

2.4 PRELIMINARY ECOLOGICAL APPRAISAL

An extended Phase 1 Habitat survey was conducted on 31st July 2018 to update the results from the Preliminary Ecological Appraisal completed in June 2015. The purpose of the assessment was to identify existing habitats, carry out a protected species risk assessment and to make recommendations for enhancing the nature conservation value of the site.

PROPOSED HABITAT IMPROVEMENTS

Broadleaved woodland currently covers approximately 3.7 ha. (14%) of the Park. Much of the canopy cover is very dense and as a result shrub and ground layers are limited. Proposals include to diversify 40% of the woodland areas within the park by clearing many self-seeded species to allow more light into the understorey and encourage a more diverse field and shrub layer to support a larger variety of wildlife. Existing fallen and standing deadwood will be retained in situ within less accessible areas of woodland providing opportunities for fungi and deadwood invertebrates such as the Species of Principal Importance stag beetle. Areas of amenity and semi-improved grassland within the Sweet Walk will see an additional 900m² of shrub and field layer improvements with a palette of flowering and berry producing shrubs of known value to wildlife to provide foraging opportunities to pollinating insects, birds and small mammals. Fruiting shrubs will be chosen to target particular declining bird species, such as song thrush.

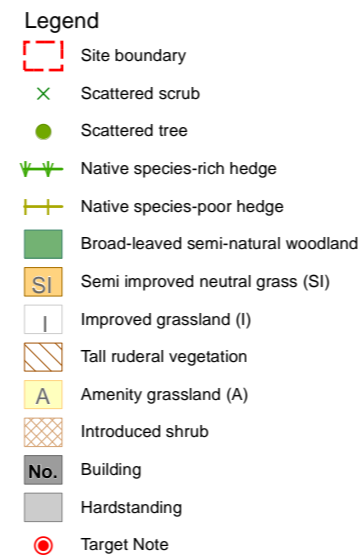
Semi-improved grassland makes up 2.2 ha. (8%) of the Park. By relaxing the mowing regime in areas of amenity grassland to encourage a more diverse ground flora, a further 1.3 ha. of semi-improved grassland can be contributed. This is proposed mainly along the northern boundary of the Park, in belts across the East Meadow and to the perimeter of the proposed dog-free area extension in the West Meadow. New areas of semi-improved grassland will be seeded with a locally sourced species mix collected from nearby grassland to ensure local provenance and encourage ecological connectivity. The grassland would be managed by infrequent hay cuts in a similar way to existing semi-improved grassland at the site, allowing for a longer flowering season and encouraging pollinating insects, including bees, butterflies and flies. A healthy invertebrate fauna would also provide a prey resource for birds and bats.

New tree planting is proposed within the Pleasure Grounds, in the form of avenues, groves and orchards, occurring in currently open areas of amenity grassland and as part of the broadleaved woodland diversification. The orchards will

include a mixture of cherry, plum, apple and pears known to have historic relevance. The grassland beneath will have a relaxed management regime, allowing this habitat to mature as a traditional orchard (a Habitat of Principal Importance). New trees will predominantly comprise native species or those with known wildlife value. Elms, including wych elm, English elm and the Dutch Elm Disease-resistant variety of *Ulmus japonica*, will be utilised to support the Priority Species of butterfly the white-letter hairstreak, whose caterpillars feed on elms. The new tree avenues running north-south in the Pleasure Grounds will encourage new bat flight lines and sheltered foraging opportunities. Further tree planting is proposed within the extended bands of semi-improved grassland in the East Meadow.

Note: Further specific survey work has been undertaken in relation to bats and badgers, refer to the subsequent sections.

Please refer to the full Preliminary Ecological Appraisal report, The Ecology Consultancy, August 2018.



Surveyed habitat areas



2.5 BAT SURVEY

The following bat survey work was carried out by FOA Ecology between September 2016 and August 2018 to inform the project proposals:

- Collation of bat records
- Buildings inspection (internal and external)
- Bat detector surveys of buildings
- Ground-level tree assessment
- Bat detector surveys of trees
- Bat activity surveys (walking transects and static detector deployment)

The full survey report can be found in the appendices accompanying this application.

The main findings of the building survey work are:

- Marble Hill House - no evidence of use by bats from internal and external inspection
- Coach House - no evidence of maternity roosts, non-breeding summer roosts or mating roosts
- Ticket Office - no evidence of maternity roosts, non-breeding summer roosts or mating roosts
- Disused Toilet Block - no evidence of maternity roosts, non-breeding summer roosts or mating roosts

Six trees were identified to have potential for roosting bats, T12, G8.31, G8.53, G9.7, G9.10 and G9.17 as surveyed.

The main findings of tree survey work are:

- G8.31 had been removed between the 2017 and 2018 inspection for health and safety reasons by English Heritage.
- No direct evidence of any of the trees being used by roosting bats identified during survey
- Tree G9.10 is assessed to have moderate maternity and day/transitional roost potential
- All other trees assessed to have low maternity/hibernation and moderate day/transitional roost potential

The main findings of the walking transect bat activity survey are:

- Evidence of several bat species forage within and traverse the park
- Most common bats detected are soprano and common pipistrelles and 'big bat' species such as noctule, Leislers and serotine
- Bat activity is encountered in all areas of the park, along wooded edges, the woodland quarters surrounding Marble Hill House and above open spaces such as the Great Lawn

The main findings of the static bat survey work are:

- The majority of bat activity is dominated by pipistrelle species
- The highest volume of bat activity is concentrated along the southern boundary of the park adjacent to the River Thames
- The bat activity detected in each of the woodland quarters was varied but evidenced that, collectively, along with the western avenue leading down to the Thames, they are an important foraging resource and commuting route for bats

The following mitigation and enhancements are suggested as part of the project proposals:

- A staged plan of tree removals and coppicing works
- The use of mature shrub and tree specimens as part of replacement planting
- Provision of tree and building mounted bat boxes
- Light spillage minimisation controls to be employed both in proposals and throughout the construction phase
- Inclusion of bat-friendly plant species such as night-scented plants to encourage flying insects
- Provision of bat access to the existing Ice House
- Provision of crevice features in existing Grotto structure
- Provision of bat access to areas of the Marble Hill House basement
- Increased habitat connectivity across east meadow through additional tree/shrub planting with wildflower-rich grassland understorey

The majority of the mitigation and enhancement recommendations can be achieved within the landscape proposals. The proposed new understorey shrub planting will include night-scented species to attract flying insects for bat foraging and the tree belt in the east meadow will be bolstered by new tree planting and a relaxed mowing regime to encourage a more biodiverse grassland. Working alongside an ecologist bat boxes will be provided in suitable locations and no additional lighting is proposed within the landscape, above current provision (the park will remain closed to the public at night). A programme of tree works would be developed in collaboration with the contractor to ensure staged operations. Further exploration will need to be carried out to establish opportunities for bat-friendly features within the Ice House and Grotto, whilst respecting their heritage significance. Bat mitigation and enhancement measures in relation to the Stables and Marble Hill House are not covered in this landscape chapter of the Design & Access Statement.

Of the trees identified to have bat roost potential, the following works are proposed as part of the project works:

- T12 - Cat B. tree to be retained
- G8.31 (already removed for health and safety reasons)
- G8.53 - Cat. U tree proposed for removal for health and safety reasons
- G9.7 - Cat. U tree to be retained as standing dead wood for ecological reasons
- G9.10 - Cat. U tree to be retained as standing dead wood for ecological reasons
- G9.17 - Cat. U tree to be removed for health and safety reasons (tree has major decay at the base)

All works to the bat potential trees will be carried out under supervision of a qualified bat worker and suitable bat features will be retained where possible, whilst meeting health and safety requirements.



2.6 BADGER SURVEY

The following badger survey work was carried out by FOA Ecology between October 2017 and July 2018 to inform the project proposals:

- Initial badger walkover survey
- Badger sett camera trapping (2017 and 2018)
- Formal badger sett and latrine survey
- Badger bait marking survey

The full survey report can be found in the appendices accompanying this application.

During the initial badger walkover survey, six sets of holes were identified within the woodland quarters surrounding Marble Hill House, that could be characteristic of badger. This enabled the scope of the first camera trap survey to be determined.

The main findings of the 2017 camera trap survey are:

- Badger movement was captured at hole H1, located in the south-east woodland quarter, and is deemed to be an outlier sett
- Badger movement was captured at hole H2, located in the north-east woodland quarter, and is deemed to be an outlier sett
- No further badger footage was captured at holes H3-H6

The following year, in 2018, a formal badger sett survey was carried out. Approximately 30no. badger setts were identified within Marble Hill Park and the immediately surrounding area. The setts were categorised by location; Marble Hill Park, Meadowside, Cambridge Park and Orleans House Gallery (woodland). This survey, along with a latrine survey, informed the scope of the badger bait marking work which was carried out to establish the presence of one or more badger social setts.

The colour-coded bait pellets were distributed at 3no. sett locations; the main sett located at Meadowside, a large sett located in the garden of a property in Cambridge Park and an outlier sett in the north-east woodland quarter in Marble Hill Park. The results of the survey inferred that the badgers present at Marble Hill belong to a single social group which make use of numerous different setts within their territory.

Expanded camera trap survey work was carried out in June and July 2018 to include the sett to the eastern boundary of Marble Hill Park, as well as the woodland quarters. The following is a summary of the findings:

- NE woodland quarter - badger footage captured and deemed consistent with use as an outlier sett
- SE woodland quarter - badger footage captured and

deemed consistent with use as an outlier sett

- SW woodland quarter (at tree root) - badger footage captured and deemed consistent with use as an outlier sett
- SW woodland quarter (at side of path) - no badger footage captured, deemed not in current use
- East park boundary - badger footage captured of both adult and young, and deemed consistent with use as cub rearing sett (annexe)

The following mitigation and enhancements are suggested as part of the project proposals:

- Pre-works sett monitoring prior to any construction works
- Licensed sett closure where required for implementation of landscape design proposals
- Provision of small artificial sett
- Provision of widened tall grassland and new tree planting
- Provision of badger gaps in new fence lines
- External light spillage reduction
- Standard construction stage precautionary mitigation measures
- Increased habitat connectivity across east meadow through additional tree/shrub planting with wildflower-rich grassland understorey
- Provision of new native shrubs and hedgerows to south and east sections of park boundary

The majority of the mitigation and enhancement recommendations can be achieved within the landscape proposals. Further badger monitoring work will be carried out and all necessary licenses will be obtained prior to construction works commencing.

The tree belt in the east meadow will be bolstered by new tree planting and a relaxed mowing regime to encourage a more biodiverse grassland, which will not only provide increased movement corridors and foraging areas for badgers, but will also benefit bat habitats as mentioned in the previous section. The proposed new avenues and grove tree planting to the east and west of the Pleasure Grounds will have an understorey of tall grassland, encouraged by a relaxed mowing regime, which will also increase badger movement corridors. Where new sections of hedge and fencing are proposed around the woodland quarters, the team will work closely with an ecologist to establish badger movement corridors and provide suitable gaps in fencing to allow access to existing setts and potential habitats.

Provision of a small artificial badger sett will be further explored, working with an ecologist to establish the most suitable location. Provision of native shrubs and hedgerows to the south and east park boundaries of the park will be delivered as part of long-term management and on-going planting in the park, undertaken by the head gardener and apprentices, and has the potential to be a volunteer engagement activity.