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Biological recording at Hamiltonhill Claypits Local Nature Reserve, Glasgow, Scotland

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ABSTRACT
Hamiltonhill Claypits is a popular Local Nature Reserve, situated in the north of Glasgow. The mosaic of habitats at the site has given rise to a plethora of species (766 species recorded as of December 2022), with ecological monitoring of the site taking place from 2001. In 2021, the site reopened after infrastructural work, and species recording has continued with renewed vigour. This paper briefly describes the habitat mosaic of the Claypits, previous recording that has taken place there, and plans for future recording by the recently established Ecological Working Group.

INTRODUCTION
Hamiltonhill Claypits, Glasgow, Scotland was first established as a Local Nature Reserve (LNR) in 2016, and work to improve the accessibility of the site was completed 2021, thanks to European funding assigned via the Green Infrastructure Fund, details of which can be found in Faulkner (2023). As a green space that was already much-loved by community members and naturalists, the improvement works to the Claypits facilitates a wider community use, helping to reconnect people with nature. Located along the Glasgow Branch of the Forth and Clyde Canal, the Claypits opens up routes for active travel as well as preserving space for nature to thrive. Biological recording at the site has been carried out since 2001, and more recently (beginning in 2022), an Ecological Working Group (EWG) was set up to continue recording species at the site. The EWG is organised as a subgroup of the Hamiltonhill Claypits LNR Management Group, and comprises a small number of volunteers that regularly visit the site and have some knowledge on specific taxon groups that inhabit it. The involvement of the EWG at the site helps to run species surveys, events and social media that relays the group's work to the local community. Here we give an account of previous ecological monitoring at the Claypits, as well as along the canal itself from the bridge at Firhill Road to the Applecross Basin, including the towpath on the west side (Fig. 1). Furthermore, we describe the mosaic of habitats that comprise the Claypits and outline the future monitoring plans of the site by the ecological working group.

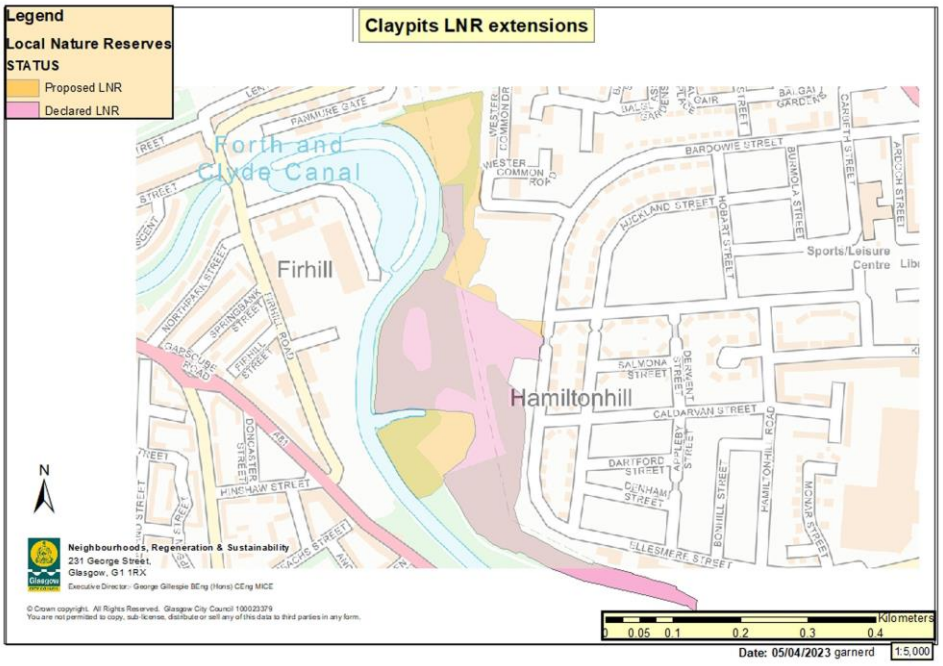

Fig. 1. Claypits LNR, Glasgow, Scotland and proposed extension. (© Open Street Source)

HABITAT

The Claypits is composed of a mosaic of habitats (Fig. 2A), which supports rich floral communities. The formation of different habitats over a short geographical distance is a common characteristic of brownfield sites, resulting from years of perturbation and human pressures (Mathey *et al.*, 2015). Moreover, lack of management and release from disturbances means that vegetation in brownfield sites is often in different successional stages (Macadam *et al.*, 2013). The industrial history of the Hamiltonhill area of Glasgow and of the Glasgow Branch of the Forth and Clyde Canal are described by Faulkner (2023), with the historical disturbance to the Claypits habitat largely arising from the removal of clay from the site (Faulkner, 2023). Furthermore, the industrialised use of the land in the surrounding area such as the iron works (Faulkner, 2023), has contributed to the high iron content found in the soils on site. More recently, infrastructural works to the site, which include path formalisation (Fig. 2B), have contributed to the disturbance pressures at the site. The introduction of such paths has increased habitat fragmentation and further promoted the mosaic pattern of habitats. Fig. 2A shows the diversity of habitat at the Claypits which includes mixed woodland, scrub, neutral and acidic grassland. Biodiversity in the area also benefits from blue infrastructure, in the form of the Forth and Clyde Canal.

BIORECORDING HISTORY

The Claypits would have been surveyed in the 1980s as part of The Changing Flora of Glasgow Project (Dickson *et al.*, 2000), but the species were recorded by tetrad so cannot be ascribed to individual sites. Thus, the first known biodiversity records for the site are from a Phase 1/Phase 2 Habitat Survey in 2001 which formed part of a project run by the Scottish Wildlife Trust (D. Herd & N. Dadds, unpublished report for Scottish Wildlife Trust, 2001). The report listed 203 taxa, of which 187 were botanical, with a few amphibians, insects, mammals, and birds, in the "Westercommon Community Woodland" which was the former name of the site. The report recommended the site as ideal for a community conservation project.

However, there is little evidence of further bio-recording until a public event called "Bats, Beasties and Buried Treasure" in 2011. It was repeated in a couple of subsequent years, but its principal effect was to stimulate regular recording by local naturalists. Thus, in 2012 there was a field excursion by Glasgow Natural History Society (GNHS) members, and a survey of terrestrial molluscs by a specialist. GNHS members continued to visit in succeeding years, adding to the bird and insect records in particular.

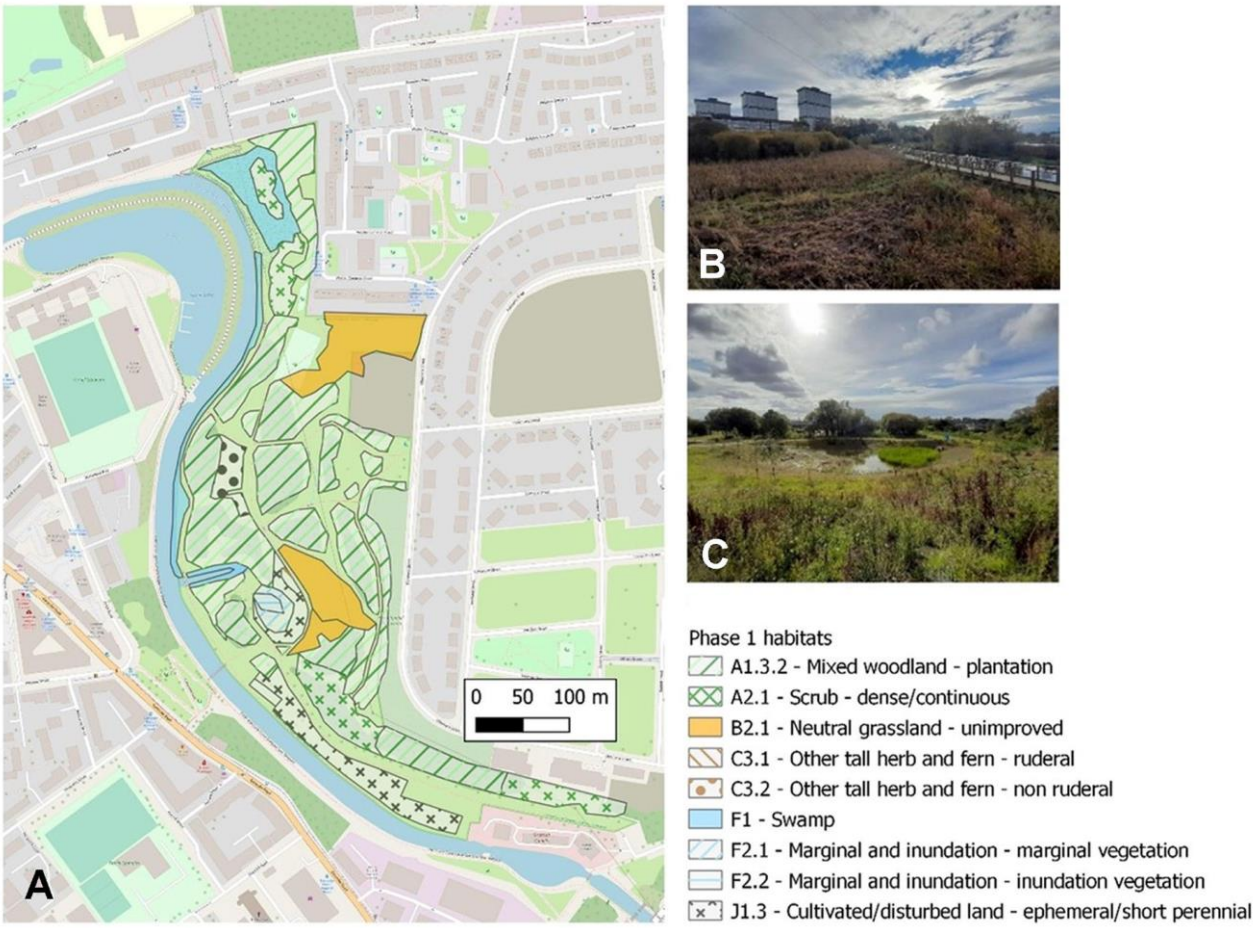

Fig. 2. Claypits LNR, Glasgow, Scotland. (A) Map of the Phase 1 Habitat Survey conducted at the Claypits in July 2022 by CdeLH. (B) North part of site, showing new boardwalks. (C) Sustainable drainage system (SuDS). (Photos: Cathel de L. Hutchison)

In 2013 a further report was commissioned by the Friends of Possilpark Greenspace to inform the habitat management plan for the site (P. Say, Natural Capital Ltd., Edinburgh, unpublished report for Friends of Possilpark Greenspace, 2013). This listed 183 taxa, again mainly botanical, but there were also 30 birds, and nine butterfly species, including an early record of the comma (*Polygonia c-album*) in Glasgow. Further bird and many invertebrate records were added in 2014-2017 by GNHS members and local ornithologists.

An extensive Phase 1 Habitat Survey was carried out in May of 2017 by Land Use Consultants Ltd. This survey classified the habitat types that make up the Claypits, as well as considering the suitability of the site for protected species. Although the survey did not record faunal species, a desk study of the site suggested that otters (*Lutra lutra*), Daubenton's bats (*Myotis daubentonii*), common pipistrelles (*Pipistrellus pipistrellus*), and soprano pipistrelles (*P. pygmaeus*) could potentially inhabit the site due to the habitat present and records of the species in the surrounding area. In fact, the soprano pipistrelle was recorded on the site in 2011 but has not been recorded since, due to the lack of surveys.

In 2018 there was a public event at the Claypits, forming part of city-wide events commemorating the 30th anniversary of the Glasgow Garden Festival, which included displays and recording forays by organisations such as Butterfly Conservation, the Royal Society for the Protection of Birds (RSPB) and FrogLife. A notable find at the event was a marsh pug (*Eupithecia pygmaeata*), which was only the second record of this moth in Glasgow.

Furthermore, 2018 was also the year that the cinnabar moth (*Tyria jacobaea*) first appeared at the site, and adults and caterpillars have been recorded there ever since. Regular moth-trapping in the compound at the north end of the Scottish Canals buildings also started in July 2018. Caddisflies (Trichoptera) and some other insects found in or around the trap have also been identified and recorded.

Little recording was possible during the time the site was fenced-off for the engineering works, and the COVID lockdown further limited visits, though some bird records were made from the tow-path.

There is a regularly-updated list of species that have been recorded in the Claypits area (as defined in the introduction above) on the GNHS website at https://www.glasgownaturalhistory.org.uk/biodiversity/claypits_splist.pdf which also lists the years when each species was first and last recorded.

RECORDING SINCE THE RE-OPENING AND FUTURE RECORDING

The re-opening of the Claypits on 31st July 2021 included a bio-recording event by Friends of Possil Park Greenspace. Additionally, regular Saturday morning walks, as well as ongoing visits by local naturalists have yielded some species sightings. To date, recording events have been sporadic, with some taxon receiving more attention than others.

Botanical surveys in collaboration with Botanical Society of Britain and Ireland recorders in July and August 2021 added a further 70 botanical species which had been absent from previous surveys, including the first recordings of bifid hemp-nettle (*Galeopsis bifida*) and Nuttall's waterweed (*Elodea nuttallii*) on the site. It is likely that some of the additions were from the seed-mixes used in re-seeding bare ground, and others were instead opportunists. Further botanical surveys are planned from 2023 onwards, with the objective of establishing transects and squares to standardize and regularise monitoring.

Local ornithologists have been contributing records for the Claypits via the British Trust for Ornithology's (BTO) project Birdtrack, with a total of 12 species added to the list since 2021, such as the kingfisher (*Alcedo atthis*), the pied wagtail (*Motacilla alba*), and the chiffchaff (*Phylloscopus collybita*). Another notable sighting was a red kite (*Milvus milvus*) in 2019. However, this was not added to the species list as it was only observed flying over the site. In addition, a breeding bird survey (BBS) was conducted in the spring of 2022 in collaboration with the RSPB. This survey recorded 56 pairs of birds across 23 species, including blackcaps (*Sylvia atricapilla*), goldfinches (*Carduelis carduelis*) and cormorants (*Phalacrocorax carbo*). Both the recording via Birdtrack as well as the BBS will contribute to recording in the future, with members of the ecological working group carrying out this work.

Many invertebrates (99 insects, and one harvestman) have been added to the species list since the reopening. Regular moth trapping produced the first Scottish sighting of the orache moth (*Trachea atriplicis*) in July 2022, this being now a rare immigrant in the U.K. Use of the light trap will continue to monitor the moth and caddisfly taxa. Furthermore, a regular butterfly transect was started in April 2022, by a member of the Claypits EWG. Sightings of small copper (*Lycaena phlaeas*) on the site were particularly welcome as this species had not been seen since 2013. An event in July of 2022 called "An Intro to Inverts at the Claypits" was aimed at encouraging people to learn more about the invertebrate species that could be found on site, and gathering enthusiasm within the local community to record these species. At the event ten insect species were added to the species list, such as the painted lady butterfly (*Vanessa cardui*) and the hoverfly species *Volucella pellucens* and *Eristalis nemorum*. The event was successful at enthusing local community members; over 25 local community and GNHS members attended, resulting in several people expressing their interest in getting involved with the EWG.

It has been important to continue recording species at the site after it reopened to the public, as the work on site was thought to have disturbed some habitats. For example, the installation of paths may have disturbed

ground nesting bee species, while works to create a sustainable drainage system (SuDS) pond (Fig. 2C) may have impacted waterfowl nesting opportunities and palmate newts (*Lissotriton helveticus*) at the site, the latter being last recorded in 2018.

Other planned recording activities include a joint excursion with the Clyde and Argyll Fungus Group and members of GNHS in 2023, which will hopefully add more fungi records to the species list. So far only nine species of fungi have been recorded at the Claypits which include turkey tail (*Trametes versicolor*), collared earthstar (*Geastrum triplex*), and sticky scalycap (*Pholiota gummosa*).

As the ecological working group at the Claypits continues to grow, more surveys will be added to the monitoring protocol at the site, focusing on a wider variety of taxa and helping volunteers to improve their identification skills. Furthermore, with funding from GNHS's Blodwen Lloyd Binns bequest, more equipment will be purchased to help improve ecological monitoring at the site. Planned new surveys in 2023 include a DragonflyWatch survey, pitfall traps for ground dwelling invertebrates, dawn and dusk bat surveys, and mammal surveys using camera traps and Longworth traps. Details of these surveys will be outlined in the Claypits Ecological Monitoring Strategy, which will be available upon request from the authors of this paper. Furthermore, there are plans to join with local groups such as Clyde Bat Group and Clyde Amphibian and Reptile Group, in order to host training or surveying events which will provide the local community with a chance to be involved with bio-recording on the site. Finally, another future aspiration of the EWG is to carry out bryophyte surveys on site with help from experts in this field.

CONCLUSION

The species list for the Claypits has grown dramatically since the first known records for the site in 2001. Furthering species recording at the Claypits through the use of systematic protocols is a key aim of the EWG. By combining some surveying sessions with events, the hope is to involve the local community in recording, helping them to improve their species identification skills whilst in turn learning from them as individuals who are regularly at the site. Furthermore, other recording groups with specific expertise are invited to record species at the site, and GNHS are likely to include the Claypits on their 2023 summer field excursion list. Whilst sightings from community members and groups are welcome, having standardised recording methods that are carried out by a core group of people will allow research grade data to be collected and compared. Overall, recording will help to inform future management of the site, including the invasive species control and targeted planting of trees and shrubs.

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