BOS Support Webinar

Harnessing biodiversity survey data for reuse - tools and outlook

Questions and Answers

Topic: BioNet – future developments

Are there plans to make the current BioNet records and mapping of records more user friendly and efficient? The current system is very cumbersome, often the mapping function doesn't work and a lot of time is wasted just trying to check records.

Yes. The existing BioNet-Atlas application was developed and released in 2011-2012. The Department of Planning, Industry and Environment (the Department) is having several issues with the platform and are also aware of issues faced by users. The Remote Sensing & Landscape Science Branch is currently seeking funding for a major redevelopment of BioNet, including development of the BioNet Map Viewer.

As outlined in the webinar presentation, the Department has undertaken work to make this data available through the BioNet web services API. This will remove dependency on the BioNet Map Viewer to view and query records. We have used the API to present data through the SEED Portal. The SEED Portal is the NSW Government's central resource for Sharing and Enabling Environmental Data ('SEED'). It also enables anyone to build their own map product. An example of this is provided in the presentation, however, there are a number of other groups integrating the data API directly into their own applications.

Is the Department working on the addition of wildlife camera imagery and data to BioNet? Imagery could be analysed by citizen science and/or artificial intelligence with automatic data transfer to BioNet.

Yes. The Department has a program called WildCount that has been running for several years. However, there are certain challenges with migrating these data into BioNet. The primary challenge being wildlife camera trapping generates an enormous amount of data, particularly regarding imagery file size. WildCount currently has a separate data storage location. Wildlife camera trapping imagery, which generally has many images per site, is beyond the capacity of the BioNet servers at this stage, however this may be feasible in future. BioNet currently contains imagery from other programs (e.g. flora survey) where there is one image per site.

There is a citizen science project connected to WildCount to attribute wildlife camera data which is then reviewed by scientists. At the conclusion of that process, there will be records of a given species at a location and a date. The WildCount program uploads those data into BioNet, excluding the images.

A scientific licence is only required for survey and/or research work that harms or may harm threatened species, ecological communities or their habitat as a defence under the *Biodiversity Conservation Act 2016*. However, there is no requirement for a surveyor to submit records of species that have been observed. How do we ensure capture of these in BioNet?

As noted in the question, there are no mandatory requirements for this data to be provided. This highlights a key challenge regarding data capture and reuse. The Department acknowledges the importance of data capture and as such, a review of the scientific licence requirements is proposed.

Additionally, there are currently many user-friendly Applications for incidental species sightings that feed information through to the national repository Atlas of Living Australia e.g. iNaturalist.

Again, this is a technical supply chain challenge which requires further work to connect these systems.

It is also important to recognise that the people contributing the data, in a lot of cases, are also users of the data.I It is in their interests to have the data they collect in the repository.

Are there plans to have a single platform for biodiversity searches for ecological projects i.e. no need for the double up of BioNet and Commonwealth protected matters searches?

A key priority of the National Digital Environmental Assessment Program is the development of a Biodiversity Data Repository to bring together assessment data in one location, including Commonwealth data. The intent would be for these data to also be available in the NSW system (i.e. SEED Portal).

The SEED Portal is the NSW Government's central resource for Sharing and Enabling Environmental Data. It was developed for the NSW community in a collaborative effort between government agencies to provide an accessible and reliable platform for environmental data. BioNet sightings data and flora survey plots are incorporated into the SEED Portal.

There is an analysis module for the SEED Portal under development, this will support assessors in completing desktop BAM assessments. It will allow an assessor to define an area of interest, and the module would automatically intersect a series of nominated datasets.

Does the Department intend to selectively add Atlas of Living Australia (ALA) data to BioNet? These data can be linked to photos, increasing scientific rigour.

Yes, there is certainly an intention for ALA data to be incorporated into BioNet. However, it is important to recognise that there are significant challenges with incorporating data from systems with lower minimum data requirements.

The ALA data model has different minimum standards to BioNet, creating technical data suitability issues e.g. ALA accepts data with missing information such as dates. Data updates and changes to records from ALA also pose a significant challenge.

Is there any interaction proposed with WIDX?

No, not currently. WIDX is the external user interface of the Weeds Information Database (WID) which allows weeds professionals in NSW to log on and access subsystems of the WID - the same system that drives the NSW WeedWise smart phone app and website.

Will the BioNet Atlas data and Plant Community Type (PCT) maps be available via Web Feature Service (WFS)?

A WFS is a type of web map service that carries real data rather than map images (Web Map Service, WMS). They require larger computing power so data volumes are often capped to avoid performance problems.

BioNet flora plots and species sighting are published from the SEED Portal as a combined WMS/WFS. It allows a small amount of data to be downloaded as GIS Shape file data. Here is quick demo.

Work is under way to develop a new PCT map service, and it is hoped that this will include WMS/WFS.

Topic: BioNet – General

What quality control systems are in place for external PCT data flowing into BioNet?

Flora survey plot data that is supplied to BioNet –Atlas may be used to update and improve the quality of the PCT classification. To ensure repeatability and rigor in the PCT development process only data that is held in BioNet –Atlas will be used in the development of PCTs.

Quality control is applied at multiple points. Firstly, the upload of plot data into BioNet forces conformance of data fields and detection of species geographic outliers. Secondly, the plot selection and preparation process consider survey methods, completeness of data fields, completeness taxonomic sampling and taxonomic name assignment. Thirdly, the cluster analysis of the selected plots detects patterns, including outliers, that are further investigated and may lead to rejection of additional plots. At this point new PCTs must be supported by a minimum number of plots to move into the final proposed list of PCTs. A fourth layer of quality control is applied as the new or modified PCTs are loaded back into BioNet and prepared for final approval and publication.

Could you please provide more information on mandatory reporting and use of standard survey techniques for BioNet?

The mandatory requirement for supply of data into BioNet, as mentioned in the presentation, are based on the scientific licence conditions in the *Biodiversity Conservation Act 2016* (BC Act). The Department will continue to review those conditions. The Department acknowledges that the current data supply process is cumbersome, and that any changes in data supply requirements need to be supported with streamlined data capture and upload processes and technology.

Survey standards are already embedded in certain assessments e.g. BAM. The Department retains type standards for collecting systematic vegetation survey data and flora survey data.

Could you please provide more information on the frequency and timing of data submission and updates for BioNet?

This question could be interpreted in two different ways:

- The first relates to the supply of data to BioNet in accordance with the scientific licence. This is currently required annually. However, the Department is working towards making this more frequent.
- The second relates to the upload of data into BioNet. This involves a review process which may take up to one or two weeks. On occasion, there may be records that are considered outliers by the system and are put into quarantine. At present, there is an intensive manual step in that upload process, for the contributor and for the data manager. The intent as part of the BioNet rebuild is to automate some of these functions to speed up the process.

How are the following observations handled under the BioNet data recording systems? Bird species identified outside of the standard 2ha plot and potentially in a different PCT to the plot.

The standard bird data model in the fauna survey component of BioNet includes a flag for whether species are recorded within or outside of the plot. From the point of view of systematic data, it is the species that are flagged as inside the plot that would be considered. Bird species recorded outside of the plot are included as an option to allow for a regional record of bird

presence. You could not assume they are located in the same PCT as the plot and indeed you would not necessarily know the PCT in which they are located.

Topic: Biodiversity data collection applications

Will BioNet include field data capture in future?

Yes. As noted in the presentation, to date the Department has focused on making data accessible via the BioNet API and is now moving its attention to filed data capture. Currently both species observation and systematic survey data collected in the field and uploaded to BioNet-Atlas via the BioNet data upload CSV spreadsheets. This is a rather cumbersome manual process. The Department is exploring ways to automate the flow of data from in-field capture to BioNet upload.

Are there any further plans for development of a BioNet 'endorsed' mobile field data capture application?

Streamlining the capture and supply of ecological assessment data is a high priority for industry and the Department. The Department does not wish to duplicate efforts in building mobile data capture applications where others are already doing it well. Working with partners to ensure our system connects with, and supports, industry mobile applications is our preferred model. It is expected the endorsement of applications will be required. Endorsement is likely to focus on quality assurance, compliance with data standards, and data supply chain.

How will others operating biodiversity data field applications be engaged in the Department's projects?

The Department is committed to a co-design and engagement approach to systems design. Once funding for the next pilot, the Biodiversity Data Repository Project, is confirmed the Department will establish clear processes for engagement with stakeholders.

A broader project for a full biodiversity data capture solution and redevelopment of BioNet is also proposed. In the interim, the Department welcomes ideas and feedback in terms of supporting different technologies and solutions. Feel free to contact the BioNet team at BioNet@environment.nsw.gov.au.

If you are developing applications against BioNet web services (APIs) consider registering as a BioNet Webservice Early Adopter by contacting the BioNet Team.

Is there a Web or app link for EcoServer?

EcoServer is an application with several modules within it e.g. EcoPlot (BAM and BBAM) and EcoTransect. A website will be available in 2021. Further information and updates are available for other users. Contact info@ecoserver.com.au for more information.

EcoServer is an IOS platform which is used to speed up data collection in the field. The user collects BAM plot data and exports it for upload straight into BioNet and the BAM calculator. It also has other functions.

The EcoServer team reached out to the BioNet team to be involved in the co-design of BioNet APIs through the BioNet Early Adopter Scheme.

Topic: Revision of NSW Plant Community Types

Are fine scale PCTs identified by assessors for Biodiversity Assessment Reports (BARs) being fed into the regional PCT mapping?

It is assumed that the fine scale PCTs referred to in this question are PCTs mapped into vegetation zones in accordance with the BAM (being PCTs that have been segmented further into certain condition classes). A data standard for PCT or vegetation type mapping was developed by the Department. This standard supports fine scale mapping of PCTs and the Department is in the process of designing a framework for this function. Once a system for harnessing local site base maps is available, theoretically it can be supplied by the assessor and uploaded into the state-wide PCT layer.

The Eastern NSW revised PCT classification is due for release by the end of the 2020/2021 financial year. To date, many assessors have contributed their data to this project, with several thousand BAM plots being fed into the Eastern NSW revised PCT classification. Harnessing this information is critical for continual improvement to the classification and to the associated maps. This also enables effective diagnostic tools, allowing for a transparent and robust classification system for the user. Improved data feeds through to other legislative priorities such as Threatened Ecological Communities (TECs).

Refer to the BOS Support Vimeo webpage for further information on the Eastern NSW revised PCT classification and associated tools to assist with PCT identification.

It was previously mentioned that externally collected data are being used to update PCT mapping, are these data also stored in BioNet?

Yes. All data analysed for the purpose of PCT development must be stored in BioNet. The BioNet Veg Classification and Diagnostic Tools are now linked backed to BioNet Flora survey. The new BioNet flora survey data includes the PCT numbers for each of the plots.

There will be transparent links between the information that is stored in BioNet and the quantitative PCTs. Refer to the BOS Support Vimeo webpage for further information on the Eastern NSW revised PCT classification and associated tools to assist with PCT identification.

Note, datasets within BioNet may have different security access based on what the custodians have agreed to, and thus may not always appear for external users. The preference is to have all data publicly available. However, this may not be supported by the contributors of certain external data sources. This reflects a relatively small proportion of data used for PCT classification.