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Kelvin Biodiversity Network: a decade of co-operation and citizen science

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ABSTRACT

Formed in the autumn of 2013, Kelvin Biodiversity Network (KBN) focuses on the biodiversity of, and issues facing the lower River Kelvin, which is essentially the stretch of the waterway flowing through the city of Glasgow, Scotland. The network reaches about 30 organisations, mainly non-governmental organisations (NGOs). We describe KBN's activities involving member groups working together, specifically on a conference, regular bio-recording and an annual exhibition, and discuss its achievements (especially in citizen science), limitations and possible futures.

INTRODUCTION

In the autumn of 2013, the Council of Glasgow Natural History Society (GNHS) discussed a suggestion from Friends of the River Kelvin (FORK) that there was a need for more biodiversity recording along the urban stretches of the river and its surroundings, partly to provide evidence of biodiversity value in the light of possible development proposals. Council agreed that Roger Downie, Richard Weddle and Lyn Dunachie (all Council members but also with roles in other relevant groups and organisations) should convene a meeting of stakeholders to explore this idea. An initial meeting of five people (the three listed above plus Lucy Reynolds of FORK and Gemma Jennings of the Clyde River Foundation (CRF)) took place in December 2013. This paper describes and assesses the activities of the Kelvin Biodiversity Network (KBN) that arose from that meeting, and which has operated since.

THE RIVER

The Kelvin, a river of about 35 km, has its source east of Kilsyth near the village of Banton, North Lanarkshire. It flows southwest, joined by the Glazert Water and Luggie Water near Kirkintilloch, then by the Allander Water at Bardowie, East Dunbartonshire, then south through the west end of Glasgow to join the River Clyde at Partick. The Kelvin has seen many centuries of modification by people, such as canalisation, straightening and the creation of weirs for industrial uses (Hume, 2018), including paper-making and flour-milling. Although the last mills on the river closed by the 1970s, they have left a series of weirs and mill lades, and related transportation systems have left railway bridges and tunnels, now all out of use and/or derelict, except for the most spectacular of them, the Kelvin Aqueduct, carrying the Forth and Clyde canal high above the river at Maryhill. Industrial effluent along with waste-water led to the river being highly polluted, and essentially dead in terms of the wildlife it could support: one of us (JRD) can remember the stench and cloudy appearance of the water in the 1960s. However, the closure of the mills and improved sewage treatment measures led to gradual improvement. The Clyde River Purification Board began monitoring the Kelvin for invertebrate and aquatic plant diversity as measures of pollution levels in 1979 and this has been continued to the present by its successor organisation, the Scottish Environmental Protection Agency (SEPA). Early signs of improvement in the lower Kelvin were the appearance of stonefly (Plecoptera) larvae in 1999, followed by pollution-sensitive cased caddisflies (Trichoptera) in 2005. Overall scores have improved fairly steadily over the monitoring period (Arnold *et al.*, 2018). These improvements have paid off in terms of other species returning to the river, such as salmon (*Salmo* spp.), otters (*Lutra lutra*) and kingfishers (*Alcedo atthis*), but pollution events still occur (Scott, 2018). The full length of the Kelvin and its banks in Glasgow is now designated as a Site of Importance for Nature Conservation (SINC), and this includes Yorkhill Park, Kelvingrove Park, Glasgow Botanic Gardens and Dawsholm Park, which has the additional status of Local Nature Reserve. To the north of the city is an additional SINC at Millichen Flood, East Dunbartonshire, on the Kelvin floodplain, an important site for wading birds. The stretches of the river through East Dunbartonshire and North Lanarkshire also include important wildlife sites such as Balmore Haughs and Buchley Sandpit. Another improvement has been the creation of the Kelvin Walkway, a path which allows walkers and cyclists to travel the 14 km from the river's confluence with the Clyde to Milngavie, where serious hikers can start the West Highland Way (which ends in Fort William, Lochaber).

THE MEETINGS

During the ten full years in which KBN has been active, we have had on average seven meetings a year (i.e. slightly more than bi-monthly). For the first six years, these were held in the Graham Kerr Building, University of Glasgow, but this pattern ground to a halt after February 2020 when the COVID-19 pandemic restrictions came into force. Meetings resumed that August, but this time online using the *Teams* or *Zoom* platforms, and we have retained that format ever since, because it allows the busy people who contribute to KBN to participate without spending time travelling to

a venue. One outcome of the initial meeting was the assembly of a list of other organisations to be invited to participate in the network. In practice, groups have had three kinds of involvement: a) core members, who have attended and contributed to most meetings: these are GNHS, FORK, the Royal Society for the Protection of Birds (RSPB - Glasgow office), The Conservation Volunteers (TCV), Yorkhill Greenspaces and Friends of Glasgow Botanic Gardens (FGBG); average attendance over the 12 meetings to June 2023 is eight; b) occasional attenders: over the years, these include CRF, the Children's Wood, Glasgow City Council ranger and biodiversity services, and East Dunbartonshire's biodiversity officer; c) mailing list members, who tend not to attend meetings, but do receive minutes of meetings and other information from the network, and who may contribute to activities. All types of member are listed as e-mail addresses on the KBN contact list, currently 35 individuals (Table 1). For data protection reasons, the mailing list is held solely by the GNHS membership secretary, who distributes all mailings.

Each meeting includes reports and updates from the organisation representatives attending, consideration of any current issues such as planning applications, and discussion of upcoming activities (see below). To give a flavour of the topics discussed at our meetings, we give a short list taken from KBN meeting minutes.

- After a few initial meetings, the CRF representative drew our attention to a 2011 report written by Nick Underdown, a British Trust for Conservation Volunteers (now TCV) communities trainee: the report had recommended the establishment of some kind of network to address the issues facing the Kelvin and its tributaries. Members read the report, which contained ideas similar to those we were developing, but Nick had hoped to involve the whole river and its catchment, a much bigger task than we could deal with.
- Sand martins (*Riparia riparia*) have been observed nesting near the Kelvin's confluence with the Clyde. The network discussed how to enhance this nesting site and the promotion of another potential site at Garscube estate. An outcome was the siting of an artificial sand martin wall at Garscube, funded by GNHS's Blodwen Lloyd Binns bequest.

a) Frequent and occasional attenders at meetings
*Glasgow Natural History Society
*Friends of the River Kelvin
*Royal Society for the Protection of Birds
Glasgow Botanic Gardens
*Friends of GBG
Glasgow City Council Biodiversity Officers
Glasgow City Council Countryside Rangers
*The Conservation Volunteers
Friends of Yorkhill Park
North Kelvin Meadow and Childrens' Wood
East Dunbartonshire Biodiversity Officer
Clyde River Foundation
b) Others occasionally involved or otherwise interested at some time
University of Glasgow GALLANT Project
University of Glasgow Campus Biodiversity Working Group
*Glasgow Museums Biological Records Centre
Friends of Glasgow West
Friends of Kelvingrove Park
*Friends of Glasgow's Local Nature Reserves
Glasgow City Council Sustainable Glasgow Partnership
Woodlands Community Garden
c) Other organisations contributing to Kelvin at the Kibble
Tom Donald Photography
Scottish Environmental Protection Agency
Upstream Battle (Keep Scotland Beautiful)
Scottish Water
Froglife
Clyde Amphibian and Reptile Group
Photoscot
Scottish Wildlife Trust
Glasgow National Park City
*Friends of the Earth Glasgow

Table 1. Organisations currently taking part in the Kelvin Biodiversity Network. Asterisks indicate those contributing to most *Kelvin at the Kibble* exhibitions.

- TCV has developed a "Dead Good Dead-wood" project aimed at discouraging the clearance of rotting timber so that the fungi and invertebrate species utilising dead wood can be encouraged This project was much discussed by the network and has led to management changes along the forested banks of the river, particularly along stretches managed by Glasgow Botanic Gardens.
- The network had discussions on the need for a nature trail in leaflet form covering the urban Kelvin either in one leaflet, or in several sections. An earlier trail had covered Kelvingrove Park, and the Glasgow Treelovers' Society had produced a guide to the trees in the park. The discussions contributed to the production of junior leaflets for the Botanic Gardens, and a more advanced one for Kelvingrove.
- RSPB Glasgow's Giving Nature a Home team have worked with schools and communities for over 10 years, aiming to connect people with nature. In the west end of the city, this has included a schools programme at Kelvingrove Art Gallery and Museum, and developing Hillhead High School as a Species Ambassador school. The team's work is regularly highlighted at KBN meetings, including bioblitzes, creation of a demonstration wildlife garden in the Botanic Gardens, developing wildflower meadows and hedgerows, and enhancing house sparrow (*Passer domesticus*) habitat in collaboration with citizen scientists and the University of Glasgow.
- In recent years, the Botanic Gardens have become the venue for events such as the summer drama performances of "Bard in the Botanics" and the winter light and sound show "Glasglow". The network has contributed to discussions of the environmental impacts of these events, especially any impact on biodiversity, and the need for proper assessments.
- Scottish Water has carried out major works along the urban Kelvin, aiming to improve waste water treatment. The works required considerable tree felling and temporary path relocation. The network has discussed the arrangements for re-instatement but particularly the need for planting of appropriate species of trees.
- A major planning application for the Kelvin valley on the outskirts of the city came to the network's attention and, after discussion, we helped spread information on what was planned and its likely impact on biodiversity.
- The diversity of invertebrate species living in the river provides a measure of the water's ecological health. The Scottish Environmental Protection Agency (SEPA) does some sampling along the Kelvin, but the network feels there is scope for a citizen science contribution. This clearly needs training, since the species can be hard to identify, and there are safety issues in sampling from the river.

ACTIVITIES

The first meeting included a brainstorm of the possible scope of the network and its potential actions. It was agreed initially that the scope would be the River Kelvin and its immediate surroundings as it passes through the city of Glasgow, from the city boundary to the river's confluence with the Clyde at Partick. As noted below, engagement with the Kelvin beyond the city has been limited so far. The network was intended not to be a competitor to existing organisations but to organise activities that would benefit from groups working together and help to publicise the activities of member groups. Potential activities identified were: bioblitzes aimed at improving biological records; educational activities focused on the river; and contributions to Glasgow Science Festival (GSF), focusing on the science of the river.

Conference: The River Kelvin - its History and Natural History

The idea for a conference on the River Kelvin came up at a KBN meeting in October 2014. The city aimed to burnish its environmental image by designating 2015 as the Green Year, with each month having its own environmental theme, and GSF had decided to follow this theme. KBN offered to contribute a conference to the Festival and this was soon accepted. We brainstormed possible topics and agreed that it would be valuable to include an account of the historical uses of the river, as well as its natural history, since the two themes are likely to be interlinked. Some invited speakers felt unable to give an account focused on the Kelvin, but there was no difficulty in filling a day's programme with seven substantial talks, introduced by the chairs of the network's two founders, GNHS and FORK, and followed by an entertaining picture quiz and facilitated discussions giving the audience a chance to air views on topics such as invasive plants and the potential for power generation along the river. On the day, 6th June 2015, about 80 people attended. The printed programme included full abstracts of all the topics covered and a list of forthcoming events related to the Kelvin, including talks and excursions. Jon Barnes led a walk along the Kelvin on the day after the conference. It had always been intended that the conference proceedings should be published in *The Glasgow Naturalist.* In the event, this took longer than expected, papers not appearing online until December 2017 and in print the following March (Downie, 2018). Of the seven conference talks, we received publishable versions of only four, plus the text and illustrations from a poster as a short note. This was disappointing, but the published talks are substantial, especially John Hume's account of the industrial uses of the river, accompanied by historical illustrations, and Keith Watson's update of the river's flora.

Bio-recording

An initial aim of KBN was to accumulate more

knowledge of the biodiversity along the river and its immediate surroundings. The network has contributed to this in various ways, especially as a promoter of bioblitzes, a citizen science bio-recording activity, such as those organised by the RSPB in the Botanic Gardens in 2017 (Fig. 1) and Kelvingrove Park for City Nature Challenge (the first of these occurred in 2019 as a Nature Discovery Day, associated with the visit to Kelvingrove Museum and Art Gallery of the Natural History Museum's Dippy the Dinosaur) and the 30th anniversary of the Glasgow Garden Festival (2018). In July 2016, the network discussed the idea of revisiting the biodiversity recording project carried out by GNHS in the Glasgow Botanic Gardens two decades before (published as Hancock, 1998, 1999). The project would coincide with the celebration of the Gardens' bicentenary (1817-2017) and, as before, would focus on recording species living in a wild state in the Gardens. The plan was to publish papers based on bio-records accumulated over the previous 20 years, to broaden the scope of the animal and plant groups covered, but also to carry out one or more new bioblitzes. A bioblitz in September 2017 added 71 new species records for the Gardens (Forster, 2018). In the event, preparation of the papers resulting from the project took longer than anticipated, resulting in a very substantial output, 18 papers published over three issues of *The Glasgow Naturalist* (volume 27, parts 1, 3 and 4).

Fig. 1. The Glasgow WildFest bioblitz, Botanic Gardens, September 2017. (A) The species identification laboratory. (B) Explaining worm charming. (Photos: Gregory Vaux, RSPB)

Apart from the bioblitz events, the extra effort included regular night insect-trapping sessions, with identification of as many as possible, principally moths and caddis-flies. A visit by a mollusc expert added substantially to the species found in the glass-houses, and a survey aimed at spiders also added more insects, plus, surprisingly, freshwater turtles (Cathrine & Monir, 2022). The list of papers does not include an update of the flowering plant list, but many plant records were added by Botanical Society of the British Isles recorders. Roy Watling visited the gardens with a display of fungi and led a short foray, later contributing a substantial paper (Watling, 2019) on the non-lichenised fungi of the Gardens over 200 years (including at the previous Sandyford site). Watson (2022) covered the bryophytes and Wilkie (2022) the lichens. Overall, many species new to Glasgow and even some new to Scotland were recorded during this project, with a chart of the discoveries published as Table 3 in Weddle & Downie (2021). The ever-increasing species list can be found at www.gnhs.org.uk/biodiversity/GBG_splist.pdf. An additional recording effort has been aimed at the small parks at Yorkhill, close to the river's confluence with the Clyde: Yorkhill Greenspaces seem to add new species records each month, totalling 1,355 by September 2023. In 2023, a new project began to accumulate data on the distribution of animals and plants along the urban stretch of the Kelvin. This is part of the GALLANT project, a collaboration between the University of Glasgow, Glasgow City Council, local voluntary organisations and individual volunteers. The project's website can be accessed at https://www.inaturalist.org/projects/river-kelvin-wildlife-glasgow.

Kelvin at the Kibble

For many years, FORK had held an annual summer gala based around their headquarters, Halfpenny Bridge House. This had included stalls publicising the work of groups other than FORK itself. The gala was a huge effort for a small organisation, and very dependent on the weather. The network came up with a different, simpler plan: an exhibition put on by contributing groups celebrating the river and its biodiversity, with the obvious location being the foyer and main corridor of the Botanic Gardens' Kibble Palace. This idea was first discussed in July 2015: the then manager of the Gardens, Ewen Donaldson, was quick to agree that we could use the Kibble for a fortnight free of charge, and the first exhibition happened in May-June 2016. Nine groups produced exhibits; the event had an official opening; on most days, exhibits were unstaffed (so had to be self-explanatory), but the middle Saturday was advertised as a "family day" to include events such as a story-teller and guided walks, and with most exhibits staffed. *Kelvin at the Kibble*, as the exhibition has been named, has continued since 2016 (Fig. 2). The 2017 event was restricted to the south wing of the Kibble, because much space was needed for the Gardens' bicentenary celebration. The first three exhibitions simply celebrated the river and provided information on stakeholder groups, but since 2019, each exhibition has had a theme: pollution in 2019, highlighting a core activity of FORK, which carries out monthly clean-ups along the river. In 2020, we planned to shift the exhibition to September and to focus on climate change, as a link to the UN's COP26 climate change conference in Glasgow. However, the COVID-19 pandemic delayed both COP26 and our exhibition until autumn 2021. In May 2022, our theme was the biodiversity crisis, associated with the other big UN environment conference, COP15's review, in China, of the progress of the Convention on Biological Diversity. In 2023, we returned to pollution, as news reports flooded in of sewage releases into England's rivers (and the resultant effects on fish and other animal groups), by the privatised water companies. Over the seven years of *Kelvin at the Kibble*, the number of contributing groups has been 22 with some present every year (Table 1).

DISCUSSION

KBN has now existed for over a decade, but is essentially simply a mailing list. We have no constitution, no formal structure and no source of funding. The network persists because the people on the mailing list appreciate its existence. The lack of funding and a

Fig. 2. *Kelvin at the Kibble*. (A) Poster advertising the 2023 *Kelvin at the Kibble* exhibition (poster designed by Lyn Dunachie). (B) Visitors studying the Friends of the River Kelvin stall at the 2023 exhibition. (Photo: Lyn Dunachie)

formal structure means that the network can have no campaigning role. Rather, it can exchange information and promote the activities of contributing organisations. The network has been able to organise some limited activities: the *Kelvin at the Kibble* exhibition relies on the willingness of contributing organisations to exhibit their material, and the Botanic Gardens to provide space. The Kelvin conference was funded by the Blodwen Lloyd Binns Bequest, GNHS's trust fund. In our view, the network will persist as long as contributing organisations want it to, and there is no need for any formal structure.

Some of the activities involving KBN's members can be termed "citizen science", especially the bio-recording work. The idea of citizen science, as an activity where ordinary citizens contribute to the accumulation of scientific knowledge, originates in the 1990s (Irwin, 1995). Much of the knowledge gained concerns biodiversity, but citizen science is multi-disciplinary and also international (Wikipedia, 2023). There has been much debate on how to ensure that knowledge gathered by citizen scientists is reliable, with training and new technology both involved.

We contend that the continuation of the network over ten years, and its stimulation of the various activities described here demonstrate its usefulness. Some permanent outcomes are the conference proceedings and the new species records added with the encouragement of the network. We have been less involved in commenting on planning applications and their impacts on biodiversity than might have been expected, but, as noted earlier, the network's role on such issues is restricted to information dissemination.

So far, KBN has been involved mostly with the urban Kelvin. We have made contact with East Dunbartonshire Council's biodiversity staff, but they have had limited input so far, and we have had no contact with any NGOs that operate along the river outside the city. Given that environmental interests are often localised, this lack of reach may be no bad thing, but we intend to keep trying for wider involvement. An exciting recent development is a plan to restore the meanders in the East Dunbartonshire stretch of the river, allowing the formation of wetlands with good visitor access.

The future of KBN will be determined by the network's active members. We hope to continue with our annual exhibitions; we are sure that there are more species to record, perhaps especially in groups where identification is more challenging, and this may require more engagement with training; and, as noted earlier, the issues concerning the river beyond Glasgow's boundaries are relatively unexplored.

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REFERENCES

Arnold, K., McLeman, A. & Krokowski, J. (2018). Ecological monitoring of the lower River Kelvin by SEPA, 1979-2014. *The Glasgow Naturalist* 26(4), 21-23.

Cathrine, C. & Monir, T. (2022). The turtles (Testudines) of Glasgow Botanic Gardens including the first record of *Mauremys reevesii* (Gray, 1831) for the U.K., outside captivity. *The Glasgow Naturalist* 27(4), 65-69. https://doi.org/10.37208/tgn27420

Downie, J.R. (Editor) (2018). The River Kelvin: history and natural history. *The Glasgow Naturalist* 26(4), 3-23.

Forster, S.J. (2018). A wild day out! Finding wildlife in the Glasgow Botanic gardens. *The Glasgow Naturalist* 27(1), 50-52. https://doi.org/10.37208/tgn27109

Hancock, E.G. (Editor) (1998). On the wildside - the natural history of Glasgow Botanic Gardens. Supplement, Part 1. *The Glasgow Naturalist* 23(3), 40-56.

Hancock, E.G. (Editor) (1999). On the wildside - the natural history of Glasgow Botanic Gardens. Supplement, Part 2. *The Glasgow Naturalist* 23(4), 59-64.

Hume, J. (2018). The River Kelvin: route and resource from pre-history to the 20th century. *The Glasgow Naturalist* 26(4), 4-10.

Irwin, A. (1995). *Citizen Science: A Study of People, Expertise and Sustainable Development*. Routledge, London.

Scott, C. (2018). Glasgow's biodiversity: the importance of the Kelvin corridor. *The Glasgow Naturalist* 26(4), 10-14.

Watling, R. (2019). The tale of the fungi of two gardens: non-lichenised fungi of the Botanic Gardens in Glasgow. *The Glasgow Naturalist* 27(1), 57-67. https://doi.org/10.37208/tgn27111

Watson, K.J. (2018). The changing flora of the Kelvin. *The Glasgow Naturalist* 26(4), 14-17.

Watson, K.J. (2022). The bryophytes of Glasgow Botanic Gardens. *The Glasgow Naturalist* 27(4), 60-64.

https://doi.org/10.37208/tgn27415
Weddle, R.B. & Downie, J.R. (2021). On the Wildside 2: what the Glasgow Botanic Gardens wildside project has achieved and what remains to be done. *The Glasgow Naturalist* 27(3), 68-71. https://doi.org/10.37208/tgn27325
Wikipedia (2023). *Citizen Science*. https://en.wikipedia.org/wiki/Citizen_science Accessed 19th September 2023.
Wilkie, I.C. (2022). The lichens of Glasgow Botanic Gardens. *The Glasgow Naturalist* 27(3), 77-85. https://doi.org/10.37208/tgn27315