Ms M. Saxl,
Low Carbon West Oxford

Bioscan (UK) Ltd
The Old Parlour
Little Baldon Farm
Little Baldon
Oxford
OX44 9PU

Tel: +44 (0) 1865 341321
Fax: +44 (0) 1865 343674
bioscan@bioscanuk.com
www.bioscanuk.com

18th December 2018
Our Ref: BC18/E1960/MS-L2

Dear Ms Saxl,

KINGFISHER CORNER, BOTLEY PARK, OXFORD
'EXTENDED' PHASE 1 HABITAT SURVEY AND MANAGEMENT RECOMMENDATIONS

Further to a visit to the above site on the 24th October 2018 I write to set out the findings and implications of the preliminary ecological appraisal carried out in the context of your intention for a brief management plan to be produced in order to support and enhance the site for wildlife.

Background
Kingfisher Corner is located in the western corner of Botley Park in Oxford at grid reference SP498064. It is broadly triangular in shape, and extends to approximately 0.37 hectares. It is bounded to the east by a playing field, to the north-west by Bulstake Stream and to the south-east by Osney Ditch (both watercourses are tributaries of the River Thames).

The site of Kingfisher Corner was a children's play area until 2009. Following this it is understood that Low Carbon West Oxford (LCWO) created three shallow scrapes (possibly utilising the depressions left by the removal of the play equipment) within this area, and then planted aquatic plant species in the scrapes, and scrub in the immediate surrounds[1].

Methodology

Desk Study
Oxford City Council's Local Plan 2016-2036 Policies Map was reviewed in order to understand if there are non-statutory nature conservation sites within one kilometre (km) of the site. In addition, the Multi-Agency Geographic Information for the Countryside website (www.magic.gov.uk) was searched for information on statutory sites designated for their nature conservation interest within the same search area, or whether there are records of priority habitats locally. The NBN Atlas web facility was also consulted to assess whether there are any protected or notable species records within 1km of the site. Further information may be held by Thames Valley Environmental Records Centre (TVERC) but as this organisation operates on a charging basis for such information, that avenue was not pursed as part of this commission.

Due to the close proximity of the Oxford Flood Alleviation Scheme to the site, online documents relating to this scheme were reviewed to understand if there will be any anticipated impacts on Kingfisher Corner.

[1] https://www.lowcarbonwestoxford.org.uk/news/kingfisher-corner-opening/

It is understood that a BioBlitz of the site was carried out in 2013; however, at the time of writing the full results have not been provided.

Habitats

An extended Phase 1 habitat survey of the site was carried out on 24th October 2018. The methodology for this survey followed the technique set out in the Handbook for Phase 1 Habitat Survey[2] devised by the former Nature Conservancy Council (now Natural England), as updated periodically by the Joint Nature Conservation Committee. In addition to habitat classification and mapping, representative lists of vascular plant species were made for each habitat within the site. Further, any incidental observations of other fauna were also recorded.

Results- Desk Study

Designations

The watercourses bordering the site to the north-west and south-west comprise the 'Bulstake Stream, Botley Park' Site of Local Importance for Nature Conservation (SLINC); however, no description regarding this site could be found online. Due to the resolution of Oxford City Council's Local Plan map the exact extent of this SLINC is not clear and it cannot be determined if any part of Kingfisher Corner is encompassed within this non-statutory local designation.

SLINC's, along with other non-statutory designated sites, receive policy protection under Policy CS12 of the Oxford Core Strategy 2026[3]. This policy states:

> "*Local Sites: No development should have a significant adverse effect upon a site that is designated as having local importance for nature conservation or as a wildlife corridor, save in exceptional circumstances where the importance of the development outweighs the harm, and where it is possible to compensate for damage caused by providing adequate replacement habitat*".

No part of the site is subject to any statutory nature conservation designations, the closest such site is Port Meadow. This is located approximately 780m to the north and is designated a Site of Special Scientific Interest (SSSI) (forming part of the 'Port Meadow with Wolvercote Common & Green' SSSI) and a Special Area of Conservation (SAC) (forming part of 'Oxford Meadows' SAC). This site is designated for the presence of lowland hay meadows and creeping marshwort *Apium repens*.

The site just falls within the 'Oxford Meadows and Farmoor Conservation Target Area[4] (CTA)'. The Oxfordshire Biodiversity Action Plan Targets listed for this CTA that could be pertinent to the site (given the habitats present) include:

- "*Lowland meadow- maintenance, restoration and creation*
- *Arable field margins- maintenance, restoration and creation (for wild flowers in particular)*
- *Rivers- maintenance (including resource protection)*"

A review of the MAGIC website did not identify the site as being part of a priority habitat; however, fields immediately to the north of the site have been mapped as the priority habitat 'Coastal and Floodplain Grazing Marsh'. This habitat "*is defined as periodically inundated pasture, or meadow with ditches which maintain the water levels, containing brackish or fresh water*[5]*.*"

[2] JNCC, (2010), *Handbook for Phase 1 habitat survey - a technique for environmental audit*

[3] Adopted March 2011

[4] Conservation Target Areas identify some of the most important areas for wildlife conservation in Oxfordshire, where targeted conservation action will have the greatest benefit.

[5] http://jncc.defra.gov.uk/pdf/UKBAP_BAPHabitats-07-CoastFloodGrazingMarsh.pdf

A review of the NBN Atlas website[6] reveals that kingfisher *Alcedo atthis,* a Schedule 1 on the Wildlife and Countryside Act 1981 (as amended), has been previously recorded near the site.

It is noted that part of Kingfisher Corner could be affected by the Oxford Flood Alleviation Scheme. The Environmental Statement submitted in support of the scheme[7] states:

> "*Installation of flood gates to the footbridges at the ends of Helen Road and Henry Road, adjacent to Botley Park, that restrict (but not cut-off) flow*."
>
> And that:
> "*a 0.7ha area of park will be affected during construction of the proposed flood-gates*".

It is not known where this 0.7ha area of the park will be, but it may be that the proponents of that project envisage using the grassed areas of the park as a temporary construction compound.

As stated above, the results from a 2013 BioBlitz of the site have not been provided; however, a brief summary of the event[8] states: "*101* [species] ... *were in Kingfisher Corner, including the picture-wing fly- the rarest fly recorded during the BioBlitz*". The specific species of picture-winged fly (Ulidiidae) involved is not stated.

Results - Habitats

The following broad habitat types were identified during the survey:

- Improved grassland
- Scrapes/ depressions
- Ruderal
- Dense Scrub
- Trees

Each habitat is mapped on Figure 1, and a brief description of each habitat with an account of the dominant or more notable plant species recorded given below.

Improved grassland
A small area of grassland is present in the southern part of the site, with elements of this habitat present elsewhere. Species noted within this habitat include the graminoids Timothy *Phleum pratense*, common bent *Agrostis capillaris*, cock's-foot *Dactylis glomerata*, Yorkshire-fog *Holcus lanatus*, fescue *Festuca* sp. and perennial rye-grass *Lolium perenne* with the broadleaved herb component including dandelion *Taraxacum officinale* agg., dove's-foot crane's-bill *Geranium molle*, creeping buttercup *Ranunculus repens*, cleavers *Galium aparine* and ash *Fraxinus excelsior* saplings.

Scrapes/ depressions
The three scrapes and their immediate surrounds comprise a ruderal/grassland matrix, which include species such as ribwort plantain *Plantago lanceolata*, cock's-foot, common bent, yarrow *Achillea millefolium*, creeping cinquefoil *Potentilla reptans*, dandelion, Michaelmas daisy *Aster amellus*, red clover *Trifolium pratense*, perforate St John's-wort *Hypericum perforatum*, cut-leaved crane's-bill *Geranium dissectum*, greater plantain *Plantago major*, ground-ivy *Glechoma hederacea*, dove's-foot crane's-bill, field scabious *Knautia arvensis*, common knapweed *Centaurea nigra*, common bird's-foot-trefoil *Lotus corniculatus*, greater bird's-foot-trefoil *Lotus pedunculatus* and oxeye daisy

[6] NBN Atlas occurrence download at http://nbnatlas.org. Accessed 09 November 2018
[7] CH2M (2018) Oxford Flood Alleviation Scheme. Environment Agency
[8] https://www.lowcarbonwestoxford.org.uk/community-projects/tree-and-wildlife-group/

Leucanthemum vulgare. The latter five species are weak indicators of less agriculturally improved mesotrophic grassland according to the Natural England VEGAN database[9] (but none are scarce or rare). They are also common components of wildflower seed mixtures and this could mark their origin here. At the time of the survey these features were dry, and it is considered, due to the paucity of aquatic species, that these are likely to remain dry through most of the year.

Ruderal
The distinction between this habitat type and those of the scrapes/ depressions are not clearly defined; however, the height of the vegetation within this habitat is generally taller (possibly indicating higher levels of historic ground disturbance). Species encountered in this habitat include creeping thistle *Cirsium arvense*, common knapweed, tufted hair-grass *Deschampsia cespitosa*, sycamore *Acer pseudoplatanus* saplings, hop *Humulus lupulus*, pendulous sedge *Carex pendula*, hedge woundwort *Stachys sylvatica*, cow parsley *Anthriscus sylvestris*, the non-native Canadian goldenrod *Solidago canadensis* and the invasive species Himalayan balsam *Impatiens glandulifera*. This latter species is present in the north of the site near to Bulstake Stream. Common nettle *Urtica dioica* is more prevalent in the northern part of the site forming the ground layer beneath the crack willows *Salix fragilis*.

Dense scrub
This habitat comprises approximately half of the area of this site. The predominant species are bramble *Rubus fruticosus*, dog-rose *Rosa canina* and blackthorn *Prunus spinosa*, with other species including hawthorn *Crataegus monogyna*, elder *Sambucus nigra*, Guelder-rose *Viburnum opulus*, silver birch *Betula pendula* and sycamore. There were one to two individuals of buckthorn *Rhamnus cathartica*, hazel *Corylus avellana*, wych elm *Ulmus glabra*, rowan *Sorbus aucuparia*, spindle *Euonymus europaeus* and holly *Ilex aquifolium*, and due to the similar size of these specimens, it is considered that these specimens were planted by LCWO a few years ago.

Trees
Mature ash trees as well as crack willow *Salix fragilis* are present between the perimeter fence and the watercourses around the site.

A row of maturing apple *Malus* sp. trees is located in the southern part of the site.

Results - Other Species

Due to the presence of the watercourses adjacent to the site there is the potential for these to be used by otter *Lutra lutra* and water vole *Arvicola amphibius*. Fresh otter spraint was found along the Bulstake Stream around 300m downstream of the site in spring 2018 by Bioscan MD Dominic Woodfield. However, access could not be gained during the current survey to the watercourses to check for evidence for field signs of these species.

A small number of common bird species were recorded within the site during the survey, with these largely concentrated within the scrub; species recorded include blackbird *Turdus merula*, blue tit *Cyanistes caeruleus*, coal tit, dunnock *Prunella modularis*, goldcrest *Regulus regulus*, great tit *Parus major*, house sparrow *Passer domesticus*, long-tailed tit *Aegithalos caudatus*, robin *Erithacus rubecula*, song thrush *Turdus philomelos* and wren *Troglodytes troglodytes*. Additional species noted from this area in spring 2018 included carrion crow *Corvus corone*, jay *Garrulus glandarius*, magpie *Pica pica*, blackcap *Sylvia atricapilla*, chiffchaff *Phylloscopus collybita* and green woodpecker *Picus viridis*. A broader range of species use the remaining areas of the park, surrounding gardens and the undeveloped land to the north.

[9] Rowell, T.A.& Robertson, H.J. (1994) The grassland database: VEGAN version 4.0. Supplement to the version 3.0 manual. English Nature Research Reports No.113. Peterborough.

Evaluation

Habitats

The majority of the site comprises dense scrub and outgrown grassland, the interest of which is mainly due to the contrast to the adjoining more intensively managed park. Whilst the floral species identified across the site are common and can be frequently recorded within similar habitats, of minor note are the presence of weak indicator species of semi-natural mesotrophic grassland such as field scabious, common knapweed, common bird's-foot-trefoil and oxeye daisy. Many of these indicator species were found within the vicinity of the scrapes/ depressions and could be the result of seeding/planting carried out by LCWO. The habitat structure is more complex than the remaining parts of the park (except the outer periphery) and represents a haven for species intolerant of mowing, fertiliser enrichment, and damper ground conditions.

Species

In terms of protected species, the watercourses adjacent to the site are known to be used by otter and could potentially support water vole. In recent years, otters have increased locally and nationally due to a reduction in persecution in the UK. In contrast there is a well-documented decline in numbers of water voles in the UK due to habitat loss, pollution and predation. They are however present on the nearby Oxford Canal.

The site, along with the watercourses and the wider Botley Park, is likely to be used as a foraging area for common bat species such as common and soprano pipistrelle. The larger trees adjoining the site have some potential to offer roost sites for these species.

The bird assemblage found during the survey is considered to be consistent with a site of this size and nature. However, some of the species recorded, such as dunnock, house sparrow and song thrush are listed as Species of Principal Importance (SPI)[10], with dunnock listed on the Amber list[11] on the Birds of Conservation Concern[12], and house sparrow and song thrush listed on the Red list. Nevertheless, these species are still relatively common in a local and national context.

The site ostensibly offers habitats for common reptile species, and visits from grass snakes moving through the area along the watercourses are possible. It is probably too small to sustain a resident population of this or any other herpetofauna species however.

As requested, we have given through to appropriate management prescriptions to maximize the site's interests, and these are set out in the attached document.

I trust the above and the attached is of assistance and please do not hesitate to contact me to discuss anything further if necessary.

Regards

FOR AND ON BEHALF OF BIOSCAN (UK) LTD

Ben Carpenter MCIEEM
Consultant Ecologist
bencarpenter@bioscanuk.com

[10] SPI species, formerly known as Biodiversity Action Plan (BAP) species, have been identified by the government as requiring conservation action to prevent continuing declines in populations.

[11] In broad terms, amber list species are those that have shown a moderate decline in populations over the last 25 years, with red list species showing a severe decline in populations over the same period.

[12] Eaton *et al.* (2015) Birds of Conservation Concern 4: the population status of birds in the United Kingdom, Channel Islands and Isle of Man. British Birds 108, pp708-746.

Kingfisher Corner – Suggested Management Plan

Summary Description:

Site name:	Kingfisher Corner, Botley Park, Oxford
Site status:	The watercourses along two of the site boundaries form part of the 'Bulstake Stream, Botley Park' SLINC
Location:	(OS) SP 498064
County:	Oxfordshire
Area:	0.7 hectares
Site description:	A former playpark, this triangular-shaped site now comprises a matrix of scrub and grassland, with three dry scrapes/depressions near its centre. It is bounded on two of the three sides with mature trees and then watercourses.
Tenure:	Low Carbon West Oxford manage the site.
Existing Management:	Currently, it would appear no active management of the site is carried out.
Rights of access:	The site, along with the wider Botley Park, is open public access. The park can be accessed via footbridges from Helen Road and Henry Road, as well as from Botley Road to the south.
Constraints/site characteristics:	The following points have been identified in respect of the future aspirations for the management of the site: - Local residents have raised issues with occasional drug use on the site (and this is likely to be due to the enclosed nature of site). - There was evidence of a campfire on the site during the site visit, and therefore it is considered that leaving loose vegetation (e.g. cut branches, logs) openly visible within the site should be avoided to prevent these from being burned. - Children play on the site and therefore incorporating open water and steep banks have been avoided. - The invasive species Himalayan balsam is present near to Bulstake Stream. - Due to the close proximity of watercourses there is the potential for flooding.
Main objective:	Taking into account the above points the main management objectives for the site are: "*To manage the site for the benefit of a wide variety of flora and fauna, and to create a safe, clean and welcoming environment that can be used and enjoyed by the local community*".

Management prescriptions

The following provides details regarding each area within the site, the aims and objectives for a period of ten years. The text below should be read in conjunction with the accompanying Figure 2.

Area A- Scrub

Background: This area currently comprises dense scrub along the eastern boundary of the site, and effectively acts as visual screen into the site from the remainder of Botley Park.

Aim: Remove scrub to open up the sight-lines into the site to improve visual security and then establish a wildflower area for the benefit of invertebrates and local residents.

Objectives:

1) Cut scrub to ground level outside of the bird nesting season (which typically runs from mid-February to August inclusive) using strimmers or hand tools, and dig up larger roots.
2) Cut scrub to be removed from site and taken to the existing composting area behind the bowls club in the eastern part of Botley Park.
3) This area should be scarified using a rake (or similar) and then sown with a wildflower mix (such as 'BSBP Butterfly and Bee Wildflower Seed mix' or similar) in spring or autumn. This will not only create an area suitable for foraging bees and butterflies, but would also provide an attractive flower display for local residents during the spring and summer.
4) This area should then be subject to a suitable annual management regime (such as a cut in either late autumn or early spring using a strimmer, mower or a scythe).

Area B- Scrub

Background: This area currently comprises dense scrub along the northern part of the site.

Aim: Instigate a management regime for the scrub to prevent it becoming overgrown and leggy.

Objectives:

1) The attached Figure 2 divides this area into four broadly equal areas; the western-most area should be retained to prevent public access to the otter holt (see below). The remaining three areas are to be cut on rotation (e.g. Area B1 to be cut in Year 1, Area B2 to be cut in Year 4, Area B3 to be cut in Year 7, then Area B1 cut in Year 11 etc.).
2) A 1m strip of scrub inside the fence should be retained in order to reduce disturbance onto the watercourses (in terms of otter and water voles).
3) Scrub removal should be undertaken outside of the bird nesting season.
4) Cut vegetation should be removed from the site and taken to the composting site behind the bowls club.
5) The growth of the scrub should be assessed annually to assess if the frequency of the rotational cutting needs to be modified.

Area C- Grassland

Background: This area comprises an established area of species-poor improved grassland in the southern part of the site. A management regime should be established to provide a species-rich wildflower meadow.

Aim: To create a species-rich wildflower meadow.

Objectives:
1) The grass in this area should be kept short for one growing season by regularly mowing (approximately every fortnight to three weeks depending on the growth of the grass).
2) During each cut, vegetation should be removed from this area and taken to the composting site behind the bowls club.
3) During the autumn, yellow rattle seeds should be sown over this area. Yellow rattle is a semi-parasite of grasses and should help in reducing grass vigour to help wildflowers to grow.
4) Depending on how well the yellow rattle has taken, a wildflower seed mixture should be sown over this area in either Year 2 or Year 3. The seed mixture should be relatively basic (e.g. Emorsgate EM2 – Standard General Purpose Meadow Mixture or similar).
5) This area should then be subject to an annual cutting regime (either a cut in the spring or in autumn).

Area D- Ruderals

Background: Small pockets of ruderal vegetation are present on the site.

Aim: To control the amount of ruderal vegetation on the site and to control the more vigorous species from spreading to other areas of the site.

Objectives:
1) The ruderal vegetation should be cut using a strimmer or similar annually in autumn or early spring.
2) The cut vegetation should be removed from the site.

Area E- Himalayan Balsam

Background: This invasive species was noted to be present in the northern part of the site near to Bulstake Stream. This species can spread rapidly if not removed and can eventually smother native species. As only a few stems were noted during the survey it is recommended that removal of this species is commenced as soon as possible before further spreading occurs. Based on the It is listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) which means it is an offence to plant or cause this species to grow in the wild.

Aim: To eradicate this species from the site (and surrounds if possible).

Objectives:
1) Hand-pulling of the stems should be carried out between April and October (the whole stem including the roots should be pulled if possible).
2) The pulled stems should then be left to dry out over a fence or a sturdy branch within the site.
3) Ideally the site should be checked weekly and any stems present should be pulled (in order to remove as many stems as possible prior to this species seeding) and then left to dry as per objective 2 above.

4) The site should checked at least monthly between April and October for a period of two years following the first year of pulling in order to remove any additional stems (seeds in the ground can survive up to 18 months).

A Himalayan balsam fact sheet is provided in Appendix 1 and provides further information regarding the removal of this species from a site.

Area F- Bat and bird boxes

Background: Due to the presence of the watercourses and the mature trees, the site is likely to be used by a range of foraging bats and birds. The site could be further enhanced for bats and birds by providing roosting and nesting opportunities.

Aim: To provide roosting opportunities for bats, and roosting and nesting opportunities for birds (such as great tits and blue tits).

Objectives:
1) Identify the trees which appear suitable to support the boxes.
2) Three bat boxes (1FF Schwegler or similar) and three bird boxes (1B Schwegler or similar) should be erected onto identified mature trees (assuming that these trees are within the control of LCWO).
3) The bird nest boxes should be checked and cleared of nesting material between September and February.

Area G- Herb garden

Background: The removal of the scrub in Area A allows the establishment of areas suitable for providing a feeding resource for a variety of invertebrate groups.

Aim: To provide an alternative feeding resource for bees, butterflies and other invertebrates

Objectives:
1) The soil should be prepared to receive the herb seeds.
2) Seeds of species such as rosemary, lavender, marjoram, thyme, basil and sage to be sown in autumn or spring.
3) Regular weeding during the growing season to be carried out.
4) The need for additional sowing or removal of certain species to be reviewed following the first year.

Area H- Otter holt

Background: If the small area of land beyond the fence to the west (at the confluence of Bulstake Stream and Osney Ditch) is within the control of LCWO then an otter holt (or laying up feature) could be constructed at this location. Although this area is likely to flood on occasions, the holt could be constructed in such a way that it does not hold water. In addition, it should incorporate two entrances (one facing onto the stream, and the other onto the land) so that any otters present could leave if there was a sudden flooding event.

Aim: To provide a feature suitable to be used by otters.

Objectives:
1) Appendix 2 provides a suggested otter holt design.

2) The trunk and branches of a fallen tree in this area could be used to aid in the construction of the holt.
3) It was noted during the site visit that the fence at this location is partially broken due to the fallen tree. Therefore it is recommended that the fence is fixed in order to prevent public access to this area.

Area I- Flowers

Background: The majority of the other plantings on the site provide feeding opportunities for invertebrates during the spring and summer. In order to provide a feeding resource for early emerging bees and other invertebrates early flowering plants should be planted within Area C.

Aim: To provide a feeding resource for early emerging bees and other invertebrates.

Objectives:
1) Approximately twenty snowdrop bulbs to be planted in March, twenty crocus bulbs to be planted in September and cowslip seeds to be sown in the autumn.
2) Assess the need for additional planting in following years.

Area J- Fruit trees

Background: In order to provide a diversity of fruit on the site plum trees should be planted.

Aims: To provide an additional fruit tree resource on the site in order to provide an opportunity for local residents to 'wild forage'. The fruit trees would also provide a resource for nectar feeding invertebrates when the trees are flowering, and a feeding resource for birds when the tree is fruiting.

Objectives:
1) Three to four plum trees (to comprise a mix of greengage and 'Victoria') should be planted within the vicinity of the apple trees in the south of the site during the winter.
2) Any loses should be replaced.

Area K- Ivy

Background: Ivy is growing on the site, particularly along the south-western boundary. This species provides a feeding resource for late season bees and invertebrates.

Aim: To continue to provide a feeding resource for late season invertebrates.

Objective:
1) Retain the ivy within the site.

Area L- Sycamore

Background: Sycamore saplings/whips were noted to be present on the site during the survey. This non-native species can dominate a site if left unmanaged.

Aim: To prevent the site from becoming overgrown with sycamore trees.

Objectives:

1) In early autumn each year any sycamore saplings/whips remaining on the site (following the scrub clearance outlined above) should be cut to ground level.
2) The cut vegetation to be removed from the site.

Area M- Vegetation cutting

Background: The parts of the site not covered under the above also need to be managed to prevent these areas from becoming overgrown.

Aim: To bring the remaining parts of the site under a management regime.

Objective:

1) The sward in the remainder of the site should be subject to an annual cut in autumn using a strimmer or mower.

Monitoring

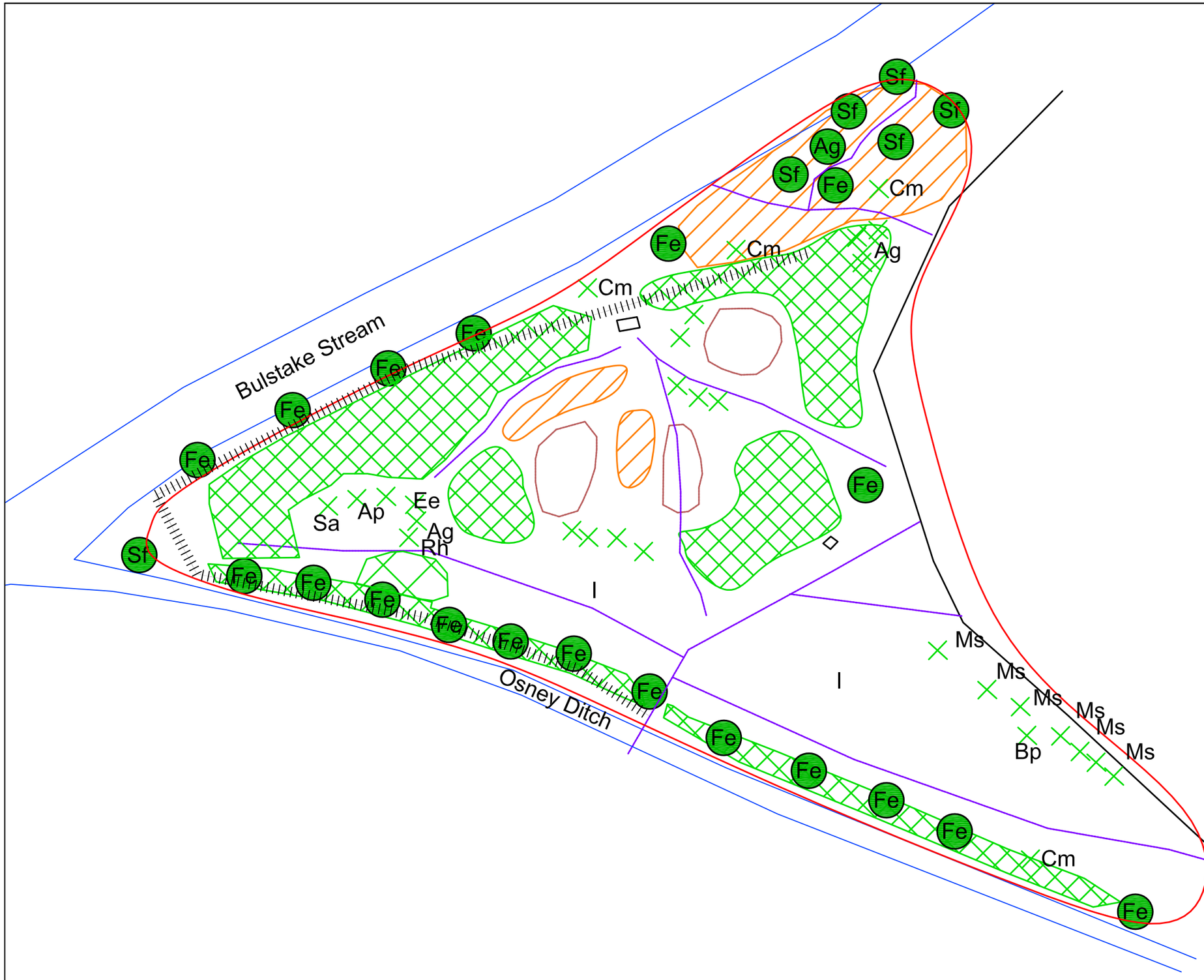
It is recommended that in Year 5 a repeat habitat survey is carried out to assess whether the aims and objectives of this management plan are being met. This plan should then be modified as necessary to take into account any areas that do not appear to have become established.

The following table provides a summary of the above tasks and in which year they should be carried out.

Area	Objective	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10
Area A- Scrub	Cut scrub to ground level and remove from site	X									
	Soil to be scarified and then sown with a wildflower mix	X									
	Subject to a suitable management regime		X	X	X	X	X	X	X	X	X
Area B- Scrub	Scrub removal of Area B1	X									
	Scrub removal of Area B2				X						
	Scrub removal of Area B3							X			
	Assess condition of scrub and modify cutting regime as appropriate			X	X	X	X	X	X	X	X
Area C- Grass	Existing sward to be kept short with regular mowing, with arisings removed and taken off-site	X									
	Yellow rattle seeds to be sown in area	X	X								
	Sow with a meadow seed mixture			X	X						
	Subject to a suitable management regime				X	X	X	X	X	X	X
Area D- Ruderals	Ruderals to be cut in autumn or early spring and arisings removed from site	X	X	X	X	X	X	X	X	X	X
Area E- Himalayan balsam	Hand-pull stems through growing season	X									
	Site to be checked regularly with any additional growth pulled		X	X		X		X		X	

Area	Objective	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10
Area F- Bat and bird boxes	Suitable trees identified	X									
	Boxes erected	X	X								
	Boxes checked and cleared out as necessary		X	X	X	X	X	X	X	X	X
Area G- Herb garden	Soil prepared to receive seeds, and then seeds sown	X									
	Regular weeding as appropriate		X	X	X	X	X	X	X	X	X
	Assess need for additional sowing		X	X	X	X	X	X	X	X	X
Area H- Otter holt	Create otter holt (ideally using as much of the fallen tree at this location as possible)	X									
	Mend broken fence	X									
Area I- Flowers	Bulbs and seeds planted during first year	X									
	Assess the need for additional planting/sowing		X	X	X	X	X	X	X	X	X
Area J- Fruit trees	Three to four plum trees to be planted in Area C	X									
	Any losses to be replaced as appropriate		X	X	X	X	X	X	X	X	X
Area K- Ivy	Retain ivy within the site	X	X	X	X	X	X	X	X	X	X
Area L- Sycamore	Remove sycamore saplings/whips	X	X	X	X	X	X	X	X	X	X
Area M- Vegetation cutting	Sward in remainder of site to be subject to an annual cut in October	X	X	X	X	X	X	X	X	X	X
Monitoring	Repeat Phase 1 habitat survey					X					
	Modify management plan as necessary					X					

Figure 1
Habitat Map



Key

- Study area
- Dense scrub
- Scattered scrub
- Ruderal
- Mature trees
- Scrapes/depressions
- Footpaths
- I Improved grassland
- Watercourses
- Fence
- Cm Hawthorn (*Crataegus monogyna*)
- Fe Ash (Fraxinus excelsior)
- Sf Crack willow (*Salix fragilis*)
- Ag Alder (*Alnus gluntinosa*)
- Bp Silver birch (*Betula pendula*)
- Ms Apple (Malus sp.)
- Sa Rowan (*Sorbus aucuparia*)
- Ee Spindle (*Euonymus europaea*)
- Rh Buckthorn (*Rhamnus catharticus*)

DO NOT SCALE

Title
Habitat map

Project	Client
Kingfisher Corner	Low Carbon West Oxford

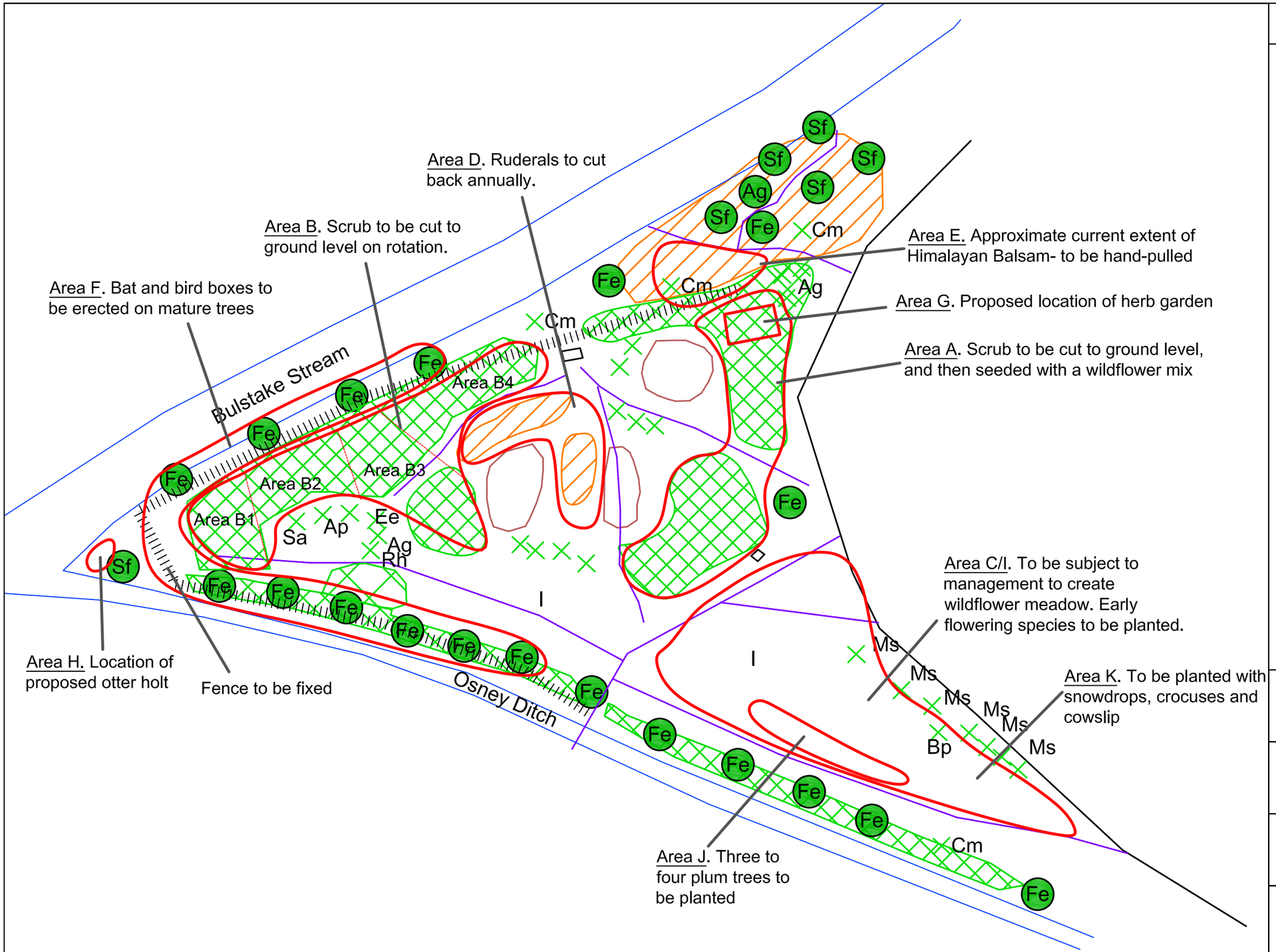
Drawing No.	Revision	Project No.
Figure 1	A	E1960

Drawn	Checked	Date
BC	DW	November 2018

Bioscan (UK) Ltd
The Old Parlour,
Little Baldon Farm,
Little Baldon,
Oxford,
OX44 9PU.

T: +44 (0) 1865 341321
F: +44 (0) 1865 343674
bioscan@bioscanuk.com
www.bioscanuk.com

Figure 2
Management Plan



Key

- Management areas
- Dense scrub
- Scattered scrub
- Ruderal
- Mature trees
- Scrapes/depressions
- Footpaths
- I Improved grassland
- Watercourses
- Fence
- Cm Hawthorn (*Crataegus monogyna*)
- Fe Ash (Fraxinus excelsior)
- Sf Crack willow (*Salix fragilis*)
- Ag Alder (*Alnus gluntinosa*)
- Bp Silver birch (*Betula pendula*)
- Ms Apple (Malus sp.)
- Sa Rowan (*Sorbus aucuparia*)
- Ee Spindle (*Euonymus europaea*)
- Rh Buckthorn (*Rhamnus catharticus*)

DO NOT SCALE

Title
Management plan

Project	Client
Kingfisher Corner	Low Carbon West Oxford

Drawing No.	Revision	Project No.
Figure 2	B	E1960

Drawn	Checked	Date
BC	DW	December 2018

Bioscan (UK) Ltd
The Old Parlour,
Little Baldon Farm,
Little Baldon,
Oxford,
OX44 9PU.

T: +44 (0) 1865 341321
F: +44 (0) 1865 343674
bioscan@bioscanuk.com
www.bioscanuk.com

Appendix 1
Himalayan balsam fact sheet

Himalayan Balsam
(Impatiens Glandulifera)

SUSSEX WILDLIFE TRUST

Species Identification

Height: A tall, annual herb growing up to 2.5m
Stem: Hollow brittle stems which are light green/ red early in the year, turning pink/red in summer.
Leaf: Finely serrated slender to elliptical leaves, often with a reddish mid-rib. Leaves are 5 - 18cm long and 3 - 7cm wide and grow in opposite pairs or in whorls of 3- 5 from the stem or branches.

Flower: Trumpet shaped, sweetly scented bright pink flowers (sometimes light pink or white), with spots and markings inside. Flowers measure 2.5 - 4cm long
Seed: Seed pods grow following flowering. 4-16 green/brown 'coiled spring' shaped seeds are encased in distinctive green droplet shaped seed pods with a point at one end. Seeds hang off red stalks and measure 2.5cm in length. When ripe they 'explode' when touched, firing seeds at high speed in all directions.

Himalayan Balsam
© F Southgate

Ecology

Habitat Description:
Himalayan Balsam grows in moist and semi-shaded damp places including waste ground, and thin woodlands. It commonly grows along linear corridors which facilitate its spread such as rivers or disused railway lines.

Reproduction & Life Cycle:
Seeds germinate in February-March, followed by rapid growth of leaf rosettes in spring. Plants flower from June to October setting seed from mid July. One plant can produce 500 + seeds which can remain viable for up to 2 years.

Dispersal and Spread:
Seeds can be flung up to 7m away from the parent plant with the slightest disturbance. The plant can spread rapidly along riverbanks as seeds are carried downstream where they germinate on soft exposed, mud banks. Seeds may also be transported unintentionally by wildlife, machinery, grazing livestock and people using sites for recreation. Plants are still grown for ornamental purposes and can be easily spread in garden waste and soil.

Himalayan Balsam (Impatiens Glandulifera)

Impact

Native Habitats:
Himalayan Balsam can rapidly out-compete native plants due to its ability to rapidly reproduce and grow in dense stands. The plant produces a large amount of nectar which may result in less pollination of native species by bumblebees and a subsequent loss of biodiversity. Populations along river banks die back in winter, exposing banks to erosion and providing minimal cover for native fauna. Invasion of Himalayan Balsam into rare natural habitats such as fens can severely impact their ecology. The plant can grow in dense woodland which may have severe effects on (ancient) woodland flora.

Human Health Effects:
Himalayan Balsam is not toxic to humans, although some people may be allergic to its pollen. Some parts of Himalayan Balsam are edible, and the flowers can be used to make 'champagne' similar to that which is made with elderflowers.

Economic and Societal Effects:
Dense populations of Himalayan Balsam restrict access to riverbanks and paths for anglers and other amenity users, for health and safety checks and they can cause losses in biodiversity which can impact on recreational income. Dense areas of dead Himalayan Balsam can impede river flow as it gets washed into the water during flood events. The plant can also invade cropped areas and restrict the availability of grazing fodder. Exacerbation of erosion can have severe impacts on fisheries due to increases in siltation of gravels etc.

When dense infestations of Himalayan Balsam die back during winter, large areas of river bank can be exposed to erosion © C Chatters

Legislation

Listed under Schedule 9 of the Wildlife and Countryside Act (W&CA) in England and Wales (as amended) and stated as unlawful to plant or otherwise cause it to grow in the wild in Section 14 of the W&CA. There are also restrictions on moving soil which is contaminated with Himalayan Balsam seed.

Management Approaches

Prevention Methods - Early detection and rapid response

1. Map the distribution of all known populations
2. Identify areas that are 'at risk' to new infestations
   - ⇒ Within downstream and adjacent flood zones of infested watercourses
   - ⇒ (Wetland) Sites connected to infested sites by public access routes
   - ⇒ Water bodies close to infested sites that are used for recreational purposes
   - ⇒ Garden waste sites and sites close to urban areas
3. Use GIS and local knowledge to map 'at risk' areas
4. Implement a management plan to prevent further spread of the plant including:
   - ⇒ Restricting the sale of Himalayan Balsam through garden centres, supermarkets, aquarists and other retail outlets and removing seed populations from formal gardens.
   - ⇒ Avoiding unintentional seed transportation by:
     - Limiting access to sites during autumn to reduce disturbance of seedpods and the unintentional spread of seed
     - Increasing public awareness at infested sites ensuring (boats, boots, angling) equipment is drained and cleaned before leaving any infested water body
     - Encourage cattle grazing but discourage other forms of livestock grazing on infested river banks / sites
     - Managing extant stands along waterways and transport corridors to prevent dispersal, starting in headstreams to remove seed sources
     - Monitoring 'at risk' and vulnerable sites to enable fast eradication if invasion occurs

Eradication, Control and monitoring effects

Himalayan Balsam can be effectively controlled and/or eradicated from isolated sites within 3 years but should be monitored for at least 5 years following eradication. For populations growing along riverbanks it may be necessary to implement a bank side stabilisation programme after the invasion is eradicated. All control measures should aim to prevent flowering and subsequent seed production. **Treatment in the early stages is highly recommended.**

Method	Description	Time of Year	Limitations
Mechanical Removal	Cutting or strimming. Plants must be cut below the lowest node to avoid re-flowering	Before June and regularly for up to 3 years	Requires access for machinery. Dormant seeds can be transported by labour force and on equipment.
Manual Removal	Pulling out stems by hand	As above. Before seed pods appear	Only suitable on small patches, however can be used to compliment mechanical removal
Herbicides	Pesticides containing Glyphosate + Topfilm are now the only pesticides approved for use ON or near water. These should be sprayed on actively growing plants. No pesticides are approved for use IN water.	Springtime	Glyphosate requires a license from the Environment Agency. It eradicates non-target species including grasses. 2, 4-D amine is no longer approved for use, and must be used within 6 months or returned to suppliers for disposal. There is no longer any herbicide legally approved for use IN water.
Grazing	Graze with cattle throughout the growing season until no new growth occurs	From April	Can cause increased erosion if population is on riverbank.

Himalayan Balsam (Impatiens Glandulifera)

Contacts

Sussex Wildlife Trust
(Wetlands Project)
www.sussexwt.org.uk
01273 497555

Environment Agency
Ask for Fisheries & Biodiversity or Land Drainage consent teams
03708 506506
www.environment-agency.gov.uk

Sussex Biodiversity Record Centre
01273 497521
www.sxbrc.org.uk

Non Native Species Secretariat
www.nonnativespecies.org

Natural England
0845 600 3078
enquiries.southeast@naturalengland.org.uk
www.naturalengland.org.uk/regions/southeast/contacts.

Centre for Aquatic Plant Management
www.nerc-wallingford.ac.uk/research/capm/index.htm

References & Further Reading

- **CEH** (2004) Information Sheet 3: Himalayan Balsam. Available online at www.capm.org.uk;
- **Environment Agency** (2010) Managing invasive non-native plants. Available online at: http://publications.environment-agency.gov.uk/PDF/GEHO0410BSBR-E-E.pdf;
- **NNSS** (undated) Himalayan Balsam Identification Sheet. Available online at: https://secure.fera.defra.gov.uk/
- **SNH** (undated) Invasive non-native plants associated with fresh waters: A guide to their identification. Available online at: www.snh.org.uk/speciesactionframework

Sussex wetlands project promotes the sustainable management of rivers and the restoration of wetland habitats for people and wildlife

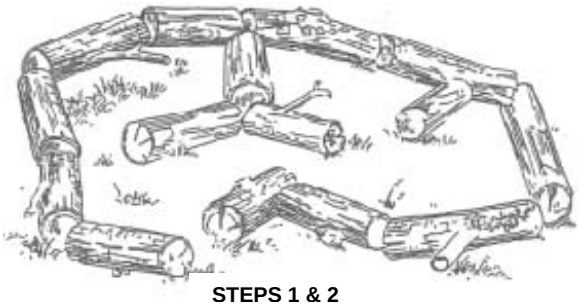
Appendix 2
Example otter holt design

CONSTRUCTION OF A LOG-PILE OTTER HOLT

One of the most common resting places used by otters are piles of bankside timber debris or old tree roots. Unfortunately this kind of habitat is quite scarce along modern rivers. Artificial log piles imitate this habitat and represent an inexpensive but effective way of increasing the number of available sites. The log site can be built anywhere along rivers, streams, lakes or ponds. Locate as close to the water's edge as possible and in an area where there is natural cover or where cover can be created.

STEPS

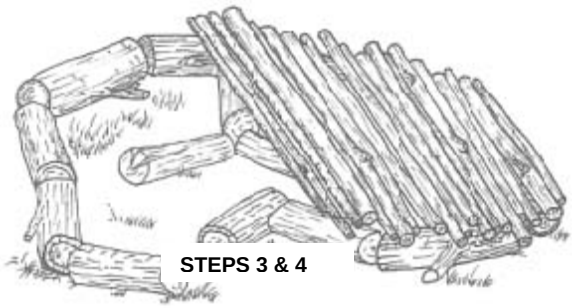
1. Trees and shrubs should not be cleared to create this habitat. Timber can be obtained from fallen trees, pollarding, coppicing or brashings from hedge thinning etc. You will need 12/15 logs up to 1m long and 30-40cm in diameter, 50/65 poles of 3 to 4 metres in length and 3/15 cm in diameter plus a large volume of brashing.
Ensure any chainsaw work is undertaken by a qualified chainsaw operator.



STEPS 1 & 2

2. Large logs should be placed and staked to form a holt, roughly 3m in diameter. Create inside chambers of 1m^2 with the remaining logs (also staked) with 2 entrance gaps of about 15/20 cm, one facing the water's edge.

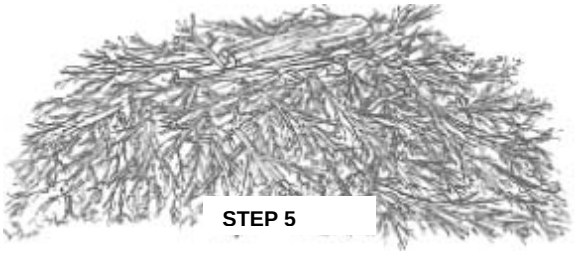
3. Use large poles to form a roof over the chambers and fill in gaps with smaller poles making it dark and water resistant.



STEPS 3 & 4

4. If the site is liable to flooding then the holt needs to be secured after stage 3 with staked ropework or wire.

5. Pile the brashing densely on top completely covering the poles and logs (leaving entrances clear) to ensure dark dry chambers.



STEP 5

OTHER POINTS

- Holt must be situated above the winter flood level.
- Choose a site that has minimal disturbance, and if possible fenced off from livestock.
- Allow the natural scrub to develop around the holt or plant with species typical of the locality.
- Particularly good river locations for holts are where a side channel and main channel meet or within a meander.

For more information contact the Conservation Officer for Rivers and Wetlands at Dorset Wildlife Trust, Brooklands Farm, Forston, Dorchester DT2 7AA. 01305 264620