



Habitat and Species Survey Guidelines

Conducting surveys of the types of habitats and the species present on your golf course will give invaluable baseline information both as a record and a baseline against which to measure change achieved through positive nature management in the years to come.

This guidance document includes:

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Habitat and Species Survey Techniques

This section outlines the standard techniques of habitat and species surveys currently used in the UK. Two techniques have been developed to identify the nature conservation value of any site. Both provide a consistent terminology, and are now adopted as standard for surveying and describing habitats throughout the UK:

- The Phase 1 Habitat survey
- The National Vegetation Classification (NVC)

Phase One Habitat Survey

This is the standard technique for classifying and mapping British habitats as laid down by the [Joint Nature Conservation Committee \(JNCC\)](#). A Phase 1 Habitat Survey would identify, map and describe the main habitats, giving dominant plant species and target notes about special value in each compartment. This type of survey provides a record of habitats that are likely to be ecologically important, including providing target notes on important aspects of a site. The survey can be conducted at any time of the year, but it is best done in spring/summer when vegetation is more readily identifiable.

The following is included in a phase 1 habitat survey:

- Desk study (obtaining pre-existing ecological data relating to the site)
- Field survey (on site visit to map habitats)
- Written report
- Map (produced to JNCC standard phase 1 habitat survey classification)

The broad classification of habitats is:

- woodland and scrub
- grassland and marsh
- tall herb and fern
- heathland
- mire
- swamp, marginal and inundation
- open water

Most if not all of these habitats occur on Scotland's golf courses. Each broad category is subdivided into more detailed components which are recognizable in the field by trained surveyors. The survey

is recorded onto 1:10,000 or 1:25,000 OS maps using a standard system of colouring and annotation. The minimum unit of recording is 0.1ha.

The 'Phase 1 Maps' are designed to be easily read and can be employed in planning procedure. Where a surveyor identifies habitats regarded as significant, a 'Target Note' is made which indicates the need for a more detailed 'Phase 2' survey of the site at a later date.

Phase 2 Habitat Survey

A Phase 2 Habitat Survey could subsequently be done to provide more in depth information for the most valuable areas, which would produce a comprehensive species inventory and DAFOR analysis to record populations. (DAFOR = Dominant, Abundant, Frequent, Occasional, Rare).

In unusual circumstances there is provision for a 'Phase 3' survey. Target notes may highlight the need to carry out further, species-specific studies (which may be subject to seasonal constraints) to fully inform a planning application.

The National Vegetation Classification (NVC)

The NVC is a detailed phytosociological classification, which assesses the full suite of vascular plant, bryophyte and macro-lichen species within a certain vegetation type. For more detailed information on NVC please refer to www.jncc.gov.uk/page-4259

In the context of golf course design and management, Phase One Surveys will highlight areas of importance for nature conservation and allow a description of the natural history resource of an area, whereas NVC will provide detailed information on all areas which should be considered in design decision making.

Species specific studies

Whilst Phase 1 and 2 Surveys focus on plant species, surveyors usually compile anecdotal list of birds, mammals, amphibians and invertebrates they observe casually during their visit. Great crested newts, water vole, pine martin, otters, red squirrel, all bats, badgers and numerous bird and plant species are protected under Schedule 5 of the Wildlife and Countryside Act 1981.

Scottish Golf recommends specialist surveys should be carried out to highlight the most appropriate action regarding future management. These surveys can be conducted by specialist surveyors, local ranger services, amateur natural history groups, etc. The presence of such a species rarely imparts management constraints on the club and additional funds are available for responsible stewardship.

For survey information that Scottish Natural Heritage (SNH) hold go to the following interactive web map: <http://gateway.snh.gov.uk/natural-spaces/index.jsp>

Habitat Survey Calendar

Type of Survey	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Phase 1 Habitat Survey													
Phase 2 Habitat Survey													
Badgers	All survey methods - best time in early autumn/winter												
Bats	Survey of hibernation, tree & building roosts			Roost inspections / Emergence and Activity surveys									Survey of hibernation roosts
Birds	Winter Birds		Breeding Birds/Migrant Species		Breeding Birds		Breeding Birds/Migrant Species		Winter Birds				
Great Crested Newt													
Squirrel (red & grey)													
Water Voles													
Otters	Surveys conducted all year round												

Guidelines for Badger Surveys

Ecology

Badgers are found in both rural and urban areas. They live in underground tunnels and chambers called a sett. A Sett can be complex, consisting of numerous holes and connected annexe setts.

Badgers feed on a variety of food including insects, worms, grain and fruit. They do not hibernate through the winter, but they are much less active and stay below ground.

Survey Methods

Badger surveys can take place all year round. Typically the development area and surrounding 30m are surveyed for evidence of badgers in the form of latrines, setts, paths between setts or leading to feeding areas, scratching posts, hair traces and footprints.

Protection & Legislation

Under the Protection of Badgers Act 1992 it is illegal to:

- Wilfully kill, injure, take, possess or cruelly treat a badger or attempt to do so;
- Intentionally or recklessly damage, destroy or obstruct access to badger sett (whether or not there is a badger in it at the time);
- Disturb a badger while it is occupying a sett;
- Sell, keep or mark a healthy badger or possess any dead badger or part thereof.

Badgers are also protected under the Wild Mammals (Protection) Act 1996, which protects animals against cruelty.

Licensing & Mitigation

Where development will interfere with a badger sett, a development licence from Scottish Natural Heritage (SNH) www.snh.gov.uk is required. A development licence will only be granted if a suitable mitigation plan has been written by a suitably qualified ecologist.

Typical mitigation measures include:

- Construction of an artificial sett;
- Planting of natives shrubs and trees;
- Sett closure and badger exclusion;
- Maintaining badger food sources;
- Fencing;
- Post-construction monitoring.

For further information and best practise guidelines please refer to:

<http://www.snh.gov.uk/about-scotlands-nature/species/mammals/land-mammals/>

<http://www.nfbg.org.uk/content/home.asp>

Also see the document on this website 'Badgers on Golf Courses'. This document outlines the management and mitigation methods available to golf clubs to reduce conflict.

Guidelines for Bat Surveys

Ecology

There are 18 species of bat in the UK (17 of which are known to be breeding here), all of which are protected by law because their numbers have decreased so dramatically.

Bats roost individually or in colonies, feeding at night and roosting during the day. Roosting habitat includes buildings, bridges, quarries, trees, cliffs and caves. Suitable foraging habitat includes woodland, scrub, parkland, farmland, hedgerows, wetlands, waterways, suburban gardens and well-lit urban open spaces, all of which feature on golf courses.

Survey Methods

Several survey methods can be used to determine the presence of bats or a bat roost. A licensed ecologist is required to undertake these surveys:

Walkover survey for buildings: All areas of a building are searched for signs of bats, evidence includes bat droppings and food remains. Building structures are also searched for potential bat entrance holes.

Walkover survey for trees and woodland: This involves searching trees and woodland for potential roost sites such as mature trees, peeling bark, tree splits and dead trees.

Bat Detectors: This involves using specialist equipment designed that a surveyor can hear bat echolocation calls at a frequency which is audible to them.

Emergence Survey: This type of survey occurs at dusk with observers in particular positions around a survey site to record any bat activity.

Transect Survey: This type of survey is used for conducting a bat survey in open areas with no buildings.

From November to March, surveys of hibernation, tree and building roosts can be conducted and from April to October roost inspections/emergence and activity surveys can be undertaken.

Protection & Legislation

Under the Wildlife and Countryside Act 1981, and the Habitats Regulations 1994 it is illegal to:

- Intentionally or deliberately kill, injure or capture bats;
- Intentionally, deliberately or recklessly disturb bats;
- Intentionally, deliberately or recklessly damage, destroy or obstruct any place used for shelter or protection, i.e. bat roost (even if they are not currently occupied);

- Possess, sell or transport a bat, or anything derived from it.

Licensing & Mitigation

Any development works that will impact bats or bat roosts will require a development licence from Scottish Natural Heritage (SNH) www.snh.gov.uk. A development licence will only be granted if a suitable mitigation plan has been written by a suitably qualified ecologist.

Mitigation measures typically include:

- Provision of artificial roosts;
- Construction of bridges and underpasses;
- Planting of vegetation to provide feeding habitat;
- Linear planting to provide flight corridors;
- Careful design of lighting;
- Post-development monitoring.

For further information on bats and best practise advice please refer to www.bats.org.uk.

Guidelines for Bird Surveys

Ecology

Birds are widespread and occupy a range of habitats both in urban and rural areas. As a result of this birds are often found nesting on potential development sites and existing golf courses. It is recommended that an experienced ecologist is contacted during the early stages of planning in order to prevent a delay in proceedings.

Survey Methods

There are a variety of survey techniques that can be used to survey birds. The type of survey that is used depends on what information you require. Common methods include:

- Line transects – travelling a predetermined route and recording birds either side of the transect line;
- Visual inspection of a building/structure to establish previous or present bird nesting activity;
- Listening for bird calls/songs.

Different surveys are carried out at different times of the year:

November – February, winter birds can be surveyed.

March - May, breeding and migrant bird surveys

June - July, breeding bird surveys

August – October, breeding and migrant bird surveys.

Protection & Legislation

All wild birds (including resident, visiting and introduced species) in the UK are protected by law under the Wildlife and Countryside Act (WCA) 1981 (as amended) making it illegal to:

- Kill, injure or take any wild bird;
- take, damage or destroy the nest of any wild bird while it is being built or in use;
- take or destroy the eggs of any wild bird;
- Possess or control any wild bird or egg unless obtained legally.

Bird species listed in Schedule 1 of the WCA receive special protection. This means that in addition to the offences above, it is also illegal to intentionally or recklessly disturb any bird listed on schedule 1 while nesting or to disturb any of its young.

Birds are also protected against cruelty under the Protection of Animals Act 1911.

In order to avoid legal prosecution any works on a structure or feature that is being used by a nesting bird should be undertaken outside the breeding bird season or when the young have fully fledged the nest.

If you find a wild bird that is injured it is legal to capture it or for it to be humanly killed.

Licensing & Mitigation

There is no requirement to obtain a development licence for works that have an impact on birds, except for those species listed on Schedule 1. But in order to avoid prosecution adequate surveys and mitigation plans must be carried out by an experienced ecologist prior to any works commence that will impact birds.

Mitigation measures may include some of the following:

- Re-scheduling of works to avoid the breeding season;
- Creating an exclusion area around nesting birds to avoid disturbance;
- Habitat creation to provide nesting and feeding habitat;
- Provision of nest boxes;
- Design of building to enhance suitability for nesting birds e.g. ledges and access slots for nesting.

Under certain circumstances which are described below it may be possible to obtain a licence to disturb a Schedule 1 bird:

- Science, education or conservation ;
- Photography;
- Preventing the spread of disease;
- Preserving public health or public safety.

For further information and best practise guidelines please refer to:

<http://www.snh.gov.uk/about-scotlands-nature/species/birds/>

Guidelines for Great Crested Newt Surveys

Ecology

Great crested newts spend the majority of their lives on land, but must migrate to water in order to breed. This migration occurs in early spring when temperatures rise above 5°C, with most newts arriving at the ponds by mid-March. Courtship and egg laying then takes place until mid-May.

At the end of the breeding season the adults begin to leave the ponds, while the larvae remain in the ponds for a further 2-3 months until they have completed metamorphosis. It takes juveniles 2-4 years to reach sexual maturity and they will spend this time on land, returning to the ponds when they are ready to breed. Adults hibernate from October through to February, finding protection in refuges such as amongst tree roots, deadwood, rubble piles and constructed hibernacula.

As a consequence of great crested newt ecology the timing of any operational works in pond/ditch and wetland areas on golf courses should be carried out post survey and during the months of November to February.

Survey Methods

A variety of survey methods are used to detect great crested newts. As a consequence of great crested newt ecology the timing of survey is constrained to the breeding season (mid March – mid June). However it is possible to conduct a refugia (logs, bark, rocks and cover objects) search outside the breeding season, but this cannot be relied on as a sole survey method.

All survey methods must be carried out by a licensed ecologist and include:

- **Egg search:** Examining submerged vegetation for newt eggs
- **Torching:** Searching a pond by torchlight between dusk and midnight
- **Netting:** A dip-net is used to search the perimeter of the pond
- **Bottle trapping:** Bottle traps are submerged around the pond perimeter at dusk and removed the following morning. This method can only take place when night time temperatures exceed 5°C, so is confined to Spring and Summer
- **Terrestrial search:** Refugia such as logs, bark, rocks and debris are carefully searched.

Types of survey: There are two commonly used methods of great crested newt survey. Both types require 50% of surveys to take place between mid April and mid May:

Presence/Absence survey: To determine the presence or absence of great crested newts, up to four survey visits in suitable weather conditions, using three different survey methods are usually required.

Population Size Class Assessment: To assess the great crested newt population size, six visits in suitable weather conditions using bottle trapping and torching survey methods are usually required.

Protection & Legislation

Great Crested Newts are listed on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and schedule 2 of the Conservation (Natural Habitats &c.) Regulations 1994 (as amended), receiving protection for the animal and its habitat. Under the Wildlife and Countryside Act it is illegal to undertake the following:

- Intentionally or deliberately kill, injure or capture great crested newts;
- Deliberately disturb great crested newts;
- Damage, destroy or obstruct access to and any structure or place used for shelter or protection by great crested newts;
- Possess or transport a great crested newt or any parts of a great crested newt unless acquired legally;
- And sell, barter or exchange great crested newts or any parts of great crested newts.

Licensing & Mitigation

If great crested newts are found on land proposed for development a mitigation plan will be required. This mitigation strategy will only be granted a licence from Scottish Natural Heritage (SNH) www.snh.gov.uk if it is clear there will be no net loss in local great crested newt status. Hence, mitigation should aim to maintain a population of equivalent status on or near the original site, and should enhance links to adjacent populations where present.

If your golf course has a pond where great crested newts have been recorded then this should be considered when formulating a pond management plan.

The nature of the proposed development will affect the type of mitigation, but typical mitigation measures include:

- Habitat creation, restoration or enhancement – to provide receptor areas for displaced newts, in compensation for areas to be lost or damaged;

- Avoidance of disturbance, killing or injury – taking all reasonable steps to ensure works do not harm individuals, by altering working methods or timing to avoid newts; capture and removal; exclusion to prevent newts entering development areas;
- Long-term habitat management and maintenance – to ensure the population will persist;
- Post-development population monitoring – to assess the success of the scheme and to inform management or remedial operations.

For further information and best practise guidelines please refer to:

<http://www.snh.gov.uk/about-scotlands-nature/species/amphibians-and-reptiles/>

<http://www.narrs.org.uk/>

<http://www.herpconstrust.org.uk/>

<http://www.froglife.org/>

Guidelines for Otter Surveys

Ecology

Otters live alongside rivers, lakes and sea coasts feeding mainly on a diet of fish. They rest and breed in dens called "holts" which are usually in the roots of old river bank trees. Pollution and habitat loss caused a severe decline in otter numbers during the 1950's, but conservation efforts have meant that they are now increasing in number.

Survey Methods

Otters are shy and predominantly nocturnal and therefore survey techniques are mainly based on searching for field signs such as footprints, droppings, holts and worn paths alongside water courses. Otters are active all year round and therefore survey timings are not seasonally constrained.

Protection & Legislation

Otters are protected by the EC Habitats Directive, which is transposed into domestic law through the Conservation (Natural Habitats, &c.) Regulations 1994. The latter are hereafter referred to as 'the Habitats Regulations'. Under the Habitats Regulations, otters are classed as "European Protected Species" and therefore given the highest level of species protection.

In the following description 'otter holt' includes hovers and couches, which are otter resting places above ground. Artificial holts are not considered as holts under the legislation until they are known to be used by otters. The Habitats Regulations make it illegal to:

- Deliberately capture, injure or kill an otter Deliberately disturb an otter in such a way as to be likely to significantly affect the local distribution or abundance of otters or the ability of any significant group of otters to survive, breed, rear or nurture their young Damage or destroy an otter holt Possess or transport an otter or any part of any otter;
- Sell (or offer for sale) or exchange an otter.

Otters have become exempt from many of the provisions of the Wildlife and Countryside Act 1981 (as amended). However, otters are still protected under Section 9(4)(b) and (c) and (5) of the Wildlife and Countryside Act. This means that, in addition to the provisions of the Habitats Regulations, it is also illegal under the Wildlife and Countryside Act to:

- Intentionally or recklessly disturb any otter whilst it is occupying a holt ;
- Intentionally or recklessly obstruct access to a holt.

Licensing & Mitigation

A development licence is required to permit otherwise illegal activities which are described above. A development licence will only be granted if an appropriate mitigation plan has been written by a suitably qualified ecologist.

Mitigation measures may include:

- Construction of artificial holts;
- Maintenance of habitat corridors;
- Safe river and road crossing points;
- Otter proof fencing along roads.

For further information, licensing and best practise guidelines please refer to:

<http://www.snh.gov.uk/planning-and-development/advice-for-planners-and-developers/protected-animals/>

Guidelines for Reptile Surveys

Ecology

There are three species of reptile native to Scotland. The Slow-worm, the Adder and the sand lizard was also introduced as an experiment from Dorset to the Inner Hebrides in 1971 and a small colony survives around the release site today. Reptiles are found in a wide range of habitats including heaths, moors, rough grassland and woodland edges, all of which feature on golf courses.

Survey Methods

Reptiles are most active in late spring and late summer; hibernation occurs between November and February. Reptile surveys therefore can take place from March to October, with late spring (April-June) and September being the best time to survey. During these months the best times to survey are morning (8.30am-11am) and early evening (4pm-6.30pm). Survey times can be limited by high temperatures in July/August, because reptiles will consequently spend less time basking.

Weather conditions are also another factor influencing survey. It is best to survey when air temperatures are between 9 and 18°C, with rainy or windy conditions being unsuitable for survey.

The different types of survey methods are as follows:

- Direct observation: Experienced ecologists can visually search for basking reptiles in suitable habitats.
- Artificial refuges: Materials such as corrugated iron, roofing felt and carpet tiles are placed in potential reptile 'hotspots'. These refuges provide shelter from predation and aid the reptile to absorb heat. This method works well for slow-worms and snakes but is less effective for lizards.

To determine the presence or absence of reptiles, seven survey visits (less if found earlier) must be conducted in suitable weather conditions.

Protection & Legislation

The slow worm and adder are protected under Section 9 of the Wildlife and Countryside Act, 1981 against injuring, killing or selling. The sand lizard is fully protected under the Wildlife and Countryside Act, 1981 (section 9) and Regulation 9 of the EU Habitats Regulations 1994 against killing, injuring, capture, damaging or destroying a breeding or resting site, intentionally obstructing access to a place used for shelter, keeping, transporting or selling.

This means that not only are the animals themselves protected but so are their habitats. For development sites Scotland, to avoid prosecution under the Wildlife and Countryside Act 1981 (as amended), wherever works will impact on slow worms, adders or sand lizards there must be evidence that every reasonable effort was made to avoid breaking the law – including proof of adequate surveys and mitigation plans. Mitigation measures should, ideally, be agreed with the Scottish Natural Heritage (SNH)

Licensing & Mitigation

If reptiles are found on site, planning must incorporate the following:

- Protection of reptiles from any harm that might arise during the development work;
- Ensure that sufficient quality, quantity and connectivity of habitat is provided to accommodate the reptile population, either on site or at an alternative site, with no net loss of local reptile conservation status.
- Achieve the above aims appropriate mitigation must be implemented. This will typically involve some of the following:
 - Translocation: Moving reptiles to a receptor site permanently or temporarily while development work takes place. This will involve capturing and removing all of the reptiles from the development site before works can commence.
 - Fencing: If reptiles are to be kept on site during development works, they should be fenced in an area of the site which is not proposed for development; in order to prevent disturbance.
 - Habitat creation: Post development habitat creation may involve construction of hibernaculum or log piles and areas of grassland.

For further information and best practise advice please refer to:

<http://www.snh.gov.uk/about-scotlands-nature/species/amphibians-and-reptiles/reptiles/>

Guidelines for Water Vole Surveys

Ecology

Water voles are found in both urban and rural areas and feed on a variety of different plant species. Habitats occupied include water bodies with well vegetated banks such as streams, ditches, reed beds, marshes and ponds, all of which are present on golf courses. Within the banks of the water body water voles excavate extension burrow systems which they use for protection from predators, sleeping and nesting.

Survey Methods

Direct sightings of water vole are rare and therefore surveying techniques rely on the observation of characteristics field signs including faeces, latrines, feeding stations, burrows and footprints. Surveys can be conducted between the months of April – October.

Protection & Legislation

Water voles are protected because they have shown a significant decline in numbers over the last fifty years; this is thought to be attributed to increased habitat isolation and predation from the introduced American mink.

The law regarding water voles was strengthened in April 2008 when the Wildlife and Countryside Act, 1981 was amended. It is now an offence to:

- Kill, injure or take a water vole;
- Intentionally or recklessly damage or destroy its place of shelter e.g. a burrow;
- Intentionally or recklessly disturb a water vole when it is occupying a place of shelter;
- Sell, buy or possess a water vole.

Licensing & Mitigation

Licences are available from the Scottish Natural Heritage (SNH) www.snh.gov.uk to allow activities that would otherwise be an offence, including:

- For scientific or educational purposes;
- For the purposes of ringing or marking;
- For conserving wild animals or introducing them into a particular areas;
- Preserving public health or public safety;
- Preventing the spread of disease;
- Preventing serious damage to any form of property or to fisheries.

The type of mitigation measures used depends on the mitigation strategy. The following are an example of common techniques:

- Water vole exclusion temporarily/permanently;
- Vegetation clearance;
- Habitat creation including creation of reed beds, ponds, ditches and fencing of banks.

For further advice and best practise guidelines please refer to:

<http://www.snh.gov.uk/about-scotlands-nature/species/mammals/land-mammals/water-voles/>

