BioNet strategic roadmap 2024–29

Department of Climate Change,
Energy, the Environment and Water

NSW GOVERNMENT

Acknowledgement of Country

Department of Climate Change, Energy, the Environment and Water acknowledges the Traditional Custodians of the lands where we work and live.

We pay our respects to Elders past, present and emerging.

This resource may contain images or names of deceased persons in photographs or historical content.

Artist and designer Nikita Ridgeway from Aboriginal design agency Boss Lady Creative Designs created the People and Community symbol.

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Environment and Heritage
Department of Climate Change,
Energy, the Environment and Water
Locked Bag 5022, Parramatta NSW 2124
Phone: +61 2 9995 5000 (switchboard)
Phone: 1300 361 967 (Environment and Heritage enquiries)
TTY users: phone 133 677, then ask for 1300 361 967
Speak and listen users: phone 1300 555 727, then ask for 1300 361 967
Email info@environment.nsw.gov.au
Website www.environment.nsw.gov.au

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Contents

List of tables

List of figures

Improving NSW biodiversity outcomes through the best available data

Our vision

BioNet is the authority for NSW biodiversity data. It enables accessible and intuitive open data exchange.

Our comprehensive and credible data enriches biodiversity knowledge, supports evidence-based decision making, and empowers the community and government to manage and enhance biodiversity outcomes.

Our 5-year roadmap

This document sets out the strategic roadmap that will direct investment priorities in the Biodiversity Information Systems (BIS) team through to 2029.

The following 4 strategic outcomes guide our activities.

They will help us achieve our vision for the team and the BioNet data system.

Strategic outcomes

1. Our stakeholders understand our purpose allowing us to leverage broader biodiversity information management efforts.
   - Activity 1.1: Develop a stakeholder engagement and communication plan.
   - Activity 1.2: Develop partnerships with industry and non-government organisations.
   - Activity 1.3: Participate in national discussions and leverage available tools and resources.
2. Our infrastructure and services are secure and supported.
   - Activity 2.1: Deliver critical upgrades to priority BioNet systems (NextGen stage 1).
   - Activity 2.2: Develop and implement the technology blueprint (NextGen stage 2).
   - Activity 2.3: Maintain cybersecurity management systems.
   - Activity 2.4: Acquire and retain skillsets to support business capabilities.
3. User interactions are easy and intuitive.
   - Activity 3.1: Improve user interfaces.
   - Activity 3.2: Improve self-service functions.
   - Activity 3.3: Strengthen data-as-a-service.
4. BioNet data supports confident decision making.
   - Activity 4.1: Implement a quality management system.
   - Activity 4.2: Improve data quality.

- Activity 4.3: Strengthen data validation and audit capabilities.
- Activity 4.4: Provide software-as-a-service for plant community type identification and validation.

Building on our achievements

Recognised custodian for NSW biodiversity data

The BioNet system is the main repository of biodiversity data within New South Wales. It collects, stores and shares complex datasets.

It provides a trustworthy and reliable source of biodiversity data. It encompasses sectors including ecology, conservation, government and software development.

Enabling open access and community participation

BioNet is a leader in data-as-a-service. It delivers standardised and integrated data services to other platforms and applications.

BioNet Web Services allows the community to interact with biodiversity data and deepen their knowledge. It offers specialised data tools for citizen-focused interfaces. These include Trees Near Me, Credits Near Me and I Spy Koala.

Use and impact

BioNet resources and applications are widely used. Up to September 2024, this included:

- more than 6,000 registered BioNet Atlas users
- more than 110,000 page visits per year to the BioNet threatened biodiversity profiles
- 65,000 page visits per year to the BioNet home page.

Popular mobile applications that use BioNet data services include:

- I Spy Koala (11,000 downloads since 2022)
- the award-winning Trees Near Me app (20,000 downloads since 2022).

The economic benefits of Integrated Bionet Vegetation Data products (plots, classification and maps) to 2 government programs, NSW Biodiversity Offset Scheme and NSW Koala Strategy, is estimated to be $32 million annually.

Continuing momentum

Some of BioNet's system infrastructure is nearing its end of life. However, we continue to improve system functionality and data management practices through targeted enhancement projects.

BioNet's legacy systems has been migrated to cloud platform that features modern DevOps capabilities. This work will align with BioNet's NextGen system redevelopment.

Collaboration

We are participating in national discussions and working groups to establish the standards and partnerships required to enable a distributed ecological data ecosystem capable of leveraging the knowledge, practices and assets of other application developers and data administrators to deliver the best data to where it is needed

Customer support

We have an in-depth understanding of BioNet users.

We use ongoing engagement and longitudinal satisfaction surveys to identify users' pain points. These insights guide investment priorities. They inform our user-centric development process.

We also know that our users have great respect and appreciation for the BioNet team. This includes working with other teams in the department and supporting external stakeholders when technology doesn't meet their needs.

About NSW BioNet

BioNet empowers evidence-based decision making to enhance biodiversity outcomes across New South Wales.

The BioNet data system is the main repository for data collected on biodiversity in the state.

It aggregates primary data and publishes integrated data products, supporting environmental awareness and tracking environmental values.

BioNet aims to improve biodiversity outcomes in New South Wales by helping the community and government manage and enhance biodiversity using comprehensive, credible and robust data.

It is managed by the BIS team within the Department of Climate Change, Energy, the Environment and Water (the department).

Our principles

Trusted

Data is robust and its scientific authority is transparent and certain.

Community owned

Biodiversity data in BioNet is community owned.

Open

Data is open by default, and where it is not the reasons are clearly communicated.

Easy

It is easy to discover, contribute and access data.

Enables collaboration

BioNet enables collaboration between parties.

Customer centric

BioNet design is focused on customers, giving them greater visibility and control over their data.

Flexible and adaptable

BioNet design is flexible, adaptable and responsive to user needs.

Empowering

BioNet enables and helps others to innovate on the data.

Co-created

BioNet actively engages stakeholders in design and decision making.

Our products and data

Data collections

NSW BioNet hosts 7 data collections, including:

- Species Sightings Data Collection
- Systematic Survey Data Collection
- Threatened Biodiversity Data Collection
- Vegetation Classification Data Collection
- Species Names List Data Collection
- Vegetation Map Data Collection
- NSW (Mitchell) Landscapes.

NSW BioNet supports data collection for:

- primary data, such as 20 million species sightings records and 600,000 systematic survey sites
- decision-ready products, including 1,700 threatened biodiversity profiles, 1,200 plant community type and state vegetation type maps
- enabling vocabularies, including controlled species names and taxon lists.

Infrastructure

BioNet has 5 applications, including:

- BioNet Atlas
- BioNet Vegetation Classification
- BioNet Threatened Biodiversity Profiles
- BioNet Web Services
- Plot to Plant Community Type (PCT) Assignment Tool.

BioNet data is hosted across 5 purpose-built applications.

Users can access data via BioNet web service APIs. This supports easy integration with other applications. These include SEED (Sharing and Enabling Environmental Data portal), government business systems and third-party developed platforms.

Data access

BioNet seeks to maximise the amount of data available under open data principles, enabling frictionless data sharing. There are 3 levels of public access:

- open data access – more than 99% of government-owned data in BioNet is publicly available under a creative commons licence (CC-BY4.0) that does not require access approval or login

- registered user access – all members of the community can register as a user, giving them the ability to contribute and edit data where authorised
- licensed user access – licensed users have access to sensitive species data and the ability to enter systematic survey data. This access is only available to professional users involved in research, conservation environmental assessment and impact mitigation.

Our stakeholders

The BioNet data system serves many different audiences for various purposes.

We call stakeholders who interact with BioNet our users, clients or customers.

This includes:

- consumers – stakeholders who consume BioNet data
- contributors – stakeholders who contribute to BioNet data
- partners – stakeholders who contribute data to BioNet and support improvements to data management, maintenance and access through a formalised arrangement or partnership.

This contribution and collaboration with our stakeholders are essential to fulfil our purpose of improving biodiversity outcomes across New South Wales.

Guiding our next 5 years

This strategic roadmap identifies priority areas to meet business and user demands for the 5 years to 2029.

Scope and purpose of the strategic roadmap

The strategic roadmap aims to improve how we manage biodiversity information held in the BioNet repository. This includes the technological and professional services we use to capture, manage and share the data.

It sets out how we will connect and partner with other systems to improve data supply. It also shows how we will influence data standards and data management practice along the data supply chain.

Ultimately, the strategic roadmap aims to improve data quality and service for BioNet customers.

We recognise that successfully implementing the roadmap depends on the commitment of others.

Creating integrated and decision-ready information products requires close collaboration with other teams. This includes products like threatened biodiversity profiles, state vegetation type maps, vegetation classification, and vegetation condition benchmarks.

The BIS team standardises, coordinates, and authorises processes to ensure system components integrate logically within BioNet for publication through BioNet data services.

Scope

- Deliver professional services
- Engage with stakeholders
- Enhance the functionality and usability of our systems
- Store data in the system
- Share data effectively
- Control who has access and what they can do
- Ensure data assurance and curation
- Maintain data standards
- Partner to improve data supply
- Influence to improve data quality

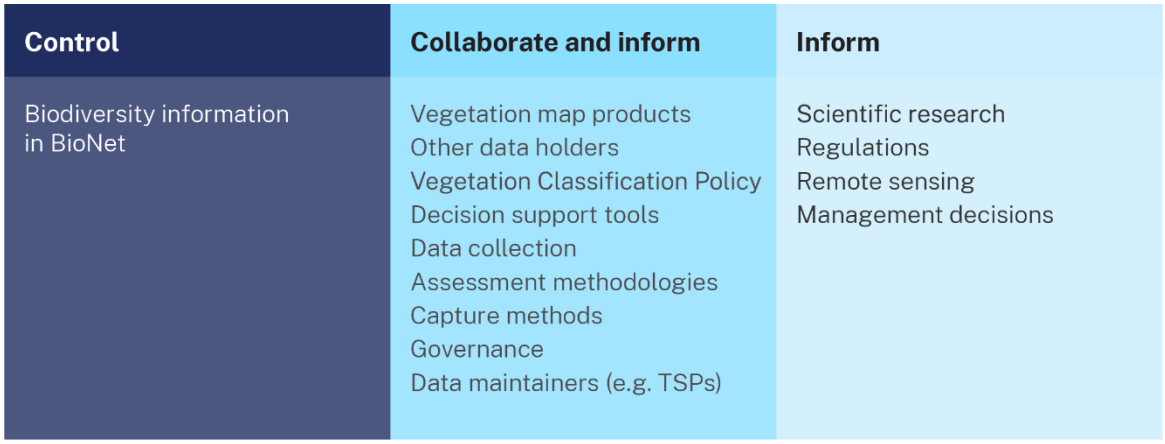

Figure 1 Scope of this strategic roadmap

Developing the strategic roadmap

User perspectives informed the development of this strategic roadmap.

We consulted with 72 users through 10 virtual stakeholder workshops and an online survey. Stakeholders came from the government, research, conservation and private sectors.

We asked stakeholders about their tasks, goals, pain points and processes to validate existing knowledge. We also wanted to identify use cases and needs that BioNet had not captured previously.

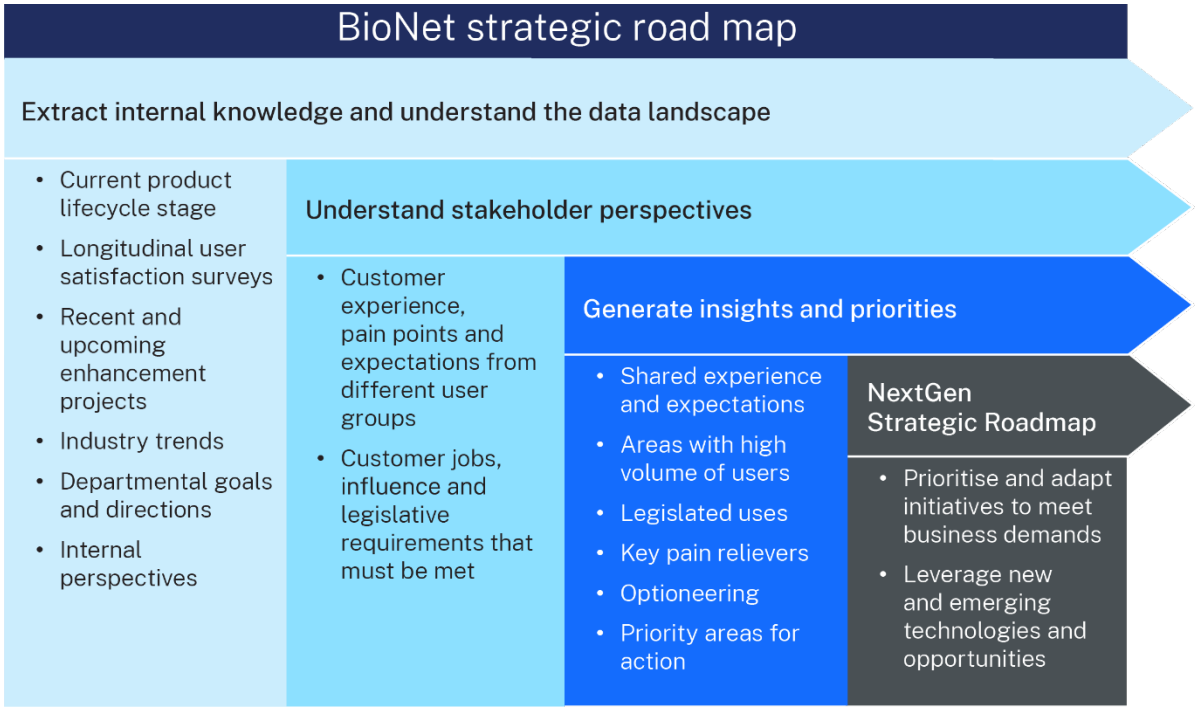

Figure 2 **A summary of the steps taken and information inputs to develop the strategic roadmap**

Influencing factors

This section examines the elements and considerations shaping our context and future.

Strategic context

Australian Government

The Nature positive plan: better for the environment, better for business[i] is the Australian Government's response to reviews of the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).

It identifies better data as a priority to improve planning and ecological decisions. This will rebuild accountability and trust in the EPBC Act.

To support this, the Australian Government established a new Environmental Information Australia division.

The division will develop and implement a national environmental data strategy in collaboration with federal and state agencies. This will improve data availability, interoperability, management and quality.

Key initiatives include:

- **Biodiversity Data Repository (BDR)**: This platform will catalogue species data across Australia. It will integrate with existing datasets to improve all jurisdictions' access to high-quality biodiversity data across all jurisdictions. BioNet will serve as the NSW state database node. As we proceed with NextGen development, we will prioritise system alignment and data interoperability.
- **Australian Biodiversity Information Standard (ABIS)**: This is the data exchange standard for systematic survey and species observation data. BDR uses this standard. We will migrate legacy BioNet systems to the ABIS standard. This will improve data flow and interoperability between jurisdictions. In the longer-term this will enable national standardisation of field data capture devices.
- **National Environmental Standards**: These standards will guide practices to improve environmental outcomes. They cover areas relevant to BioNet, such as data and information, matters of national environmental significance and regional planning. The BioNet team will monitor the development of these standards. We will ensure BioNet complies with the established criteria. This will improve data quality, sharing protocols, threatened species management and spatial data visualisation. The standards help to ensure accurate and consistent interpretation of biodiversity data.

NSW Government

The department's *Strategic plan*[ii] sets out its key purpose to protect, restore and enhance the natural environment.

It identifies 3 categories of enablers.

Table 1 Enablers and what they mean for BioNet

Enabler	Key direction	What this means for BioNet
People	Empowering and developing our people and using our collective expertise	Work with the team to identify capacity and capability needs to deliver efficiency and performance
Data and systems	Enhancing data and systems to improve efficiency and evidence-based decision making and showcase outcomes	Deliver essential upgrades to ensure our systems can support quality and up-to-date data for decision making
Engagement and partnership	Building on how we work together internally and externally to optimise delivery	Define our scope and understand our influence to deliver positive biodiversity outcomes collaboratively

The *NSW plan for nature*[iii] is the NSW Government's response to 2 legislative reviews:

- review of the Biodiversity Conservation Act 2016
- review of the native vegetation provisions of the *Local Land Services Act 2013*.

It sets out a nature-positive vision for the future. This requires collective action to reverse biodiversity loss, restore habitats and embed conservation considerations across all stages of land use and development.

Table 2 shows how BioNet supports this outcome.

Table 2 How BioNet supports a nature-positive future

Pillar	Action	Existing challenges	How BioNet can respond
Pillar 2: Nature-positive spatial pools	6. Identify and map areas of high biodiversity value	• Strategic land-use planning does not currently accord primacy to biodiversity considerations • Need for robust information on biodiversity in a single spatial tool	• Strengthen location information by enabling data contributors to see and correct errors • Enhance BioNet data services to improve data integration with spatial tools and visualisation • Promote the standardisation of new products that map

Pillar	Action	Existing challenges	How BioNet can respond
			species location and distribution
Pillar 3: Nature-positive development	7. Front-load nature and biodiversity considerations in regional planning 8. Improve bio-certification to drive better strategic land-use planning outcomes 9. Improve biodiversity outcomes from the Biodiversity Offsets Scheme	• Development in NSW must be biodiversity positive • Prioritise traditional ecological knowledge and biodiversity of cultural value to Aboriginal people • Increase use and outcomes of bio-certification process and Biodiversity Offsets Scheme	• Incorporate non-Western data types to store Aboriginal and traditional ecological knowledge • Improve data-as-a-service capabilities to ensure comprehensive BioNet data is used in decision making. It will also make it easier to apply the Biodiversity Offsets Scheme and other frameworks
Pillar 4: Species and ecosystems	13. Improve species and ecosystem programs 14. Coordinate our approach to listing threatened species and ecological communities	• Recovery and restoration of species and ecosystems to achieve nature-positive and zero-extinction outcomes	• Use and structure BioNet data to facilitate easy tracking of species and habitat information over time. This will aid in identifying threats and supporting recovery and restoration efforts
Pillar 5: Data-informed decision making	16. Improve and upgrade biodiversity data gathering and management 17. Deliver decision-ready information and tools 18. Improve data quality, accessibility, sharing and custodianship	• BioNet capabilities, inputs, access and user experience need updating • Lack of near real-time data acquisition to enable faster reporting and management response • Need to align with the International Union for Conservation of Nature's global ecosystem typology • Biodiversity data needs to be quality assured to ensure transparency and confidence	• Deliver BioNet NextGen stage 1 and 2 upgrades to enhance data management and overall functionalities, including ingestion and supply of data • Deliver software-as-a-service functions to ensure information and outputs are decision-ready • Implement quality management systems and data frameworks to ensure quality is a key consideration across the data supply chain

Pillar	Action	Existing challenges	How BioNet can respond
			• Investigate new technology such as artificial intelligence to improve data validation capabilities

Legislative context

The *Biodiversity Conservation Act 2016* governs activities that may affect biodiversity in New South Wales.

You need a licence to undertake activities that affect native or threatened species and their habitats. This includes environmental assessments and research.

Under the Act, licensees must submit biodiversity data to BioNet to ensure accurate data capture, storage, and reuse.

This data forms the evidence base for biodiversity monitoring and management. It guides decision making across conservation, land use and other planning functions.

BioNet data underpins critical functions across other NSW legislation. This includes:

- Local Land Services Act
- Environmental Planning and Assessment Act
- Environment Protection and Biodiversity Conservation Act
- Forest Act
- National Parks and Wildlife Act
- Rural Fire Act
- State Records Act.

BioNet has pivotal role in government decision making and statewide biodiversity conservation efforts.

The NSW Government uses BioNet data to determine policies, assess biodiversity values, identify permissible land uses, and issue certificates and permits.

BioNet's NextGen initiatives will consider this interconnected legislative framework.

Building the roadmap

Stakeholder insights

User pain points

Improve the inflow and outflow of data

- Introduce solutions that make it easier to upload and extract data. This will improve data availability and currency.
- Integrate systems to increase ease and frequency of use. This includes direct ingestion using external surveying/data tools and data sharing with external systems via application programming interfaces (APIs). Better integration will improve user engagement and the evidence base.

Focus on user-centric design

- Improve the user interface for easier access. Focus on intuitive navigation and robust search and comparison functions. This will help users find the right data. It will also boost user satisfaction.
- Create ways to catalogue or store different types of records. This includes images, videos, audio recordings and non-Western data, such as Indigenous knowledge.

Instil trust through quality control

- Prioritise continuous improvement. This includes monitoring for data integrity. Allow users to identify data sources. Allow them to perform reliability, audit and quality checks of records.
- Offer software-as-a-service. This includes customising data delivery for specific use cases. This will ensure that quality outcomes extend beyond the system. It will also support effective decision making.

Key enablers

Change management and capacity building

- BioNet's value depends on users being able to produce informed insights and decisions. This means shifting the focus from 'data custodian values' to 'customer service values'. Consider changes that focus on people and capacity. This includes improving the workforce's digital capability to support delivery, apply user-centric technologies, and understand the impacts of interactions across the data supply chain.

Business capabilities

- Develop business capabilities and skillsets to support BioNet's development as technology advances rapidly. Automate system testing so that development has minimal impact on business-as-usual activities.

- Build strong communication capabilities. This will maintain relationships with users and partners as the system undergoes change. Communicate the value and rationale of improvements. Provide education resources to reduce the need for ad hoc support.

Sustained investment

- Ensure BioNet remains a trusted source of truth for biodiversity data by providing reliable, stable services and digital infrastructure.. Invest in the system to ensure continuous improvement.
- Design cycles of feature development, cyber security updates and regular enhancements to match the current speed of technological evolution and ensure the system remains functional and relevant to users.

Data governance and leadership

Ecosystem view

- Ensure data integrity across the whole data ecosystem. NextGen developments should consider the limitations, challenges and bottlenecks of the data supply chain. This will ensure improved data quality inputs to BioNet for users. It will also support more efficient and effective decision making across government and industry.

Standards, definitions and guidelines

- Establish standards, definitions and guidelines to provide strong data governance. This is crucial for data consistency, quality and reliability.
- Develop a data governance framework that supports frequent and accurate data uploads. This will also ensure user-collected data from third-party platforms meets minimum data quality and supports automated data ingestion.

Data syndication

- Biodiversity monitoring is moving towards live and real-time data. This means minimising latency to ensure timely data access. Investigate options for data syndication between government systems. This will improve transparency, timeliness and efficiency of data transfer.

National and state data repositories

- New South Wales can benefit from national aggregation and analysis of biodiversity data. Staying informed on the development of other State and National data repositories and analytics platforms will provide the opportunity to leverage available tools and insights, adopt best practices and consistency to improve data quality and outcomes for New South Wales.
- Monitor the effectiveness of resource description framework (RDF) sematic graph technology upon which the national Biodiversity Data Repository has been developed to understand it’s utility and feasibility for application in BioNet Next Generation.

Partnership opportunities

- Develop partnerships with industry and non-government organisations that provide solutions that better support user needs and use cases. It will also create more opportunities for application developers to innovate. This will encourage broader participation and awareness in conservation.

Priority functions

BioNet's NextGen developments will make the best use of finite resources.

This includes prioritising investment for the greatest impact:

- Legislated uses have a systemic impact. Prioritising these uses will directly influence policy and activities that achieve biodiversity outcomes.
- Operational uses also have broad systemic impact. This includes land and conservation management. These uses are crucial for the day-to-day protection of natural habitats and biodiversity.
- Scientific research aims to understand ecology and the factors affecting biodiversity. It generates knowledge and frameworks that inform policies. This guides operations and practices on the ground.
- Individual actions are crucial to the broader legislative framework and scientific knowledge. Community participation and grassroots efforts drive legislative change and foster engagement in biodiversity conservation.

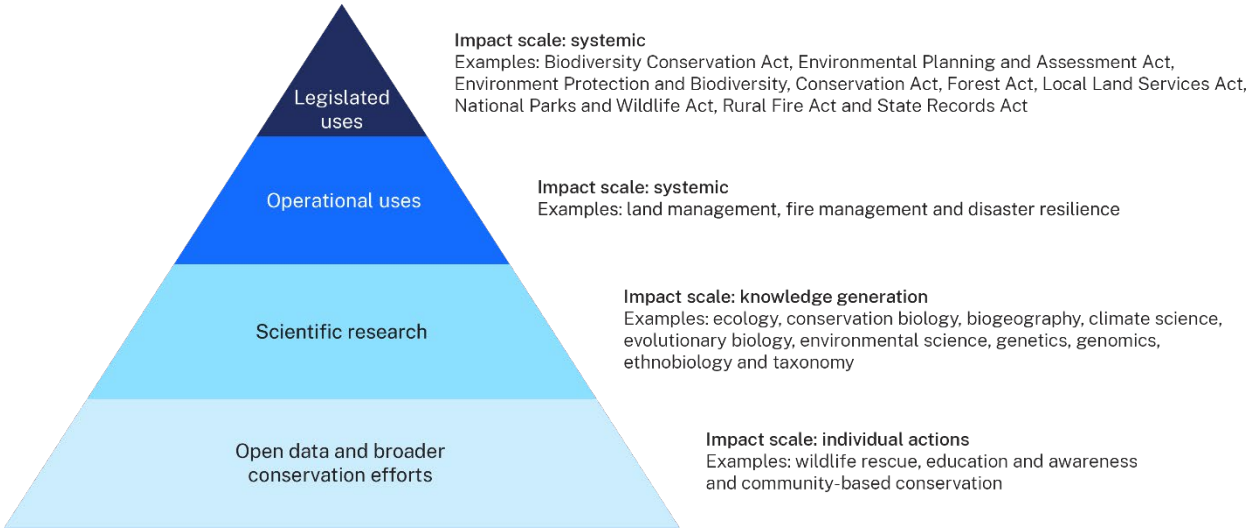

Figure 3 Priority functions

Emerging challenges and opportunities

The BIS team will need to navigate technological changes. This includes maintaining and upgrading existing systems and infrastructure.

Table 3 Challenges and opportunities

Category	Challenges	Potential risks and opportunities
Systems	• Ageing technology hinders performance. It is costly to maintain. • Multimedia management can be complex. This includes managing diverse formats and large data volumes. • National data ecosystems like the Atlas of Living Australia and BDR use different standards. There may be interoperability issues.	• Users spend more time trying to use the system rather than collecting or analysing data. • Important data may be lost. • Data may degrade during the data integration process between systems. • APIs can help provide seamless integration between software applications allowing for enhanced user experiences.
Processes	• Maintaining decision-ready data products is becoming more distributed and complex. • Data quality assurance requires ongoing maintenance of data and systems. • Processes must keep pace with customer demand and expectations. This requires adaptability and continuous improvement. • Data processing inefficiencies can cause delays. This can be costly. • Resourcing constraints limit BioNet's ability to address issues effectively.	• Inconsistent or inaccurate data can undermine decision-making and operational effectiveness. • Documenting business processes and systems can reduce the impact of staff turnover. It can also minimise errors and help to deliver consistent quality over time.
Resourcing	• Data import backlog and recovering old data can be resource intensive. Manual processes can cause errors. • Customer support struggles to keep up with demand.	• Valuable data can be lost when recovering old data. Customer backlog causes significant inefficiencies for users of the system. • Longer response times can affect users' business. Users may avoid submitting data or reporting errors. This can lead to poorer data quality.
Framework	• National data standards promise long-term efficiency. However, they may be complex to implement. They lead to system variability,	• Data inequalities during implementation of the framework may affect operational efficiencies. Adopting national standards

Category	Challenges	Potential risks and opportunities
	organisational resistance, compliance risks and high costs.	requires more resources to improve the data infrastructure.
Emerging technologies	• Remote monitoring and data collection generate large volumes of data. This data is in different formats. It may not be adequately stored and managed. • New technologies create large amounts of data. This will require more powerful data infrastructure and processing tools. These are costly and resource intensive. • Users now expect real-time data. • Technology is advancing rapidly. This creates higher demand for system testing to maintain functionality and cybersecurity.	• New data formats generate large volumes of data. This requires improved data infrastructure and warehousing. • Emerging technologies can support task automation and data processing. This includes artificial intelligence, machine learning and automated system testing. • Social media can enable interactive data and public participation, and standardisation of real-time data will result in less processing times and faster uploads.
Cybersecurity	• Cybersecurity threats are malicious activities that target digital systems and networks to compromise its security, steal data or cause disruptions.	• Effectively managing cybersecurity risks requires strong security protocols, risk assessments and employee training.

Strategic outcomes

Strategic outcome 1: Our stakeholders understand our purpose in broader biodiversity information management

We foster strong relationships with our user base. We use proactive engagement and transparent communication. We do this to inform and empower users.

We have a clearly defined scope and focus. We concentrate on improving key functions and leveraging our collective efforts with other stakeholders.

While BioNet cannot meet every need, we aim to deliver high-quality, targeted services that produce optimal biodiversity outcomes.

Activity 1.1: Develop a stakeholder engagement and communication plan

Action	Impact	Measuring success
• Develop a stakeholder engagement and communication plan to identify stakeholder groups, develop communication strategies and implement activities. • Appoint an engagement officer to do this.	Stakeholders better understand BioNet's scope, initiatives and legislated functions. There is a clearer division of duties between BioNet and other stakeholders. The collective works together to improve biodiversity outcomes.	Activity measures • Stakeholder engagement and communication plan developed • Engagement officer appointed Outcome measures • Improved user satisfaction • Reduction in related support requests

Activity 1.2: Develop partnerships with industry and NGOs

Action	Impact	Measuring success
• Develop a partnership strategy and formal agreements with industries and NGOs to better service users. • Enhance and formalise the early adopter program for app developers.	Partnerships and integrated systems foster efficient and standardised data flows. Partnerships improve service for citizen science communities and address diverse needs.	Activity measures • Partnership strategy developed Outcome measures • Enhanced collaboration with industry partners • Improved satisfaction from stakeholders and professional users

Activity 1.3: Participate in national discussions and leverage available tools and resources

Action	Impact	Measuring success
• Proactively monitor and track the development of national initiatives (e.g. national environmental data strategy, BDR and national standards). • Continue to take part in communities of practice relating to other state and national data repositories.	BioNet complies with the national standards and aligns with federal directions. It is part of the national data ecosystem. BioNet tracks efforts and initiatives in other parts of the ecosystem to avoid duplication of effort. This generates efficiencies and improves interoperability.	Activity measures • Participation in national discussions Outcome measures • Better integration across systems • Reduction in duplication of work

Strategic outcome 2: Our infrastructure and services are well-maintained, secure and supported

We improve biodiversity outcomes and fulfill our responsibilities using the best available data. Our team and systems are well-resourced to perform optimally.

Data infrastructure must keep up with technological advancements by updating old systems, developing new features, and ensuring smooth implementation.

BioNet requires sustained investment to maintain its physical infrastructure, software systems and support services. This will ensure it can meet growing user demands.

A well-resourced BioNet will have the appropriate structure, capability and capacity to operate efficiently and effectively. It will proactively manage risks and remain resilient in the face of evolving challenges.

Activity 2.1: Deliver critical information and communications technology (ICT) upgrade to facilitate redevelopment (NextGen stage 1)

Action	Impact	Measuring success
• Carry out critical ICT updates.	Critical upgrades are delivered rapidly to prevent the loss of data and maintain key functions. These upgrade packages are discrete. They can be executed as standalone modules. This provides immediate relief and bridging the gap between current and future state.	Activity measures • ICT upgrades delivered Outcome measures • Improved user satisfaction • Better system navigation • Reduction of time spent on manual handling of data and ad hoc support

Activity 2.2: Develop and implement technology blueprint (NextGen stage 2)

Action	Impact	Measuring success
• Develop a technology blueprint that outlines the vision, solutions and implementation plan. • Secure funding to implement the technology blueprint.	The technology blueprint identifies the desired future state. This includes the necessary capabilities, technology stack and system architecture. The blueprint is a comprehensive plan to update and maintain data infrastructure. The blueprint also includes an implementation strategy. This will ensure sufficient resourcing for development and improvements. This supports the system and the team.	Activity measures • Technology blueprint developed • Funding secured • Blueprint implemented Outcome measures • Improved user satisfaction • Improved staff satisfaction • Improved infrastructure maintenance and upgrades

Activity 2.3: Maintain cybersecurity management systems

Action	Impact	Measuring success
• Review cybersecurity policy. • Conduct regular audits of the system and user access to assess for cybersecurity risks and threats.	BioNet protects sensitive species and other private data within the system. This defends against cybersecurity crimes and unauthorised data mining.	Activity measures • Cybersecurity policy updated • Regular audits conducted Outcome measures • BioNet system does not lose data or get disrupted • Only approved users access sensitive data

Activity 2.4: Acquire and retain key skillsets to support business capabilities

Action	Impact	Measuring success
• Develop a business architecture framework. • Implement a Dev/Ops development approach to deliver ongoing system improvements. • Appoint a business analyst to identify problems, define requirements,	BioNet has a plan that identifies the right skills, capabilities, and team structures. BioNet allocates resources during system development and testing to avoid disrupting daily operations.	Activity measures • Business architecture framework developed • A baseline of mandatory staff maintained and new staff appointed • Regular review of capability and capacity

Action	Impact	Measuring success
enhance efficiency and develop solutions. • Appoint an engagement officer to manage communication between BioNet and stakeholders. • Review and identify capability and capacity needs to address gaps.	BioNet supports continuous improvement of systems.	gaps conducted Outcome measures • BIS team has the right mix of skillsets to support its functions and customer demands • Staff workloads are managed and sustainable • System upgrades and enhancements are delivered consistently

Strategic outcome 3: User interactions are easy and intuitive

BioNet aims to ensure users have seamless interactions.

This translates into comprehensive and accurate data utilisation. It is vital for biodiversity and conservation tasks throughout the ecosystem.

We will focus on 3 areas to improve BioNet's useability:

- our data interfaces
- wraparound support capabilities
- data integration into other applications.

This provides an efficient process to supply, locate and use data throughout the data supply chain. It reduces manual efforts and the cost of doing business.

Activity 3.1: Improve user interfaces

Action	Impact	Measuring success
• Include co-design in all development projects • Redesign and deliver improved user interfaces	Engaging users in the design process helps to provide user-focused development. This process provides a deep understanding of user interactions and experience. This will ensure the final product meets users' needs. User-focused interfaces improve BioNet's use and efficiency.	Activity measures • Co-design sessions held with targeted users • New interfaces developed Outcome measures • Improved user satisfaction • Reduction in support calls

Activity 3.2: Enhance self-service functions

Action	Impact	Measuring success
• Develop self-managed login registrations, including single sign-on. • Publish an interactive knowledge management system such as online user guides and manuals.	Intuitive self-service functions create a better user experience. They empower users to complete tasks independently and without delays. Successful self-service can reduce BioNet's need to provide manual support. This allows the team to focus on high-value tasks.	Activity measures • Self-service registration and sign-in functions delivered • Knowledge management system launched Outcome measures • Reduction in registration and licence renewal wait times • Improved user satisfaction • Increased usage • Fewer support calls

Activity 3.3: Strengthen data-as-a-service

Action	Impact	Measuring success
• Prioritise data services and data integration capabilities. • Enable more BioNet data to be used in other applications more broadly.	BioNet provides a service-oriented architecture framework that operates within a connected data ecosystem. BioNet data is available to inform decisions.	Activity measures • More data collections and data are shared via API Outcome measures • More API connections established between BioNet and third-party platforms/applications

Strategic outcome 4: BioNet data supports confident decision making

BioNet data helps the government make decisions. It's important that this data is current, complete, and accurate. It supports policies and guides land-use activities to minimise impacts on species and habitats.

Many different stakeholders collect and supply biodiversity data, and many of these activities are beyond BioNet's direct control.

However, BioNet has a responsibility to influence and guide stakeholders throughout the data supply chain.

BioNet will also explore initiatives for the use and interpretation of data. This will improve decision making and build confidence in the system.

Activity 4.1: Implement quality management system

Action	Impact	Measuring success
• Implement a Biodiversity Information Quality Management System (ISO9001).	Quality management systems provide an important framework for quality assurance. They are based on standard operating procedures and continuous improvement.	Activity measures • QMS ISO9001 implemented • Biodiversity Information QMS policy and procedures approved Outcome measures • BioNet user satisfaction increases

Activity 4.2: Improve data quality

Action	Impact	Measuring success
• Develop and implement a data governance framework to define how data should be collected, managed and supplied to BioNet. • Introduce data standards and a data dictionary to support the data governance framework. • Modernise BioNet's biodiversity data capture solution.	Transparent data quality control measures ensure the accuracy and consistency of data. They also improve integrity, useability and user engagement. Stronger data upload capabilities will boost the reliability and completeness of data within BioNet. They also make the process more intuitive and efficient, encouraging more consistent and frequent data submissions.	Activity measures • Data governance framework implemented • Data standards and a data dictionary published • New data capture solution launched Outcome measures • Increased user satisfaction • Near real-time data is available • Increased frequency in data uploads • Increased volume of quality data supplied • Reduction in support calls

Activity 4.3: Strengthen data validation and audit capabilities

Action	Impact	Measuring success
• Develop functions to audit BioNet data and report errors. • Develop better methods of data validation during upload to provide users with instant feedback. • Investigate new validation solutions enabled by AI	Data validation and audit capabilities ensure BioNet is a trusted source for decision-making data. Developing these functions at the point of data upload ensures BioNet provides verified and decision-ready data.	Activity measures • Audit and report functions available • Validation functions available prior to submission • New technologies adopted to improve data validation

Action	Impact	Measuring success
and other emerging technologies. • Develop capacity to report when data has been successfully uploaded to BioNet.	Auditing data submitted to BioNet provides rigour and transparency in relation to regulated activities such wildlife licensing and environmental assessment.	Outcome measures • Reduction in data quarantined • Increased user satisfaction

Activity 4.4: Provide software-as-a-service for plant community type identification and validation service

Action	Impact	Measuring success
• Modernise BioNet Map Viewer. • Explore other opportunities to deliver software-as-a-service (SaaS) products. This includes plant community type identification services.	SaaS capabilities aim to streamline workflows and decision-making processes. They can eliminate the need to work across multiple tools to apply frameworks manually. SaaS will also allow BioNet to introduce a certification function when undertaking environmental assessments. This will ensure high-quality data.	Activity measures • BioNet Map Viewer delivered • PCT ID certification service introduced Outcome measures • Increase in user satisfaction • PCT ID certification routinely used in environmental assessments

Supporting our outcomes

Our activities work together to support the 4 strategic outcomes.

Together, we will:

- allocate more resources to legislative purposes while encouraging external solutions to maximise our collective impact
- develop user-centric infrastructure that prioritises stakeholder experience and data accessibility, enabling efficient data access through our interfaces or users' preferred systems
- emphasise the importance of decision-ready data by maintaining consistent standards, quality and usability throughout the data supply chain.

Table 4 Outcomes matrix

Scenario	Strategic outcome 1: Our purpose	Strategic outcome 2: Our infrastructure and service	Strategic outcome 3: User interactions	Strategic outcome 4: Support decision making	Prioritising legislated and operational uses
Scenario 1: No change to BioNet	Outcome not supported	Outcome not supported	Outcome not supported	Outcome partially supported	Outcome not supported
Scenario 2: Implementation of the strategic roadmap	Outcome supported	Outcome supported	Outcome supported	Outcome supported	Outcome supported

Table 5 How the activities support the outcomes

Activity	Strategic outcome 1: Our purpose	Strategic outcome 2: Our infrastructure and service	Strategic outcome 3: User interactions	Strategic outcome 4: Support decision making	Prioritising legislated and operational uses
Activity 1.1: Engagement plan	X	–	X	–	–
Activity 1.2: Partnerships	X	–	X	–	X
Activity 1.3: National discussions	–	X	–	X	X
Activity 2.1: ICT redevelopment	–	X	X	–	–
Activity 2.2: Technology blueprint	–	X	X	–	–
Activity 2.3: Cybersecurity	–	X	X	–	X
Activity 2.4: Capabilities	X	X	X	X	X
Activity 3.1: User interfaces	–	–	X	–	–
Activity 3.2: Self-service	–	–	X	–	–

Activity	Strategic outcome 1: Our purpose	Strategic outcome 2: Our infrastructure and service	Strategic outcome 3: User interactions	Strategic outcome 4: Support decision making	Prioritising legislated and operational uses
Activity 3.3: DaaS	X	X	X	X	X
Activity 4.1: Quality management	X	–	-	X	-
Activity 4.2: Data quality	X	–	X	X	X
Activity 4.3: Validation and audit	–	–	X	X	X
Activity 4.4: SaaS	–	X	X	X	X

Implementation

The implementation schedule indicates when activities should start and an estimate of the time to complete them.

Table 6 Strategic outcome 1

Our stakeholders understand our purpose in broader biodiversity information management efforts	2025 Year 1	2026 Year 2	2027 Year 3	2028 Year 4	2029 Year 5	2030 5+ Years
Activity 1.1: Develop a stakeholder engagement and communication plan	X	–	–	–	–	–
Activity 1.2: Develop partnerships with industry and NGOs	X	X	–	–	–	–
Activity 1.3: Participate in national discussions and leverage available tools and resources	X	X	X	X	X	X

Table 7 Strategic outcome 2

Our infrastructure and services are well-maintained, secure and supported	2025 Year 1	2026 Year 2	2027 Year 3	2028 Year 4	2029 Year 5	2030 5+ Years
Activity 2.1: Deliver critical ICT upgrade to facilitate redevelopment (NextGen stage 1)	X	X	–	–	–	–
Activity 2.2: Develop and implement technology blueprint (NextGen stage 2)	–	–	X	X	X	-
Activity 2.3: Increase cybersecurity management systems	X	X	–	–	–	–
Activity 2.4: Acquire and retain skillsets to support business capabilities	X	–	–	–	–	–

Table 8 **Strategic outcome 3**

User interactions are easy and intuitive	2025 Year 1	2026 Year 2	2027 Year 3	2028 Year 4	2029 Year 5	2030 5+ Years
Activity 3.1: Improve user interfaces	X	X	–	–	–	–
Activity 3.2: Enhance self-service functions	X	X	X	–	–	–
Activity 3.3: Strengthen data-as-a-service	–	–	X	X	X	X

Table 9 **Strategic outcome 4**

BioNet data is decision-ready	2025 Year 1	2026 Year 2	2027 Year 3	2028 Year 4	2029 Year 5	2030 5+ Years
Activity 4.1: Implement quality management system	X	X	–	–	–	–
Activity 4.2: Improve data quality	X	X	X	X	–	–
Activity 4.3: Strengthen data validation and audit capabilities	–	X	X	X	–	–
Activity 4.4: Provide software-as-a-service	–	X	X	X	X	X

[i] https://www.dcceew.gov.au/sites/default/files/documents/nature-positive-plan.pdf

[ii] Internal document.

[iii] https://www.nsw.gov.au/departments-and-agencies/cabinet-office/resources/nsw-plan-for-nature