

Malls Mire Community Woodland: restoring biodiversity on a brownfield site, a green infrastructure project in Glasgow, Scotland

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ABSTRACT

Malls Mire Local Nature Reserve, Glasgow's first community woodland, is an interesting case study of a project that is aiming to impact all the pillars of sustainability, especially environmental protection and social equity through a community-led approach. Situated within the Toryglen area in the south of the city, the site has a varied history of agriculture, forestry, golf, and industrial development. It also has a legacy of associated pollution and dumping of waste materials. Urban Roots, the charity involved in the management of the site, has worked alongside Clyde Gateway and Glasgow City Council on a green infrastructure project. Funded through the European Regional Development Fund Green Infrastructure programme, administered through NatureScot, with additional resources from Sustrans, it has enabled large scale improvements at Malls Mire. The work which began in 2020 has connected greenspaces throughout Malls Mire, brought derelict land into positive management and also saw new Sustainable Drainage Systems ponds installed on site. The wide range of resulting benefits include improved access, increased personal safety, shared-use paths, better lighting,

opportunities for outdoor recreation, education and volunteering as well as enhanced habitats and benefits for biodiversity and climate change adaptation.

INTRODUCTION AND HISTORY

Located in the Toryglen district of south Glasgow, the Malls Mire Community Woodland is nestled between the Polmadie Traction and Rolling Stocks Maintenance Depot (TRSMD) and several residential areas (Fig. 1).

The high water-table indicates that the area has been a mire at least in the recent past, although not much is known about the history of the site prior to the 1850s.

The Ordnance Survey (OS) map of 1859 (Ordnance Survey, 1859) shows Malls Mire lying between two farms, Blackfaulds to the east and Toryglen in the west. At this point, much of the eastern part of the site was a managed woodland, containing conifer and broadleaf plantations. To the west lay fields surrounded by wooded boundaries. According to the OS survey maps, the woodland had disappeared by the 1890s (Ordnance Survey, 1893), with the whole area having been converted to fields. The first



Fig. 1. Aerial view of Malls Mire (arrow), Glasgow, Scotland. (Image: Google Maps)

sign of a pond appeared on maps from 1910 and by 1930 the area was void of trees and the adjacent farmland was transformed into Toryglen Golf Course and the old farm house was turned into the club house (Ordnance Survey, 1936). By the 1950s, both farms as well as the golf course had disappeared from the maps (Ordnance Survey, 1956). The ground levels appear to have been altered in the north-eastern corner of the site, through the deposition of industrial waste, possibly in relation to the extension of the railway line and the necessary removal of the road bridge that used to lead across it. The outline of the pond, which now was larger, had also been altered.

In the 1990s, several botanical surveys were undertaken and Glasgow City Council (GCC) designated Malls Mire as a Site of Importance for Nature Conservation (SINC) in recognition of the importance of the wetland site within the region. 1993 saw the afforestation of the eastern part of the site and this has resulted in the creation of the woodland as it can be seen today. The planting design was sympathetic to the integrity of the valuable wetland habitats. As the woodland is maturing it has increasingly become important as a valuable wildlife habitat and also serves an important role as social space.

Urban Roots, a community-led environmental and health improvement charity, has been involved in the management of Malls Mire since 2007, when the first access and habitat improvement projects were undertaken with local residents. Urban Roots is an example of a genuine grassroots organisation, which grew out of the Toryglen Gardening club, and their management aims continue to be for the benefit of the local community and nature conservation. Urban Roots helps people across the south side of Glasgow to connect with nature and to help tackle the causes of climate change and the biodiversity crisis. This is done through weekly woodland conservation groups, community garden plots, and weekly gardening groups, as well as many outdoor and educational events for local families and schools.

In 2015 the Community Woodland and associated open habitats of Malls Mire, an area of 8.5 ha, were designated as a Local Nature Reserve (LNR), with a proposed extension planned for 2023. The extension will include areas of wetland, swales, grassland and more woodland at the Polmadie community plots (Fig. 2).

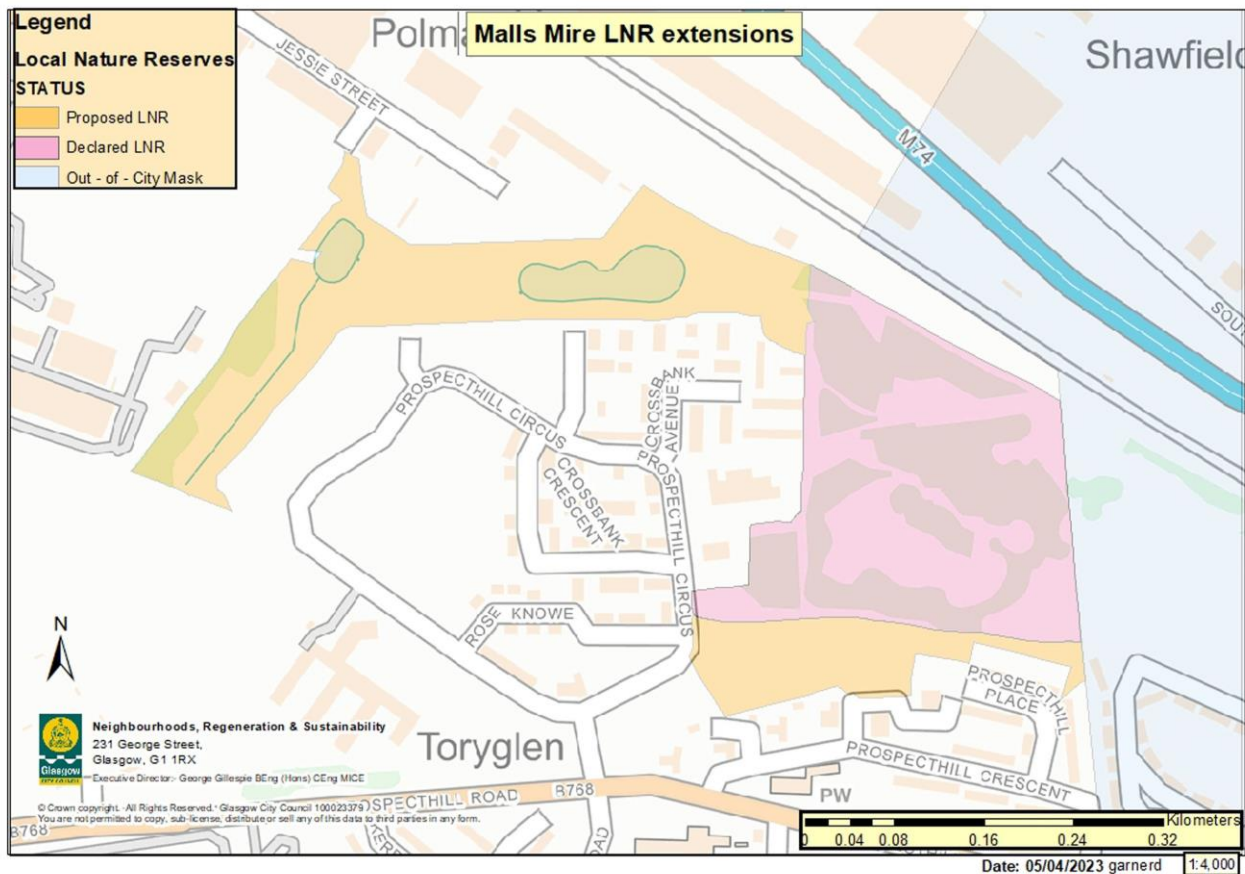


Fig. 2. Proposed Malls Mire LNR extension. (© Open Street Source)

GREEN INFRASTRUCTURE PROJECT

North Toryglen estate was built in the 1950s and 1960s by GCC and was part of a wider ambition to build residential tower blocks in an effort to clear inner city overcrowded Victorian tenements. As these buildings fell out of favour due to high levels of crime and the poor living standards associated with them, demolitions started in the 1990s and 2000s.

In 2011, a team was commissioned to design a regeneration project for North Toryglen, which was one of eight areas identified as Transformational Regeneration Areas (TRAs) within the City of Glasgow. Work on new housing began in 2014 and Urban Roots started working on a Green Infrastructure Engagement Fund project in 2018. Following a comprehensive community consultation, a master plan was developed, taking into account local residents' hopes for the area. Consultants from Land Use Change (LUC) worked on the design for the Malls Mire Park.

The project linked a further 16 ha of greenspace to the existing Malls Mire Community Woodland, enhancing not only the value for biodiversity but also for the local community as it transformed the area from a derelict site, filled with litter and safety concerns, into a thriving greenspace for local communities to connect with nature, play, exercise and to spend quality time in.

The multiple benefits of this green infrastructure project include mitigation and adaptation to climate change, protection against flooding through the use of Sustainable Drainage (SuDS) ponds, improved habitats and connectivity to support biodiversity, as well as the improved quality of life for the communities surrounding Malls Mire.

Throughout the project, work continued in the community woodland, where weekly volunteering sessions ensure the habitat is maintained and the woodland is accessible. Among other things, the volunteers clear and maintain paths, create and maintain wildflower meadows through planting and scything, remove invasive species, coppice willow and pick litter as and when required. In addition to these tasks, the volunteers have had training in traditional hedge-laying practices, which enables them to work on two stretches of hedge, thereby improving them as habitats for birds and other wildlife, as they are now much denser and offer more protection and foraging opportunities.

The green infrastructure project has enhanced the opportunities for the delivery of a variety of community engagement and education programmes. A scheme to adopt a plot at the Polmadie community garden was set up and several after-school and holiday clubs were held throughout the year, which included Urban Explorers and Into the Woods children's clubs. These were very popular and the aim is to continue these in the future, alongside the

continued support for local primary school classes to achieve their John Muir award.

BIODIVERSITY

Malls Mire was recognised for its value for biodiversity early on (Figs. 3 and 4), beginning with the designation as SINC based on botanical surveys in the 1990s and later on when it was designated as LNR in 2015. As of January 2023, 414 species have been recorded on site, with several notable species for the area such as the bronze shieldbug (*Troilus luridus*), which was a first for the Clyde region.



Fig. 3. Common spotted orchid (*Dactylorhiza fuchsia*). (Photo: Urban Roots)

Caledonian Conservation was commissioned by Urban Roots in 2014 to conduct an invertebrate survey of Malls Mire (Cathrine & Norris, 2015). They recorded 174 species, including a nationally scarce spider, the southern motherphage (*Coelotes terrestris*) in good numbers, and focused on the community woodland and associated open habitats on the eastern side of the site.

Some notable bird species on the list of U.K. Birds of Conservation Concern 5 (BoCC5) (Stanbury *et al.*, 2021), have been recorded at Malls Mire. These include the ringed plover (*Charadrius hiaticula*) recorded in 2018 (GNHS, 2023) and the herring gull (*Larus argentatus*) in 2021, both of which are on the Red List. Sightings from birds on the BoCC5 amber list include the mallard (*Anas platyrhynchos*), woodpigeon (*Columba palumbus*), reed



Fig. 4. Tree bumble bee (*Bombus hypnorum*) pollinating a wild cherry (*Prunus avium*). (Photo: Urban Roots)

bunting (*Emberiza schoeniclus*), kestrel (*Falco tinnunculus*), meadow pipit (*Anthus pratensis*), dunnock (*Prunella modularis*), moorhen (*Gallinula chloropus*) and wren (*Troglodytes troglodytes*). Several species that are on the Glasgow Local Biodiversity Action Plan (Glasgow City Council, 2001) were also recorded. These include the common frog (*Rana temporaria*), the reed bunting, and the only two species of Odonata recorded on site, the large red damselfly (*Pyrhosoma nymphula*) and the common darter (*Sympetrum striolatum*).

Several species of moth found on the Scottish Biodiversity list (NatureScot, 2020) have also been recorded, such as the powdered quaker (*Orthosia gracilis*) and the shaded broad-bar (*Scotopteryx chenopodiata*). A butterfly transect was set up in 2022 with the help of Butterfly Conservation, but due to a lack of volunteers only a few species were recorded, including the small heath (*Coenonympha pamphilus*). There are plans in place to restart the weekly transect butterfly work from April 2023, and to increase the number of volunteers in an effort to collect more records.

Glasgow Museums Biological Records Centre (Glasgow Life) holds records of all the sightings at Malls Mire, from which a regularly-updated species list is produced (Glasgow Natural History Society, 2023).

In addition to individual species of conservation concern, the site also features several priority habitats from the Glasgow Local Biodiversity Action Plan, and the U.K. Biodiversity Action Plan list: wet woodlands, ponds and hedgerows. These habitats have been identified as being the most threatened and in need of conservation action.

Wet woodlands are commonly found on poorly drained soils that are seasonally wet and are usually dominated by alder (*Alnus* spp.), birch (*Fagus* spp.) and willow (*Salix* spp.) species, often showing a history of coppicing. These woodlands are important for many taxa and due to the high level of humidity favour bryophyte growth (JNCC, 2016). There are also many invertebrates associated with the main tree species found there, including craneflies (Tipulidae). This makes it noteworthy that few have been recorded, with a future aim to record more the on site.

Ponds are a valuable habitat for biodiversity and also provide important ecosystem services, such as flood water regulation and carbon sequestration. In the U.K., ponds have suffered severe declines in the past century and they continue to face threats from pollution, urban expansion and agricultural land drainage (Wood *et al.*, 2003). In addition to a pond within the community woodland, Malls Mire also has SuDS ponds, which have been designed to manage stormwater (Fig. 5). There has been research to show that they can be beneficial for biodiversity (O'Brien *et al.*, 2019). Surveys of the woodland pond as well as the SuDS ponds are planned for 2023, as there is a lack of current data about these ecosystems.



Fig. 5. SuDS pond and wetland area. (Photo: Urban Roots)

The third priority habitat that can be found at Malls Mire is hedgerows. There has been a decline of hedgerows in Scotland, but these habitats are very valuable for wildlife, such as birds, mammals and butterflies, as they can provide a source of food and shelter, and are also important habitat corridors. The hedge along the eastern side of the site was transformed through traditional hedge-laying techniques by a group of volunteers to further increase its value for biodiversity through increased shelter opportunities. Additional planting of hedges will form part of the ongoing management plan of the site to further expand this habitat.

In addition to beneficial species and habitats, Malls Mire also hosts invasive non-native species such as Japanese knotweed (*Fallopia japonica*). A survey was carried out by Urban Roots in 2019 to inform the green infrastructure project, but records of this plant go back to 1984 (GNHS, 2023). The main stand of Japanese knotweed is found on

the northern boundary with the railway line and work continues to ensure that it does not spread. Another invasive species present at Malls Mire is *Cotoneaster horizontalis*, which has spread throughout the community woodland. Volunteers have spent time in 2021 to remove some of the plants. As it forms part of the limited understorey of the woodland, the remaining stands have been left to ensure the integrity of the overall woodland structure until further understorey growth by native plants can be encouraged.

Future plans for Malls Mire not only consist of practical conservation tasks such as scything meadow areas (Fig. 6), coppicing, planting of native species and the removal of invasives, but also include a renewed focus on biodiversity recording, especially for the taxa where records are lacking, such as fungi, Odonata, molluscs, craneflies and aquatic invertebrates. A moth survey is also planned for 2023 as only limited surveys have been possible due to the urban location of the site and the consequent possibility of vandalism. Another invertebrate survey, including the areas of the planned LNR extension, would be beneficial, and plans are in place to secure funding for it.



Fig. 6. Volunteers scything the meadow areas of Malls Mire. (Photo: Urban Roots)

CONCLUSION

Malls Mire has demonstrated that transformation of a previous derelict and unsafe area to a community woodland can have multiple benefits for the environment as well as the local community. This is especially the case when the project is designed and run with meaningful input of residents. Future aspirations for Malls Mire include a continuation of the work with the community. Urban Roots plans to build on their work to connect people with nature for the benefit of the environment as well as the community. This will include more citizen science projects, increased recording of species found at Malls Mire, from fungi and amphibians to butterflies and invertebrates. A bioblitz in collaboration with the Glasgow Natural History Society and other partners is also planned for the future.

Working in partnership with local GPs and “green prescribing” (recommending visits to the places like this as part of treatment) is another way in which Malls Mire is aiming to help people improve their mental health through nature-based activities and interventions. Continued efforts are on their way to engage with the young people of the area to provide opportunities for outdoor activities, learning and employability skills. The aim is to provide a year-round youth programme to achieve this.

Urban Roots plans to focus on evidence-based woodland and site management to maintain and enhance the biodiversity benefits of the site, while generating opportunities for volunteering and nature-based art and crafts activities. The planned extension for the LNR is the next step in ensuring positive management of the site for nature and people. A craft willow coppice is planned alongside the existing willow and hazel coppice areas, as well as the planting of more fruit bushes for foraging and the expansion of the network of hedges. There are also plans to have more interpretation and community art installations on site to better relate the site to its visitors and to tell the story of Malls Mire. Linking up with other community woodland groups to exchange learning and best-practice ideas is also planned for the future of Malls Mire in an effort to continue to work on the sustainability of the site.

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