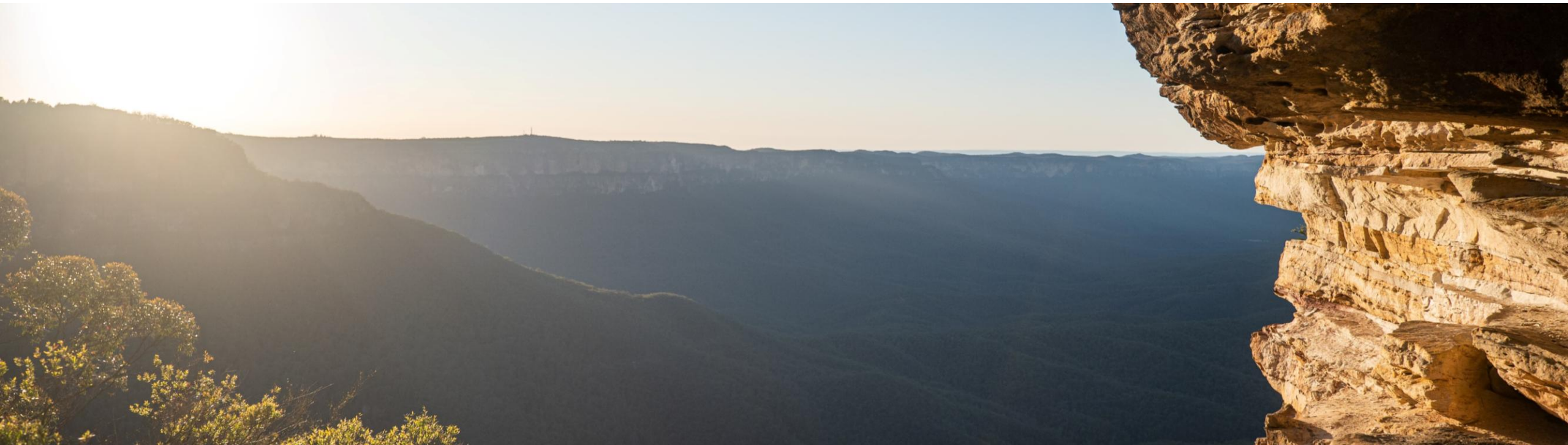


Mapping and evaluating the commercial suitability of the private native forest estates for timber production in northern and southern NSW, Australia

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Presentation Outline

Introduction

- Background & Objectives
- Assessment area

Private Native Forest Availability mapping

- Data
- Mapping exclusion areas
- Mapping Available PNF areas

Private Native Forest Suitability mapping

- Data
- Commercial & non-commercial PNF areas
- Mapping commercially suitable PNF areas (NHA)

Private Native Forest Property evaluation & ranking

- Property PNF evaluation parameters
- Ranking modelling parameters



Mapping and evaluating the commercial suitability of the private native forest estates for timber production in northern and southern NSW, Australia



Introduction

- ✓ Background & Objectives
- ✓ Assessment Area

Introduction (Background)

- Private native forestry (PNF) operations in NSW date back to early European settlement;
- Important role of the commercial timber production on private land in meeting the State's future hardwood needs;
- Ecologically sustainable forest management principles to help reduce Australia's growing reliance on timber imports;
- Very little assessment of PNF from a timber resource perspective;
- Geographic Information Systems (GIS) modelling capability enabled the efficient and cost-effective assessment of native forests on a broad scale.



Introduction (Objectives)

Develop a comprehensive multi-criteria methodology to:

- (1) map available private native forest for timber production;
- (2) map commercially suitable private native forest for timber production;
- (3) assess and rank private properties based on their commerciality and suitability for native timber production.



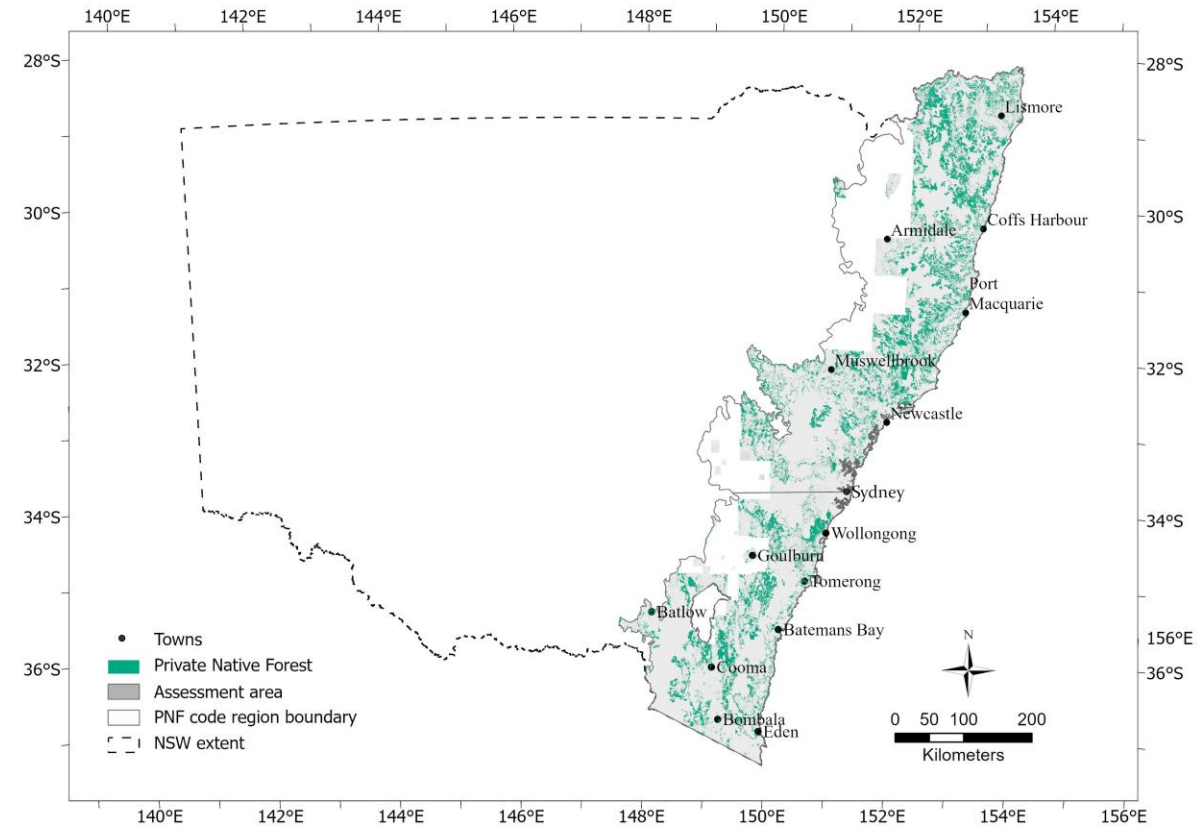
Introduction (Assessment Area)

Forested area:

- Covers 18.7 Mha of eastern NSW
- Includes 3.6 Mha of private native forest
- Covered by two PNF Codes of Practice regions
- LiDAR covered areas of the regions (in grey)

Climate:

- Diverse regime changes from cool temperate to sub-tropical, also includes some sub alpine areas (AdaptNSW, 2015)
- distinct rainfall patterns:
 - Northern: the highest rainfall in summer
 - Southern: the highest rainfall in winter



Assessment area

Mapping and evaluating the commercial suitability of the private native forest estates for timber production in northern and southern NSW, Australia



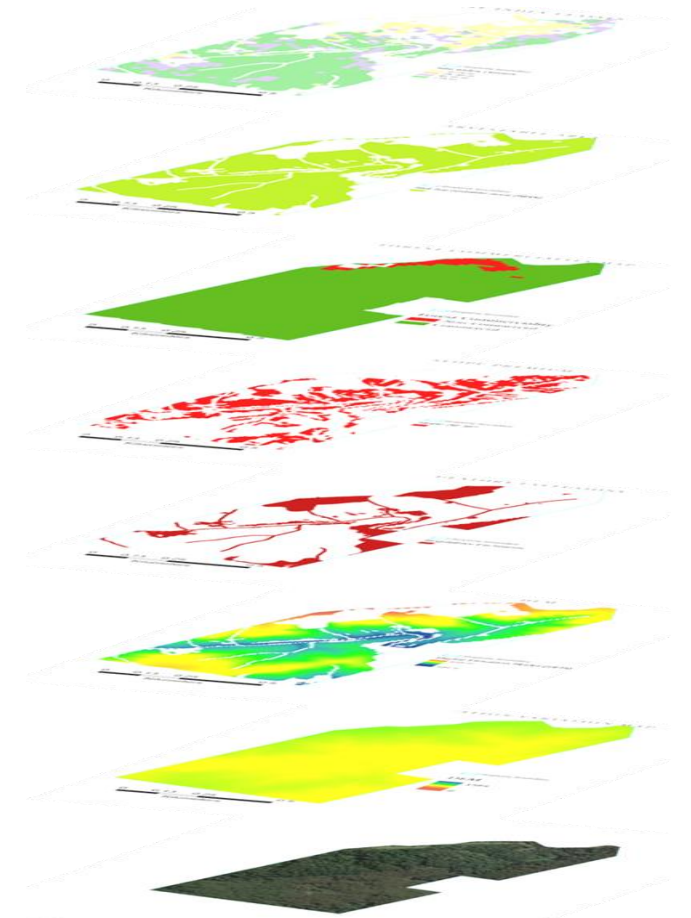
Mapping PNF availability for timber harvesting

- ✓ Data
- ✓ Mapping exclusion PNF areas
- ✓ Mapping Available PNF areas

Mapping available PNF (Data)

PNF Exclusion categories according to the LLS PNF codes of practice:

- Aboriginal areas and sites
- Conservation agreement areas
- Heathlands
- Heritage
- Offset & Biodiversity
- Old growth & Rainforests
- Remedial actions
- Riparian
- Soil conservation
- Swamps & Wetlands
- Threatened species: Fauna & Flora



Mapping available PNF (Data)

PNF Exclusion categories according to the LLS PNF codes of practice:

Regulatory Exclusions
Aboriginal
Indigenous Protected areas of Australia
Aboriginal Cultural Heritage - Archaeological Surveys
Aboriginal sites
Aboriginal places
Conservation agreement area
Conservation Agreements
Conservation Land Covenants NCT
Registered Property Agreement
Nature Conservation Trust
Heathlands
Heathlands
Heritage
State Heritage register centroids
World Heritage
Heritage State

Regulatory Exclusions
Offset
PVP offset incentive conservation
Plantation Retained
Biodiversity Certified
Biobanking Sites
Old Growth Forest
Old Growth
Rainforest
Rainforest
Littoral Rainforest2018
Remedial Action
Remedial Action
Riparian
Strahler all 5m riparian Exclusion
Prescribed Streams

Regulatory Exclusions
Rock
Rock
Soil conservation
Steep Slopes (> 30)
MassMovement
Coastal Sand Dune Protection
Swamps & wetlands
Important Wetlands
NSW Wetlands
SEPP Coastal Wetlands
Ramsar Wetlands

Regulatory Exclusions
Threatened species - animals
Koala Core Habitats
KPOM core Koala habitat
Threatened Fauna category 14
Threatened Fauna category 15
Threatened Fauna category16
Threatened Fauna category 17
Threatened Fauna category 18
Threatened Fauna category 19
Flora and Fauna Protection
Threatened species -plants
Critically Endangered Plants
Critically Endangered Ecological Communities
Threatened Flora Atlas Flora

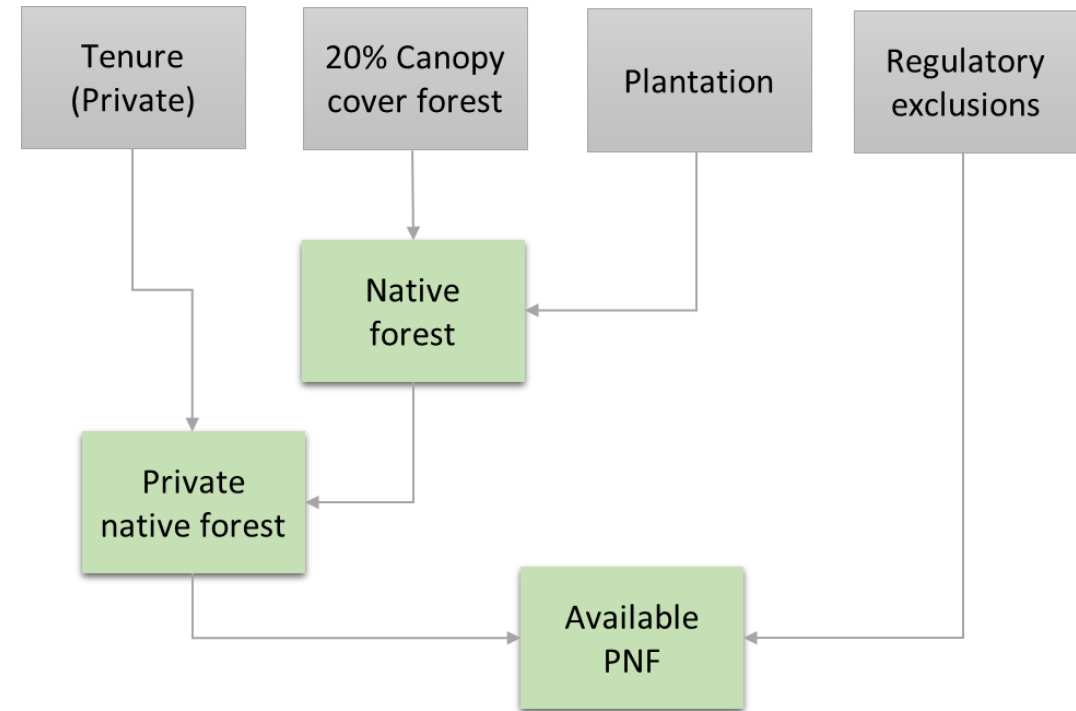
Mapping available PNF (Methods)

Potential available PNF areas for timber harvesting

- Create native forest layer using 20% canopy cover and plantation layers
- Private native forest layer using native forest and Private tenure layers
- Available private native forest for timber production using PNF exclusion mask layer and private native forest layer

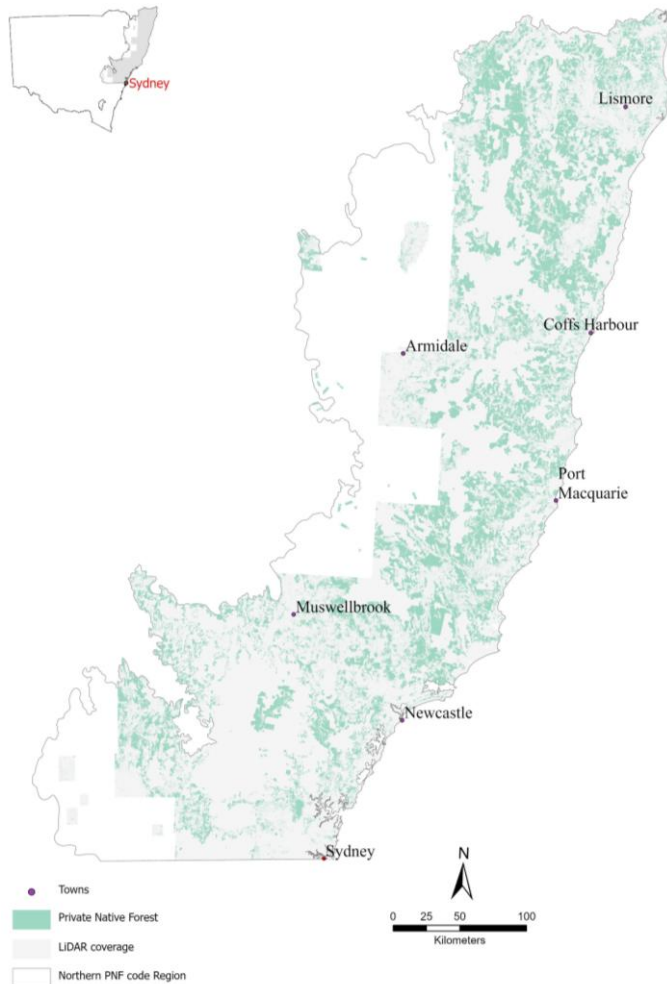
Data source:

- Canopy cover: data.gov.au (DCCEEW)
- Plantation: DPIRD Plantation unit
- Tenure: DPIRD forest science

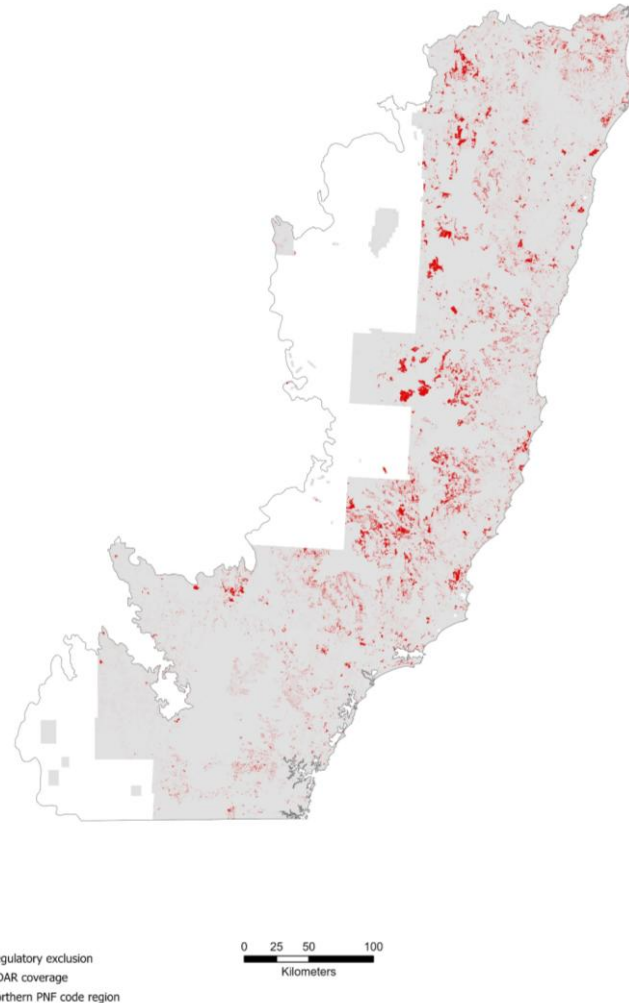


Simplified flowchart of mapping potential available PNF areas for timber harvesting

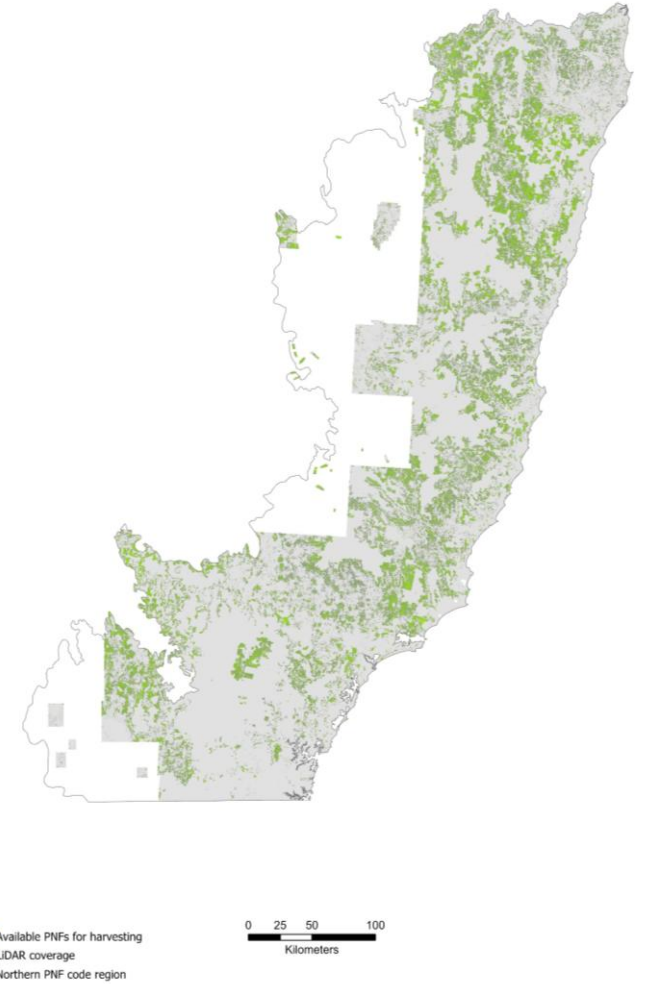
Mapping available PNF-Northern PNF code region (Results)



Gross PNF area (2.5 Mha)

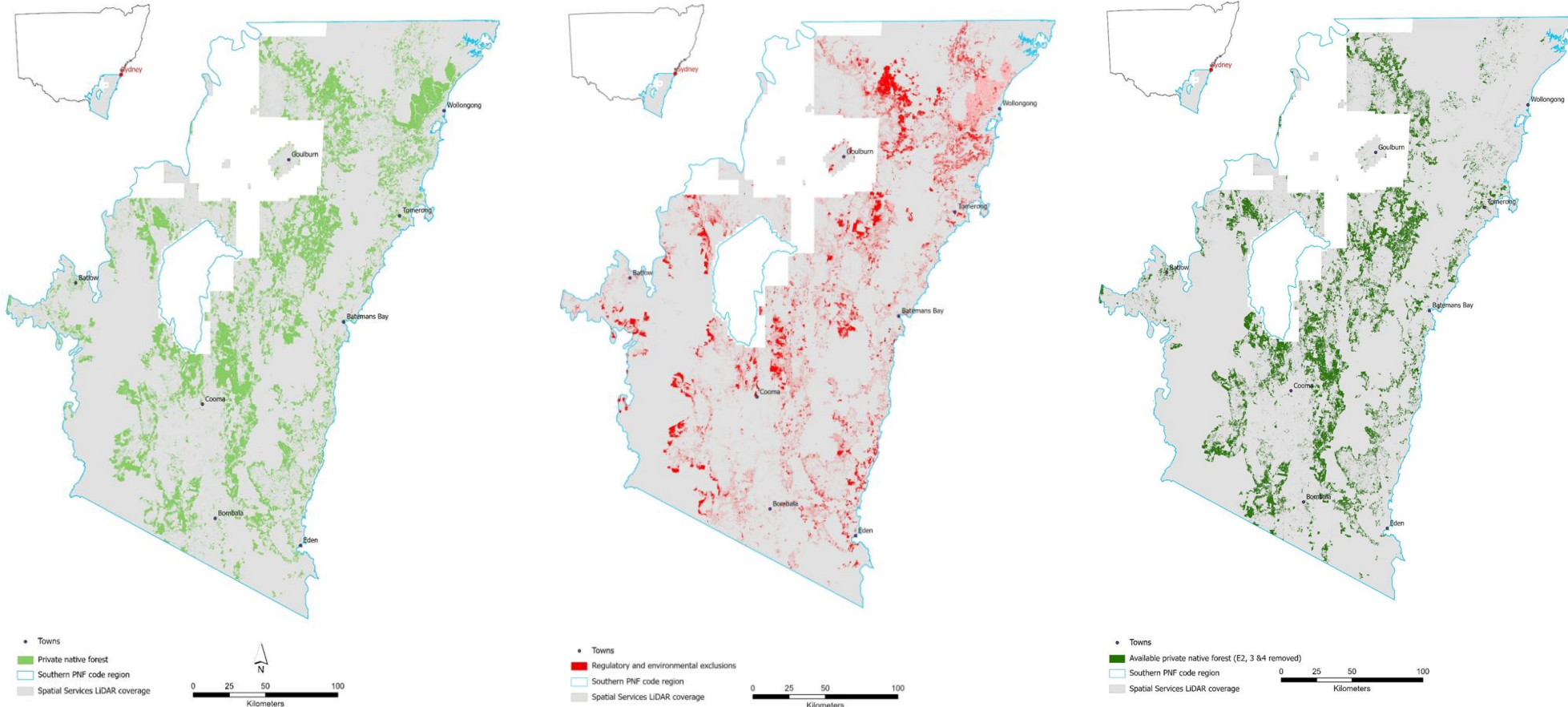


PNF Exclusion map (0.6 Mha)



Available PNF area (1.9 Mha)

Mapping available PNF-Southern PNF code region (Results)



Gross PNF area (1.1 Mha)

PNF Exclusion map (0.4 Mha)

Available PNF area (0.7 Mha)

✓ Overall, 72% of the assessed private native forests in Eastern NSW are available for timber production

Mapping PNF suitability for timber harvesting

- Data
- Commercial & non-commercial PNF areas
- Mapping commercially suitable PNF areas (NHA)

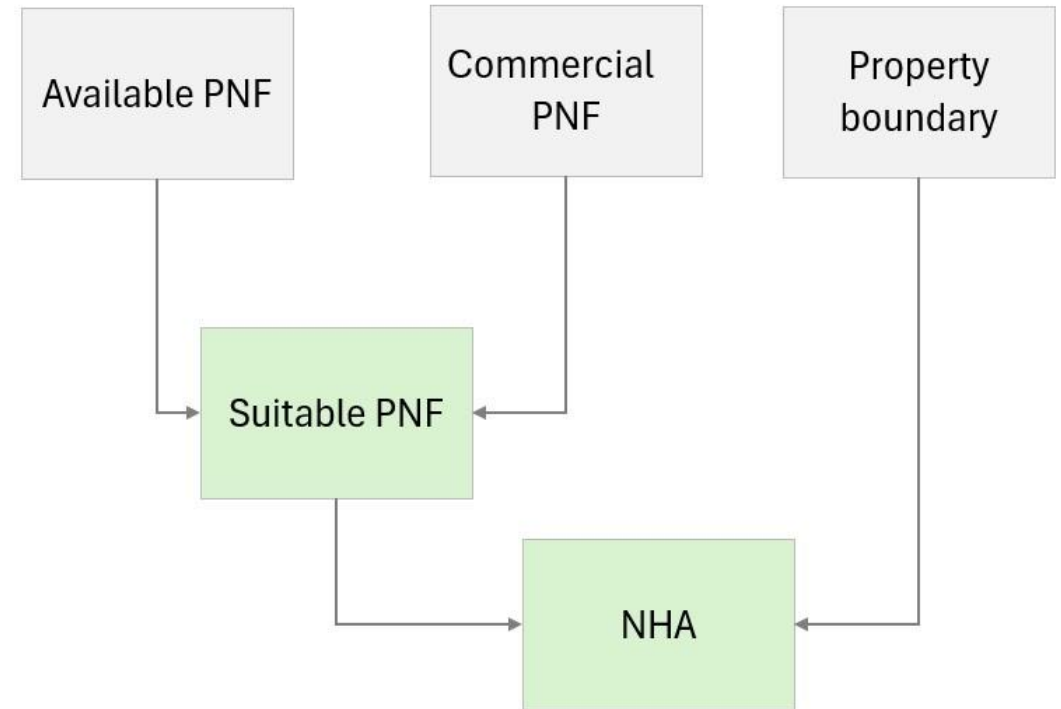
Mapping PNF suitability for timber harvesting (Data & Methods)

Datasets for mapping suitable PNF areas

- Available PNF
- Commercial & non-commercial forest (Kathuria, 2022)
- NSW cadastre (The NSW Spatial Collaboration Portal)

Method

- Exclude low quality or non-commercial private native forest
- Calculate suitable private native forest area
- Map net harvestable areas within the boundary of private properties
- Eligible property: property area ≥ 25 ha & NHA ≥ 15 ha



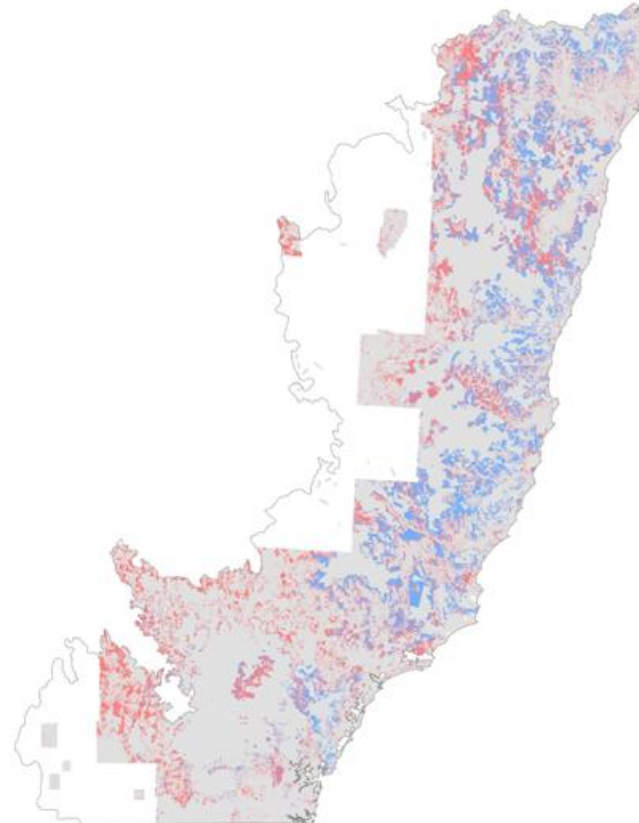
Simplified flowchart of mapping potential suitable PNF areas for timber harvesting

Mapping NHA-Northern PNF code region (Results)



Available PNFs for harvesting
LIDAR coverage
Northern PNF code region

Available PNF area (1.9 Mha)



Commercial PNFs
Non-commercial PNFs
LIDAR coverage
Northern PNF code region

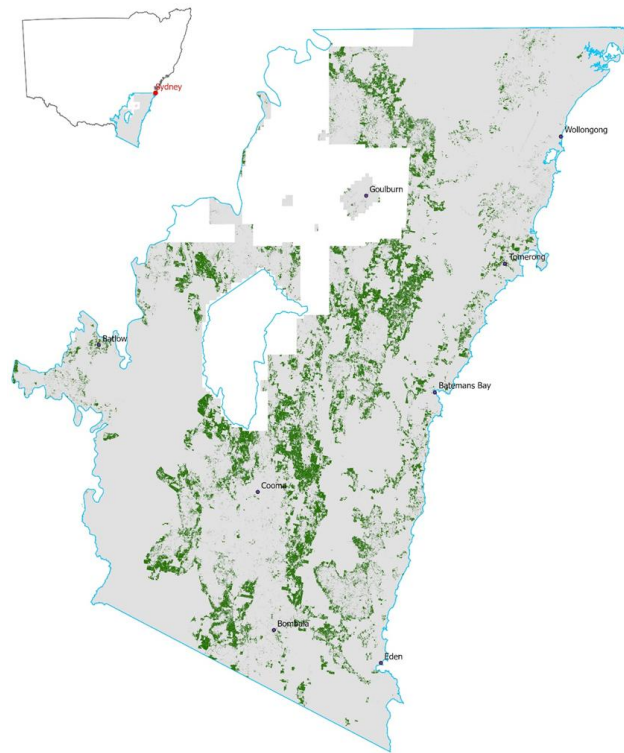
Non-Commercial (1.3 Mha)



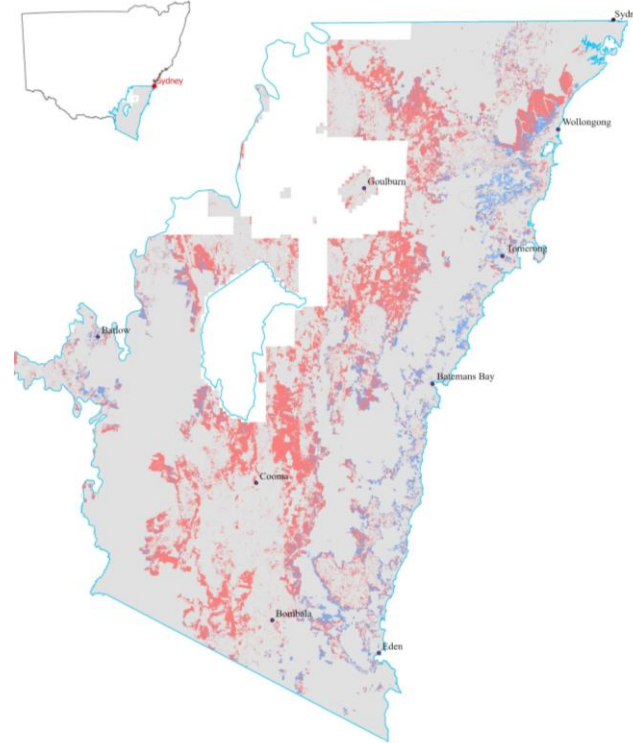
Suitable PNFs for harvesting (NHA)
LIDAR coverage
Northern PNF code region

*Suitable PNF area (0.6 Mha)
NHA (0.5 Mha)*

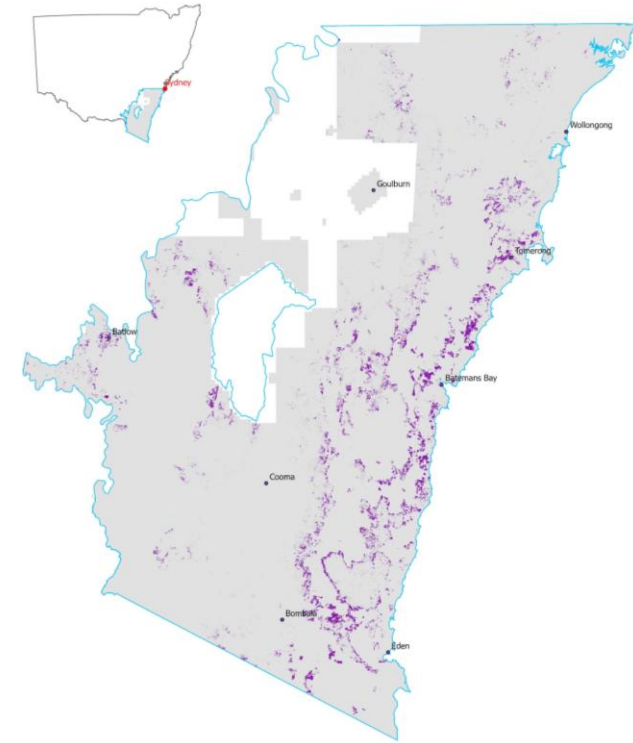
Mapping NHA-Southern PNF code region (Results)



Available PNF area (0.7 Mha)



Non-Commercial (0.6 Mha)



*Suitable PNF area (0.1 Mha)
NHA (0.08 Mha)*

- ✓ Overall, only 17% of the assessed private native forests in Eastern NSW are commercially suitable for timber production

Mapping and evaluating the commercial suitability of the private native forest estates for timber production in northern and southern NSW, Australia



PNF Property evaluation & ranking

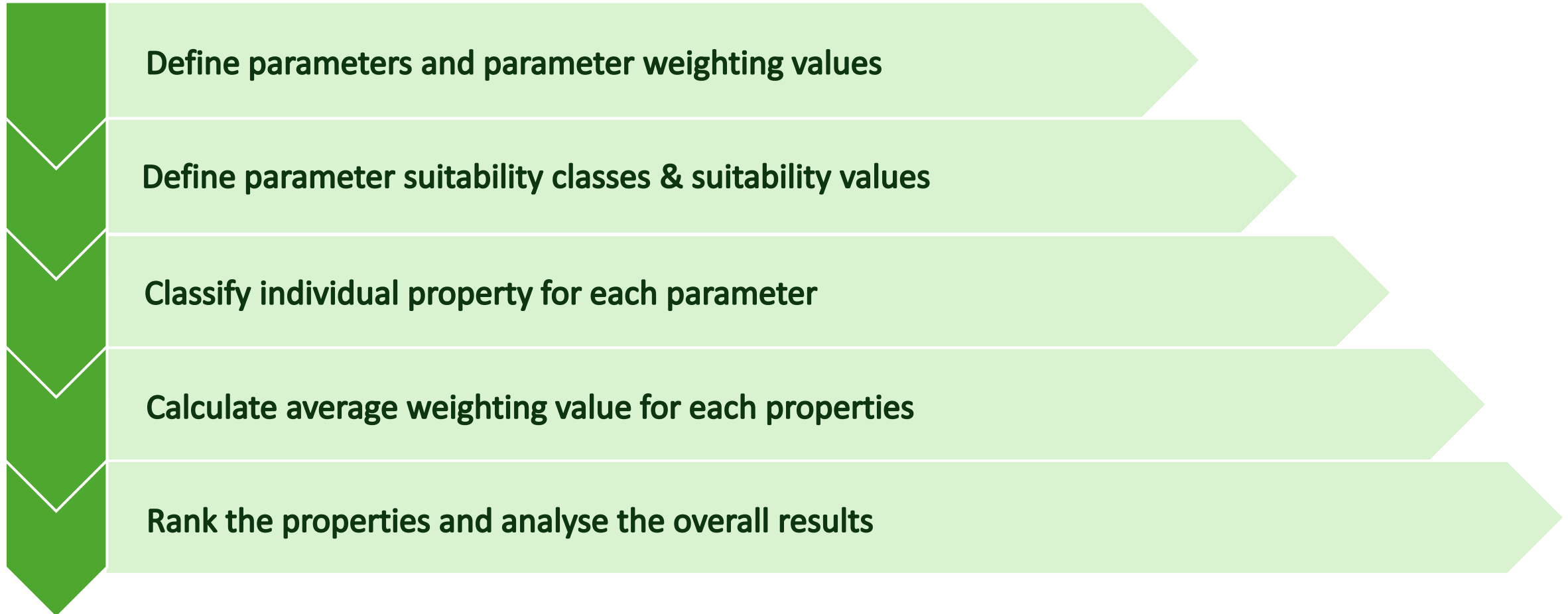
- ✓ Data
- ✓ Property evaluation parameters
- ✓ Weighting and combining modelling parameters

PNF Property evaluation and ranking (Data)

Datasets used for Property evaluation and ranking

- Net Harvestable Area: Mapped suitable areas for timber production within each private property
- Public roads: All public roads within 100 km from the PNF region's boundary (Spatial Services, 2020)
- Digital elevation model: Spatial Services LiDAR derive elevation data (NSW Spatial Services)
- Wood processing facilities: location coordinates of Southern and Northern NSW wood processing facilities (FCNSW & DPIRD Forest Carbon)
- Forest site quality: Modelled dataset to differentiate forests based on their productivity and timber yield potential (Kathuria, 2021)
- Forest Yield association group: Modelled forest yield association groups data to differentiate between preferred and non-preferred forest types for timber harvesting (Kathuria et al., 2023)
- LiDAR point cloud (NSW Spatial Services)

PNF Property evaluation and ranking (Methods)



PNF Property evaluation and ranking (Methods)

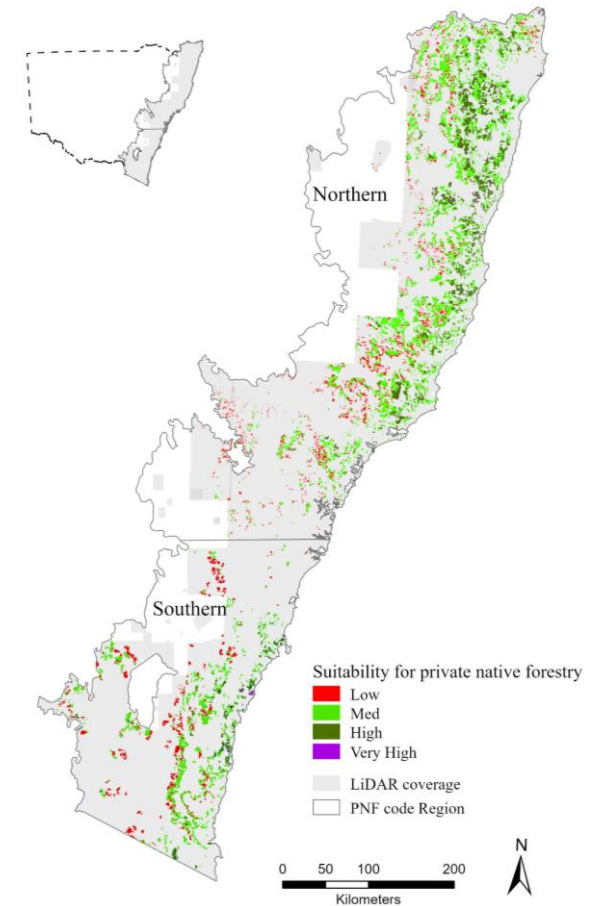
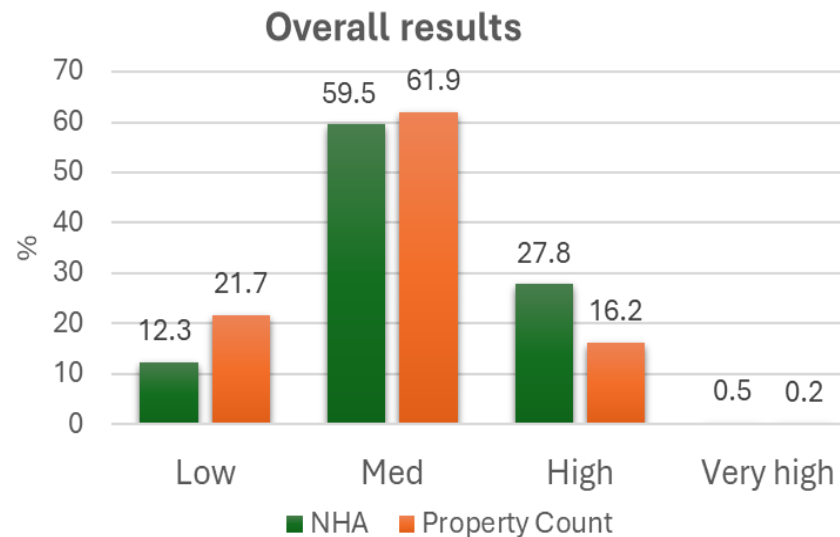
Parameters for evaluating eligible private properties for timber harvesting

Parameter name & Weighting	Parameter definition	SC: Very High SV: 4	High 3	Medium 2	Low 1
P1- Net harvestable area (NHA)- 20%	Size of NHA within the private property boundary	≥ 200 ha	≥ 100 to < 200 ha	≥ 50 to < 100 ha	≥ 15 to < 50 ha
P2- Distance by road to wood processing facility- 20%	Distance by road from property boundary to the closest wood processing facilities	< 15km	≥15 to < 25km	≥25 to < 50km	≥ 50km
P3- Slope premium- 10%	Proportion of land within the NHA with slopes between 20°- 30°	< 10%	10% - 25%	25% - 50%	50 - 100%
P4- Terrain roughness premium- 10%	Variability in elevation within forested areas of a property as a topographical accessing limiting factor	1st σ	2nd σ	3rd σ	>3rd σ
P5- Yield Association Group & species commerciality- 20%	Broad forest type mix within the NHA and the species commerciality	≥ 3.5	2.5 – 3.5	1.5 – 2.5	< 1.5
P6- Site Index model- 20%	Dominant mature tree height within the NHA	> 35m	30 - 35m	25 - 30m	≤ 25m

PNF Property evaluation and ranking (Results)

Overall results of property evaluation and ranking across the project area

- vast majority of the assessed private native forest is not commercially available and suitable for commercial timber production.
- Most of the assessed forests that are available and suitable do not score high in terms of their commercial suitability.



Suitability of private properties

Future work & Recommendations

- The methodology and results presented are based on projects conducted in 2020-2021 for the NPNF region and 2021-2023 for the SPNF region.
- The NSW PNF codes of practices were updated in May 2022, introducing new regulations and updating some existing ones. Any potential future PNF work should apply the new PNF codes of practices.
- Current work could be expanded to the Western NSW regions and River Red Gum PNF code of practice regions.



Thank you!
Any questions please?



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www.dpi.nsw.gov.au/forestry/science/forest-resources

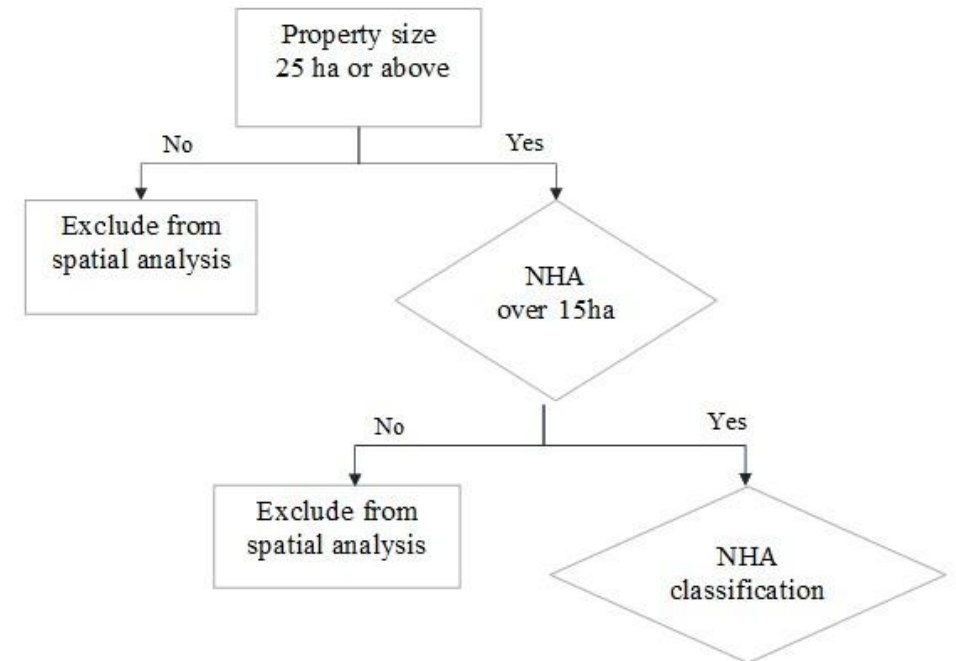




Mapping Suitable PNF (Methods)

Eligible property selection

- ✓ Criteria for eligible property selection: property area ≥ 25 ha & NHA ≥ 15 ha



Eligible property selection

PNF Property evaluation and ranking (Methods)

Yield Association Group

Northern and southern Yield Association Groups and the associated weighted commerciality classes and values as supplied by FCNSW

Weighted Commerciality class	Weighted Commerciality value	Northern YAG	Southern YAG
Very High	4	Coastal Eucalypts _ tall moist Blackbutt _ tall moist	Alpine Ash*
High	3	Spotted Gum _ tall moist Blackbutt _ semi- moist and taller dry Spotted Gum _ semi- moist and taller dry	Moist Coastal Spotted Gum
Medium	2	Tableland Eucalyptus _ tall moist Coastal Eucalyptus _ Semi-moist and taller dry Blackbutt _ dry Spotted Gum _ dry Tableland Eucalyptus _ Semi-moist and taller dry	Brown Barrel _ Messmate Coastal dry Silvertop Ash Yellow Stringybark _ Gum
Low	1	Vinery Scrub Coastal Eucalyptus _ dry Tableland Eucalyptus _ dry Swamp Sclerophyll	Negligible Productive Types Tableland Gum Peppermint
NA	NA	Rainforest	Rainforest