



Environmentally
Sustainable Systems Ltd

LAND AT KILMAHEW, CARDROSS
INITIAL ECOLOGICAL ASSESSMENT

Report to ERZ Ltd

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INTRODUCTION

Environmentally Sustainable Systems Ltd. (ESS) was commissioned by ERZ Ltd in December 2009 to undertake an initial ecological assessment survey on a specified area of woodland (hereafter 'study area') at Kilmahew, Cardross on behalf of their client NVA, an environmental arts charity.

The study area is located approximately 0.5km to the northeast of Cardross. The study area is at present subject to preliminary scoping for an as yet unspecified project on behalf of NVA and this ecological assessment will inform the decision making process.

METHODOLOGY

Study area

The study area contains most of the former Kilmahew Estate woodland which extends to approximately 24.9 hectares. Rising from south to north it is bordered predominantly by pastoral farmland to the north and east and to the west by Cardross golf course. The southern end of the study area is bordered by Carman Road, with grassland and arable land immediately to the south (see Figure 1: Site Boundary and Phase 1 Habitat plan).

The study area is intersected by two burns: the Kilmahew Burn and the Wallacetown Burn. The former enters the study area from the north, near Kilmahew Farm, the latter from the east. The confluence of both burns lies in the south of the study area from where they drain southwards. Both are relatively fast-flowing streams, characterised by rocky substrate and steep, inaccessible wooded gullies. The Kilmahew Burn contains several water falls.

Several buildings are present within the woodland, most notably the abandoned St Peter's College and the remnants of Kilmahew Castle (see Figure 1). A number of small roads and tracks are present within the study area; which provide access to the buildings. Many of these roads in the east of the study area are impeded by overgrown vegetation or fallen trees.

Earlier survey and reporting work by the Scottish Wildlife Trust (SWT, 1998) divided the site into several compartments and described each individually. Habitat descriptions in this report refer, where relevant, to the findings of the SWT report.

Purpose and Survey methodology

The study area was visited by ESS ecologists Ed Robinson and Joris Driessen on the 15th January 2009. An extended Phase 1 habitat survey (JNCC, 2003) was undertaken in order to identify the main habitats with notes on fauna utilising the study area through observations and field signs. For this purpose the walk over of the study area was undertaken in an attempt to cover as much of the area as possible. A full list of all fauna recorded from the study area is included as Appendix 1.

Desk Study

ESS' approach to site assessment comprises of two main areas: desk-based study and field study. The aim of the desk study is to compile background information on the site and its surroundings from local record centres and interest groups where relevant. As part of this study the following organisations were contacted with regard to information they hold on protected, rare and notable species and habitats within 3km and 5km of the study area respectively:

- Glasgow Museum Biological Record Centre (BRC)

A search was also made for information on bats in close proximity to the site from the National Biodiversity Network (NBN) website and this information has been reproduced in Table 3 (see Results section).

Date, time of survey and weather conditions

Timing and weather conditions from the field visit are detailed below (see Table 1). The previous night a substantial amount of precipitation had fallen, leading to high water levels in the burns and actively working drains flowing into the study area, particularly on the wooded slopes along Carman Road. As a result the overall conditions within the study area were quite wet.

Table 1 Weather Conditions Recorded During Site Visit

DATE	TIME	WEATHER
15/01/09	10:00 – 16:00	Wind 1-2, 100% clouds, continuous drizzle / light rain, mild 8-10 Celsius

Survey constraints

The timing of the survey meant that the ability to identify ground flora was limited as many species are not apparent above ground at this time of year. However, for the purpose of a Phase 1 Habitat survey, which looks at broad habitat types rather than providing a comprehensive species assemblage for each plant community present, this is not considered to be a major issue.

The prevailing weather conditions are also considered to have had an effect on the ability to find signs of otter in the form of spraint and prints. Substantial precipitation overnight is likely to have had a negative effect on the probability of finding spraint. Such signs are washed away as a result of prolonged and / or heavy rain whilst prominent rocks – water course features characteristically used by otters to mark their territory - are submerged temporarily by higher water levels in burns.

Although access to Kilmahew Castle was possible for the purpose of an internal inspection, no attempt was made to enter the St. Peter College buildings for health and safety reasons. Certain sections of both watercourses were inaccessible due to a combination of high water levels, dense undergrowth and the steepness of the gullies.

RESULTS

Results of desk-based study

There is currently no active BRC for Argyll & Bute as a whole (with the exception of a BRC on Islay, covering that island only). Glasgow Museum BRC covers the rest of Argyll & Bute on an informal basis, thus consequently the amount of available data is limited.

Information received from Glasgow Museum BRC has been included in Table 2 below:

Table 2: Information received from Glasgow Museum BRC

Name	Grid Ref	Date Recorded	Source
Common Frog	NS3702278993	March 2005 - May 2005	Unknown CARG
Palmate Newt	NS36957894	March 2005 - May 2005	Unknown CARG
Common Frog	NS36957894	March 2005 - May 2005	Unknown CARG
Common Frog	NS36957894	March 2005 - May 2005	Unknown CARG
Common Toad	NS3678078417	March 2005 - May 2005	Unknown CARG
Common Frog	NS3678078417	March 2005 - May 2005	Unknown CARG
Common Frog	NS3717677856	March 2005 - May 2005	Unknown CARG
Common Toad	NS3678078417	March 2005 - May 2005	Unknown CARG
Japanese Knotweed	NS329781	01/05/2007	Adrian Sumner
Common Frog	NS3678078417	March 2005 - May 2005	Unknown CARG
Palmate Newt	NS3512878459	March 2005 - May 2005	Unknown CARG
Common Frog	NS3512878459	March 2005 - May 2005	Unknown CARG
Common Frog	NS3512878459	March 2005 - May 2005	Unknown CARG
Common Frog	NS3685078874	March 2005 - May 2005	Unknown CARG
Common Frog	NS3685078874	March 2005 - May 2005	Unknown CARG
Palmate Newt	NS3685078874	March 2005 - May 2005	Unknown CARG
Common Frog	NS3702278993	March 2005 - May 2005	Unknown CARG
Palmate Newt	NS3702278993	March 2005 - May 2005	Unknown CARG
Eastern Grey Squirrel	NS338777	08/12/2007	SSS Recorder

Records of protected species were also obtained from the National Biodiversity Network (NBN) website (<http://www.nbn.org.uk/>), particularly with regard to bats as Glasgow Museum BRC stated that they did not yet source bat records from the Clyde bat group. This information is reproduced in Table 3 below (BCT: Bat Conservation Trust; NCC: Nature Conservancy Council).

Table 3 Information obtained from NBN on Bats

Name	Grid Ref	Date Recorded	Source
Pipistrelle spp.	NS310736	21/5/2005	BCT
Pipistrelle spp.	NS336733	21/5/2005	BCT
Pipistrelle spp.	NS358707	21/5/2005	BCT
Pipistrelle spp.	NS363730	21/5/2005	BCT
Myotis daubentonii	NS3070	31/8/2004	BCT
Myotis daubentonii	NS3977	15/8/1998	BCT
Plecotus spp.	NS3477	3/7/1985	NCC

Plecotus spp.	NS37	Between 1960 - 1994	Gibson, Dr. J. A
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The nearest bat record obtained from NBN lies less than 1 km southwest of the site.

In their previous report, SWT (1998) recorded the presence of pipistrelle bats *Pipistrellus pipistrellus* within the study area in 1998.

Statutory and non-statutory sites

Part of the study area has a non-statutory designation: the Wallacetown Glen, encompassing the Wallacetown Burn and associated woodland, is designated as a Site of Importance for Nature Conservation (SINC) under the Lower Clyde Valley Project, Nature Conservation Strategy. This area is situated between the South Lodge entrance up to the cattle grid along Carman Road (just outside of the study area). The woodland within the study area as a whole is listed on the Ancient Woodland Index, as are most woodlands within 5 km of the study area.

Survey Results

Phase 1 Habitat survey

The main habitat types observed within the study area are broadleaved plantation woodland, scrub, semi-improved neutral grassland, tall ruderal vegetation, open standing water and running water. These habitat types are described in some detail below. Where relevant, reference is made to the findings of the 1998 survey (SWT, 1998). Figure 1 gives an overview of the habitat categories recorded within and adjacent to the study area and should be referred to for details of the location and extent of the broad habitats described below.

In order to avoid duplication, a detailed overview of the woodland in the study area, including descriptions of age, structure, species composition and diversity is presented in the accompanying preliminary Woodland Assessment Report.

Broadleaved plantation woodland

Under Phase 1 habitat classification the majority of the study area is considered to be broadleaved plantation woodland as less than 10% of the canopy is made up by coniferous species and more than 30% of the canopy has been planted (JNCC, 2003). In the centre of the study area, around St. Peter's College, is an area formerly managed as an ornamental garden and arboretum. The woodland comprises some semi natural elements with clear signs of past management activity, notably coppicing.

The tree canopy is dominated by sycamore *Acer pseudoplatanus*, pendunculate oak *Quercus robur*, ash *Fraxinus excelsior*, beech *Fagus sylvatica*, and common lime *Tilia x europaea*. Wych elm *Ulmus glabra*, Scot's pine *Pinus sylvestris* and a variety of exotic conifers also occur infrequently throughout the study area. Fallen dead wood is abundant throughout the study area, although standing dead trees are also common. In places the boundary between woodland and farmland is marked by hawthorn *Crataegus monogyna* hedgerows. Wych elm has LBAP status (Local Biodiversity Action Plan) in Argyll & Bute.

With the exception of the northern end of the site and, patchily, the wooded slopes of the Wallacetown Burn, the understory across much of the woodland is comprised almost exclusively of rhododendron *Rhododendron ponticum* and occasional holly *Ilex aquifolium*. In the north of the study area, tree stands are dominated by beech, resulting in a classic open beech stand with little undergrowth. Both pendunculate oak and common lime occur here to a lesser extent. Across the site ivy *Hedera helix* and honeysuckle *Lonicera periclymenum* are striking features, regularly covering mature trees and / or dead wood.

Scattered scrub

Patches of scrub are present within the walled garden, mainly composed of hawthorn *Crataegus monogyna* and various *Ribes* and *Rubus* species (particularly bramble *Rubus fruticosus* and raspberry *Rubus idaeus*).

Semi-natural neutral grassland

A small patch of semi-neutral grassland is present on a slope near the main entrance to St. Peter's College.

Tall Ruderal Vegetation

In addition to shrub vegetation (see above) parts of the walled garden are overgrown with tall ruderal vegetation communities. This area is dominated by stands of rosebay willowherb *Chamerion angustifolium* with nettle *Urtica dioica* and spear thistle *Cirsium arvense* also present.

Open standing water

Two water bodies, linked by a small drain, are situated in the north west of the site. At the time of the survey the water level was such that both appeared effectively as a single water body. To a large extent it is overshadowed by nearby trees, a substantial layer of dead leaves was visible in the shallow margins with Alder *Alnus glutinosa* and Reed canary-grass *Phalaris arundinacea* also present. Very little aquatic vegetation seemed to be present (although the time of year plays a role in the latter's near absence). Standing water has both UKBAP and LBAP status.

Running water

The Kilmahew and Wallacetown Burns are characterised by their variety in flow speed between sections, stony substrate and streambeds which are deeply cut into the rock. An abundance of prominent rocks, dead wood, occasionally in piles, and upturned tree root systems add to the diversity. Due to the steep wooded banks, the near absence of footpaths perpendicular to either burn and the apparent low level of recreational use the gullies are of a very secluded nature and are probably rarely disturbed.

Adjacent Habitats

In the immediate vicinity of the study area the following habitat categories were identified: marshy, semi-improved acid, improved and amenity grassland (i.e. the golf course). These have been incorporated in the Phase 1 habitat map in order to place the study area in its local habitat context.

Faunal Activity

During the site assessment, notes were made on faunal activity and the potential for the presence of protected species within the study area.

The immediate vicinity of the study area contained an abundance of mole *Talpa europea* hills, notably to the northwest in areas of improved grassland. A dead hedgehog *Erinaceus europaeus* was found on the southern slope of the Wallacetown Burn gully. Based on the evidence available the animal had been predated by a raptor or owl species.

Roe deer *Capreolus capreolus* prints, droppings and scrapes were recorded throughout the study area, particularly on the slopes above the Wallacetown Burn. Signs of browsing damage were evident throughout the site, likely caused by roe deer. Fox *Vulpes vulpes* droppings were found on a grass embankment near the main entrance to the buildings at St. Peters College. Evidence of rabbit *Oryctolagus cuniculus* - burrows and droppings – were found along most woodland edges, particularly in the northern half of the study area and in the more open parts of the woodland along the Wallacetown Burn.

Mammal pathways were recorded throughout the study area, usually on the boundary of woodland and surrounding grassland. Such pathways were particularly

abundant along the northern and eastern side of the study area. An examination of the prints attributed some of these to rabbit and roe deer, other prints could not be identified. Along the woodland edge in the north eastern part of the study area the fence has come down in several places, leading to cattle gaining access to this part of the woodland, as evidenced by the presence of cattle pathways, droppings and some signs of light grazing.

Other mammal species such as badger and otter were not recorded in or near the study area. Mammal pathways present could not be attributed to badgers directly and it is likely that these are in the main attributable to roe deer, rabbit and fox.

In all, 23 bird species were recorded within the study area. Of these song thrush *Turdus philomelos* is on the Red List, and barn owl *Tyto alba*, dunnock *Prunella modularis* and woodcock *Scolopax rusticola* are on the Amber List (Gregory *et al.* 2002). Redwing *Turdus iliacus* is placed on the latter as well, though on the basis of its status as a breeding bird, not on its wintering status in the UK. All other species are considered to be common and widespread. In addition song thrush is listed as both a UKBAP (UK Biodiversity Action Plan) and a LBAP species.

Barn owl pellets and droppings were abundant within the ruins of Kilmahew Castle, indicating a regular presence of this species, at least in winter time.

Other species of interest were dipper *Cinclus cinclus* observed along the Wallacetown Burn and two to three woodcock noted in the centre of the study area.

All bird and mammal species encountered on site are presented in Appendix 1.

ASSESSMENT

Legislative Context

This initial ecological assessment has made due consideration to the following pieces of nature conservation legislation:

- The Wildlife and Countryside Act, 1981 (as amended);
- EC Directive 92/43 on the Conservation of Natural Habitats and of Wild Fauna and Flora;
- Conservation (Habitats etc.) Regulations, 1994 (amended 2000);
- Nature Conservation (Scotland) Act, 2004 (amended 2007).

Bats

All species of bat in the UK are fully protected under Schedule 5 of the Wildlife and Countryside Act (1981, as amended), Schedule 2 of the Conservation (Natural Habitats etc.) regulations (1994) and are listed on Annexe IV of the EC Habitats Directive as European Protected Species (EPS). Collectively, these regulations make it an offence to intentionally kill, injure or capture (take) bats, to deliberately or recklessly disturb bats in a roost or any other structure or place it uses for shelter or protection and to intentionally or recklessly damage, destroy or obstruct access to a bat roost even if bats are not in residence.

Otter

Otters are specially protected by international and national legislation. They are listed as European Protected Species (EPS) and are protected in the UK by Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). The legislation was updated by the Nature Conservation (Scotland) Act 2004 (amended 2007) to include 'reckless' acts.

In practice, the legislation states that otters are protected from deliberate or reckless killing, injury or capture. In addition, their habitat, including holts, couches and any other place used for 'shelter or protection' are also protected against damage or destruction. SNH guidance (SNH, 1997) recommends that works within 50m of a protected structure may need to be licensed.

Badger

The Protection of Badgers 1992 consolidates the previous Badgers Acts of 1973 and 1991. Badgers are also protected by the Wildlife and Countryside Act 1981, as amended in Scotland by the Nature Conservation (Scotland) Act. The legislation aims to protect the species from persecution, rather than being a response to an unfavourable conservation status as the species is widespread and common across much of Britain.

In addition to protecting the animal itself, the 1992 Act also makes the intentional or reckless destruction, damage or obstruction of a badger sett an offence; a sett being defined as "any structure or place which displays signs indicating current use by a Badger" where current use is defined by Scottish Natural Heritage as "*any sett within an occupied badger territory, regardless of when it may have last been used*" (SNH, 2002).

Therefore, a sett in an occupied territory is considered to be in current use even if it is only used seasonally or occasionally by badgers, and as such, is afforded the same protection in law. In addition, the intentional elimination of sufficient foraging area to support a known social group of badgers may, in certain circumstances, be construed as constituting 'cruel ill treatment of a badger'.

Barn owl

Barn owl is a Schedule 1 species under the Wildlife and Countryside Act 1981. The species can be impacted during construction if activities take place near nests or roosts. For barn owl, Currie & Elliot (1997) indicate a minimum 'provisional safe working distance' during the nest building and egg laying period to be approximately 250 metres. Hardey *et al.* (2006) emphasise that avoidance of disturbance is particularly important during the pre laying period (February to April) and at hatching (April to August, peak period May to June).

Furthermore barn owls should not be flushed from nests or roosts in daylight as this might affect their survival (especially in winter months). Although not a legal requirement, avoiding the immediate vicinity of the buildings in December and January would be beneficial for the species and a clear case of "good practice" on behalf of the developer.

Discussion

Due to the woodland's plantation origin, the presence of a substantial number of exotic specimens and the complete absence of management in recent times (which has resulted in rhododendron becoming dominant in the understory), ESS considers that the botanical interest of the study area is limited and that the habitats present are common and widespread.

Several habitat types and one tree species present within the study area have UKBAP and / or LBAP status: running water and open standing water are both UKBAP and LBAP listed. Wych elm is an LBAP species and thus of local conservation concern in Argyll & Bute. Based on the woodland present within the study area ESS considers there to be a potential towards the development of lowland mixed deciduous woodland and wet woodland (both UKBAP habitats) through targeted habitat management. Such an approach would benefit aforementioned habitat categories, subsequently strengthening the quality of these habitat types on a local scale and supporting a nationwide effort at biodiversity conservation through the UKBAP framework.

A detailed discussion of the current state of the woodland and the potential for future habitat management is presented in the accompanying preliminary Woodland Assessment report.

ESS considers that the habitats present do provide good potential habitat for bat species, otter and barn owl.

Bats

The study area contains an abundance of mature trees as well as several buildings in various stages of dilapidation which offer opportunities for roosting bats. Furthermore, the watercourses, water bodies, woodland edges and clearings and

roads which intersect the woodland provide an abundance of features suitable for bat navigation and foraging activity, particularly in a larger spatial context with habitat corridors connecting the site with larger tracts of woodland, scrub habitat and several reservoirs beyond the study area boundary (e.g. Asker Reservoir to the north). This apparent suitability is supported by the observations of pipistrelle spp. near the South Lodge entrance and over the water bodies during the survey undertaken by the SWT in 1998 (SWT, 1998).

In addition, the common pipistrelle *Pipistrellus pipistrellus* is a Local Biodiversity Action Plan (LBAP) species and is therefore a local conservation priority for Argyll & Bute Council.

Otter

Although no otter signs were found within the study area ESS consider it likely that otters use the site at least intermittently. In a Scottish context it is important to note that Green & Green (1997), based on national survey data, estimated that over 83% of all Scottish water courses support otter populations. In the vicinity of the study area otter records are known from along the Clyde, the River Leven and towards Loch Lomond (all NBN records). The Kilmahew and Wallacetown Burns, both fast flowing, clean streams and likely to hold relatively healthy fish populations, provide extensive foraging habitat for this species. Otters have both UKBAP and LBAP status.

Along watercourses, otters use a variety of places for shelter or as places where they can rest up. Holts are subterranean resting sites typically under root systems on or adjacent to river embankments or under overhanging vegetation on river embankments. Couches are 'above ground' resting sites typically consisting of densely vegetated islets in the middle of rivers or as secluded inlets. Not all resting places are directly adjacent to watercourses and holts have been recorded up to 500 metres or more from a watercourse.

Badger

No badger setts or field signs which could be directly attributed to badgers were observed within the study area. Due to the extensive presence of rhododendron and the inherent problem in trying to access certain areas of the site, the absence of a badger sett can not reliably be ruled out completely. However as the study area is characterised by naturally wet soil conditions the presence of a sett is deemed unlikely as badgers require free draining soils in order to dig their setts.

While it is considered possible that badgers may occasionally use the site in transit or to forage, ESS considers the lack of any field signs and the abundance of suitable habitat within the wider surrounding area means that the site is unlikely to be important to badgers. The SWT report which covered an area significantly larger than that requested of ESS, extending further north along the Kilmahew burn, did not report any sign of setts or other field signs attributable to badgers.

Barn owl

Barn owls have been known to breed in Kilmahew Castle for several years during the nineties (SWT 1998). The presence of recent pellets and droppings in the castle ruins recorded during the ESS survey indicates that the building is currently (2009) at least within a barn owl's home range; which is occupied year round. Confirmation of presence or absence of a breeding pair in the building or nearby mature trees would require a follow up visit in April – June.

Dipper

The presence of dipper along the Wallacetown Burn indicates a healthy burn system as the species prefers clear, fast-flowing streams and rivers, particularly where a stony streambed provides an abundance of invertebrate prey such as mayflies, stoneflies and caddisflies.

Amphibians

SWT (1998) found both palmate newt *Triturus helveticus* and smooth newt *Triturus vulgaris* occupying both ponds within the study area. At this stage the presence or absence of great crested newt *Triturus cristatus* within the study area cannot be concluded without a targeted suitability assessment of both ponds, although their presence is considered unlikely by ESS.

RECOMMENDATIONS

As the nature of the proposed development has not been specified yet it is not possible to assess the likelihood, extent and magnitude of any potential impact on protected species and habitats at present. ESS considers that the need for further survey work will be dependent upon the nature and specification of the proposed development of the site once established and at which point, potential impacts to protected fauna and flora can be established.

However, ESS is aware of the presence of barn owl and considers that bat species, and otter are highly likely to be present within the study area and that these species will need to be considered, at an early stage, as part of any development plans, activities and associated habitat management in order to ensure that the proposed development does not breach nature conservation legislation (as detailed in the Legislative Context section above).

CONCLUSIONS

Environmentally Sustainable Systems Ltd. (ESS) was commissioned by ERZ Ltd in December 2008 to undertake an initial site assessment on a proposed development site near Cardross, Argyll & Bute.

ESS is aware of the presence of barn owl and considers that bat species, and otter are highly likely to be present within the study area and makes recommendation that these species are given consideration as part of any development plans in order to ensure that the development does not breach nature conservation legislation.

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APPENDICES

APPENDIX 1**Birds**

Wren *Troglodytes troglodytes*
Great Tit *Parus major*
Robin *Erithacus rubecula*
Blue Tit *Parus caeruleus*
Blackbird *Turdus merula*
Magpie *Pica pica*
Dunnock *Prunella modularis*
Wood Pigeon *Columba palumbus*
Chaffinch *Fringilla coelebs*
Carrion Crow *Corvus corone corone*
Dipper *Cinclus cinclus*
Barn owl *Tyto alba*
Tree creeper *Certhia familiaris*
Long-tailed tit *Aegithalos caudatus*
Buzzard *Buteo buteo*
Redwing *Turdus iliacus*
Jay *Garrulus glandarius*
Raven *Corvus corax*
Song thrush *Turdus philomelos*
Meadow pipit *Anthus pratensis*
Pheasant *Phasianus colchicus*
Great spotted woodpecker *Dendrocopos major*
Woodcock *Scolopax rusticola*

Mammals

Mole *Talpa europae*
Roe deer *Capreolus capreolus*
Rabbit *Oryctolagus cuniculus*
Hedgehog *Erinaceus europaeus*
Fox *Vulpes vulpes*