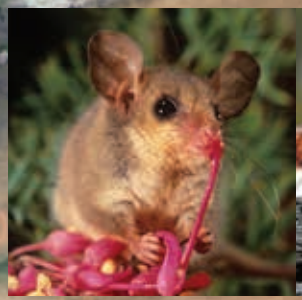
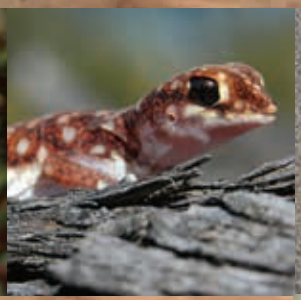
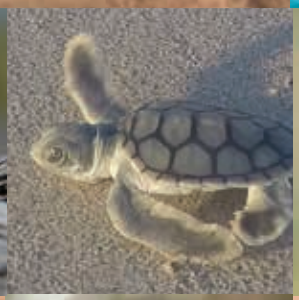
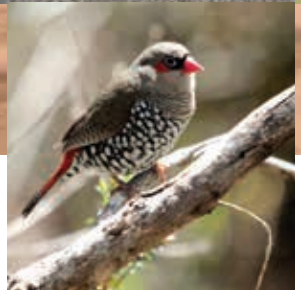
DIGITALLY TRANSFORMING ENVIRONMENTAL ASSESSMENT

Leveraging Digital Information to Streamline Environmental Assessment and Approvals









The Western Australian Biodiversity Science Institute

Western Australian Marine Science Institution

Report of the Digital Environmental Impact Assessment Working Group

REPORT PREPARED BY:

The Western Australian Biodiversity Science Institute

ACKNOWLEDGEMENTS

The Western Australian Biodiversity Science Institute and the Western Australian Marine Science Institution have been working together to enhance access, aggregation, interpretation and management of biodiversity information collected in Western Australia. In collaboration with industry, government and researchers, both organisations have led the Secretariat to produce this report.

WORKING GROUP

In January 2019 the Western Australian Environmental Protection Authority formed a Working Group to investigate ways in which digital technologies could be used to streamline the capture, supply and interpretation of data in the environmental impact assessment (EIA) process.

Members of the Working Group were:

- **Dr Tom Hatton** Chair, Environmental Protection Authority, Western Australia
- **Nicole Lockwood** Deputy Chair, Infrastructure Western Australia and Chair, Westport
- **Professor Chris Moran** Deputy Vice-Chancellor, Research, Curtin University
- **Erica Smyth AC** Chair, National Offshore Petroleum Safety and Environmental Management Authority
- **Dr Paul Vogel AM** Chair, Environment Protection Authority, Northern Territory

Specific aspects that the Working Group considered included:

- Short-term streamlining of EIA of development proposals;
- Longer-term development of a cumulative impact and decision-making framework to support complex environmental assessments, including strategic assessments;
- Bioregional conservation planning and management by government and community groups; and
- Improved decision-making by governments, companies and communities to secure ecologically sustainable development and management.

BIODIVERSITY DATA SHARING ADVISORY COMMITTEE

In September 2017 Western Australia formed a Biodiversity Data Sharing Advisory Committee. It has met five times, most recently in May 2019, and is actively leading a cultural change in the way biodiversity data is collected, managed and used to generate value in Western Australia. It comprises:

- **Dr Tom Hatton** Chair, Environmental Protection Authority, Western Australia
- **Darren Foster** Director General, Department of the Premier and Cabinet
- **Mike Rowe** Director General, Department of Water and Environmental Regulation
- **Dr Phil Gorey** Deputy Director General, Department of Mines, Industrial Relations and Safety
- **Mark Webb** Director General, Department of Biodiversity, Conservation and Attractions
- **Professor Peter Klinken AC** Chief Scientist of Western Australia
- **Alec Coles OBE** CEO, Western Australian Museum
- **Dr Paul Vogel AM** Chair, Environment Protection Authority, Northern Territory

SECRETARIAT

Department of Water and Environmental Regulation, Western Australian Marine Science Institution, The Western Australian Biodiversity Science Institute, Chris Gentle, Rob Freeth, Dr Luke Twomey and Dr Mike Young.

PHOTO ACKNOWLEDGEMENTS

WAMSI, WABSI, Megan Hele, Lochman Transparencies, DBCA, Alcoa, and Renee Young.

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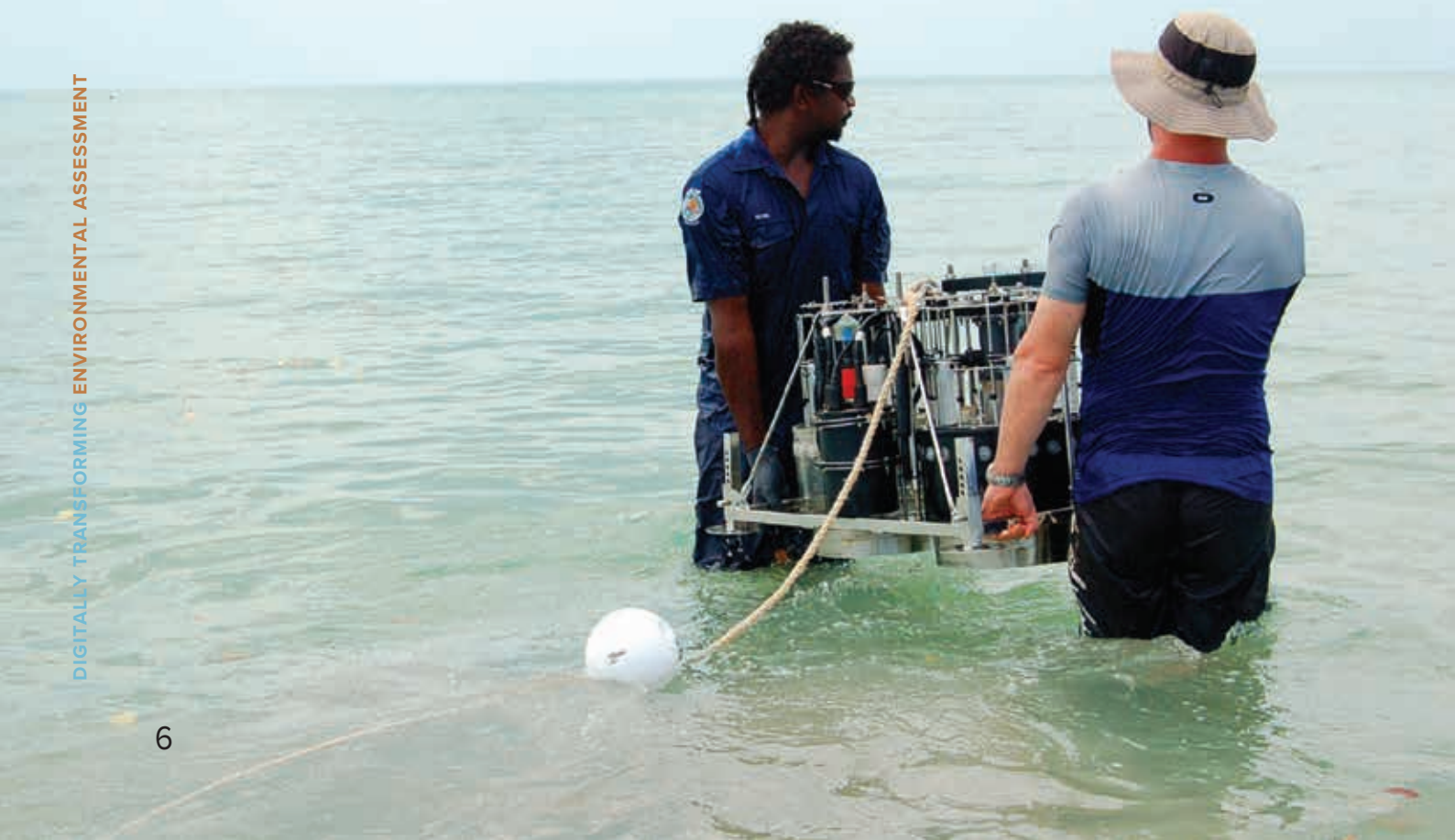
ABBREVIATIONS

BIO	Biodiversity Information Office
DBCA	Department of Biodiversity, Conservation and Attractions
DEE	Department of the Environment and Energy
DMIRS	Department of Mines, Industry Regulation and Safety
DPC	Department of the Premier and Cabinet
DWER	Department of Water and Environmental Regulation
EAVIE	Environmental Spatial Viewer (DMIRS system)
EIA	Environmental Impact Assessment
EO	Environment Online
EPA	Environmental Protection Authority
GSWA	Geological Survey of Western Australia
IBSA	Index of Biodiversity Surveys for Assessments
NEPS	National Environmental Prediction System
NOPSEMA	National Offshore Petroleum Safety and Environmental Management Authority
PDF	Portable Document Format
PoW	Program-of-Works Spatial system (DMIRS)
SAFE	Shared Analytic Framework for the Environment
SAPPR	Strategic Assessment for the Perth and Peel Regions
WABSI	The WA Biodiversity Science Institute
WAMSI	WA Marine Science Institution



FOREWORD

Biodiversity is a natural capital asset with immense economic and cultural significance for Western Australia. Each year, a substantial amount of information on the State's biodiversity is collected by industry and government. The Environmental Protection Agency (EPA) recognises the importance of biodiversity information and accurate data in assessing environmental change, and its importance to effective decision-making processes at all levels. The value of innovation in improving access, aggregation, interpretation and management of this information is highlighted in the WABSI Research Priorities Plan and the Blueprint for Marine Science Western Australia.

The ongoing challenges in this regard are to:

- Improve the **efficiency** for environmental assessments from project inception to final decision, for both the proponent and regulator.
- Improve the **confidence** of the regulator that they have made an informed decision at both the project level and at a landscape (cumulative impact) scale.
- Improve public trust in Environmental Impact Assessment (EIA) decisions through **transparency** and visibility of data and methods underpinning decisions.
- Provide **assurance** that compliance with Ministerial conditions are proceeding as planned through continuous monitoring, assessment and reporting.

There is an imminent explosion in the volume and variety of data that will help our understanding of the natural environment and biodiversity. This includes genetics, species traits, species interactions, population ecologies, and more. With appropriate resourcing, we can establish the systems and skills that will allow us to take advantage of these developments as they occur over the next decade. This report is timely. The current momentum to harness digital technology to deliver quicker, targeted government services is aligned with several policy drivers for reforming environmental assessment and approval systems.

Just as the Geological Survey of Western Australia underpins economic growth by effectively informing decision-making in the mining sector, creating the equivalent for capturing, curating and analysing biodiversity data promises to enhance effective environmental assessment and protection.

This report builds on the collaboration to enable Western Australia to leverage information collected and streamline environmental assessment and approvals through digital transformation.

Dr Tom Hatton

CHAIR, WORKING GROUP

EXECUTIVE SUMMARY

Biodiversity is a natural capital asset with immense economic and cultural significance for Western Australia. The need to balance economic activities that provide societal wealth, with community expectations and an increasing public focus on environmental sustainability, presents an opportunity to lift understanding and confidence in the ability to forecast the future state of our environment and the biodiversity within it.

Current approaches for undertaking environmental assessments are largely paper-based. Technology offers the opportunity to transform assessment, by providing new means to process and analyse data. Western Australia has already sought to capitalise on the availability of data in digital form. In May 2018, the Index of Biodiversity Surveys for Assessments (IBSA) was launched, which ensures that biodiversity data collected as part of environmental assessment is captured for later aggregation and re-use.

Acknowledged nationally and internationally as best practice in collecting environmental data, the Index enables Western Australia to continue to transform its environmental assessment processes into a contemporary digital approach: Digital Environmental Impact Assessment. With appropriate resourcing and support, this transformation can:

- Improve the **efficiency** for environmental assessments for both the proponent and regulator.
- Improve the **confidence** of the regulator that they have made an informed decision at both the project level and at a landscape (cumulative impact) scale.
- Improve public trust in EIA decisions through **transparency** and visibility of data and methods underpinning decisions.
- Provide **assurance** that commitments to Ministerial conditions are proceeding as planned through continuous monitoring and assessment.

Harnessing digital technology and aligning policy drivers to establish integrated, modernised processes and better regulatory practice would also ensure that Western Australia remains a recognised investment destination with a strong economy through reduced time for environmental impact assessment of WA's strategic projects, allowing earlier start for projects, and earlier delivery of economic and societal benefits.

In January 2019, the Western Australian Environmental Protection Authority formed a Working Group to investigate ways in which digital technologies could be used to streamline the capture, supply and interpretation of data in the environmental impact assessment process. Through broad consultation with key State Government agencies, the Commonwealth Department of the Environment and Energy, industry, and the science community, the Working Group developed two recommendations with associated short-term actions for consideration.

The first recommendation is to implement a program of work to streamline environmental assessment in particular, regulatory Environmental Impact Assessment, to provide more efficient information flows and tools to aid environmental assessment. This includes supporting the WA Environment Online program, and developing new, shared tools for assessment officers and proponents to reduce the administrative overhead associated with existing processes.

Secondly, to develop a Shared Analytic Framework for the Environment (SAFE), with digital analytic tools to assist environmental impact analysis, including identifying trends and predicting impacts of multiple activities in a region over time. This would lift confidence in decisions made and reduce the need to rely on the precautionary principle.

In addition to improving regulator and community confidence in how our environment is managed, streamlined, digitally transformed environmental impact assessment is estimated to deliver over $150 million per annum of benefit to Western Australia through accelerated private and public project development.

INTRODUCTION

Three driving forces are requiring increased effort in managing the way humans affect the natural environment:

1. There is increasing pressure on natural assets, from changes in their habitat due to climate change, invasive species, and the cumulative effect of human activities;
2. There is continued need for economic activities to provide societal wealth and the products we use; and
3. There is increasing public focus on environmental sustainability.

As a consequence, there will be an increasing need to confidently forecast the future state of the environment and the biodiversity within it, especially in response to potential changes from human activity. The implications of this are that proposals for development will become more complex, especially when considered in the context of other existing and potential activities.

The current approaches for undertaking environmental assessment are largely based on a history of paper-based documents. For formal Environmental Impact Assessment (EIA) this causes a significant data divide: proponents use their digital systems to develop environmental management plans, which are converted into a digital document echoing the old paper-based model. The regulator receives the document, but virtually none of the data or parameters that led to the proponent's decisions.

To continue with the current approach will require a growth in the number of assessment staff, and potentially add to the time taken for each assessment.

Technology offers an opportunity to transform assessment, by providing new means to process and analyse data.

Significantly, Western Australia has already sought to capitalise on the availability of data in digital form. In May 2018, the Index of Biodiversity Surveys for Assessments (IBSA) was launched, which ensures that biodiversity data collected as part of environmental assessment is captured for later aggregation and re-use.

In May 2019, the State Government Biodiversity Data Sharing Advisory Committee supported the establishment of a Biodiversity Information Office (BIO).

A proposal for BIO is currently being developed. If established, BIO is anticipated to:

- Create and lead a culture of shared expertise, common data standards, policies and incentives for data sharing and support a system for persistent storage and archiving of data.
- Mobilise biodiversity data from all available sources (IBSA, government departments, Natural Resource Management groups, research community, community groups etc.) to make the data promptly and routinely available to the entire biodiversity community.
- Curate and manage surveys into data layers that give individual surveys context and meaning, enabling this data to be used as evidence, as well as to derive products.

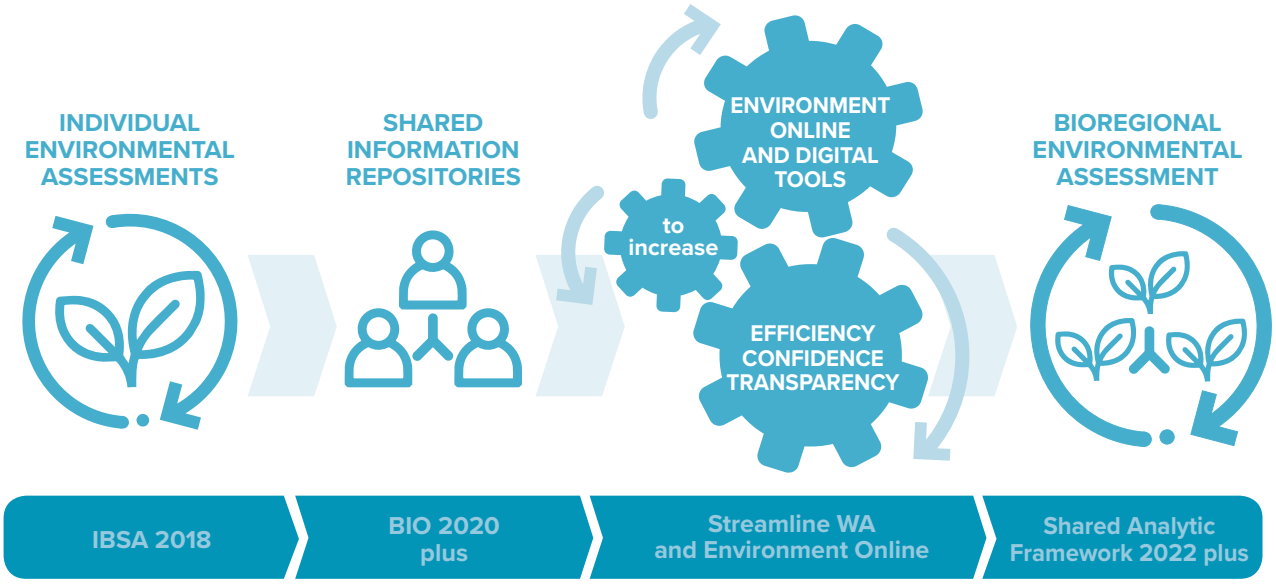


FIGURE 1 The transformation pathway to digital assessment at a bioregional scale

These initiatives place Western Australia in a good position to continue to transform its environmental assessment processes into a contemporary digital approach: Digital EIA (see Figure 1).

This approach offers the opportunity to:

- Improve the **efficiency** for environmental assessments from project inception to final decision, for both the proponent and regulator.
- Improve the **confidence** of the regulator that they have made an informed decision at both the project level and at a landscape cumulative impact scale.
- Improve public trust in EIA decisions through **transparency** and visibility of data and methods underpinning decisions.
- Provide **assurance** that compliance with Ministerial conditions are proceeding as planned through continuous monitoring, assessment and reporting.

A TRANSFORMATION FOR ENVIRONMENTAL ASSESSMENT

ENABLING STRATEGIC OUTCOMES

Having implemented IBSA, Western Australia is in a good position to continue to transform its environmental assessment processes into a contemporary digital approach. Doing so supports key strategic priorities in Western Australia.

Using digital technologies to transform work processes associated with environmental assessment supports fundamental drivers for the State's economy and environment, as seen below:

OUTCOME	REQUIREMENT
Western Australia remains a recognised investment destination with a strong economy	Requires an efficient, transparent and timely environmental regulatory process.
Reduced time for environmental impact assessment of WA's strategic projects, allowing earlier start for projects, and earlier delivery of economic and societal benefits	Requires baseline data to be discoverable and easily accessible, with tools to aid analysis of environmental impacts.
A liveable environment, protecting Western Australia's globally recognised biodiversity	Requires a sound understanding of conservation areas and the cumulative impacts of human activity.
Prosperity in our regions	Depends on faster environmental assessments, and support for local conservation management and environmental tourism opportunities.
Greater confidence that environmental protection decisions are the correct ones	Requires better tools for assessment of the cumulative impact of activities in an area, over time with less reliance on the precautionary principle.
Improved public trust that our environment is being well managed	Requires increased transparency in the data and methods used to assess environmental status and potential impacts, and increased monitoring of environmental status.
Optimal conservation reserve planning and management	Requires understanding of the biodiversity estate and gaps, and ongoing estate monitoring to measure impact of all changes (including climate).
Equitable environmental offset decisions as options become limited	Requires understanding of current natural assets to assess viability.
Improved environment condition monitoring	Requires supply of monitoring data as projects are implemented.
Digital transformation in government	Needs data analytics capabilities within the WA public sector to underpin good policy development and better targeted service delivery.
WA is recognised as a global leader in biodiversity informatics sciences	Taking a leadership role in working collaboratively with national counterparts to define a national framework for using bioinformatics.

WHAT DOES THE FUTURE LOOK LIKE?

The future will see a number of environment assessment and management processes sharing tools and data, rather than operating in independent and costly silos of information (see Figure 2).

Underpinning this transformation are three key principles:

1. Western Australia is leading a digital transformation in biodiversity data management.
2. Comprehensive, curated data is a necessary pre-requisite for digital environmental assessment.
3. Digital tools will be essential to assist decision-making for increasingly complex proposals, and for regional studies.

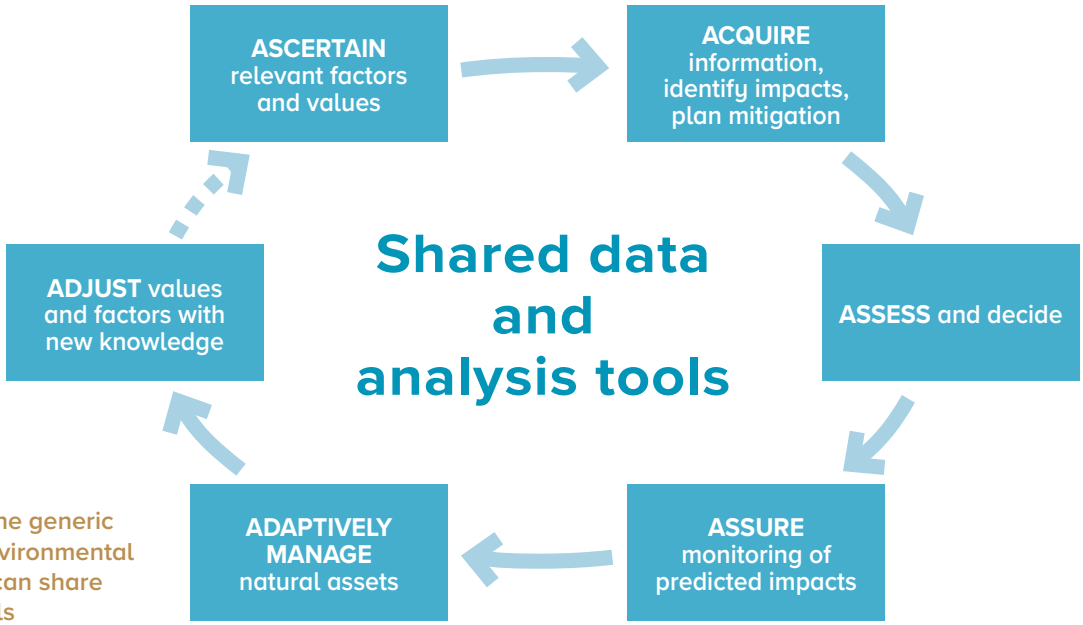


FIGURE 2 The generic stages for environmental assessment can share data and tools

Digitally transforming environmental assessment:

CHALLENGE	CURRENT SITUATION	THE FUTURE
Environmental data	Scattered in a number of locations, and rarely preserved across projects or regions.	Data is accumulated and curated, with interpretation-ready data sets available for use, expediting environmental assessment.
Assessment of activities potentially affecting the environment	Projects individually assessed.	Projects are routinely assessed in the context of cumulative past and forseeable activities and environmental impacts on that region.
Local and regional studies	Only undertaken for large projects. Significant time and effort is spent on gathering and accessing information. Limited tools for identifying cumulative impacts.	Access to information is easier; more information is accessible; better predictive tools are in use; cumulative impacts are better understood.
Document transmittal	Large documents are transmitted in a static digital form that echoes a paper-based past (.pdf format).	Information is transmitted in a form which is easier for the proponent to develop, includes linkage to shared data and models, and is easier for the regulator to process.
Filling data gaps	Limited ability to identify priority areas for data acquisition.	Biodiversity and environmental surveys are routinely prioritised and undertaken to improve environmental outcomes.
Data for the public conservation estate	Disjointed across a mixture of industry, government, and NRM groups.	Integrated and curated data allows biodiversity health trends to be monitored and inform actions.
Confidence	Limited availability of environmental modelling tools, with low confidence in those currently in use.	Advanced modelling tools aid environmental modelling at local, sub-regional, and regional scales, allow better prediction of human and environmental changes and planning land management interventions.
Bioinformatics	An emerging science discipline.	Western Australia has valued people with skills and capability opening up opportunities to export this capability.

CASE STUDY

Westport – a digital model to guide strategic decisions

WHAT IS WESTPORT?

Westport is preparing a strategy to accommodate Perth and surrounding regions' freight demand, focusing on shipping containers, for the next 50 years and beyond:

- Focused on the ports at Fremantle, Kwinana and Bunbury, the roads and rail that deliver the freight, and the intermodal terminals required.
- Assessing solutions of all kinds, including operational changes (more off-peak operations, more freight on rail), new infrastructure and more.
- Balancing priorities of economic growth, sustainability and the environment.

DIGITAL ENVIRONMENTAL ASSESSMENT

Westport is developing a 'digital model' to undertake strategic analysis and enable effective communications with stakeholders. The digital model includes:

- A base of authoritative data in which the taskforce and stakeholders can have confidence in.
- Numerous supply chain options for WA.
- Key inputs such as environmental factors, land use and infrastructure planning data.
- A set of digital tools that allow the sharing of data and information across all stakeholders.
- Constraints and options to facilitate Environmental Impact Assessment.

CHALLENGES

The size and scale of the Westport project have made it challenging to gather the digital data to support understanding environmental challenges, analysing supply chains and the development of port concept designs. With tight timeframes to complete options analysis, identifying, discovering and acquiring data to support the Westport digital model has proven challenging, with a significant investment in a spatial data program office required.

The marine factor of Westport presents a specific challenge. The potential areas of marine environment have been impacted for more than 50 years by human population growth and the associated environmental stress, such as nutrient discharges, contaminated land and groundwater inputs, coastal modifications and fishing pressures.

The marine environment is a contested space with diverse social and environmental values. These values must be considered, prioritised and protected for future infrastructure projects to be considered for environmental approval. Decisions on future development need to consider historic and cumulative impacts on the system. This can only be achieved with the acquisition of high-quality marine surveys combined with robust historic data in a form that can be interrogated to inform gap analysis, future research needs and ultimately better decision making.

OPPORTUNITIES

Westport has had the opportunity to leverage best practices from the Western Australian spatial community and beyond. Key to the success of developing a solid information base was to leverage expert knowledge and systems from multiple government agencies. As this knowledge base is expanded and the digital model enhanced, sharing of this digital model with State and Commonwealth regulators will present a significant opportunity to streamline the Westport environmental assessment process significantly reducing the time taken to assess the environmental impacts of the project. It will also provide a foundation for future modelling and monitoring of the health of the environment within the study area.

Significant time, resources and budget have been invested to create the Westport digital model, and it is recognised that the intellectual property and data captured and created through Westport is a significant state resource. This Westport investment has created an opportunity to consider the formation of a service unit to coordinate and provide information common to multiple strategic infrastructure projects, such as those identified by Infrastructure WA, to improve decision making capability and social engagement.

Streamlining government–industry engagement through improved environmental approvals

Extract from the Resources 2030 Taskforce Report

https://www.industry.gov.au/dataand-publications/resources-2030-taskforce-report

Australia's modern environmental assessment processes have successfully balanced new development with environmental protection. This has allowed substantial development of resources with minimal long-term impact on the environment. There are opportunities for reforms that can reduce complexity and duplication in environmental assessment processes while maintaining stringent environmental protections. The taskforce believes that key reforms in this area can facilitate more efficient, timely and affordable environmental assessment. If properly implemented, these reforms will allow Australia to continue to protect the environment and encourage new resources to be developed in more sustainable ways.

RECOMMENDATION 24: Governments, industry and other stakeholders should develop holistic approaches to basin and landscape planning and project approvals, to consider cumulative impacts and promote mutually beneficial outcomes on shared resources such as water and land.

THE VALUE PROPOSITION

If appropriately resourced, improving efficiencies in the environmental assessment process will reduce the time and effort for projects to reach implementation stage and contribute to maintaining Western Australia's reputation as a favoured investment destination.

Benefits of digital EIA — values and beneficiaries

BENEFICIARY	Reduced effort	Reduced project delay	Avoidance of 'good' projects not proceeding	Reduced uncertainty and risk
Project proponents				
Private	• Lower cost of information search – Routine assessments at pre-referral stage – Strategic assessments • Reduced need for detailed field surveys – Targeted surveys require significantly less field work	• More complete impact information at the pre-referral stages may reduce the need for a formal EIA (6-18 month time saving) • Better information at pre-referral stage will lead to more projects being assessed on the proponents information rather than a full Public Environmental Review (6 month time saving)	• Better understanding of cumulative impacts will give regulators greater confidence about the significance of environmental impacts, and reduce the risk of high-value projects being stopped on the basis of the precautionary principle	• Improved monitoring data will reduce risk of operations being temporarily suspended due to a single compliance breach • Increased confidence in WA for business investment • Improved predictability of accessing markets
Public	• State Government agencies and government trading enterprises will similarly benefit from reduced resource demands on preparing proposals for assessment	• Reduced delays for public infrastructure projects – Particularly strategic and regional assessments	• As above	
Regulators				
State	• Improved efficiency in assessments – Demands on resourcing lower than would otherwise be the case going forward			• Improved confidence in data submitted by proponents
Commonwealth	• As above			
Community				
Public benefit		• Streamline access to project royalties • Enhance international reputation for attracting investment.		• Resources directed to those areas in greatest need of environmental protection • Better, more appropriate offsets • Greater transparency of data promotes trust • Improved community confidence in EIA process

These sections summarise benefits, with calculation details in Appendix B.

STREAMLINE WA

The use of digital data and digital technologies offer the opportunity to improve what can often be complex regulatory processes, supporting a key objective of the current government, announced in December 2018. Streamline WA aims to improve how government interacts with private and community sectors and develops best practice principles for creating and applying regulation.

Reducing time and effort to source data, is estimated to yield:

For EIA, pre-referral	**$1 million per year** for proponents
For strategic assessments	**$1 million per project**, plus potential reduction of 1 year elapsed time to prepare documents

Streamlining the assessment process has benefits to both regulator and proponent:

For EIA assessment	Reduced effort for regulators to assess complex proposals, because proponent has better access to information before lodging, and assessor has better access to data and tools when assessing. Reduced need for regulator to seek additional information, because data is shared

Example: DMIRS Program of Work (PoW) Spatial

Released in March 2017, PoW Spatial is a map-based application which allows users to enter their proposed activities, either by loading existing spatial files or creating spatial files on screen. The system conducts automatic checks by intersecting the proposed activities with other data layers of environmental and cultural significance, and alerts the user with the results.

In 2017-18, a total of 2,643 programs of work (PoW) applications for exploration ground disturbance were assessed and approved this year, with 94 per cent approved within 30 business days. PoW Spatial has reduced assessment timeframes by 7-10 days on average and survey feedback received in October 2017 indicated the new system is strongly supported by industry.

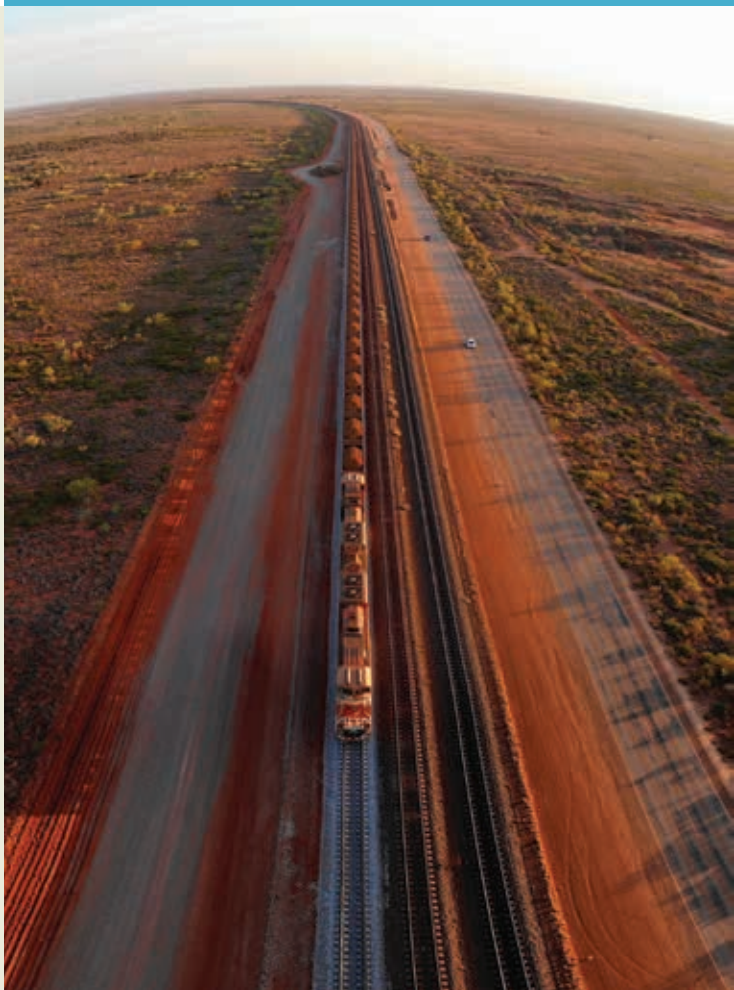
DMIRS Annual Report, 2017-18

Environment Online

Aligned with the 2019 Strategic Plan, DWER is actively developing a program to enable their transformational 'Environment Online' vision. If appropriately resourced, Environment Online would provide a digitised environmental regulatory platform, that integrates the regulatory cycle and creates a quality online experience for staff, industry, developers, customers and community. Environment Online has the capacity to:

- Increase the volume of online services and improve the online customer experience
- Enable efficient business process through digital platforms
- Establish a 'change ready' culture to ensure adoption and the development of digital capabilities
- Improve the quality and visibility of information to enable greater collaborative decision making across an integrated regulatory cycle.
- Deliver the digital service through innovative technology in a secure and resilient way.

DWER Environment Online Vision and Digital Direction, 2019.



USING DIGITAL TOOLS TO SUPPORT ENVIRONMENTAL ASSESSMENT AND APPROVALS

If appropriately resourced, digital data and technologies are expected to improve the current environmental assessment process by:

- Providing tools which assist proponents to check, prior to engagement with the regulator or at early stages in the regulatory process, whether they have considered appropriate factors and have sufficient data to allow assessment.
- Providing tools which allow proponents and regulators to determine the requirements to meet environmental assessment needs, to reduce collection of information not necessary or not aligned with the potential environmental impacts and risks of a project.
- Having adequate baseline information to better set conditions, especially adaptive management conditions, or avoiding delay of a project until certain additional studies are completed.

These changes would improve confidence earlier in the assessment process, and in some cases may remove the need for further detailed environmental assessment. In many cases this would remove the need for proponents to provide additional information during the assessment process, further reducing the elapsed time to decision. There will be less reliance on the precautionary principle.

The costs of delays have a significant investment and societal impact; further details are in Appendix B. Improving confidence early in the process can allow decisions to be made earlier, which can bring forward investment decisions and reduce the cost of delays.

One large project ($500 million) per year does not require detailed assessment due to better pre-referral presentation, saving 6–18 months	**$18–54 million per year**
Two smaller projects ($250 million) per year can be assessed on proponents information, rather than a full Public Environmental Review, saving each 6 months	**$18 million per year**
One-year time saving for a major State Government infrastructure project ($800 million)	**$100 million**

INCREASED REGULATORY TRANSPARENCY

Using open tools and data to guide environmental decisions will make the process more transparent and build trust and certainty in the process.

Increased investor and community confidence will deliver continued interest in business development in the State.

OTHER BENEFITS

Having shared, easily accessible data with tools to process will have additional benefits to routine business processes, including:

Optimising returns on offset investment decisions	Environmental offsets need to be cost-effective, relevant and proportionate to the significance of the environmental value being impacted. Better tools will help assess the scale of the impact, and the value, type and success of any proposed offsets.
More informed conservation reserve planning to meet State and Federal goals	The State Government is committed to expanding the conservation reserve by declaring national and marine parks in areas of high biodiversity. The State also acquires land to build the National Reserve System. Better assessment data and analysis tools would identify biodiversity gaps, help it prioritise and assess proposed acquisitions, and manage the existing conservation estate.
Supporting national and international frameworks	Australia is building a solid reputation for sound environmental regulatory processes. Nationally there is a recognised need to build better tools for analysis of environmental impacts at landscape scale. Western Australia has an opportunity to take a lead role.
Building data analytic capabilities	Build data analytics capabilities within the WA public sector to underpin good policy development and analysis, and better targeted service delivery.

RECOMMENDATIONS

The Working Group's recommendations are structured within two categories:

1. **Streamlining Current Environmental Impact Assessments:** Implement a program of work that actively supports the Streamline WA and Environment Online initiatives to streamline environmental assessment in particular, regulatory Environmental Impact Assessment.
2. **Next Generation Environmental Assessment:** Develop a **Shared Analytic Framework for the Environment (SAFE)** to improve capability for analysis of cumulative environmental impacts; and build confidence in the analytical outputs.

The recommendations proposed are aligned with the decisions of the Biodiversity Data Sharing Advisory Committee, that is actively leading a cultural change in the way biodiversity data is collected, managed and used to generate value in Western Australia. They are based on the findings of consultations undertaken (refer Appendix A).

STREAMLINE ENVIRONMENTAL IMPACT ASSESSMENT

RECOMMENDATION 1: Support Streamline WA and Environment Online to provide more efficient information flows and tools to aid environmental assessment. This includes developing new, shared tools for assessment officers and proponents to reduce the administrative overhead associated with existing processes.

To fully streamline environmental assessment, several supporting actions are recommended:

Action 1.1: Create a central clearing house for Western Australia's biodiversity data, to create comprehensive, curated digital data feeds that can be delivered to proponents, assessment officers, land managers, and the community (BIO).

Action 1.2: Capture marine environmental survey data, following the model established by IBSA for capture of terrestrial biodiversity survey data and develop a shared vision and objectives for a 'Marine Information Office'. This would enable digital data and analytics that can be delivered to proponents, assessment officers, marine researchers and the community.

Action 1.3: Identify and prioritise gaps in critical information, including data sets at risk of loss; geographic areas where lack of data is hindering environmental assessment; and high priority species where additional information would aid environmental planning, assessment, and approvals.

Action 1.4: Identify and prioritise derived (interpretation-ready) data products, based on aggregated data available, that would significantly add value.

Action 1.5: Continue to improve policy and processes across government for data sharing to make sure the State's data resources are discoverable and accessible, supported by agreed standards and online tools.

Action 1.6: Investigate the feasibility and options of capturing environmental monitoring data collected as a requirement under environmental approval conditions, and integrating it into an appropriate data curation facility to make the data available to government, proponents and the public.

Action 1.7: Investigate the benefits and implementation options for a shared 'Project Analytics Services (PAS)' service unit within the Western Australian government to provide specialist data, multi-criteria analytics, and maps and publications to support the planning and execution of WA Government strategic infrastructure projects.

Action 1.8: Actively support the Environment Online program and the continued knowledge sharing and systems alignment between 'Streamline WA' partners to maximise digital workflow and decision support transformation opportunities.

A SHARED ANALYTIC FRAMEWORK FOR THE ENVIRONMENT

RECOMMENDATION 2: Develop digital analytic tools to assist environmental impact assessment, including identifying trends and predicting impacts of multiple activities in a region over time, to improve confidence in decisions made and to reduce the need to rely on the precautionary principle.

Action 2.1: Western Australia facilitates a collaborative group with representatives from the State, Commonwealth, and other jurisdictions, to develop Shared Analytic Framework for the Environment (SAFE), to guide development of shared analytic environmental impact assessment tools.

Action 2.2: Using SAFE as a guide, identify 'quick-win' tools that can be implemented such as sharing data to and from open data infrastructures like the Atlas of Living Australia and GBIF: the Global Biodiversity Information Facility.

Action 2.3: Using the SAFE framework, identify the next tranche of tools that can be developed, by working with appropriate science, research, and development communities; and guide implementation into operational systems.

Action 2.4: Government to work with industry and academia to ensure Western Australia is developing a future talent base of biodiversity informatics specialists.

Action 2.5: Build decision-makers and public confidence that advanced analysis can provide the right balance between economic imperatives and longer-term development impacts, and provides an acceptable level of environmental sustainability.

APPENDIX A
Consultations and findings

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• Margaret Byrne, Paul Goia, Stephen van Leeuwin, Lesley Gibson	Department of Biodiversity, Conservation and Attractions
• Karen Caple, Phil Gorey, Stephen Bandy	Department of Mines, Industrial Relations and Safety
• Bridget Hyder, Mike Young	Western Australian Environmental Protection Authority
• Katrina Walton	Department of the Premier and Cabinet
• Jamie Shaw	AECOM / Environmental Consultants Association
• George Watson	BHP
• Ian Cresswell	CSIRO
• Alec Cole, Di Jones	WA Museum
• Ron Avery	Office of Environment and Heritage, NSW
• Beth Brunoro, Greg Terrill, Dave Osborn	Department of Environment and Energy
• Hamish Holewa	Atlas of Living Australia
• Guru Siddeswara	TERN
• Nicole Lockwood, Tim Collins, Chris Barber,	Westport
• Piers Higgs	Gaia Resources
• Jamie Shaw	Environmental Consultants Association
• Ed Cripps, Chari Pattiaratchi	The University of Western Australia
• Sally Cripps, Alex Harrington	The University of Sydney
• Matt Judkins, Sara James	Deloitte
• Peter Zurzolo, Denise True, Lesley Gibson, Guy Boggs, Bruce Webber, Steve Morton	The WA Biodiversity Science Institute
• Luke Twomey, Luke Edwards	WA Marine Science Institution

Summary of findings

DATA

1. Discovery and access to existing government data remains an issue, adding significantly to time and cost of gathering data for assessments, especially regional studies (Strategic Assessment of the Perth and Peel Regions, Westport, etc.).
2. Services to deliver curated and authoritative digital data are an essential pre-requisite for tools to streamline environmental assessment.
3. Derived data, summarising data at landscape or regional scale, are an important aid to landscape-scale environmental assessment. Without these, each proponent has to create their own interpretation.
4. There are no data sharing pathways to align proposed survey effort leading to a lack of coordinated data collection between proponents, government and community.
5. Data collected during environmental monitoring is not available to the regulator, nor to the community in a coherent, systematic manner.

ENVIRONMENTAL ASSESSMENT

1. There is a data divide between proponents, the regulator, and the community.
2. There are significant short-term opportunities to streamline workflows in the EIA process, using currently available information systems.
3. The EIA process has evolved from a paper-based system, which was automated to use a digital version of the paper document (PDF). We now at least capture the data also (IBSA), but there are opportunities to improve by delivering information in non-PDF format.
4. DMIRS has already developed an excellent tool to aid native vegetation clearing (PoWS / EAVIE), accessible to proponents prior to lodging documents. It has reduced assessment times significantly (e.g. from 4 hours to 30 minutes) by semi-automating the process for identifying potential issues, and making this tool available to the proponent.
5. IBSA has been well received and has already collected 368 surveys in its first year of operation. There is an opportunity to capture marine assessment data, as IBSA does for terrestrial data.

DATA SCIENCE AND TOOLS

1. An opportunity exists to use existing digital tools to ‘data mine’ the existing repository of ‘PDF’ assessment documentation.
2. Generally, the development of tools to support advanced environmental modelling (trends and predictions) is immature. There are, however, many simple tools (data completeness and quality checks, spatial proximity checks) that could quickly be adopted.
3. Globally there is increasing recognition of 'bioinformatics' as a discipline.
4. There is currently low confidence in the results produced from environmental modelling tools.
5. There is strong support from Federal and eastern states counterparts to collaboratively develop a shared set of tools to support environmental assessment.

OTHER

1. Legal barriers to sharing data remain.
2. Leadership is necessary to drive digital transformation, which will help lead to a culture of data sharing.
3. There is a shortage of skilled data scientists coming through the education pipeline.


LANE ENDS MERGE RIGHT
EXIT

APPENDIX B
Value calculations

The direct value of transforming to a Digital EIA process derives from:

- There is increasing pressure on natural assets, from changes in their habitat due to climate change, invasive species, and the cumulative effect of human activities
- There is continued need for economic activities to provide societal wealth and the products we use; and
- There is increasing public focus on environmental sustainability.

These factors lead to a direct valuation of the benefits:

VALUE OF PROVIDING ACCESS TO CONSOLIDATED DATA

VALUE COMPONENT	EXPLANATION
Reduced effort in finding information for routine environmental assessment at pre-referral stage. • **$1 million per year**	Each proposal requires time to gather information during the pre-referral stage. Improved access to information at this early stage could amount to around an annual saving of around 750 days effort (at environmental specialist level), at a cost saving of around $1 million. For regulators, having better access to information database would improve confidence in the data submitted by proponents although it is not likely to significantly reduce assessment time.
Reduced effort in finding information for strategic assessments. • **$1 million per project, plus** • **Reduction of 1 year elapsed time per project**	Most strategic assessments take around 5 years to complete, with significant effort required to collect relevant data to inform the project, and maintain current data during the assessment preparation. Halving the time for the data component alone could save $1 million per project, and reduce the elapsed time for the project from 5 years to 4 years by allowing earlier data analysis.
Better information leads to less need for additional field work. • **$1.5 million per year**	In some cases, instead of a Detailed Field Survey, a Targeted Survey may be all that is required. Targeted surveys require significantly less field effort, somewhere between 25% and 40% of the effort.

REDUCED COST OF DELAY

The cost of delay in most major projects is primarily due to the opportunity cost associated with delaying cash flows from the project. For example, consider a proposed mine with a $1 billion capital outlay over 2 years generating $4.4 billion net income spread evenly over subsequent 12 years. A delay of one year reduces the project's Net Present Value from $941.7 million to $840.8 million, or approximately $100 million. As the Productivity Commission notes in its 2013 report, delayed project expenditure and income translates into a societal cost.

These figures show each month's delay costs around $8 million, once carrying costs, investor confidence, and commodity price-cycle timings are considered. Such delays can especially be a significant issue for small-to-medium companies. The figures are in line with those of the Productivity Commission in 2013 showing a 1-year delay for a $470 million project costing $26-$59 million. To be conservative, calculations below are based on a value of $6 million per month for a $1 billion capital project, and $3 million per month for a $500 million project.

VALUE COMPONENT	EXPLANATION
Reduced cost of delays for projects. • **$36-72 million per year**	Scoping and preparation of environmental impact information will be more complete during the pre-referral stages, and incorporate regional considerations. If, as a consequence, the EPA decides just one major project with a capital investment value of $500 million does not require formal environmental impact assessment that could save the project 6-18 months elapsed time. Based on the cost figures above, this could have a value of **$18-$54 million**. Similarly, with better information available pre-referral there is increased likelihood that a project can be assessed on the proponent's information (API), rather than a full Public Environmental Review (PER). The savings would be at least 6 months elapsed time. If just two smaller projects ($250 million) per year followed this path, the saving would have a value of at least **$18 million**.
Reduced effort for environmental approval for State Government Infrastructure projects. • **$100 million** benefit for removing a year's delay from a typical infrastructure project.	The State Government routinely has a number of infrastructure projects that require environmental approval. A typical infrastructure project might have capital expenditure in the order of $800 million and Present Value of Costs around $976 million, with Present Value of the Benefits of $2,500 million (using a 7% real discount rate). A delay of 12 months has been estimated to reduce the Net Present Value from $1570 million to $1468 million, a decrease of around $100 million. Evidence underpinning these calculations is provided by Infrastructure Australia.
Reduced costs of delays for State Government strategic and regional assessments. • **Significant savings due to earlier decisions**	The WA State Government has a number of Strategic Assessments and regional studies, including Westport, SAPPR, Bunbury Coastal Region, Collie Region, and the Kimberley (especially Fortescue Valley).

APPENDIX C
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