ST. MICHAEL'S SWORDS

SURVEY OF LARGE MAMMAL ACTIVITY

FINAL REPORT

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MAMMAL SURVEY

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ST. MICHAEL'S SWORDS
MAMMAL SURVEY

1. INTRODUCTION

Faith Wilson (an independent ecological consultant and mammal specialist) was commissioned by St Michael's House to undertake a survey of mammal activity in lands adjoining St. Michaels' House on the Dublin road in Swords.

St. Michael's House are proposing to build a day care centre for people with disabilities on this site and in a land swap, Fingal County Council are giving them a site adjoining their premises at 61 Dublin Road, Swords as depicted on **Figure 1** below.

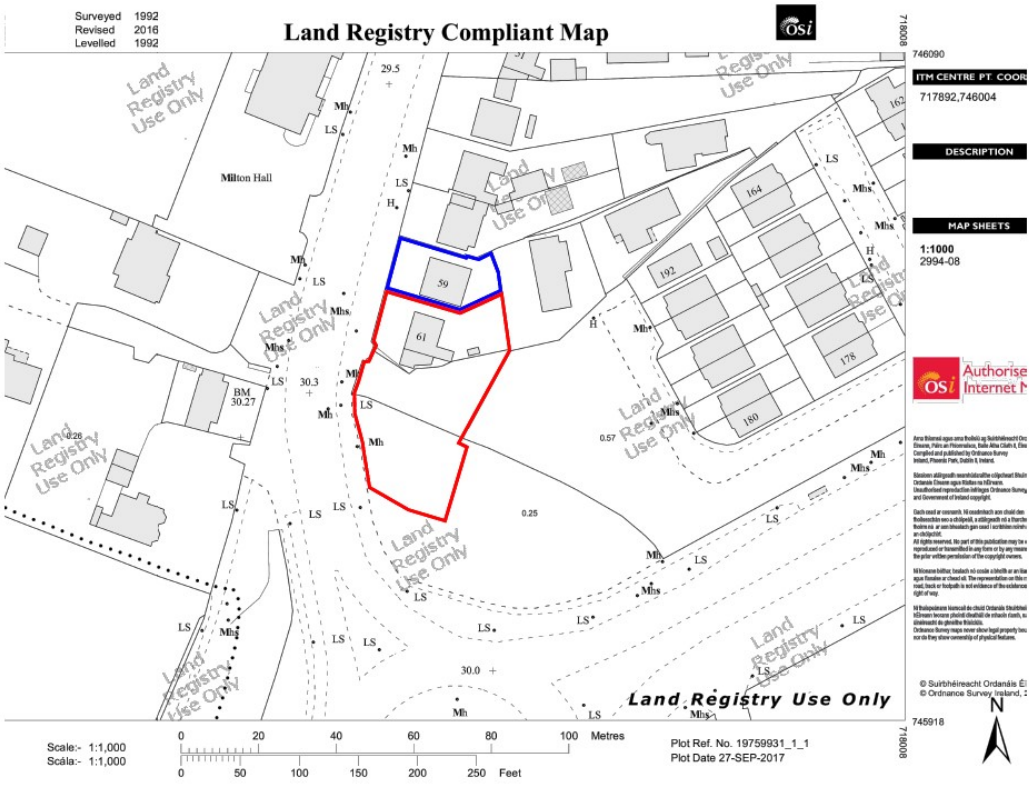

Figure 1. Proposed development lands.

Part of the site is within a wooded area, which is owned by Fingal County Council. As part of the planning application for St. Michael's House, Fingal County Council requested that an Environmental Report is prepared on the wooded area to see if it will affect bats or other wildlife.

This assessment of the potential use by mammal fauna of the wooded area focused principally on badger and bats, but notes on any other small terrestrial mammals and bird species encountered have also been included. Comments and observations and on other aspects of ecological/conservation interest are also provided. This report details the findings of the survey and proposes suitable mitigation measures to reduce any potential impacts of the development on mammals and other ecological interests. Some of these will need to be implemented by Fingal County Council and some by St. Michael's House.

2. METHODOLOGY

2.1 General Methods

This mammal survey was first carried out on the 8th January 2021 by Faith Wilson, with an additional follow up survey for bat activity on 18th May 2021. A dedicated large mammal survey was carried out during the site visits using the techniques as prescribed in Ecological Survey Techniques for Protected Flora and Fauna (NRA, 2009). This entailed searching for and identification of signs, tracks and droppings of various mammals (including badger, pine marten, Irish stoat, Irish hare, red squirrel, hedgehog and pygmy shrew along with non-native species such as, American mink, grey squirrel and rabbit) within the study area. Badger setts, trails and foraging areas were looked for along earthen banks and treelines within the property. The presence of mammals is indicated principally by their signs, such as dwellings, feeding signs or droppings, though direct observations are also occasionally made.

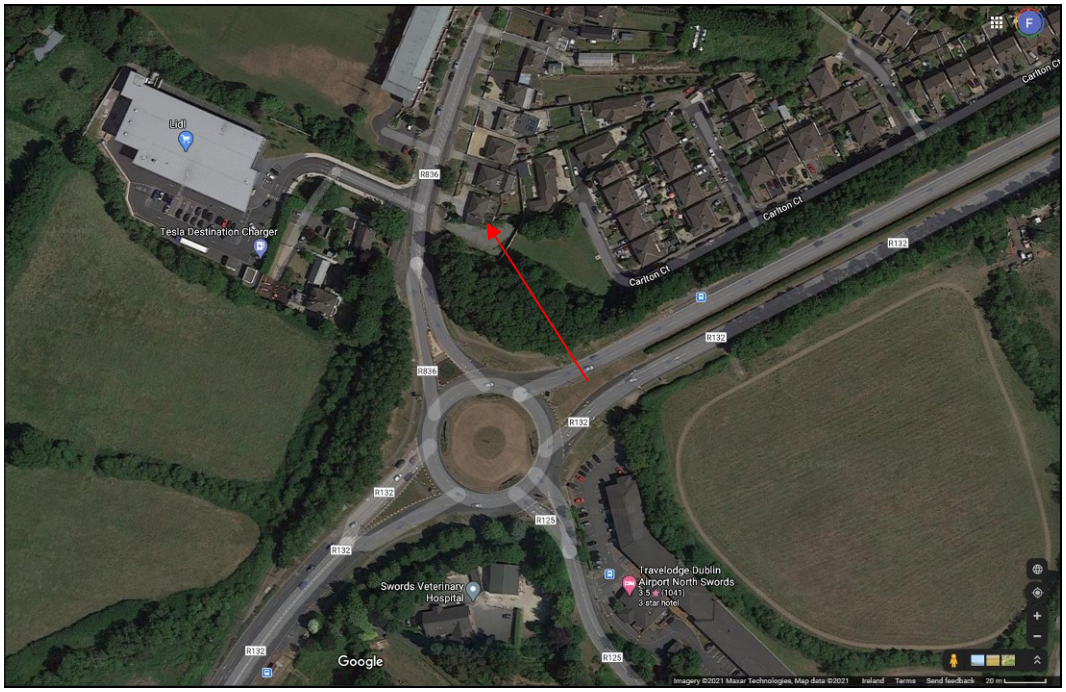

Figure 2. Google mapping showing extent of wooded area adjoining St. Michael's House (indicated by the red arrow) at the Pinnockhill Roundabout.

2.2 Desk study

A desk study was carried out to collate the available information on the ecological environment. The National Parks and Wildlife Service (NPWS) database of designated conservation areas and NPWS records of rare and protected plant and animal species were checked with regard to the location of the wooded area at Pinnockhill Roundabout.

Information on protected species of fauna and flora listed for protection under Annex II of the EU Habitats Directive (92/43/EEC), Annex I of the Birds Directive (79/409/EEC) and the Wildlife (Amendment) Act (2000) was also

sought from NPWS and other published sources including previous studies in the area.

These included a survey of lands to the east of the R132 at Barrysparks conducted by this author in December 2020 and surveys conducted as part of the Swords/Airport to City Centre Swiftway project by this author in 2015.

2.3 Wildlife Legislation

Badgers

Badgers (*Meles meles*) are common and widespread in Ireland, and are found in all lowland habitats where the soil is dry and not subject to flooding (Hayden and Harrington, 2000). Badgers are social animals that live in complex underground tunnel systems called setts. Badger territories may vary in size from about 60-200 ha (Smal, 1995).

Badgers and their setts legally are protected under the provisions of the Wildlife Act, 1976, and the Wildlife Amendment Act, 2000. It is an offence to intentionally kill or injure a protected species or to wilfully interfere with or destroy the breeding site or resting place of a protected wild animal. It is standard best practice to ensure that mitigation measures are taken to limit impacts on badgers and badger populations during developments.

Bats

Eleven species of bats occur in Ireland and all are protected under both national and international law.

Wildlife Act 1976

In the Republic, under Schedule 5 of the Wildlife Act 1976, all bats and their roosts are protected by law. It is unlawful to disturb either without the appropriate licence. The Act was amended in 2000.

Bern and Bonn Convention

Ireland has also ratified two international conventions, which afford protection to bats amongst other fauna. These are known as the 'Bern' and 'Bonn' Conventions. The Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention 1982), exists to conserve all species and their habitats, including bats. The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention 1979, enacted 1983) was instigated to protect migrant species across all European boundaries, which covers certain species of bat.

EU Habitats Directive

All bat species are given strict protection under Annex IV of the EU Habitats Directive, whilst the lesser horseshoe bat (*Rhinolophus hipposideros*) and greater horseshoe bat (*Rhinolophus ferrumequinum*) are given further protection under Annex II of the EU Habitats Directive. Both are listed as a species of community interest that is in need of strict protection and for which E.U. nations must designate Special Areas of Conservation (SACs). The latter is only known from a

single site and no breeding populations have been recorded to date. The former are a species of the western seaboard of Ireland and have not yet been recorded on the east coast.

The principal pressures on Irish bat species have been identified as follows:

- urbanized areas (e.g. light pollution);
- bridge/viaduct repairs;
- pesticides usage;
- removal of hedges, scrub, forestry;
- water pollution;
- other pollution and human impacts (e.g. renovation of dwellings with roosts);
- infillings of ditches, dykes, ponds, pools and marshes;
- management of aquatic and bank vegetation for drainage purposes;
- abandonment of pastoral systems;
- speleology and vandalism;
- communication routes: roads; and
- inappropriate forestry management.

Invasive Species

Until recently there has been no legal framework for the control or eradication of non-native invasive species in the Republic of Ireland. The Birds and Habitats Regulations (2011) which were signed on 21st September 2011 by the then Minister for Arts, Heritage and the Gaeltacht Jimmy Deenihan, included new legislation on invasive and non-native species in Sections 49 and 50.

Since then the EU Regulation on Invasive Alien Species (EU Regulation 1143/2014) also came into force on the 3rd August 2016.

The plant and animal species to which the Birds and Habitats Regulations (2011) apply are presented in Schedule Three. Part 1 details the plants species, while Part 3 outlines those animal or plant vector materials and are presented below.

Third Schedule: Part 1 Plants

Non-native species subject to restrictions under Regulations 49 and 50.

First column	**Second column**	**Third column**
Common name	**Scientific name**	**Geographical application**
American skunk-cabbage	*Lysichiton americanus*	Throughout the State
A red alga	*Grateloupia doryphora*	Throughout the State
Brazilian giant-rhubarb	*Gunnera manicata*	Throughout the State
Broad-leaved rush	*Juncus planifolius*	Throughout the State
Cape pondweed	*Aponogeton distachyos*	Throughout the State
Cord-grasses	*Spartina* (all species and hybrids)	Throughout the State
Curly waterweed	*Lagarosiphon major*	Throughout the State
Dwarf eel-grass	*Zostera japonica*	Throughout the State
Fanwort	*Cabomba caroliniana*	Throughout the State
Floating pennywort	*Hydrocotyle ranunculoides*	Throughout the State
Fringed water-lily	*Nymphoides peltata*	Throughout the State
Giant hogweed	*Heracleum mantegazzianum*	Throughout the State

First column	Second column	Third column
Common name	**Scientific name**	**Geographical application**
Giant knotweed	*Fallopia sachalinensis*	Throughout the State
Giant-rhubarb	*Gunnera tinctoria*	Throughout the State
Giant salvinia	*Salvinia molesta*	Throughout the State
Himalayan balsam	*Impatiens glandulifera*	Throughout the State
Himalayan knotweed	*Persicaria wallichii*	Throughout the State
Hottentot-fig	*Carpobrotus edulis*	Throughout the State
Japanese knotweed	*Fallopia japonica*	Throughout the State
Large-flowered waterweed	*Egeria densa*	Throughout the State
Mile-a-minute weed	*Persicaria perfoliata*	Throughout the State
New Zealand pigmyweed	*Crassula helmsii*	Throughout the State
Parrot's feather	*Myriophyllum aquaticum*	Throughout the State
Rhododendron	*Rhododendron ponticum*	Throughout the State
Salmonberry	*Rubus spectabilis*	Throughout the State
Sea-buckthorn	*Hippophae rhamnoides*	Throughout the State
Spanish bluebell	*Hyacinthoides hispanica*	Throughout the State
Three-cornered leek	*Allium triquetrum*	Throughout the State
Wakame	*Undaria pinnatifida*	Throughout the State
Water chestnut	*Trapa natans*	Throughout the State
Water fern	*Azolla filiculoides*	Throughout the State
Water lettuce	*Pistia stratiotes*	Throughout the State
Water-primrose	*Ludwigia* (all species)	Throughout the State
Waterweeds	*Elodea* (all species)	Throughout the State
Wireweed	*Sargassum muticum*	Throughout the State

EU Regulation 1143/2014 on Invasive Alien Species

On 14 July 2016 the European Commission published Commission Implementing Regulation 2016/1141 which set out an initial list of 37 species to which EU Invasive Alien Species Regulation 1143/2014 applies. The associated restrictions and obligations came into force on 3rd August 2016.

Plant species listed on the directive include:

- American skunk cabbage *Lysichiton americanus*
- Asiatic tearthumb *Persicaria perfoliata* (*Polygonum perfoliatum*)
- Curly waterweed *Lagarosiphon major*
- Eastern Baccharis *Baccharis halimifolia*
- Floating pennywort *Hydrocotyle ranunculoides*
- Floating primrose willow *Ludwigia peploides*
- Green cabomba *Cabomba caroliniana*
- Kudzu vine *Pueraria lobata*
- Parrot's feather *Myriophyllum aquaticum*
- Persian hogweed *Heracleum persicum*
- Sosnowski's hogweed *Heracleum sosnowskyi*
- Water hyacinth *Eichhornia crassipes*
- Water primrose *Ludwigia grandiflora*
- Whitetop weed *Parthenium hysterophorus*

Animal species listed on the directive include:

- Amur sleeper *Perccottus glenii*
- Asian hornet *Vespa velutina*
- Chinese mitten crab *Eriocheir sinensis*
- Coypu *Myocastor coypus*

- Fox squirrel *Sciurus niger*
- Grey squirrel *Sciurus carolinensis*
- Indian house crow *Corvus splendens*
- Marbled crayfish *Procambarus* spp.
- Muntjac deer *Muntiacus reevesii*
- North american bullfrog *Lithobates (Rana) catesbeianus*
- Pallas's squirrel *Callosciurus erythraeus*
- Raccoon *Procyon lotor*
- Red swamp crayfish *Procambarus clarkii*
- Red-eared terrapin/slider *Trachemys scripta elegans*
- Ruddy duck *Oxyura jamaicensis*
- Sacred ibis *Threskiornis aethiopicus*
- Siberian chipmunk *Tamias sibiricus*
- Signal crayfish *Pacifastacus leniusculus*
- Small Asian mongoose *Herpestes javanicus*
- South American coati *Nasua nasua*
- Spiny-cheek crayfish *Orconectes limosus*
- Topmouth gudgeon *Pseudorasbora parva*
- Virile crayfish *Orconectes virilis*

On 13 July 2017 the European Commission published Commission Implementing Regulation 2017/1263 which added a further 12 species to the current list of 37 species regulated under the EU Invasive Alien Species Regulation (1143/2014). These are:

Plant species

- Alligator weed (*Alternanthera philoxeroides*)
- Milkweed (*Asclepias syriaca*)
- Nuttall's waterweed (*Elodea nuttallii*)
- Chilean rhubarb (*Gunnera tinctoria*)
- Giant hogweed (*Heracleum mantegazzianum*)
- Himalayan balsam (*Impatiens glandulifera*)
- Japanese stiltgrass (*Microstegium vimineum*)
- Broadleaf watermilfoil (*Myriophyllum heterophyllum*)
- Crimson fountaingrass (*Pennisetum setaceum*)

Animal species

- Egyptian goose (*Alopochen aegyptiacus*)
- Raccoon dog (*Nyctereutes procyonoides*)
- Muskrat (*Ondatra zibethicus*)

The associated restrictions and obligations came into force from 2 August 2017 for all these species apart from the Raccoon dog, which came into force until 2 February 2019.

Other Invasive Species

The main guidance document that has been prepared dealing with invasive species/noxious weeds on sites is the NRA *'Guidelines on The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads'* which was published in 2010. This document details other non-native species of note. A detailed survey for such species was conducted.

2.4 Seasonal Constraints

This project began in December 2020 and field surveys commenced in January 2021. The survey was initially conducted within the optimum time for conducting badger and other large mammal surveys (December–March) as the likelihood of detecting both setts and signs of badger/large mammal activity diminishes later in the year as vegetation cover increases.

However it was not initially the correct time of year in which to conduct bat surveys as these are seasonally constrained and must be conducted within the appropriate time period as set out in the NPWS Bat Mitigation Guidelines – see below.

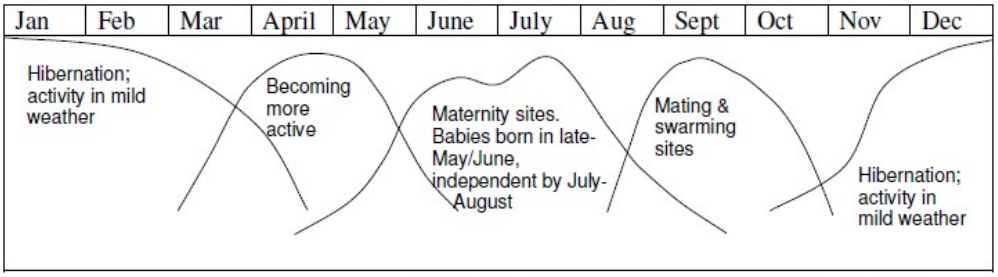

Figure 8. The bat year. Although there are species-specific differences, the bat year can be divided into the two major phases of breeding and hibernation, with other activities interspersed.

Season	Roost Type	Inspection	Bat detectors and emergence counts
Spring (Mar – May)	Building	Suitable (signs, perhaps bats)	Limited, weather dependent
	Trees	Difficult (best for signs before leaves appear)	Very limited, weather dependent
	Underground	Suitable (signs only)	Static detectors may be useful
Summer (June-August	Building	Suitable (signs and bats)	Suitable
	Trees	Difficult	Limited; use sunrise survey
	Underground	Suitable (signs only)	Rarely useful
Autumn (September – November)	Building	Suitable (signs and bats)	Limited, weather dependent
	Trees	Difficult	Rather limited, weather dependent; use sunrise survey?
	Underground	Suitable (signs, perhaps bats)	Static detectors may be useful
Winter (December - February)	Building	Suitable (signs, perhaps bats))	Rarely useful
	Trees	Difficult (best for signs after leaves have gone)	Rarely useful
	Underground	Suitable (signs and bats)	Static detectors may be useful

A survey was therefore scheduled for May 2021 once bats had become active again.

3. SURVEY RESULTS

3.1 Receiving Environment

The lands adjoining St. Michaels's House on the Swords Road/Pinnockhill Roundabout are currently dominated by **immature woodland (WS2).** This was established as part of landscaping planting associated with the development of a dual carriageway when the Swords Bypass was developed in the 1980s. The main species present are Ash (*Fraxinus excelsior*), Alder (*Alnus glutinosa*), Beech (*Fagus sylvatica*), Scot's pine (*Pinus sylvestris*), Field maple (*Acer campestre*), Holm oak (*Quercus ilex*), and Black pine (*Pinus nigra*) with an understorey of more rarely Honeysuckle (*Lonicera periclymenum*), Hawthorn (*Crataegus monogyna*), Elder (*Sambuccus nigra*) and bramble (*Rubus fruticosus* agg.). The non-native invasive species Cherry laurel (*Prunus laurocerasus*), Cotoneaster and Wilson's honeysuckle (*Lonicera nitida*) are also present. These are all garden escapes.

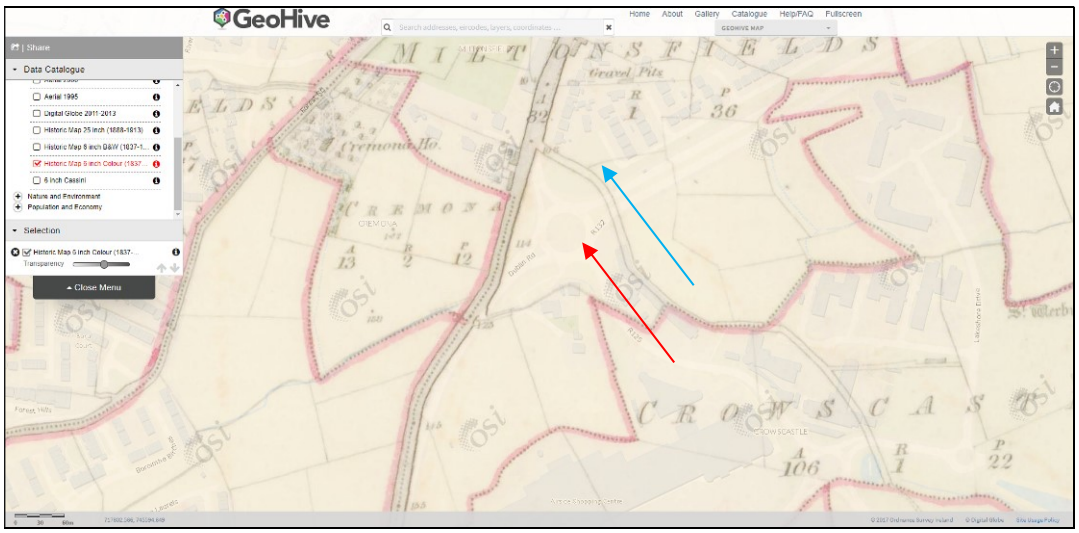

Figure 3. Historic mapping (OSI 6" First Edition) of the area – the Pinnockhill Roundabout is indicated by the red arrow and the section of extant field boundary by the blue arrow.

Along the northern boundary of the woodland is a remnant **treeline (WL2)** with some mature trees including a multi-stemmed Ash (*Fraxinus excelsior*), elder and Wych elm (*Ulmus glabra*) with an associated **earthen bank (BL2)** – this is the remains of an old field boundary, which is shown on the first edition of the 6" series Ordnance Survey maps as can be seen on **Figure 3** above. These field boundaries were mapped between 1829 and 1842 when the Ordnance Survey Ireland completed the first ever large-scale survey of an entire country so this area is of some antiquity.

The ground flora within the woodland was dominated by Bramble (*Rubus fruticosus* agg.) and Ivy (*Hedera helix*) with Cow parsley (*Anthriscus sylvestris*), Herb Robert (*Geranium robertianum*), and occasional Red dead nettle (*Lamium purpureum*).

Adjoining the area of woodland to the north in the environs of Carlton Crescent is an area of mown **amenity grassland (GA2),** adjoining the Pinnockhill

Roundabout is also a non-native planted hedge, a mown grassy verge and some **ornamental planting (BC4)**.

3.2 Conservation Designations

The lands adjoining St. Michaels's House on the Swords Road/Pinnockhill Roundabout are not currently the subject of any conservation designations under either international or national conservation legislation.

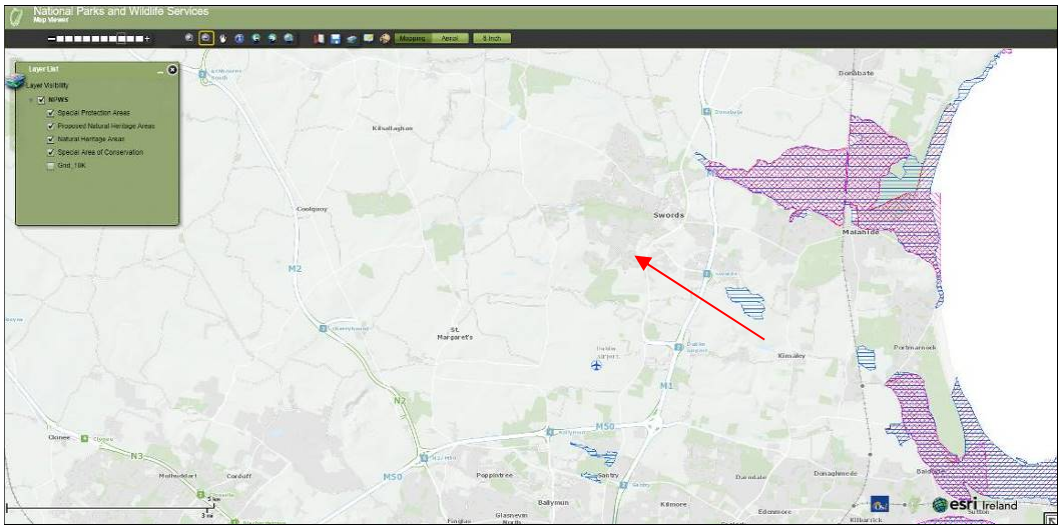

Figure 4. Site location at Swords indicated by the red arrow. (Source: National Parks and Wildlife Service online map viewer).

There are seventeen Natura 2000 sites within a 15km radius of the lands adjoining St. Michaels's House as follows:

- Baldoyle Bay SAC 000199
- Baldoyle Bay SPA 004016
- Howth Head SAC 000202
- Howth Head Coast SPA 004113
- Ireland's Eye SAC 002193
- Ireland's Eye SPA 004117
- Lambay Island SAC 000204
- Lambay Island SPA 004069
- Malahide Estuary SAC 000205
- Broadmeadow/Swords Estuary SPA 004025
- North Dublin Bay 000206
- North Bull Island SPA 004006
- Rockabill to Dalkey Island SAC 003000
- Rogerstown Estuary SAC 000208
- Rogerstown Estuary SPA 004015
- South Dublin Bay SAC 000210
- South Dublin Bay and River Tolka Estuary SPA 004024

Special Areas of Conservation (SACs) contain habitats or species of international significance that have been identified by NPWS and submitted for designation to the EU.

A Special Protection Area (SPA) is a statutory designation, which has a legal basis under the EU Birds Directive (79/409/EEC). The primary objective of SPAs is to maintain or enhance the favourable conservation status of the birds for which the SPAs have been designated.

National Conservation Designations
Proposed NHAs are habitats or sites of interest to wildlife that have been identified by NPWS. These sites become NHAs once they have been formally advertised and land owners have been notified of their designation. NHAs are protected under the Wildlife (Amendment) Act, 2000, from the date they are formally proposed. NHA is a statutory designation according to the Wildlife (Amended) Act, 2000 and requires consultation with NPWS if any development impacts on a pNHA.

There are twenty proposed Natural Heritage Areas (pNHAs)/Natural Heritage Areas (NHAs) within 15km of the lands adjoining St. Michaels's House some of which are also designated as Natura 2000 sites. These pNHAs include:

- Baldoyle Bay pNHA 000199
- Bog of the Ring pNHA 001204
- Booterstown Marsh pNHA 001205
- Dolphins, Dublin Docks pNHA 000201
- Feltrim Hill pNHA 001208
- Grand Canal pNHA 002104
- Howth Head pNHA 000202
- Ireland's Eye NHA 000203
- Knock Lake pNHA 001203
- Lambay Island pNHA 000204
- Liffey Valley pNHA 000128
- Loughshinny Coast pNHA 002000
- Malahide Estuary pNHA 000205
- North Dublin Bay pNHA 000206
- Portraine Shore pNHA 001215
- Rogerstown Estuary pNHA 000208
- Royal Canal pNHA 002103
- Santry Demesne pNHA 001208
- Sluice River March pNHA 001763
- South Dublin Bay pNHA 000210

NHAs are considered to be of national importance, while SACs and SPAs are of international importance for nature conservation.

3.3 Badger
There was no evidence of the presence of badgers (*Meles meles*) within the study area. This is unsurprising on account of the small area of woodland habitat, the history of land use and levels of disturbance in the area and the surrounding developed lands of Swords and environs.

3.4 Bats

3.4.1 Desktop Research

The Bat Conservation Ireland Database of bat records was searched for records of bats from the Swords/Malahide area. The database contains records of roosts, ad hoc observations and the results of surveys such as the BATLAS 2010 project and the All Ireland Daubenton's Monitoring Project. Bat species recorded from within a 10km radius of Swords include:

- Common pipistrelle (*Pipistrellus pipistrellus*),
- Soprano pipistrelle (*Pipistrellus pygmaeus*),
- Daubenton's bat (*Myotis daubentonii*),
- Leisler's bat (*Nyctalus leisleri*),
- Brown long-eared bat (*Plecotus auritus*),
- Several unidentified *Myotis* species, and
- an unidentified pipistrelle species (*Pipistrellus* sp.).

Surveys conducted by this author of nearby lands in Barrysparks on the other side of the Swords Bypass recorded three species of bats foraging in the area. These were soprano pipistrelle (*Pipistrellus pygmaeus*), common pipistrelle (*Pipistrellus pipistrellus*) and Leisler's bat (*Nyctalus leisleri*).

A previous bat survey had also been completed by this author of lands near the Holywell Distributor Road in June 2018 when two species of bat were recorded - soprano pipistrelle (*Pipistrellus pygmaeus*) and Leisler's bat (*Nyctalus leisleri*).

Studies conducted in 2013 by this author for the Swords to Dublin City BRT Project recorded no bat activity along the length of the R132 between Swords and Dublin Airport. Although much of the carriageway is well planted with mature treelines of poplar, ash, sycamore, beech and willows with an understorey of Wych elm, field maple, dogwood, hawthorn and bramble the route is brightly lit, which would make the area less favourable for foraging bats.

3.4.2 Tree Survey

A number of trees within the site were identified as having potential to support roosting bats – these are shown in the photographic record in **Appendix 2**. These were examined from ground level using an endoscope during both surveys to see if any bats were present but none were in residence at the time of either survey.

3.4.3 Building Survey

An external and internal examination of the building owned by St. Michael's House was completed on the 18th May 2021. The attic of the house was fully accessible and was examined for signs of bats such as droppings, grease staining, live bats, etc. No signs of same were observed. The ridge beam of the attic was festooned with cobwebs which would indicate that bats are not utilising the space. Externally the fascia, soffits, window frames, etc. were also examined for signs of bats but none were present. The torch on felt flat roof extension at the rear of the property would be favourable to roosting bats – particularly crevice dwelling species such as pipistrelles.

3.4.4 Detector Survey

A bat detector survey of the study area and adjoining woodland area was completed in May 2021. The detector survey did not record any bats either emerging from or returning to the building at either dusk or dawn. Three species of bats were recorded foraging in the woodlands adjacent to the site and hunting over the existing car park clearing. These were common pipistrelle, soprano pipistrelle, and Leisler's bat.

As no bats are currently roosting in the building a bat derogation licence is not required from National Parks and Wildlife Service for the works.

3.5 Other Mammals

The terrestrial fauna consists of relatively few species. The surveys confirmed the presence of brown rat (*Rattus norvegicus*), fox (*Vulpes vulpes*) and pygmy shrew (*Sorex minutus*), while rabbit (*Oryctolagus cuniculus*), and wood mouse (*Apodemus sylvaticus*) would also be expected.

3.6 Birds

A good variety of bird species were recorded during the survey. These include blackbird (*Turdus merula*), wren (*Troglodytes troglodytes*), robin (*Erithacus rubecula*), dunnock (*Prunella modularis*), song thrush (*Turdus philomelos*) and mistle thrush (*Turdus viscivorus*).

3.7 Evaluation

The ecological importance of the habitats within the survey area was assessed using the criteria listed in the *Guidelines for Assessment of Ecological Impacts of National Roads Scheme*s (NRA, 2009) and the *Guidelines for Ecological Impact Assessment in the UK and Ireland* (CIEEM, 2019).

Criteria used to evaluate habitats and sites include site designation, presence of rare and/ or protected species, local rarity, habitat functional role, naturalness, habitat diversity, size of habitat or species population and rich assemblages of plants and animals. The importance of an ecological feature is considered within a defined geographical context. Under this ecological evaluation scheme habitats are rated as being of either:

- International ecological importance
- National ecological importance
- County ecological importance
- Local (higher value) ecological importance
- Local (lower value) ecological importance

These habitats are assessed as being of moderate local value (D site) for biodiversity within the context of the urban setting of Swords and environs, with the remnant treeline being rated of high local value (C site) on account of its antiquity.

4. MITIGATION MEASURES

The primary mitigation measure that should be implemented in every project is that of avoidance of impact or reduction of same. In light of the findings of this survey the initial proposals for the car parking area at St. Michael's House were reviewed and the area of woodland impacted was reduced as shown on **Figure 5** below, however it was not possible to completely avoid the woodland area and hence avoid faunal and other wildlife impacts. A series of mitigation measures to ameliorate same are therefore set out below.

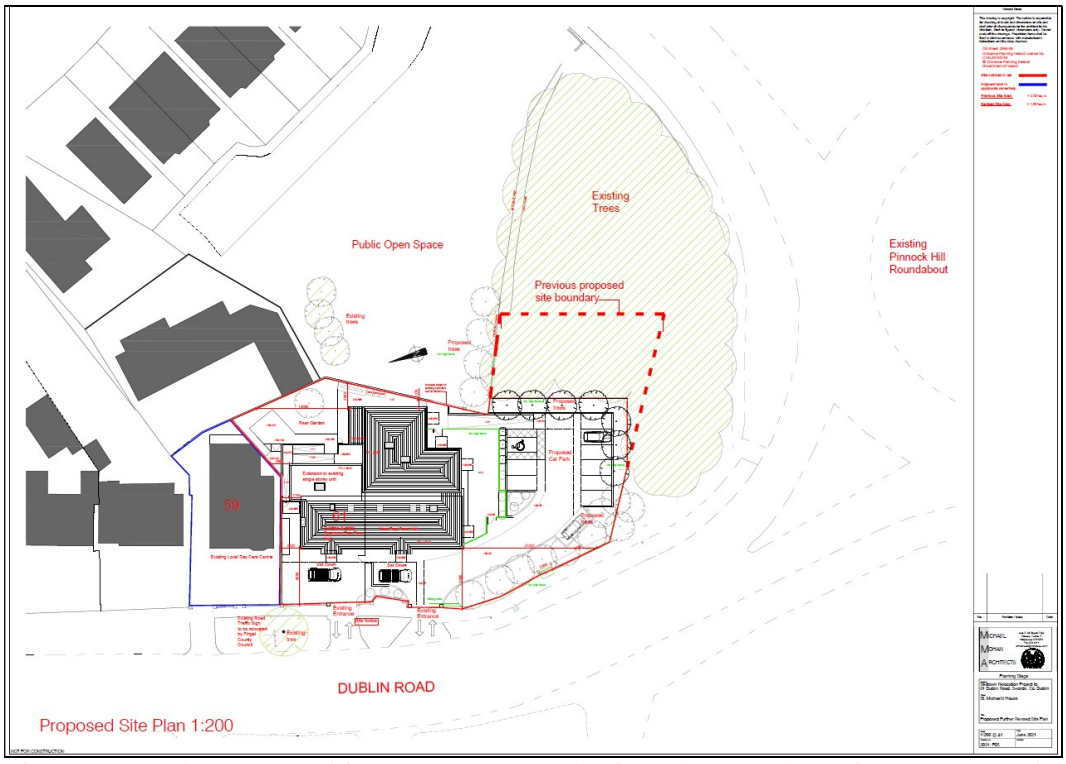

Figure 5. The car parking area was redesigned to reduce impacts on the woodland area.

4.1 Protection of Bats – Buildings

The building owned by St. Michael's House has potential to support roosting bats and good levels of bat activity were recorded in the immediate environs of the property. If a significant time period has lapsed between this survey and the commencement of works (i.e. greater than 6 months) they should be re-examined for bats prior to any works to the roof areas.

4.2 Protection of Bats – Trees

A number of trees have been identified that have potential to support roosting bats within the woodland. These will be examined for evidence of roosting bats prior to their removal to ensure protection of same. Trees identified as potential bat roosts will be checked by a licensed bat specialist and felled in their presence. If any bats are encountered National Parks and Wildlife Service will be notified and a bat derogation licence sought for the works.

4.3 Provision of roosting spaces for Bats – Woodland Area
It is recommended that three bat boxes (1 no. 1FF Schwegler Bat Box, 1 no. 2F Schwegler Bat Box and 1 no. 2FN Schwegler Bat box) are erected on retained trees in the wooded area to compensate for the loss of roosting potential in trees. These will be erected by a licensed bat specialist to ensure they are suitably sited.

4.4 Provision of roosting spaces for Bats – Buildings
The new building will incorporate provision for roosting bats in its design – products such as a bat brick or bat tube can be integrated into the external fabric of the building without compromising the integrity of same.

4.5 Tree Survey
An arborist has been engaged to determine the appropriate root protection area for the mature trees within the treeline to ensure that impacts on these trees are avoided and they can be retained.

4.6 Tree and Vegetation Protection
All trees and vegetation that are to be retained will be afforded adequate protection in accordance with BS5837:2012[1] to ensure that boughs and root systems are not damaged during works. This will require each retained tree being fenced with a protective fence located outside the drip line of the canopy to prevent compaction of soil around tree roots, alteration of ground levels surrounding the tree, dumping of materials/soil, etc. and damage to boughs.

4.7 Protection of Nesting Birds
Tree felling or surgery will not be carried out from March 1st to August 31st (except in circumstances of immediate danger to the public) as set out in the Wildlife Act, 1976 as amended. This will protect nesting birds, eggs and nestlings from injury or death.

4.8 Protection of Birds – Nesting Boxes
It is recommended that ten bird boxes are erected on retained trees in the wooded area to compensate for the loss of nesting habitat in the area. These will be erected by a suitably qualified ecologist to ensure they are suitably sited.

4.9 Planting of Native Species
A hedgerow of native scrubby species will be established along the edge of the woodland on the boundary adjoining the R132 Swords Bypass roadside to create a naturalised woodland edge and around the perimeter of the new St. Michael's House car park as a hedge. Species used will be native and of certified Irish genetic origin. Species suitable for planting include:

- Hawthorn (*Crataegus monogyna*)
- Blackthorn (*Prunus spinosa*)
- Guelder rose (*Viburnum opulus*)
- Hazel (*Corylus avellana*)

[1] British Standards Institution (BSI) (2012). *BS 5837:2012 Trees in Relation to Design, Demolition and Construction - Recommendations*. British Standards Institution, London, United Kingdom.

- Holly (*Ilex aquifolium*)
- Spindle (*Euonymus europaeus*)

4.10 Pollinator Planting
Landscaping planting within the environs of St. Michael's House should be pollinator friendly. Detailed guidance on same is presented in the All Ireland Pollinator Plan 2015 – 2020 document 'Gardens: actions to help pollinators' available from:
https://pollinators.ie/wordpress/wp-content/uploads/2018/04/Gardens_actions-to-help-pollinators-2018-WEB.pdf

4.11 Lighting
Lighting for the St. Michael's House lands will consider the detailed information on lighting design for bats and other wildlife as presented in the document prepared by the Bat Conservation Trust and the Institute of Lighting Professionals 'BCT (2018). Guidance Note 08/18 - Bats and artificial lighting in the UK. Bats and the Built Environment series' and the EUROBATS Light Pollution Guidance available from:

https://cdn.bats.org.uk/pdf/Resources/ilp-guidance-note-8-bats-and-artificial-lighting-compressed.pdf?mtime=20181113114229&focal=none

and

https://cdn.bats.org.uk/pdf/Resources/EUROBATSguidelines8_lightpollution.pdf?mtime=20181113114256&focal=none

The use of cowled lighting which directs lighting to a focused area ensuring that adjoining vegetated areas/sections of the night sky are not illuminated is recommended.

Consideration should be given by Fingal County Council to modifications to the existing lighting along the Swords Bypass.

4.12 Invasive Species
The cherry laurel within the woodland area and on the old field boundary treeline needs to be removed and the stumps treated. This will need to be done by Fingal County Council (as opposed to St. Michael's House) in accordance with the best practice guidelines prepared by Woodlands Of Ireland available from:
http://www.woodlandsofireland.com/sites/default/files/No.%203%20-%20Rhododendron%20Control.pdf

The Wilson's honeysuckle and Cotoneaster should also be removed.

4.13 Woodland Management
The area of immature woodland has not received any obvious management since the trees were established. As a result many of the trees are drawn up and leggy with poorly developed crowns. On completion of the removal of trees necessary for the construction of the car park for St. Michael's House the retained trees

should be assessed by an arborist and Fingal County Council and may benefit from some crown release work to stabilise the stand in the long term. Coppicing of some edge trees could also improve the stand structure and provide additional foraging habitat and cover for nesting birds and other fauna. There are good levels of natural regeneration within the woodland – these saplings are currently in check and require improved light levels to successfully develop.

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6. APPENDIX 1: LIST OF VERTEBRATES AND ADJUDGED STATUS

(N.B. Excluding bat species)

Mammals		**Status in study area**
Insectivora		
Hedgehog	*Erinaceous europaeus*	Likely
Pygmy Shrew	*Sorex minutus*	Possible
Lagomorpha		
Rabbit	*Oryctolagus cuniculus*	Likely
Irish Hare	*Lepus timidus hibernicus*	Absent
Rodentia		
Red Squirrel	*Sciurus vulgaris*	Unknown
Grey Squirrel	*Sciurus carolinensis*	Likely
Bank Vole	*Clethrionomys glareolus*	Absent
Wood Mouse	*Apodemus sylvaticus*	Likely
House Mouse	*Mus musculus domesticus*	Present
Brown Rat	*Rattus norvegicus*	Present, sightings/holes
Black Rat	*Rattus rattus*	Absent
Carnivora		
Fox	*Vulpes vulpes*	Likely
Badger	*Meles meles*	Absent
Pine Marten	*Martes martes*	Absent
Irish Stoat	*Mustela erminea hibernica*	Unknown
Otter	*Lutra lutra*	Absent
American Mink	*Mustela vison*	Absent
Artiodactyla		
Red Deer	*Cervus elaphus*	Absent
Sika Deer / hybrids	*Cervus nippon*	Absent
Fallow Deer	*Dama dama*	Absent
Feral Goat	*Capra*	Absent
Amphibians		
Frog	*Rana temporaria*	Absent
Reptiles		
Common Lizard	*Lacerta vivipara*	Absent

7. APPENDIX 2: PHOTOGRAPHIC RECORD

Plate 1. Crevices such as these offer bat roosting potential.

Plate 2. Rot holes in trees offer bat roosting potential.

Plate 3. The woodland edge, non-native hedgerow and ornamental planting adjoining Pinnockshill Roundabout.

Plate 4. The woodland edge, non-native hedgerow and ornamental planting adjoining Pinnockshill Roundabout.

Plate 5. An informal pedestrian path runs through the woodland.

Plate 6. Cherry laurel – a non-native species is present in the woodland.

Plate 7. Wilson's honeysuckle – a non-native species is present in the woodland.

Plate 8. Cherry laurel is present on the old field boundary within the wooded area.

Plate 9. Multi-stemmed Wych elm on the old field boundary.

Plate 10. The earthen banks and associated ditch of the old field boundary.

Plate 11. The existing car parking area adjoining St. Michael's House at 61, Swords Road.

Plate 12. St. Michael's House, 61, Swords Road.

Plate 13. Front of St. Michael's House, 61, Swords Road.

Plate 14. Flat roof extension at the rear of St. Michael's House, 61, Swords Road.