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Champhibians, a citizen science programme for schools: a project introduction and case study from Malls Mire Local Nature Reserve in Glasgow, Scotland

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ABSTRACT
Champhibians, the "champions of amphibians," a pond adoption project instigated by Amphibian and Reptile Conservation (ARC), provides an interesting case-study of a citizen science project that was specifically designed for schools. This paper highlights the main aims and benefits of the project by showcasing one of the pilot schools that has participated in the project and adopted a pond at the Malls Mire Local Nature Reserve (LNR) in Glasgow, Scotland. The benefits of this project stem from its links to the school curriculum as well as the connection it establishes between schools, the ARC Trust and managers of local community greenspaces. The importance of outdoor education has long been recognised for benefitting children's mental health and well-being as well as their relationship with nature. It can help to incorporate several of the United Nations Sustainable Development Goals (UNSDGs) into the curriculum, such as life below water, climate action and life on land, while at the same time providing valuable data for land managers through its citizen science approach.

INTRODUCTION

Champhibians is a pond adoption scheme for schools that was developed by Amphibian and Reptile Conservation (ARC), a national wildlife charity committed to conserving amphibians and reptiles. This citizen science project allows schools to work with their own ponds or adopt a nearby pond in the community. The project's primary purpose is for the school to monitor and support the amphibians in their adopted pond. The data collected include information on the general condition of the ponds, water quality indicators as well as recording the animal life within the pond. Citizen science projects, such as the Great Garden Birdwatch by the RSPB (2023) or the Dragons in your Garden recording scheme by ARC (2023), are widespread across the U.K. All of these projects allow for recording on an occasional basis and are highly inclusive, simple and easy to use and require no previous recording experience.

Schools are encouraged to take part in various recording schemes and, although Champhibians is building on these principles, it is to our knowledge the first citizen science project in the U.K. that was specifically designed for schools. It actively links into the Scottish Government's Curriculum for Excellence (CfE) (Education Scotland, 2024), and aims to incorporate regular outdoor education into a school's yearly lesson plan and to build a close relationship between the ARC Trust, land managers and schools. Following the successful piloting of the Champhibian project in Scotland in 2022, it was launched nationwide in February of 2023.

The importance of citizen science is not only to gain broader survey data (de Sherbinin *et al*., 2021), but also to increase the understanding of species biodiversity within the wider community. This is especially important for communities in areas of socio-economic deprivation, as they face additional barriers to participating in these programmes (Hobbes & White, 2012). These barriers include a lack of opportunities, lack of accessibility and the perceived cost and knowledge required to participate.

Through ARC's pond adoption scheme, children can become more familiar with their local amphibians. As there are only seven native amphibian species in the U.K., it is relatively easy to study these animals, which can help to reduce perceived barriers like accessibility due to a lack of knowledge. The children and their teachers learn how to recognise amphibians, and how different species live and survive, and they learn about the threats amphibians face and how they can help to protect them, including habitat management. Amphibians are considered to be the most threatened vertebrate class on a global scale (Stuart *et al.*, 2004), though in Europe they appear to share this high level of threat with several other vertebrate groups (Beebee *et al.*, 2009). The need for more long-term monitoring has been identified alongside the need for habitat enhancement in the context of Scottish conservation (Downie *et al*., 2019), and Champhibians can contribute to these goals.

The data gathered by the schools can be used to create regional hubs for sharing and mapping the species of several schools that are located in the same area. Land managers of the adopted ponds can also benefit from these data and the survey records generated by the schools. The online portal also facilitates the creation of

charts and introduces simple data-handling techniques at levels suitable for each age group. As the results for each school can be linked across the Champhibian network, individual and regional results can be analysed and reviewed, giving each school access to more data they can work with. Over a few years, the data sets will become more interesting and comparison techniques can be introduced and utilised.

CHAMPHIBIANS AT MALLS MIRE

St. Brigid's primary school in Toryglen, Glasgow was one of three pilot schools across Scotland that were chosen for this project. As St. Brigid's does not have a pond in their own school grounds, they chose to adopt a pond at Malls Mire Local Nature Reserve (LNR), which is managed by Urban Roots, a community-led environmental charity. The Malls Mire Community Woodland has been a Local Nature Reserve since 2012, with an expansion planned for 2023 (Digruber, 2023). This expansion will include the Sustainable Drainage Systems (SuDs) ponds and wetland area, which is home to a healthy population of frogs.

Urban Roots have been working with local schools and nurseries to help children connect to their local greenspaces. Being able to work with ARC on the Champhibian project has been a great opportunity for Urban Roots to strengthen their ties with the local education providers as well as local children and their families. Programmes such as Champhibians tie in directly to the charity's mission of connecting the local community to their greenspaces, delivering outdoor education and encouraging pro-environmental behaviour.

St. Brigid's has had several visits in 2023 to the ponds at Malls Mire, where they have been able to pond dip with the support of ARC and Urban Roots (Fig. 1). A science day was organised at Malls Mire on 8th June 2023 to coincide with the Glasgow Science Festival and the Scottish Herpetological Conference organised by The Glasgow Natural History Society (Downie *et al.*, 2024). This involved St.Brigid's Champhibian classes as well as Toryglen primary school, who have also signed up to the Champhibian project as a result of the close partnership with Urban Roots. Two local nursery schools were also invited to learn about ponds, amphibians and the wider biodiversity on their doorstep. Throughout the day 100 children were introduced to the SuDs pond at Malls Mire and learned how to pond dip and identify froglets (*Rana temporaria*) alongside various families of aquatic invertebrates (Fig. 2).

SUPPORTING THE CURRICULUM FOR EXCELLENCE

Champhibians is intended to be an enjoyable and engaging educational experience, with opportunities to fulfil many of the requirements for Learning for Sustainability from the Scottish CfE through a coherent, rewarding and transformative learning experience. It helps to embed regular outdoor education sessions into a school's yearly lesson plan and through its collaborative approach builds a legacy where the results

Fig. 1. Pupils of St. Brigid's Primary School pond-dipping at the Malls Mire SuDS pond, Glasgow.

Fig. 2. Frog found by the school children at the Malls Mire ponds.

of each year show development and change.

There are many opportunities to expand from the simple surveying activity to cover the three core areas for learning and thus link the outdoor sessions back to class-based learning goals. Describing habitats and ponds helps to develop language and literacy skills, while dealing with data from surveys aids numeracy. Communication of this information in an inclusive and accessible way is also part of the learning experience (Fig. 3). Health and well-being skills are gained by being in a natural environment and by learning about risks and safe pond-dipping practices.

Through hands-on citizen science, the four capacities that form part of the CfE are achievable. These four capacities are for children to become: successful learners, confident individuals, effective contributors, and responsible citizens.

Through Champhibians, children are learning to be scientists, who monitor and care for the world. They learn as individuals and as a team about their responsibilities as surveyors and how to survey with respect for life. The processes and procedures of being a Champhibian are to be a citizen scientist and a responsible citizen at the same time.

Fig. 3. Janet Ullman at Malls Mire demonstrating pond-dipping to local school children.

BENEFITS FOR COMMUNITY GREENSPACES

Some of the children who have a connection to Urban Roots and the Malls Mire LNR through the Champhibian project have then attended other outdoor education and play activities. The contact with the schools has also allowed Urban Roots to bring classes and their teachers to the woodland for John Muir award sessions as well as other bushcraft activities. The teachers have been more confident in bringing the children to Malls Mire and, as a result, the children have had an increased amount of outdoor learning opportunities in the community woodland. This local impact through collaboration and community engagement is important to help create a sense of place for young children as well as their families, thus helping communities to value their local area and feel better connected. The outdoor education and time spent in local greenspaces are helping to increase environmental awareness and can foster pro-environmental behaviour from a young age. The long-lasting connection between the schools and local conservation managers enables opportunities for volunteering to enhance local habitats and biodiversity and the data collected by the school can help inform management plans.

FUTURE PLANS

Following the successful pilot projects of Champhibians in Scotland and the rollout across the U.K., schools will be encouraged to survey as much or as little as they can. Community spaces like Malls Mire can act as hubs for several Champhibian schools to work together and collaborate with the support of ARC staff and land managers. This collaboration with community greenspaces can facilitate relationships with nurseries that are feeding into the primary schools as well as young people from local high schools. This will allow schools access to larger amounts of data, even if they are limited in the number of times they can visit a pond themselves.

Building on an existing partnership with the Scottish Rural College (SRUC), Urban Roots will work with an HND cohort and their lecturer on bespoke outdoor education lesson plans for Champhibians. This will be based on a very engaging superhero theme, which was trialled at Malls Mire in 2023 with several classes from a local primary school. These lesson plans can then be utilised across the various schools and tie in well with the Champhibian superhero mascot “Newtrino” (Fig. 4).

Fig. 4. The Champhibians superhero mascot “Newtrino”.

CONCLUSION

The pilot project of Champhibians at Malls Mire has highlighted the potential of this citizen science project to increase the time children spend actively engaged with outdoor education while facilitating and enhancing partnerships between schools, land managers and the ARC trust. Supporting schools and teachers with resources and opportunities to engage in science, technology, engineering and maths (STEM) topics in their local area can be an important tool to incorporate sustainability and environmental awareness into the curriculum in a fun and engaging way. It is also very beneficial for local community greenspaces as it contributes to many of the outreach and education activities already taking place and enables land managers to build and strengthen their ties with local schools.

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