

Site Improvement Plan

Fenn's, Whixall, Bettisfield, Wem & Cadney Mosses

Site Improvement Plans (SIPs) have been developed for each Natura 2000 site in England and for most sites which straddle the border between England and Wales. This plan has been drawn up as part of the Improvement Programme for England's Natura 2000 sites (IPENS) in conjunction with the LIFE Natura 2000 Programme for Wales. Natura 2000 sites is the combined term for sites designated as Special Areas of Conservation (SAC) and Special Protected Areas (SPA). This work has been financially supported by LIFE, a financial instrument of the European Community.

The plan provides a high level overview of the issues (both current and predicted) affecting the condition of the Natura 2000 features on the whole site (in both England and Wales), and outlines the priority measures required to improve the condition of the features. It does not cover issues where remedial actions are already in place or ongoing management activities which are required for maintenance.

The SIP consists of three parts: a Summary table, which sets out the priority Issues and Measures; a detailed Actions table, which sets out who needs to do what, when and how much it is estimated to cost; and a set of tables containing contextual information and links. Once this current programme ends, it is anticipated that Natural England and others, working with landowners and managers, will all play a role in delivering the priority measures to improve the condition of the features on these sites.

The SIP for this cross-border site between England and Wales is based on Natural England and Natural Resources Wales's current evidence and knowledge, and are live, and not legal documents; they will be updated to reflect changes in our evidence/knowledge and as Actions get underway. The information in the SIP will be used to update both England and Wales's contributions to the UK's Prioritised Action Framework (PAF).

The SIPs are not formal consultation documents, but if you have any comments (relating to areas within England and/or Wales) about the SIP or would like more information please email us at IPENSLIFEProject@naturalengland.org.uk, or contact Natural England's Responsible Officer for the site via our enquiry service 0300 060 3900, or enquiries@naturalengland.org.uk

To contact Natural Resources Wales telephone 0300 065 3000, or email enquiries@naturalresourceswales.gov.uk

This Site Improvement Plan covers the following Natura 2000 site(s)

UK0012912 Fenn's, Whixall, Bettisfield, Wem & Cadney Mosses SAC

Site description

This is a large lowland raised bog that straddles the English/Welsh border. It is amongst the largest and most southerly raised bogs in the UK. Although much of the site has been subject to peat extraction, areas of partially-cut and uncut mire still remain.

Plan Summary

This table shows the prioritised issues for the site(s), the features they affect, the proposed measures to address the issues and the delivery bodies whose involvement is required to deliver the measures. The list of delivery bodies will include those who have agreed to the actions as well as those where discussions over their role in delivering the actions is on-going.

Priority & Issue	Pressure or Threat	Feature(s) affected	Measure	Delivery Bodies
1 Inappropriate water levels	Pressure	H7110 Active raised bogs, H7120 Degraded raised bog	Develop and implement plan for establishing appropriate water levels	Canal and River Trust, Environment Agency, Meres and Mosses NIA, Natural England, Shropshire Council, Wrexham Maelor Borough Council, Natural Resources Wales
2 Water Pollution	Pressure	H7110 Active raised bogs, H7120 Degraded raised bog	Divert nutrient-rich water by re-routing drainage ditches	Environment Agency, Natural England, Natural Resources Wales
3 Air Pollution: impact of atmospheric nitrogen deposition	Pressure	H7110 Active raised bogs, H7120 Degraded raised bog	Control and ameliorate aerial nitrogen deposition	Environment Agency, Natural England, Natural Resources Wales
4 Inappropriate scrub control	Pressure	H7110 Active raised bogs, H7120 Degraded raised bog	Remove plantations and control areas of scrub	Natural England, Natural Resources Wales
5 Overgrazing	Pressure	H7120 Degraded raised bog	Secure farming practices that safeguard the peat soil	Natural England, Natural Resources Wales
6 Planning Permission: general	Pressure	H7110 Active raised bogs, H7120 Degraded raised bog	Revise permissions necessary for bog restoration	Natural England, Natural Resources Wales
7 Peat extraction	Pressure/Threat	H7110 Active raised bogs, H7120 Degraded raised bog	Cease peat extraction through licence acquisition	Natural Resources Wales
8 Invasive species	Pressure/Threat	H7110 Active raised bogs, H7120 Degraded raised bog	Monitor and control invasive species	Natural Resources Wales

Issues and Actions

This table outlines the prioritised issues that are currently impacting or threatening the condition of the features, and the outstanding actions required to address them. It also shows, where possible, the estimated cost of the action and the delivery bodies whose involvement will be required to implement the action. Lead delivery bodies will be responsible for coordinating the implementation of the action, but not necessarily funding it. Delivery partners will need to support the lead delivery body in implementing the action. In the process of developing the SIPs Natural England has approached the delivery bodies to seek agreement on the actions and their roles in delivering them, although in some cases these discussions have not yet been concluded. Other interested parties, including landowners and managers, will be involved as the detailed actions are agreed and delivered. Funding options are indicated as potential (but not necessarily agreed or secured) sources to fund the actions.

1 Inappropriate water levels

Because of the highly modified nature of the cut over peat surface, the large size of the site and the extensive and complex nature of the artificial drainage system allowing for pastoral agriculture and forestry on the main peat body, the restoration of a favourable hydrological regime requires considerable effort. To achieve stable water levels near to ground level beyond the core area will involve improving and reconfiguring the drainage system on and around the site beyond the current rewetted area of the National Nature Reserve (NNR) and this may have implications for the viability of agricultural grazing and forestry. This will be complex and require a significant investment of resources. Barriers that have prevented a water level management plan being put in place need to be reviewed and addressed. Further progress will require further planning, negotiation and the co-operation of landowners and watercourse managers, as well as the funding to implement the necessary measures that are identified.

Action	Action description	Cost estimate	Timescale	Mechanism	Funding option	Delivery lead body	Delivery partner(s)
1A	Review the designated site boundary to ensure it appropriately includes the full extent peat body required for hydrological restoration of the bog habitats.	Not yet determined	2015-18	Designation strategy (SSSI)	Not yet determined	Natural England	Natural Resources Wales
Action	Action description	Cost estimate	Timescale	Mechanism	Funding option	Delivery lead body	Delivery partner(s)
1B	Improve the understanding of the site's complex hydrology including ground water interactions to inform hydrological restoration and abstraction decisions (taking account of previous studies under Stage 3 of the Review of Consents and Restoring Sustainable Abstractions programme).	£15,000	2015-21	Investigation / Research / Monitoring	Not yet determined	Environment Agency	Natural England

<i>Action</i>	<i>Action description</i>	<i>Cost estimate</i>	<i>Timescale</i>	<i>Mechanism</i>	<i>Funding option</i>	<i>Delivery lead body</i>	<i>Delivery partner(s)</i>
1C	Improve the understanding of the site's complex hydrology including ground water interactions to inform hydrological restoration.	£25,000	2015-18	Investigation / Research / Monitoring	Not yet determined	Natural Resources Wales	Environment Agency, Natural England
1D	Consider the options for the relocation of infrastructure necessary to enable hydrological restoration of the site e.g. buildings, roads drains.	£8,000	2018	Water Level Management Plan	Not yet determined	Local partnership	Environment Agency, Natural England, Shropshire Council, Wrexham Maelor Borough Council, Natural Resources Wales
1E	Consider the options for the removal/relocation of infrastructure necessary to enable hydrological restoration of the site e.g. buildings, roads, drains.	£28,000	2015-18	Investigation / Research / Monitoring	Not yet determined	Natural Resources Wales	n/a
1F	Secure long term conservation management of 115 ha of core peatland adjoining the NNR to enable high water level management necessary to allow effective bog restoration.	£1,725,000	2015-25	Mechanism not identified / develop mechanism	Not yet determined	Natural England	n/a

<i>Action</i>	<i>Action description</i>	<i>Cost estimate</i>	<i>Timescale</i>	<i>Mechanism</i>	<i>Funding option</i>	<i>Delivery lead body</i>	<i>Delivery partner(s)</i>
1G	Secure long term conservation management of 176 ha of core peatland adjoining the NNR to enable high water level management necessary to allow effective bog restoration.	£2,112,000	2015-25	Mechanism not identified / develop mechanism	Not yet determined	Natural Resources Wales	n/a
1H	Programme of management works on NRW/NE land to progressively raise water levels required to expand the area of recovering degraded active bog (115 ha approximately).	£165,000	2015-25	Direct management: NRW	Not yet determined	Local partnership	Canal and River Trust, Environment Agency, Meres and Mosses NIA, Natural England, Shropshire Council, Wrexham Maelor Borough Council, Natural Resources Wales
1I	Programme of management works on NRW/NE land to progressively raise water levels required to expand the area of recovering degraded active bog (235 ha approximately).	£335,000	2015-25	Water Level Management Plan	Not yet determined	Natural Resources Wales	Canal and River Trust, Environment Agency, Meres and Mosses NIA, Natural England, Shropshire Council, Wrexham Maelor Borough Council

<i>Action</i>	<i>Action description</i>	<i>Cost estimate</i>	<i>Timescale</i>	<i>Mechanism</i>	<i>Funding option</i>	<i>Delivery lead body</i>	<i>Delivery partner(s)</i>
1J	Secure agreements to enable a programme of management works on private land to enable the progressive raising of water levels necessary to expand the area of recovering degraded active bog (350 ha).	Not yet determined	2015-25	Rural Development Programme for England (RDPE): Common Agricultural Policy 2014-20 (New Environmental Land Management Scheme)	Not yet determined	Natural England	n/a
<i>Action</i>	<i>Action description</i>	<i>Cost estimate</i>	<i>Timescale</i>	<i>Mechanism</i>	<i>Funding option</i>	<i>Delivery lead body</i>	<i>Delivery partner(s)</i>
1K	Secure agreements to enable a programme of management works on private land to enable the progressive raising of water levels necessary to expand the area of recovering degraded active bog (350 ha).	Not yet determined	2015-25	Glastir/ Section 15 Management Agreement	Not yet determined	Natural Resources Wales	n/a
<i>Action</i>	<i>Action description</i>	<i>Cost estimate</i>	<i>Timescale</i>	<i>Mechanism</i>	<i>Funding option</i>	<i>Delivery lead body</i>	<i>Delivery partner(s)</i>
1L	Develop a Water Level Management Plan in partnership with other authorities and stakeholders: identify water level restoration required and prepare a detailed engineering plan of implementation.	£35,000	2015-17	Water Level Management Plan	Not yet determined	Local partnership	Environment Agency, Natural England, Shropshire Council, Wrexham Maelor Borough Council, Natural Resources Wales

<i>Action</i>	<i>Action description</i>	<i>Cost estimate</i>	<i>Timescale</i>	<i>Mechanism</i>	<i>Funding option</i>	<i>Delivery lead body</i>	<i>Delivery partner(s)</i>
1M	Regularise and control the existing ditch maintainace by renegotiating management agreements.	£3,150	2015-25	Glastir/ Section 15 Management Agreement	Not yet determined	Natural Resources Wales	n/a
<i>Action</i>	<i>Action description</i>	<i>Cost estimate</i>	<i>Timescale</i>	<i>Mechanism</i>	<i>Funding option</i>	<i>Delivery lead body</i>	<i>Delivery partner(s)</i>
1N	Develop a Water Level Management Plan in partnership with other authorities and stakeholders: identify water level restoration required and prepare a detailed engineering plan of implementation.	£65,000	2015-17	Water Level Management Plan	Not yet determined	Natural Resources Wales	Natural England, Shropshire Council, Wrexham Maelor Borough Council

2 Water Pollution

Bog vegetation for the most part requires low nutrient acidic water supplied via rainfall. However in various places the extensive artificial drainage network causes mineral and nutrient-rich water to ingress into bog areas e.g. Bronington Manor drain, and the Border drain. As well as reducing excess nutrients in the drainage network (by addressing small point sources such as septic tanks, nutrient rich drains and by reducing diffuse sources), in the medium and long-term problematical ditches and drains require diversion around the edge of the site.

<i>Action</i>	<i>Action description</i>	<i>Cost estimate</i>	<i>Timescale</i>	<i>Mechanism</i>	<i>Funding option</i>	<i>Delivery lead body</i>	<i>Delivery partner(s)</i>
2A	Divert mineral-rich/ nutrient-rich water around the bog habitat by re-routing drainage ditches, and contain and re-route upwelling mineral-rich water.	Not yet determined	2018-25	Direct management: NRW	Not yet determined	Natural England	Environment Agency

<i>Action</i>	<i>Action description</i>	<i>Cost estimate</i>	<i>Timescale</i>	<i>Mechanism</i>	<i>Funding option</i>	<i>Delivery lead body</i>	<i>Delivery partner(s)</i>
2B	Divert mineral-rich/ nutrient-rich water around the bog habitat by re-routing drainage ditches, and contain and re-route upwelling mineral-rich water.	£220,000	2018-25	Direct management: NRW	Not yet determined	Natural Resources Wales	n/a

<i>Action</i>	<i>Action description</i>	<i>Cost estimate</i>	<i>Timescale</i>	<i>Mechanism</i>	<i>Funding option</i>	<i>Delivery lead body</i>	<i>Delivery partner(s)</i>
2C	Investigate water quality of discharges in the the area of Befesa.	£100,000	2015-16	Investigation / Research / Monitoring	Not yet determined	Natural Resources Wales	n/a

<i>Action</i>	<i>Action description</i>	<i>Cost estimate</i>	<i>Timescale</i>	<i>Mechanism</i>	<i>Funding option</i>	<i>Delivery lead body</i>	<i>Delivery partner(s)</i>
2D	Investigate the viability of removing military waste from the military range.	£5,000	2017-20	Investigation / Research / Monitoring	Not yet determined	Natural Resources Wales	n/a

<i>Action</i>	<i>Action description</i>	<i>Cost estimate</i>	<i>Timescale</i>	<i>Mechanism</i>	<i>Funding option</i>	<i>Delivery lead body</i>	<i>Delivery partner(s)</i>
2E	Buyout/ lease the shooting rights across 420 ha.	Not yet determined	2017-20	Acquire shooting rights	Not yet determined	Natural Resources Wales	n/a

3 Air Pollution: impact of atmospheric nitrogen deposition

Aerial nitrogen deposition exceeds site relevant critical loads. Fortunately the prevalent wind direction bringing rain to the SAC does not cross major industrial areas, but there are immediate local sources of ammonia (including Wardle's Aluminium Works and nearby poultry units), many of which are too small to be consented and therefore controlled as emitters.

Action	Action description	Cost estimate	Timescale	Mechanism	Funding option	Delivery lead body	Delivery partner(s)
3A	Investigate the potential atmospheric nitrogen impacts and consider actions at a strategic and site level to reduce impacts.	Not yet determined	2014-20	Investigation / Research / Monitoring	Natural Resources Wales	Natural Resources Wales	Environment Agency, Natural England

Action	Action description	Cost estimate	Timescale	Mechanism	Funding option	Delivery lead body	Delivery partner(s)
3B	As mitigation for air pollution impacts: control birch, and consider the options for the control of <i>molinia</i> which shade bog plants.	Not yet determined	2016-25	Site Nitrogen Action Plan	Not yet determined	Natural England	Natural Resources Wales

4 Inappropriate scrub control

Where the peatland has experienced excessively dry conditions and is ungrazed secondary woodland has developed. In other areas conifer plantations were established in the past. As well as producing shade and leaf litter, water loss is higher under tree cover due to greater evapo-transpiration losses. Tree cover exceeding 10% is a negative factor in attempting to restore bog habitat however in making decisions regard should be given to the impact on invertebrates.

Action	Action description	Cost estimate	Timescale	Mechanism	Funding option	Delivery lead body	Delivery partner(s)
4A	From unmanaged areas remove 24 ha of broadleaved trees and scrub.	£140,000	2014-17	National Nature Reserve (NNR) management plan	Not yet determined	Natural England	Natural Resources Wales

Action	Action description	Cost estimate	Timescale	Mechanism	Funding option	Delivery lead body	Delivery partner(s)
4B	Control the regrowth of scrub and trees.	£50,000	2014-20	National Nature Reserve (NNR) management plan	Not yet determined	Natural England	n/a

<i>Action</i>	<i>Action description</i>	<i>Cost estimate</i>	<i>Timescale</i>	<i>Mechanism</i>	<i>Funding option</i>	<i>Delivery lead body</i>	<i>Delivery partner(s)</i>
4C	Control the regrowth of scrub and trees.	£100,000	2014-20	National Nature Reserve (NNR) management plan	Not yet determined	Natural Resources Wales	n/a

<i>Action</i>	<i>Action description</i>	<i>Cost estimate</i>	<i>Timescale</i>	<i>Mechanism</i>	<i>Funding option</i>	<i>Delivery lead body</i>	<i>Delivery partner(s)</i>
4D	Secure long term conservation management of the 125 ha of conifer plantations in the SAC to achieve open recovering bog habitat, involving clearfell of conifers and rewetting.	£1,563,169	2014-20	Direct management: NRW, and land acquisition	Not yet determined	Natural Resources Wales	n/a

<i>Action</i>	<i>Action description</i>	<i>Cost estimate</i>	<i>Timescale</i>	<i>Mechanism</i>	<i>Funding option</i>	<i>Delivery lead body</i>	<i>Delivery partner(s)</i>
4E	Secure conservation management of the 142.8 ha of peat body covered by scrub and trees.	£790,036	2015-25	Direct management: NRW, and land acquisition	Not yet determined	Natural Resources Wales	n/a

5 Overgrazing

Most of the pastureland in the SAC is grazed very heavily and for as much of the year as possible. This leads to the peat profile being damaged by poaching and the addition of nutrients (manure and fertilizers) as well as by cultivation practices such as re-seeding.

<i>Action</i>	<i>Action description</i>	<i>Cost estimate</i>	<i>Timescale</i>	<i>Mechanism</i>	<i>Funding option</i>	<i>Delivery lead body</i>	<i>Delivery partner(s)</i>
5A	Seek management agreements (Section 15/ NELMS) to improve stocking levels and the seasonality of grazing to prevent further deterioration of degraded raised bog areas.	Not yet determined	2015-20	Rural Development Programme for England (RDPE): Common Agricultural Policy 2014-20 (New Environmental Land Management Scheme)	Not yet determined	Natural England	n/a
<i>Action</i>	<i>Action description</i>	<i>Cost estimate</i>	<i>Timescale</i>	<i>Mechanism</i>	<i>Funding option</i>	<i>Delivery lead body</i>	<i>Delivery partner(s)</i>
5B	Seek management agreements (Section 15/ NELMS) to improve stocking levels and the seasonality of grazing to prevent further deterioration of degraded raised bog areas.	Not yet determined	2015-20	Glastir/ Section 15 Management Agreement	Not yet determined	Natural Resources Wales	n/a

6 Planning Permission: general

Activities permitted by planning permission that prevent the restoration of the SAC need to be reviewed.

<i>Action</i>	<i>Action description</i>	<i>Cost estimate</i>	<i>Timescale</i>	<i>Mechanism</i>	<i>Funding option</i>	<i>Delivery lead body</i>	<i>Delivery partner(s)</i>
6A	Explore options to revoke or buy out licences, permissions and authorisations constraining improvement of the site's SAC features.	Not yet determined	2015-20	Regulation: Environmental Permits	Not yet determined	Natural England	Natural Resources Wales

7 Peat extraction

Peat cutting reduces the extent of bog vegetation but also requires drainage, which affects a considerably greater area than that cut. The extent of commercial planning permission has reduced to allow only for the hand cutting which is a lease requirement.

Action	Action description	Cost estimate	Timescale	Mechanism	Funding option	Delivery lead body	Delivery partner(s)
7A	Acquire the remainder of the moss licences held in Wales	£22,500	2016-20	Land / Tenancy Acquisition: Tenancy Negotiation/ Buy Out	Not yet determined	Natural Resources Wales	n/a

8 Invasive species

Crassula Helmsii, Australian Stonecrop is a non-native invasive plant species and is present in the peripheral drains of the site. It has a tendency to spread quickly and may form dense mats. Anecdotal evidence suggest that it does not compete well where acidic sphagnum moss is abundant. Effective methods of elimination and control are currently absent. Japanese Knotweed is present in some locations.

Action	Action description	Cost estimate	Timescale	Mechanism	Funding option	Delivery lead body	Delivery partner(s)
8A	Monitor the success of <i>Crassula</i> control at Lodge Farm.	No additional cost	2015-20	Invasive Control Plan: Invasive Species Control Programme	Not yet determined	Natural Resources Wales	n/a
8B	Control Himalayan balsam, Japanese knotweed, and rhododendron.	£4,650	2015-20	Invasive Control Plan: Invasive Species Control Programme	Not yet determined	Natural Resources Wales	n/a

Site details

The tables in this section contain site-relevant contextual information and links

Qualifying features

#UK Special responsibility

Fenn's, Whixall, Bettisfield, Wem & Cadney Mosses SAC	H7110# Active raised bogs
	H7120 Degraded raised bogs still capable of natural regeneration

Site location and links

Fenn's, Whixall, Bettisfield, Wem & Cadney Mosses SAC

Area (ha) **949.2** Grid reference **SJ487364** [Map link](#)

Local Authorities Shropshire; Wreccsam/ Wrexham

Site Conservation Objectives

Site Conservation Objectives (covers area in England) [European Site Conservation Objectives for Fenn's, Whixall, Bettisfield, Wem & Cadney Mosses SAC](#)

Site Conservation Objectives (covers area in Wales) [Countryside Council for Wales: Landscape and Wildlife Site Management Advice](#)

European Marine Site conservation advice [n/a](#)

Regulation 33/35 Package [n/a](#)

Marine Management Organisation site plan [n/a](#)

Water Framework Directive (WFD)

The Water Framework Directive (WFD) provides the main framework for managing the water environment throughout Europe. Under the WFD a management plan must be developed for each river basin district. The River Basin Management Plans (RBMP) include a summary of the measures needed for water dependent Natura 2000 sites to meet their conservation objectives. For the second round of RBMPs, SIPs are being used to capture the priorities and new measures required for water dependent habitats on Natura 2000 sites. SIP actions for non-water dependent sites/habitats do not form part of the RBMPs and associated consultation.

Fenn's, Whixall, Bettisfield, Wem & Cadney Mosses SAC

<i>River basin</i>	Dee RBMP
<i>WFD Management catchment</i>	Middle Dee
<i>WFD Waterbody ID (Cycle 2 draft)</i>	n/a

Overlapping or adjacent protected sites

Site(s) of Special Scientific Interest (SSSI)	
Fenn's, Whixall, Bettisfield, Wem & Cadney Mosses SAC	Fenn's, Whixall, Bettisfield, Wem & Cadney Mosses SSSI

National Nature Reserve (NNR)	
Fenn's, Whixall, Bettisfield, Wem & Cadney Mosses SAC	Fenn's, Whixall & Bettisfield Mosses NNR
	Wem Moss NNR

Ramsar	
Fenn's, Whixall, Bettisfield, Wem & Cadney Mosses SAC	Midland Meres & Mosses Phase 2

Special Areas of Conservation (SAC) and Special Protection Areas (SPA)	
Fenn's, Whixall, Bettisfield, Wem & Cadney Mosse	n/a

<i>Version</i>	<i>Date</i>	<i>Comment</i>
1.0	23/12/14	



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