Biodiversity Duty:
Mollusca Survey of St Fagans: National History Museum

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Introduction

From 1 October 2006, all public authorities in England and Wales have a duty to have regard to the conservation of biodiversity in exercising their functions (Section 40 of the Natural Environment and Rural Communities Act 2006). As part of the Museum's response to this legislation, biodiversity audits are being carried out at a series of its sites. In this report, a list of Mollusca species is presented from a survey of the grounds of the National History Museum, St Fagans in Autumn 2008. It also contains some previous data collected from pond surveys carried out on the site in 2004.

Methods

The ornamental ponds and stream areas of the site were surveyed in 2004. The four castle ponds were surveyed for habitat character, water chemistry, lichens, bryophytes, higher plants, molluscs, crustaceans, insects and birds between August and October of that year to assess the impact of a possible removal of silt from the ponds. The qualitative survey of aquatic molluscs was undertaken on 26th August 2004. Hand nets were used to take samples from the sediment and vegetation, and the margins of the ponds were examined by hand.

The 2008 survey was carried out on two separate days in October. As the site is so large we felt it necessary to do two visits so as to adequately ensure that a wide range of habitat types were sampled. In addition this also allowed for some variability in environmental conditions, a possible factor affecting the number of species visible on a particular day. The area surveyed is shown in Figure 1.

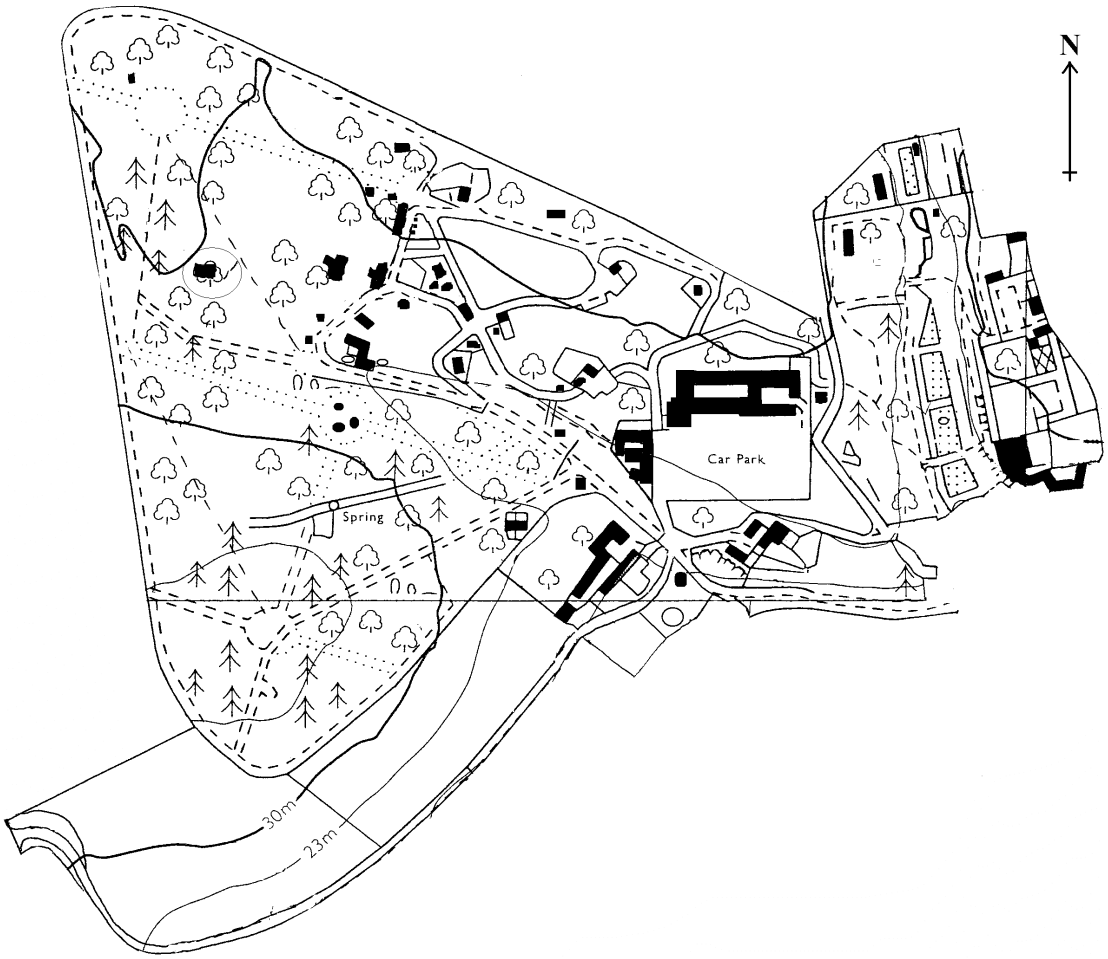

Figure 1. Boundary of area surveyed, National History Museum

We carried out the survey by walking around the grounds. As a Phase 1 habitat survey had been carried out on the site earlier in the year we were able to concentrate our searches on those habitats best suited to molluscs, a great advantage as the site is so large. In addition it also meant that we could cover a good range of different habitat types so as to ensure that our survey was comprehensive.

The list below is a condensed version of the habitat types as identified in the phase 1 habitat survey, for the comprehensive list please see the report by Tim Rich.

Broad-leaved and mixed semi-natural woodland: Broad-leaved semi-natural woodland is widespread at St Fagans, especially in the west of the site. This is the main habitat type across the site, and the canopy varies locally from beech, to ash, to sycamore or to oak with some more mixed areas. Some areas have mixed deciduous and conifer woodland, the main area remaining is in the western woodland.

Dense and scattered scrub: A few small areas of Buddleja scrub or willow scrub occur on the edges of woodland. There are a few small patches of bramble scrub and young hawthorn trees by the Celtic village.

Broad-leaved parkland, mixed parkland and scattered trees: The extensive gardens at St Fagans have many areas with planted broad-leaved trees. Included in this category also are the few apple orchards in the grounds and the 'arboretum' area on the west side of St Fagans Castle grounds.

Marshy grassland: A small area of newly established marshy grassland by the Celtic Village was surveyed.

Amenity grassland: Most of the open areas of grassland and lawns within the museum are amenity grassland. We focused on one area at the northern end of the site.

Introduced shrub: A few patches of garden shrubs are planted around the site, and much of the formal gardens come under this category. We targeted those found in the grounds just outside the castle building.

Walls and buildings: There are many walls within the site, those around the castle grounds sometimes supporting vascular plants and/or mosses and lichens. Buildings are obviously also numerous and a good place to look as often molluscs are attracted to the sheltered nooks and crevices that they offer, as well as the lime wash on the walls.

Manual searches were carried out in a range of these target habitats. This involved searching on our hands and knees through the foliage and leaf litter layer (figures 2 and 3), searching on the trunks and around the bases of trees (figure 4), searching walls and on the outsides of old buildings (figure 5), we were also allowed access to the old greenhouses by the castle building (figure 6). In addition to this, we used a sweep net in areas where there was low hanging vegetation (figure 7). Finally, we collected samples of leaf litter and surface soil from eight different areas, which we then dried out in an oven at a low temperature, sieved (5mm and 0.5mm sieve sizes) and then searched through under a bright light to find smaller litter dwelling species.

We were able to identify a large proportion of the taxa in the field, but some specimens difficult to identify were collected for later determination. Nomenclature follows Roy Anderson, 2005 - An annotated list of the non-marine mollusca of Britain and Ireland. *Journal of Conchology*, **38** (6): 607-637. Notes on the distribution on the taxa in the UK are taken from Michael Kerney, 1999 - *Atlas of the Land and Freshwater Molluscs of Britain and Ireland*. 264 pp. Harley Books.

Figure 2. Searching in ditch in grassland.

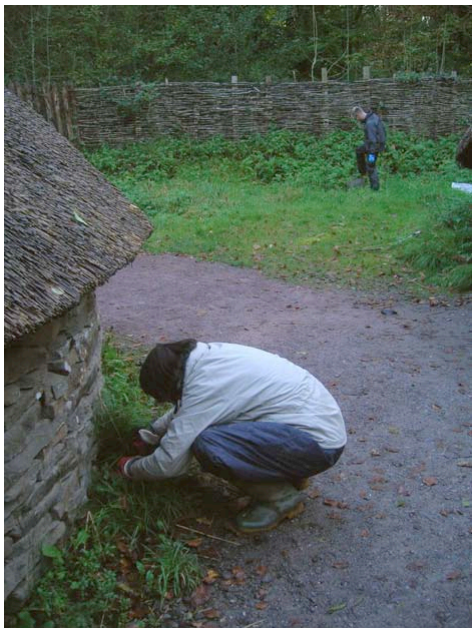

Figure 3. Searching in foliage in the Celtic village.

Figure 4. Searching the trunks of trees.

Figure 5. Searching a wall by the castle grounds.

Figure 6. Searching in the greenhouses in the castle grounds.

Figure 7. Searching through the finds of the sweep net

Results

The species recorded are listed below, the aquatic species being listed separately to the terrestrial.

TABLE 1. MOLLUSCA RECORDED AT ST FAGANS.

AQUATIC

Species	Common name (if applicable)	UK distribution of taxa
Acroloxus lacustris	Lake limpet	Native – quite widespread although distribution affected in recent years by pollution and habitat destruction.
Bithynia (Bithynia) tentaculata	Common Bithynia	Native – common, although less so in the north and west of Britain.
Galba (Galba) truncatula	Dwarf pond snail	Native – common and widespread.
Gyraulus (Armiger) crista	Nautilus ram's-horn	Native – fairly common, less so in the north and west of Britain where it is under recorded due to its minute size.
Gyraulus (Gyraulus) albus	White ram's-horn	Native – common and widespread.
Gyraulus (Torquis) laevis	Smooth ram's-horn	Native – uncommon though not in decline. Sparse distribution across Britain.
Hippeutis complanatus	Flat ram's-horn	Native – common and fairly widespread.
Lymnaea (Lymnaea) stagnalis	Great pond snail	Native – common, although less so in the north and west of Britain.
Lymnaea (Stagnicola) cf. *fuscus*	Marsh pond snail	Native – common and widespread.
Musculium lacustre	Lake/Capped orb mussel	Native – common and fairly widespread, uncommon in Ireland.
Physa fontinalis	Common bladder snail	Native – common and widespread. A good indicator of unpolluted conditions.
Physella (Physella) cf. *gyrina*	Snail – no common name	Introduced – N. American in origin. Thought to be widespread although actual distribution not yet determined.
Pisidium sp.	Pea clam	Species not identified so unable to give regional distribution.
Potamopyrgus antipodarum	Jenkin's spire snail	Introduced – first noted in Essex, England in 1852. Common and widespread, its range continuing to expand.
Radix cf. *auricularia*	Ear pond snail	Native – fairly common, although less so in the north and west of Britain. An indicator of good quality aquatic lowland habitat.
Radix balthica	Common/Wandering pond snail	Native – common and widespread.
Sphaerium corneum	Horny orb mussel	Native – common, although less so in the north and west of Britain.
Valvata (Cincinna) piscinalis	Common valve snail	Native – common, although less so in the north and west of Britain.

TERRESTRIAL

Species	Common name (if applicable)	UK distribution of taxa
Acanthinula aculeata	Prickly snail	Native – common and widespread.
Aegopinella nitidula	Smooth glass snail	Native – common and widespread.
Arion (Arion) ater	Large black slug	Probably native – common and widespread.
Arion (Arion) flagellus	Durham slug	Possibly native – widespread in the West of Britain, less so elsewhere though under recorded.
Arion (Carinarion) circumscriptus	Dotted slug	Probably native – common and widespread.
Arion (Kobeltia) distinctus	Common garden slug	Probably native – under recorded yet likely to occur throughout most of the British Isles.
Arion (Kobeltia) hortensis	Southern garden slug	Native – common and widespread.
Arion (Mesarion) subfuscus	Dusky slug	Probably native – common and widespread, though rare in East Anglia.
Balea (Balea) heydeni	Heyden's tree snail	Native – only recently distinguished as a distinct species so distribution records are poor. Thought to be mostly restricted to western Britain and Ireland.
Boettgerilla pallens	Worm slug	Introduced – first noted in England and Wales in 1972. Continuing to spread rapidly.
Candidula intersecta	Wrinkled snail	Probably introduced – a relatively modern introduction from southern Europe. Common and widespread though less so in the north.
Carychium tridentatum	Slender herald snail	Native – common and widespread.
Cepaea (Cepaea) nemoralis nemoralis	Grove/Brown-lipped snail	Native – common and widespread.
Clausilia (Clausilia) bidentata bidentata	Common/Two-toothed door snail	Native – common and widespread.
Cochlicopa cf. *lubrica*	Slippery moss snail	Native – common and widespread.
Cochlicopa cf. *lubricella*	Snail – no common name	Native – common and widespread.
Columella edentula	Toothless chrysalis snail	Native – common, fairly widespread though under recorded.
Cornu aspersum	Common/Garden snail	Introduced – early in Romano-British period. Broadly distributed although less so in northern parts of Britain.
Deroceras (Deroceras) laeve	Marsh slug	Probably native – common and widespread.
Deroceras (Deroceras) panormitanum	Caruana's/Sicilian slug	Probably introduced – first record for SE Wales in 1931. Spread has been rapid, now common in many areas of the UK.
Deroceras (Deroceras) reticulatum	Field/Milky slug	Probably native – common and widespread.
Discus (Gonyodiscus) rotundatus rotundatus	Rounded/Radiated snail	Native – common and widespread.
Euconulus (Euconulus) cf. *fulvus*	Tawny glass snail	Native – common and widespread.
Lauria cylindracea	Common chrysalis snail	Native – common and widespread.

Lehmannia marginata	Tree slug	Probably native – common and widespread, some decline in central and eastern England.
Limacus flavus (eggs)	Yellow slug	Probably introduced – distribution is patchy yet widespread.
Merdigera obscura	Lesser bulin	Native – fairly common and widespread.
Oxychilus cellarius	Cellar snail	Native – common and widespread.
Oxychlius draparnaudi	Draparnaud's glass snail	Introduced – in Roman/post-Roman period. Common in southern and central Britain, not in Scotland or N Ireland.
Oxychilus navarricus helveticus	Glossy/Swiss glass snail	Probably introduced – common in southern and central Britain although distribution is patchy in parts.
Pyramidula pusilla	Rock snail	Native – fairly common although distribution is patchy across Britain, becoming less common in the north and east.
Tandonia budapestensis	Budapest slug	Probably introduced – first recognized in Britain in 1921, but possibly before. Common and widespread, range spreading slowly north.
Tandonia sowerbyi	Keeled/Sowerby's slug	Probably introduced – common in S and central Britain although distribution is patchy in parts.
Trochulus (Trochulus) striolatus	Strawberry snail	Native – common and widespread, continuing to extend its range north.
Vallonia pulchella	Smooth grass snail	Native – common in S, E and NE parts of England, SE and SW Wales and parts of Ireland.
Vertigo (Vertigo) pygmaea	Common whorl snail	Native – fairly common though less so in the north. Under recorded due to its minute size.
Vitrea contracta	Milky crystal snail	Native – common and widespread.
Vitrea crystallina	Crystal snail	Native – common and widespread.
Zenobiella subrufescens	Brown snail	Native – mostly restricted to the west of Britain, parts of the midlands and the north. Receding in the English lowlands.

Discussion

A total of 57 species of molluscs were recorded (18 aquatic and 39 terrestrial). This is a good number that reflects the wide range of habitats that this site contains. The majority of molluscs species found are common and none of them are listed as threatened or protected. Despite this, there are a number of species worth noting.

Two aquatic snail species, *Physa fontinalis* and *Radix auricularia* stand out, as they are good indicators of water quality. *Physa fontinalis* (figure 8) is common in bright, clean running water in lowland rivers and streams, canals and drainage ditches. It is a good indicator of unpolluted conditions showing a marked decline in areas where pollution is high. *Radix auricularia* (figure 9) is a species restricted to high quality lowland aquatic habitat, usually in places with good aquatic flora. Both species were recorded from one of the larger ponds (see the 2004 pond survey report for full details).

Figure 8. Common bladder snail – *Physa fontinalis*

Figure 9. Ear pond snail – *Radix auricularia*

A terrestrial species that is a good indicator of habitat quality is *Zenobiella subrufescens* (figure 10). This is a snail typical of undisturbed habitats such as old, broad-leaved woodland, wild ancient hedgerows, on rocks and cliffs, and on lush grassy roadside banks. Its range is undoubtedly receding from English lowlands in part due to climate change, but mostly due to habitat destruction. We found it in a clump of rushes in the apple orchards in the north of the site.

Figure 10. Brown snail – *Zenobiella subrufescens*

One of the slug species of note is *Boetgerilla pallens* (figure 11), also known as the 'worm slug' due to its worm-like, extensible body which has evolved as an adaptation to living below ground in cracks, root holes and worm burrows (see figure 11). It is an introduced species first recorded in England and Wales in1972, since then its spread appears to have been rapid although apparently uneven and unpredictable (see Kerney, 1999).

Figure 11. Worm slug – *Boetgerilla pallens*