



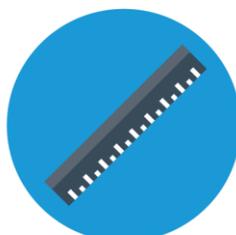
FIRST PERSON
CONSULTING

Forest Monitoring and Improvement Program mid-term evaluation

Prepared for
the Natural Resources Commission



RESEARCH



EVALUATION



DESIGN

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Acronyms

IFOA	Integrated Forestry Operations Approval
FMIP	Forest Monitoring and Improvement Program
FPC	First Person Consulting
LLS	Local Land Services
NPWS	National Parks and Wildlife Service
NRC	Natural Resources Commission
RFA	Regional Forest Agreement

1 Introduction

1.1 Overview

The Natural Resources Commission (the Commission) is overseeing the design, implementation, review and continuous improvement of a State-wide Forest Monitoring and Improvement Program (the FMIP or the Program). The FMIP aims to “improve the evidence base for decision-making across forest tenures – public and private – and strengthen the NSW Government’s ability to strategically and adaptively manage forests and forestry practices over time”.¹

The FMIP started in early 2019 and is due for a mid-term evaluation. **This report outlines the findings of the mid-term evaluation.**

1.2 Objectives of the mid-term evaluation of the FMIP

In line with the evaluation plan for the Program², **the mid-term evaluation aims to:**

1. demonstrate the impact and value of the Program (to date)
2. ensure accountability and transparency
3. identify opportunities for improvement and innovation.

These aims translate into a series of key evaluation questions (Table 1). Although these questions are in the program evaluation plan, some are only partially relevant at this mid-term stage:

- early indications – these questions related to overarching and/or longer-term outcomes that might only be showing early signs of progress
- assessed to date – these questions are more process-related and thus more relevant here, through will be assessed in terms of delivery so far.

Table 1 shows delivery of the FMIP, highlighting the difference between:

- the scoping, design and baseline data phase (which is the focus of this mid-term evaluation)
- the actual implementation of monitoring initiatives and routine collection of data and reporting (yet to occur).

Table 1. Key evaluation questions guiding the mid-term evaluation and the extent to which they are expected to be able to be addressed (bolded text indicates priority questions).

Key evaluation questions	Sub-questions	Extent to which addressed in mid-term
1. Are we achieving what we said we would?	a. Has the Program contributed to improved forest management as expected?	Early indications
	b. What other outcomes have resulted from the Program?	Early indications
	c. Has the Program adapted to new evidence and priorities?	Assessed to date

¹ Terms of Reference – Independent oversight of a NSW Forest Monitoring and Improvement Program. <https://www.nrc.nsw.gov.au/PDF/Forestry/Forest%20monitoring%20and%20improvement/Terms%20of%20reference%20-%20FMIP.pdf>

² Program evaluation plan – NSW Forest Monitoring and Improvement Program. 2020. Natural Resources Commission.

Key evaluation questions	Sub-questions	Extent to which addressed in mid-term
	d. Is the Program meeting the needs of participants and other key stakeholders?	Early indications
2. Are we achieving it in the way we said we would?	a. To what extent have the good practice principles been implemented in designing and delivering the Program?	Assessed to date
	b. To what extent has the Program been delivered as intended?	Assessed to date
	c. Are there any barriers to Program delivery? If so, how can the program be improved?	Assessed to date
	d. To what extent has the Program been well governed?	Assessed to date
3. Is the program efficient and cost-effective?	a. Does the Program provide value for money?	Early indications
	b. Could the Program have been delivered more efficiently?	Assessed to date
4. Are we learning and improving the Program?	a. To what extent has the impact and value of the program been demonstrated?	Early indications
	b. What lessons are there in relation to program design and delivery?	Assessed to date
	c. To what extent has the program been reviewed as anticipated?	Assessed to date

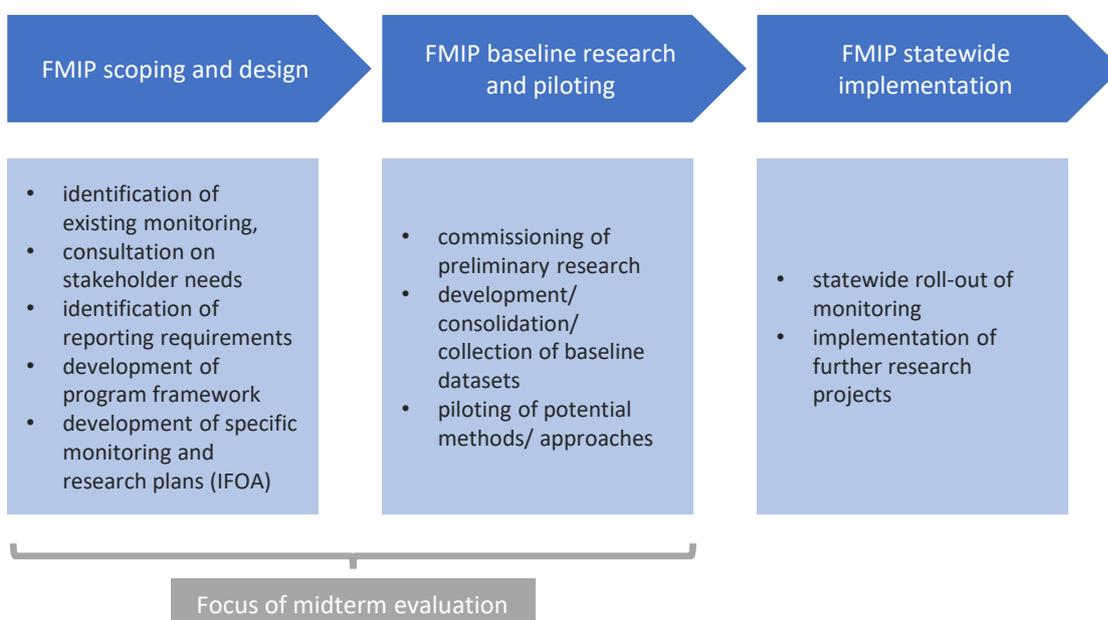


Figure 1. Broad stages of the FMIP and mid-term evaluation focus.

1.3 Approach to the evaluation

Our approach to this mid-term evaluation involved:

- initial scoping work with the Commission to clarify the objectives and approach to the evaluation, including development of a mid-term evaluation plan
- interviews with key stakeholders, including:
 - members of the Steering Committee (13)
 - members of the Technical Working Group (5)
 - select Program partners involved in key projects (7)
- a workshop with Commission staff (6) to collate their input
- review of key documents such as project reports, the FMIP Program Framework, annual reports and select Steering Committee papers.
- development of this evaluation report that has considered and integrated feedback from the Commission.

Several limitations should be kept in mind when reviewing the results of this evaluation:

- The evaluation was completed over October and November 2021. Many the final reports and datasets for foundational projects were being delivered at this stage. This means interviewees were only just getting access to them and that their results and implications had not been discussed.
- Although independent, this mid-term evaluation is heavily reliant on the perceptions of stakeholders involved in the Program – there is unavoidable subjectivity and the potential for bias. We have attempted to balance this by consulting a range of groups and our independent judgement, but the results, nevertheless, need to be interpreted with this in mind.
- The evaluation is weighted towards the process of delivery, rather than outcomes, which are considered at reasonably high level. There are suggestions for further evaluation of outcomes in the recommendations.

1.4 This report

This report:

- first summarises the key findings and recommendations from the evaluation (Section 2)
- provides a brief outline of the FMIP (Section 3)
- reviews the high-level achievements of the Program to date (Section 4)
- assesses the FMIP delivery (Section 5)
- reviews additional insights on program lessons and improvement (Section 6).

2 Key findings and recommendations

2.1 Key findings

Since 2019, The FMIP has drawn together a large array of people, questions and data. In doing so, it has established the foundations of an important hub for improved forest knowledge and management. In line with good practice in this area, it has developed a question-driven framework for monitoring, commissioned a broad array of foundational work that leverages existing data and has fostered collaboration among the organisations responsible for managing NSW's forests.

The FMIP has taken an important first step in dramatically improving the information available for managing forests. There are now a range of opportunities for improving both what and how the FMIP operates. In particular, there is the need to build on the foundational work that has been done so far with a secure, long-term monitoring program.

With respect to each of the key evaluation questions asked as part of this evaluation, we found:

Are we achieving what we said we would?

- The Program is effectively 'on track' in terms of providing information that should address the needs of forest management and, in turn, improve forest management.
- The Coastal IFOA monitoring plan has been established and is already being adaptively refined.
- Large amounts of historical data – which has often been difficult to access – has been collated and integrated into important projects, establishing baseline conditions for a range of forest values.
- Different agencies and perspectives have been brought together to contribute to the work so far, resulting in good contribution and buy-in to the program.
- Productive collaboration among agencies is a key achievement of the Program. However, differences in the drivers and objectives of contributing agencies are still evident and will continue to need management. The Commission's role as being an 'honest broker' has been highlighted as critical to this.
- The Program has begun to address values that are often left out of forest monitoring, such as Aboriginal values and methods for assessing forest-related jobs.

Are we achieving it in the way we said we would?

- The Program has been well-managed. The Commission has used a clear, systematic and consultative approach in developing the FMIP Program Framework and the associated foundational projects.
- Most of the initiatives scoped in the framework have been delivered as planned, however:
 - There have been some delays in finalising the cross-tenure forest plot network. While acknowledged to be frustrating, these delays have been warranted in the interests of ensuring this central – and most costly – component of the FMIP is planned appropriately. This is a clear priority for the Program to finalise.
 - Some projects did not use the most up-to-date or relevant data sets without intervention from the Steering Committee. This was because of a range of factors, including project teams that were not familiar with all of the NSW-relevant data, as well as the general issues with data availability noted above.
 - The open tender process allowed for a diverse range of expertise to be used in the Program. However, interviewees emphasised the need to balance this against the

risk of reducing government capability and private firms controlling long-term delivery (though intellectual property, proprietary software, etc).

- The Program has appropriate governance structures in place and stakeholders provided good feedback about their effectiveness. There are some minor opportunities for improving how the review process works among the committees.
- There are a range of challenges that the FMIP has, and will continue to face in this space:
 - A history and continued tendency for agencies to do forest research and monitoring independently of each other. This is a long-seated cultural barrier that the FMIP is beginning to address.
 - Different agencies have different objectives for forest management and thus different priorities for monitoring and research.
 - Forest systems are complex. In line with this complexity, the FMIP is a large, complicated program that stakeholders acknowledge may need to be simplified in line with resource constraints. It also has a broad array of initiatives that have yet to be integrated into cohesive set of insights.
 - Climate change is a significant challenge for forest management and needs to continue to be integrated into thinking and planning – particularly in terms of supporting how forests might actually be managed for these impacts.

Is the program efficient and cost-effective?

- The program has been delivered with a clear focus on providing cost effective outcomes – including trialling new technologies, using historical data and aligning work across agencies.
- All the interviewees that provided feedback about program efficiency indicated that it has been well run, with no obvious opportunities for improving efficiency.

Are we learning and improving the Program?

- The FMIP has good processes in place for ensuring that it is reviewing, reporting and continually improving on its performance. This interim may have been timed slightly too early to capture the full value of the program so far and there is potential to consider other outcomes in future evaluations.
- The value of the program is still emerging and may not have been fully recognised among agencies.
- The outputs from the FMIP are wide and varied. While they offer value as individual projects, there is a need to draw them together into a cohesive set of insights and implications.
- There is a tension between ensuring that the results from monitoring and research are not improperly extrapolated to contexts they do not apply to and the need for such work to inform management decisions. This will be a challenge for the Program going forward, though it points to the importance of having research that is well-integrated and builds systematically over time.
- Many of the relationships, including those with Traditional Owners, have required substantial effort to build (from all parties involved). It will be important to ensure that these relationships are continued as the Program progresses, both to help them realise their potential and to maintain levels of trust.

2.2 Recommendations

Based on the key findings above and the more detailed results in the remainder of this report (and acknowledging that the Commission is already planning some of these actions), we recommend:

1. **The Commission and the Steering Committee should take stock of the Program deliverables to date and re-assess the priorities for future work under the FMIP.** Key interviewees acknowledge that the Commission has already carefully and thoroughly assessed what the FMIP needs to answer. However, the program is, large, complicated and may be prohibitively/unsustainably costly. There is, therefore, a need to re-assess priorities in light of the work that has been so far. This process could include:
 - a. Developing a summary ‘insights’ report that draws together the results of the various projects to date. Commission staff note that such a report is already planned, and so the timing of this becomes the key issue. The aim of the report is, as suggested by interviewees, to both draw together the pieces of the puzzle, but also to consider the ‘so what?’, i.e. the implications for management decisions.
 - b. Such a report (or series of themed reports) could be worked through with Steering Committee members and other relevant stakeholders to explore how the insights might help them in the management of forests and what the outstanding questions and data needs are.
 - c. Based on this, identify the ‘must-have’ priorities for the program going forward. It will be important to inform this discussion with results from power-analysis work so that stakeholders can understand the likely level of certainty under different monitoring scenarios/levels of investment.
 - d. This might be complemented with some additional mocking up of hypothetical data – based on what could be developed from proposed long-term monitoring processes, to help make the question of prioritisation less conceptual and more concrete. The work done modelling future scenarios might be something to build from here.
 - e. It may also be necessary, as part of this process, to revisit the state-wide evaluation questions. The questions are currently broad and, therefore, do not lend themselves to immediately tractable answers. There could be value in defining a range of more specific sub-questions to help in the identification of priority information needs. The process for prioritising needs under the Coastal IFOA monitoring plan was similarly granular and there may be learnings from stakeholders involved there.
2. To complement the above work, **the Commission should consider developing a summary of key findings from the work so far – potentially based on the insights report and tailored to individual land tenures.** This could then be used by agency staff on the Steering Committee or Technical Working Group to help engage others within their organisations in the program and its potential for delivering information that is relevant to their work.
3. **The role that the Commission plays in coordinating work across agencies is important and should continue to be funded.** Coordination, particularly among groups that have a history of working in isolation, takes time, effort and skills. If forest management is to be efficient and effective across all the land management tenures in NSW, a central point and driver of coordination is critical.

The Commission itself should ensure that it maintains and actively fosters connections to other monitoring work that is developing within NSW, including the NSW Biodiversity Indicators program and the emerging work being done by NPWS.

4. **The Commission should continue to progress the design of the plot network**, cognisant of the need to not let ‘the perfect be the enemy of the good’. Staged implementation of a program of this size and scale may be one alternative if all of the details of design have not been finalised. As part of the design/finalisation process, there may also be value in critically revisiting what is needed from this element of the program (in line with Recommendation 1), that it is appropriately question-driven and that it is designed with a realistic understanding of the uncertainty inherent in the data and the timeframes required to notice and respond to changes.
5. **Continue to embed climate change and resilience thinking within the structure of the monitoring program.** Interviewees highlighted that forest managers are not well prepared for climate change impacts and that it will be important for the FMIP to be able to learn about and identify useful forest management strategies – potentially through work at the stand-scale – for managing climate impacts.
6. **When commissioning further work, ensure the foundational datasets and expectations are clear to delivery partners.** This might be done as part of the tendering process or during project scoping, but should involve appropriate experts familiar with NSW data. There is also a need for tendering processes to consider the long-term implications of who is doing projects (i.e. businesses or government agencies) and ensuring that any methodologies/analyses are transparent and able to be repeated by other providers/researchers.
7. **To further improve transparency** of the FMIP, the Commission should consider:
 - a. developing a publication schedule for reports and workshops and ensure the website is updated accordingly
 - b. providing Technical Working Group members time for a final revision of papers prior to the papers being sent to the Steering Committee, particularly for contentious issues/reports
 - c. providing the SC with more details (or accessible summaries) of expenditure on different projects under the FMIP.
8. **From an evaluation perspective, future stages of the FMIP might benefit from:**
 - a. A clearer hierarchy of outcomes that articulate what might be expected to occur within agencies over shorter versus longer timespans. This could help in demonstrating the impacts of the program and that it is ‘on track’.
 - b. A clearer articulation of how the information for forest management might be better (i.e. articulating expectations about it being more extensive, more up to date)
 - c. Capturing these outcomes in a revised program logic.
 - d. More detailed consideration of how the economic savings/impacts of the program might be assessed to ensure that data is being collected as the program is delivered (if needed).

3 Background to the FMIP

3.1 Program origin and high-level aims

The NSW Government established the FMIP in February 2019. Under the terms of reference for the Program, the Commission is responsible for independently overseeing and advising on the Program’s design, implementation, review and continuous improvement.

The FMIP ultimately seeks to **improve the evidence-base for decision-making and “strengthen the NSW Government’s ability to strategically and adaptively manage forests and forestry practices over time”**.³ The Program applies to all forest tenures on both public and private land. The five aims of the FMIP as per the terms of reference are:

1. Focus on the information required to improve the adaptive management of NSW forests.
2. Provide the public with transparent, independent, accessible, and robust evidence of forest management performance.
3. Be adaptable to changes to both research priorities and forest monitoring methods.
4. Be cost effective by employing efficient mechanisms to meet Program objectives.
5. Satisfy NSW’s obligations for national and international forest management reporting.⁴

Among other benefits, the Program is expected to lead to opportunities to:

- enhance NSW the NSW Government’s engagement with stakeholders
- enable the NSW Government to track progress against commitments and milestones made under the Regional Forest Agreements (RFAs)
- assess the effectiveness and performance of the Integrated Forestry Operations Approvals (IFOAs) in delivering their intended objectives and outcomes
- contribute to improving community confidence in line with the NSW Forestry Industry Roadmap.

3.2 Program structure

The Commission coordinates, oversees and advises on the Program, including chairing a Forest Monitoring Steering Committee. The Steering Committee has representatives from NSW Government agencies as well as independent experts (Table 2) and aims to “ensure the objectives and intended outcomes of the Forest Monitoring and Improvement Program are achieved in an efficient and effective manner”.⁵ The Steering Committee is also tasked with oversight of the ongoing Coastal IFOA monitoring program as part of the FMIP.

Table 2. Forest Monitoring Steering Committee membership.

Group	Organisation
NSW Government	Department of Primary Industries
	Crown Lands

³ Terms of Reference – Independent oversight of a NSW Forest Monitoring and Improvement Program. p 1.

⁴ NSW Forest Monitoring and Improvement Program – Program Framework 2019-2024. September 2019. NSW Forest Monitoring Steering Committee and the Natural Resources Commission. D19/2049.

⁵ NSW Forest Monitoring and Improvement Program – Forest Monitoring Steering Committee Charter, p. 1.

Group	Organisation
	Local Land Services
	Aboriginal Affairs NSW
	National Parks and Wildlife Service
	Department of Planning, Industry and Environment
	Crown Lands
	Department of Primary Industries
	Environment Protection Authority
State owned enterprise	Forestry Corporation of NSW
Independent experts	Dr Peter Hairsine
	Bhiamie Williamson
	Prof. Patrick Baker
	Assoc Prof. Jacki Schirmer
	Assoc. Prof. Philip Gibbons

To help guide the Program, the Commission developed a Program Framework in 2019 that provides an “early foundation”⁶ for the Program and sets its broad direction over the 2019-2024 period. A key component of this framework is the explicit definition of good practice principles for design of the program and outcomes/benefits that are expected from the program in relation to each of the program aims (Table 3).

In line with good practice for ecological monitoring programs⁷, the Program has also developed a set of state-wide evaluation questions (Figure 2) that derive from management and reporting needs and have been used to prioritise areas of work.

Table 3. FMIP aims and expected outcomes.

FMIP Aim	Expected outcomes and ongoing benefits
Focus on the information required to improve the adaptive management of NSW forests.	<ul style="list-style-type: none"> • Forest monitoring, evaluation and research answers priority evaluation questions related to forest management in NSW across tenures. • Uncertainties in forest management approaches are reduced systematically, through the provision of targeted evidence-based information. • Following the first four years of the Program, the NSW Government continues to invest in the Program, as it is providing valuable information for improving forest management in NSW.
Provide the public with transparent, independent, accessible, and robust evidence of forest management performance.	<ul style="list-style-type: none"> • Stakeholders and the community trust the Program’s processes and outputs. • Forest monitoring data, research and evaluations are made available to the public.
Be adaptable to changes to both research priorities and forest monitoring methods.	<ul style="list-style-type: none"> • Monitoring, evaluation and research activities adopt and adapt to new or evolving priority evaluation questions and decision needs. • Best-practice research, evaluation and monitoring methods are adopted where appropriate and affordable.

⁶ Forest Monitoring and Improvement Program: Program Framework 2019-2024.

⁷ Effective ecological monitoring. Lindenmayer D and Likens G. 2018. CSIRO Publishing

FMIP Aim	Expected outcomes and ongoing benefits
	<ul style="list-style-type: none"> NSW agencies demonstrate how research has informed their on-ground monitoring and evaluation of forest management practices.
Be cost effective by employing efficient mechanisms to meet Program objectives.	<ul style="list-style-type: none"> Unit cost of data collection is lowered, for example through technological improvements and collaboration The Program enhances synergies between NSW agencies and enables cost sharing and improved consistency in data collection; duplication is reduced and reporting aligned. Use of existing monitoring data is maximised for evaluation and research into enhanced forest management
Satisfy NSW’s obligations for national and international forest management reporting	<ul style="list-style-type: none"> Reporting commitments are met on time and are publicly accessible. RFA’s reports and for national State of the Forests reports, track progress against the commitments to ESFM, including an improvement in the full suite of forest values in NSW.

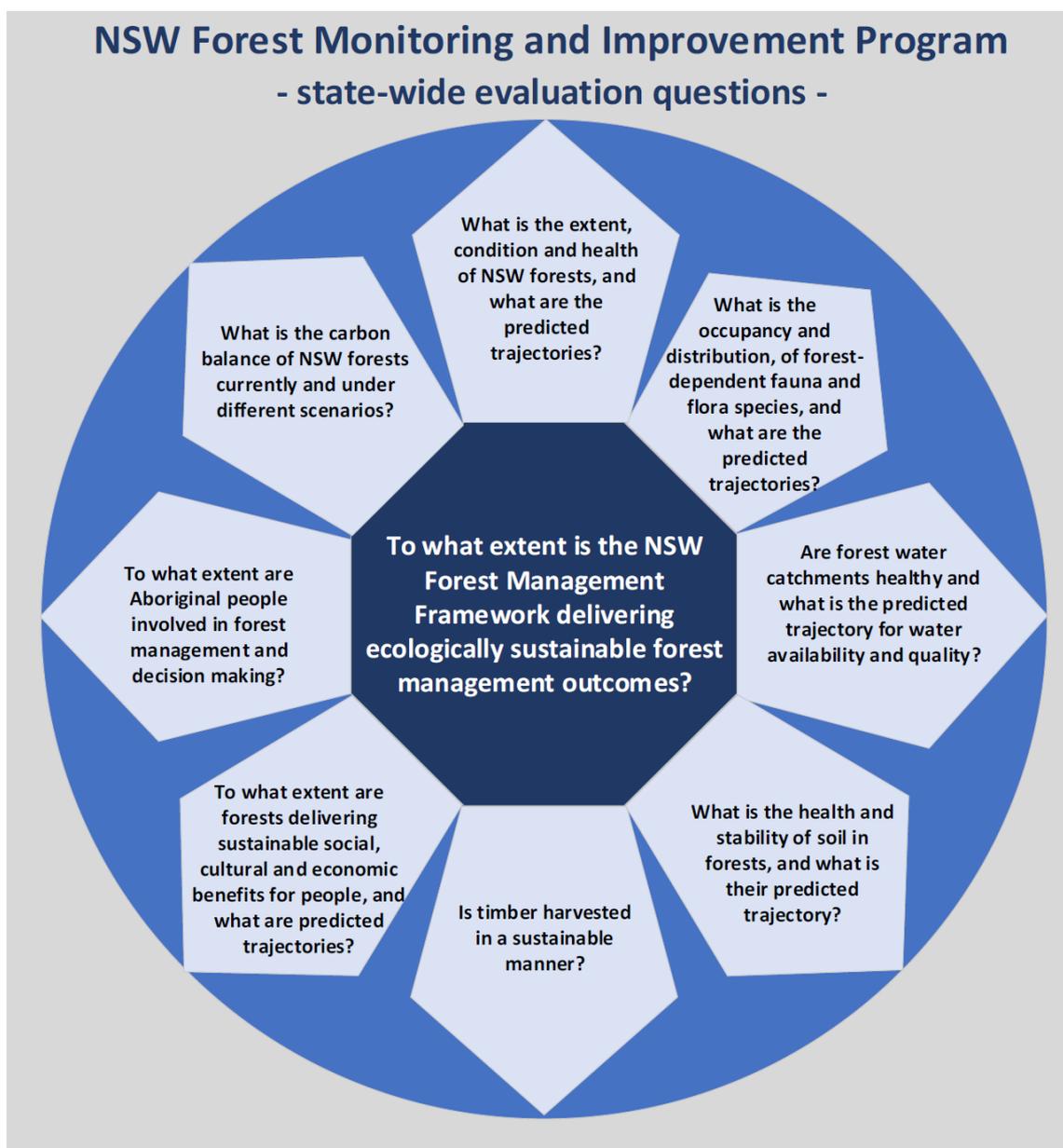


Figure 2. State-wide evaluation questions developed under the FMIP.

4 FMIP achievements

4.1 Overview

This section centres on the question, “Are we achieving what we said we would?”, including:

- early indications of **progress towards improved forest management**
- **other outcomes** to date
- early indications of **whether the program is meeting the needs of key stakeholders**
- **whether and how the program has adapted** to new evidence and priorities.

Box 1 – An overarching perspective on the Forest Monitoring and Improvement Program

“Overall, I think that the NSW FMIP has been an exemplar for how to develop a complex, long-term, spatially dispersed, multi-platform piece of public infrastructure.

The project involves multiple government agencies, each with its particular portfolio of constituents and resources; diverse stakeholder groups, with often competing interests; complex histories of interactions at the local, regional, and state-wide levels; information that spans a gradient from nearly absent data for some variables in the past to petabyte-scale tsunamis of data from recent remote-sensing platforms; and, importantly, an environment that is rapidly changing in many ways -- some of which we can anticipate, some of which we cannot.

To have made as much progress as the FMIP has over the past two years -- particularly given the upheaval of the 2019/20 bushfire season and the limitations imposed by COVID in 2020 -- is a testament to everyone involved and their commitment to the process. It really is a remarkable achievement and one that should be widely acknowledged.”

Independent expert on the Forest Monitoring Steering Committee⁸

4.2 Contribution to improved forest management

The Commission and the Steering Committee have delivered – or started delivering – a broad range of work under the FMIP. Since the Program began in 2019, this includes (Table 4):

- structural and conceptual planning for the Program
- monitoring program plans
- stakeholder engagement plans and resources
- foundational projects focusing on baselines and preparing for long-term monitoring
- other foundational initiatives to support the program objectives.

Many of these activities, particularly the research and baseline monitoring – are only just starting to deliver outputs that can be built on in future stages.

⁸ Sourced from Natural Resources Commission File note: 29 March 2021: Feedback on RFA MER Plan

Table 4. Key pieces of work delivered or initiated under the FMIP (2019-mid 2021).

Category of work	Project/ initiative
Structural and conceptual planning for the Program	
	FMIP Program Framework 2019-2024
	State-wide evaluation questions
	FMIP evaluation plan
Monitoring plans	
	Coastal IFOA Monitoring Plan
	RFA Monitoring, Evaluation and Research Plan
	Citizen Science Strategy
Stakeholder engagement	
	Aboriginal stakeholder engagement plan
	Stakeholder and community engagement plan
	Annual Forum (2020)
Foundational projects – baselines and long-term monitoring	
	FE1: Baselines, drivers and trends for forest extent, condition and health
	FE2: Supporting post-fire ecological resilience and recovery planning in NSW forests
	FE3: Remote sensed forest plot network
	BD1: Baselines, drivers and trends for species occupancy and distribution
	BD2: Fauna monitoring on North Coast forests
	BD3: Fauna call recognisers
	BD4: Koala and habitat response post-wildfires
	SW1: Baselines, drivers and trends for forest water catchments
	SW2: Baselines, trends and drivers for soil stability and health in forest catchments
	SW3: Evaluating forest road network to protect forest waterways
	AV1: Aboriginal values and renewal post-fire - Coordinator
	AV2: Aboriginal values and renewal post-fire - Case studies
	PC1: Baselines and trends in wood supply
	SE1: Forest-dependent jobs
	CC1: Carbon balance of NSW forests
Other foundational projects	
	Future scenarios workshop
	Forest-Eye: Scaling up the impact of citizen science
	Forest-Eye: Engaging citizen scientists for data analysis
	Bridging the gap between data capture and decision-making
	Open data – Data services project

Based on our review of the materials developed under the FMIP and the feedback from key stakeholders, the Commission has laid an important foundation of work for the Program. The foundational projects – in combination with the underlying program structures that have been developed – are making progress towards the expected outcomes identified in the program framework (Table 5). In most cases these outcomes have not been measured directly but there are appropriate structures in place and, as the Program continues to progress, further evidence around the achievement of these outcomes is expected to be collected.

Table 5. Aims and outcomes of the FMIP⁹ and early indications of progress.

Program aims/outcomes	Early indications of progress
Aim: Focus on the information required to improve the adaptive management of NSW forests	
Forest monitoring, evaluation and research answers priority evaluation questions related to forest management in NSW across tenures	<p>In progress - The program is structured to address priority questions and those questions are in the process of being answered.</p> <p>In developing the FMIP, the Commission has put substantial effort into ensuring that the Program addresses priority questions related to forest management. Both the FMIP Framework and the associated state-wide evaluation questions¹⁰ demonstrate a considered approach to development of research and monitoring activities. Feedback from key stakeholders indicated:</p> <ul style="list-style-type: none"> the program comprehensively addresses the areas and questions of interest in forest management – there are no outstanding gaps or areas that stakeholders thought had been missed. some areas that had been neglected in the past, such as Aboriginal values and social and economic monitoring, were receiving dedicated attention under the FMIP now that initial work has been done, there is a need to re-prioritise work to ensure the ‘must have’ research and monitoring is identified as essential for ongoing funding.
Uncertainties in forest management approaches are reduced systematically, through the provision of targeted evidence-based information	<p>In progress - the program is structured to address uncertainties and those uncertainties are in the process of being addressed.</p> <p>As above, the FMIP components are expected to reduce key areas of uncertainty in forest management across the diverse areas of work that have been funded. This ranges from soils to socioeconomics to threatened species. As the results from projects are reported on, outstanding uncertainties need to be re-prioritised.</p>
Following the first four years of the Program, the NSW Government continues to invest in the Program, as it is providing valuable information for forest management	<p>In progress</p> <p>A business case for funding beyond the initial four years of the Program is in preparation. As outlined in Section 4.3, much of the value of the FMIP is only beginning to emerge as the results from projects are documented and communicated and the underlying structure of the Program is built on and expanded. This fits with the broader literature on monitoring programs that highlights the growth in value of programs through time – something that is only achievable with long-term funding.¹¹</p>
Aim: Provide Transparent and accessible evidence	

⁹ from the Forest Monitoring and Improvement Program Framework 2019-2024

¹⁰ Forest Monitoring and Improvement Program State-wide evaluation questions. March 2020.

¹¹ Effective ecological monitoring. Lindenmayer D and Likens G. 2018. CSIRO Publishing

Program aims/outcomes	Early indications of progress
Stakeholder and community trust the Program's processes and outputs.	<p>In progress – direct feedback on trust has not been collected but the FMIP approach is well aligned with this outcome</p> <p>The Commission has developed a stakeholder and community engagement plan for the FMIP and, in line with the aim of making evidence accessible, has been publishing updates and reports on the Commission website since the outset of the Program. The Commission has also committed to hosting annual forums, offering information about the program and the opportunity ask questions and provide feedback. This transparency is an important element in building trust in the Program processes and outputs.</p> <p>In line with the Program Evaluation Plan, the Commission plans to collect data from stakeholder groups on their perceptions of the FMIP and their level of trust in its outputs. This is expected to occur after the bulk of the work from the initial rounds of research are published.</p> <p>Environmental NGOs are one group that are recognising the potential value of the program, with the Nature Conservancy Council recommending in a recent submission "that the NSW Government provide the NRC with ongoing funding to continue the Forest Monitoring and Improvement Program beyond 2022".¹²</p>
Forest monitoring data, research and evaluations are made available to the public	<p>Being achieved as an ongoing outcome</p> <p>As noted above, the Commission has been publishing updates and reports on its website since the start of the Program. This includes a substantial number of reports that are being produced as the same time as this evaluation and that are expected to be shortly made available to the public.</p> <p>In addition to this, a key component of the FMIP has been ensuring that data collected through the program is made accessible by the community, research, business and industry. This includes either uploading data to NSW's Sharing and Enabling Environmental Data (SEED) portal or the Spatial Collaborative Portal.</p> <p><i>The mechanism of making the data available through SEED ... or whatever it ends up being – that's a great initiative to make it as available as possible and that was a criticism of the RFA process in that it was a black box when it came to the data (Steering Committee interviewee)</i></p> <p>Note that not all the reports that are indicated to have been produced for the FMIP have been released on the website. It is also not clear what the release schedule is and, therefore, there may be value in providing a planned publication schedule.</p>
Aim: Be adaptable to changes to both research priorities and forest monitoring methods	
Monitoring, evaluation and research activities adopt and adapt to new or evolving priority evaluation questions and decision needs	<p>Being achieved as an ongoing outcome</p> <p>Although the evolution of a monitoring program to adapt to new priorities and questions is important in the long-term, the FMIP has already shown evidence of adapting to changing circumstances. This includes an additional program of work examining post-fire ecological resilience and recovery planning.</p> <p>It has also responded to feedback about Aboriginal representation on the Steering Committee, expanding membership beyond Aboriginal Affairs NSW to include an independent member with greater expertise on indigenous forest management.</p>

¹² Nature Conservation Council – Submission to the NSW Upper House inquiry into the long-term sustainability and future of the timber and forest products industry. NSW Nature Conservation Council. June 2021. https://d3n8a8pro7vhmx.cloudfront.net/natureorg/legacy_url/2427/210607_sub_forestry_inq_final.pdf?1630462686

Program aims/outcomes	Early indications of progress
	Stakeholders did not identify any evidence or issues that emerged that the Program did not adapt to.
Best-practice research, evaluation and monitoring methods are adopted where appropriate and affordable.	<p>Being achieved as an ongoing outcome</p> <p>Stakeholders – including independent experts on the Steering Committee and members of the technical working group – were generally satisfied that the projects being run under the FMIP were contemporary best-practice.</p> <p><i>From what I've seen the approach [to different projects] has been sound – I know they're making methodologies align where they can with existing processes ... I don't have any criticisms from a technical perspective.</i> (Technical Working Group interviewee)</p> <p>Interviewees did, however, point to several challenges with projects that required attention:</p> <ul style="list-style-type: none"> • at least two of the projects required intervention to ensure they were using the most up to date data or modelling outputs, reinforcing the challenges around data access noted in Section 5.4 • the interpretation and extrapolation of findings from some of the reports was – in the view of some interviewees – beyond the scope of the research findings and that more cautious interpretation/communication is required in the future.
NSW Agencies demonstrate how research has informed their on-ground monitoring and evaluation of forest management practices	<p>In progress</p> <p>Feedback from across the stakeholders interviewed here indicated that it has been too early for the FMIP research to have informed their on-ground monitoring, but there is substantial potential for this to occur.</p> <p><i>The process has started to inform discussions about management – particularly projects like the work on koalas – and in next 6-12 months, my sense is that some of those pieces of work will start to flow through to actions</i> (Technical Working Group interviewee)</p>
Aim: Employ cost-effective mechanisms	
Unit cost of data collection is lowered, for example through technological improvement and collaboration	<p>In progress – efficient collection through tools such as remote sensing is being prioritised as an approach but clear outcomes have not been demonstrated yet</p> <p>Routine monitoring has not yet been established and so the unit cost of data collection has not yet been assessed. That said, the FMIP has had a strong focus on exploring cost-effective data collection and analysis methods. This includes:</p> <ul style="list-style-type: none"> • exploring the use of remote-sensing approaches for monitoring key forest metrics – testing and validating these methods against traditional on-ground, plot-based methods • combining technology such as camera traps with emerging research on acoustic monitoring devices to potentially support a broader range of species occupancy monitoring • exploring novel analysis methods, including citizen science programs.
The Program enhances synergies, reduces duplication, and improves consistency of data collection	<p>In progress – the program is focused on coordination and consistency and should deliver these benefits provided it can continue to secure funding and buy-in</p> <p>This is one of the fundamental drivers of the Program and it appears to have been embedded throughout the Program's design and delivery. This includes:</p> <ul style="list-style-type: none"> • the cross-tenure focus of long-term monitoring (be they for soil, forest condition or species occupancy)

Program aims/outcomes	Early indications of progress
	<ul style="list-style-type: none"> the collation of existing data to inform baseline and trend analysis the development of processes to draw together data in centralised, accessible repositories (i.e. SEED). <p><i>I can see how it's emerging as a platform for minimising research redundancy – the way NRC have curated the RFA monitoring research pages and the way that its' emerging as a hub will be a positive (Technical Working Group interviewee)</i></p> <p>An important point to note here, however, is that despite the work done under the FMIP, some agencies are continuing to progress some monitoring independent of the FMIP – including work by both NPWS and LLS. While these initiatives are not incompatible with the FMIP, there is a need to continue to ensure they are aligned as far as possible and that further design of FMIP monitoring programs accounts for these other initiatives, such as is being done with the DPIE Biodiversity Indicator program.</p>
<p>Use of existing monitoring data is maximised for evaluation and research into enhanced forest management</p>	<p>Being achieved as an ongoing outcome</p> <p>This has been one of the key achievements of the program and been done in a range of areas, ranging from soils to species occupancy to fire history. Commission staff and program partners indicated that this required a substantial effort, highlighting the poor data management practices of previous programs (e.g. data left on personal computer hard drives), as well as a history of curtailed monitoring programs that did not collect follow-up data.</p> <p><i>It's fair to say, it took a lot of the project time to work out what didn't know – some of the data sets we were working with were a mess (Program partner interviewee)</i></p> <p>This work will be important in informing the future analysis of forest trends, but also in highlighting for the FMIP the importance of robust data management processes and the significant risk of funding for monitoring programs being curtailed.</p>
<p>Aim: Satisfy NSW's obligations to national and international forest management reporting</p>	
<p>Reporting commitments are met on time, and publicly accessible</p>	<p>In progress</p> <p>No reporting commitments are relevant at this stage, but these are planned to be delivered in line with obligations.</p>
<p>Tracking of progress against the commitments to ESFM, including improvement in the full suite of forest values in NSW</p>	<p>In progress</p> <p>The FMIP has been designed around high-level questions about how forest management can be improved (i.e. the state-wide evaluation questions). Importantly, it has also been underpinned with clear reference to and consideration of NSW's reporting obligations around forests (i.e. in line with the principles of ecologically sustainable forest management and the Montreal Process criteria).</p> <p>This includes consideration of how to monitor indicators relating to forest condition, biological diversity and productive capacity. The FMIP also includes work relating to indicators of social and economic benefits and Aboriginal values and management – areas that are often neglected in forest monitoring programs.</p> <p><i>They've been remarkably equitable - to the FMIP credit, some of these things are usually poorly informed, but – they've taken the time to invest in them up front and that's good (Steering Committee interviewee)</i></p>

4.3 Other outcomes

In addition to the ‘expected’ outcomes from the FMIP (Section 4.2), the Program has also contributed to a range of other outcomes. These outcomes form an underlying groundwork for improved forest management in the future, and include:

- **Establishing a platform for integrating information about forests.** As noted variously in Section 4.2, the commission has:
 - identified gaps and needs in terms of the information for forest monitoring and reporting
 - collated existing datasets from diverse and often difficult-to-access locations
 - progressed a way of making future forest research and monitoring data accessible
 - developed an initial program of research and method-development projects.

A range of Steering Committee and Technical Working Group interviewees highlighted that, in aggregate, these actions have created a central framework and structure for research and monitoring in NSW forests. This is something that can now be built on with ongoing monitoring work and further projects.

They’ve setup some really good structures for reporting and monitoring ... and I’m excited to see all of the work come in. There’s private, university and government researchers all working on this and the point is that it’s bringing the best operational and thought leaders together from across the nation to talk about NSW forests. (Technical Working Group interviewee)

- **Drawing together and fostering of collaboration among agencies.** Almost half of the Steering Committee interviewees indicated that one of the most important outcomes so far has been the productive working relationships that have been developed among agencies. This includes both the collaborative approaches to individual projects as well as the open dialogue and breaking down of silos of work that occurs through the Steering Committee.

I think the greatest achievement is simply the breakdown of institutional barriers. It’s been a new way of working (Steering Committee interviewee)

One of the key achievements has been that it’s brought together, as a group, disparate agencies and different people – they are coming together with the platform of science as the meeting point. That’s the key uniter (Technical Working Group interviewee)

- **Enhancements to knowledge about NSW forests.** The FMIP has commissioned more than a dozen of projects that have collated, analysed and reported on different forest values, trends and management practices. Many of these projects are currently in the final stages of delivery – as one interviewee noted, there is “an absolute firehose of work that’s coming through” – and will projects provide a wealth information on NSW forests (see Table 4).

Projects that interviewees highlighted as being particularly significant included:

- case study work to understand Aboriginal values and management relating to forests
- assessment of the carbon balance of NSW forests
- establishing baselines for species occupancy
- koala occupancy and nutritional quality in NSW north coast hinterland forests subject to selective harvesting

Establishing that baseline data for status and trends – that was a huge task and a huge job (Steering Committee interviewee)

- **Developing methods for future monitoring and research.** A range of the projects funded under the FMIP are expected to provide more sophisticated and cost-effective approaches for addressing forest-related monitoring and research questions. This includes work relating to:
 - Remote sensing tools and methods to help prioritise management interventions that support resilience to fire (by better understanding post-fire recovery).
 - Development of a standard and repeatable method for assessing employment from forest-dependent activities (noting that there were a range of data collection challenges for this project, including difficulty getting data from stakeholders).
 - Acoustic monitoring methods for doing more cost-effective surveys of fauna occupancy.
 - Testing of high-resolution terrestrial LiDAR systems that offer the potential to replace intensive forest-structure measurements.

4.4 Adaptation of the program

As noted in Table 5 (p. 13), the FMIP has had little opportunity to adapt to new evidence but has shown a flexibility and responsiveness to emerging priorities and contextual shifts. This includes:

- including an additional program of work examining post-fire ecological resilience and recovery planning
- responding to feedback about Aboriginal representation by including an additional expert member on the Steering Committee.

In response to feedback about consideration of traditional owners being underdone, they've quickly pivoted in an effective way – not only do they have more expertise [on the Steering Committee] but they've put a lot of focus on ensuring that engagement is being done well in this space and not 'tick the box' (Steering Committee interviewee)

4.5 Is it meeting the needs of key stakeholders

There was good support among interviewees that the program was 'on track' to meet the needs of key stakeholders. These comments acknowledged that much of the potential value of the program in meeting these needs would emerge over a longer period, but that the underlying structure and focus of the Program was generally appropriate.

Specific points here are:

- As noted in Table 5, the Program is currently asking questions that are relevant to forest managers and to broader community stakeholders. This derives from the systematic approach used in assessing reporting requirements and early consultation by the Commission around the state-wide evaluation questions and framework.¹³
- As such, the early work of the Program (i.e. the research and baseline analyses that are in progress) should lead to useful insights for managers and the broader community in the short term. This includes having more information about forests publicly available.

¹³ Forest Monitoring and Improvement Program: State-wide evaluation questions – methods statement
Prepared for the NRC

- It would have been pre-emptive to collect feedback from broader stakeholders (e.g. community members, industry, NGOs) for this evaluation because the bulk of the work of the Program was only just becoming available. There is an opportunity to collect feedback on these outputs in the future.
- With the above points in mind, it is also important to note that stakeholder needs are not fixed. Once the first tranche of work under the FMIP has been collated and synthesised, it will be important for the Commission to re-assess what stakeholder's priority needs are in light of the findings from this work.

The program has highlighted that there are heaps of gaps ... but I think that it will do more to meet the needs [of forest managers] than anything previously. (Steering Committee interviewee)

5 FMIP delivery

5.1 Overview

This section centres on the question, “Are we achieving it in the way we said we would?”, including:

- To what extent have the good practice principles been implemented in designing and delivering the Program?
- To what extent has the Program been delivered as intended?
- Are there any barriers to Program delivery? If so, how can the program be improved?
- To what extent has the Program been well governed?

5.2 Good practice principles

The FMIP Program Framework 2019-2024, established early in the Program, outlines a set of ‘good practice principles’. These principles were derived from a literature review on monitoring programs and provide a useful reference point for considering the design and delivery of the program (Table 6).

The design and delivery to date has generally been clearly aligned with these principles and, in other cases, it is likely that the program will be aligned as it evolves.

Table 6. Alignment between good practice principles in the FMIP Program Framework and delivery to date.

Aim	Good practice principles	Evidence of alignment
1. Focus on priority information needs	The program should meet both decision-making needs and reporting requirements	Clearly aligned. The FMIP has been developed with a clear emphasis on addressing decision-making needs and reporting requirements, as outlined in Table 5. Note that the fulfilment of needs may need to be reassessed once the foundational set of projects has been finalised and assessed.
	Evaluation questions should inform the program design and focus monitoring	Clearly aligned - see state-wide evaluation questions in Section 3.2.
	The program should provide information at relevant spatial scales and timescales	Should be aligned – both spatial and temporal scales are being considered in all projects. IFOA monitoring focuses to a greater extent on site-scale assessments while the state-wide forest plot network and remote sensing data will bridge the gap between site and landscape scale monitoring. The frequency of the long-term monitoring program is expected to be appropriate but will need to be confirmed.
	Performance triggers, thresholds and baselines should be employed where possible	Should be aligned –baseline data has been collated and will be important in developing trend analysis and forecasting. Thresholds and performance triggers have yet to be implemented and, as noted in Walshe et al. ¹⁴ , adoption of (often) arbitrary thresholds should be done carefully.

¹⁴ Bridging the gap between data capture and decision-making: A survey of forest managers. Walshe T, et al. 2020.

Aim	Good practice principles	Evidence of alignment
2. Provide transparent and accessible evidence	The program should facilitate public engagement and improve public confidence	Clearly aligned , as outlined in Table 5 given the focus on making data public and providing opportunity for input through the submission process and annual workshops.
3. Adapt to changes in research and monitoring priorities	The program should continually evolve to respond to priority questions and risks	Clearly aligned as outlined in Section 4.4.
	The program will continue to use best practice monitoring and research methods	Should be aligned. As outlined in Table 5 there was good feedback about the quality of the methods employed to date
4. Employ cost-effective mechanisms	Program priorities should be determined through an analysis of risks, opportunities and value for money	Clearly aligned. Initial priorities have been established based on management and stakeholder needs and commissioned through a competitive tender process. Significant work is being done on the statistical power of the long-term elements of the monitoring program and this will be critical in ensuring these initiatives are as efficient as possible. A substantial risk assessment and prioritisation process was used in developing the Coastal IFOA monitoring plan. A similar risk- and value-based approach should be used for the finalisation of the forest plot network design.
	The program should facilitate coordination between agencies and data sharing	Clearly aligned. This is a central tenant of the program and something that has been highlighted as a key strength (Section 4.3), despite it being a challenge (Section 5.4).
5. Satisfy reporting obligations	Review periods should be frequent enough to inform management and decision-making	Should be aligned. The program itself has been good at ensuring there is regular review of its progress. It is unclear at this stage what the review periods will be for ongoing monitoring, other than adhering to obligated reporting periods.
	The program should meet both decision-making needs and reporting requirements	Should be aligned. The program is clearly aligned with reporting requirements and, as noted in Section 4.5, has been designed to address decision-making needs. The challenge will be ensuring that the program continues to iterate and adapt to these needs as findings emerge.

5.3 Delivery as intended

Overall, the FMIP is largely running in line with the schedule of deliverables slated in the FMIP Program Framework (Table 7).

The key exception is the forest plot network. Three key points are worth noting here:

- The lack of progress with the forest plot network was highlighted as a key gap. Three interviewees noting that while they acknowledge the complexity of it, they were frustrated that it has not been established sooner as it represents the ‘lynchpin’ of any long-term

monitoring program – essential for a range of forest values but also for validating remote sensing work.

- However, as a critical and expensive element of the Program, the Commission has also worked hard to ensure that it is developed to be as valuable, practical and cost-effective as possible. This includes investing in an on-ground pilot and commissioning statistical support in the sampling design. These exercises have both led to a range of important refinements.
- The tension here reflects a challenge common to many monitoring programs – “a rush to ‘get people to work’, without giving the necessary time to think through and then carefully plan a monitoring design and subsequent field program”.¹⁵ That said, part of the delay with the forest plot network has been a change in staff within the Commission and a subsequent loss of momentum. This is an area of the program that is thus essential to progress in the immediate future.

In terms of delivery of the FMIP more broadly, interviewees highlighted two as being important for the effectiveness of the Program so far:

- **The Commission, as an organisation, is well suited to acting as an ‘honest broker’** in bringing together the key stakeholders required for this cross-agency program. This includes its independent nature, its relationships, its consultative ways of working and its experience and expertise in natural resource management.
- **The individual skills and abilities of the Senior Advisors working on the FMIP.** Several interviewees – both among program partners and the Steering Committee - pointed to the quality of the staff and their importance in ensuring projects under the FMIP were delivered effectively.

The role of the senior advisors is a good one. They make the projects more effective and I’ve been impressed (Steering Committee interviewee)

Table 7. Deliverables for the FMIP as outlined in the FMIP Program Framework 2019-2024. Progress is based on assessment reported to the Forest Monitoring Steering Committee in February 2021 and updated through this evaluation.

Deliverable	Description	Progress	
Aim: Focus on priority information needs			
2019-2020	1.1	Priority information needs and evaluation questions are agreed by the Steering Committee to guide investment in forest monitoring, evaluation and research by early- 2020.	Completed
	1.2	Identify priority information needs for Aboriginal peoples in respect to forest management and monitoring by early-2020.	Completed
	1.3	A strategic and peer-reviewed cross-tenure permanent forest monitoring plot network is designed to monitor key metrics, linked to remotely sensed information by mid-2020.	Behind
	1.4	Foundational projects for monitoring, evaluation and research that provide early building blocks for the program established by end-2019.	Completed
	1.5	The Coastal IFOA monitoring program is designed and recommended by end-2019.	Completed

¹⁵ Effective ecological monitoring. Lindenmayer D and Likens G. 2018. CSIRO Publishing, p. 79

Deliverable	Description	Progress
1.6	Second tranche projects for monitoring, evaluation and research that align to priority information needs and evaluation questions are established, by mid-2020. These projects complement and potentially scale-up the early foundational projects.	Completed
1.7	The Regional Forest Agreement (RFA) monitoring, evaluation and research plan is designed, which identifies and prioritises monitoring and reporting obligations and commitments, and the extent of monitoring, evaluation and reporting required to satisfy each obligation and commitment by mid-2020.	Completed
2021-2024		
1.8	At least two existing forest management plans or programs have been evaluated providing recommendations to enhance management by end-2021.	On-track
1.9	A cross-tenure network of permanent forest monitoring plots are established in RFA regions to report on priority ESFM indicators by end-2022.	Not started
Provide transparent and accessible evidence		
2019-2020		
2.1	Forums for stakeholder consultation are established to draw in expertise of research organisations, forest managers, stakeholders and the community, in reviewing forest monitoring, research and evaluations starting in 2019.	Completed
2.2	Explore and document an approach to citizen science by mid-2020.	Completed
2021-2024		
2.3	Forest agreement reporting commitments, including for RFAs and IFOAs, are met and publicly available.	Not started
2.4	Annual independent insights/progress reports, including independent recommendations to the NSW Government on potential improvements to forest management.	On track
2.5	Monitoring data and information is provided through the NSW's Sharing and Enabling Environmental Data (SEED) portal by end-2021 (see also deliverable 5.2).	On track
Adapt to changes in research and monitoring priorities		
2019-2020		
3.1	The application of emerging research and technology is piloted or adopted by the Program in the implementation of foundational projects starting 2019.	Completed
3.2	Research opportunities and partnerships are established in the implementation of foundational projects by end-2020.	Completed
2021-2024		
3.4	New technologies and monitoring methods, such as advances in remote sensing, are adopted and implemented by the Program where they are cost-effective by end-2022.	Commenced
3.3	Annual forums for researchers, land managers and stakeholders to review data, findings and implications from monitoring and research.	On-track
Employ cost-effective mechanisms		

Deliverable	Description	Progress	
2019-2020	4.1	Efficiency measures are introduced by foundational projects that reduce duplication in data collection and optimise existing forest monitoring programs by end-2019.	Completed
	4.2	Identify opportunities to improve how existing NSW agency monitoring, evaluation and research data programs can better inform adaptive forest management in NSW by mid-2020.	Completed
2021-2024	4.3	The unit costs of site-based sampling approaches can be demonstrated by end-2021	On-track
	4.4	Data management plans are established, providing efficiencies by standardising existing or new monitoring and sampling protocols, datasets and data formats by early-2021.	On-track
Satisfy reporting obligations			
2019-2020	5.1	Foundational evaluation questions and projects are designed to provide useful and practical information for reporting on ecologically sustainable forest management by 2019.	Completed
2021-2024	5.2	Reporting commitments for forest agreements are being met on time and reporting information and monitoring data on ESFM is available on NSW's Sharing and Enabling Environmental Data portal by end-2021.	On-track

5.4 Barriers and challenges to delivery

FMIP documents and feedback from stakeholders point to a range of challenges that the Program has experienced during delivery to date. Some of these have been logistical challenges – such as delays caused by COVID-19 – while others are more fundamental challenges in the forest management space, such as the complex and sometimes conflicting nature of forest management objectives. In terms of these underlying – and often interrelated – challenges, the FMIP has grappled with:

- **A history of agencies doing research, monitoring and evaluation work independent of each other.** Although this was a noted success of the program in getting effective collaboration among stakeholders from different parts of the NSW government, interviewees highlighted that this was a difficult and ongoing challenge.

They've been stepping on a lot of silos - each group has their own. It's been saying to them that they need to be doing something different when they've all got their current way of doing things ... and they've done a good job of bringing that together and corralling agency representatives and independent experts (Technical Working Group interviewee)

- Related to the above point, **different agencies have different objectives for forest management and priorities for research and monitoring.** Although the Program has been deliberately designed with these differences in mind, it creates challenges in communicating the benefits of a state-wide, cross-tenure monitoring program. This appeared to particularly be the case with components such as the forest plot network, which stakeholders acknowledge has good long-term value but does not necessarily fit with the day-to-day priorities of different agencies at this stage.

It's bringing together different people and different objectives and what they want to get out of the FMIP. It's often a narrow perspective for the benefits of their agency and that will always come before something that fits across all tenures and that's just something that the NRC will have to manage (Technical Working Group interviewee)

In an example of how this challenge is manifesting, the NPWS is developing a separate scorecard monitoring program. While there is good opportunity here for integration with the FMIP, it emphasises how agencies are still driven by their own – sometimes quite specific needs – and that an all-encompassing, cross-tenure program remains a long-term endeavour.

- **The linked challenge of funding for agencies.** The challenge with above is exacerbated by an ongoing uncertainty about how such monitoring would be rolled out and what commitment would be required from agencies to fund that work through existing resources. This resourcing issue extended to several key stakeholders who noted that they would like to have participated more in the development of the FMIP, but that a lack of organisational resources has limited their involvement.

I think that there's more of an opportunity for agencies to prioritise this work once a long-term monitoring program becomes clear and they are able to integrate it into their programs with resourcing (Technical Working Group interviewee)

- **The complexity of forest management and of designing a monitoring program that addresses this complexity.** Alongside the differing objectives of forest management that are (at least partially) reflected in the goals of different agencies, forest management is inherently complex. Forest values are influenced by a diverse range of factors, change at different spatial and temporal scales. There are logistical considerations for monitoring across vastly different geographic regions and management tenures, as well as conceptual challenges in addressing issues ranging from socio-economics to timber availability to threatened species.
 - Stakeholders indicated that this complexity has been dealt with well by the Commission, which has used a logical and systematic approach in developing the FMIP and the projects that it has funded so far.
 - Despite the efficacy of this approach, a range of interviewees highlighted that the scale and complexity of the program risks it being too large and expensive, potentially undermining its long-term sustainability.

It's perhaps a bit too wide reaching and ambitious. It hasn't gone beyond its remit, but the challenge that they're facing now is that a lot of monitoring programs fail because they're too big and complicated.

- **Fragmentation of work.** In addition to its complexity, several key stakeholders on the Steering Committee noted that the FMIP projects to date – although broad-reaching – have been implemented quite separately and have yet to be brought together in a cohesive way.

We've had to start with lots of little projects that don't easily link together. And it's not always clear what the implications are for the overarching program. There's a need to bring it together and to look at the different aspects as a whole ... rather than a range of independent projects (Steering Committee interviewee)

- **Difficulties in accessing existing data.** This was highlighted by Commission staff and project partners as a major barrier to project delivery (e.g. for projects focused on developing baselines from historical data). This reinforces the underlying aim and rationale of the FMIP and the value of its work in: a) collating historical data; and b) establishing systems for making data accessible in the future.
- **The pervasive challenge that climate change presents to forest management** and the associated need for appropriate management strategies and, in turn, monitoring and evaluation of those strategies. Interviewees highlighted that there is currently a lack of knowledge about what strategies might be effective in this space – particularly given the significance of the impacts of climate change across NSW's forests. In this context, they emphasised that purposeful adaptive management – trialling different approaches – and being able to track how individual stands are responding over time will be the best source of new ideas about how to manage these forests going forward.

5.5 Governance

The FMIP has been well-governed to date. It is overseen by an inter-agency Steering Committee who operate under a governance charter. The Commission is Chair of the Steering Committee and responsible for coordinating and advising on the Program. Alongside this sits the Technical Working Group – another inter-agency group that provides more technical advice and oversight to support the Forest Monitoring Steering Committee.¹⁶

Feedback from key stakeholders was strongly supportive of the program governance. All Steering Committee interviewees agreed that the governance mechanisms were satisfactory, with more than half (7/13) providing unsolicited high praise for the Commission's work, highlighting their work:

- providing a good space for discussion and being attentive to the differing positions of stakeholders
- delivering high-quality papers
- making good use of time.

[The] Commission has done an excellent job of that and the general collegial nature of the meetings and the discussions about – sometimes sensitive issues – has been really productive. (Steering Committee interviewee)

¹⁶ see NSW Forest Monitoring and Improvement Program: Forest Monitoring Steering Committee Charter. v1.2.

Interviewees identified two main opportunities for improving FMIP governance:

- **Improving transparency about how the comments from different members/agencies are dealt with**, particularly within the Technical Working Group. This included interest in an additional opportunity to papers after feedback had been addressed. Although there was commentary that issues are generally “tossed around until we’re comfortable”, an additional review cycle was noted to be useful in circumstances that had more potential to be contentious. Other suggestions for the Technical Working Group were for more regular meetings (two comments) and for a slightly longer window for review (one comment).
- **Improving gender diversity of the Steering Committee and the Technical Working Group.** There are currently three women on the 13-person Steering Committee and one on the 5-person Technical Working Group. Although three interviewees identified this as an area for improvement, there was also acknowledgement that diversity can be difficult to achieve in cases that require specific people from organisations (i.e. because of their role/position).

5.6 Efficiency and cost effectiveness of the program

The question of whether the program is efficient and cost-effective was intended to be asked in relation to the ongoing value of the monitoring developed under the FMIP. As such, this mid-term evaluation has largely limited to the feedback from key stakeholders about the program value and whether it could have been more efficiently delivered. This feedback indicated:

- All the interviewees that provided feedback about program efficiency indicated that it has been well run, with no obvious opportunities for improving efficiency.

I’m pretty impressed with how much is getting done. I don’t see any outstanding opportunities ... the only way to make it more efficient is to reduce stakeholder engagement, and that’s fundamental to the program (Steering Committee interviewee)

- Most interviewees could not speak to the specific costs of individual projects or investments. One Steering Committee member suggested that a greater level of transparency around individual projects might help with this, particularly as the Program moves into a more operational phase that might involve greater delivery by agencies.

Beyond these points, the Program itself has had a clear emphasis on delivering cost-effective outcomes. This was embedded in the FMIP terms of reference, but has also flowed through to:

- the way that questions and projects have been prioritised – and will be further prioritised going forward
- the use of competitive tendering processes to drive value in the foundational projects
- the attention given to identifying and trialling new technologies (e.g. ground-based LiDAR, acoustic monitors) and approaches (using citizen science analysts) that could provide cost-savings
- the effort that went into identifying and using existing historical datasets
- the focus on reducing duplication and streamlining monitoring and reporting processes across agencies.

6 Learning and improving

6.1 Overview

This section centres on the question, “Are we learning and improving the program?”, including:

- To what extent has the impact and value of the program been demonstrated?
- What lessons are there in relation to program design and delivery?
- To what extent has the program been reviewed as anticipated?

6.2 Demonstration of impact and value

In line with the commentary in Table 5 in Section 4.2, the program is recognised to have substantial potential value, but that this value is still emerging. In terms of seeing the results flow into improved decision-making, as one Steering Committee interviewee noted:

In terms of its achievements it's still early on, but there are a raft of projects that are coming in at the moment and they are of great interest – they're more than enough to start making good progress on improving forest management.

This reflects other feedback from key stakeholders that supports the future value of the program and its importance.

The concept of having a monitoring and improvement program for forest management – something that deals with ecosystem and cultural and community values – it's fantastic. It will provide opportunities for comparison across tenures and the potential learnings and implications are significant (Steering Committee interviewee).

Some interviewees suggested that to further demonstrate the value of the Program, some agencies might need help in “connecting the dots” (Technical Working Group interviewee). This includes integration and interpretation of the results coming out of the foundational projects (see the point about integration in Section 6.3), as well as “fast facts and figures”, such as the value of carbon or jobs across tenures and regions – material that would help in communicating potential outputs to executives and ministers. As emphasised by an interviewee who has studied how people value monitoring data:

One of the challenges is that some stakeholders can't see the value in it because, without a prototype, it's hard to see what it might look like and what it might do for them (interviewee)

6.3 Additional lessons in relation to design and delivery

Building on the challenges noted in Section 5.4 and the other opportunities identified elsewhere in this report, interviewees pointed to four further lessons from the FMIP so far that should be considered going forward:

- The open tendering process for the suite of foundational research and baseline-development projects led to a broad range of organisations being funded. This included government agencies, universities and businesses. While interviewees generally supported

this process in terms of accessing expertise and running efficient projects, several issues and cautions were raised about this approach:

- **Risks around intellectual property.** For any long-term monitoring program, there is a risk that outsourcing elements of method development ‘locks in’ a particular form of proprietary software or intellectual property that limits, or makes it difficult, for others to engage in the work in the future. This needs to be a consideration in both the contracting of such projects, but also in thinking about the long-term capability-building aspirations of such programs and where such expertise best sits.
- The process highlighted that **some government research/monitoring teams lack capability in developing clear, competitive and well-aligned proposals.** This has potentially ‘undersold’ the expertise of government researchers and risks projects missing out on experience and -in some cases – the use of less-well-suited datasets.
- The issue of **some projects only using the most relevant datasets after prompting by independent experts** reinforces both the fragmented nature of data in this space and the need to, during the tendering phase, establish the foundational assumptions and datasets that proponents should be using.
- Interviewees acknowledged the volume and quality of the work coming out of the Program so far. However, three committee/working group members **cautioned against the overinterpretation and extrapolation of findings from some of the work.**

In both the FMIP and IFOA, there have been some recent reports of high quality ... but I would probably say we’ve become a little uncomfortable with the extrapolation of report conclusions ... which moves a little past research and science.

This highlights an underlying challenge in the task of the FMIP: to improve the information about a large, complex system but making sure this information is available in useful timeframes – and with appropriate levels of certainty – to inform decision-making. Although the Commission included clear caveats in its media release on recent, contentious work on koalas and selective harvesting¹⁷, these caveats were not sufficient to dispel this ‘unease’. This reinforces the importance of positioning the FMIP’s approach as an iterative one that will support the adaptive management of forests by building the knowledge base through time, further reducing uncertainties and expanding localised findings to more generalisable findings. This includes, as suggested by a Technical Working Group member, ensuring that other pieces of the picture are drawn into and build on these results:

*It would be nice to verify against other datasets - data from other agencies; there’s drone data for example – that’s the next stage, that’s where there are other pieces that need to come together
(Technical Working Group interviewee)*

- Building on the above point, around a third of the Steering Committee interviewees highlighted **a need for the FMIP to now go through a process of integration** – a drawing together of the different pieces of work to make sense of them. This includes consideration of what the findings mean and what their implications are – not just for monitoring but for management. Commission staff agreed, noting that this is intended to be the next planned phase of the Program and part of the process of realising and communicating the value of the initiative. As emphasised by a Steering Committee interviewee:

¹⁷ <https://www.nrc.nsw.gov.au/Media%20Release%20v2%20-%20Koala%20research%20-%20October%20%202021.pdf?downloadable=1>

We sit in some of these meetings – reviewing the monitoring data and don't tend to get engaged in the question of 'what do we do now?'. We tend to get into the flaws in the data ... but we don't really engage in discussion about 'what do we do next?' (Steering Committee interviewee)

- At both the project and Program level, Commission staff, partners and Steering Committee members emphasised **the need to continue transdisciplinary work on Aboriginal values and on indigenous approaches to forest management**. This emphasised relationships that had been created through the three case-study projects and the importance of continuing to foster these relationships.

They've done really positive work and a built a really positive rapport – it would be a lost opportunity if they weren't to continue now that they've got a bit of a history and a good working relationship ... so we should at least continue those relationships... and maybe even ramp up the work there. (Steering Committee interviewee)

The other key opportunity highlighted here is– in the same way that the FMIP is helping to integrate forest monitoring work across NSW – to develop guidance for other agencies in engaging with indigenous communities on land management issues. This could build on existing guidance from Aboriginal Affairs NSW and include issues around cultural burning, resource management, informed consent and safeguarding of indigenous data.

6.4 Reviewed as anticipated

The program has been reviewed and reported on as planned, including:

- development of a FMIP evaluation plan (February 2020)
- annual progress reports (February 2020, April 2021)
- regular communiques from the Steering Committee
- annual stakeholder forums (November and October 2020, yet to be run for 2021)
- an annual 'health check' of the Coastal IFOA monitoring program
- this interim evaluation
- publishing project reports on the Commission website.

Overall, the Commission has adopted a strong position on monitoring, evaluation and reporting on the Program. They have been critically reflecting on delivery throughout and have built-in good structures for review and improvement. This includes the above noted processes, but also individual pieces of work, such as small, interim evaluations of two pilots run under the Program.