Biodiversity Duty:
Mollusca Survey of Big Pit - National Coal 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 Big Pit – National Coal Museum in the summer of 2009.

Methods

The survey was carried out on 9 July 2009. The area surveyed is shown in Figure 1.

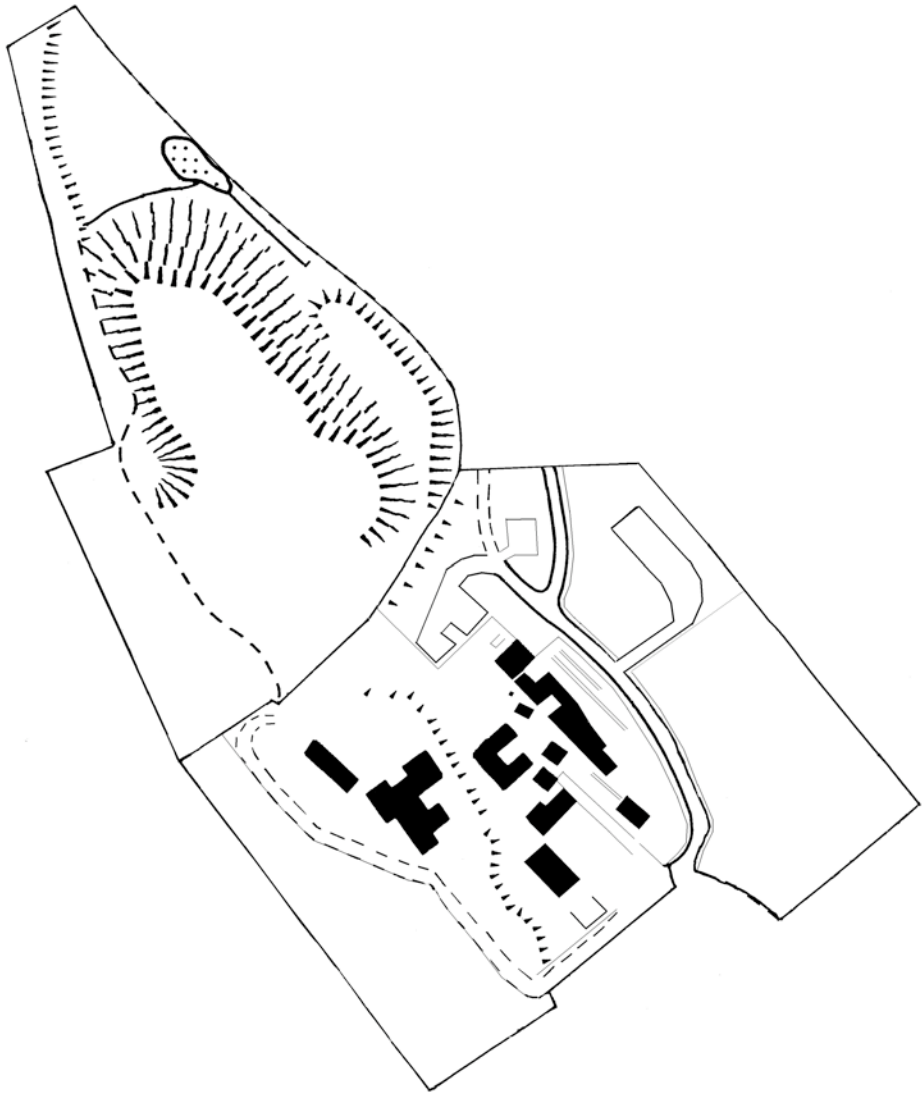

Figure 1. Boundary of area surveyed: Big Pit – National Coal Museum

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 semi-natural woodland
A small area of woodland is present on Coity Tip. It is secondary woodland and is species poor without a typical woodland ground flora.

Scattered Scrub
There are several areas around Coity Tip where scrub is colonizing the heath and grasslands.

Grassland
There are three main types of grassland. On the more acidic, dry areas of the tips, species-poor unimproved acid grassland has developed, often in association with heathland. There are two main areas of marshy grassland on the western edge of the site, and in the soft rush flushes. Amenity/Restored grassland is present in the area around Big Pit itself, although there are areas of grassland developing over the introduced limestone ballast/rubble, no typical calcareous grassland has yet developed.

Acid dwarf shrub heath
The dry heathland on the tips is dominated by heather, or by heather mixed with large patches of bilberry.The main area of wet heathland occurs above and west of the wood on Coity Tip.

Standing Water
One permanent pond occurs at the northeast corner of Coity Tip and supports a range of wetland plants. Another small pond on the top of the tip may not hold water all year. One small seasonal pond was found at the southern end of the wood, with tadpoles but no wetland plants.

Running water
Three moorland streams drain eastwards from the hills into the site, eventually merging into one stream along the west side of Coity Tip, thence into the pond, and thence south into a culvert and off-site. The streams are probably seasonal and subject to small flash-flooding, and support no obvious aquatic plants.

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 (figure 2 and 3), searching on the trunks and around the bases of trees, and searching walls and on the outsides of old buildings. We also used a suction sampler to help draw out any small species living in the dense grass or deep cracks of walls (figure 4). We sampled the area of standing water on the northeast corner of Coity Tip, to do this we collected material from the bottom of the pond using a long handled net (figure 5).

Finally, we collected samples of leaf litter and surface soil from different areas which we then dried out in an oven at a low temperature, sieved (5mm and 0.5mm sieve sizes) and 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 grassland in a flush

Figure 3. Looking in the rushes by the side of the pond on the northeast corner of Coity Tip

Figure 4. Using a suction sampler

Figure 5. Pond dipping in the standing water on the on the northeast corner of Coity Tip

Results

The species recorded are listed below.

TABLE 1. MOLLUSCA RECORDED AT BIG PIT

AQUATIC

Species	Common name (if applicable)	UK distribution of taxa
Galba (Galba) truncatula	Dwarf pond snail	Native – common and widespread.
Pisidium sp.	N/A	See "Discussion"
Radix balthica	Common/Wandering pond snail	Native – common and widespread.

TERRESTRIAL

Species	Common name (if applicable)	UK distribution of taxa
Arion (Arion) ater	Large black slug	Probably native – common and widespread.
Arion (Arion) flagellus	Durham slug	Possibly native – widespread in the W of Britain, less so elsewhere though under recorded.
Arion (Arion) rufus	Large black 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 (Kobeltia) intermedius	Hedgehog slug	Probably native – common and widespread.
Arion (Mesarion) subfuscus	Dusky slug	Probably native – common and widespread, though rare in East Anglia.
Cochlicopa cf. *lubrica*	Slippery moss snail	Native – common and widespread.
Cornu aspersum	Common/Garden snail	Introduced – early in Romano-British period. Broadly distributed although less so in northern parts of Britain.
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.
Nesovitrea hammonis	Rayed glass snail	Native – common and widespread.
Oxychilus alliarius	Garlic snail	Native – common and widespread, no evidence of regional change.
Vallonia pulchella	Smooth grass snail	Native – common in S, E and NE parts of England, SE and SW Wales and parts of Ireland.

Vitrea contracta	Milky crystal snail	Native – common and widespread.
Vitrina pellucida	Pellucid glass snail	Native – common and widespread.

Discussion

A total of 22 species of molluscs were recorded. All of the mollusc species found are common and none of them are listed as threatened or protected.

The low number of species found can be attributed to the fact that the habitat is quite acidic and exposed. Snails need a calcium-rich chalky soil to form their shells, and this may account for their low numbers, and also the increased numbers of slug species found (9 out of the 22 species).

A number of the species found are indicative of this acidic upland environment such as *Arion (Arion) ater* (Large black slug), *Arion (Kobeltia) intermedius* (Hedgehog slug), *Euconulus (Euconulus) fulvus* (Tawny glass snail) and *Discus (Gonyodiscus) rotundatus rotundatus* (Rounded or radiated snail).

Figure 6. Large black slug – *Arion (Arion) ater*

Figure 7. Hedgehog slug – *Arion (Kobeltia) intermedius*

Figure 8. Tawny glass snail – *Euconulus (Euconulus) fulvus*

Figure 9. Rounded or radiated snail – *Discus (Gonyodiscus) rotundatus rotundatus*

We found a large accumulation of bivalve molluscs of the genus *Pisidium* from a hillside flush in one of the main areas of marshy grassland and soft rush flushes. *Pisidium* is a genus of very small freshwater clams known as pill or pea clams.

Figure 10. Various species of the genus *Pisidium*

Although I have not been able to ascertain the particular species, I think it is most likely to be *Pisidium personatum* or *P. casertanum*. Both are common, widespread and native, and often found in association with one another. It is most likely to be one or both of these species as they are the most tolerant of habitats that are at high elevations and that are subject to dessication. It was interesting to find them as the flush they were living in was completely dry, indicating that they seem to be able to tolerate prolonged spells of dessication.