbeds are wetlands dominated by common reed (*Phragmites communis*). Reed may also be the dominant plant along some watercourses and rhine systems and also fringing tidal mudflats. They have a specific fauna associated with them and are important for invertebrates and numerous bird species which use them for breeding (i.e. reed warbler) or foraging (i.e. otter).

National and local status:

Reedbeds of significant size are uncommon across the UK and all are of conservation value. Even smaller reedbeds (over 0.5 ha) have conservation value. In the Board's area the only reedbed of significance is at Purton Timber Ponds, adjacent to the Sharpness Canal, although reed is common along watercourses and ditches throughout the Board's area, especially south of Gloucester

Potential improvements

There is little scope for the IDB to manage existing sites although the creation of reedbeds in the Severn Vale remains a county BAP target so there may be scope for IDB involvement in future reedbed creation

Action	Partners	Date	Outcome
Engage with any proposals to create reedbed habitat within the Board's area.	WWT/GWT, etc.	On-going	Engagement with projects creating and extending reedbed habitat
Assist where possible with any projects to enhance Purton Timber Ponds	GWT/CART	On-going	Improved and connected reedbed habitat

Ponds

Description

Ponds are permanent or temporary areas of standing open water and are a valuable habitat for a range of wildlife, especially those ponds with variable depths, irregular margins and diverse vegetation.

National and local status:

Ponds have declined nationally especially where alternative water supplies have replaced farm ponds as a source of water for livestock. Neglect has seen many ponds become silted and overgrown by trees and shrubs reducing their value. Elsewhere built development has isolated ponds and separated them from, or reduced, their surrounding terrestrial habitat on which many pond creatures rely.

Potential improvements

There is scope for the IDB to improve existing ponds within its area. This could involve using machinery to desilt and enlarge ponds and this would be best targeted at ponds with

known significant interest. The Board could also become involved in the creation of new ponds and these may be best placed near to existing ponds to increase available habitat, especially for amphibians. Partners may well be involved in pond projects and the IDB could help to support these.

Action	Partners	Date	Outcome
Identify opportunities to manage existing ponds and create new ponds within the Board's area	GWT/WWT/Parish Councils	March 2017	2 ponds managed 2 ponds created

Fen, Marsh and Swamp

Description

Fens, marshes and swamps are wetland areas with impeded drainage which develop unique plant and animal communities. In some cases peat may have accumulated beneath some fen habitats creating complex water retention regimes.

National and local status

Significant areas of this habitat are restricted in the Board's area to protected sites, with Ashleworth Ham and Walmore Common being two prime examples of this rare and declining habitat.

Potential improvements

There is little scope to influence this habitat other than through the Water Level Management Plans which the IDB is required to produce for the two sites identified above

Action	Partners	Date	Outcome
Ensure that the Board is aware of locations supporting this habitat type and avoid activity which may impact on water regimes controlling them	GWT/WWT/landowners/Local Record Centres	On-going	Fen, marsh and swamp habitat maintained
Identify opportunities to expand and create this type of habitat within the Board's area	GWT/WWT/landowners	On-going	0.5 hectares of habitat created

Unimproved Neutral Grassland

Description

Unimproved neutral grassland is grassland on neutral soils (which underlie the bulk of the Board's area) which have never been improved for agriculture (i.e. ploughing, addition of fertilisers, etc.) and which consequently, because of their low nutrient status, retain a rich diversity of wildflowers and associated invertebrates. Such sites are often small and isolated. This habitat type may grade into or be associated with lowland wet grassland.

National and local status

Unimproved neutral grasslands are now a rare habitat in lowland Britain with over 95% having been improved for agriculture since 1950. Some may have survived in areas where their agricultural value is marginal and not considered viable for improvement. Significant examples of this habitat type are now almost exclusively associated with protected sites – i.e. Ashleworth Ham, Chaceley Meadow

Potential improvements

There is little scope for the IDB to be involved in the management of this habitat (other than through the WLMP process)

Action	Partners	Date	Outcome
Ensure that the Board is aware of the location of all such habitat within its area and avoid activity which may have an adverse impact	GWT/WWT/ Local Record Centres	On-going	Unimproved neutral grassland within the Board's area conserved.

SPECIES AUDIT

This species audit summary lists the BAP priority species that occur within the IDB district as identified by the information gathering exercise. Also listed are species deemed to be of local importance and/or identified in the county Local Biodiversity Action Plan that occur in the IDB district. Species that are of potential importance for the IDB, where water level management or other IDB activities may be of benefit, are identified. Finally, brief notes are included on the potential for the IDB to maintain or increase the population or range of species of importance.

Table 6. Summary of Priority Species in the Board's area

Common Name	Scientific Name	UK BAP Priority Species	Local BAP Species	Non-BAP Species Important in IDB Area	Location of Species of Importance for IDB	IDB Potential for Maintaining or Increasing Species Population or Range
Water Vole		Yes	Yes		A few isolated areas	Identify existing sites and manage and expand where possible
Otter		Yes	Yes		Throughout IDB Area	Ensure suitable holts are retained (and more created)
Brown Hare		Yes	Yes		Throughout IDB Area	Conduct survey of distribution using IDB operatives
Bats		Some	Yes		Throughout IDB Area	Maintain roosts and flightlines
Barn Owl		Yes	Yes		Occasional across IDB Area	Maintain/increase foraging habitat and nest sites
European Eel		Yes	Yes		Throughout IDB Area	Replace pumps at pumping stations and look for other opportunities to remove barriers to migration
Great Crested Newt		Yes	Yes		Occasional across IDB Area	Manage and create ponds
Reed Bunting		Yes	Yes		Throughout IDB Area	Manage more rhine side vegetation to provide breeding habitat
Lapwing, Snipe, Curlew,		No	Yes		Local throughout IDB Area	Record sightings of potential breeding

Redshank						
Stag Beetle		Yes	Yes		Chaceley/ Ashleworth Ham	Create buried wood habitat for this species.
True Fox Sedge		Yes	Yes		Ashleworth Ham	None
Water Violet		No	No	Yes	Walmore Common	Maintain existing populations and identify opportunities to enhance and connect sites
Black Poplar		No	No	Yes	Uncertain	Record distribution
Invasive Non- Native Species		No	No	Yes	Various, throughout IDB Area	Record distribution and eradicate where possible

Species of Importance for the IDB

1. Water Vole

Water voles were once widespread over the UK, though commonest in the lowlands. As their name suggests they have close associations with water, living in the banks of watercourses, feeding on bankside and emergent vegetation. They are found in natural and artificial habitats, from remote streams to rural canals. Water voles have suffered a major population decline over the last 2 decades, being absent from 90% of their former sites over the UK. In Gloucestershire and Avon there are scattered populations in the Board's area. The decline is thought to be the result of a variety of factors, but particularly mink predation and habitat destruction.

Legal Protection Status

Water Vole is legally protected under the Wildlife & Countryside Act 1998. Its original protection under Section 5 was increased in April 2008 to full protection under Section 9, which means that it is an offence wilfully to take, kill or injure the animals or damage any place or structure used by them.

Action	Partners	Date	Outcome
Identify the locations of all habitat supporting water vole within the Board's area	GWT/AWT/Local Record Centres	September 2016	Board aware of all water vole populations in its area
Develop a plan which targets changes in rhine and water	GWT/AWT	March 2017	Water vole populations

course management to enhance and connect existing water vole populations			enhanced as a result of amended management
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2. Otter

This mammal was once common throughout the British Isles. Though always closely associated with water they regularly travel considerable distances overland between watercourses. Their requirement is for good fish-stocks for food and riparian cover, particularly trees and shrubs, for lying up and breeding sites. Most otter signs are of spraints, (their droppings) which are used as a means of communication.

The factors thought to have caused the population decline and which will limit recovery included: insufficient prey associated with poor water quality; impoverished bankside habitat features for resting and breeding; and incidental mortality from road traffic accidents. There are signs of otter throughout the Board's area and the IDB rhines provide feeding, travelling and resting habitat for otters.

Legal Protection Status

Otters receive protection under: Appendix I of CITES; Appendix II of Berne Convention; Annexes II & IV of the Habitats Directive ; Schedule 2 of the Conservation (Natural Habitats etc) Regs 1994; & Schedule 5 of the Wildlife & Countryside Act 1981.

Action	Partners	Date	Outcome
Establish management protocols to ensure that no damage is caused to otter habitat or populations by Board operations.	GWT/NE/EA	March 2017	Management taking into consideration the requirements of otters
Train IDB operatives in how to identify good otter habitat	GWT	March 2017	IDB operatives identifying otter habitat as part of their routine works
Identify opportunities to create habitat for otters including artificial holts	GWT	On-going	3 holts created

3. Brown Hare

The brown hare is widespread across the Severn Vale although it is difficult to be sure of numbers. It favours open areas of grassland where it can forage and breed but is less common where arable or silage is the main agricultural activity.

Action	Partners	Date	Outcome
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Train IDB operatives in brown hare identification and encourage them to submit details of any observations within the Board's area	GWT/GCER	On-going	Better knowledge of the distribution of the Brown Hare in the Board's District
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4. Bats

While some species of bats are UK priority species, others are not, but all are susceptible to similar pressures. Population declines have been observed in many species and common factors in the declines have included the destruction of roost & breeding sites, fragmentation of feeding habitat and connectivity between the two. All UK bats are insectivorous and all to an extent depend on trees for their survival. Trees not only provide roosting and breeding sites, they provide shelter from the wind which increases the activity, and thus availability of their insect prey. Many species of bats tend to keep close to trees while feeding or travelling to and from feeding sites. Water supports large flying insect populations and so the combination of trees and water is frequently exploited by bats. The Board's watercourses provide an extremely valuable habitat for bats. Watercourses with tree cover on one bank can make important feeding sites as well as providing corridors between feeding and roosting sites.

Legal Protection Status

All bats are legally protected under the Wildlife & Countryside Act 1998 and it is an offence wilfully to damage any place or structure used by them. Some species are afforded extra legal protection.

Action	Partners	Date	Outcome
Maintain existing pollards where they occur and increase bankside tree cover and pollard establishment where appropriate (i.e. to fill gaps and enhance bat flightlines)	GWT/NE	On-going	Improved bat flightlines and connectivity across the

5. Barn Owl

The barn owl is not a UK BAP priority species but is of local concern. Barn owls occur occasionally throughout the Severn Vale although numbers may vary from year to year, mainly dependent on weather and food supply. They are commonly found on low-lying floodplains, especially in winter where they hunt for small mammals in areas of rank grassland often found on un-mown watercourse banks or ungrazed marshland. UK barn owl populations declined severely in the 1970s, through factors including, pesticide poisoning, (especially from rodenticides), loss of nesting sites from farm building restoration or conversion, and from loss of trees due to Dutch Elm disease. Changes in farming practices were probably also hugely influential, with the loss of rough grassland through improved agricultural techniques reducing food supplies. There is scope for the IDB to work with partners to further barn owl conservation in its area.

Legal Protection Status

The Barn Owl is listed in Annexes II and IV of the EC Habitats Directive and Appendix II of the Bern Convention. It is protected under Schedule 2 of the Conservation (Natural Habitats, etc.) Regulations 1994, and Schedule 5 of the Wildlife and Countryside Act 1981.

Action	Partners	Date	Outcome
Where possible manage watercourse banks and trees to provide feeding, roosting and nesting opportunities for barn owls.	GWT/WWT/AWT	On-going	Improved habitat for barn owls
Identify suitable locations and erect nestboxes to increase nesting opportunities for barn owls	GWT/WWT/AWT	December 2016	More barn owls breeding in the Board's area

6. European Eel

The River Severn is of major importance to the European Eel. Young glass eels migrating from the Sargasso Sea each year make their way up the river and its tributaries where they mature before returning back across the Atlantic to breed. While in the Severn Vale they spread throughout the drainage ditch network and into the area's wetlands where they grow before returning back to the sea. There is still much to learn about the complex life history of this charismatic species, but what is well known is that sluices and other obstructions on major river tributaries, along with water pumps and hydro installations, along Europe's western coast are acting as major barriers to migration and threaten the very existence of this fast declining species.

Legal Protection Status

The situation has become so serious that the EU has issued a major directive to address the issue. The Eels (England and Wales) Regulations 2009 came into force on 15 January 2010 to support the UK in implementing EC Council Regulation 1100/2007. Under this European Regulation, the UK must take action to halt and reverse the decline in the European eel stock, aiming to meet a target set for the number of mature adult eels leaving each river basin to return to spawn at sea. The EC Eel Regulation requires UK to consider eel passage as part of the solution.

The Board has already acknowledged that the Eel Regulations apply to its activity and at a its meeting in June 2015 agreed to refund the replacement of the pumps at all of its pumping stations through an increase in the levy on landowners across its district. This not insignificant financial investment will undoubtedly make a major contribution to facilitating eel passage at one of the most important areas within its range.



Eel mortality at Swedish Hydropower installation

Action	Partners	Date	Outcome
Implement a plan of pump replacement to ensure compliance with the Eel Regulations		To agreed timetable	Board compliant with Eel Regulations
Assist with work to improve the management of watercourses and wetlands in the Board's area to benefit eels	GWT/Bristol Water	On-going	Habitat improved for eels

7. Great Crested Newt

The great crested newt is widespread but fast declining across much of its range due to habitat loss, both from agricultural activity but more recently built development. It is protected by national and European legislation as the UK supports a significant proportion of the European population. It requires both aquatic habitat where it breeds during April and May and terrestrial habitat within 500m of the pond consisting of rough grassland, scrub and woodland where it spends the rest of the year foraging and hibernating.

Great crested newts live in meta-populations meaning that a single population may occupy a number of different ponds at different times. The maintenance of all ponds within its range is essential to safeguard their future survival. Great crested newts occur throughout the Board's area and are probably under-recorded.

Legal Protection Status

The great crested newt is an internationally important species protected under Annex IIa and IVa of the EU Habitats Directive and the Wildlife and Countryside Act 1981

Action	Partners	Date	Outcome
Identify ponds within the Board's area of operation known to support great crested newts	GWT/WWT/AWT/ Local Record Centres	March 2017	Improved knowledge of the distribution of GCNs in the Board's area
Target pond creation to increase the viability of newt meta-populations	GWT/AWT/WWT/ landowners	On-going	More sustainable great crested newt populations in the Board's area
Tailor management operations within 500m of key great crested newt ponds to improve terrestrial habitat	landowners	On-going	Improved terrestrial habitat for key great crested newt populations

8. Reed Bunting

Reed buntings are birds of wet farmland favouring vegetation along wet ditches where it nests and can forage for seed on adjoining fields. The reed bunting has suffered a decline due to habitat loss and agricultural improvement and isolation due to lack of connectivity in its favoured habitat. During the breeding season male birds sing from ditch side shrubs and hedgerows. There is scope for the IDB to improve the management of some of the rhines in its area to benefit reed buntings.

Legal Protection Status

The reed bunting has no special protection, but like all birds it – along with its nest and eggs - are protected under the Wildlife and Countryside Act, 1981.

Action	Partners	Date	Outcome
Train IDB operatives in the identification of reed bunting and encourage reporting of this species.	GWT/AWT/WWT	March 2017	Improved knowledge of the distribution of reed bunting in the Board's area.
Manage rhine-side vegetation to benefit reed bunting where appropriate, targeting areas	landowners	On-going	Improved habitat for reed bunting.

already known to support the species.			
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9. Lapwing, Curlew, Snipe, and Redshank

These four wading birds are typical of wet grassland in the Board's area but are in decline as breeding species due to loss of appropriate open wet habitat. The snipe has not breed in the region for over 20 years and the other three species breed successfully only sporadically across the area depending on weather, water levels, agricultural management, disturbance and predation. Of the four species curlew favour drier grassland habitats in which to breed and are often faithful to individual fields as breeding sites. As late breeders, however, they are often susceptible to early silage and hay cuts. The landscape scale approach in the Severn Vale NIA aims to improve habitat and prospects for these four species.

Legal Protection Status

These species have no special legal protection, but like all birds they – along with their nest and eggs - are protected under the Wildlife and Countryside Act, 1981.

Action	Partners	Date	Outcome
Train IDB operatives in the identification of these four wading birds and encourage reporting of these species.	GWT/AWT/WWT	March 2017	Improved knowledge of the distribution of waders in the Board's area.

10. Stag Beetle

The stag beetle was once widespread across much of the UK but has declined due to the loss or removal of dead wood and stumps within which its larvae live for several years before emerging as an adult beetle. There is a small discrete population in north Gloucestershire/ south Worcestershire in the Chaceley/Ashleworth/Eldersfield area. The population can be helped by ensuring an on-going supply of buried deadwood, and there is scope for the IDB to contribute towards the conservation of this species as part of its on-going activity.

Legal Protection Status

The stag beetle is listed on Annex II of the EC Habitats Directive.

Action	Partners	Date	Outcome
Train IDB operatives in the identification of stag beetle and encourage reporting of these species.	GWT/AWT/WWT	March 2017	Improved knowledge of the distribution of stag beetle in the Board's area.
Identify opportunities to create deadwood habitat (buried logs) for stag beetle in the area (north Gloucestershire/ south	GWT/AWT/landowners	On-going	Improved habitat for stag beetle in their known core area.

Worcestershire) known to support stag beetle.			
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11. True Fox Sedge

The True fox sedge is a rare species of wetland sedge which is restricted within the Board's area to four locations in the Ashleworth area. A similar species – false fox sedge - is however, widespread across the district. There is not much the IDB can do to contribute to the conservation of this species other than to be aware of its presence when updating the WLMP.

Legal Protection Status

The plant has no specific legal protection but is nationally classified as “vulnerable”.

Action	Partners	Date	Outcome
Ensure the Ashleworth Ham WLMP recognises the requirements of this species.	NE/GWT	On-going	Species maintained at its known locations.

12. Water Violet

The water violet is a plant of ponds and ditches and is vulnerable to insensitive management. It is capable of surviving summer droughts but not permanent drainage. The plant was thought to be extinct in the Board's region until ditch work at Walmore Common exposed seed from the peat which germinated in the cleared ditch. Despite its name it is not actually a violet but rather belongs to the primrose family. The Board needs to be aware of the location of this species in the event of carrying out any work at Walmore Common, but also aware that such work may unearth more seeds of this species.

Legal Protection Status

The plant has no special protection but like all plants it is illegal to uproot without consent of the landowner.

Action	Partners	Date	Outcome
Ensure operatives working at Walmore Common are aware of the location of this species and are able to identify it.	NE/GWT/ Trustees of Walmore Common	On-going	Existing populations maintained
Monitor works carried out at Walmore Common to see if other populations become established	NE/GWT Trustees of Walmore Common	On-going	Any new populations identified and protected.

13. Black Poplar

Black poplars are typical floodplain trees which when mature have a distinctive shape. A declining species, it is rarely found and often grows in isolation. They often exist in the

landscape unidentified. Trees are either male or female and their rarity means that they rarely produce seeds. They can spread by suckering and can also be propagated from cuttings. There is scope for the IDB to record the location of black poplars in its area and to plant more trees in order to maintain the population in the long term.

Legal Protection Status

None.

Action	Partners	Date	Outcome
Ensure that the known distribution of Black Poplar trees in the Board's area is mapped and their presence taken into account whenever work takes place in the vicinity.	GWT	December 2016	Known Black Poplar trees protected
Train IBD operatives in the identification of Black Poplar and encourage reporting of any new trees found.	GWT	On-going	New findings identified, mapped and protected.
Undertake the planting of new trees of appropriate gender in appropriate places.	GWT/AWT/WWT/landowners	On-going	Population of the Board's area more diverse and sustainable.
Increase management of old/unstable/damaged trees to prolong their survival.	GWT/AWT/WWT/landowners	On-going	Life of existing trees prolonged.

14. Invasive Non-Native Species

Invasive non-native species are considered to be the second most significant threat to biodiversity after climate change. Globally such species – inevitably translocated by man, either deliberately or unwittingly - are having a devastating impact on a whole range of native species from plants to mammals and amphibians to crustaceans. In the UK aquatic and wetland invasive species are prolific and include Himalayan balsam, signal crayfish and zebra mussel. The latter poses a serious threat to pumping stations and waterworks and can have a significant economic impact as a result. Himalayan balsam is widespread throughout the Board's area and when established can overshadow all other plant species. This can leave soil exposed in the winter when the balsam dies down completely leading to erosion and siltation. There is scope for the IDB to track the spread of some species and take action to eradicate

Legal Protection Status

There are over 45 international instruments relating to the control of non-native species. Of these, the Convention on Biological Diversity (CBD) is the only legally binding instrument that addresses non-native species across all groups, vectors and continents. Article 8(h) calls for contracting parties to “*prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species.*”

Action	Partners	Date	Outcome
Determine the extent to which invasive non-native species are an issue within the Board's area and prepare an appropriate plan of action to control or eradicate them.	GWT/AWT/WWT/CART	On-going	Threat from invasive non-native species identified.
Train IDB operatives in the identification of key invasive non-native species	GWT	March 2017	Locations of species of concern identified and mapped.

PROCEDURAL ACTION PLAN

Introduction

A number of procedural targets and actions have been established within this Procedural Action Plan. These are intended to integrate biodiversity considerations into IDB practices and procedures.

Objectives and Targets

1. Improving employee/contractor biodiversity awareness
2. Introducing training for staff and contractors in conservation management of drainage channels
3. Extending partnership-working
4. Improving data and information flows
5. Establish Biodiversity Working Group

IMPLEMENTATION

The BAP will be implemented, always following appropriate flood risk management assessments, in 2 ways:

- a. through modifications to standard operations in designated locations
- b. in special projects with partners

The same modification to a standard operation may fulfil the requirements of a number of BAP species or habitats. For example the establishment of staggered bank-flailing operations would benefit water vole and barn owls and even bats, as well as non- target, but perhaps threatened species like reed bunting, as well as support the survival of some scarce plants. Where flood risk management does not preclude it this option should be adopted as widely as possible.

Special projects will take place under the advice of specialist partners and sometimes in conjunction with actions undertaken by them, for example, improving habitat for water voles or great crested newts.

There will be projects that may require capital works or be one-off management experiments. For example an experimental project requiring special funding might be the construction of silt traps for the mitigation of diffuse water pollution.