



Forest & Wood Products Australia

Native Forest Silviculture Investment Plan Review

September 2022

FWPA

Acknowledgements

FWPA gratefully acknowledges the support provided by the following organisations in undertaking this review:

VicForests, Sustainable Timber Tasmania, Forestry Corporation of NSW, Queensland Department of Agriculture and Fisheries, Forest Products Commission (WA), North East NSW Forestry Hub, Private Forestry Service Queensland, Forestry Australia.

Background

The vision of the Grower Research Advisory Committee (GRAC)¹ is to “*double the value of Australia’s commercial forests by 2040, by fostering an innovation culture in our enterprises, applying world’s best practices, collaborating and investing into research and development as appropriate*”.

In support of the GRAC Vision, FWPA commissioned a suite of investment plans that provided technical reviews and business cases to guide industry investment in RD&E for the Australian forestry sector from 2019 to 2023, with an outlook to 2028 and beyond to 2040.

FWPA’s Native Forest Silviculture Investment Plan (Investment Plan)², published in 2020, reviewed opportunities for progressing the GRAC Vision through investments in RDE that help build productivity, sustainability credentials, social acceptance and industry capacity.

In August 2022, FWPA held a workshop with representatives of the respective State native forest managers³ to consider and update the collaborative RD&E priorities listed in the Investment Plan. The priorities identified in the workshop were subsequently reviewed by the GRAC.

This document summarises the outcomes of that workshop and broader industry review, represents an addendum to the Investment Plan, and should be read in conjunction with the Investment Plan. The Research⁴ Project Topics and their prioritisation supersede those in the 2020 Investment Plan.

Review Objectives

This review aims to provide native forest management-sector-led recommendations to the GRAC to consider when making investment decisions and to record collaborative RD&E projects that have commenced since the 2020 Investment Plan was published. The review incorporated:

1. Review status of investment or completion of proposed RD&E projects
2. Provide native forest management-sector opinion on the prioritisation of existing RDE projects
3. Provide native forest management-sector opinion on the prioritisation of newly proposed Research Project Topics.

Method

FWPA facilitated an online workshop with representatives from VicForests, Sustainable Timber Tasmania, Forestry Corporation of NSW, Queensland Department of Agriculture and Fisheries and Forest Products Commission (WA). The group discussed each Research Project Topic and considered whether and how the priorities assigned in 2018 had changed. Comments made in the workshop are recorded against each Research Project Topic. Additional input was provided to the draft report by the North East NSW Forestry Hub, Private Forestry Service Queensland and Forestry Australia.

Additionally, new Research Project Topics were identified, discussed and prioritised.

¹ An advisory committee to Forest and Wood Products Australia.

² FWPA, 2020. Research, development and extension priorities for native forest silviculture, 2020. Forest Wood Products Australia, Melbourne, Australia. Adapted from FWPA RDE Investment Plan – Native Forest Silviculture, prepared for FWPA by Author: John Hickey.

³ VicForests, Sustainable Timber Tasmania, Forestry Corporation of NSW, Queensland Department of Agriculture and Fisheries, Forest Products Commission (WA). Participant list in Appendix A.

⁴ Refers collectively to research, development and extension activities.

Outcomes

A draft of this report was reviewed by workshop participants and their comments were considered in finalisation of the report.

Outcomes of the workshop are set out in Tables 1 and 2.

Table 1: Prioritisation of existing RDE projects in the Native Forest Silviculture Investment Plan. Research Project Topics were scored High, Medium or relatively Lower priority.

Note that the 2018 scores were determined by an industry and researcher workshop and the 2022 scores were determined by native forest managers consulted as part of this review.

Ref	Code	Research Theme	Research Project Topics	2018 score	2022 score	Description in 2018 investment plan	Comments
1	1.1.1	Productivity	Commercial thinning guided by remote sensing	High	Medium	Commercial thinning is now a significant practice in NSW Tas, WA and Vic State native forests. • LiDAR and Digital Aerial Photography, and UAV and microsatellite technology offer great potential to better target thinning operations and record outcomes. • Remote sensing can reduce field-time of operations staff, improving efficiency and safety. • Containing costs of harvesting and monitoring, through better information on ground and stand conditions, will improve opportunities for better contractor management (ie compliance with silvicultural specifications – stems per ha and distribution of habitat elements) leading to better reporting/transparency. • Better selection of retained stems will improve future production of high value timber, and better forecasting of future yields. Anticipated gains: Cost savings	<p>Priority significantly reduced since 2018 in some states. In NSW following 2019-20 bushfires the issue remains a high priority, particularly for private native forests and forests that pose a bushfire threat to local communities.</p> <p>In NSW there is good coverage of LiDAR and Digital Aerial Photography however analysis has not yet occurred on private land.</p>
2	1.1.2	Productivity	Remote sensing regeneration success	Medium	High	There is a need to reduce cost and OHS issues associated with regeneration surveys. • LiDAR and Digital Aerial Photography, and UAV and microsatellite technology offer great potential to identify regeneration success. • Research is needed to develop the image analysis techniques and timing of imagery according to seasonal variation. • Most applicable for growers who routinely do regeneration surveys (FPC, STT, VicForests) Anticipated gains: Cost savings	<p>High priority for Tas, Vic, Qld, Lower priority for WA.</p> <p>Some success with high resolution UAV to date in NSW public forests. The selective nature of private native forests (PNF) may limit what can be achieved in NSW private forest. In NSW the value of the project is differentiating between regeneration success that is obvious and where it is doubtful. This can greatly assist with narrowing the target on ground survey area.</p> <p>Anticipated gains: Cost savings and safety improvements, reduce the area in need of on-ground assessment</p>

Ref	Code	Research Theme	Research Project Topics	2018 score	2022 score	Description in 2018 investment plan	Comments
3	1.1.3	Productivity	Integrated harvesting of high-graded forests Restoration of degraded production forests	Medium	Medium	<p>The need is most evident in Qld, where productivity levels could be lifted from <1 to 2 m³ /ha/y through better silviculture and development of markets for small wood (bioenergy, peelers, pulp).</p> <ul style="list-style-type: none"> • The project is also relevant to NSW private growers. • Research is needed to determine how much small wood can be harvested without depleting soil nutrients. • Appropriate silvicultural prescriptions need development to increase productivity and provide for retention of nutrients and coarse woody debris habitat. <p>Anticipated gains:</p> <ul style="list-style-type: none"> • Increased sawlog increments • Immediate revenue from residue sales 	<p>This research project is now of special interest to NSW and Qld and considered high priority for Qld private native forests. There, the scope would be expanded beyond integrated harvesting to collecting data and developing guidelines for restoring the productivity of degraded forests (e.g. by nurturing trees with future potential and limiting those with none). The research should examine the causes of the degradation including high-grading, inappropriate fire regimes, weeds and regeneration failures.</p> <p>Tools for managing the issue include harvesting, mechanical and chemical thinning, and fire.</p> <p>Additional anticipated gains:</p> <ul style="list-style-type: none"> • Bringing unproductive forests back into production • Greater ownership and commitment to the long-term management of forests for timber • Enhanced forest management knowledge and skills
4	1.1.4	Productivity	Options for improving jarrah productivity	High	NA	NA	No longer a priority due to policy change.
5	1.1.5	Productivity	Evaluation of previous productivity investments	Lower	NA	NA	No longer a priority.
6	1.1.6	Productivity	Understanding private native forest productivity and the needs of growers (blue aspect added in 2022)	Medium	Medium	<p>This project would seek to determine the values, aspirations and silvicultural preferences of private native forest growers. The focus of the project would be private native forest owners in Queensland, New South Wales and Tasmania which are the main sources of timber from private land.</p> <ul style="list-style-type: none"> • The State of the Forests Report 2018 indicated knowledge of private native forest owners' aspirations as a key gap in predicting wood flows from the private native forest estate. • Objectives for private native growers are different to public native forest growers and their attitudes and aspirations are important to maintaining a significant supply of forest products from the private forest estate. Anticipated gains: Increased knowledge for private native forest support agencies to provide assistance to encourage sustainable forest management 	<p>Focus revised in 2022. High priority for Qld and NSW via Local Land Services. Most inventory plots are in Spotted gum, which is only one of five forest types. Need to demonstrate understanding of productivity to justify harvesting under the Precautionary Principle. Considered interdependent and complimentary with 1.1.3 for Qld private native forests.</p>

Ref	Code	Research Theme	Research Project Topics	2018 score	2022 score	Description in 2018 investment plan	Comments
7	1.1.7	Productivity	Climate-adapted protocols for provenances and species	High	High	The effect of rising temperature is expected to cause species range shifts that are most likely to be southerly or to higher elevations. Native forest communities are likely to experience local extinctions and the introduction of new species and higher potential for diseases, weeds and pests as well as an increase in wildfire frequency that will increase tree mortality and, in young regenerating stands, jeopardise forest re-establishment. • Native forest growers use seed-zone systems to prescribe the use of on-site or in-zone seed for regeneration. However, climate change may well dictate that alternative provenances, and perhaps even 44 Project Title Key points alternative native forest species, are better matched to future site conditions. • This project would develop measures to improve provenance decision-making, including embedding provenance trials, developing dynamic, evidence-based provenance policies; and establishing stronger research-grower collaborations to facilitate the adoption of research outcomes. • This is most relevant to managing provenance selection for growers who apply broadcast sowing but is also relevant to growers who use supplementary planting as part of their regeneration treatments. Anticipated gains: Climate-adapted seed provenance protocols. Avoided losses.	University of Melbourne is working on Alpine Ash in NSW, Vic, ACT, Tas, modelling persistence of species in response to fire and climate change. Ongoing measurements for next two years. FWPA Capacity Building Program with UTas has a PhD project - <i>Improved provenance choice for native forest silviculture and management in the face of climate change</i> . Modifying the choice of seed sources to account for future climate is a major issue facing the managers of native Australian forests. Currently, most seed transfer guidelines are based on contemporary climate matching and the concept that 'local is best'. This project will look at new approaches that account for predicted climate change, along with potential tools for their implementation. Implications for interacting with regulatory systems and certification systems that prescribe management of provenance. Requires ongoing political support for industry to continue research.
8	1.1.8	Productivity	Decision support apps for harvest planning	Medium	NA	-	No longer a priority.
9	2.1.1	Sustainability	Guidelines for responsible recovery of timber from burnt forests	High	High	Bushfires have always been part of the forested landscape and may be increasing due to climate change. When areas designated for wood production are burnt efforts are usually made to recover the fire-damaged timber. The science literature by ecologists and hydrologists highlights the negative aspects of salvage logging, often without acknowledging the benefits. • Negative impacts of the salvage harvesting can be reduced with responsible operating procedures, including the retention of islands of less burnt forest. • The suitability of fire-damaged wood for particular uses (sawn, engineered wood products, pulp) needs to be better understood by growers and customers. A range of often-conflicting views on suitability are advanced by customers. While much has been learnt about timber properties and markets, very little of that knowledge has been made available to guide future salvage harvesting operations. • This project would engage a consultant or consultants researcher , to review all relevant literature and document what growers know, and what they need to know, about responsible	Project that consolidates past and current research into minimising environmental impact of harvesting in forests burnt by bushfires. Various technical reports exist, in relation to protecting regeneration and water quality, the contribution that dead trees make to species survival, and optimal patterns of forest retention. Of particular interest in Victoria. In NSW there is an opportunity to review the effectiveness and the economic impact of the site specific conditions that

Ref	Code	Research Theme	Research Project Topics	2018 score	2022 score	Description in 2018 investment plan	Comments
						salvage harvesting drawing on experiences from Victoria (2003, 2006, 2009 bushfires), WA (2015 and 2016 bushfires) and Tasmania (2016 and 2019 bushfires) and with particular reference to: OHS, habitat retention, water quality, market (wood quality and timing) and assisted regeneration requirements. The work should consider regulatory and certification requirements. Anticipated gains: Guidelines for responsible recovery of timber from burnt forests. Optimising salvage of burnt timber to markets.	were applied following the 2019-20 bushfires in State forest harvesting areas.
10	2.1.2	Sustainability	Coarse Woody Debris prescriptions for high residue removals	Medium	High	Coarse woody debris (CWD) is the standing and fallen dead wood in a forest and serves an important role in ecosystem functioning, especially as habitat for invertebrate fauna. <ul style="list-style-type: none"> • Studies in Tasmania, partly stimulated by potential biomass energy projects, indicated that CWD levels in wet eucalypt forests are very high. • Less is known about CWD levels and dynamics in dry forests. This project is a high priority for WA jarrah where prescribed burning may interact over time to deplete CWD retained at harvest events. • This project also has relevance to any native forests where a high level of residue removal is planned or undertaken. • This project would review data of CWD levels in harvested and unharvested forests for major commercial native forest types; establish additional plots where information is lacking; develop simple models to indicate CWD levels over time; and develop prescriptions for CWD retention where minimum retention levels would not otherwise be assured. Anticipated gains: Practical prescriptions for adequate CWD retention after harvesting where minimum retention levels would not otherwise be assured. 	This project topic should be addressed in association with ecological thinning (1.1.9). Victoria – major storm damage of forests highlighted a knowledge gap in this area. Tasmania – science needs revisiting as is 10-20 years old. No longer a priority for WA or NSW. Studies in NSW have demonstrated that harvesting enhances CWD levels well beyond natural levels. Consideration should also be given to researching the effect of harvesting residues on bushfire hazard.
11	2.1.3	Sustainability	National workshop on Long-term forest monitoring	Medium	Medium	Growers need to know how resilient their forests will be to harvesting, wildfires, disease and climate change, which requires long-term monitoring. They also need effectiveness monitoring to determine if their management actions are working (as per regulatory and certification requirements), particularly for threatened species. <ul style="list-style-type: none"> • Many agencies have an interest in long-term monitoring, but few are prepared to fund it (at least not without partners). The Terrestrial Ecological Research Network (TERN) Australia is the lead agency for fostering long-term research sites but needs contributors. • Growers could play a useful role by asking FWPA to facilitate and co-fund a national workshop to determine “What long-term monitoring worked, and what didn’t? How should we best go forward, given likely budgets and resources?” • The workshop should particularly consider monitoring outcomes and futures for the FORESTCHECK, Warra LTER and Victorian Silvicultural Systems projects. • Workshop presentations could be lodged on a website and a short synthesis of proceedings and recommendations should be prepared for FWPA and potential long-term site partners. Anticipated gains: <ul style="list-style-type: none"> • Increased awareness of, and commitment to, significant long-term monitoring efforts. 	Development of consistent monitoring methods, benchmarking, agreement on metrics to monitor. Potential link to Natural Capital Accounting methods. ABARES likely has a role. Cross-tenure monitoring will bring in other forest managers and avoid bias of focus on timber harvesting. The NSW government recently decided to cease funding of its Forest Monitoring & Improvement Program.

Ref	Code	Research Theme	Research Project Topics	2018 score	2022 score	Description in 2018 investment plan	Comments
						<ul style="list-style-type: none"> • Identification of cost-effective monitoring approaches to meet regulatory and certification requirements. 	
12	3.1.1	Social impact	Reduced reliance on clearfelling and burning	High	High	<p>Clearfelling with high intensity burning is now mainly confined to commercial wet eucalypt forests in Tasmania and Victoria with dense understoreys. Despite a marked reduction in clearfelling over the last two decades, and the inclusion of significant retention at the landscape level, the practice is still somewhat controversial. The smoke nuisance posed by high intensity burns, and concentrated in a narrow burning window in Autumn, is a significant social acceptance issue.</p> <ul style="list-style-type: none"> • Variable retention (VR) silviculture is a system developed as an alternative to clearfelling, and with the explicit goal of maintaining species, habitats and structural features at the stand level. About 200 ha per year of variable retention are currently applied annually, mainly in Tasmania (MPIGA and NFISC 2018). The silviculture is now reasonably well developed (Scott et al 2011) but difficult to implement. • More widespread adoption of VR is hampered by the difficulty of reducing high slash loads, primarily through burning, while maintaining patches of retained forest within harvest boundaries. • A program of continuing to reduce reliance on clearfelling and high-intensity burning whilst achieving regeneration of the forest is attractive because it addresses social and biodiversity concerns. • The most likely “game changer” for moving away from clearfelling and high-intensity burning to more socially acceptable systems (small-patch clearfells, VR or uneven-aged silviculture) would be strong markets for residues. This would allow slash-loads to be considerably reduced and burnt in small heaps under cooler conditions and over a much longer season. • While this project is fundamentally important, it is recommended that a large research program is not currently needed, at least until markets for residues, or alternative slash-busting technology, become available. However, two significant questions can be explored in 2019-2023 with moderate funding, as described below: <ul style="list-style-type: none"> • A. Understanding the importance of burnt seedbeds for long-term vigour of eucalypts. • B. Understanding the public’s preference for alternative silviculture approaches in forest landscapes. Anticipated gains: Clarification of the importance of burning for eucalypt productivity in the long-term. Better understanding of public preferences for alternatives. 	<p>Impact of smoke has notably created conflict in recent years.</p> <p>This research proposal is not applicable to NSW, QLD or WA.</p>
13	3.1.2	Social impact	Community engagement approaches for native forest growers	Lower	Lower	<p>A handbook was developed to guide community engagement for plantation managers (Dare, M., Schirmer J. & Vanclay, F. 2010. Handbook for operational community engagement within Australian plantation forest management).</p> <ul style="list-style-type: none"> • While some of the social issues are common between native forest and plantation growers, many are more prominent with native forestry, eg. around biodiversity, smoke management, use of public native forests. 	<p>This is an important issue in QLD, WA and Victoria where decisions have been made to phase out native forest harvesting. It is also an important issue in NSW where there are ongoing campaigns against timber production in native forests.</p>

Ref	Code	Research Theme	Research Project Topics	2018 score	2022 score	Description in 2018 investment plan	Comments
						<ul style="list-style-type: none"> This project would review community engagement approaches currently or potentially used by native forest growers, with a focus on increasing social acceptance as well as meeting certification and regulatory requirements. It would develop a handbook for operational community engagement for Australian native forest growers. Anticipated gains: A handbook for operational community engagement for Australian native forest growers 	
14	4.1.1	Capacity	Future silviculturists: NFS Interest Group and undergraduate support	Lower	NA	NA	Not considered a research topic
15	4.1.2	Capacity	Standardised silvicultural classification and terminology	Lower	NA	NA	Not considered a research topic
16	4.1.3	Capacity	Training materials (procedural manuals/videos/apps) for native forest growers, employees and contractors)	Lower	Medium	<p>Growers need employees and contractors to be trained sufficiently to achieve best outcomes for the forests they are growing, eg prescriptions for thinning. Growers are increasingly turning to technical training providers to train field foresters, eg in Certificate III in Forest Growing and Management.</p> <ul style="list-style-type: none"> Training providers need good materials on native forest silviculture to deliver effective training. This may include manuals and videos. This project would have two phases: 1. Engagement of an experienced silviculturist to liaise with public native forest growers, private native forest grower support agencies, universities and VET training providers to identify a prioritised list of current and potential training materials. 2. Development of new or revised training materials identified in phase 1 within budget constraints. <p>Anticipated gains:</p> <ul style="list-style-type: none"> A prioritised list of training material needs. At least one new or improved training material for each state by 2023. 	<p>States have training materials, some need to be specific to the state and regulatory framework but many don't.</p> <p>Most silvicultural training materials need to be tailored to forest types There is a strong need for this material to assist private native forest managers.</p>

Table 2: identification and prioritisation of new RDE projects that are to be added to the Native Forest Silviculture Investment Plan. Research Project Topics were scored High, Medium or relatively Lower priority.

Ref	Code	Research Theme	Research Project Topics	2022 score	Comments
16	1.1.9	Productivity/forest health	Ecological thinning of native forests with commercial outcomes through timber utilisation	High	WA Jarrah forests – public and private, Western Victoria Red gum and Box Ironbark forests, Qld forests
17	1.1.10	Productivity	LiDAR project to build on recent pilot undertaken by DPI NSW – Characterisation of native forest structural elements.	High	Very high priority for Qld resource assessment. High priority for NSW. Helicopter LiDAR worth exploring.
18	1.1.11	Productivity	Understanding and minimising ecological impacts of commercial forestry on threatened species	High	Important to understand cumulative impacts. Remote sensing (e.g. drones, LiDAR, eDNA, sensors (e.g. thermal, acoustic) for surveys of arboreal mammals and birds (e.g. Tasmania - wedgetail eagles, swift parrots, masked owls etc, Qld – koalas, greater gliders) and surveys of other threatened species.
19	1.1.12	Productivity	Better understanding of industry supply chains by private native forest owners.	Medium	Identified as a priority for WA private native forest owners, to enable them to participate in commercial negotiations more actively and equitably.
20	3.1.3	Social acceptance	Broad communication of forest practices and ecological conservation measures used in native forest management.	High	There may be a RD&E aspect and may also be a communications component. “Telling the native forestry story.”

Appendix A – Workshop Participants

Native Forest Silviculture Investment Plan review workshop attendees and their affiliations.

Attendee	Organization
Dean Williams	Sustainable Timber Tasmania
Suzette Weeding	Sustainable Timber Tasmania
Mike Sutton	Forest Corporation NSW
Kerrie Catchpoole	Queensland Department of Agriculture and Fisheries
Ben Fitzpatrick	VicForests
Bill Paul	VicForests
Islay Robertson	Forest Products Commission (WA)

Input was provided following the workshop by:

Attendee	Organization
Nick Cameron	North East NSW Forestry Hub
David Menzies	Private Forestry Service Queensland
Lachie McCaw	Forestry Australia