Cofnod: Creating Data Systems for Consultant Ecologists

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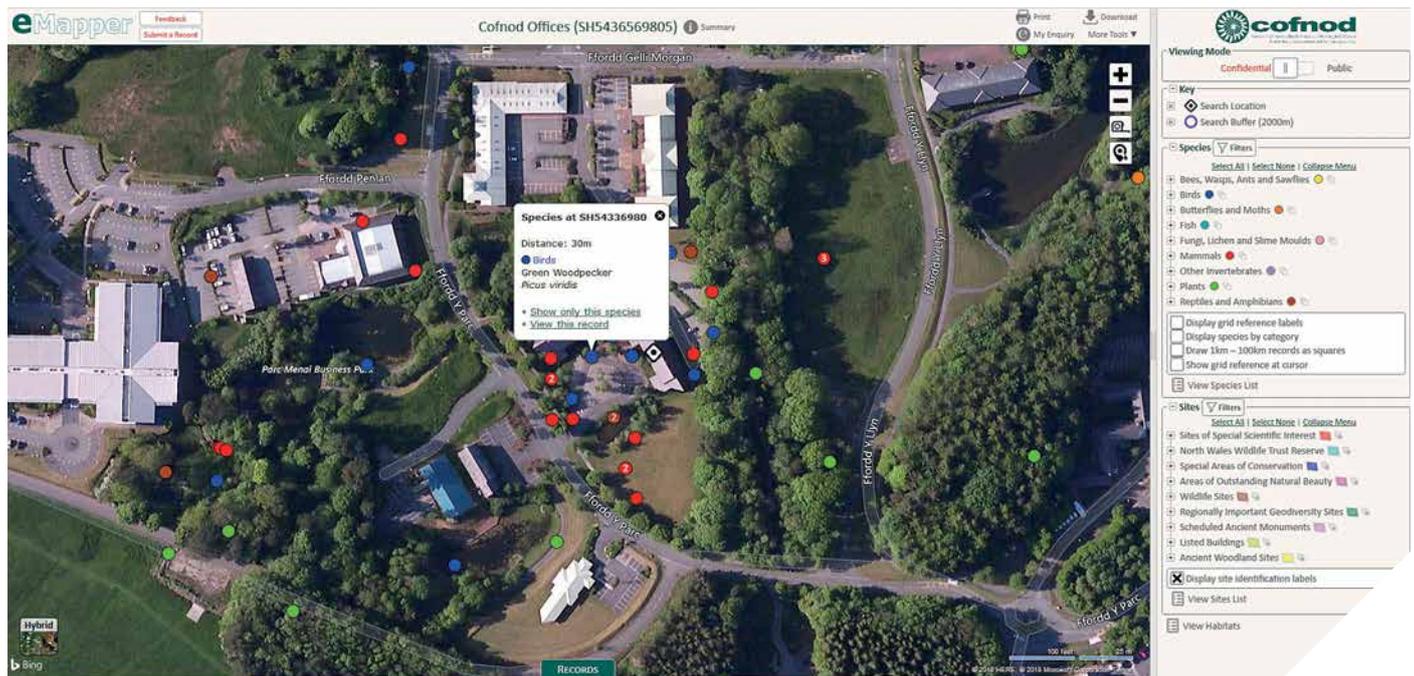North Wales Environmental Information Service

Figure 1. A typical eMapper output showing species and sites on an online map.

Consultant ecologists need rapid, straightforward access to environmental data held by Local Environmental Records Centres. Recent developments at Cofnod have transformed the way data are stored, managed and provided. This article describes our new tool called eMapper, which allows users to interact with ecological data through an online map, offering greater flexibility and making data interpretation more efficient. For clients using eMapper, turn-around times for data requests have been drastically reduced and reports can be downloaded in a wide range of formats to allow scrutiny offline. These improvements have revolutionised our data retrieval service, providing ecology and environmental professionals with a rapid, efficient and cost-effective way of acquiring the data they need.

The back story

Based in North Wales, Cofnod is one of over 60 Local Environmental Records Centres (LERCs) in the UK. Established in 2005, we were part of a 5-year programme to establish LERCs covering Wales. Although LERCs have similar remits, the scale of operation and business model can vary, contributing to some differences in the products and level of service, which can occasionally cause difficulties for clients. An accreditation scheme introduced in 2012 by the Association of Local Environmental Records Centres seeks to address this by improving levels of service and increasing standardisation. Cofnod hopes to receive accreditation before long, joining a range of LERCs across the country attaining this standard.

Data request service

Along with other LERCs, Cofnod offers a data request service for a range of customers including consultant ecologists. First introduced in 2007, this service has seen a gradual increase in use, with over

320 requests from consultants last year compared to just 80 in 2008. Nevertheless, we continue to find it difficult to predict the numbers and types of requests each year and although our capacity to deal with requests has increased, the service continues to feel under-used. A recent study in London suggested that over 18% of all planning applications required a LERC data search, yet less than 1% requested data from GiGL (Greenspace Information for Greater London CC), the LERC covering Greater London (Greater London Authority 2016). This pattern is replicated in North Wales, where we estimate that less than 2% of all planning applications requested a data search from us last year. So why are the percentages so low when consultant ecologists know the services we provide and have probably used them previously? Maybe they were unhappy with the level of service they received, or perhaps they don't think they need the data. Most likely, their clients are unwilling to pay for the cost of data searches. To encourage greater use of the environmental records we hold, we continue to improve the data retrieval service we provide to consultants. For example, we recently agreed to provide unlimited data requests for an annual fee from one of the larger local consultancies. This has seen a dramatic increase in the number of data requests they make, as they

no longer need to justify data search cost to their clients. This not only demonstrates that our service was previously under-used but also, crucially, that the data we provide are now being used more consistently, which is our ultimate aim.

Delivering a better service

Since 2015, we have made fundamental technical changes to the way we store, maintain and manipulate data, moving to a single integrated system with improved functionality. Previously, although we had largely automated the process of combining and querying the data, the production of outputs took several defined and often lengthy steps. For example, creating an easy-to-interpret map to scale was often time consuming, especially where there were hotspots of data or large search areas. The product, which was essentially a formatted table of species with associated maps, was sometimes criticised for being too static and difficult to use, especially with large bodies of data.

By contrast, the new system allows users to:

- interact with the data online, making the information easier and quicker to interpret

- download reports in a wide range of data formats

- access data shortly after making a request.

Creating an online mapping approach: eMapper

Development of an interactive mapping interface was key to improving user experience. We created a program called eMapper that allows our data to be manipulated and interrogated using online mapping tools. For the first time, eMapper allows users to interact with the species, site and habitat data across the search area, allowing them to quickly visualise how species and habitats could potentially be impacted by a proposed development (Figure 1).

The eMapper system provides all relevant data, rather than just selected species or groups. Hence users are sometimes presented with more data than they specify but the on-board filters allow them to quickly focus on the important features, making use of the data much more comprehensive and versatile. For example, for large complex sites, it is easy to zoom into areas and display certain data, such as all species recorded within the last 10 years or all species with a protected status (Figure 2). Furthermore, users can create their own custom maps by changing the way the data are displayed and using a variety of base maps. We felt this was important for customers without GIS capability. In addition, we provide a range of download formats
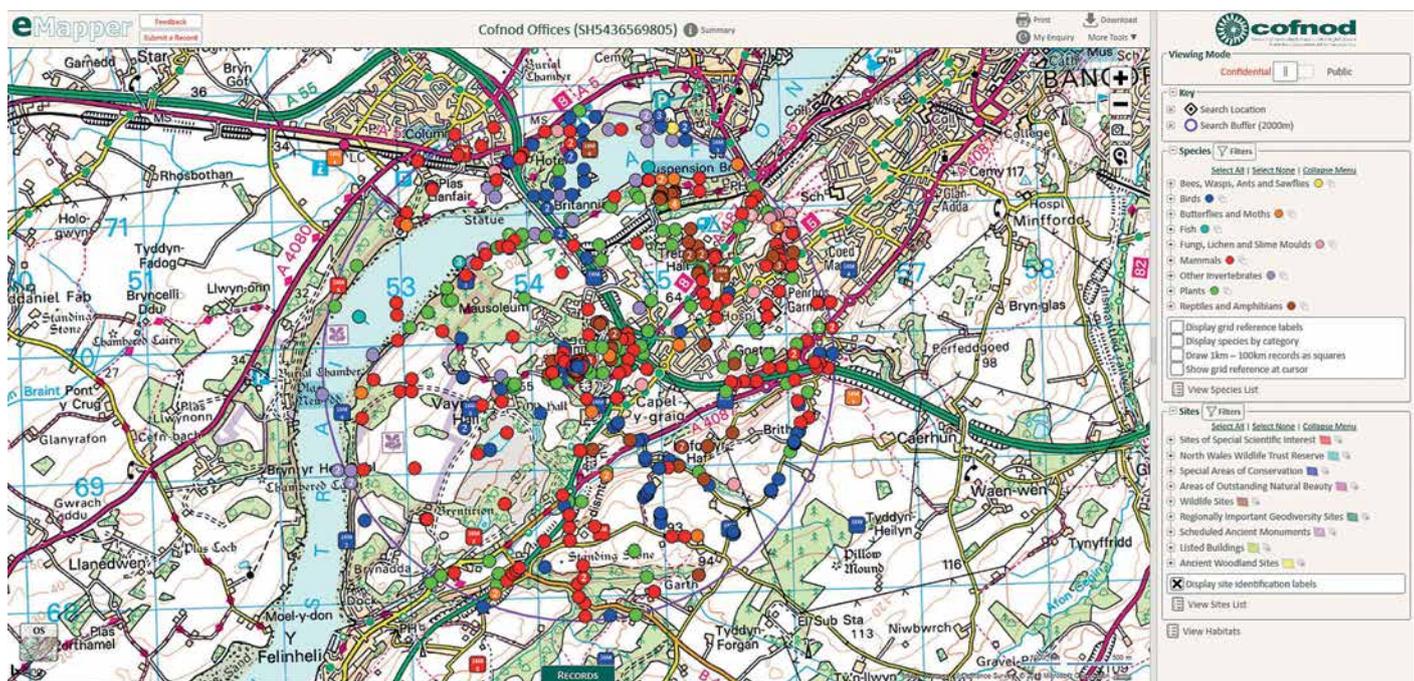
A close up eMapper view showing clusters of species records.

	Steps	Who	How
5 minutes	Define search requirements	Consultant Ecologist	Cofnod website
	Retrieve an instant quote		
	Register or login		
	Submit data request		
10 minutes	Process data request	Cofnod	Cofnod internal systems
	Run data search		
	Send search results		
	Send invoice		
	Receive search results	Consultant Ecologist	Email containing eMapper weblink
	Open results in eMapper		Web browser and online mapping
	Pay invoice within 28 days		

Table 1. Cofnod's data request process. Note that times are approximate.

including Excel or ESRI Shape for users who wish to analyse the data further.

Speeding up the service

The eMapper interface allows us to offer a significantly improved level of service and a consistently high response time. Customers still submit a data request via the Cofnod website but in most instances they receive results within minutes of submitting their request (Table 1). This has largely been achieved by streamlining the data request process to utilise a series of standard, predefined products (built on experience of what the majority of our customers require) together with online mapping tools to better specify the data search location. The system automatically provides an exact price for the work when customers make the data request, depending on the product selected. This allows users to vary parameters in advance in line with resource constraints – an important development in its own right. Once the data request parameters have been verified by a Cofnod staff member, a weblink is emailed. This provides online access to the data requested via the eMapper software. Turn-around times are usually between 10 minutes and two hours.

The way forward

Since its launch, feedback about eMapper and the service we provide has been overwhelmingly positive:

"the eMapper tool is by far the best service/method of data delivery I've seen from any LERC"

"I have to say that your website and e-mapper service is one of the easiest user interfaces I have come across".

Other LERCs are starting to adopt eMapper, with Leicestershire and Rutland Environmental Records Centre being the first to integrate it within their products. eMapper is also used in the Wales Biodiversity and Reporting Database, Aderyn, which is currently used in Wales to service national contracts and provide outputs for consultants in Mid Wales.

Capturing data from professional ecologists

In their Code of Professional Conduct, CIEEM states:

'members wherever possible, should make scientific data collected during the course of their professional duties available to others such as records centres.'

Over the past few years we've tried a variety of methods to capture data from consultant ecologists but although the pace of exchange has increased, mainly through collaborations with smaller, local consultants, more could be achieved. The time saved through eMapper has allowed us to focus more on sourcing high quality data, thereby creating a better product as well as offering an improved service. Currently, with the permission of local planning authorities and consultants, we are digitising important species information held on planning files. We have also

developed a system to archive ecological reports and store vital metadata. This important contextual information helps create a direct link between the species records and a copy of the original report. Our aim is to develop a simple system for consultant ecologists to directly upload ecological reports or data. We hope this will encourage more people to share their data with us, allowing it to be more widely used in our reporting process.

Making things easier

Although many of the systems we've developed at Cofnod are designed to allow us to source and manage local environmental records more efficiently, we are wholly committed to pushing forward with systems that improve the user experience for those who need to access our database. We look forward to further development, working with the community of consultant ecologists and environmental professionals to make the data we hold ever more useful to their work.

Reference

Greater London Authority (2016). *Planning for Biodiversity – Are development proposals being informed by appropriate data on species and habitats?* A report commissioned by the Mayor of London. Greater London Authority, London.

About the Author

Roy Tapping is the Manager of Cofnod and a Member of CIEEM. Before establishing Cofnod, some 13 years ago, Roy worked for the Countryside Council for Wales, English Nature and the Institute of Terrestrial Ecology, both in technical and ecological roles. Cofnod continues to provide Roy with a unique opportunity to blend his knowledge of ecology with a passion for environmental data. Alongside a small, highly skilled team, he has coordinated the development of a Local Environmental Records Centre with particular strengths in system development and implementation.

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