2017-2023

WYCHAVON

Management Plan

Avon Meadows,
Community Wetland, Pershore

WYCHAVON DISTRICT COUNCIL
good services, good value

Contents

1 Introduction

1. Introduction

1.1 Our vision

Our vision for Avon Meadows Community Wetland is to be a place that is rich in flora and fauna, loved and cared for by the people of Pershore who respect and value it as an accessible space to learn, explore and enjoy.

1.2 Management aims

1. Site aims and management objectives:

- Retain and manage the existing high quality habitat areas of Avon Meadows
- Restore or recreate additional high value habitat where identified as suitable
- Avon Meadows is valued as an outdoor classroom by local schools and community groups
- Local people actively take part in managing and enjoying Avon Meadows
- Improve public access to and enjoyment of Avon Meadows
- To reduce Pershore's contribution to flooding and improve the quality of water entering the River Avon.

1.3 About this plan

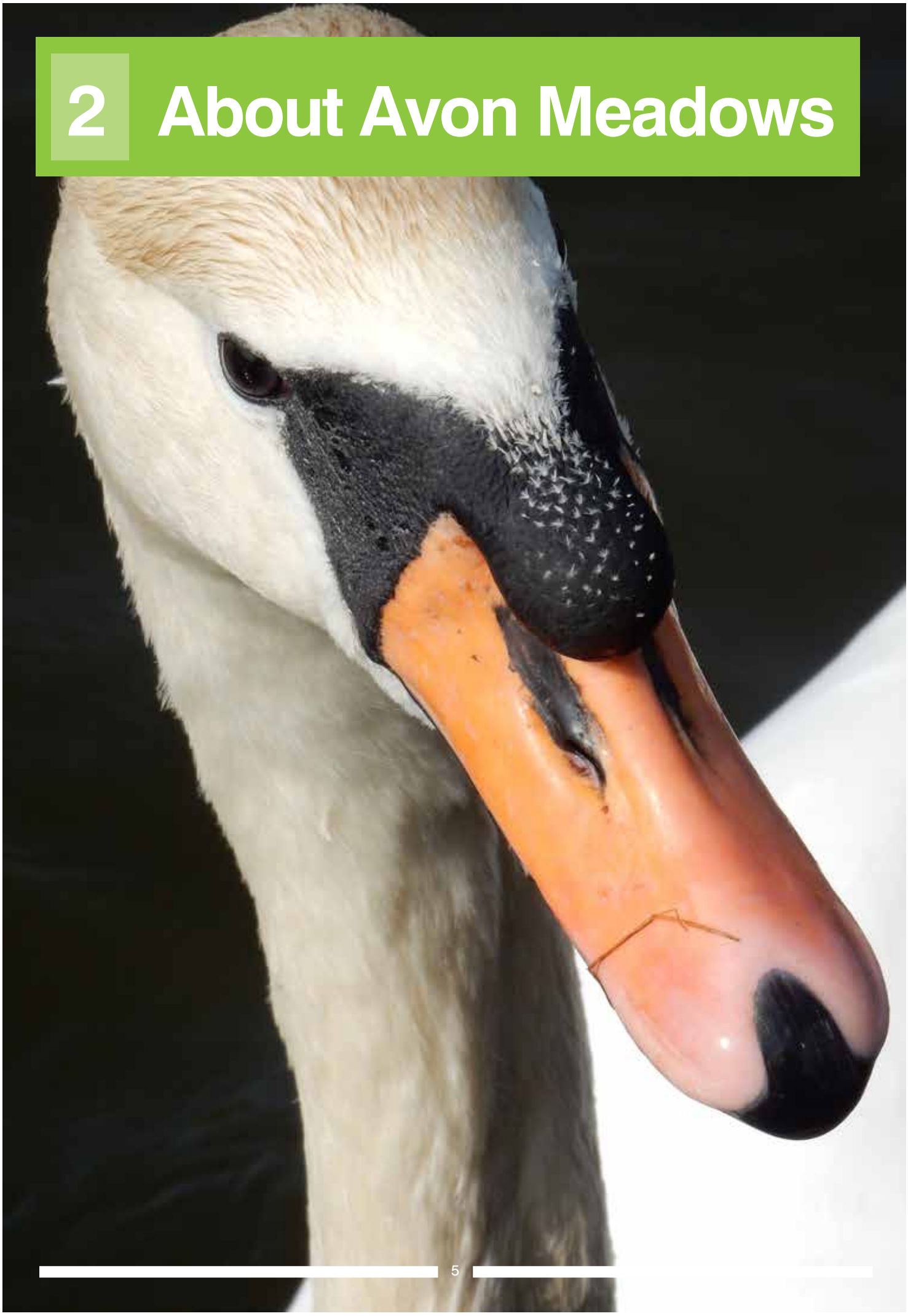
Avon Meadows management plan has been put together with representatives from the Friends of Avon Meadows, Wychavon District Council and Pershore Town Council, with advice and technical assistance from Worcestershire Wildlife Trust, The Floodplain Meadows Partnership, Freshwater Habitats Trust, the Environment Agency and Natural England.

This management plan for Avon Meadows looks forward over the long term. By producing and sharing this plan, we hope that everyone who has an interest in Avon Meadows will understand what we are hoping to achieve with our actions, understand why we are managing the meadows the way that we are and can enjoy the positive changes for people and wildlife that we are planning to deliver.

This management plan is designed to enable Wychavon District Council, Pershore Town Council and the Friends of Avon Meadows to understand what environmental condition, public access and community engagement levels should be achievable and realistic over the next five years and importantly, how we are going to achieve those targets and monitor our progress towards them. It also has longer term goals and ambitions that need a longer view.

It is intended to be a publicly available document, but also a working document. As with any semi-natural environment, activities will inevitably change as conditions change and once this plan is finalised, it will almost certainly change. The actions outlined are those needed to meet our aims; however they may not take place exactly at the times as specified, due to constraints such as flooding.

2 About Avon Meadows



2. About Avon Meadows

2.1 Location and area

Name: Avon Meadows Community Wetland and Local Nature Reserve

Location: Land between the rear of Cherry Orchard, Meadow Walk and the River Avon, Pershore

Area: 24 ha

Ownership: Wychavon District Council (part), Pershore Town Council (part)

Conservation Status: Designated as a Local Nature Reserve in 2013

2.2 History of Avon Meadows

Avon Meadows Community Wetlands sits on the banks of the River Avon and forms part of its natural floodplain. The nature reserve consists of wet meadows, created reed beds, ditches, pools, areas of scrub and boundary hedgerows. Public access is freely available from a number of points around the meadows and a series of footpaths, both formalised and desire lines have sprung up as the nature reserve has matured.

The floodplain meadows are largely unimproved, having had a long history of agricultural use as both hay meadows and grazing land. While they have a wide number of grass species, the species richness of flowering plants is much reduced from what could reasonably be expected in this setting.

Until 2006, the land had been managed under a Countryside Stewardship Scheme with the objectives of increasing public access and enhancing biodiversity in the context of maintaining viable livestock grazing and hay cutting.

Various environmental improvements have been carried out since then, including tree and shrub planting, pond and scrape creation, restoration and maintenance of the historic ditch system and enhancements to public access. These environmental and access improvements were carried out in 2009, following extensive public consultation and engagement and were funded through the Wetland Vision programme and delivered in partnership with Worcestershire Wildlife Trust, Natural England, the Environment Agency and Pershore Market Town Partnership. This also led to the formation of the Friends of Avon Meadows, a voluntary group dedicated to the management and monitoring of Avon Meadows in partnership with Pershore Town Council and Wychavon District Council.

Following these enhancements, the site has become even more popular with local residents, particularly for dog walking and wildlife watching. Since 2009, the newly created reed bed habitat has established itself and become a haven for wetland birds, waterfowl and invertebrates, while the reduced agricultural pressures have allowed more plant species to recover in the wet meadows.

The success of initial habitat creation led to a successful bid to the Heritage Lottery Fund in 2010 for development funding to build on the community engagement activities that began with the habitat creation works. In 2012, the funding for a three year capital works and volunteer engagement project was secured and a project officer appointed in March 2013.

Through the Wetlands for All project, supported by the Heritage Lottery Fund, the Friends of Avon Meadows have been able to develop both their practical conservation management skills and their biological recording abilities. They have also received training in running community events and supporting school visits and have run a number of public events exploring the wildlife of Avon Meadows.

Avon Meadows Community Wetland was formally designated as a Local Nature Reserve in 2013 and forms part of wider network of wetland sites along the River Avon that support significant numbers of wetland birds and waterfowl. The Friends of Avon Meadows have hosted a number of visits from other site managers and wildlife organisations keen to see how the community management approach to wetland sites works.

As the meadows have developed, the management needed to keep them in good condition has changed. Thanks to the Friends, we have excellent biological records and are able to assess the health of the meadows based on the flora and fauna recorded. To add to this information, a Phase 1 habitat survey was completed in spring 2014 by Focus Ecology, which has provided baseline data for us to base our management objectives on.

2.3 Site description

Cherry Orchard 1st School sits on the western boundary and benefits from direct access onto the Meadows.

Provision has been made for disabled anglers through the laying of a concrete path and fishing platform. The riverside path gives access to other informal angling platforms.

A public right of way (footpath) runs diagonally across the site from King George's Way towards Wyre Mill, although desire line paths run around and across the site.

2.4 Issues facing Avon Meadows

Climate change is an issue facing us all and one that may have unpredictable effects for us. For wildlife to survive and thrive in the face of increasing temperatures and a shift to more extremes of weather there needs to be a certain level of permeability in the landscape to enable wildlife to move through it, to find a climate zone that it is adapted to.

For Avon Meadows, this mean more unpredictable rainfall, longer periods of flooding and drier summers. It is important that we maintain

Non-native invasive species are one of the biggest threats to our wildlife up and down the country. Often these introduced species have no natural predators or control methods and completely take over an existing natural ecosystem. Key non-native invasive species that may threaten Avon Meadows are Himalayan Balsam, which is endemic in the Avon Catchment and most UK waterways. This plant forms a dense monoculture stand on river banks, blocking light and smothering other plant growth. Its attractive pink flowers attract insects and while it can provide an important source of nectar, it does so at the expense of native plant species. Himalayan Balsam spreads by means of seed, which it fires explosively out of its pods, which can then be carried along water ways to take hold in new places.

Other non-native species on Avon Meadows include American Mink, which are already present and thought to be responsible for the loss of juvenile water birds and Signal Crayfish, in both the Avon and Piddle Brook. Signal Crayfish out-compete our native white clawed crayfish and spread crayfish plague. We suspect that Nuttall's Water Weed (Elodea nuttallii) is already established, particularly around the tilting weir, but it does not seem to be having a detrimental effect on the wider wetland system. A similar species, E. canadiensis can be much more vigorous and have a similar smothering effect.

Non-native invasive species that we need to remain particularly vigilant for are those plants and animals that infect water bodies, such as New Zealand Pygmy weed (crassula helmsii), which forms a smothering mat in still and slow flowing waters, Parrot's Feather, (Myriophyllum aquaticum), which again smothers native plant growth in water bodies causing obstruction and oxygen depletion.

Killer shrimp (Dikerogammarus villosus) have the potential to have a significant impact on freshwater invertebrates and ecosystems through predation and the spread of parasites

A full list of non-native invasive species classified by their threat to habitats and ecosystems can be found here.

As with all sites of value to wildlife that are publicly accessible, there can be a degree of conflict between users of the site and those who manage it. Dog walking is one of the main recreational uses of Avon Meadows. The vast majority of dog walkers enjoy and respect Avon Meadows, but as with all groups, there is a tiny minority that do not.

Bagging and binning dog poo is now the norm for almost all dog owners, however there are a persistent number that do not pick up after their dog, which, for a site that is open for everyone and accessible for all, the amount of mess can be offputting, particularly along paths. Dog bins are located at all major entrances to the wetland

Our need to graze the meadows also causes difficulties with dog owners, who value being able to let their dogs off the lead to play. For 10 weeks a year, we graze the meadows with sheep, but put up sufficient warning signs to ensure that those who wish to exercise their dog off lead

Many of the activities that are undertaken by the Friends of Avon Meadows between 2013 and 2016 have been supported by a full-time project officer as part of the Heritage Lottery Fund supported wetlands for all project. Now this funding has ceased, the project officer has been retained on a part-time, but cannot now devote as much time to Avon Meadows as previously.

3 Community value

3. Community value

Community groups and interested parties

Right from the very beginning, the people of Pershore have been involved in the planning, design, development and management of Avon Meadows community wetland and local nature reserve. This has been continued through the active involvement of the Friends of Avon Meadows (FoAM) in the day to day management of Avon Meadows. The Friends do much more besides simple maintenance and litter picking, tackling highly skilled management tasks such as reed management and grassland monitoring as well as maintaining access and carrying out essential repairs to infrastructure, where possible.

The Friends are largely drawn from the local community surrounding Avon Meadows, however some do live outside the immediate catchment area. Currently there are over 200 supporting members of the Friends of Avon Meadows, those people who subscribe to receive a newsletter update, with over 30 active volunteers, regularly contributing their time in many different roles.

Volunteer roles include – Work party co-ordinator, biological surveyor (bird, butterfly, dragonfly, plant, mammal, bee, spider etc.) website manager, newsletter author, photographer, work party volunteer, brush cutter user, management plan contributor, habitat management research and monitoring, moth trapper, event supporter, educational visit assistant, first aider, work party leader.

Avon Meadows has hosted visits from:

The local group of Worcestershire Wildlife Trust, staff and volunteers, Freshwater Habitats Trust, Worcestershire Bat Group, Tewkesbury Nature Reserve, Worcestershire County Council, Worcestershire Wardens Partnership, the Environment Agency, Natural England, Wildfowl and Wetlands Trust, Vale Landscape Heritage Trust, Broadway Natural History Society, Rooftop Housing,

As Avon Meadows is open 24/7 365 days a year, it is a well-used site. Visitor counts show that an average daytime 3 hour slot across the seasons has between 20 and 30 people using the meadows. There are times when there are no visitors, for example when the site is flooded or the rain is particularly severe, but there are times when there are hundreds of people on the meadows, like a warm bank holiday weekend, with over 200 people recorded using the meadows in one hour during Easter 2014.

Dog walking remains the most popular use of Avon Meadows, however now people can walk from Cherry Orchard playing Field to King George's way without getting muddy, walking through the meadows to access the town centre has become more popular. Walkers following longer distance routes, such as the Wychavon Way also use the meadows and Walking for Health groups use the meadows as one of their regular walk venues. Pleasingly, numbers of those who come here specifically to watch or photograph wildlife are on the rise, including families who enjoy being able to get close to the ducks and other wildfowl.

Bug hunting

Pond-dipping

Access and interpretation

Physical access has been significantly improved since 2013, with easy access available to the heart of the wetlands from the two most used entrances. Signage from town is poor, but this is not restricted to Avon Meadows, the riverside as a whole is not well publicised from the town centre, or from main roads leading into Pershore.

Each main entrance onto the meadows has an interpretation panel which features a map of the meadows and tactile information for those who are partially sighted. It also features a

the other from the eastern end of the car park, which leads to the disabled angling platform. Both are timber frame construction self-closing gates with trombone handles. Vehicular access to the meadows is through a metal field gate from the eastern end of the car park, next to the pedestrian access to the disabled fishing platform.

Through the Wetlands for All project, two education packs have been produced, targeting school age pupils up to KS4. They have activities that can be delivered by teaching staff without support from either Wychavon DC staff, or the Friends of Avon Meadows, however we have found that teachers are more likely to come to Avon Meadows is they have someone with them who knows the site well.

After school clubs and whole study days at the Meadows have proved popular with schools, pond dipping and bug hunting are perennial favourites as these are activities that are harder to do within school grounds and require a certain amount of knowledge of species to get the most out of them.

Teacher cite a lack of confidence with wildlife ID and getting lost on Avon Meadows as two deterrents to using the nature reserve, along with a lack of toilets and excessive dog mess, which are the two main reasons schools are put off from visiting.

Training – Avon Meadows is an ideal training venue for both practical conservation skills and wildlife ID.

4 Habitat descriptions


FURLONGS
FURLONGS R
ROAD
AVON ROAD
D ROAD
OAD
CHERRY ORCHARD
Sch
Drain
H1
H2
H3
H4
H5
H6
H7
H8
H9
C1
C2
C3
C4
C5
C6
C7
C8
Key:
Unimproved neutral grassland
Marshy grassland
Reed swamp/reed beds
Inundation vegetation
Standing water
Dense/continuous scrub
Tall herb – ruderal
Tall herb – non-ruderal
Bare ground
Wet ditch
Marginal vegetation
Hedgerow
Tree (indicative)
Walking route
C4 Compartment boundary

4. Habitat descriptions

(Taken from Phase 1 habitat survey –Focus Ecology and input from survey work)

4.1 Grassland

Neutral grassland makes up the majority habitat at Avon Meadows, comprising some 13 hectares. It has been cut annually for hay around the 12th July in recent years with the exception of 2007 and 2012, due to flooding. Aftermath grazing has been used, both cattle and sheep, but this has been problematic with sheep drowning in ditches and cattle being deeply unpopular with users of the meadow as they caused significant damage to footpaths and reed beds.

There has been no agricultural improvement of the grassland for well over 10 years, perhaps longer, therefore we can classify the grassland as unimproved neutral (neither acid or calcareous) grassland. The grassland is divided into a number of discrete compartments, bounded by ditches or hedgerows, and is generally dominated by grass species (80% or more) with a good diversity of grass species present throughout the sward. Flowering plants, sedges and rushes are also present in varying amounts and their distribution and frequency is influenced by the underlying soil and hydrology.

The following grass species were recorded at varying levels of frequency – Yorkshire fog, meadow foxtail, creeping, bent, meadow barley, tufted-hair grass, false oat grass, rough meadow grass, common couch, sweet vernal grass, tall fescue, meadow fescue, perennial rye grass, Timothy, cock's foot, crested dog's tail, reed canary grass and floating sweet grass. Concentrations of species that are indicative of agricultural enrichment, such as perennial rye-grass, are limited and mostly confined to well-trodden pathways.

Flowering plants are generally rare or occasional within the grassland but include meadow buttercup, creeping buttercup, meadow vetchling, common sorrel, cuckooflower, teasel, creeping cinquefoil, cut-leaved crane's bill, red clover, meadowsweet, hogweed, cow parsley. Less desirable species are also present within the sward at rare to occasional frequency. These are curled dock, broad-leaved dock, clustered dock and creeping thistle. Common ragwort is present but rare across the site.

The majority of the grassland can be given the National Vegetation Classification code (NVC) MG9 – Holcus lanatus – Deschampsia cespitosa (Yorkshire fog – tufted hair grass) however it occurs in mosaic with other grassland classifications including MG1a (Arrhenatherum elatius grassland, Festuca rubra subcommunity) which could also be a possible species poor form of MG4 Sanguisorba officionalis – Alopecurus praetensis (great burnet – meadow foxtail traditional floodplain meadow) grassland Holcus lanatus subcommunity.

MG13 Agrostis stolonifera-Alopecurus geniculatus, (creeping bent – marsh foxtail) which has clear links to inundation or flood-prone grasslands, is also present in small quantities, tending towards those areas that stay wetter longer into the spring.

Sedges and rushes occur in a complex mosaic across the grassland but are generally found in areas where drainage is impeded through either soil compaction or a locally high water table. Where larger concentrations of sedges and rushes occur they can be classified as marshy grassland. Typical species here include hard rush, soft rush, jointed rush, hairy sedge, false-fox sedge, brown sedge and black sedge.

Broader swathes of marshy grassland habitat occur to the rear of Cherry Orchard and are dominated by sedges, rushes and broad-leaved plants, with little in the way of grasses. These areas are largely unmanaged and have a wide diversity of species, including tufted hair grass, false oat grass, cock's foot, common couch, reed sweet grass, reed canary grass, greater pond sedge, hairy sedge, false fox sedge, slender tufted sedge, black sedge, brown sedge, spiked sedge, teasel, great willowherb, meadowsweet, hog weed, marsh marigold, marsh woundwort, meadow vetchling, bramble, cleavers, cut-leaved cranesbill, common vetch, curled dock, broad-leaved dock, clustered dock, field horsetail, water figwort, silverweed, purple loosestrife, water forget-me-not, flag iris, amphibious bistort and creeping buttercup

Key species

Meadow vetchling, meadow and marsh foxtail, yellow rattle, marsh/fen bedstraw, great burnet, tubular water-dropwort.

Grassland management objectives

- **G1** Increase diversity of flowering plants in the grassland – restore to appropriate species rich community dependent on underlying hydrology – MG4, MG8, MG13.
- **G2** Prevent further compaction and alleviate existing compaction if possible.
- **G3** Maintain wet grassland for feeding waders and wildfowl.
- **G4** Maintain rush coverage below 30% across the meadows area.

4.2 Marginal and inundation vegetation – ditch and riparian habitat

This habitat type covers vegetation that grows up to 5 metres around a water body, such as ditches, rivers or ponds. Anything that extends to over 5 metres is classified as swamp. Marginal vegetation is present across much of the site and is strongly associated with the network of ditches and the margins of the Piddle Brook and the River Avon.

This is a species-rich community with a range of grasses and broadleaved plants. Larger grasses and reeds are dominant, such as reed mace, reed sweet-grass, reed canary-grass and common reed. Floating sweet-grass and fool's watercress are also present in high numbers and species including branched bur-reed, water plantain, water mint, gypsywort and water forget-me-not occur frequently.

Other species typically associated with the margins of ditches include hard rush, soft rush, jointed rush, false fox-sedge, hairy sedge, greater pond sedge, brown sedge, tufted hair grass, creeping bent, marsh foxtail, common club-rush, common spike-rush, purple loosestrife, great willowherb, water figwort, tubular water-dropwort, fen bedstraw, marsh bedstraw, meadow vetchling amphibious bistort, pink water-speedwell, silverweed, skullcap, celery-leaved buttercup, marsh woundwort and wild angelica.

The lower banks of the Avon have margins dominated by reed sweet-grass, reed canary-grass and common reed with patches of greater pond sedge, common club rush, branched bur-reed and rarely, flowering rush. Where the bank is undercut, the overlying vegetation is dominated by rough grasses, hogweed, common nettle, false oat grass, wild turnip, cow parsley and hemlock.

Inundation vegetation was recorded in areas where the water table clearly fluctuates significantly during the course of the year which has resulted in a specialised plant community, mostly around the two original pools in the wader scrape. Here the grassland is dominated by a dense mat of creeping bent together with occasional tufted hair grass, marsh foxtail, celery leaved buttercup and trifid bur marigold.

Key species

Tubular water dropwort, Trifid bur-marigold, Common toad, Dragonfly and damselfly species, thread-leaved water crowfoot, flowering rush.

Ditch and riparian habitat management objectives

D1. Maintain open water mosaic, with 50% open water in June.

D2. Record and monitor the extent of tubular water dropwort and expand range where possible.

D3. Remove reed mace and willow from ditches and berms.

D4. Monitor ditch below tilting weir, including vegetation and silt levels to allow the free flow of water from recognised surface water outfalls into the ditch. Recognised outfalls to be kept clear of excessive vegetation.

D4. Remove excessive plant growth and silt from ditches and spurs below tilting weir to assist in maintaining free flow of surface water from the adjoining residential area.

For tubular water-dropwort, reducing the competition of tall herbaceous vegetation via low intensity grazing or by mechanical means (e.g. the cutting of ditch edge vegetation) appears to be essential (de Cauwer & Reheul 2009). If new populations are to establish via dispersal, thought must also be given to the hydrological connectivity of extant sites and suitable receptor sites nearby that are able to be managed post-colonisation.

4.3 Reed swamp

Swamp habitats have developed on ground that is underwater for all or much of the year and mark the stage of transition between open water and dry land. Swamp at the wetlands is dominated by common reed, which forms a single species stand in many areas and was planted when the wetlands were first established in 2009. Bulrush, reed canary-grass, reed sweet grass and branched bur-reed also occur. The margins of the reed beds support occasional soft rush, hard rush, false fox sedge, flag iris, water mint, branched bur-reed, water plantain, bulrush, gypsywort, purple loosestrife, greater pond sedge, amphibious bistort, floating sweet grass, tufted hair grass, great willowherb, celery-leaved buttercup, tubular water dropwort, wild angelica, water mint meadowsweet and fool's watercress.

The reed beds have developed rapidly, playing a vital role in water purification and providing a habitat for nesting birds including reed and sedge warblers (and cuckoo), reed buntings, mallard, coot, moorhen, and mute swan. Other birdlife including heron, little egret and little grebe also utilise the reed beds, as do aquatic species.

Now that the reed beds are reaching maturity it is essential that they are managed to maintain their extent and health. It is necessary to promote healthy regeneration and to control the proliferation of invasive weeds, grasses and reed mace. It is also necessary to control the natural spread of the reed rhizomes in order to maintain the areas of open water and channels within the reed beds.

Excessive willow sapling growth is a significant threat to the wetlands and reed beds in particular as they speed the drying of the reed bed.

The type and quality of the reed planted is unsuitable for commercial applications such as thatching. The objective is to manage the reed beds to ensure healthy regeneration and to provide the best possible mix of habitats for wildlife. This is achieved by dividing the reed beds into 10 roughly equal areas to be cut on a 5-year

rotational cycle to promote regrowth. Cutting is carried out in the autumn when water levels can be expected to be at their lowest; if necessary lowering the level by means of the tilting weir. Cut reed and detritus would be removed to a convenient place in the Meadows to be dried and burned. No two adjacent areas would be cut in the same year. In the winter and spring, the cut areas provide ideal feeding and nesting habitat for wildfowl (mallard, coot and moorhen). The uncut areas would provide suitable habitat for returning, nesting reed and sedge warblers and reed buntings.

Also with the objective of promoting healthy growth of the common reed, the existing programme of control of invasive species and particularly of reed mace and willow will be continued. The reed mace is best controlled by pulling but summer cutting below the water level can also lead to drowning of the rhizomes. Willow is cut in autumn with the cut stems painted directly with a concentrated solution of glyphosate (see appendix x for Approved pesticides and their safe use).

In some areas of open water there have been several metres of reed encroachment since the original planting of the reed beds and some channels are now virtually closed. The attached photograph taken in June 2013 shows the main areas of encroachment into open water pools and the approximate course of channels suffering from reed clogging. If action is not taken soon, some of the smaller pools will be reduced dramatically. The blocking of the channels is detrimental to the easy passage of wildfowl, especially during the breeding season with young allowing concealment from disturbance and predators.

Control of encroachment is best achieved through underwater cutting of reeds in summer leading to drowning of the rhizomes. Depending on the development of water levels and thus the time the cut stems are submerged, effective control may take two or more seasons. Care will of course be taken to ensure there is no disturbance to breeding birds during these cutting operations.

Key species

Reed bunting, starling – used as winter roost, water rail, cuckoo, Cetti's warbler.

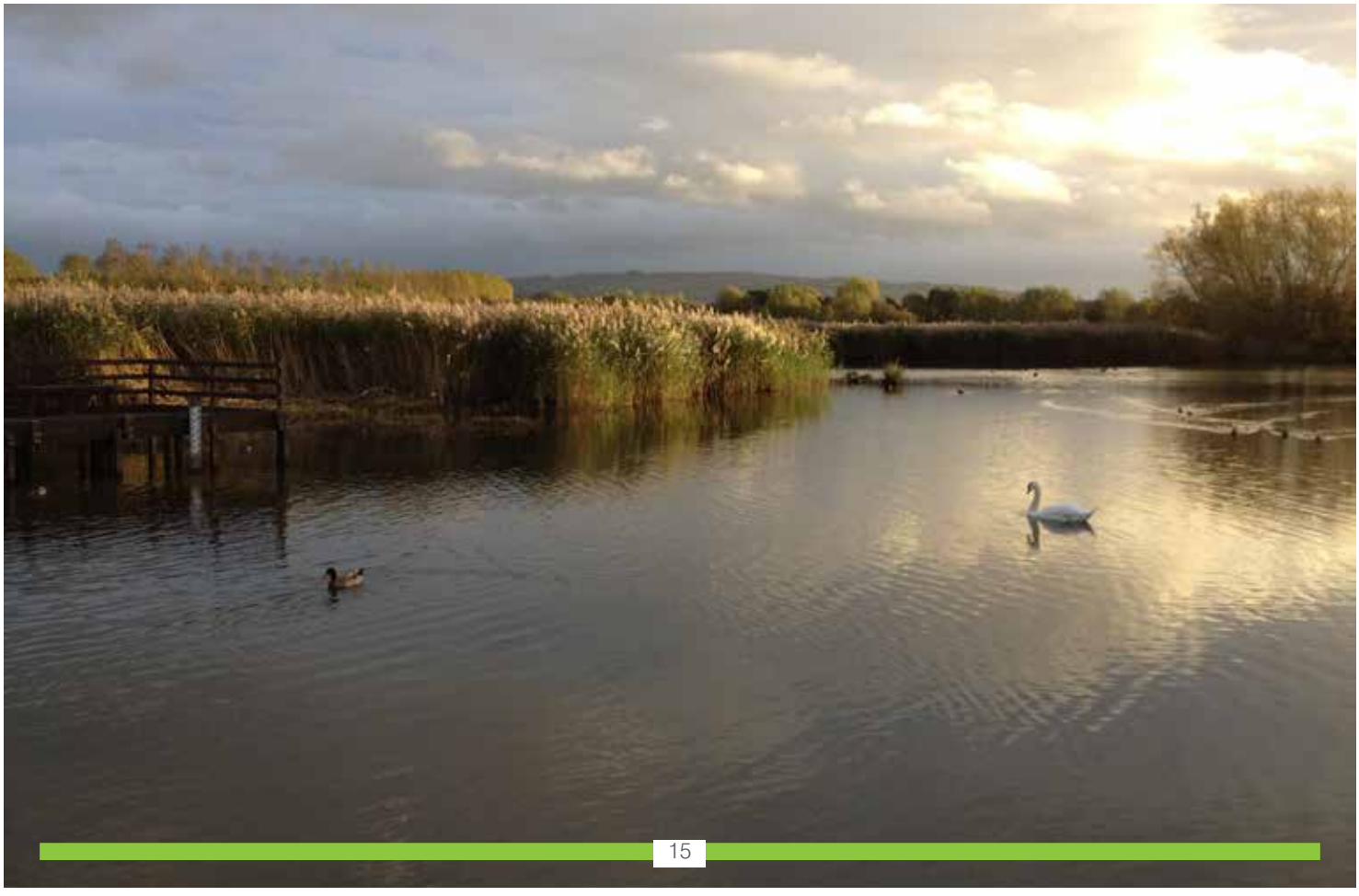
Reed swamp management

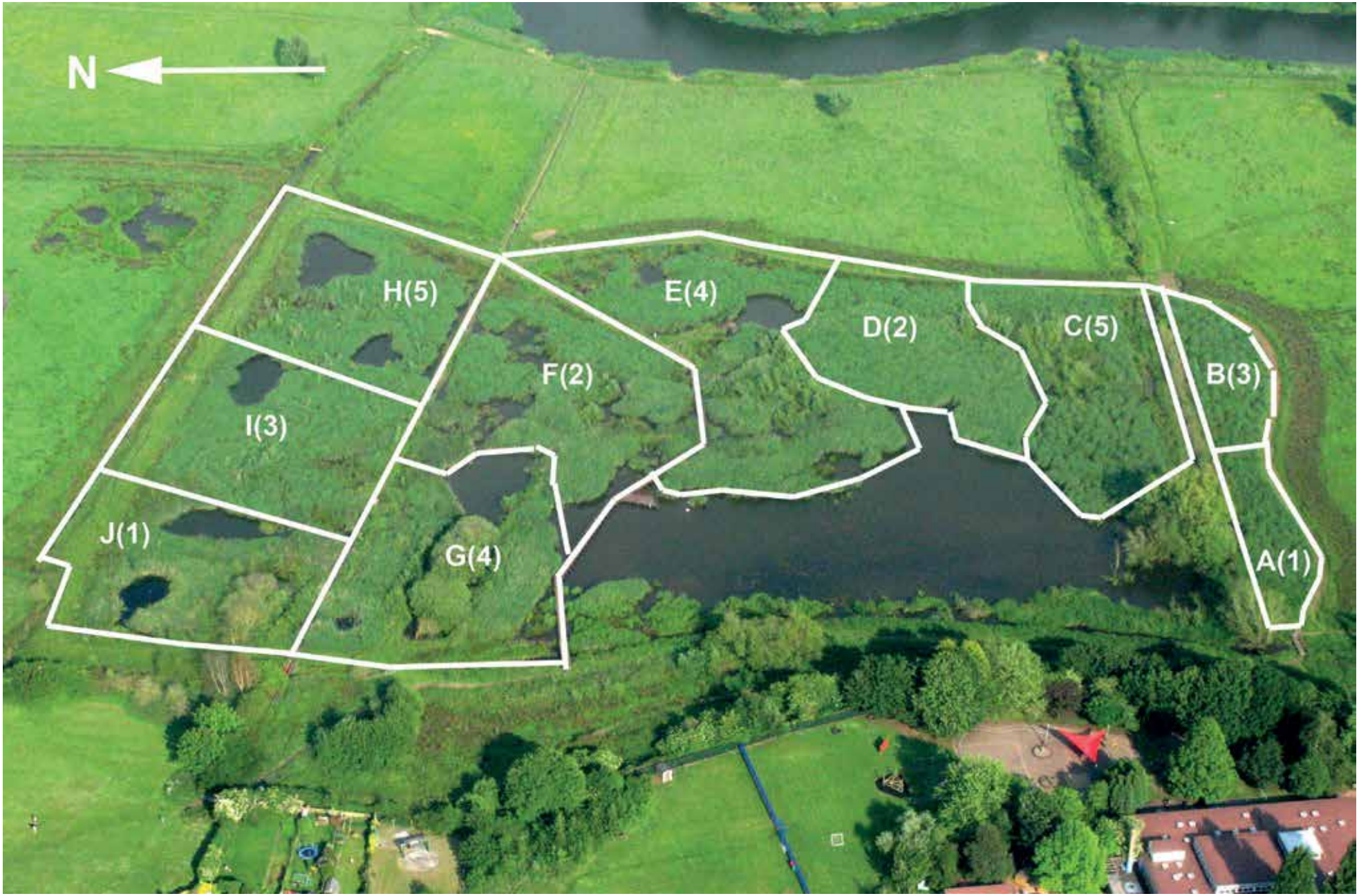
R1. Continue the 5 year rotational cut and annual encroachment reed cutting programme

R2. Maintain levels of open water at 2013 aerial photograph levels as a minimum

R3. Control the spread of reed mace and willow scrub within the reed beds and water body margins

R4. Monitor for key species using the reed beds.

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4.4 Ponds and open water habitat

Ponds and open water form an integral part of the wetland and ditch habitat mosaic, however there are three open water areas that can be viewed specifically as ponds.

4.5 Hedgerows and boundary features

Please refer to the habitat map for the hedgerow numbering key.

H1. This intact hedgerow runs 66m east-west along the side of Cherry Orchard playing field. It comprises mostly blackthorn, with occasional hawthorn, dog rose, horse chestnut and cherry. The hedge is fenced on both sides, with post and wire and reaches up to 4m in height.

Management: Layering, including staking and top binding. Significant pre-work needed.

H2. This hedgerow is approximately 227m in length and runs roughly north-south alongside Meadow Walk. It is composed of elder, hawthorn, blackthorn, sycamore, bramble and willow species. Occasional clumps of trees occur within the scrub and ruderal vegetation. This hedgerow includes a large piece of standing dead wood surrounded by dense bramble scrub. This hedgerow is not intact and has significant breaks.

Management: Manage as lowland dry scrub, long rotational cutting programme.

H3. This hedgerow is approximately 240m in length and runs roughly east-west, following Mill Lane. It is 4-6m high and includes mature trees. Associated woody species include mature hawthorn, blackthorn, mature ash, elder, bramble, ivy and dog rose. Ground flora includes hedge bindweed, hogweed and teasel. Mammal trackways pass through this hedgerow.

Management: No formal management proposed. Some cutting back by the boundary with Mill Cottage to prevent encroachment onto garage roof

H4. This hedgerow runs to the bottom of Cherry Orchard playing field and is largely inaccessible from Avon Meadows due to the presence of a ditch. It comprises hawthorn, blackthorn, dog rose and bramble and is approximately 3m in height.

Management: Layering where possible.

H5. This short stretch of hedgerow separates Avon Meadows from the properties at Mill Cottage and comprises a post and wire fence with field maple and ash approximately 5m in height.

No management proposed.

Hedgerow (Boundary) 6. This is a combination of post and wire fencing, chain link fencing, scattered scrub and multi-stemmed crack willow trees that runs alongside the Piddle Brook. Woody vegetation includes isolated hawthorn and dog rose shrubs, mature crack willows and tall herbaceous vegetation including common nettle, great willowherb and teasel. Significant bat activity has been recorded along this area, including Leisler's, Brandt's/ Whiskered, Daubenton's, Noctule, Brown long eared, common, soprano and Nathusius' pipistrelle.

Management: Manage as riparian habitat – trees to be managed individually.

Hedgerow 7. This hedgerow is approximately 178m in length, runs roughly north-south and forms part of the boundary with Cherry Orchard First School. It is an intact, unmanaged hedgerow approximately 5m in height. Woody components include elder, hawthorn, hazel, dog rose, ash and bramble. The southern section to the hedgerow forms a rough tree line with a mixture of mature and semi-mature trees with no dominant species component. Tree species in this area include horse chestnut, sycamore, cypress spp, ash and crack willow. This hedgerow has numerous bird and moth species associated with it and significant Pipistrelle (common and soprano) activity is recorded above this hedgerow. Fox and possible badger

Management: Manage as scrub, whilst maintaining continuity of perimeter between the meadows and the school grounds.

Hedgerow 8. This hedgerow with trees is approximately 60m in length and runs along part of the southern boundary of the site. The hedgerow has a mixture of immature and semi-mature trees including sycamore, horse chestnut, ash, crack willow and hawthorn. Bramble scrub occurs frequently together with great willowherb and teasel.

Management: Manage as scrub, long rotational cutting programme.

Hedgerow 9. This is essentially the southern continuation of hedgerow 8, alongside the car park, comprising post and mesh fencing with off-site trees and shrubs overhanging the fence. Associated trees and woody vegetation include crack willow, hawthorn, silver birch and blackthorn. Tall herbs include curled dock, great willowherb and common nettle.

Manage as scrub and tall herb.

Hedgerow 10. A gappy, relict hedgerow, recently layered (2014) in an attempt to rejuvenate. It is approximately 130m in length and overshadows an adjacent ditch to the immediate north. The hedgerow is composed of hawthorn, blackthorn, dog rose, ash and elder. The blackthorn has been allowed to sucker freely and now encroaches some 4m from the main hedge line. Mistletoe grows in a number of hawthorn bushes and other associated species include common nettle, great willowherb, bramble, curled dock false oat-grass and cock's foot.

The taller hawthorns are popular perches for birds, including reed bunting, stonechat, green finch, chaffinch and visiting grasshopper warbler.

Management: monitor for rejuvenation success and trim lightly if needed.

4.6 Running water

There are two water bodies with natural flow that form the north east and eastern boundaries of Avon Meadows, The Piddle Brook and the River Avon. The River Avon is a wide, low, meandering river as it passes through Pershore and much of its level at this point is controlled by the weir a few hundred metres down stream of Avon Meadows.

The River Avon is classed by the Environment Agency as a heavily modified water body which means that rather than being assessed for its ecological and chemical condition, it is assessed for its ecological potential. Under the Water Framework Directive monitoring, the Avon at Pershore is classed as being at Moderate Potential, which is less than Good status, which means that it is failing under the Water Framework Directive.

The Water Framework Directive works on the basis that if a water body fails one element of the test, then the whole test is failed. The reasons for the River Avon failing to meet good ecological and chemical potential are the amount of phosphate in the water and the lack of natural morphology (shape and flow) of the river as it has been extensively managed by dredging, straightening and impounding with weirs.

Our boundary section of the Piddle Brook and its confluence with the Avon is so heavily influenced by the condition and water level of the main river that it is mapped as such on the Environment Agency website. Upstream, the Piddle Brook is classed as being in Good Ecological condition, but it deteriorates before it reaches Avon Meadows, shortly before passing under the A44 at Lower Moor/Wyre Piddle. The Piddle Brook that runs through Avon Meadows is both straight and sinuous in places, with concrete culverts and foot bridges and the appearance of an over-steep bank which suggests that this section has been modified over time from its natural morphology.

Both water bodies flood extensively, with flooding occurring most winters and Avon Meadows falls entirely within the natural floodplain of both water bodies.

Species that could have a negative impact on this environment are mink, which have been recorded using the confluence as a landing point to gain access to the meadows, Signal Crayfish and Killer Shrimp (Dikerogammarus villosus) and Himalayan balsam, which is rife in other parts of the catchment. There is a record for Signal Crayfish near the allotments on Defford Road, Pershore, so their presence on Avon Meadows water bodies is quite possible.

Key species for the Piddle Brook and River Avon

Common yellow waterlily, Banded and Beautiful Demoiselle. Fish species present in the main Avon River include Pike, Barbel, Perch and Common eel.

Current management: The River Avon is managed by Avon Navigation Trust, who are concerned with maintaining the navigability of the river for craft and public enjoyment. Their management has included dredging, repairing and stabilising banks as well as clearing vegetation. The Environment Agency also have a responsibility for main rivers and undertake water quality monitoring at set points along the River and have statutory responsibility for rivers and flooding. The Friends of Avon Meadows have not undertaken management in the channel of either water body.

Management objectives for running water

W1. Work with the Environment Agency to create a fish refuge on Avon Meadows

W2. Explore opportunities for river restoration as part of a Catchment Scale Approach for the River Avon and Piddle Brook

W3. Monitor for non-native invasive species and eradicate where possible.

4.7 Scrub

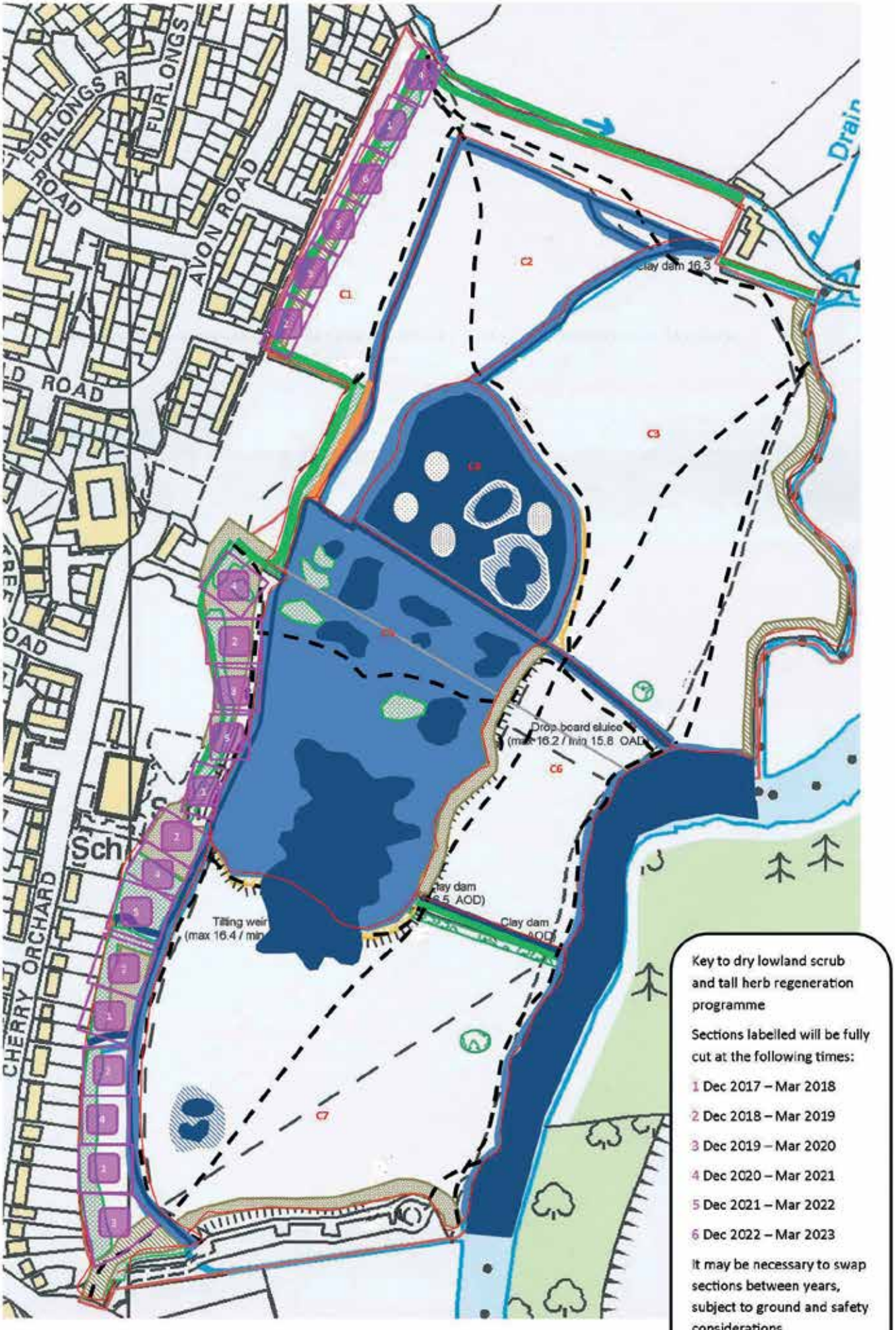
Scrub is good! For many years, scrub was treated as a pariah habitat to be eradicated in favour of other, more “valuable” habitat types. At Avon Meadows, the conservation value of our scrub comes not from its species floristic diversity, but the other species that it supports.

Dry lowland scrub is found almost continuously along the western boundary of the meadows. Dominated by bramble, it forms dense, banks over 3m high in places. Rarely, hawthorn, dog rose and elder are present and this marginal habitat grades into the tall herb communities. This scrub community W24 Bramble – Yorkshire fog is typical of abandoned management, waste and disturbed ground.

Wet lowland scrub is a feature of the reed beds and areas to the east of Cherry Orchard school boundary, below the dry, bramble scrub. Here, willow species are dominant, including grey, goat, crack and osier willow. It is important to recognise that wet scrub has considerable conservation value and management should aim to maintain a balance of scrub and other priority wetland habitats.

In fens, willow dominated scrub can be highly invasive and damaging, as nutrient rich litter accumulates and so soils become drier. Management is then needed to control the scrub expansion. In established wet scrub, management needs to focus on maintaining a mosaic and preventing succession to woodland or encroachment into priority open habitats.

Scrub found on Avon Meadows is generally of low conservation value when looked at in terms of plant species composition and physical structure. However, both bramble and willow scrub have a diverse and important range of birds and invertebrates associated with them, notably breeding house sparrows, starlings, Cetti’s warbler, dunnock and reed bunting.


FURLONGS R
FURLONGS
ROAD
AVON ROAD
ROAD
Drain
C1
C2
C3
C5
C6
C7
Clay dam 16.3
Drop board sluice
(max 16.2 / min 15.8 OAD)
Clay dam
Tilting weir
(max 16.4 / min
Clay dam
AOD)
CHERRY ORCHARD
Key to dry lowland scrub and tall herb regeneration programme
Sections labelled will be fully cut at the following times:
1 Dec 2017 – Mar 2018
2 Dec 2018 – Mar 2019
3 Dec 2019 – Mar 2020
4 Dec 2020 – Mar 2021
5 Dec 2021 – Mar 2022
6 Dec 2022 – Mar 2023
It may be necessary to swap sections between years, subject to ground and safety considerations.

Scrub management objectives

Lowland dry scrub

S1. Enhance diversity of age, species and physical structure in Compartment 1

S2. Reduce amount and enhance quality of scrub in Compartment 8

S3. Prevent further encroachment onto priority habitat (marshy grassland) Compartment 8

Lowland wet scrub

S4. Reduce amount of new willow scrub in compartments 5 and 8

S5. Retain existing mature stands of willow scrub in compartments 5 and 8

S6. Coppice small sections of mature willow scrub annually in compartments 5 and 8

Harlequin Ladybird

4.7 Tall herb community

The tall herb community found at Avon Meadows if often looked at as messy and not of much botanical interest, however it supports a wide range of invertebrates, mammals and birds and acts as a gradational habitat between scrub or hedgerows and grassland. Typical plant species include teasel, great willowherb, cleavers, cow parsley, nettles, creeping thistle, hogweed and meadow buttercup.

Tall grasses are also frequent here, including cock's foot, tufted-hair grass, common couch, timothy, Yorkshire fog and false-oat grass. Many of the flowering plants are important nectar sources for invertebrates, which later become seed sources for birds and small mammals. The dense layer of litter that builds up can be important shelter and feeding grounds for small mammals, invertebrates and reptiles.

Management objectives for tall herb community

TH1. Retain tall herb communities where they transition from scrub or hedgerows to grassland

TH2. Scallop edges of tall herb community where it adjoins grassland to maximise edge habitat

TH3. Allow tall herb community plants to set seed and retain seed heads through autumn and winter

TH4. Regenerate tall herb community on a rotational 5 year basis, coupled with scrub regeneration programme.

4.8 Trees

Avon Meadows supports a variety of mature tree species, mainly concentrated around the boundaries of the nature reserve, with isolated individual trees or small clusters within the wetlands and meadows themselves. Crack willows are the dominant mature tree, with purple willow and white willow also present. Previously pollarded willows are found along the boundary with the Piddle Brook, with some of these almost certainly fulfilling veteran criteria in terms of girth (3.5m at chest height), fungal growth, damage, rot and dead wood.

Pollarded willows are a characteristic feature of the Severn and Avon Vales landscape character area and some of the younger willows along the Piddle Brook may be candidates for reinstating this method of management, however it will not be suitable for all mature trees and could cause harm, rather than regeneration. Advice from a professional tree surgeon with experience of mature willows will be required before any pollarding takes place.

Standing deadwood is a vital habitat, often overlooked. Avon Meadows is blessed with a variety of standing deadwood, thanks in some part to raised water levels. Standing deadwood is left in situ where it poses little risk to people and removed where it poses a significant risk to users.

To the rear of Cherry Orchard School there are four dead black poplar hybrids that failed to thrive after pollarding some years ago. These trees have numerous woodpecker holes, bark fissures and sections of lost bark which are ideal bat roosting sites.

Bird boxes have been placed in some trees with modest success. A kestrel box has been used by a barn owl for roosting, great tits and blue tits make use of the smaller nesting boxes and field mice have also used a dislodged bird box to overwinter.

Key species

Mistletoe, brown long eared bat, common and soprano pipistrelle bat, barn owl, greater spotted woodpecker.

Management objectives for trees

VT1. Retain veteran trees and standing deadwood where safe to do so

VT2. Inspect all trees for safety on 3-yearly basis

VT3. Tree works only where H&S risk is not acceptable/ access cannot be altered, or to create additional dead wood habitat/prevent catastrophic failure of a veteran tree.

VT4. Assess feasibility of reinstating pollarding on younger bankside willows without veteran features or potential

VT5. Monitor mistletoe for mistletoe marble moth larvae

VT6. Bird box siting, more bird boxes, bat boxes, cleaning and monitoring.

4.9 Wader Scrape

The wader scrape was constructed in spring 2015 and the surrounding ditches joined to enclose the area, with management and survey access achieved by a gated bridge. The wader scrape was designed to retain winter flood and rain water and dry out slowly through the summer. It has a number of raised islets to create safe resting places for wading birds and possible future breeding sites, with scalloped and graded edges to provide plenty of muddy margins for feeding.

It covers approx. 1ha and includes two species-rich pools that were retained during construction to act as restocking reservoirs for the new wet areas both for plant species, amphibians and invertebrates. It will take several years for the wader scrape to develop to its full potential for wildlife, however it is already showing promise, particularly for wildfowl.

In the first few years, it will be necessary to manage colonising plants, such as rushes or grasses, to prevent them from choking the whole area. Patchy cover of marginal plants will provide cover for young chicks, but if this exceeds more than 25% of the scrape, then management should be considered. Grazing with livestock at a moderate intensity is ideal as it creates a mosaic of tussocks and short turf used for nesting by a range of wader species and augments the invertebrate population of the margin through dunging. If grazing is not possible, cutting or cultivation could be used. Cutting should be timed for suitably dry periods after the end of the breeding season, usually between August and October. It is not necessary to remove the cuttings, as they will initially provide a source of seed food and later, as it decomposes, a source of insect food for birds.

Following summer/autumn management, re-flooding in winter will kill colonising perennial vegetation such as grass. Annual weeds, which germinate each year on the muddy margins as the water retreats, are important as they provide a large supply of seeds for dabbling duck as well as number of passerines such as yellowhammer, reed bunting and linnet

Key species

Trifid bur marigold, snipe, lapwing, pied wagtail

Wader scrape management objectives

WS1 Exclude all but essential access for maintenance and species monitoring

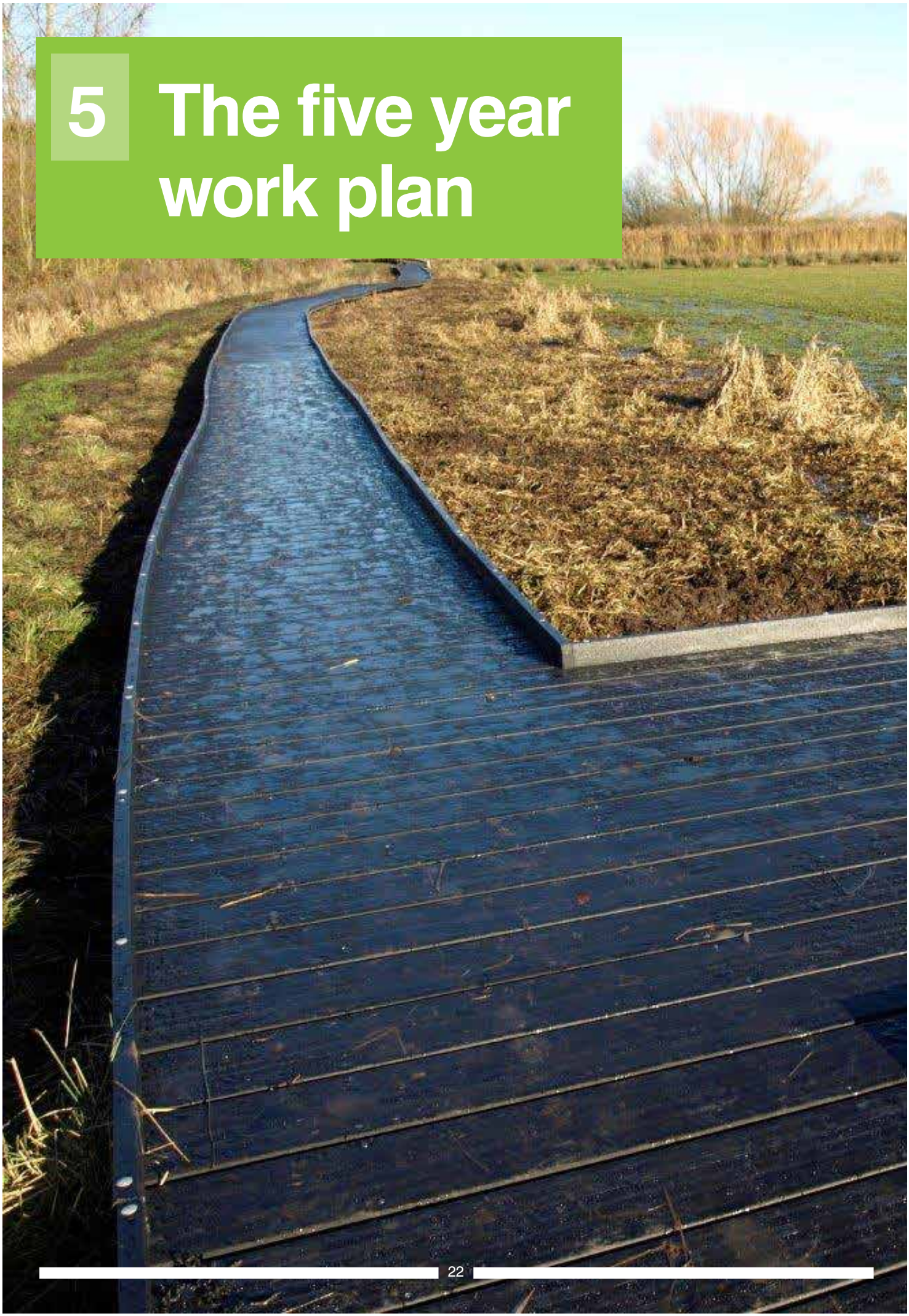
WS2 Keep islets free from tall vegetation,

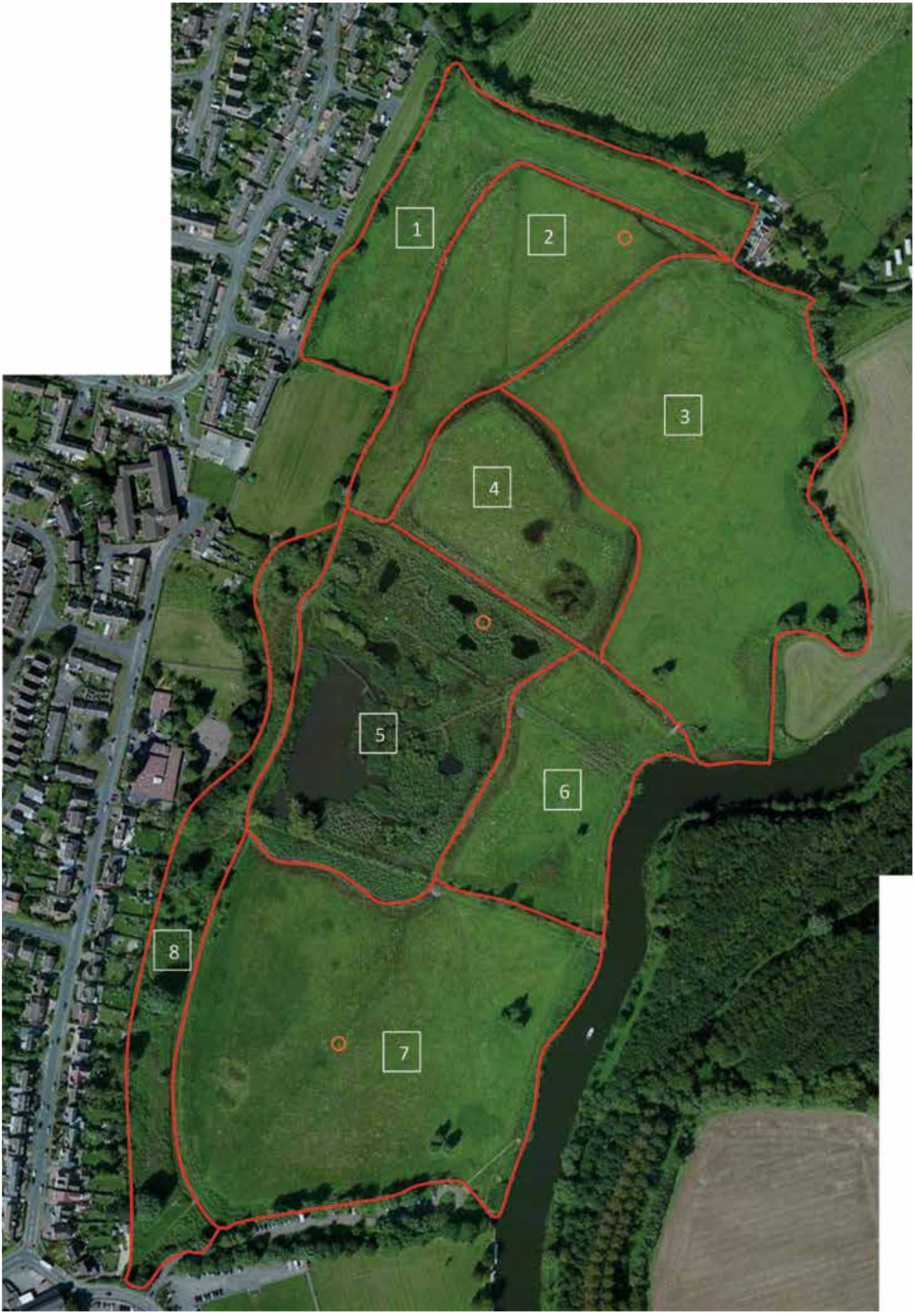
WS3 Install gravel on 2 or 3 islets to attract species that prefer bare ground.

WS4 Ensure that no willow, typha or tall upright plant species becomes established in the boundary ditches

WS5 Monitor for evidence of breeding waders and wildfowl.

5 The five year work plan

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5. The five year work plan

Compartment map and descriptions. Compartment boundaries are defined by ditches, hedgerows and change in habitat type

Compartment 1

forms an elongated inverted L-shape that runs along the boundary of Cherry Orchard playing field, below Meadow Walk and along Mill Lane.

Work guidelines

- Reduce bramble scrub dominance targeting height and encroachment along Meadow Walk boundary. Scallop scrub edges.
- Enhance species diversity of marshy grassland once soil fertility is reduced
- Lay hedgerow H1 along boundary with Cherry Orchard playing field
- Maintain access and interpretation points at Mill Lane and Cherry Orchard
- Clear typha and willow from boundary ditches
- Monitor presence and extent of tubular water-dropwort in ditches
- Keep boundary with Mill Cottage free from excessive plant growth to 2m distance from boundary.

Compartment 2

is entirely enclosed by ditches and forms the triangular section of the north meadow.

- Restore species rich grassland – MG4-MG13 mosaic
- Clear typha and willow from boundary ditches – treat willow stumps to prevent regrowth
- Monitor presence and extent of tubular water-dropwort in ditches
- Cut ditch side vegetation on 3 year rotation and in 100m sections
- Pond management
- Monitor grassland species annually.

Compartment 3

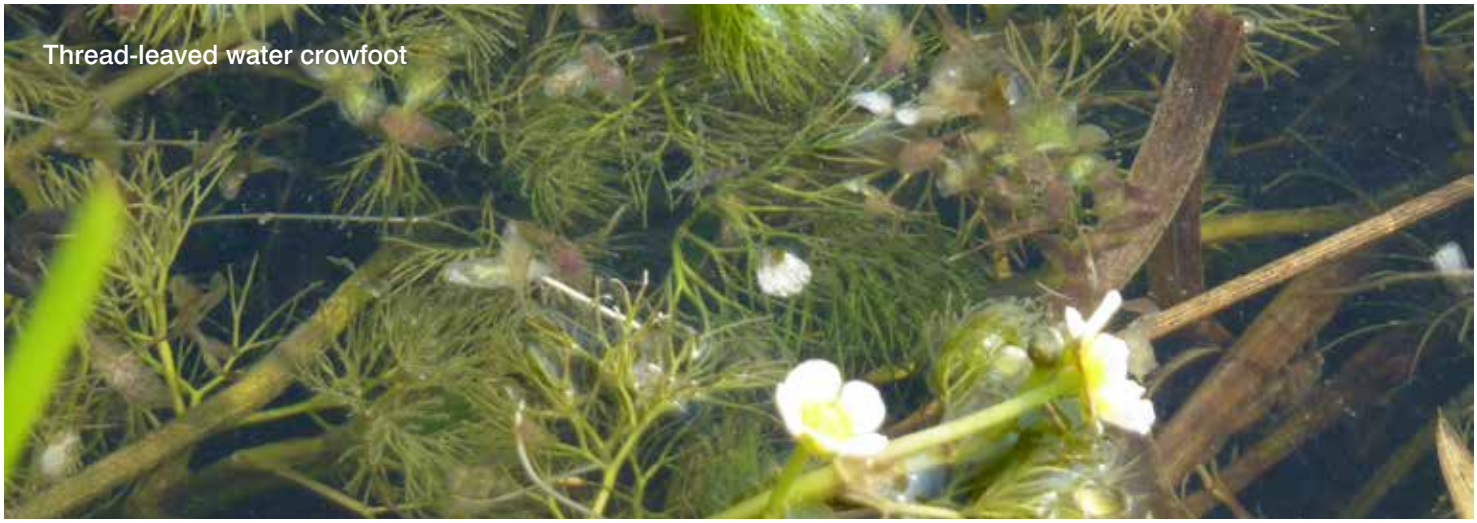
makes up the bulk of north meadow, boundary to east is the Piddle Brook, includes confluence of the Piddle and the Avon, other boundaries are ditches. PROW crosses this compartment with access to Wyre Mill via steps.

- Maintain access and interpretation points at Wyre Mill entrance
- Tree maintenance and inspection every three years
- Check operation of drop-board sluice annually
- Restore to species rich grassland MG4
- Retain veteran trees and prevent catastrophic failure
- Pollard willows along Piddle Brook where suitable
- Install bat and bird boxes.

Compartment 4

comprises the wader scrape constructed in 2015 it is entirely enclosed by ditches with access via a bridge and locked gate

- Secure access to the wader scrape for staff and volunteers undertaking survey and maintenance work
- Cut excessive plant growth from islands and perimeter bund annually
- Install weed supressing membrane and gravel onto 2 or 3 islands
- Cut ditch side vegetation on 3 year rotation and in 100m sections
- Clear typha and willow from boundary ditches – treat willow stumps to prevent regrowth
- Monitor for breeding birds.


Thread-leaved water crowfoot

Compartment 5

comprises 3 hectares of reed bed and standing water, bounded by footpaths and bunds and crossed by a raised recycled plastic boardwalk with handrail. There is one dipping platforms extending from the boardwalk and a separate dipping platform on one of the smaller pools - both platforms incorporate bench seating.

Pools are fed through a pipe carrying surface water run-off from housing to the west of Avon Meadows as well as direct input from rainfall and groundwater. They are occasionally supplemented by winter flood water, although this is rare.

The pools are linked by a series of channels and a drainage ditch which is controlled by means of a tilting weir at the southern end. This structure controls water levels in the water bodies to the south of the input pipe, those pools to the north currently have no means of controlling water level.

The input pipe feeds a settling pond which allows heavy metals and other solids to precipitate. Surrounding reed beds perform a cleaning function, removing pollution from the waste water before it is returned to the natural river system.

Work guidelines

- Cut reed beds and channels on 5 year rotation and remove arisings
- Monitor depth of silt and heavy metal content in the settling pool
- Cut reeds around main and dipping pool annually to prevent encroachment
- Maintain existing pockets of wet willow scrub and remove new saplings from the reed beds
- Inspect boardwalk and arch for safety and stability once a month and after a flood
- Monitor for breeding birds.

Compartment 6

is made up of the two middle meadows, bounded to the north by a ditch, east the river Avon, south, the laid hedgerow and west, the bund surrounding the reed beds.

Work guidelines

- Monitor grassland species, water levels and soil fertility
- Take a timely hay cut and graze the aftermath
- Monitor presence and extent of tubular water-dropwort along ditch
- Monitor undercutting of river bank – may need to push informal footpath further into the meadows.
- Continue to trial grassland enhancement in the southernmost of the two meadows by spreading yellow rattle seed in autumn 2016
- Restoration to species-rich grassland in summer 2017.

Compartment 7

encompasses the southern meadow, with the main ditch forming the western boundary with compartment 1, the bund around the reedbeds and the east-west hedgerow form the northern boundary. The River Avon bounds the east of the compartment and the southern boundary is a post and mesh fence with some hedgerow planting that separates the meadows from the Riverside car park.

The recycled plastic boardwalk installed in 2014 runs close to the boundary of this compartment.

Work guidelines

- Monitor grassland species, water levels and soil fertility
- Monitor rush growth and ensure it does not exceed 20% of this compartment
- Maintain the welcome at all entrances – cut back overgrowth and put woodchip over mud
- Monitor presence and extent of tubular water-dropwort along southern boundary and exclude area from hay cut
- Cut areas of tubular water-dropwort after seed has set (September)
- Hay cut and aftermath grazing
- Strimming/mowing along boardwalk, woodchip on informal bund footpath as needed
- Check boardwalk for damage monthly, record findings and repair as needed.

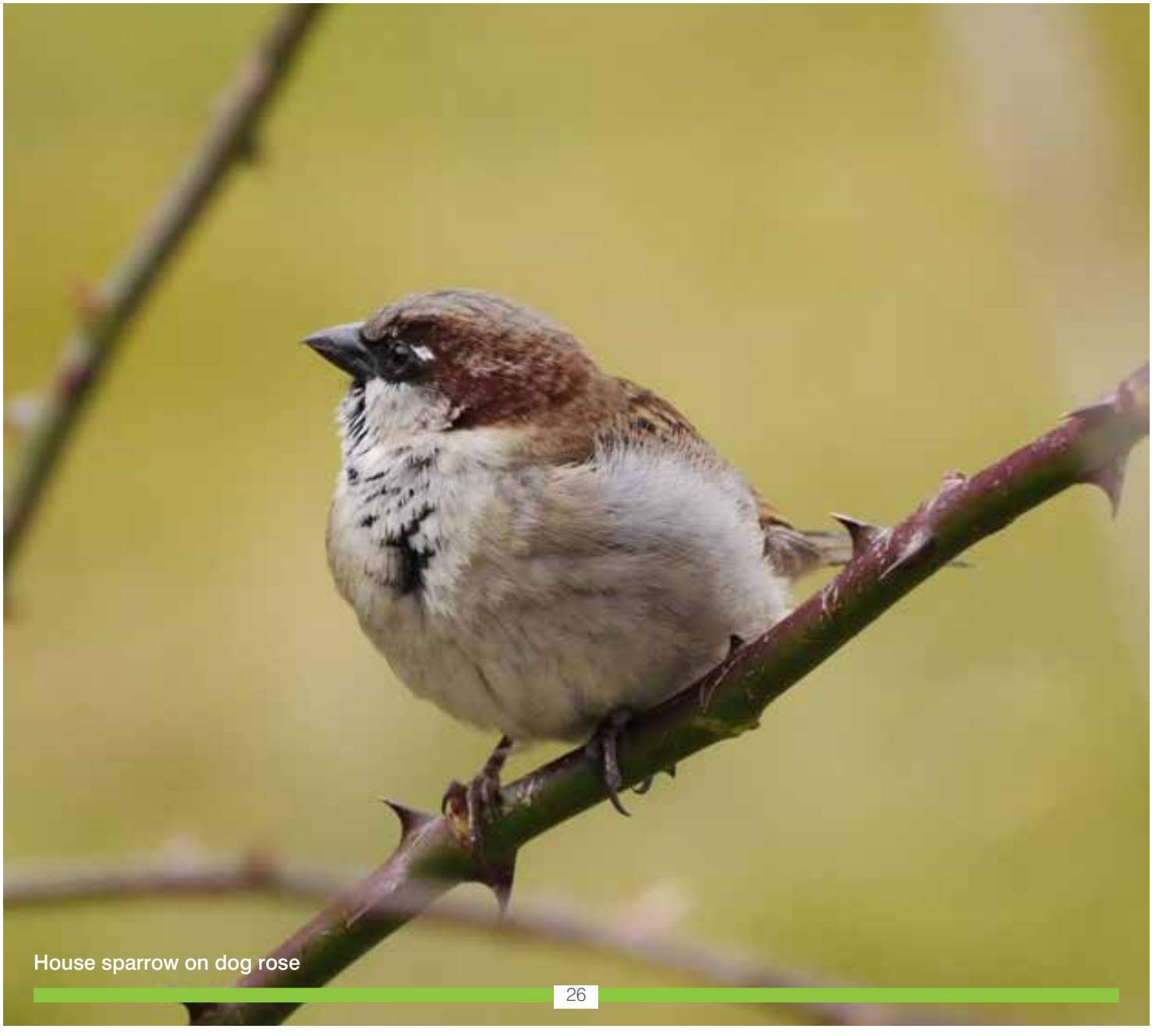
Compartment 8

forms the boundary and buffer between the rear gardens of Cherry Orchard, including Cherry Orchard First School to the west of the meadows and extends as far as Cherry Orchard Playing Field. The eastern boundary of this compartment is the main ditch which runs from the inlet pipe in compartment 5 to the junction of compartment 7 with the riverside car park.

- Cherry Orchard School have an access gate directly on to Avon Meadows from their grounds.
- The Public Right of Way that crosses Avon Meadows enters through this compartment via a Centrewire steel medium kissing gate with RADAR key access. The PROW is grassed through this compartment and crosses into compartment 4 over a concrete accommodation bridge.
- **Key habitats** – Marshy grassland, scrub, trees, ditch and riparian habitat
- **Key species** – Marsh marigold, starling, sparrow, grass snake.

Work guidelines

- Reduce extent of bramble scrub across the compartment, particularly to the rear of the Cherry Orchard property gardens to expand the amount of marshy grassland/fen habitat
- Diversify scrub species by cutting sections on long rotation 5-6 years
- Maintain 20% dense bramble scrub across the compartment at all times
- Enhance species diversity of marshy grassland by late summer cutting and removal of arisings
- The main ditch water surface should be kept 50% clear of emergent vegetation in June
- Cut back vegetation along PROW during spring and summer.
- Monitor long ditch and spurs for siltation and desilt periodically as needed and cut and remove in-channel vegetation as needed to assist in maintaining free flow of surface water from the adjoining residential area



House sparrow on dog rose

6 Activity plan

Aim 1	Retain and enhance the existing areas of high quality habitat of Avon Meadows					
Comp	Action	Frequency	Requirements (Higher Tier)	Who	How is this going to be delivered?	Monitoring and evidence required for Higher Tier
5	Reed management - Reed bed cutting with power scythe and brush cutters	Annually October to March	Cut particular areas by an agreed method Cut at specific times Dispose of cuttings away from the reed bed area Produce a simple map of the areas cut and the dates of cutting	FoAM	The reed bed compartment has been divided into 10 sections. 2 non-adjacent sections are to be cut each year, using BCS commander with scythe attachment and brush cutters. The arisings and litter are to be raked from the reed bed and disposed of (either burned or composted), with some material left at the edges of the cut areas to provide overwintering habitat and nesting material. Water levels in the reed beds will influence the timing of the cut. An earlier Autumn cut in September/October will allow the water levels to be dropped if needed, with the reasonable expectation that water levels will be topped back up over winter.	Number of bird species recorded using reed bed. Evidence of breeding birds. Higher tier evidence – records of areas cut and photographs of cut areas.
5	Reed management - Control reed encroachment into open water and channels using under water reed cutter (possibly manage as a Pond under Higher Tier)	Annually October to March	Manage vegetation in the pond Control scrub and invasive non-native plants Retain overhanging trees and bushes and deadwood Graze or cut the margins of the pond Carry out the work within the dates agreed with the adviser Maintain clear, unpolluted water Maintain the current water regime	FoAM – volunteers trained in the safe operation of brush cutters	To be done at the same time as the main reed cutting programme to take advantage of lower water levels. Using an approved under water reed cutter attachment for a brush cutter, volunteers will cut off stems of common reed, typhus and other fast spreading emergent aquatic plants below water level. This will require a channel cut through the reeds to the edge of the water and a safe working area to be created on land, by cutting min 1m along the pond edge. From this platform, volunteers will be able to cut reed growth under water. Occasionally, volunteers will need to enter the water, wearing safety waders, to reach some areas that need to be cut. Cut material will be removed from the water and disposed of.	Channels remain visible and ponds retain open character Higher tier evidence – records of areas cut and photographs of cut areas.

Aim 1 Retain and enhance the existing areas of high quality habitat of Avon Meadows						
Compartment	Action	Frequency	Requirements (Higher Tier)	Who	How is this going to be delivered?	Monitoring and evidence required for Higher Tier
All	Ditch management – Remove all willow from ditch edges and stump treat with glyphosate. Reed mace and emergent vegetation control by underwater cutting and hand pulling.	Annually October to March	Manage ditches and banks in a suitable manner and at the correct time of year for the target species or habitats. (target species is Tubular water dropwort) Leave one bank or section of the ditch unmanaged, as a refuge for plants and invertebrates Control and manage invasive alien species, if they're present	FoAM – under the supervision of PA1 PA6 certified volunteer/ contractor.	Most of our ditches contain tubular water-dropwort, therefore we need to be very careful using herbicides in these areas. Using a weed wiper, or brush application will be most appropriate in these areas	Stump regrowth and typha emergence is limited. Higher tier evidence Photographs of the work. Details of field operations at the parcel level, including associated invoices
C1 & C8 – See scrub compartment map	Enhance quality of scrub, seeking to move from single species dominated to a more varied species mix.	Cut 2 non-adjacent sections of bramble scrub annually.	No Higher Tier option associated with scrub management.	FoAM	Cut bramble scrub after berries have been eaten, but before bird nesting (Jan/Feb) Cutting can be undertaken with hand tools to clear tall stands of bramble or petrol/battery hedge trimmers. Stumps can be followed up with either flail mower or power scythe. Arisings should be removed and disposed of.	Scrub regenerates and has greater diversity of species. No reduction in numbers of bird species using scrub areas.
C5 and C8	Maintain mosaic of wet willow scrub in the reed beds at 2013 extent. Leave 10% untreated to allow regrowth.	Identify new growth, cut and treat regrowth. Cut annually between October and March	None	FoAM – under the supervision of PA1 PA6 certified volunteer/ contractor		Aerial photography will enable the extent of scrub to be monitored in a way that we have not been able to do before.
	Undertake tree safety survey every two years.	2018, 2020		Qualified arboricultural expert		
	Create new standing deadwood habitat on existing trees along the Piddle Brook. Manage existing veterans to prevent catastrophic failure.	Between 1st September and 1st March 2017 and from 1st September until 31st Dec 2019	Written assessment and advice received from a qualified arboricultural expert focusing on the intended outcome, the long term health and and viability of the trees to be cut and any subsequent management requirements.	External contractor – specialist tree surgeon	First pollarding of willow trees with diameter at breast height of 40cm or less. Leave cut material from veteran trees as close to the tree as possible	Photography before and after. Receipts and invoices. Catastrophic failure of veteran trees prevented. New veteran trees created New willow pollards created.

Aim 1 Retain and enhance the existing areas of high quality habitat of Avon Meadows						
Compartment	Action	Frequency	Requirements (Higher Tier)	Who	How is this going to be delivered?	Monitoring and evidence required for Higher Tier
	Plant/allow regeneration of new willow saplings to become future pollards along the Piddle Brook.		N/A	FoAM	Monitor regeneration of willow	Monitor regeneration and sapling
C1, C2, C3, C6, C7	Cut hay meadows at least once, not before 15th July	June/July	Do not cut or top before 15th July. Swath must be turned and wilted for at least 24hrs. All cuttings must be removed. Graze the aftermath Keep a monthly record of all stock grazing the parcels.	External contractor/ local farmer if willing. Will need to have herbage agreement drawn up in advance.		Once greater diversity of flowering plants has been achieved take the cut later, Aug/Sept, once in every 5 years.
C1, C2, C3, C6 & C7	Graze aftermath with either sheep or cattle (cattle ideal)	Annually from September to December. Meadows shut up for hay from Mid-March	Keep a monthly record of all stock grazing the parcels	External contractor/ local farmer if willing. Will need to have grazing agreement drawn up in advance.		Stocking densities based on 13ha of grazeable land. Consider a spring bite if ground conditions permit (MG8 benefit) Monitor ground conditions closely and exclude livestock if poaching becomes excessive.
C7, C1, C2	Monitor rush encroachment and cut in winter if grazing insufficient.	September to Feb	Graze or cut areas of dense rush growth every year so that rushes are less than 20cm high by 30 September Keep bare ground cover at less than 10% Reduce cover of dense rush growth to less than 30% of the parcel area by the end of year.	FoAM	Cutting rushes between 15 March and 15 July is not permitted. Rush encroachment should not exceed 30% in any parcel. Grazing has been effective at keeping rush growth under control and limiting spread.	Check for feeding snipe before cutting
C5 and C8	Retain existing mature stands of willow scrub	1st September to 1st March annually	N/A	FoAM	Coppice small sections of mature willow scrub annually to prevent excessive growth, but retain pockets of willow scrub for nesting and perching habitat.	Aerial photography

Aim 2 Restore or create additional areas of high quality habitat where identified as suitable						
Compartment	Action	Frequency	Requirements (Higher Tier)	Who	How is this going to be delivered?	Monitoring and evidence required for Higher Tier
C3	Maintain contact with the Environment Agency regarding opportunities to create new wetland habitat or river restoration.	As needed.	N/A	Wychavon DC	External funding reliant	N/A
C1	Increase diversity of flowering plants in the grassland by green hay strewing or seed sowing. Target for C1 is MG13/ MG8 mosaic.	Once soil P values fall below 23mg/l. Timing for hay strewing will be mid-late July, possibly 2017 or 2018	Establish at least 5 additional wildflower species in the sward. Manage the grassland by grazing, hay cutting, or a mixture of both Maintain a continuous cover, particularly over historic features Only top between 1st August and 30th September, except in patches to control injurious weeds, invasive non-native species, bracken or dominant rushes. Do not top more than 50% of the total area Do not apply any fertilisers of manure. No supplementary feeding Drainage works agreed with Natural England in advance.	Contractors with extensive support from FoAM, Natural England and Wychavon DC.	Cut prior to sowing seed or spreading green hay - we may need to take a second hay cut. The ground will need to be harrowed or scarified to create up to 50% bare ground Source appropriate seed mix or green hay – identify meadows with similar hydrological regime and soil fertility well in advance and plan for the logistics of getting hay onto site.	Photographs of the management taken Receipted invoices, consents or permissions connected with the work Field operations at the parcel level, including associated invoices A standard soil analysis, to be completed in the final agreement year and results submitted with final claim Soil analysis results Inputs used Grazing activity record. Monitor for invasive and injurious weeds and control by spot treatment. Annual grassland survey quadrats Maintain soil pH between 5.5 and 7.8 and soil P levels must not increase from level at application. By year 4, at least 2 moderate/high value indicator species for lowland meadows must be frequent/in flower during May and June and 2 high value indicator species must be occasional.

Aim 2 Restore or create additional areas of high quality habitat where identified as suitable						
Compartment	Action	Frequency	Requirements (Higher Tier)	Who	How is this going to be delivered?	Monitoring and evidence required for Higher Tier
C2, C3, C6	Increase diversity of flowering plants in the grassland by green hay strewing or seed sowing. Target for C2, C3 and C6 is MG4/5/13 mosaic	Once soil P values fall below 23mg/l	Establish at least 5 additional wildflower species in the sward. Manage the grassland by grazing, hay cutting, or a mixture of both Maintain a continuous cover, particularly over historic features Only top between 1st August and 30th September, except in patches to control injurious weeds, invasive non-native species, bracken or dominant rushes. Do not top more than 50% of the total area Do not apply any fertilisers of manure. No supplementary feeding Drainage works agreed with Natural England in advance.	Contractors with extensive support from FoAM, Natural England and Wychavon DC	Continue to take an annual hay cut and graze the aftermath until soil fertility falls to a realistic level for target plant species to thrive. Prior to sowing seed or spreading green hay we may need to take a second hay cut. The ground will need to be harrowed or scarified to create up to 50% bare ground Source appropriate seed mix or green hay – identify meadows with similar hydrological regime and soil fertility well in advance and plan for the logistics of getting hay onto site. Chop and spread hay onto site. Either graze or turn the spread hay. Graze to remove excess material. Top or treat weed species the following spring after introduction of green hay	Photographs of the management taken Receipted invoices, consents or permissions connected with the work Field operations at the parcel level, including associated invoices A standard soil analysis, to be completed in the final agreement year and results submitted with final claim Soil analysis results Inputs used Grazing activity record Monitor for invasive and injurious weeds and control by spot treatment. Annual grassland survey quadrats Maintain soil pH between 5.5 and 7.8 and soil P levels must not increase from level at application. By year 4, at least 2 moderate/high value indicator species for lowland meadows must be frequent/in flower during May and June and 2 high value indicator species must be occasional.
C1	Enhance diversity of scrub age, species and physical structure	Cut on long rotation between October and February – after fruit has been eaten.	No Higher Tier requirements for scrub managements	FoAM and Wychavon DC	Cut sections of bramble scrub on a rotational basis. Can be done with hand tools or with brushcutter/hedgecutter. Remove and dispose of arisings. Follow up cutting of vigorous spring bramble growth with BCS flail mower.	Scrub regenerates on long rotation. No decline in breeding bird numbers and indicator invertebrates.
C8	Reinstate late summer mowing in C8 marshy grassland – target restore to MG8	August mowing and remove arisings.	No Higher Tier requirements for this compartment	FoAM	Cut using the power scythe attachment. Rake and remove arisings	Monitor for change in number of marsh marigold plants and increase in other MG8 typical species.

Aim 2 Restore or create additional areas of high quality habitat where identified as suitable						
Compartment	Action	Frequency	Requirements (Higher Tier)	Who	How is this going to be delivered?	Monitoring and evidence required for Higher Tier
C8	Reduce amount and enhance quality of scrub. Prevent further encroachment onto priority habitat.	Cut annually between September and March to reduce extent. Selectively reduce bramble while retaining other species.	No Higher Tier requirements for scrub managements.	FoAM and Wychavon DC	Cut sections of bramble scrub on a rotational basis. Can be done with hand tools or with brushcutter/hedgecutter. Remove and dispose of arisings. Follow up cutting of vigorous spring bramble growth with BCS flail mower.	Reduction in amount of bramble scrub, increase in amount of priority grassland. Scrub diversity 3 or 4 woody species.
	Ditch restoration and maintenance of open water habitat - restore the wildlife value of overgrown or neglected ditches and help to establish raised water levels for restoring or creating habitats. Tubular water dropwort is key species here	Between 1st September and 1st April	Carry out the restoration work between 1 January and 28 February or 1 July and 31 December Only re-profile or cut deeper than the original profile by agreement with the adviser if re-profiling, Work from one bank in an upstream direction, restoring only half the ditch in any one year Restore one side of the ditch along its full length, or alternate 100m sections along both sides Retain any in-channel features such as gravel beds, riffles and natural meanders Create berms along the sides of the ditch Secure material at the downstream end of the ditch during dredging or re-profiling to capture silt in the water, and remove this when any silt has settled Place the spoil on top of the bank or in the field next to it, making sure that it isn't used to fill hollows or low areas within the field Make sure that the spoil isn't placed on historic or archaeological features spread the spoil thinly to prevent a spoil bank from forming	Contractors and FoAM	Manage ditches by cleaning, vegetation removal, desilting or dredging to their previous profile on a 5 year rotation. Where vegetation management is done by cutting, cut above the base of the ditch, leaving the roots in the base. Retain a fringe of emergent vegetation on one side of the ditch. Leave at least 30% of the length of the ditch unmanaged during any one operation. Do not manage all ditches in any one year. Following ditch maintenance, re-establish bankside vegetation by natural regeneration. Regular topping is permitted to control injurious weeds and re-establish the sward. Vegetation must not overhang more than half the width of the channel on more than 60% of the ditch. By year 2 there should be clear water with no signs of pollution	Photographs of work before and after. Monitor for tubular water dropwort and freshwater inverts and amphibians.

Aim 2 Restore or create additional areas of high quality habitat where identified as suitable						
Compartment	Action	Frequency	Requirements (Higher Tier)	Who	How is this going to be delivered?	Monitoring and evidence required for Higher Tier
C7, C1, C2	Monitor rush encroachment and cut in winter if grazing insufficient.	September to Feb	Graze or cut areas of dense rush growth every year so that rushes are less than 20cm high by 30 September Keep bare ground cover at less than 10% Reduce cover of dense rush growth to less than 30% of the parcel area by the end of year.	FoAM	Cutting rushes between 15 March and 15 July is not permitted. Rush encroachment should not exceed 30% in any parcel. Grazing has been effective at keeping rush growth under control and limiting spread.	Check for feeding snipe before cutting. Aerial photography.
C5 and C8	Retain existing mature stands of willow scrub	1st September to 1st March annually	N/A	FoAM	Coppice small sections of mature willow scrub annually to prevent excessive growth, but retain pockets of willow scrub for nesting and perching habitat.	Aerial photography.

Aim 3. Avon Meadows is valued as an outdoor classroom by local schools and community groups						
Compartment	Action	Frequency	Requirements (Higher Tier)	Who	How is this going to be delivered?	Monitoring and evidence required for Higher Tier
All	Support visiting groups from the University of Worcester to undertake water quality sampling and reporting	Annually (November)	Availability of staff or volunteers to support the group	FoAM / WDC staff	Maintain contact with Environmental Science	Analysis of reports received, look for anomalous readings esp BOD
All	Engage local U3A groups	As required	Guide groups around the meadows.	FoAM/WDC staff	Maintain contact with local groups	Number of group visits.
All	Volunteers trained and confident to support school visits to Avon Meadows	As required	Guide groups around the meadows.		Promote activities Training courses and support for volunteers.	Number of volunteer led visits.
All	Supported farm visits lasting 2 hours for school groups and car farming visits.	All year round	At least 20 visits of min 6 people to Avon Meadows receiving accredited farm visit. Each visit min 2hrs and complete a review form.	FoAM and WDC staff	Attend farm visit accreditation training. Complete risk assessment and farm facts template Promote the farm visits widely Complete the Farm Visit Evaluation form for each visit.	Positive feedback received from Farm Visit Evaluation forms.

Aim 4. Local people take an active part in managing and enjoying Avon Meadows						
Compartment	Action	Frequency	Requirements (Higher Tier)	Who	How is this going to be delivered?	Monitoring and evidence required for Higher Tier
All	Run regular volunteer work parties open to all	Minimum 1 per month	None	FoAM		None required. Volunteer coordinator monitors attendance.
All	Community events – guided walks	Run 2 or 3 per year	None	FoAM / WDC staff		
All	Training and inclusion for surveys	As needed	None			
All and off site	Exchange visits between other conservation groups	As needed	None			
All	Community events – wildlife monitoring events	1 per year	None	FoAM / WDC staff		

Aim 5. Improve public access to and enjoyment of Avon Meadows						
Compartment	Action	Frequency	Requirements (Higher Tier)	Who	How is this going to be delivered?	Monitoring and evidence required for Higher Tier
	Maintain informal paths on bunds around compartments by mowing and putting down woodchip	As needed at monthly work parties				
C5 and C7	Boardwalk and platform monthly safety inspection and maintenance	Monthly or after flood event				Keep inspection record
C8	Inspect gravelled path for signs of wear, repair as necessary	Monthly or after flood event				Keep inspection record
	Strim or prune tall or overhanging vegetation to keep entrances and interpretation panels clear.	Spring and summer				
	Interpretation panels – monitor for damage and clean	Every 6 months				
	Monitor site for graffiti and vandalism					
	Ensure availability of leaflets in Pershore TIC and Civic Centre					

Aim 6 – Flooding and water quality						
Compartment	Action	Frequency	Requirements (Higher Tier)	Who	How is this going to be delivered?	Monitoring and evidence required for Higher Tier
C5	Inspect settling pond for silt build up and desilt as needed.	Annually in autumn/winter	Splash pad should remain free from silt build up. Area immediately around splash pad should be free from silt build up.	WDC staff/ FoAM		Silt depth to water depth ratio
C6	Put out sedimats prior to anticipated flooding.	As required	To capture silt brought in by flood events and monitor levels of phosphate and nitrate in that silt	FoAM	This will allow us to work out how much nutrient is being deposited on the meadows in any one flood event	
	Check operation of tilting weir and drop board sluice once a year.	Annually, in September/ October	To ensure that the tilting weir functions effectively.	FoAM		Water levels can be reasonably expected to top up through the winter.
C8	Inspect ditch below tilting weir for excessive siltation and in channel vegetation growth.	Twice annually - December and June	Recognised outfalls should be clear of excessive vegetation in high summer and free flow maintained. Pinch points in the ditch monitored 6 monthly for silt and in channel vegetation build up.	WDC staff and FoAM	It is recognised that this ditch takes surface water from a number of outfalls that are part of the Severn Trent surface water network. These outfalls	Outfalls are capable of discharging water and ditch flow at pinch points is not restricted.
C8 and C5	Monitor STW and other unrecognised outfalls for signs of pollution	At all times	Prevent pollution of the River Avon by identifying incidents when they occur.	WDC staff, FoAM volunteers and members of the public	Take details of the location and nature of the pollution event. Photograph if possible. Fish deaths should be reported immediately to the Environment Agency. Other pollution incidents should be reported to WDC initially for investigation.	Identification of pollution sources is enabled and point source pollution of Avon Meadows and the wider river environment is prevented.

Monitoring and reporting timetable						
Compartment	Action	Frequency	Requirements (Higher Tier)	Who	How is this going to be delivered?	Monitoring and evidence required for Higher Tier
C1, C2, C3, C6, C7 & C8	Undertake grassland plant survey (Condition assessment/NVC or similar) and record changes.	May, June, July – before hay cut	Follow accepted methodology for surveying grassland and recording species found.		1m x 1m quadrats are fixed off the locations of the dipwells. Quadrat survey is done by identifying species present in each quadrat, estimating percentage of cover of each species and bare ground. 5 quadrats at each dipwell, data then fed into MAVIS (grassland community assessment spreadsheet).	Is there anything in the survey that suggests that management or environmental change has had a positive or negative impact on the diversity of Avon Meadows. Monitor for key grassland indicator species following sward enhancement.
	Monitor water quality for P and N levels at Cherry Orchard outfall and other points around the wetlands.	Annually, with support of University of Worcester and Freshwater Habitats Trust	None	FoAM/ WDC staff/ Freshwater Habitats Trust staff		Monitor for BOD, pH, heavy metals and phosphate
C1, C2, C3, C6, C7, C8	Standard soil analysis carried out annually until P levels fall below 25mg/l	After hay cut and grazing, when nutrient levels are at their lowest.	On request from Natural England	FoAM and laboratory, Sampling costs ~£20/ sample		
All compartments	Carry out regular bird survey work, monitoring species present and numbers of individuals and whether breeding has been successful	Monthly (weekly)	None	FoAM		Look for patterns following management work or environmental events and assess the longer term impacts based on previous monitoring results.
All compartments	Carry out seasonal terrestrial and freshwater invertebrate surveys monitoring species present and numbers of individuals	Twice yearly during spring and summer. Freshwater invertebrate surveys can be used to monitor for non-native invasive species.	Moths, dragonflies and butterflies are well recorded. More training may be required for other invertebrate groups.	FoAM	Transects for butterflies, birds and dragonflies are established.	Look for patterns following management work or environmental events and assess the longer term impacts based on previous monitoring results. If NNIS are found, report to Environment Agency. Record all data and pass to FoAM representative of Worcestershire Biological Recorders. Data submitted to WBRC for inclusion on public records.

Monitoring and reporting timetable						
Compartment	Action	Frequency	Requirements (Higher Tier)	Who	How is this going to be delivered?	Monitoring and evidence required for Higher Tier
All compartments	Undertake seasonal small mammal surveys	Twice yearly Spring and Autumn	Animal welfare needs are of highest concern. Do not trap when temperatures are predicted to fall near freezing.	Trained volunteers from FoAM with support from Worcs mammal group		Record all data and pass to FoAM representative of Worcestershire Biological Recorders. Data submitted to WBRC for inclusion on public records.
All compartments	Undertake monitoring for herpatofauna	Twice yearly	Have regard to possible presence of Great Crested Newts. If found, cease survey and all work that may be potentially disturbing.	Existing trained volunteers with FoAM	Torch survey and egg searching only, due to presence of water shrew (no bottle trapping). GCN not recorded in previous survey.	Record all data and pass to FoAM representative of Worcestershire Biological Recorders. Data submitted to WBRC for inclusion on public records.
All compartments	Monitor water bodies and river banks for non-native invasive plant and animal species. Visual inspection of site boundaries, ditches, pools and access points.	Twice a year between May and August	Vigilance required from all users of the site.	FoAM volunteers, WDC staff, visitors.	Ensure that identification is confirmed before taking eradication action.	If NNIS are discovered or suspected, confirm identification, report if necessary and eradicate where possible.
All compartments	Tree health survey – monitor	Every three years as standard.	Inspect trees that pose a risk to the public or infrastructure for potential failure	Qualified arboricultural expert	All trees will have a heath check at least every three years, with recommendations for action to make safe where needed.	Individual trees may be highlighted for more frequent inspection due to age and condition.
All compartments	Review management plans actions for the upcoming year and adjust based on environmental conditions or findings from survey work.	August annually	Check actions for relevance for the following year. Review ongoing management tasks. Review tasks planned for upcoming year Review monitoring protocols and data gathering.	FoAM and WDC staff	Is the management plan working and are the activities having the outcomes we expect? If not, is it down to the management or external environmental factors?	Management plans are living documents and will grow and evolve over time.

	Sept-Nov	Dec- Feb	Mar-May	Jun-August
Annual Recurring Activities	Monitor water and silt quality	Scrub management – willow and bramble cutting	Freshwater invertebrate survey	Freshwater invertebrate survey
	Cut reed beds	Cut reed beds	Small mammal survey	
	Cut and treat willow scrub	Ditch management – cut willow and pull typha	Path maintenance and entrance clearance	Cut MG8 Meadow
	Livestock grazing	Collate annual survey data	Amphibian survey	Hay cut
	Ditch management – cut willow and pull typha	Livestock grazing	Moth survey	Butterfly survey
	Review management plan	Hedgerow layering and trimming	Butterfly survey	Moth survey
			Top ditch edges	Path maintenance and entrance clearance
			Small mammal survey	

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