Lower Burgh Meadows, Chorley

Habitat Management Plan

April 2014

Revised June 2016

Control sheet

Project No. & Title: **BOW17/515 Lower Burgh Meadows, Chorley**
Habitat Management Plan

Client: **Chorley Borough Council**

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1 Introduction

1.1 This plan identifies the main objectives for conservation management at Lower Burgh Meadows. The site is located at Grid Reference: SD5746915503, and is part of the larger Yarrow Valley Country Park, Chorley. It aims to provide a definite plan of prescriptions, to be undertaken by the ranger service, which will contribute to the overall management aim of the site.

1.2 The meadows are located on the former Burgh Hall Landfill site. When the site was decommissioned, the waste was sealed with a bentonite cap, with silt excavated from Birkacre Big Lodge also being spread. The use of a bentonite cap, a material which is comprised primarily of impure clay, resulted in the formation of a poorly drained, wet meadow. This is the most abundant habitat on site.

1.3 Whilst the site is owned by Chorley Borough Council who undertake much of the general site maintenance via the Yarrow Valley Country Park ranger team, both Lower Burgh Meadows Conservation Group and Chorley Natural History Society also undertake a variety of conservation management and biological recording tasks.

1.4 Many habitats within the UK, including meadows, require human intervention to persist and flourish e.g. a traditional hay meadow is mown in late summer. However, in sites such as this in relatively urban locations, where public access is available, there is a risk that over-management or 'gardening' of the habitats can occur. This management plan focuses specifically on retaining the site as semi-natural habitat.

1.5 The structure of this management plan first provides background detail of the site before outlining the key aims of the management plan. Objectives are then divided into primary and secondary, ranked by their importance in achieving the overall management aim. Each objective is attributed with one or more prescriptions whose rationale, action and timings are detailed.

1.6 The duration of this management plan is 5 years, with prescriptions and their actions being detailed within the management schedule in Appendix 1.

2 Description

2.1 Site Details

Site Name: Lower Burgh Meadows
Ownership: Chorley Borough Council
Managing Agent: Chorley Borough Council via Yarrow Valley Country Park ranger team

Region: North West
County: Lancashire
O.S Grid Reference: SD5746915503
Access: The primary point of access to the site is via Burgh Hall Road at the south west corner of the site. Further access points via footpaths are to the north east, south and north-west via the recycling depot
Area: 19.9ha

Status: No statutory designations
Physical Aspects: The site is relatively level, with numerous waterlogged areas.
Key Features: Wet meadow, mature woodland, semi-mature plantation woodland, presence of local great crested newt (*Triturus cristatus*) population in a pond to the east of the site
Land Use: Previous land use includes; sand quarrying and landfill, with current use as a nature conservation area and green space

2.2 General Description

Habitats

2.2.1 Lower Burgh Meadows is part of Yarrow Valley Country Park, Chorley. A former landfill site, it is comprised primarily of wet meadow habitats, with encroaching scrub, with broadleaved woodland of varying ages and structure, both semi-natural and plantation, around the periphery. A single pond is located to the south west of the site.

2.2.2 In areas, the grassland is species rich, with an abundance of herbaceous species and varying sward height. Common species within this habitat include common knapweed (*Centaurea nigra*), ribwort plantain (*Plantago lanceolata*), hairy sedge (*Carex hirta*), jointed rush (*Juncus articulatus*), bird's foot trefoil (*Lotus coniculatus*), tufted hair grass (*Deschampsia cespitosa*), bent (*Agrostis* sp.), selfheal (*Prunella vulgaris*) and yellow rattle (*Rhinanthus minor*), with various species of orchid (*Dactylorhiza* spp.) present in places. However, the proliferation of reed canary grass (*Phalaris arundinacea*) is causing a decline in the extent of this habitat. Much of the centre of the site is vegetated by an extensive stand of reed canary grass, with occasional common reed (*Phragmites australis*). Elsewhere, smaller stands are becoming established in areas of species rich grassland. Floral diversity within these stands of reed canary grass is severely limited.

2.2.3 Woodland along the western boundary of the site appears to be of a semi-natural composition, with well-defined understory and ground flora. Canopy species include oak (*Quercus robur*), sycamore (*Acer pseudoplantanus*), ash (*Fraxinus excelsior*) and silver birch (*Betula pendula*). There is an abundance of understory shrubs and young trees including elder (*Sambucus nigra*), beech (*Fagus sylvatica*), hawthorn (*Crataegus monogyna*) and hazel (*Corylus*

avellana) with well-defined ground flora dominated by wood avens (*Geum urbanum*), common male fern (*Dryopteris filix-mas*) and broad buckler fern (*D. dilatata*) with harts tongue fern (*Asplenium scolopendrium*) in places.

2.2.4 Woodland to the north west and some areas along the northern boundary appear to be young broadleaved plantation, most likely planted following the capping of the landfill. These stands of woodland have a very limited age structure with many trees becoming spindly as they grow upwards to compete for light. The plantation woodland to the north west of the site has a varied understory layer dominated by hazel, but ground flora is primarily limited to bramble (*Rubus fruticosus* agg.) cover.

2.2.5 The pond on the woodland edge to the south west was recently excavated by Lower Burgh Meadows Conservation Group. It supports a diverse assemblage of macrophytic species and emergent vegetation and is judged to be superficially suitable for breeding amphibians. The presence of a small number of artificial hibernacula nearby also increases the suitability of the pond for use by breeding amphibians.

Protected Species

2.2.6 A number of protected species are known to occur at, or near to, the site. A population of great crested newt is noted to occur in a pond adjacent to the eastern boundary of the site, thus increasing the potential for this species to utilise the meadows in the terrestrial phase of its life cycle. The creation of both the pond on site and the artificial hibernacula also increases the potential for this species to breed on site.

2.2.7 There are records for several species of bat, noted in the 2001 management plan, including Daubenton's bat (*Myotis daubentoni*), whiskered (*M.mystacinus*) and Brandt's (*M.brandtii*) bats, with a number of bat boxes located in the woodland to the west of the site. The meadow, woodland and woodland edge are likely to provide high quality feeding areas as well as facilitating commuting routes across the site. Some of the older trees on site may also provide roosting opportunities for some species.

2.2.8 A variety of birds have been recorded on site, including several UKBAP and Lancashire BAP species, and some listed as red or amber by RSPB. Species of conservation significance include skylark (*Alauda arvensis*), lapwing (*Vanellus vanellus*), grasshopper warbler (*Locustella naevia*) and reed bunting (*Emberiza schoeniclus*). Species records for the site were collated with the most notable being prioritised within the plan. The suitability of the site for nesting skylark and lapwing has been greatly reduced by the growth of reed canary grass - both species prefer open habitats to improve predator detection. However, it is thought that the stands of reed canary grass may provide habitat for other species of breeding bird, including reed bunting.

2.2.9 In addition, two species of moth listed as Lancashire BAP species, the beautiful hook-tip (*Laspeyria flexula*) and the barred sallow (*Xanthia aurago*), have been recorded on site, with the latter feeding on beech and field maple (*Acer campestre*). Pyramidal orchid (*Anacamptis pyramidalis*) is another Lancashire BAP species that has been recorded on site.

Non-native invasive species

2.2.10 Both Himalayan balsam (*Impatiens gladulifera*) and Japanese knotweed (*Fallopia japonica*) are located on site. Both are listed under Schedule 9 of the Wildlife & Countryside Act (1981 as amended 2010) as non-native invasive

species. As such, it is unlawful to plant or otherwise cause these species to grow/spread in the wild. In addition, all arisings from Japanese knotweed, including rhizome, are classed as a contaminated waste and therefore must be disposed of appropriately.

2.3 Site Assessment

Present Land Use/Access

2.3.1 The site is currently part of Yarrow Valley Country Park and serves as a nature conservation area and public green space. The meadows are well used by walkers and dog walkers, facilitated by the sites numerous good quality, formal footpaths. The footpaths and the several entrances to the site, make it easily accessible, even for pushchairs and wheelchairs (when using the entrance at the north west of the site, keys are distributed to interested wheelchair users). The site is also used by Chorley & South Ribble Model Aircraft Society, who use the heavily mown areas at the centre of the meadows.

Past Management

2.3.2 The site was previously subject to a five year management plan produced by Chorley and District Natural History Society in 2001. It is also currently included as management zone 6 within the Yarrow Valley Country Park 10 year management plan (2004). Both plans included mowing regimes to manage the reed canary grass. The 2001 plan recommends three cuts per year to inhibit it's growth. However, it appears from the 2013-2015 mowing regime plan that the regularity of cuts has now been reduced to once every three years. Management prescriptions for the woodland included removal of sycamore saplings and diversification of the age structure in the woodland.

Education/Interpretation

2.3.3 A single interpretation board is located close to the main entrance at the south west corner of the site.

Practical Issues/Restrictions

2.3.4 Several practical issues limiting management actions have been highlighted on discussion with the ranger team. In recent years, cutting of the reed canary grass has been hampered by machinery becoming stuck, due to the waterlogged nature of parts of the site. Several posts which are used for monitoring methane levels from the landfill site are also a constraint when using heavy machinery for mowing. Anti-social behaviour has also negatively impacted the grassland areas, where there have been issues of arson early in the growing season, potentially hampering the overall success of some of the species within the sward.

3 Management Aims

The overall aim of this management plan is to maintain, and improve, the current habitat diversity of the site. This is particularly important as grassland, whilst being the dominant habitat on site, is rare in the wider local landscape of Yarrow Valley Country Park. Ornithological interest at the site should also be a priority. The development of primary and secondary objectives have been guided, first and foremost, by legal compliance. Analysing the status of species and habitats, legislatively, nationally and locally, within the site has allowed the appropriate prioritisation of primary and secondary objectives.

4 Management Objectives and Prescriptions

PRIMARY OBJECTIVES

4.1 Objective: Maintain and increase extent of species rich wet grassland

Prescription 1

4.1.1 Management of immature stands of Phalaris arundinacea within species rich wet grassland

Rationale

- Removal/management of immature stands of *Phalaris* will allow an increase in the extent of species rich grassland in the small areas where it still occurs
- Managing these immature stands as a priority should have a positive effect in a relatively short time scale

Action

- Cut *Phalaris* by hand (scythes or brushcutter)
- Possible 'spot on'/'weed wiping' treatment for *Phalaris* with Glyphosate at the end of May.
- Cut species rich grassland (not *Phalaris*) after plants have set seed, ideally by hand with strimmers
- Arisings from grassland cut to be left on site to dry and drop seed (a few days) and then removed from site

Timing

- Cut *Phalaris* in March, June, when growth is most vigorous, and August when it regrows
- Glyphosate treatment of *Phalaris* in late June/July when most of the nutrients are in the plant, before they are sent to the rhizome for winter
- Cut species rich grassland in September after plants have set seed

Prescription 2

4.1.2 Management of mature stands of Phalaris arundinacea

Rationale

- Removal/management of mature area of *Phalaris* will allow the extent of species rich grassland to increase, and encroachment by *Phalaris* to be halted
- It will also open up the habitat, increasing its suitability for skylark, lapwing (*Vanellus vanellus*) and grey partridge (*Perdix perdix*) which are known to occur at the site, and prefer more open habitats with a shorter sward than the *Phalaris* provides
- Due to there being a lack of a standard/commonly implemented method of management of *Phalaris*, there will be some flexibility in the method of control dependant on which appears to be most effective.

Action

- Breeding bird check prior to works is **essential** for the **June** cut
- Cut mature stand of *Phalaris* mechanically, three times per year
- Arisings to be mulched on site, **ONLY** on areas where mature *Phalaris* stands are to be retained.
- Arisings from areas of cut Phalaris which are proposed to be eradicated must be removed from site.

- Refer both 4.4.2 *Retention of Phalaris for birds* and Appendix 4 for areas of mature *Phalaris* to be retained

Timing

- Mechanically cut *Phalaris* in early spring when new growth is starting, June when growth is most vigorous and August when it regrows

Prescription 3

4.1.3 Grading sward height of grassland towards woodland edge

Rationale

- Promotes diversity in sward height to the edge of the site which is beneficial for invertebrates
- The benefits for invertebrates may also benefit a number of the bird species on site, whose summer diets comprise primarily of invertebrates

Action

- Maintain a graded sward height towards woodland edge, with sward becoming progressively longer closer to woodland edge. Focus on compartments 1,2 and 9.
- 1m wide strip of sward height 50cm adjacent to woodland, followed by 1m wide strip of 20cm sward height adjacent to the normal cut height
- Arisings to be left to dry and drop seed, before being removed from site

Timing

- Cut in September after plants have set seed

Prescription 4

4.1.4 Management of scrub within grassland

Rationale

- To halt the process of succession on species rich grassland areas
- Retain specific scrub areas which have value as a nesting area for notable bird species including linnet (*Carduelis cannabina*), song thrush (*Turdus philomelos*) and dunnock (*Prunella modularis*)

Action

- Removal of self-seeded scrub, e.g. ash saplings and young willow, under 6 inches diameter by hand cutting. Remove suckering horizontal growth.
- Remove at a ratio of 4 in 5 (inclusive of all species)
- Arisings could be used in construction of hibernacula/refugia details
- Scrub including large bramble thicket to south west of the site should be retained as this has good connectivity into other scrub habitat desirable for a number of bird species (see Appendix 4)
- Any scrub greater than 6 inches diameter must be removed by CBC staff only and taken off site or chipped.

Timing

- To be removed over winter

Nb. Acceptable species and locations for planting/seeding – see Appendix 8

Prescription 4

4.1.5. General Management of the Grassland.

Rationale

- Promotes species richness to the grassland and reduce the takeover of scrub.
- Communicate to other site users.

Action

- Meadow to be cut annually by tractor and bailer in September. Cut height to be no shorter than 100mm.
- Ragwort to be hand pulled and removed from identified locations to stop spread.
- It is recommended that temporary signage be erected during cutting to inform local residents of the purpose of the management.
- Areas which are too wet to cut without causing ground damage can be left. Hand strimming / scrub control may be required in these areas in the absence of vehicle cutting to control coarse grasses/rushes/scrub.
- Ash saplings to be removed during cutting.
- Mowing must not take place within 1m of woodland/scrub edges in order to have a graded habitat edge.

- Consideration could be given to leaving areas unmown for two years on a rotation to retain some cover when cutting.

- See appendix 9 for a map showing areas to be cut.

4.2 <u>Objective: Maintain current, and increase where possible, suitability and provision on site for great crested newt (*Triturus cristatus*)</u>

Prescription 1

4.2.1 Creation of hibernacula

Rationale

- Increase hibernation/refuge provision for great crested newts on site and encourage colonisation of new ponds to the west of the site

Action

- Construct artificial hibernacula (see Appendix 5) for use by great crested newts and other amphibians, on site boundary close to pond on adjacent land. Compartment 7 is ideal.
- Construct artificial hibernacula, where appropriate, near to pond at south west of site
- Use timber and arisings from other management operations as construction material. Logs and branches in excess of 6cm diameter must be cut into lengths of no more than 1m if they are to be used in habitat piles. Any larger logs may be removed off site and used as firewood.

Timing

- To be constructed during spring/summer whilst newts are in aquatic phase and therefore are most likely to be in their pond(s), rather than in a terrestrial phase of their life cycle.

Prescription 2

4.2.2 Implementation of grass mowing regimes at times of year to reduce impact on great crested newts

Rationale

- Reducing the impact of mowing regimes on great crested newts, which if in their terrestrial phase, could be injured or killed by mowing practices

Action

- The following actions are only required within a **250m** buffer of the ponds on and around the site (see Appendix 3)
- *Phalaris* management to be limited to summer months
- As species-rich grassland should ideally be cut in September, cutting should be undertaken with hand tools or strimmer/brushcutters in daylight hours to minimise potential injury to great crested newts and other amphibians
- A hand search of the areas to be cut in September would be highly beneficial prior to commencement of works **if hibernacula/refugia are to be disturbed**. Hand searches should be undertaken by an appropriately trained individual(s)

Timing

- Cutting times ideally within May/June
- If cutting species-rich grassland, refer to above recommendations
- Cutting may also take place late March- June whilst newts are in their aquatic phase
- It should be noted that the area of *Phalaris* within this buffer may not need cutting annually and this will be down to the judgement of the site manager (in this case, the Senior Ranger)

Prescription 3

4.2.3 Scrub management around pond within site

Rationale

- Reducing scrub cover around the pond on site will maintain their suitability for great crested newts
- If scrub coverage, and therefore shading, becomes too dense, the suitability of ponds will decrease due to lack of light and therefore reduced macrophyte cover

Action

- Limit scrub growth around pond to avoid over shading and loss of grassland habitat
- Clear all scrub trees under 6 inches diameter within a 4m radius if the pond edge. Focus on sycamore.
- Any scrub greater than 6 inches diameter to be removed by CBC staff only

Timing

- To be removed over winter to avoid impacts to nesting birds
- Stumps should not be removed, as they provide hibernation potential

SECONDARY OBJECTIVES

4.3 Objective: Improve structure of semi-natural and plantation woodland

Prescription 1

4.3.1 Thinning of young trees in plantation woodland

Rationale

- Coverage of young trees is currently dense on the woodland edge, thinning some of these trees would allow remaining individuals to grow with a normal form, rather than growing straight up as a means of competing with adjacent trees. Thinning would also allow an understory to develop

Action

- Removal of young trees (less than 6 inches in diameter), particularly on woodland edge. Focus on southern edge of compartment 9.
- Remove at a ratio of 1 in 4
- Any young trees greater than 6 inches diameter to be removed by CBC staff only. Timber to be moved off site as firewood.
- Felled material could be used in construction of hibernacula detailed elsewhere in management plan. Any dead hedging should be limited to appropriate locations – an ideal location would be to the rear of compartment 9 and 4 to make access more difficult to and from the recycling site.

Timing

- To be removed over winter

Prescription 2

4.3.2 Coppicing of understory

Rationale

- Coppicing creates open areas within the woodland understory, allowing wildflowers such as bluebell (*Hyacynthoides non-scripta*) to flourish
  Coppicing would also enhance woodland structure

Action

- Coppicing of hazel, willow and ash trees (less than 6 inches diameter) in woodland understory
- Coppice at a ratio of 1 in 5 understory trees
- Any understorey trees greater than 6 inches diameter to be removed by CBC staff only
- Felled material could be used in construction of hibernacula detailed elsewhere in management plan
- Willow to be staked into small habitat piles that will decompose over time and not created into dense hedges. If large amounts of willow is being taken out the work needs to be co-ordniated with the rangers who can bring the chipper on site and will help carry out this task.

- Willows to be coppiced to ground level and stump treated where necessary. Where regeneration of the willow is required, stumps to be left at 6".
- Hazel to be coppiced to 3" – 6" dependant on ground conditions and locality of public access.

Timing

- To be coppiced over winter whilst trees are in a dormant state
- Felled material could be used in construction of hibernacula detailed elsewhere in management plan

Prescription 3

4.3.3 Removal of sycamore (Acer pseudoplatanus) & Rhododendron sp.

Rationale

- Sycamore is a non-native species, and the removal of saplings within the woodland will reduce the prevalence of this species over time
- The removal of saplings will reduce competition for the saplings of native tree species also growing in the woodland
- Rhododendron is now listed on Schedule 9 of the Wildlife & Countryside Act 1981 (as amended) as a non-native invasive species and as such should be managed to limit further spread and current coverage
- The dense, spreading structure of rhododendron often shades out areas of the woodland floor, where native ground flora would normally colonise

Action

- Removal of sycamore saplings and young trees, less than 6 inches diameter, within woodland
- Any saplings/young trees greater than 6 inches diameter are to be removed by CBC staff only
- Removal of rhododendron from the understory within woodland. Focus on compartments 1 and 2.
- Arisings from sycamore could be used in construction of hibernacula detailed elsewhere in management plan
- Arisings from rhododendron to be disposed of off site

Timing

- To be removed over winter

Prescription 4

4.3.4 Creation of glades within woodland

Rationale

- Glades within the woodland would allow sunlight to reach the floor, promoting growth of ground flora
- Such glades are important for some lepidopteran species

Action

- Removal of trees and scrub (under 6 inches diameter) to create gap in canopy where sunlight can penetrate

- Removal of trees and scrub greater than 6 inches diameter only to be undertaken by CBC staff
- Two proposed glade locations, see Appendix 4. These are located away from the woodland edge.
- Incorporate coppicing of suitable species into glade to provide some structure.
- Utilise felled material on site as hibernacula, habitat piles or dead hedging where possible

Timing

- Over winter

4.4 Objective: Improve provision for notable species of conservation concern

Prescription 1

4.4.1 Installation of bat boxes on mature trees

Rationale

- Several records and numerous features judged to be of high quality for commuting and foraging bats occur at the site
- Many trees on site are still young with negligible potential for use by roosting bats, therefore provision of artificial bat boxes will increase roosting potential at the site whilst younger trees mature

Action

- Installation of bat boxes on sheltered mature trees
- Suitable boxes include:
    - Schwegler bat boxes (e.g. 1FF model)
    - Nestbox Company boxes
    - Timber built crevice boxes for species such as common and soprano pipistrelle (*Pipistrellus pipistrellus* & *P.pygmaeus*)
    - Timber built cavity boxes for species such as brown long-eared (*Plecotus auritus*)
    - Home-made bat boxes (see Appendix 6)
- Installation criteria are as follows:
    - At least 4 or 5m off the ground
    - Sheltered from strong winds
    - Positioned to receive as much sunlight as possible
    - 2 or 3 boxes clustered on same tree with different aspects (ideally south, south east and south west) to allow bats to move between to find the appropriate temperature
    - The bats approach to the box must be clear, with no obstructing branches etc
    - Domed or headless nails, not fully hammered home, or straps should be used for installation
    - Iron nails may be used on trees with no commercial value, otherwise copper or aluminium are recommended

Timing

- Any time of year. Work with South or North Lancs Bat Group for guidance on the placement within the site.

Prescription 2

4.4.2 Retention of area of Phalaris arundinacea for birds

Rationale

- Mature stands of *Phalaris* on site are likely to be utilised by species such as reed bunting and grasshopper warbler
- Although the primary objective is to maintain and increase the grassland, adequate provision should be made to retain areas of *Phalaris* which are utilised by wildlife, particularly breeding birds

Action

- To retain specified areas of *Phalaris* as provision for species such as reed bunting, which may nest in this habitat. Minimise cutting and allow stands to grow taller/ more dense in order to be more favourable for birds.
- Where scrub is to be removed from within phalaris, small areas around the scrub removal may be cut to provide small scale structural diversity.
- Fire breaks are not recommended as these would have to be relatively wide in order to act as a break, which would cause a reduction in Phalaris and encourage access and therefore increase disturbance.

- Refer to Appendix 4 for areas to be retained

Timing

- Any time of year

Prescription 3

4.4.3 Retention of beech (Fagus sylvatica) within woodland

Rationale

- Barred sallow moth (*Xanthis aurago*) is a local BAP species, known to be present on the site, which feeds on both beech and field maple (*Acer campestre*)
- Beech is present, in small amounts, within the woodland composition and therefore should be retained as provision for this species

Action

- Retention of beech in woodland understory and canopy
- Planting of young beech saplings within woodland

Timing

- Throughout duration of management plan

Prescription 4

4.4.4 Increased suitability of grassland for ground nesting birds

Rationale

- Skylark (*Alauda arvensis*), lapwing (*Vanellus vanellus*) and grey partridge (*Perdix perdix*) are local and national BAP species

Action

- Reduction in stands of *Phalaris* (see primary objectives)

Timing

- See primary objectives

4.5 Objective: Reduce extent, and eradication where possible, of non-native invasive species

Prescription 1

4.4.5 Eradication of Japanese knotweed

Rationale

- Japanese knotweed is a vigorous, non-native invasive species. I can spread very quickly, creating dense stands which can cause structural damage
- Due to its non-native status, it has no natural predators controlling its spread
-

Action

- Removal/treatment of Japanese knotweed and rhizome (where possible)
- Treatment ideally needs to be undertaken for two to four growing seasons
- Glyphosate is a non-selective herbicide, suitable for use near water (in certain formulations), which is non-persistent in the soil. It is most effective July – September
- 2,4-D amine is a selective herbicide (it won't kill grasses), suitable for use near water (in certain formulations), which is persistent in the soil for around a month, it is effective throughout the growing season
- For further guidance, please see Environment Agencies 'The Knotweed Code of Practise'

Timing

- Avoid flowering 'season' to minimise risk to pollinators such as bees.

4.4.6 Removal of Himalayan balsam

Rationale

- Himalayan balsam is a prolific annual species with high rates of regeneration
- Due to its annual lifecycle, it dies back over winter leaving large areas of bare ground, which are then susceptible to erosion – a particularly significant problem on watercourses

- Its growth season starts early, often earlier than many native species, resulting in Himalayan balsam outcompeting native species

Action

- Removal of Himalayan balsam from site by hand pulling or strimming below the first node to prevent regrowth
- If being pulled, root must be crushed
- Arisings may be left to rot down on site in specific locations identified by the site manager (Senior Ranger)
- In areas of bramble, wait for the balsam to grow taller than the bramble before pulling it out. There is no need to cut the bramble back.

Timing

- Before flowering occurs - ideally June or throughout the growing season.

General Management

- Fencing off areas of the site as wildlife sanctuary is not recommended. Current levels of disturbance away from official paths appears to be minimal**.**

- Discrete signage could be an option to educate people about the sensitive nature of the site.

- Ragwort to be hand pulled in July/Aug in compartments to be cut by the tractor and bailer to stop the spread of the plant across the whole site. Ragwort to be retained in compartment 3 and part of compartment 4 to the left of the path . Path to form the boundary between ragwort retention and eradication.

- Bracken control around the pond and boundary of the lane.

- Litter picking – working closely with LCC Waste Management Group

- Footpath management – it is important to maintain and retain the width to the footpaths on Lower Burgh Meadows to encourage regular site users to stay on the paths and ensure that the grassland and woodland are kept undisturbed.

5 Monitoring

5.1 Monitoring is essential to assess the efficacy of the prescribed management of habitats, however, setting targets and complex monitoring schemes can sometimes be onerous, particularly when resources may be limited.

5.2 To assess the progress of several of the management prescriptions on site, a simple method has been devised to be implemented on an annual basis.

- Establish a fixed point of monitoring in first year
- 1m x 1m (for grassland) or 10m x 10m (for woodland) quadrat in habitat which is typical of the area to which the prescription relates (see below)
- Record all botanical species within quadrat
- Assign a rough estimate of percentage cover to each species
- Photograph the overall area, so that the structure and composition of the habitat is visible

5.3 This method of monitoring should be utilised to monitor the change in species composition/cover for the following prescriptions:

Maintain and increase extent of species rich wet grassland

Prescription 1 – *Management of small stands of Phalaris arundinacea within species rich wet grassland*

Prescription 2 – *Management of large stands of Phalaris arundinacea*

Prescription 3 – *Grading sward height of grassland towards woodland*

Improve structure of semi-natural and plantation woodland

Prescription 1 – *Thinning of young trees in plantation woodland*

Prescription 2 – *Coppicing of hazel understory*

Prescription 3 – *Removal of Sycamore and Rhododendron from understory*

Prescription 4 – *Creation of glades within woodland*

Appendix 1. Management Schedule

Objective	Prescription	Year		2015	2016	2017	2018	2019
		Action	Timing	Location	Location	Location	Location	Location
Maintain and increase extent of species rich grassland	Management of immature stands of *Phalaris* within species rich grassland	Cut *Phalaris* with scythes or brushcutter	March, June, August	3,4,5,6*	3,4,5,6*	3,4,5,6*	3,4,5,6*	3,4,5,6*
		Cut grassland	September	3,4,5,6*	3,4,5,6*	3,4,5,6*	3,4,5,6*	3,4,5,6*
		Arisings to be left to drop seed	Up to days after cut	3,4,5,6*	3,4,5,6*	3,4,5,6*	3,4,5,6*	3,4,5,6*
		Weed wiping	Late May	3,4,5,6*	3,4,5,6*	3,4,5,6*	3,4,5,6*	3,4,5,6*
	Management of mature stands of *Phalaris*	Cut *Phalaris* mechanically	March, June, August	-	3,4,5,6*	3,4,5,6*	3,4,5,6*	3,4,5,6*
		Mulching of arisings on rentained *Phalaris* stands	March, June, August	-	5,7,8*	5,7,8*	5,7,8*	5,7,8*
	Gradation of sward height on grassland/woodland edges	Cut 1m wide strip with sward height of 50cm adjacent to woodland edge	September	-	3,7,8,9	3,7,8,9	3,7,8,9	3,7,8,9
		Cut 1m wide strip with sward height of 20cm between 50cm strip and rest of grassland	September	-	3,7,8,9	3,7,8,9	3,7,8,9	3,7,8,9
	Management of scrub within grassland	Removal of self-seeded scrub at a ratio of 4 in 5	October - February	3,4,5,6,7	-	3,4,5,6,7	-	3,4,5,6,7
		Arisings to be used to construct hibernacula where possible	October - February	1,2,3,7	-	-	-	-
		Bramble thicket and other designated scrub areas to be retained	N/A	3,4,6,78*	3,4,6,78*	3,4,6,78*	3,4,6,78*	3,4,6,78*
Maintain current, and increase where possible, suitability and provision on site for great crested newt (*Triturus cristatus*)	Creation of artificial hibernacula	Construct hibernacula on south east site boundary near to great crested newt pond	October - February	7	-	-	-	-
		Construct hibernacula near to pond to south west of the site	October - February	1,3	-	-	-	-
	Implementation of grass cutting at times to reduce impact on great crested newts (within 250m pond buffer only)	*Phalaris* management limited to summer months	May/June	3,4,6,7	3,4,6,7	3,4,6,7	3,4,6,7	3,4,6,7
		Species rich grassland cut with hand tools in daylight hours	May/June	3,4,6,7	3,4,6,7	3,4,6,7	3,4,6,7	3,4,6,7
		Hand search of haitat prior to grassland cutting	May/June	3,4,6,7	3,4,6,7	3,4,6,7	3,4,6,7	3,4,6,7
	Scrub management around pond(s)	Remove all scrub trees around pond	October - February	1	-	-	-	-

Objective	Prescription	Year / Action	Timing	2015 / Location	2016 / Location	2017 / Location	2018 / Location	2019 / Location
Improve structure of semi-natural and plantation woodland	Thinning of young trees in plantation woodland	Removal of young trees on woodland edge at ratio of 1 in 4	October - February	-	-	9	-	-
		Arisings to be utilised in hibernacula construction where possible	October - February	-	-	9	-	-
	Coppicing of understory	Coppice suitable hazel, ash and willow trees within understory at a ratio of 1 in 5	November - February	-	9	-	2	-
		Arisings to be utilised in hibernacula construction where possible	November - February	-	9	-	2	-
	Removal of sycamore (*Acer pseudoplatanus*) and *Rhododendron* sp.	Removal of young sycamore trees and saplings within woodland	October - February	-	-	1,2,9	-	-
		Removal of Rhododendron from understory within woodland	October - February	-	-	1,2,9	-	-
		Sycamore arisings to be utilised in hibernacula construction where possible	October - February	-	-	1,2,9	-	-
		Rhododendron arisings to be diposed of off site	October - February	-	-	1,2,9	-	-
	Creation of glades within woodland	Removal of mature trees and scrub to create gap in canopy in proposed locations	October - February	2,9	-	-	-	-
		Utilise arisings for hiberncula, habitat piles and dead hedging where possible	October - February	1,3,7	-	-	-	-
Improve provision for notable species of conservation concern	Installation of bat boxes	Installation of suitable bat boxes	Any time of year	-	1,2,7,9	-	-	-
	Retention of some *Phalaris* for nesting birds	Retain designated areas of *Phalaris* on site	N/A	5,7,8*	5,7,8*	5,7,8*	5,7,8*	5,7,8*
	Retension of beech for barred sallow moth	Retension of young beech trees and saplings in woodland	N/A	1,2,9	1,2,9	1,2,9	1,2,9	1,2,9
	Increased suitability of the site for ground nesting birds	Reduction in prevalance of Phalaris on site	March,June, August	-	3,4,6,7*	3,4,6,7*	3,4,6,7*	3,4,6,7*

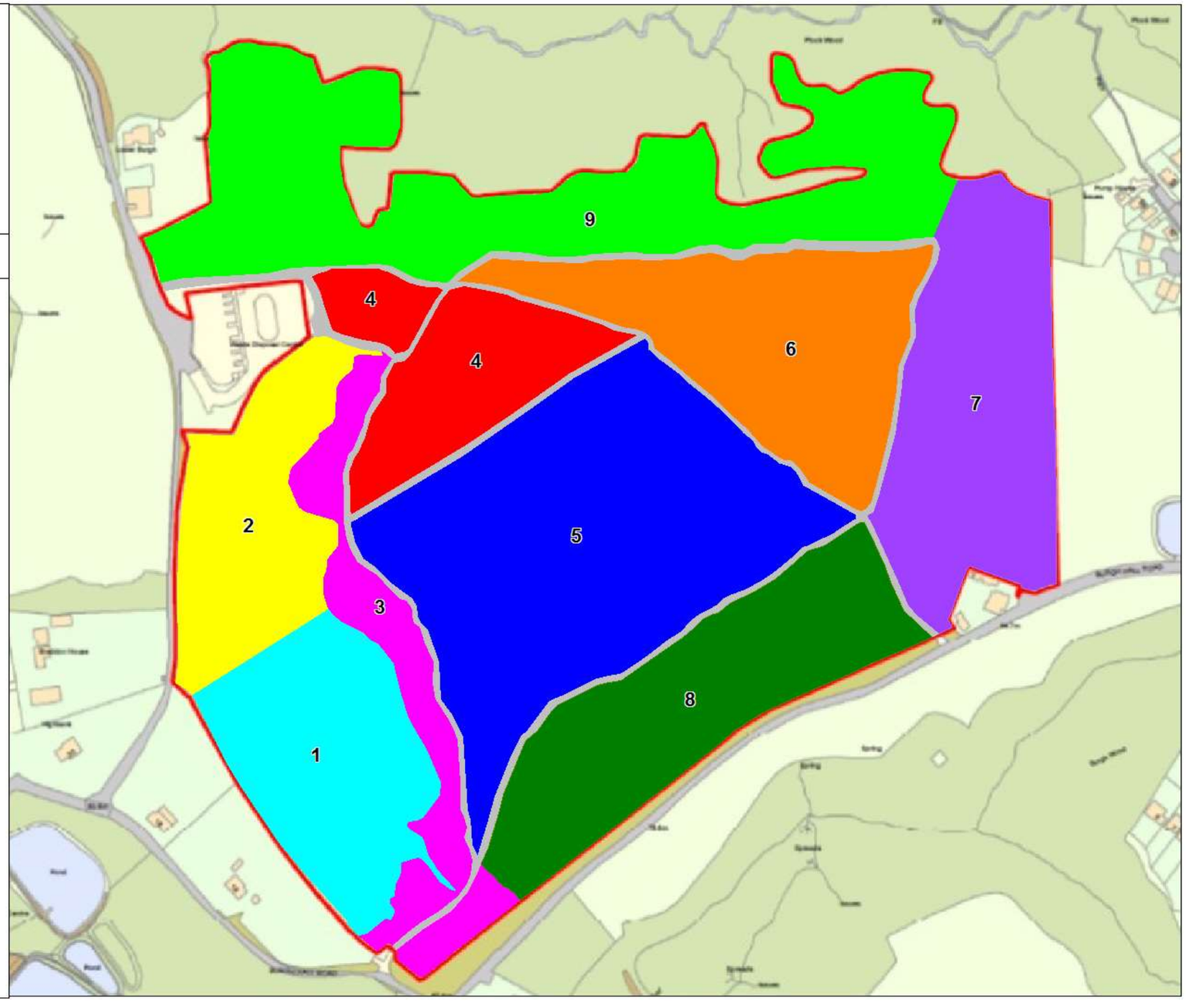
Objective	Prescription	Year / Action	Timing	2015 / Location	2016 / Location	2017 / Location	2018 / Location	2019 / Location
Reduce extent of non-native invasive species	Eradication of Japanese knotweed	Removal of Japanese knotweed and rhizome	Avoid flowering 'season'	2,9	2,9	2,9	2,9	2,9
	Removal of Himalayan balsam	Removal of Himalayan balsam by hand	June/July	All site	All site	All site	All site	.

Appendix 2. Management Compartments

BOW17.515
Lower Burgh Meadows

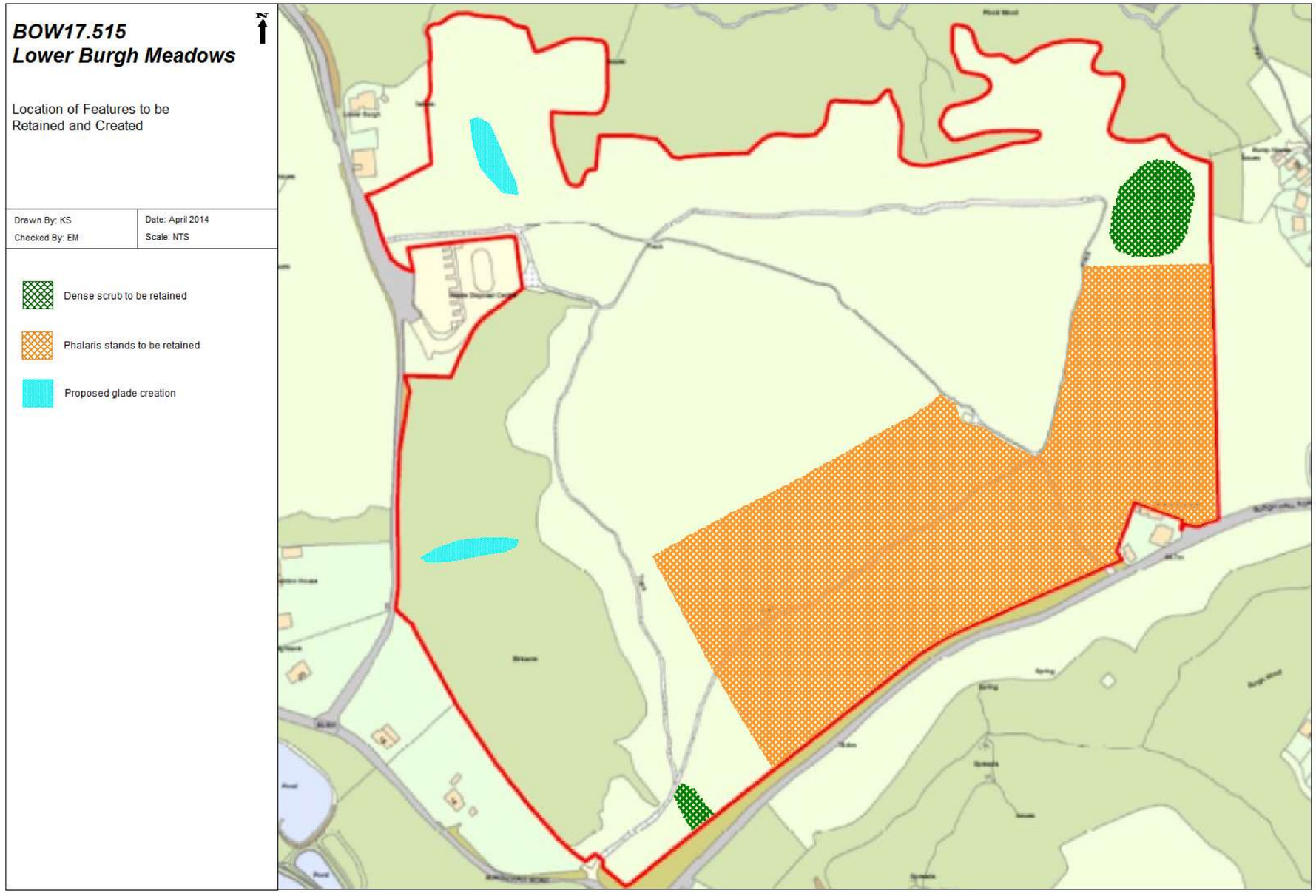
Location of Management Compartments

Drawn By: KS	Date: April 2014
Checked By: EM	Scale: NTS

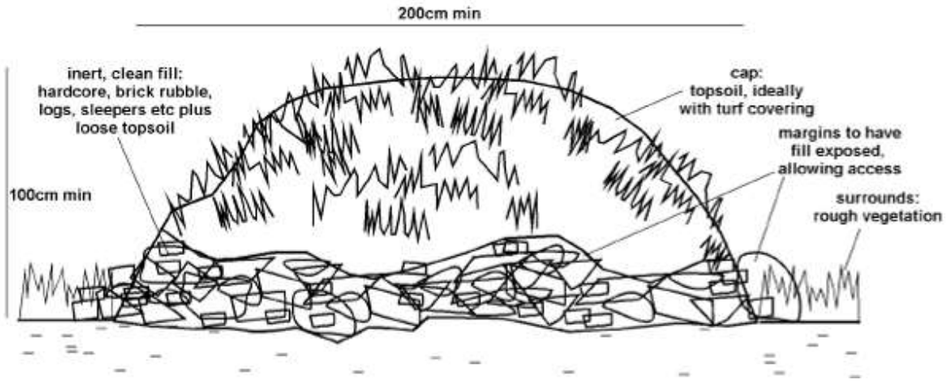


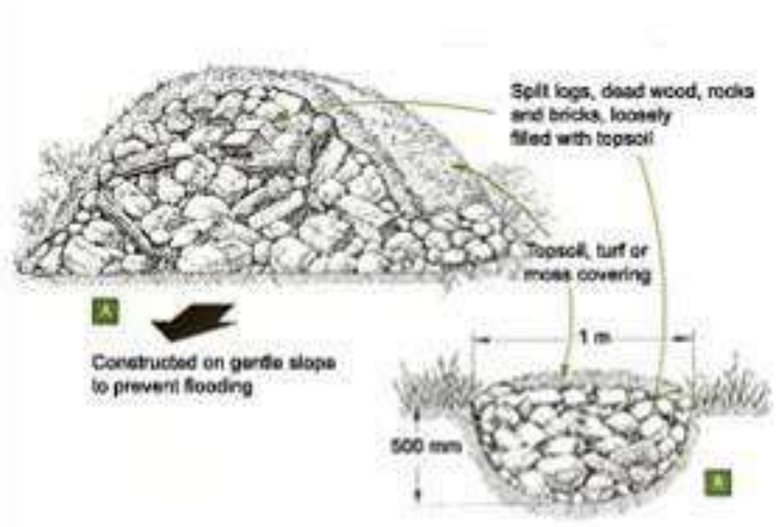
Appendix 3. Great Crested Newt Mowing Buffers

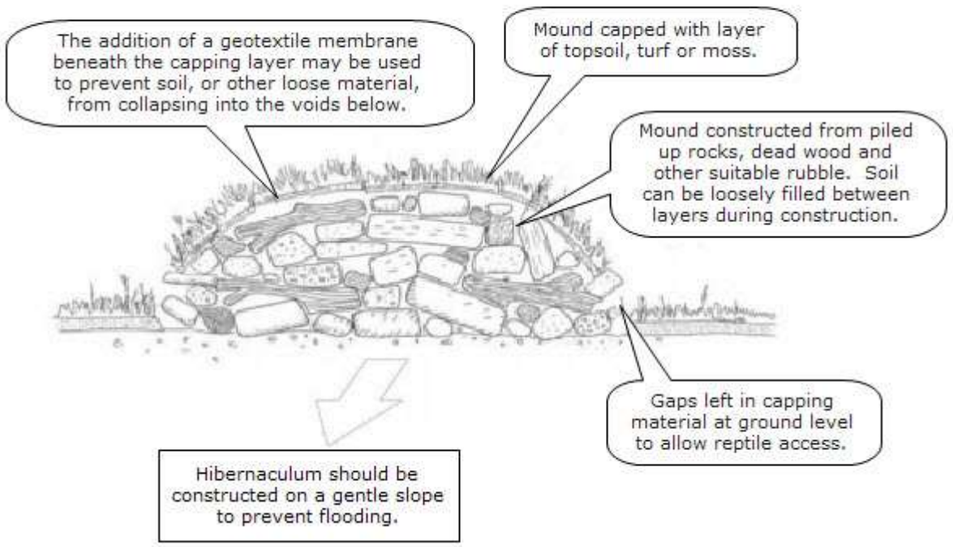
Appendix 4. Locations of Specific Management Prescriptions



Appendix 5. Great Crested Newt Hibernacula Construction Detail







Appendix 6. Bat Box Construction Detail

Bat Conservation Trust

How to make a bat box

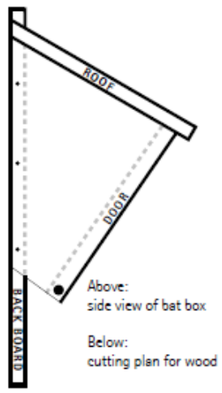
Providing bat habitats in your back garden

Bat boxes are artificial roosts, usually made of wood or woodcrete (a mixture of wood chips and concrete). They are designed to provide bats with alternative resting places to replace natural ones in tree holes, and also to encourage bats into areas where there are few such natural sites. Bat boxes have a useful place in bat conservation, but it should be remembered that bats take to boxes less readily than birds.

What makes a good bat box?

Recent research has shown that good insulation and avoidance of draughts are more important for attracting bats to boxes than is the material from which they are made. Bats do not like draughts, and prefer well-insulated boxes where temperature and humidity remain constant. Well-sealed joints are therefore important, as is the avoidance of large, loose-fitting front panels. The warmest area in a box, and the area that bats use most, is at the top – therefore a well-insulated top is important. Removable lids should be avoided, again to reduce draughts, but also to prevent disturbance or unintentional injury to bats when the box is opened. A special licence is required to disturb or handle bats in the UK, and any disturbance without a licence is illegal. For more information on bats and the law call the Bat Helpline (0845 1300 228).

All timber used in bat boxes should be rough-sawn to allow bats to cling and climb, and must also be untreated, since bats are very sensitive to the chemicals used for timber treatment. A 'bat ladder' or other landing area is essential, as is an entry slit wide enough to admit bats but narrow enough to keep out predators.



Above:
side view of bat box

Below:
cutting plan for wood

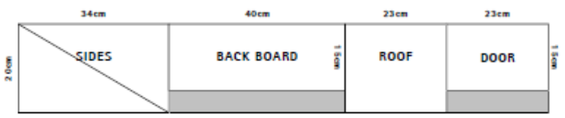
Making a bat box

Bat boxes take many shapes and sizes; here we give the details for a simple wooden wedge-shaped design that has been known to work well.

The cutting plan above is self-explanatory, except that the acute angled ends of the triangular sides are cut off to give the entrance slot of the required width, after allowing for the thickness of the door (ie cut off higher for a wider opening). The top edge of the back board and the rear edge of the roof must be bevelled to fit. The roof and back board are next to each other on the cutting plan so that, with a tilting circular saw or jigsaw, the bevels can be cut in one go. The cutting angle is approximately 62½.

The front-opening door is pivoted at the bottom on two clout nails. A hole is drilled high up through one side of the box and into the side of the door. This takes a loose-fitting clout nail which holds the door firmly closed against the door stops. These are cut from 10-12mm strip and are fitted at the top and sides of the door-opening to act as a door frame and aid weather-proofing. The side door stops are cut off about 3cm short of the bottom to allow freedom of movement of the door. A small screw is fitted as a knob for opening the door.

The only other point is to ensure that the door is a loose fit to allow for the wood swelling - the door stops take care of the gaps. We recommend gluing as well as nailing to ensure that there is the minimum of heat leakage - we suggest Extramite, which is an odourless wood glue.



With thanks to the Gwent Bat Group for this bat box design

Where should I put my bat box?

Boxes are most likely to be used if they are located in places where bats are known to feed. Woodland, parkland and river banks are good places, as are gardens close to ponds, rivers or parks. Sites should be sheltered from strong winds and exposed to sunlight for as much of the day as possible to increase their internal temperature. They should also be close to a hedge or tree line, as some species of bat use these to navigate and are reluctant to cross open spaces to get to and from roosts. Boxes should be positioned so that the bats' approach to them is clear of impediments such as tree branches, and should be as high as possible not only to maximise their exposure to sunlight but also to ensure security from cats or human vandals.

Ideally, two or three boxes should be clustered, facing in different directions in order to allow bats to select a range of roosting temperatures at different times of year – preferably south, south-east and south-west. Try to avoid due west, as this is the prevailing direction of the wind & rain!

For more information on bats, bat boxes and encouraging bats to your garden, visit www.bats.org.uk or call 0845 1300 228

The Kent bat box

Simple to construct, self-cleaning and low maintenance.

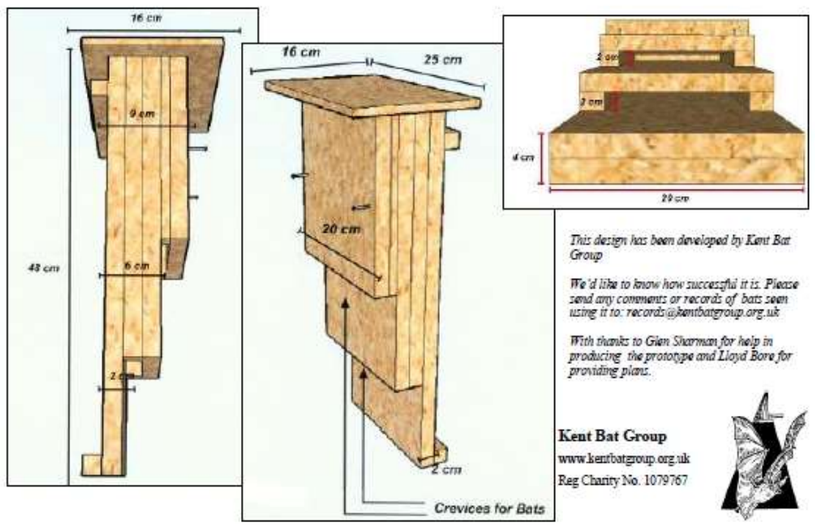
The only critical measurement is the width of the crevices—these should be no larger than suggested. Other measurements are approximate.

Materials and construction

Box to be made from untreated rough-sawn timbers
Timber should be c.20mm thick
The box should be rainproof and draught-free
Crevices can be between 15 and 25 mm wide
Fixing may be by use of brackets, durable bands or wires

Location

Boxes are best fixed as high as possible in a sheltered wind-free position, exposed to the sun for part of the day.
They can be fitted to walls, other flat surfaces or trees
A clear flight line to the entrance is important



This design has been developed by Kent Bat Group

We'd like to know how successful it is. Please send any comments or records of bats seen using it to: records@kentbatgroup.org.uk

With thanks to Glen Sharman for help in producing the prototype and Lloyd Bore for providing plans.

Kent Bat Group
www.kentbatgroup.org.uk
Reg Charity No. 1079767

Appendix 7. Protected Species Legislation

Species	Legislation (England & Wales)	Offences	Notes on licensing procedures and further advice (England & Wales)
Species that are protected by European and national legislation			
Bats *European protected species*	Conservation of Habitats and Species Regulations 2010 Reg 41	• Deliberately[1] capture, injure or kill a bat; • Deliberate disturbance[2] of bats; • Damage or destroy a breeding site or resting place used by a bat. The protection of bat roosts is considered to apply regardless of whether bats are present.	An NE licence in respect of development is required in England or a licence from the Welsh Assembly Government in consultation with CCW in Wales. *European Protected Species: Mitigation Licensing- How to get a licence* (NE 2010) *Bat Mitigation Guidelines* (English Nature 2004) *Bat Workers Manual* (JNCC 2004)
	Wildlife and Countryside Act 1981 (as amended)[4] S.9	Intentionally or recklessly[3] obstruct access to any structure or place used for shelter or protection or disturb a bat in such a place.	Licence from NE or CCW is required for surveys (scientific purposes) that would involve disturbance of bats or entering a known or suspected roost site.
Birds	Conservation of Habitats and Species (Amendment) Regulations 2012	• N/A	Authorities are required to take steps to ensure the preservation, maintenance and re-establishment of a sufficient diversity and area of habitat for wild birds in the United Kingdom, including by means of the upkeep, management and creation of such habitat. This includes activites in relation to town and country planning functions.
	Wildlife and Countryside Act 1981 (as amended)[4] S.1	• Intentionally kill, injure or take any wild bird; • Intentionally take, damage or destroy the nest of any wild bird while that nest is in use or being built; • Intentionally take or destroy the nest or eggs of any wild bird. **Schedule 1 species** Special penalties are liable for these offences involving birds on Schedule 1 (e.g. most birds of prey, kingfisher, barn owl, black redstart, little ringed plover). Intentionally or recklessly[3] disturb a Schedule 1 species while it is building a nest or is in, on or near a nest containing eggs or young; intentionally or recklessly disturb dependent young of such a species.	No licences are available to disturb any birds in regard to development. Licences are available in certain circumstances to damage or destroy nests, but these only apply to the list of licensable activities in the Act and do not cover development. General licences are available in respect of 'pest species' but only for certain very specific purposes e.g. public health, public safety, air safety. http://www.naturalengland.org.uk/Images/wlmsfaqs_tcm6-3859.pdf www.naturalengland.org.uk/ourwork/regulation/wildlife/advice/advisoryleaflets.aspx
Great crested newt *European protected species*	Conservation of Habitats and Species Regulations 2010 Reg 41	• Deliberately[1] capture, injure or kill a great crested newt; • Deliberate disturbance[2] of a great crested newt; • Deliberately take or destroy its eggs; • Damage or destroy a breeding site or resting place used by a great crested newt.	Licences issued for development by NE or from the Welsh Assembly Government in consultation with CCW. *European Protected Species: Mitigation Licensing - How to get a licence* (NE 2010) *Great Crested Newt Mitigation Guidelines* (English Nature 2001)
	Wildlife and Countryside Act 1981 (as amended)[4] S.9	Intentionally or recklessly[3] obstruct access to any structure or place used for shelter or protection or disturb a great crested newt in such a place.	Licences issued for science (survey), education and conservation by NE or CCW.

Appendix 8. Acceptable Species & Locations for Planting

Supplementary planting/sowing can be undertaken within **compartment 3 only**. All other compartments where grassland is the dominant habitat (compartments 4, 6 and 7) are to be left to allow species, which may be present in the seed bank, to come through following management of immature *Phalaris* stands.

If supplementary planting is deemed necessary, seed should be collected from site and either sown or propagated into plug plants. Buying seeds/plugs of individual species from retailers should be avoided where possible, this will ensure species of local provenance persist at the site. If plants are purchased, they should be UK grown and of local provenance, where possible. We recommend Landlife (Liverpool) and Cumbria Wildflowers (Carlisle) as both companies follow the Flora Locale/Plantlife Code of Practise.

Below are lists of species which are acceptable to plant/sow at site (with the permission of the site manager). No other species are to be planted/seeded.

Common Name	Scientific Name	Lowland	Shaded	Unshaded	Acid	Neutral	Alkaline	Damp	Dry
Yarrow	*Achillea millefolium*	*		*		*	*		*
Marsh marigold	*Caltha palustris*	*	*	*	*	*	*	*	
Common knapweed	*Centaurea nigra*	*		*		*	*		*
Foxglove	*Digitalis purpurea*	*	*		*	*			*
Meadowsweet	*Filipendula ulmaria*	*	*	*		*		*	
Field Scabious	*Knautia arvensis*	*		*		*	*		*
Meadow vetchling	*Lathyrus pratensis*	*		*		*	*	*	*
Oxeye daisy	*Leucanthemum vulgare*	*		*		*	*		*
Bird's-foot-trefoil	*Lotus corniculatus*	*		*	*	*	*		*
Ragged robin	*Lychnis flos-cuculi*	*		*		*		*	
Purple Loosestrife	*Lythrum salicaria*	*		*		*		*	
Cowslip	*Primula veris*	*		*		*	*		*
Primrose	*Primula vulgaris*	*	*	*		*	*		*
Selfheal	*Prunella vulgaris*	*	*	*		*		*	*
Yellow Rattle	*Rhinanthus minor*	*		*		*	*	*	*
Tufted vetch	*Vicia cracca*	*		*		*			*

Table 1. Acceptable terrestrial plant species

Common Name	Scientific Name	Lowland	Acid	Neutral	Alkaline	Damp	Dry
Alder	*Alnus glutinosa*	*	*	*		*	
Silver Birch	*Betula pendula*	*		*	*		*
Hazel	*Corylus avellana*	*		*	*		*
Hawthorn	*Crataegus monogyna*	*		*	*		*
Ash	*Fraxinus excelsior*	*		*	*		*
Holly	*Ilex aquifolium*	*		*			*
Honeysuckle	*Lonicera periclymenum*	*	*	*	*		*
Crab Apple	*Malus sylvestris*	*		*	*		*
Wild Cherry	*Prunus avium*	*		*	*		*
Blackthorn	*Prunus spinosa*	*		*	*		*
Pedunculate Oak	*Quercus robur*	*		*	*		*
Field Rose	*Rosa arvensis*	*		*	*		*
Dog Rose	*Rosa canina agg.*	*		*	*		*
Elder	*Sambucus nigra*	*	*	*	*		*
Rowan	*Sorbus aucuparia*	*	*	*	*		*
Guelder-rose	*Viburnum opulus*	*		*		*	
Elm	*Ulnus Lutuce*						

Table 2. Acceptable tree/shrub species

Common Name	Scientific Name	Habitat
Yellow iris	*Iris pesudacorus*	Marginal
Water forget-me-not	*Myosotis scorpioides*	Marginal
Gipsywort	*Lycopus europaeus*	Marginal
Marsh marigold	*Caltha palustris*	Marginal
Meadowsweet	*Filipendula ulmaria*	Marginal
Water mint	*Mentha aquatica*	Marginal
Water plantain	*Alisma plantago-aquatica*	Marginal
Ragged robin	*Lychnis flos-cuculi*	Marginal
Lesser spearwort	*Ranunculus flammula*	Marginal
Flowering rush	*Butomus umbellatus*	Marginal
Spiked water milfoil	*Myriophyllum spicatum*	Aquatic
Rigid hornwort	*Ceratophyllum demersum*	Aquatic
Broadleaved pondweed	*Potamogeton natans*	Aquatic
Curled pondweed	*Potamogeton crispus*	Aquatic

Table 3. Acceptable marginal/aquatic species

Appendix 9. Grass Cutting Regime