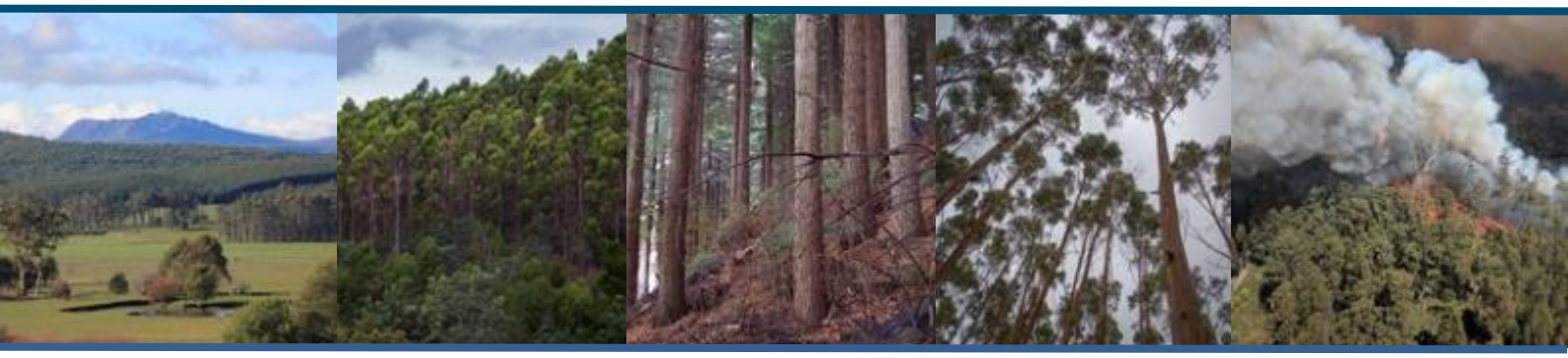
2020 Tasmanian Private Forests Resource Review:

A regional review of privately managed native and planted forest resources in Tasmania



Prepared on behalf of

Private Forests Tasmania

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19th December 2020

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Tree Alliance

Private Forests Tasmania

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In Memory of Emily

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Glossary

Dry Eucalypt Forest	Typically, eucalypt-dominated sclerophyll forest associated with water-limited or nutrient-limited conditions, and with an understorey (if present) of sclerophyll trees or shrubs. Ground cover can be bare, litter, grassy or heathy (ABARES, 2020). Within Tasmania, Dry Eucalypt Forest are distributed across low altitude and lower rainfall sites dominated by *Eucalyptus amygdalina* and *E. pulchella* vegetation communities.
EMG	Esk Mapping & GIS.
Enterprise Suitability Mapping	Classification of land suitable for growing farm tree species according to 4 suitability classes: "1.0 Well suited", "2.0 Suitable", "3.0 Moderately suitable", and "4.0 Unsuitable" based on modelled climatic, topographic and edaphic site factors. Developed by Department of Primary Industries, Parks Water and Environment, Tasmania in 2014 & 2015.
Forest Class	Stratification of native forest PI-Typing into classes that have broadly similar crown density, height and growth characteristics, and therefore are assumed to yield similar ranges of log product volume and mixes at harvest.
FPC	Forest Practices Code. A set of guidelines and standards to ensure that forest practices are conducted in a manner that provides for the long-term maintenance of the natural and cultural values of the forest. The code is legally enforceable under the *Forest Practices Act 1985* for both public and private forests.
GIS	Geographic Information System. A system for capturing, storing, analysing and managing data and associated attributes that are spatially referenced to the surface of the Earth (ABARES, 2020).
ha	Hectare. A unit of area measurement represented by a 100m-by-100m square, or 10 000 square metres.
Hardwood	Wood or wood products from flowering trees (broad-leaved tree species), such as eucalypts, irrespective of the physical hardness of the wood. Also refers to trees that have such wood, and plantations of such trees (ABARES, 2020).
Harvestable Volume	An estimate of the recoverable volume for a stand of trees that is currently available for harvest, which excludes the recoverable volume from any trees that need to be retained for FPC requirements.
Industrial-scale forest	Large tracts of forests owned by institutional investors within a single managed estate (typically more than 10,000 hectares of forest in aggregate) are termed 'industrial-scale' within this document.
LiDAR	Light Detection And Ranging. LiDAR is a remote sensing method that uses light in the form of a pulsed laser to measure ranges (variable distances) to objects on the earth.
Native Forest	Forest types dominated by the suite of native tree species naturally associated with forest in that location and located within their natural range (ABARES, 2020). Eucalypt species dominate the private native forests harvested and regenerated within Tasmania.
Other Woody Biomass	'Other Woody Biomass' is harvestable and extractable wood typically of insufficient quality to be used as Sawlog, Pulplog, etc but which may have use as biofuels, bioenergy production, etc.
Peeler Log	A log suitable for rotary peeling to produce veneer. Excludes veneer logs used to produce sliced veneer (ABARES, 2020).

PFT	Private Forests Tasmania.
PID	Property ID, a unique identifier used to group land titles with a common landowner. Used in this modelling exercise to represent a discretely managed property/land holding.
PI-Type Mapping	Photo-interpretation type mapping is mapping of forests from high resolution aerial photographs via stereoscopic examination, providing a three-dimensional view of the forest canopy. Areas of forest are mapped into polygon boundaries, primarily based on natural features or obvious changes in forest structure. Polygons are generally at least three hectares in size. Each polygon is assessed for a number of attributes, including, tree height class (m), stocking class (% tree crown cover) and the presence and density of mature crowns. Refer: Tasforests Volume 10 (M.G. Stone, Forestry Tasmania, 1998).
PTR	Private Timber Reserve. An area of private land set aside for forestry purposes and registered on the title (Private Forests Tasmania, 2020).
Pulplog	A log harvested from a plantation or native forest stand that does not meet sawlog quality specifications and is designated to produce pulpwood (ABARES, 2020).
Sawlog	Log used to manufacture sawn timber. High-quality sawlogs are sawlogs meeting specified size and grade specifications (including the amount of permissible defect). Low-quality sawlogs are sawlogs not meeting high-quality sawlog specifications (ABARES, 2020).
Softwood	Wood or wood products from conifers, irrespective of the physical softness of the wood. Also refers to trees that have such wood, and plantations of such trees (ABARES, 2020).
t	Metric tonne. Specifically, green metric tonnes in this document unless otherwise specified.
TASVEG 4.0	A digital map describing distribution of vegetation communities across Tasmania (Department of Primary Industries, Parks, Water and Environment, 2020).
Recoverable Volume	An estimate of the utilisable volume of above ground wood that is available for extraction from a tree during on-site processing (i.e. excludes stump, branches & tip).
Veneer Log	A log suitable for producing sliced veneer sheets. Excludes peeler logs used to produce rotary-peeled veneer (ABARES, 2020).
Wet Eucalypt Forest	Typically, eucalypt-dominated sclerophyll forest (not dry forest or rainforest) associated with moist (mesic) conditions, and with an understorey (if present) dominated or co-dominated by rainforest species or non-sclerophyll shrubs (ABARES, 2020). Within Tasmania, Wet Eucalypt Forests are distributed across low altitude and higher rainfall sites dominated by *Eucalyptus regnans, E. globulus, E. viminalis* and *E. obliqua* vegetation communities.
White Top Eucalypt Forests	Within Tasmania, Wet Eucalypt Forests that are distributed across high altitude are termed 'White Top Eucalypt Forests' and are dominated by *Eucalyptus delegatensis* and *E. dalrympleana* communities, 'White Top' being the local Tasmanian name for *E. delegatensis*. These are also termed 'High Altitude Eucalypt Forests'.

1 Executive Summary

1.1 Overview

Tasmania's privately managed forest estate is currently comprised of some 858,000ha of native forest, 177,000ha of hardwood plantation and 74,000ha of softwood plantation, which in total makes up approximately 16% of the total land in Tasmania (6.8Mha).

Of the privately managed plantation resources in Tasmania, some 206,000ha (82%) are managed within industrial-scale estates owned by institutional investors across a mix of private and public lands.

The 46,000ha of plantation resources managed by the independent landowners are confined to private freehold land and are distributed across some 2,600 individual land holdings, about half of these possessing more than 2ha of plantation. 32,000ha (69%) of the private independent plantations were planted in the 2006-2010 period under managed investment schemes that were active at the time. Another 6,000ha (14%) were planted in the 2001-2005 period, the remainder spread intermittently across all periods back to the 1960's and forward to current.

Conversely for private native forests, the vast majority, some 93% (785,000ha), is distributed across over 37,000 individual land holdings on private freehold land managed by independent landowners, though only 12,000 of these properties possess more than 5ha of forest.

This private independent native forest resource is generally available for harvest under the guidelines of the Forest Practices Code (Forest Practices Board, 2020), but the sheer number of land holdings across which it is distributed, and the myriad of landowner perspectives on their specific intentions for such forests make it a difficult resource to quantify in terms of likely harvest year on year. The remaining privately managed native forests on industrial-scale estates are typically excluded from harvest, contributing to ecosystem maintenance and related conservation values across their estate.

1.2 Private Industrial-Scale Forests

There is some 73,000ha of privately managed native forests on industrial-scale estates across Tasmania, all of which are typically excluded from harvest, contributing to ecosystem maintenance and related conservation values across their estate.

Of the 206,000ha of private industrial-scale plantation estate 63% is managed on private freehold land, the other 37% on public land. 140,000ha is hardwood plantation, predominantly of the species *Eucalyptus nitens*. The 66,000ha of softwood plantation is predominantly *Pinus radiata*.

The private companies that manage forest at an industrial-scale have their own experienced management & resource modelling teams, and typically have dedicated markets or are vertically integrated within aligned processing facilities. They are best approached directly for investment

opportunities or stakeholder consultation. As such these industrial estate forests are not the focus of this report and the regional industrial-scale plantation areas are provided for context only.

1.3 Private Independent Native Forest

Aggregation of the 785,000ha of private independently managed native forest into Forest Classes reveals 284,000ha of Mature Eucalypt Forest and 288,000ha of Regrowth Eucalypt Forest have the height, crown density and quality to produce sufficient log products for commercial harvest across Tasmania. There is also 32,000ha of Non-Eucalypt Forest that has some commercial potential. The remaining 182,000ha was estimated to not have any current commercial potential in this review, a small portion of which is Regenerating Eucalypt and will become available in future as it reaches Regrowth stage.

The harvesting and regeneration of the Low Quality Mature Eucalypt Forest and Low Quality Regrowth Eucalypt Forest (height growth potential less than 27m) has historically been problematic with respect to regeneration after harvesting as the harsher site conditions in which they are distributed leads to generally higher rates of mortality, even if a good seed germination is achieved initially.

Of the 604,000ha of forest viable for commercial harvest only 328,000ha has been estimated to be available for harvest after legislated restrictions on harvesting were accounted for in the model. This available area has been estimated to carry up to 51M tonnes of standing harvestable timber, distributed across Mature Eucalypt Forest (26.6Mt), Regrowth Eucalypt Forest (21.8Mt) and Non-Eucalypt Forest (2.6Mt).

Presence of a PTR on native forest is a clear indication that part or all the forest within is intended for harvesting. Any forest situated under a PTR that is harvested must be reforested to fully stocked forest if that PTR is still present at the time the Forest Practices Plan is certified. The 604,000ha described above is spread across some 7,000 individual land holdings but only 128,000ha (18%) is covered by a PTR, suggesting low intent to harvest by the bulk of landowners possessing forest on their properties. Similarly, of the 329,000ha modelled as available for harvest, 67,000ha (20%) is under PTR.

The modelling used to prepare this report provides standing timber estimations, area discount and harvesting assumptions to calculate available area and volume at a regional level and are unlikely to reflect actual local conditions for any given forest or property at an operational level. Due diligence into the need for additional operational discounts should be considered in conjunction with this report before any significant investment or planning decisions are relied upon from the figures in this report.

1.4 Private Independent Hardwood Plantation

There is some 37,000ha of private independently managed hardwood plantation currently standing within Tasmania, 97% of which is *Eucalyptus nitens*, 2% of which is *E. globulus* and the remaining 1% a mix of other eucalypt and non-eucalypt species.

The resource is well distributed across all wood catchments, excepting the South West, and is dominated by the 2006-2010 and 2001-2005 age classes. Much of the areas planted on very low rainfall sites within these age classes have failed and been converted to grazing land, so do not form part of this review.

Based on Enterprise Suitability Mapping, a reasonable proportion of the *E. nitens* plantations in these age classes in the North East and North Central are on 'Well Suited' and 'Suitable' sites, whereas those in the South Central and South East are predominantly on 'Moderately Suitable' to 'Unsuitable' sites.

High level harvest simulation suggests there will be approximately 5Mt of harvestable clear fell volume available from the standing resource at the time of harvest over the next 20 years.

Forests under a PTR that are harvested must be reforested to fully stocked forest if that PTR is still present at the time the Forest Practices Plan is active. The private independent hardwood resource is distributed across 2,248 individual properties and only 51% of the plantation area is currently covered by a PTR, a consistent trend for most wood catchments. Similarly, of the total area harvested since 2015 only 46% of the fallow area currently has a PTR. The conclusion from these statistics is that only half of this resource at best is likely to be replanted into the future if this trend continues.

1.5 Private Independent Softwood Plantation

There is 8,000ha of private independently managed softwood plantation currently standing within Tasmania of which 100% is essentially *Pinus radiata*. The only exception recorded by PFT being 28ha of *Cupressus spp*. distributed in small 1 to 8ha stands across the north of the state.

Most of the resource is situated in the North East and North Central wood catchments, and dominated by the 2006-2010 age class, which will be approaching optimal thinning age soon if not now, a valuable opportunity to add value to this resource. Based on Enterprise Suitability Mapping 90% of the *P. radiata* plantations in this age classes are on 'Well Suited' and 'Suitable' sites.

High level harvest simulation suggests there will be approximately 3Mt of harvestable volume available from the standing resource at time of harvest over the next 20 years, the mix of sawlog and pulplog (or other products) dependent on the specific silvicultural regime applied to each stand.

There is an opportunity to add value to the resource over the next 5-10 years by way of thinning to generate larger sawlogs of hopefully higher value at final harvest age. The challenge is to sell the 200,000t or so of pulp logs that will be generated to achieve this thinning in a cost-effective manner,

the traditional pine pulp market being the mill at New Norfolk which is considerable distance from most of this resource.

Like the privately managed hardwood plantations, only 54% of the private independently managed softwood plantation area is currently covered by a PTR, and only 37% of the area fallow since 2015 has a PTR suggesting that less than a half of this resource is likely to be replanted if this trend continues.

2 Introduction

The *2020 Tasmanian Private Forests Resource Review* forms part of *Private Forest Tasmania's* 5-yearly legislated reporting obligations and is designed to address information requirements to inform stakeholders and potential processors of the availability and distribution of private forest resource across Tasmania. This report does not attempt to review the state of forest ecosystem maintenance, biodiversity or other natural values and such information can be accessed from documents such as the State of the Forests Tasmania 2017 (Forest Practices Authority, 2017). Rather this report is designed to provide the reader with access to statistics on timber availability, condition, and distribution across Tasmania to support forestry-related activity.

The *2020 Tasmanian Private Forest Resource Review* describes the privately managed forest resource estate, including all native and planted forests on private land and those forests on public land managed by private interests. All forests managed directly by Sustainable Timbers Tasmania are excluded from this review.

The private companies that manage forest at an industrial-scale have their own experienced management & resource modelling teams, and typically have dedicated markets or are vertically integrated within aligned processing facilities, meaning that they are best approached directly for investment opportunities or stakeholder consultation. As such these industrial estate forests are not the focus of this report. A summary of their distribution across Tasmania is included to provide context for the independently managed forests, which are the primary focus of the *2020 Tasmanian Private Forest Resource Review*.

This report provides an overview of the resource at the state-wide level, but also provides more detail for 6 'wood catchments', as shown to the right.

Figure 1: Map of Wood Catchment Boundaries

3 Data Currency

The primary source of area and volume estimation reported in this document is derived from digital photo-interpreted type mapping (PI-Types[1]) – these are coded descriptions of forest vegetation structure and geographic shape, historically interpreted by hand from stereo pair aerial photography.

The private PI-Type (PRIPIT) GIS database managed by Private Forests Tasmania (PFT) was initially mapped out in the mid 1990's. An annual update program has been completed by PFT to ensure areas of significant change in the PRIPIT dataset have been kept current, and the PRIPIT dataset used in the resource review was current as at the 31st December 2019.

The methodology and source of mapping updates has changed over the years but is predominantly based on acquisition of recent imagery which is then georeferenced such that boundaries of forest change can be mapped within a geographic information system (GIS), and PI-Type density classes adjusted accordingly. Over the last 5 years, aerial and satellite imagery has become much more accurate and more readily available, sourced via online mapping services such as freely available government providers like the LIST, and commercial services. However, the inability to extract height information from this imagery has meant that the PI-Type height information has not been updated, which is becoming a significant issue for the native forest estate, given adjustments to compensate for growth since the 1990's have not been incorporated into resource estimation. For plantations, their homogenous nature and well researched growth habit means that height projections at any given age for a site of known quality can be reasonably well estimated based on their age. The development of LiDAR (light detection and ranging) has been a likely technology to overcome this deficiency in updating native forest height estimates but has not yet been flown across the entire privately managed private native forest estate.

The following sections describe in more detail the methodology by which the PRIPIT datasets are maintained to ensure currency.

[1] Refer (M.G. Stone, Forestry Tasmania, 1998) for more details on PI-Type forest structure mapping.

3.1 Native Forest Updates

Each year PFT access from the Forest Practices Authority the geographic coordinates of active Forest Practices Plans (FPP's) to source the imagery from which change in forest PI-Types can be mapped post-harvest. Similarly, annual vegetation change detection analysis derived from Landsat imagery is supplied annually by DPIPWE and this provides specific areas that can be targeted to remap natural and man-made disturbance or reforestation events. This remapping primarily targets changes in crown density, essentially addition or removal of forest cover, either completely in the form of clearing to pasture, temporarily in the form of clear fell harvest and reforestation activity (the regrowing forests being updated in subsequent years when they are of sufficient crown size to be detected in imagery), or partially in the form of thinning or selective harvest operations. No attempt at updating height classifications has been attempted on the original PRIPIT data since the 1990's, as such there is some conservativeness built into the derived volume estimates in terms of growth, particularly in older regrowth forests where growth rates are likely to be higher than mature forest.

Major disturbance events are treated as one-off mapping projects. For example, the 2018/19 fire boundaries were supplied by Tas Fire Service, and comparing Landsat satellite imagery (30m resolution) before and after the fire, PFT used a Normalised Burn Ratio (NBR) analysis of Infrared and Near-Infrared bands to determine the severity of the fires, and updated PRIPIT accordingly where moderate to severe damage was identified (i.e. current forest structure was too damaged for harvest).

The 2011 LiDAR program flown by Forestry Tasmania covered nearly half of the private native forest estate and has recently been analysed by PFT into PI-Type height and density classes. This data will be used to validate PRIPIT remapping into the future. As this derived product does not cover the entire PRIPIT dataset it is not planned at this stage to be used to replace the original PI-typing in bulk where it overlaps, to avoid inconsistent interpretation between sites by those that use it day to day. It is hoped that at some future point the entire private native forest estate will be covered by LiDAR such that the original 1990's PI-Types can be updated completely to better reflect growth and loss over the period.

3.2 Private Independent Plantations

PFT subscribe to a third-party service providing access to high resolution (50cm) satellite imagery captured within 1-2 weeks of the 31st of December for the current remapping program and in conjunction with the FPP plan location information to provide context, PFT review current imagery for each plantation within the 'private independent estate' to confirm if harvesting has been completed, and in subsequent years, if reforestation has occurred, and remap PRIPIT accordingly.

3.3 Private Industrial-Scale Plantations

A GIS layer of the Private Industrial-Scale Plantations data is provided annually direct from each of the forest management companies under data licence agreement and is made available for use in these types of reporting only under tight restrictions to avoid any loss of confidentiality.

4 Forest Modelling

The general approach to modelling is described briefly in the following two sub-sections but an accompanying document describes in detail the models built to populate the maps, figures and tables reported in this document. Refer *2020 Tasmanian Private Forests Resource Review - Modelling Documentation - Esk Mapping & GIS*.

4.1 Private Independent Native Forest Model

A state-wide GIS-based resource model was constructed for the Private Independent Native Forest Estate using the following key inputs:

1. Forest description (area, dominant forest species & structure) generated from PI-Types classified into Forest Classes (aggregation by yield) and Forest Types (aggregation by regenerative requirements)
2. Application of discounts to harvest area as required under the Forest Practices Code (Forest Practices Board, 2020) were made to account for maintenance of:
    a. Regeneration after harvest
    b. Soil quality
    c. Water quality
    d. Threatened Species habitat
    e. Threatened Vegetation Communities
    f. Geomorphology
    g. Cultural Heritage values, and
    h. Visual Landscape values
3. Removal of areas legislated as covenants or reserves from harvestable area
4. Removal of areas identified as having moderate to severe damage in the 2018/19 fires, based on a Normalised Burn Ratio (NBR) analysis of Infrared and Near-Infrared bands from satellite imagery
5. Yield Tables describing recoverable volume by Forest Class by Log Products (Pulplog, Industrial Grade Peeler, Sawlog & Appearance Grade Veneer) were developed and applied to the above to estimate net standing harvestable volume
6. Property information to determine economies of scale for individual forest owners
7. Presence or absence of Private Timber Reserves to assist with understanding of landowner harvest and reforestation intent
8. Key market infrastructure locations against which road-based cartage distance calculations were generated
9. Road network
10. Wood catchment boundaries against which metrics of area, volume and distance to market were analysed.

Forest Classes are aggregates of PI-Typing based on similar height and crown density structure against which estimates of log product volumes ('yield tables') can be assigned to build up a summary of the amount and distribution of likely harvestable volume across the estate. Refer appendix 12.1 for details.

Forest Types were developed to describe the interaction between the 'Forest Class' Model and the regenerative characteristics of the forest (defined by dominant eucalypt and non-eucalypt TASVEG 4.0 vegetation community). The regenerative characteristics of a forest dictate the optimum harvesting regime to be applied to ensure successful regeneration post-harvest, which in turn drives the actual volume of wood that can be extracted in the next harvest event, acting as a discount to the standing yield available for a given location. All modelling of native forests assumed that regeneration would occur after harvesting – no permanent clearing of forests was assumed.

Four commercial Forest Types were modelled:

- White Top Eucalypt Forest: generally high-altitude forests dominated by *Eucalyptus delegatensis* and *E. dalrympleana* communities
- Dry Eucalypt Forest: generally low-altitude and lower rainfall forests dominated by *Eucalyptus amygdalina* and *E. pulchella* communities
- Wet Eucalypt Forest: generally low altitude and higher rainfall forests dominated by *Eucalyptus regnans, E. globulus, E. viminalis* and *E. obliqua* vegetation communities
- Non-Eucalypt Forest: all commercial non-eucalypt vegetation communities dominated by *Acacia spp*. and *Leptospermum spp.*, with some limited *Nothofagus spp*.

4.2 Private Independent Plantation

A state-wide GIS-based resource model was constructed for the Private Independent Plantation Estate using the following key inputs:

1. Forest description (area & age) by softwood and hardwood types
2. Site productivity was modelled using the Enterprise Suitability Mapping
3. Area discounts to account for the loss of trees or parts of the forest over time due to factors such as insect damage and wind throw, and elevated mortality on poorer sites where growing conditions are limited
4. Yield Tables describing recoverable volume by Log Products by Age were developed and applied based on site suitability to estimate harvestable log product volume at age of harvest
5. Property information to determine economies of scale for individual plantation owners
6. Presence or absence of Private Timber Reserves to assist with understanding of landowner intent in terms of reforestation of currently fallow plantations
7. Key market infrastructure locations to produce road-based cartage distance calculations
8. Road network
9. Wood catchment boundaries for regional reporting purposes.

The Enterprise Suitability Mapping used as a proxy for plantation site productivity in this review was originally developed for cropping species based on digital soil mapping work carried out in 2014 and 2015 by DPIPWE (Kidd D. , Webb, Malone, Minasny, & McBratney, 2015), (Kidd D. B., et al., 2014), (Webb, et al., 2014). This mapping was applied to plantation tree species by DPIPWE based on research conducted by Private Forests Tasmania, CSIRO and The University of Tasmania, and supported by the Agrivision 2050 initiative of the Tasmanian Government.

The Enterprise Suitability Mapping was not designed to predict growth potential for a given species on a site, rather to classify land suitable for growing farm tree species according to 4 suitability classes: "1.0 Well suited", "2.0 Suitable", "3.0 Moderately suitable", and "4.0 Unsuitable". The overall suitability rating is determined using a most-limiting-factor approach, where the lowest rated parameter becomes the overall suitability rating. For this review, the yield tables were developed to represent average growth rates within the broad climatic, topographic and edaphic ranges within which these Enterprise Suitability Mapping classes were developed, and as such are only applicable at a regional scale.

4.3 Native Forest Local Operational Constraints

The native forest modelling in this report, as described in more detail in the previous sections, provides standing timber estimations, area discount and harvesting assumptions to calculate available area and volume at a regional level and are unlikely to reflect actual local conditions for any given forest or property at an operational level.

Previous studies undertaken on behalf of Private Forests Tasmania for the Dorset[2] and Huon[3] regions attempted to model the likely local operational constraints to arrive at additional discounts required to achieve a higher level of resolution of accuracy of harvestable area and volume estimation than regional models would allow. For the Dorset region, some 14% of the regional modelled resource was assessed as unavailable once operational constraints were applied, for Huon 46% was assessed to be unavailable. The operational discounts, and reasoning behind their implementation, provided in these reports should be considered in conjunction with this report before any significant investment or planning decisions are relied upon from the figures in this report.

[2] (Wilson, Dorset Woody Biomass Pre-Feasibility Study 2013: A regional inventory of potential woody biomass resources surrounding Scottsdale., 2013)

[3] (Wilson, Huon Woody Biomass Pre-Feasibility Study 2013: A regional inventory of potential woody biomass resources surrounding Huonville., 2013)

4.4 Key Market Infrastructure

To represent the key transport, domestic processing, and export facility locations to which forest products might be transported the Market Infrastructure model was built. The locations identified were by no means exhaustive, or detail every current processing facility within Tasmania, but were identified to represent a good geographic range of current and potential market infrastructure networks such that distance to market assessment for nearby locations might be inferred as needed.

The cartage distance from each property (represented by a Property ID, or PID) containing forest resources was modelled to each location identified in the Market Infrastructure model. Where known, the model included barriers along known roads which were not acceptable for log trucks such that the optimising model would not shortcut approved routes when calculating cartage distances.

When reported, rather than focusing on specific products being sent to specific locations, all resource types were modelled to all locations such that new processing, transport or export investment opportunities for any resource type or destination could be assessed.

The Market Infrastructure model included the following locations:

1. Bell Bay – processing and export facilities
2. Branxholm – processing facility
3. Brighton – transport hub
4. Burnie – processing and export facilities
5. Exeter – processing facility
6. Hampshire – processing facility
7. Huon Valley – processing facility
8. Long Reach – processing and export facilities
9. Longford – processing facility
10. Macquarie Wharf – export facility
11. New Norfolk – processing facility
12. Parattah – transport hub
13. Scottsdale – processing facility
14. Smithton – processing facility

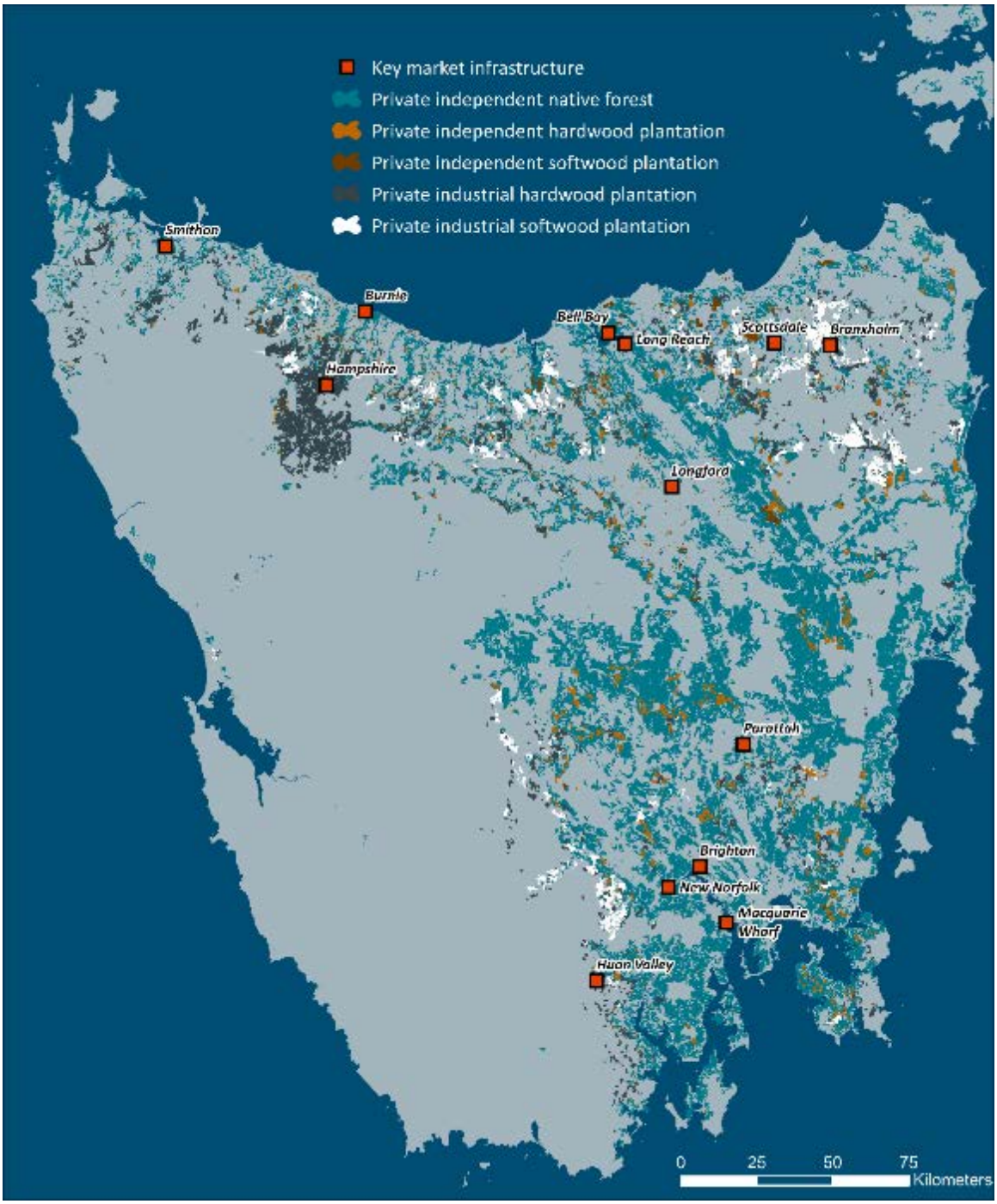
TASMANIA OVERVIEW

5 Tasmania Privately Managed Forests

5.1 Tasmania Overview

Tasmania's privately managed forest estate is currently comprised of some 858,000ha of native forest, 177,000ha of hardwood plantation and 74,000ha of softwood plantation, which in total makes up approximately 16% of the total land in Tasmania (6.8M ha), distributed as indicated in Figure 2.

Figure 2: Map of Tasmanian Privately Managed Forests



When describing the forest management arrangement of these forests, it is commonly split into those forests that are managed within large aggregated 'industrial-scale' estates by a single private forest management company, and those forests that are distributed across numerous and widespread smaller private land-holdings, each managed by an 'independent' landowner. Some cross-over does occur whereby the larger forest companies enter in some form of joint venture with the private independent landowner, whereby the forest company is essentially renting the land from the landowner to grow trees or gain access to the timber.

Of the privately managed plantation resources in Tasmania, some 79% of hardwood plantations and 89% of softwood plantations are managed within the industrial-scale estates across a mix of private and public lands.

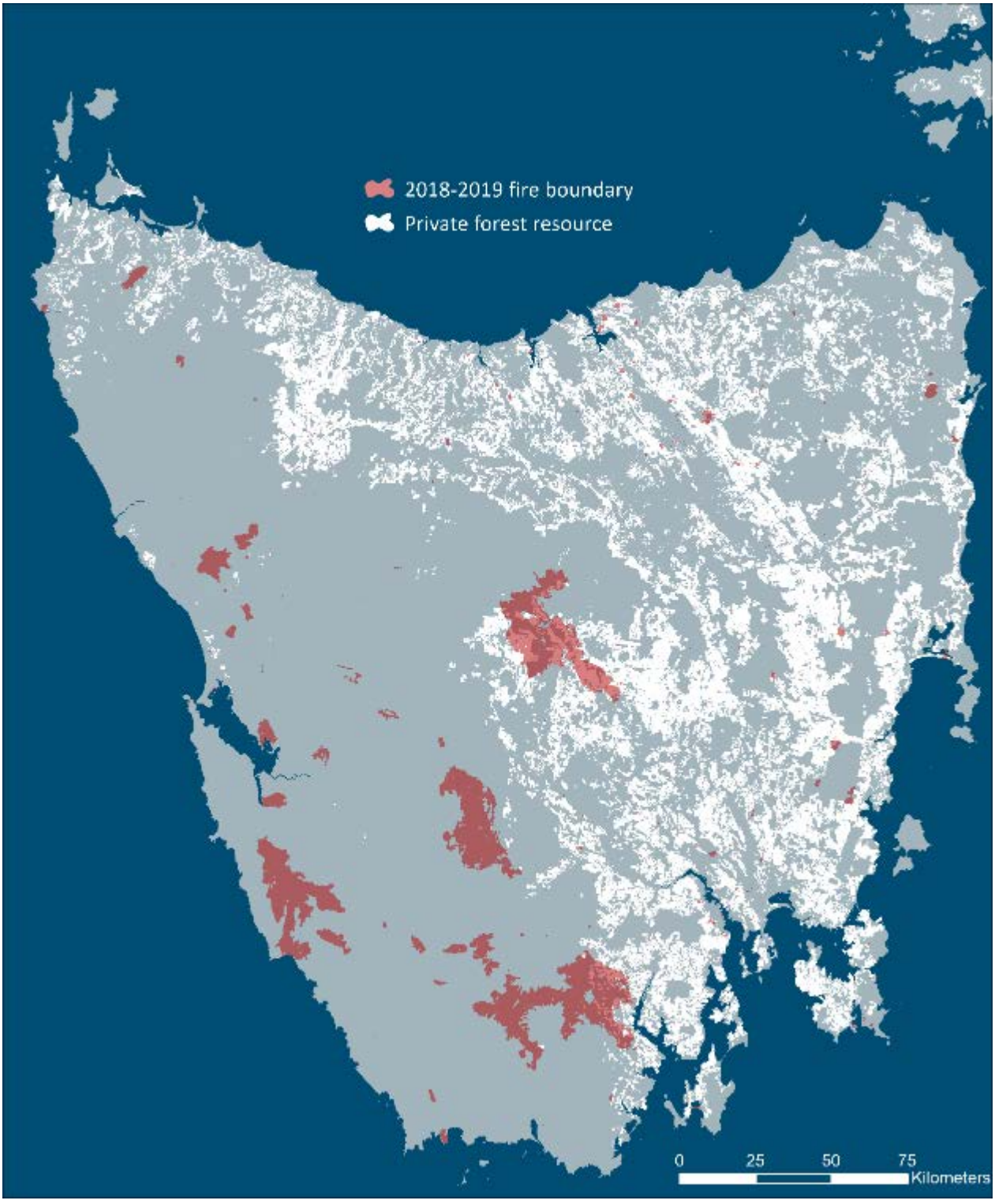
The remaining 46,000ha of plantation resources managed by the independent landowners are confined to private freehold land and are distributed across some 2,600 individual land holdings, about half of these possessing more than 1ha of plantation (i.e. more likely to be of a commercially viable scale). The majority (69%) of the private independent plantations were planted in the 2006-2010 period under managed investment schemes that were active at the time. Another 14% were planted in the 2001-2005 period, the remainder spread intermittently across all periods back to the 1960's and forward to current.

Conversely for private native forests, the vast majority, some 93% (785,000ha), is distributed across over 37,000 individual land holdings on private freehold land managed by independent landowners, though only 12,000 of these properties possess more than 5ha of forest (i.e. more likely to be of a commercially viable scale). This private independent native forest resource is generally available for harvest under the guidelines of the Forest Practices Code (Forest Practices Board, 2020), but the sheer number of land holdings across which it is distributed, and the myriad landowner perspectives on their specific intentions for such forests make it a difficult resource to quantify in terms of likely harvest year on year. The remaining 73,000ha of privately managed native forests on industrial-scale estates are typically excluded from harvest, contributing to ecosystem maintenance and related conservation values across their estate.

5.2 2018/19 Fires

The 2018/19 fires affected approximately 229,000ha of land in Tasmania, of which 25,000ha was privately managed forest and plantation, as shown in Figure 3.

Figure 3: Boundary of 2018/19 Fires relative to Privately Managed Forests



Comparing infra-red (IR) and near infra-red (NIR) satellite imagery pre- and post-fire, a 'Normalised Burn Ratio' (NBR) analysis of fire affected forests was undertaken which provided an objective estimation of the severity of damage. More severe damage essentially rendering the standing trees useless for timber production. This methodology has been observed to be both in use by insurance companies to support forest fire damage assessment claims for plantations, and to achieve good correlation with visual field assessment.

21,500ha of private native forest were affected by fires in 2018/19, predominantly in the South West and South Central wood catchments. Based on the NBR analysis some 11,400ha of private independent native forest was identified as being moderately to severely damaged and were deducted from the available resource modelled in this review. Those areas with low to no damage severity were included.

3,000ha of privately managed hardwood plantation were affected by fires in 2018/19, predominantly in the South West wood catchment, the majority on industrial-scale estates. Based on the NBR analysis only 200ha of private independent hardwood plantation was identified as being moderately to severely damaged and was deducted from the available resource modelled in this review. The remaining area with low to no damage severity was included.

500ha of privately managed softwood plantation were affected by fires in 2018/19, but none of this affected the private independent softwood plantation resource modelled in this review.

The following sections describe in more detail the availability and distribution of the privately managed native forest, hardwood plantation and softwood plantation resources across Tasmania.

5.3 Private Independent Native Forests

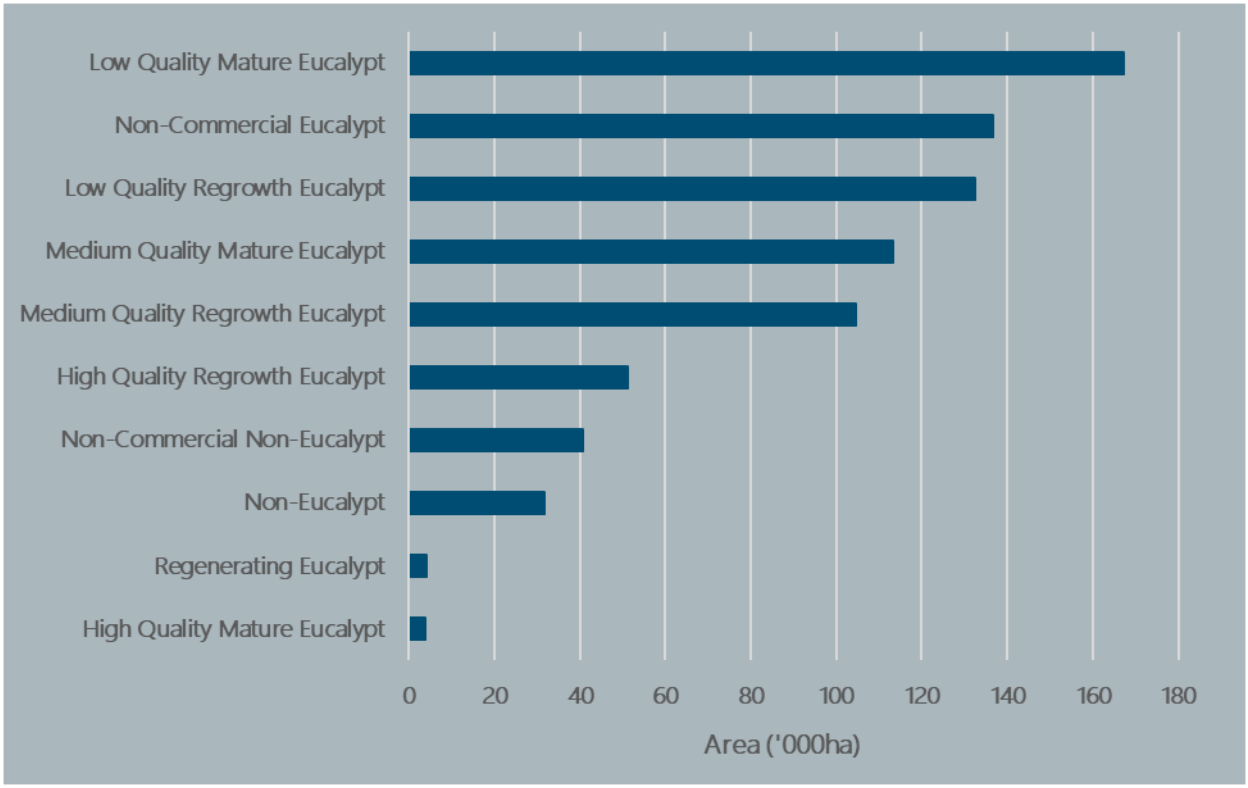
5.3.1 Forest Description

The state-wide private independent native forest resource of 785,000ha is dominated by dry eucalypt forests (77%), which in general are of lower productivity than the wet forests which are more prevalent on public land. The remainder of the private independent native forest is comprised of White Top Eucalypt Forest (10%), Wet Eucalypt Forest (9%) and Non-Eucalypt Forest (4%).

5.3.2 Resource Description

The private independent native forest description PI-Typing was aggregated into 'Forest Classes' against which state-level average standing log product volume estimates could be assigned, the state-wide area of the Forest Classes expressed in Figure 4 below.

Figure 4: Area of Forest Classes Comprising the State-wide Private Independent Native Forest Resource



Analysis of these Forest Classes reveals 284,000ha of Mature Eucalypt Forest and 288,000ha of Regrowth Eucalypt Forest have the height, crown density and quality to produce sufficient log products for commercial harvest across Tasmania. There is also 32,000ha of Non-Eucalypt Forest that has some commercial potential. The remaining 182,000ha was estimated to not have any current commercial potential, a small portion of which is Regenerating Eucalypt and will become available in future as it reaches Regrowth stage.

Of the 604,000ha of forest identified as viable for commercial harvest only 328,000ha has been estimated to be available for harvest after legislated exclusions and discounts on harvesting were accounted for in the model (refer Section 4.1).

This available area has been estimated to carry up to 51M tonnes of standing harvestable timber, distributed across Mature Eucalypt Forest (26.6Mt), Regrowth Eucalypt Forest (21.8Mt) and Non-Eucalypt Forest (2.6Mt). A detailed breakdown of log products by Forest Class are shown in Table 1.

Table 1: Area and Current Standing Harvestable Log Product Estimates for State-wide Forest Classes

Forest Class	Area ('000ha)		Estimated Current standing Harvestable Volume by Log Products ('000t)					
	Gross	Harvestable	Appearance Grade Veneer	Sawlog	Industrial Grade Peeler	Pulplog	Other Biomass	Grand Total
High Quality Mature Eucalypt	4	3	10	120	170	670	280	1,250
High Quality Regrowth Eucalypt	51	31	10	560	900	5,180	2,270	8,920
Medium Quality Mature Eucalypt	113	65	20	1,430	1,780	13,050	0	16,280
Medium Quality Regrowth Eucalypt	105	59	20	750	1,150	7,380	0	9,300
Low Quality Mature Eucalypt	167	95	0	0	0	9,150	0	9,150
Low Quality Regrowth Eucalypt	133	54	0	0	150	3,520	0	3,670
Regenerating Eucalypt	4	0	0	0	0	0	0	0
Non-Eucalypt	32	23	0	0	0	0	2,650	2,650
Non-Commercial Eucalypt	137	0	0	0	0	0	0	0
Non-Commercial Non-Eucalypt	41	0	0	0	0	0	0	0
Grand Total	786	329	60	2,850	4,140	38,950	5,210	51,210

The harvesting and regeneration of the Low Quality Mature Eucalypt Forest and Low Quality Regrowth Eucalypt Forest (height growth potential less than 27m) will potentially be problematic with respect to regeneration after harvesting. The forests are typically located on much lower nutrient soils and under drier and more exposed conditions than Medium or High Quality Eucalypt Forests, leading to a likelihood of higher mortality rates, even if good seedling germination is initially achieved (Forestry Tasmania, 2009). The Forest Practices Code (Forest Practices Board, 2020) *SECTION E, Establishing and Maintaining Forests* states:

"Management will aim to conserve soil and water quality, maintain biodiversity and long-term site productivity, reduce visual impact and protect other natural and cultural values. Prompt reforestation will contribute to the achievement of these aims."

The Forest Practices Authority (FPA) may be required to consider whether these forests can be successfully regenerated and managed on a sustainable basis. In areas where these forests are on soils of low fertility and in areas of low rainfall, the FPA may be required to limit the levels of harvesting.

It was assumed that Low Quality Eucalypt forests with crown density less than 20% (i.e. PI-Type E4d, E4f) or height growth potential less than 15m (i.e. PI-Type 'E5*' or ER*/5) could not be harvested:

- commercially, because yields were likely to be below 50t/ha, or
- sustainably, because of the before mentioned regeneration issues on very poor sites

so were included in the 'Non-Commercial Eucalypt' forest class and excluded as potential resource from this modelling.

5.3.3 Intent to Harvest

A private timber reserve (PTR) is an area of private land set aside for forestry purposes and registered on the title. Presence of a PTR on native forest is a clear indication that part or all the forest within is intended for harvesting.

Of the 604,000ha of commercially viable private independent native forest in Tasmania only 128,000ha (18%) is covered by a PTR. Similarly, of the 329,000ha modelled as available for harvest, 67,000ha (20%) is under PTR.

Despite the small area under PTR, there are many land holdings with significant scale of commercial native forests, as shown in Table 2 below.

Table 2: Scale and Current Standing Harvestable Volume of State-wide Private Independent Native Forests

Area (ha) of PINF on Property	Count of Properties (n)	Total Current Standing Harvestable Volume across all Properties ('000 t)*	Average Current Standing Harvestable Volume per Property (t)
< 1 ha	16,136	300	19
1-2 ha	4,076	500	123
2-5 ha	5,628	1,600	284
5-20 ha	7,152	7,900	1,105
20-50 ha	2,698	7,600	2,817
50-100 ha	973	5,000	5,139
100-150 ha	378	2,900	7,672
>150 ha	842	24,200	28,741
Total	37,883	50,100	1,322

**Note a small percentage of harvestable area is situated on easements outside of Title boundaries, so cannot be included in this analysis. As such, the volume figures in this table may vary slightly from other tables in this section.*

5.3.4 Proximity to Market Infrastructure

The road-based cartage distance to key market infrastructure was calculated for all properties across Tasmania which possess private independent native forest and used to generate distance-based catchment models of the available area or volume for each destination.

Table 3 describes the total harvestable volume of Mature Eucalypt Forest available for harvest in 25km cartage distance bands from each market infrastructure destination. The figures provided are cumulative, for example the value of 4,839t under '< 100km' for Exeter includes the volumes under the '< 75km,', '< 50km' and '<25km' cartage distance ranges. Table 4 describes the corresponding figures for Regrowth Eucalypt Forest.

To provide some commercial viability around the figures, properties with less than 5ha of native forest were excluded from the cumulative volume as they are less likely to be of the scale to be financially viable for harvest.

Table 3: Cumulative Harvestable Volume of State-wide Private Independent Mature Eucalypt by Road Distance Class to Market Infrastructure

Destination	Cumulative Total Harvestable Volume ('000t) by Road Cartage Distance Range								
	<25km	<50km	<75km	<100km	<125km	<150km	<175km	<200km	<650km
Bell Bay	315	1,193	2,273	3,384	5,444	10,535	14,724	17,895	24,811
Branxholm	42	493	1,431	2,892	4,529	8,658	11,235	15,118	24,811
Brighton	711	2,362	5,358	9,947	13,699	17,084	19,135	21,082	24,811
Burnie	96	253	737	1,488	2,647	3,702	4,728	7,347	24,811
Exeter	534	1,850	3,089	4,839	9,817	14,275	17,712	20,738	24,811
Hampshire	75	219	503	789	1,420	2,575	3,595	4,552	24,811
Huon Valley	267	930	2,025	2,847	3,888	7,244	11,647	14,609	24,811
Long Reach	484	1,535	2,566	3,739	7,164	11,935	15,779	19,143	24,811
Longford	279	2,167	5,581	11,464	14,990	18,620	20,758	22,395	24,811
Macquarie Wharf	186	1,748	3,450	5,810	10,415	14,034	17,325	19,472	24,811
New Norfolk	759	2,289	4,153	7,739	12,463	16,202	18,380	20,091	24,811
Parattah	937	4,303	10,071	14,750	18,554	20,819	22,202	22,770	24,811
Scottsdale	112	517	2,141	3,635	7,505	10,186	13,567	16,896	24,811
Smithton	259	769	847	947	1,035	1,187	1,842	2,585	24,811

Appendix 12.1 contains area equivalent of the above table.

Table 4: Cumulative Harvestable Volume of State-wide Private Independent Regrowth Eucalypt by Road Distance Class to Market Infrastructure

Destination	Cumulative Total Harvestable Volume ('000t) by Road Cartage Distance Range								
	<25km	<50km	<75km	<100km	<125km	<150km	<175km	<200km	<650km
Bell Bay	176	1,105	2,567	4,564	5,870	8,406	11,001	12,495	18,863
Branxholm	306	662	1,711	2,369	3,684	5,294	6,964	9,297	18,863
Brighton	464	1,648	4,567	6,907	7,946	8,849	10,139	12,940	18,863
Burnie	680	2,087	3,051	4,223	5,857	6,768	7,695	8,794	18,863
Exeter	634	1,893	4,247	5,324	7,721	10,704	12,366	13,301	18,863
Hampshire	283	1,620	2,357	3,099	4,112	5,738	6,707	7,597	18,863
Huon Valley	557	2,131	3,891	4,203	4,576	6,452	7,658	8,158	18,863
Long Reach	344	1,404	3,040	5,064	6,555	9,341	11,396	12,806	18,863
Longford	331	2,311	4,282	7,047	9,027	11,263	13,021	14,090	18,863
Macquarie Wharf	370	2,754	4,239	5,393	7,137	8,058	8,958	10,420	18,863
New Norfolk	481	2,037	4,226	6,279	7,801	8,396	9,470	11,649	18,863
Parattah	460	1,613	3,255	4,920	7,885	11,748	14,299	15,314	18,863
Scottsdale	210	1,128	2,139	3,293	4,795	6,579	8,661	11,246	18,863
Smithton	385	698	1,241	1,841	2,448	3,312	4,150	5,648	18,863

Appendix 12.1 contains area equivalent of the above table.

5.4 Private Independent Hardwood Plantations

5.4.1 Forest Description

There is 37,500ha of private independently managed hardwood plantation currently standing within Tasmania, 97% of which is *Eucalyptus nitens*, 2% of which is *E. globulus* and the remaining 1% a mix of other eucalypt and non-eucalypt species.

Figure 5 shows the area and age-class distribution of this resource by Wood Catchment. As can be observed, the resource is well distributed across all wood catchments, excepting the South West, and is dominated by the 2006-2010 and 2001-2005 age classes.

Figure 5: Area of Five-Year Age Classes by Wood Catchment of the State-wide Private Independent Hardwood Plantations

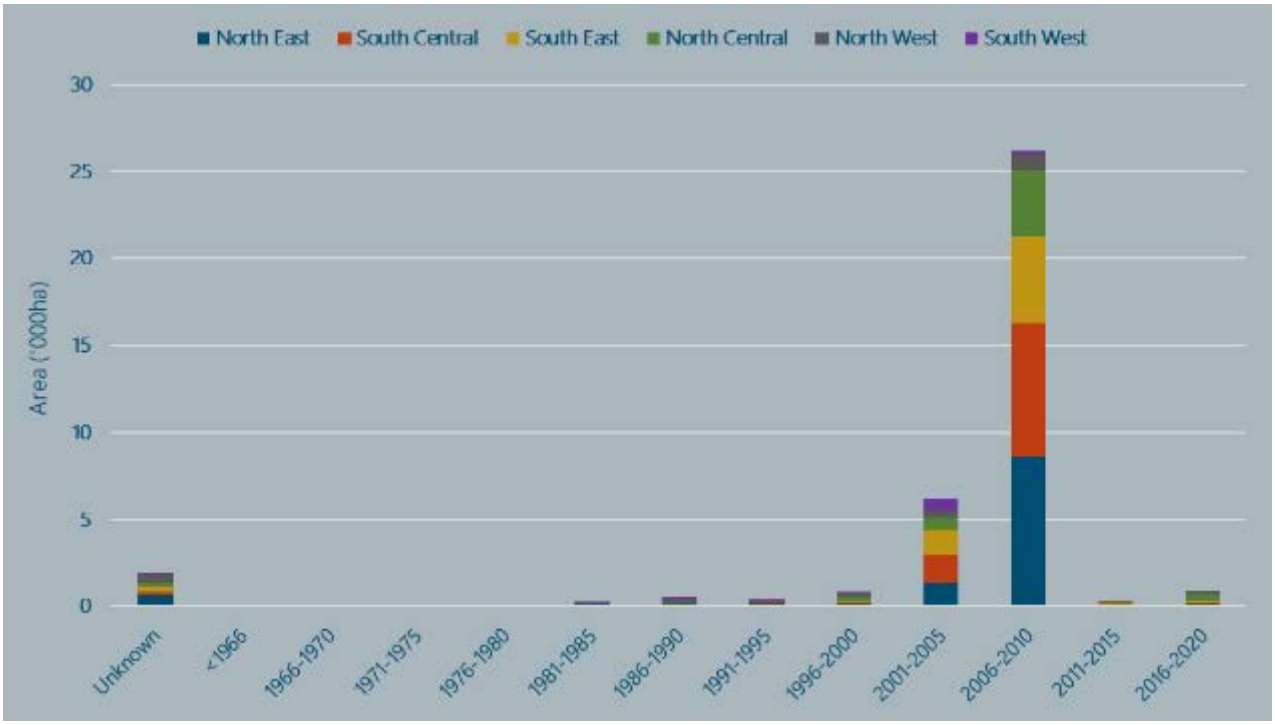
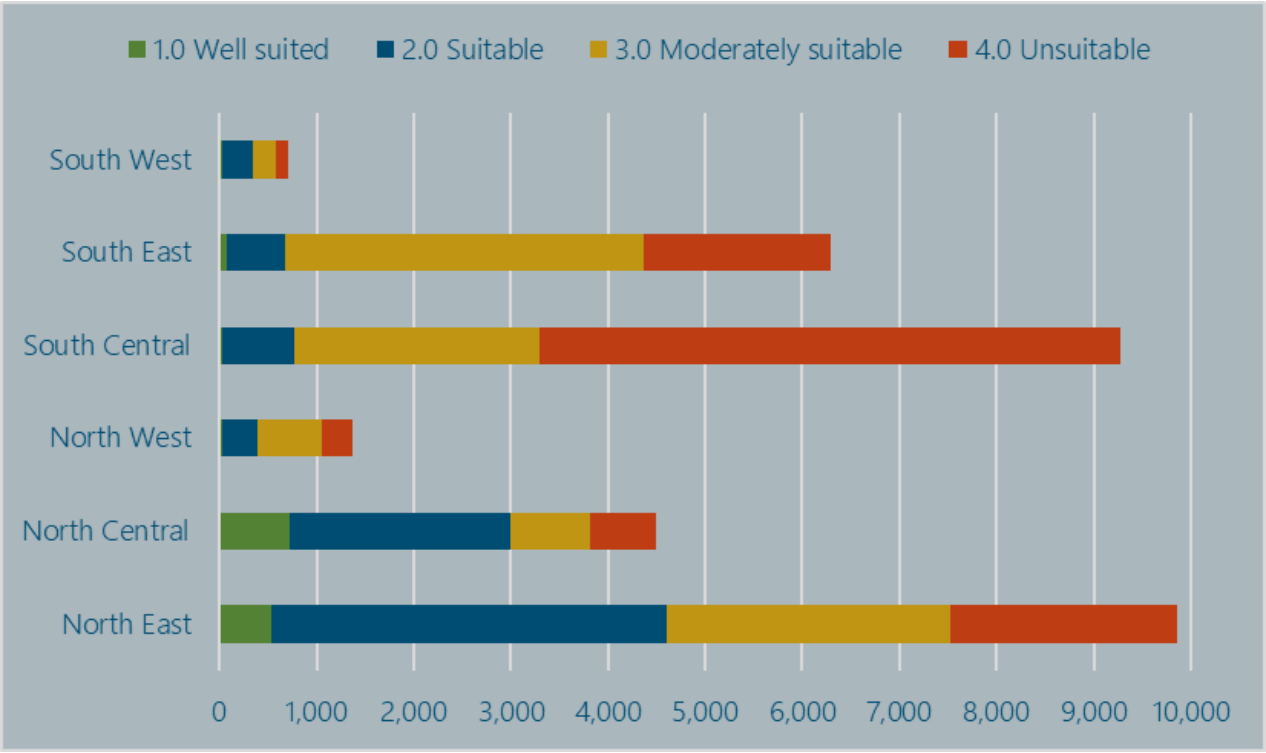


Figure 6 shows analysis of the 2006-2010 and 2001-2005 age *E. nitens* plantations against the Enterprise Suitability Mapping.

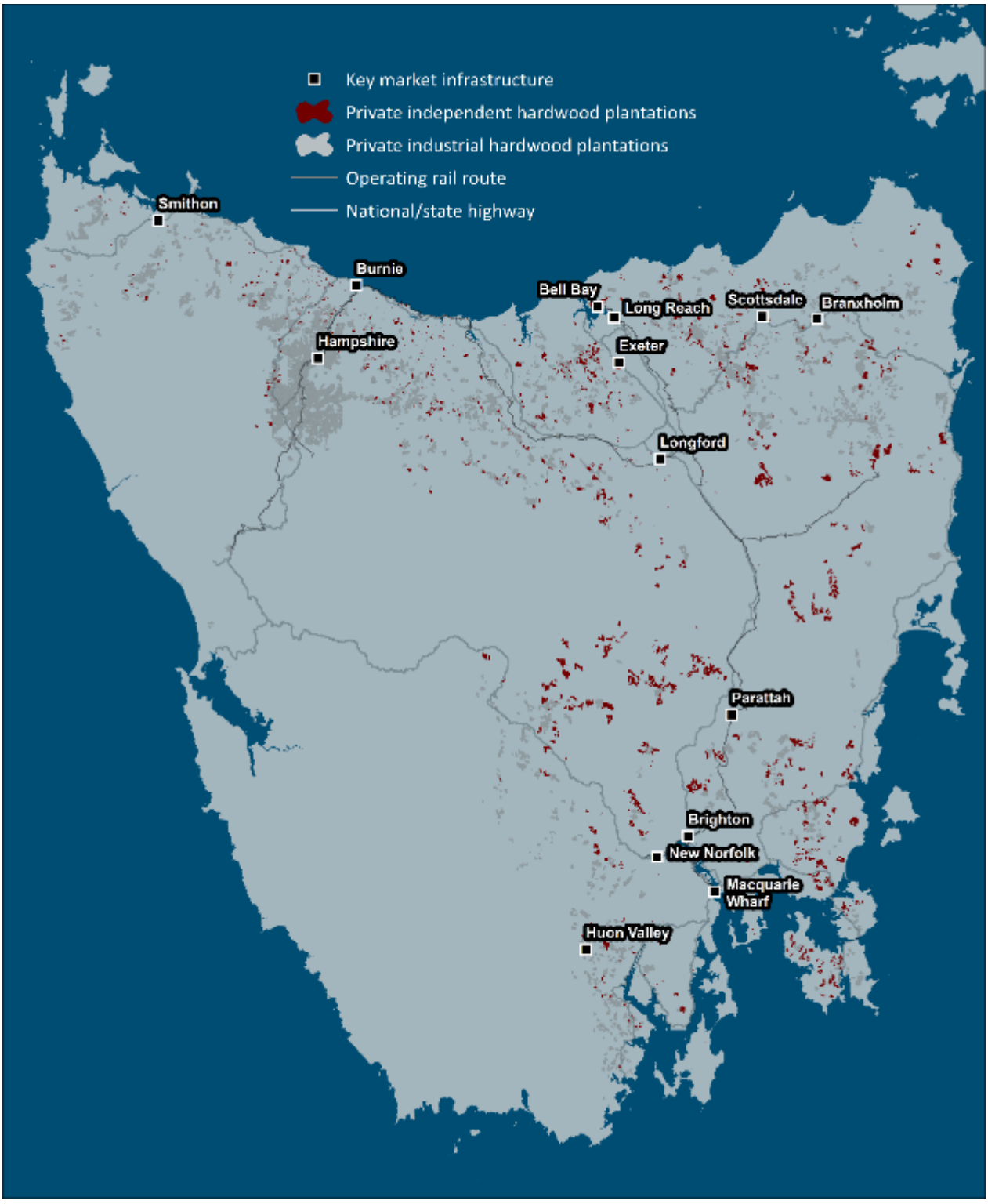
Figure 6: Enterprise Suitability Mapping of the 2001-2010 Age Class Private Independent *Eucalyptus nitens* plantations



The North East and North Central plantations have a reasonable area of 'Well Suited' and 'Suitable' sites, but the South East and South Central regions have significant areas of 'Moderately Suitable' and 'Unsuitable' sites.

Figure 7 shows the geographic distribution of this resource.

Figure 7: Map of State-wide Private Independent Hardwood Plantations and Key Market Infrastructure



5.4.2 Resource Description

The initial market driving historic hardwood plantings in Tasmania was to produce logs for pulp fibre production, as such, there is little thinning undertaken in this resource. There are emerging markets for solid timber production from this hardwood plantation resource but insufficient information on the percentage of solid wood within the standing timber at age of harvest to effectively model it in this review.

For this exercise, clearfell harvest age was modelled against productivity specifically age 13 (high), age 15 (medium), age 17 (low) and age 25 (very low). The very low productivity sites reflect low rainfall (< 600mm). Site productivity was modelled using the Enterprise Suitability Mapping prepared for plantation species based on research conducted by Private Forests Tasmania, CSIRO and the University of Tasmania, and supported by the Agrivision 2050 initiative of the Tasmanian Government.

The private independent hardwood resource is distributed across 2,248 separate land holdings or properties. Table 5 provides an indication of the scale at which these forests are distributed across land holdings in Tasmania in terms of area and total harvestable volume at modelled harvest age, based on a single rotation unpruned unthinned regime. Typically, the larger the scale of the plantation on a property, the more financially viable will be harvest, ignoring distance from market.

Table 5: Scale and Harvestable Volume at Harvest Age of State-wide Private Independent Hardwood Plantations

Scale: Area (ha) of Hardwood Plantation on each Property	Count of properties (n)	Total Harvestable Volume ('000t) by Period								Average Harvestable Volume per Property (t)
		2016-2020	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	Grand Total	
< 1ha	1,218	23	6	1	1	0	0	0	32	26
1-2ha	146	20	5	1	2	0	0	0	28	190
2-5ha	162	49	16	2	4	0	0	0	72	440
5-20	320	196	252	60	47	1	2	0	557	1,740
20-50	207	259	500	103	95	3	2	0	961	4,640
50-100	91	176	467	83	160	1	1	0	888	9,760
100-150	42	105	346	57	131	1	2	0	641	15,260
>150	62	320	873	385	462	3	8	0	2,050	33,060
Grand Total	2,248	1,148	2,465	693	901	8	14	0	5,229	2,330

**Note a small percentage of harvestable area is situated on easements outside of Title boundaries, so cannot be included in this analysis. As such, the volume figures in this table may vary slightly from other tables in this section.*

5.4.3 Intent to Replant

A private timber reserve (PTR) is an area of private land set aside for forestry purposes and registered on the title. Of the 37,000ha of private independent plantation in Tasmania 51% are currently covered by a PTR. Any forest situated under a PTR that is harvested must be reforested to fully stocked forest if that PTR is still present at the time the Forest Practices Plan is active.

Analysis of the change in land use as of 2019 for hardwood plantations established prior to 2015 are described in Table 6 below. As shown in the final column, more than half of the currently fallow area is without PTR and so unlikely to be replanted.

Table 6: Land Use Change Analysis of State-wide Private Hardwood Plantation Resource from 2015 to 2019 by Wood Catchment

Wood Catchment	Standing Area as at 2015	Standing Area as at 2019	Fallow 2019 with PTR	Fallow 2019 without PTR	% Fallow without PTR
North Central	9,100	5,200	1,800	2,100	51%
North East	22,300	11,300	4,800	6,200	56%
North West	5,000	2,300	1,300	1,400	49%
South Central	11,200	9,400	500	1,300	72%
South East	8,900	6,800	800	1,300	59%
South West	1,000	900	0	0	30%
Grand Total	57,500	36,000*	9,200	12,300	56%

**Note that some 1,000ha could not be analysed due to remapping corrections made since the 2015 dataset.*

The conclusion from these statistics is that only half of this resource at best is likely to be replanted into the future.

5.4.4 Proximity to Market Infrastructure

The road-based cartage distance to key market infrastructure was calculated for all properties across Tasmania which possess private independent hardwood plantation and used to generate distance-based catchment models of the available area or volume for each destination.

Table 7 describes the total harvestable volume of private independent hardwood plantation available in 25km cartage distance bands from each market infrastructure destination. The figures provided are cumulative, for example the value of 1,876t under '< 100km' for Exeter includes the volumes under the '< 75km,', '< 50km' and '<25km' cartage distance ranges.

To provide some commercial viability around the figures, properties with less than 1ha of plantation were excluded from the cumulative volume as they are less likely to be of the scale to be financially viable for harvest.

Table 7: Cumulative Harvestable Volume at Harvest Age of State-wide Private Independent Hardwood Plantations by Road Distance Class to Market Infrastructure

Destination	Cumulative Total Harvestable Volume ('000t) by Road Cartage Distance Range								
	<25km	<50km	<75km	<100km	<125km	<150km	<175km	<200km	<650km
Bell Bay	83	579	1,032	1,765	2,112	2,962	3,560	4,193	5,267
Branxholm	85	447	833	1,151	1,794	2,588	2,874	3,319	5,267
Brighton	36	309	924	1,427	1,832	2,428	2,772	3,645	5,267
Burnie	57	199	429	767	1,240	1,643	1,976	2,362	5,267
Exeter	318	734	1,599	1,876	2,556	3,484	4,145	4,471	5,267
Hampshire	32	217	296	412	703	1,153	1,620	1,858	5,267
Huon Valley	79	156	250	415	575	1,305	1,712	1,958	5,267
Long Reach	181	725	1,206	1,883	2,197	3,193	3,725	4,285	5,267
Longford	36	811	1,543	2,593	3,386	4,008	4,478	4,767	5,267
Macquarie Wharf		152	517	994	1,511	1,885	2,459	2,962	5,267
New Norfolk	57	298	612	1,330	1,789	2,068	2,582	3,272	5,267
Parattah	121	516	1,160	1,888	2,657	3,389	4,367	4,685	5,267
Scottsdale	210	592	1,082	1,555	2,261	2,788	3,131	3,788	5,267
Smithton	22	64	154	202	307	418	704	1,123	5,267

Appendix 12.1 contains an area equivalent of the above table.

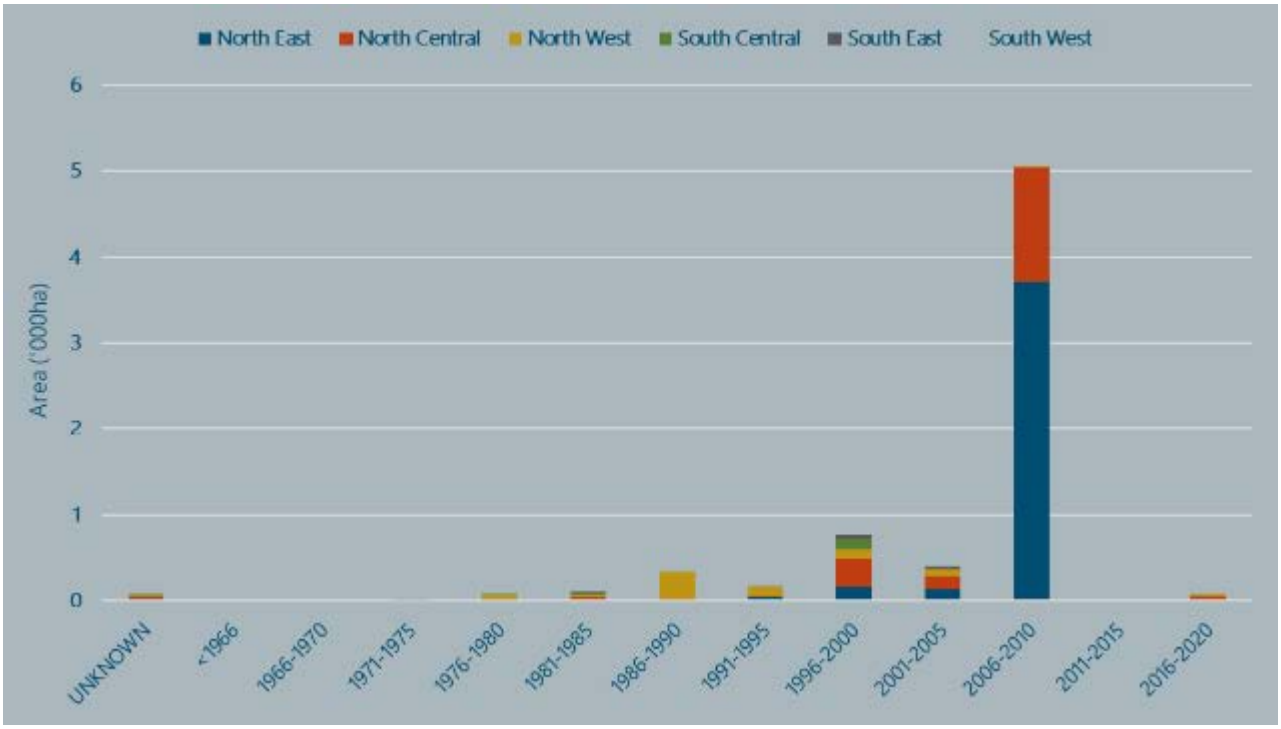
5.5 Private Independent Softwood Plantations

5.5.1 Forest Description

There is 8,000ha of private independently managed softwood plantation currently standing within Tasmania of which 100% is essentially *Pinus radiata*. The only exception being 28ha of *Cupressus spp.* recorded in small 1 to 8ha stands across the north of the state.

As shown in Figure 8 most of the pine resource is situated in the North East and North Central wood catchments, and dominated by the 2006-2010 age class, which will be approaching optimal thinning age soon if not now.

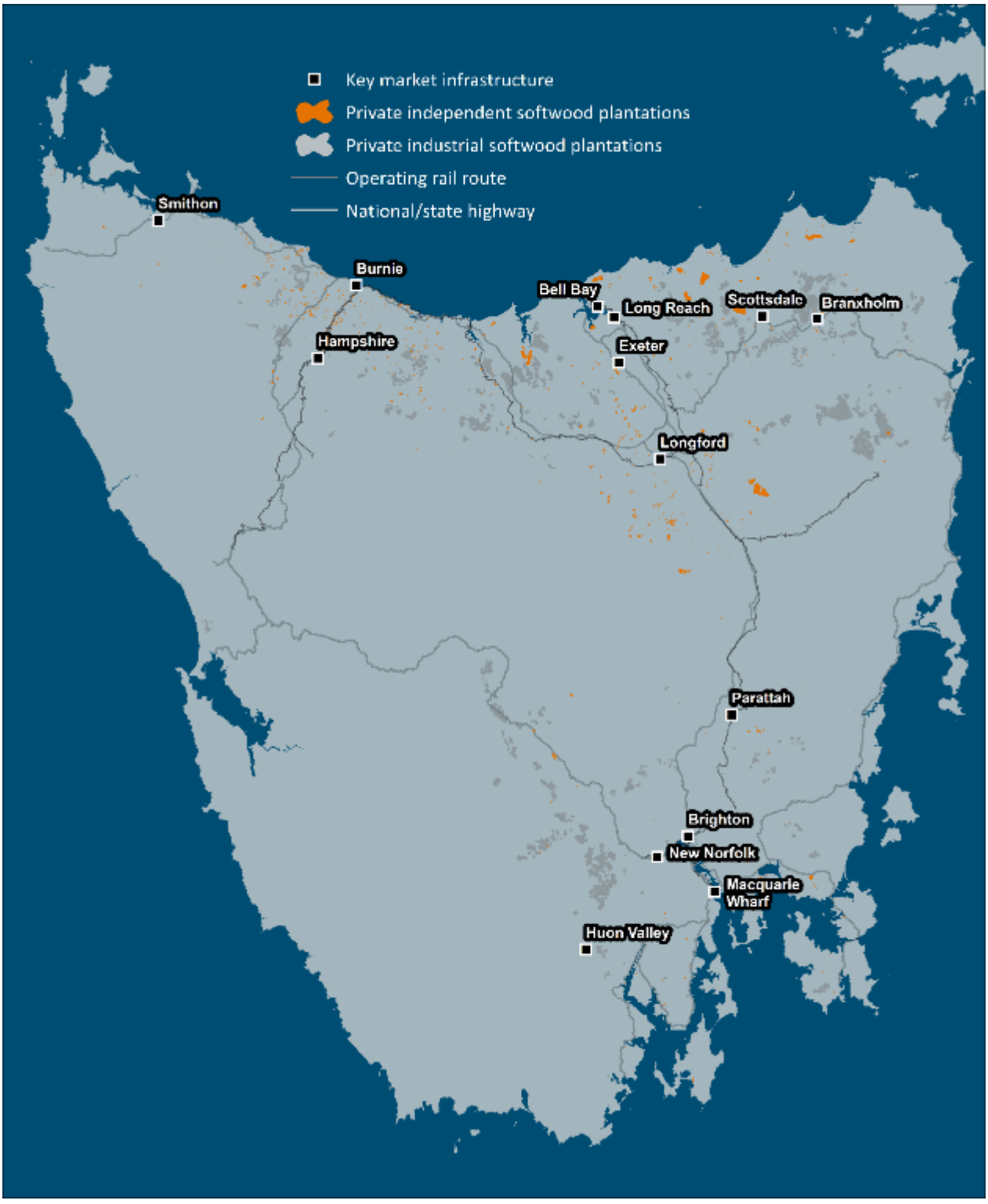
Figure 8: Area of Five-Year Age Classes by Wood Catchment of the State-wide Private Independent *Pinus radiata* Plantations



Analysis against the Enterprise Suitability Mapping for *Pinus radiata* indicates that 27% of the 2006-2010 age class is situated on 'Well suited' sites, and 64% on 'Suitable' sites, suggesting there are no to little limiting factors to growth for the majority.

Figure 9 shows the geographic distribution of this resource.

Figure 9: Map of State-wide Private Independent Softwood Plantations and Key Market Infrastructure



5.5.2 Resource Description

Historically, pine plantations in Tasmania were thinned and pruned to achieve veneer and sawlog grade timber production, but more contemporary plantings are typically only thinned for sawlog production, the thinning applied to maximise the log diameter at harvest to increase the overall value of the logs harvested.

In this exercise, without detailed information at hand as to the actual regimes that have been applied to date, it was assumed all old plantations had had at least one thinning applied. The standing younger softwood plantations were assumed to be stocked at 1000 stems per hectare and were modelled against a single thinning event for high (age 13), medium (age 15) and low (age 18) productivity sites, with a nominal residual stocking of 500 stems per hectare. Site productivity was modelled using the Enterprise Suitability Mapping prepared for plantation species based on research conducted by Private Forests Tasmania, CSIRO and the University of Tasmania and supported by the Agrivision 2050 initiative of the Tasmanian Government. Clearfell harvest age was modelled against productivity specifically age 26 (high), age 28 (medium), age 30 (low) and age 35 (very low). The very low productivity sites reflect very low rainfall (< 450mm) or high elevation (> 700m) sites.

The private independent softwood resource is distributed across 576 separate land holdings or properties. Table 8 provides an indication of the scale at which these forests are distributed across land holdings in Tasmania in terms of area and total harvestable volume at modelled harvest age, based on a single rotation unpruned single-thinning regime.

Table 8: Scale and Harvestable Volume at Harvest Age of State-wide Private Independent Softwood Plantations

Scale: Area (ha) of Softwood Plantation on each Property	Count of properties (n)	Total Harvestable Volume ('000t) by Period*								Average Harvestable Volume per Property (t)
		2016-2020	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	Grand Total	
< 1ha	261	13	2	7	2	1	0	0	25	96
1-2ha	66	17	6	11	3	0	0	0	37	561
2-5ha	73	35	12	30	10	1	0	1	88	1,205
5-20	100	97	77	135	49	16	1	0	376	3,760
20-50	38	77	48	54	69	60	10	0	317	8,342
50-100	12	23	6	66	110	17	28	0	250	20,833
100-150	11	37	27	64	335	55	0	0	518	47,091
>150	15	9	16	10	714	608	20	0	1,377	91,800
Grand Total	576	310	193	377	1,293	758	59	1	2,989	5,189

Note a small percentage of harvestable area is situated on easements outside of Title boundaries, so could be included in the analysis above. As such, the volume figures in this table may vary slightly from other tables in this section.

The corresponding statistics for the modelled single thinning volumes are presented in Table 9.

Table 9: Scale and Harvestable Volume at Thinning Age of State-wide Private Independent Softwood Plantations

Scale: Area (ha) of hardwood plantation on Property	Count of Properties (n)	Total Harvestable Volume ('000t) by Period					Average Harvestable Volume per Property (t)
		2021-2025	2026-2030	2031-2035	2036-2040	Grand Total	
< 1ha	261	0	0	0	0	0	0
1-2ha	66	0	0	0	0	0	0
2-5ha	73	0	0	0	0	0	0
5-20	100	4	1	0	0	5	50
20-50	38	10	4	0	1	15	395
50-100	12	17	0	4	0	21	1,750
100-150	11	32	4	0	0	36	3,273
>150	15	131	1	0	0	131	8,733
Grand Total	576	194	9	4	1	208	361

5.5.3 Intent to Replant

A private timber reserve (PTR) is an area of private land set aside for forestry purposes and registered on the title. Of the 8,000ha of private independent softwood plantation in Tasmania 54% are currently covered by a PTR. Any forest situated under a PTR that is harvested must be reforested to fully stocked forest if that PTR is still present at the time the Forest Practices Plan is active.

Analysis of the change in land use as at 2019 for hardwood plantations established prior to 2015 are described in Table 10 below. As shown in the final column, more than half of the current area made fallow since 2015 is without PTR and so unlikely to be replanted.

Table 10: Land Use Change Analysis of State-wide Private Softwood Plantation Resource from 2015 to 2019

Wood Catchment	Standing Area as at 2015	Standing Area as at 2019	Fallow 2019 with PTR	Fallow 2019 without PTR	% Fallow without PTR
North Central	2,190	1,950	10	220	94%
North East	4,750	4,330	140	290	68%
North West	1,670	1,090	240	350	52%
South Central	220	190	0	30	51%
South East	240	210	10	20	41%
South West	170	140	10	20	62%
Grand Total	9,250	7,900	410	930	63%

5.5.4 Proximity to Market Infrastructure

The road-based cartage distance to key market infrastructure was calculated for all properties across Tasmania which possess private independent hardwood plantation and used to generate distance-based catchment models of the available area or volume for each destination.

Table 11 describes the total harvestable volume of private independent softwood plantation available in 25km cartage distance bands from each market infrastructure destination. The figures provided are cumulative, for example the value of 837 under '< 100km' for Exeter includes the volumes under the '< 75km,', '< 50km' and '<25km' cartage distance ranges.

To provide some commercial viability around the figures, properties with less than 1ha of plantation were excluded from the cumulative volume as they are less likely to be of the scale to be financially viable for harvest.

Table 11: Cumulative Harvestable Volume at Harvest Age of State-wide Private Independent Softwood Plantations by Road Distance Class to Market Infrastructure

Destination	Cumulative Total Harvestable Volume ('000t) by Road Cartage Distance Range								
	<25km	<50km	<75km	<100km	<125km	<150km	<175km	<200km	<650km
Bell Bay	110	173	293	796	871	911	972	1,006	1,077
Branxholm		124	202	662	734	887	890	900	1,078
Brighton			18	68	140	533	566	707	1,078
Burnie	16	65	120	128	186	367	553	956	1,078
Exeter	57	197	668	837	890	938	1,008	1,058	1,079
Hampshire	5	50	116	120	128	186	349	464	1,079
Huon Valley	6	6	10	59	66	67	67	72	1,011
Long Reach	110	180	330	800	882	913	977	1,008	1,079
Longford	42	546	635	837	856	909	975	1,065	1,078
Macquarie Wharf		10	10	56	57	129	528	626	1,068
New Norfolk		6	67	68	68	72	477	576	1,011
Parattah		1	73	429	581	696	722	926	1,079
Scottsdale	90	138	662	722	814	890	900	924	1,078
Smithton	2	2	51	66	100	110	127	180	1,077

Appendix 12.1 contains an area equivalent of the above table.

5.6 Private Industrial-Scale Plantations

5.6.1 Forest Description

The state-wide private industrial-scale estate is some 206,000ha of which 63% is managed on private freehold land, the other 37% on public land. 140,000ha is hardwood plantation, predominantly of the species *Eucalyptus nitens*. The 66,000ha of softwood plantation is predominantly *Pinus radiata*.

Figure 10 provides the overall species percentage breakdown, and Figure 11 their geographic distribution across the state.

Figure 10: Breakdown of Species for State-wide Private Industrial-scale Plantations

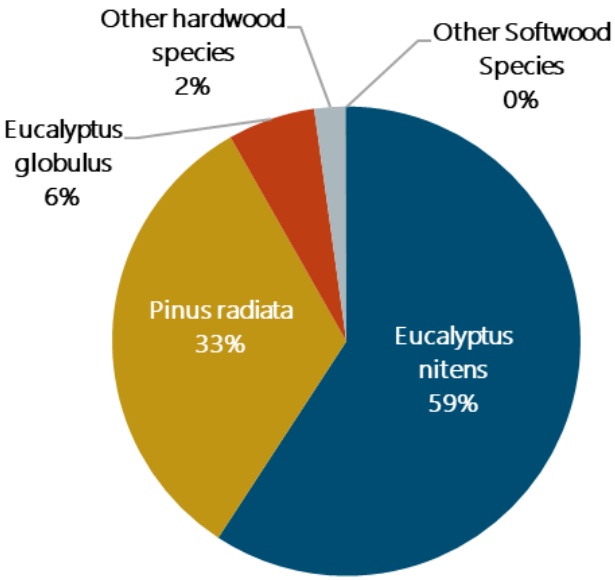
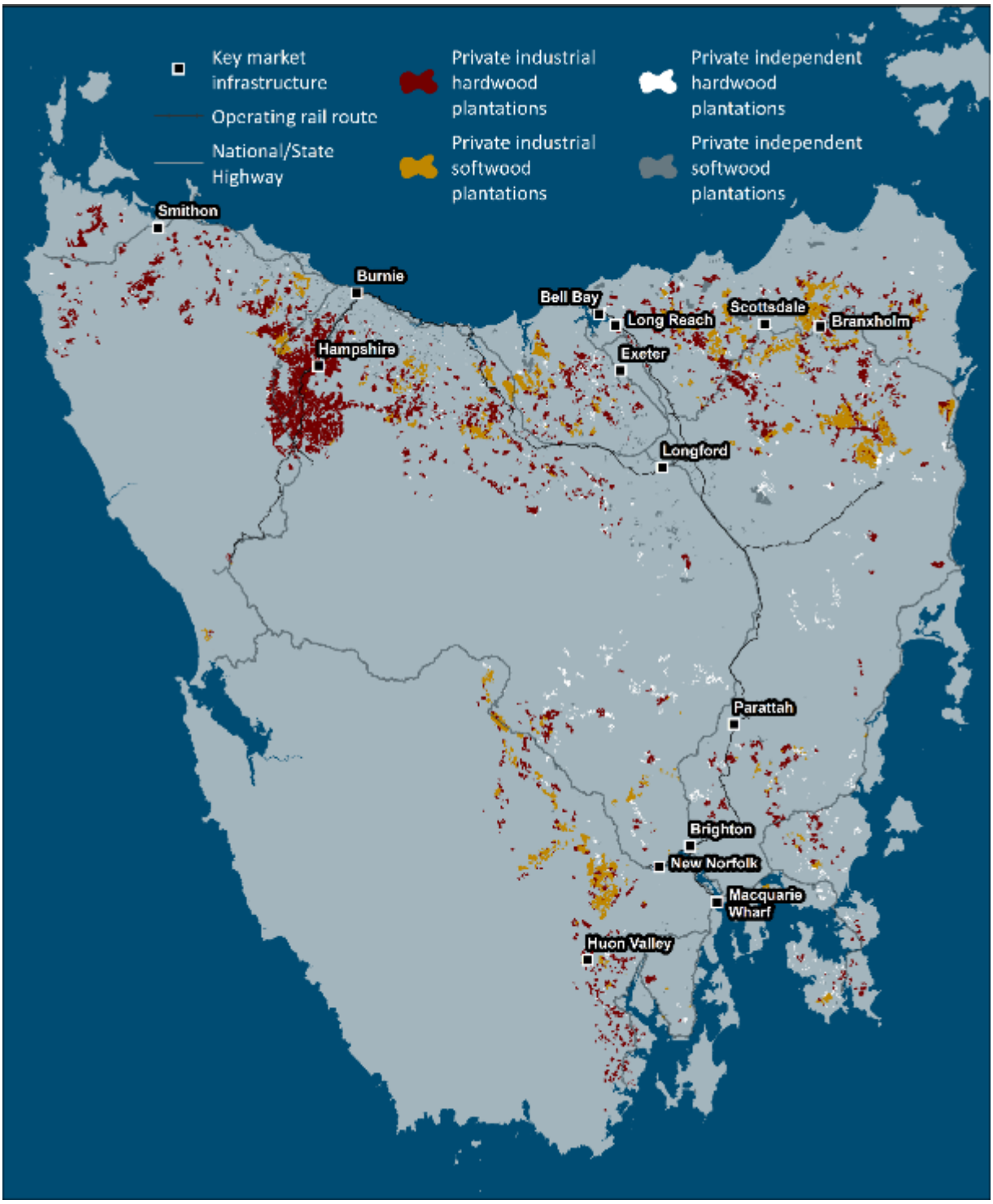


Figure 11: Map of State-wide Private Industrial-Scale Plantations



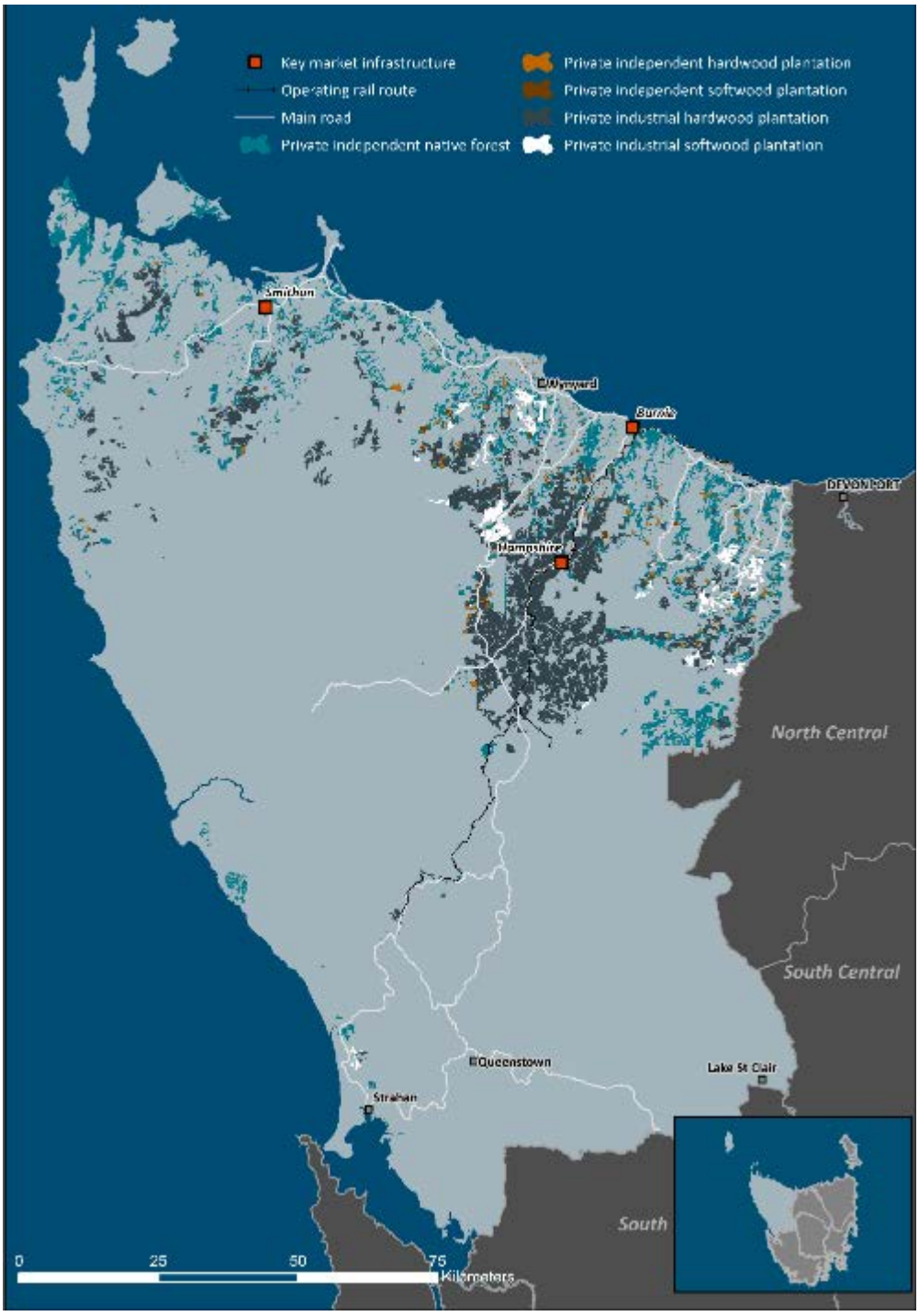
NORTH WEST WOOD CATCHMENT

6 North West Wood Catchment

6.1 North West Overview

The North West privately managed forest estate is comprised of some 82,000ha of native forest, 70,000ha of hardwood plantation and 8,000ha of softwood plantation as shown in Figure 12, which in total makes up 9% of the total land in the North West.

Figure 12: Map of North West Private Independent Forests



The 46,000ha of private independent native forest resource in the North West is distributed across approximately 4,800 individual land holdings, though only 1,600 of these properties possess more than 5ha. The main commercial components of this resource are dominated by *Eucalyptus obliqua* (47%) and *Eucalyptus nitida (13%)* vegetation communities based on analysis of the TASVEG 4.0 mapping.

Of the plantation resources in the North West, some 96% of hardwood plantations and 86% of softwood plantations are within the 'industrial-scale' estates. The remaining 3,800ha of plantation resources managed by individual landowners are confined to private freehold land and are distributed across 1,200 individual land holdings.

The following sections describe in more detail the availability and distribution of the privately managed native forest, hardwood plantation and softwood plantation resources within the North West.

6.2 Private Independent Native Forests

6.2.1 Forest Description

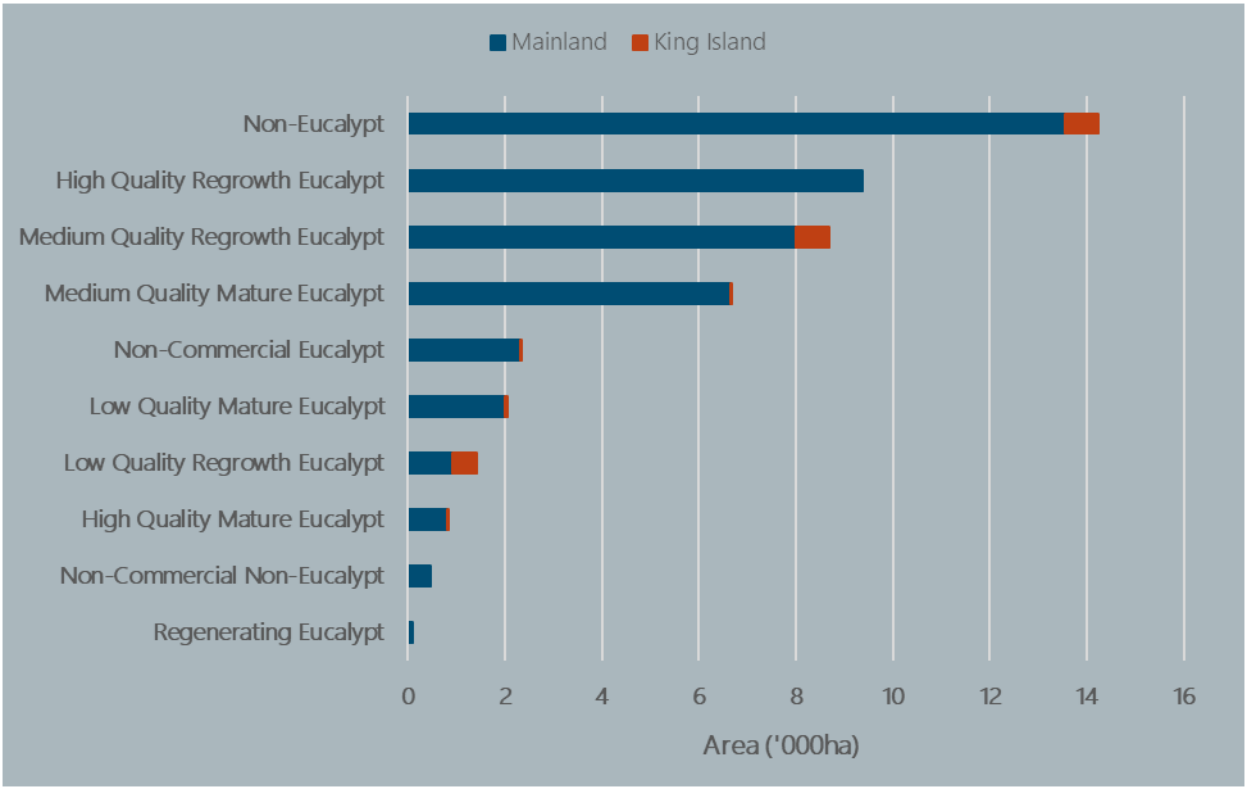
The North West independent native forest resource of 46,000ha is dominated by Dry Eucalypt Forest (77%), which in general are of lower productive capacity than the wet forests which are more prevalent on public land. The remainder of the private independent native forest is comprised of White Top Eucalypt Forest (10%), Wet Eucalypt Forest (9%) and Non-Eucalypt Forest (4%).

Note that 2,000ha of this resource is located on King Island and were excluded from the cartage distance analysis.

6.2.2 Resource Description

The private independent native forest resource was modelled as aggregated PI-Type 'Forest Classes' against which state-wide average standing log product volume estimates could be assigned, the North West breakdown for Mainland and King Island of the Forest Classes expressed in Figure 13.

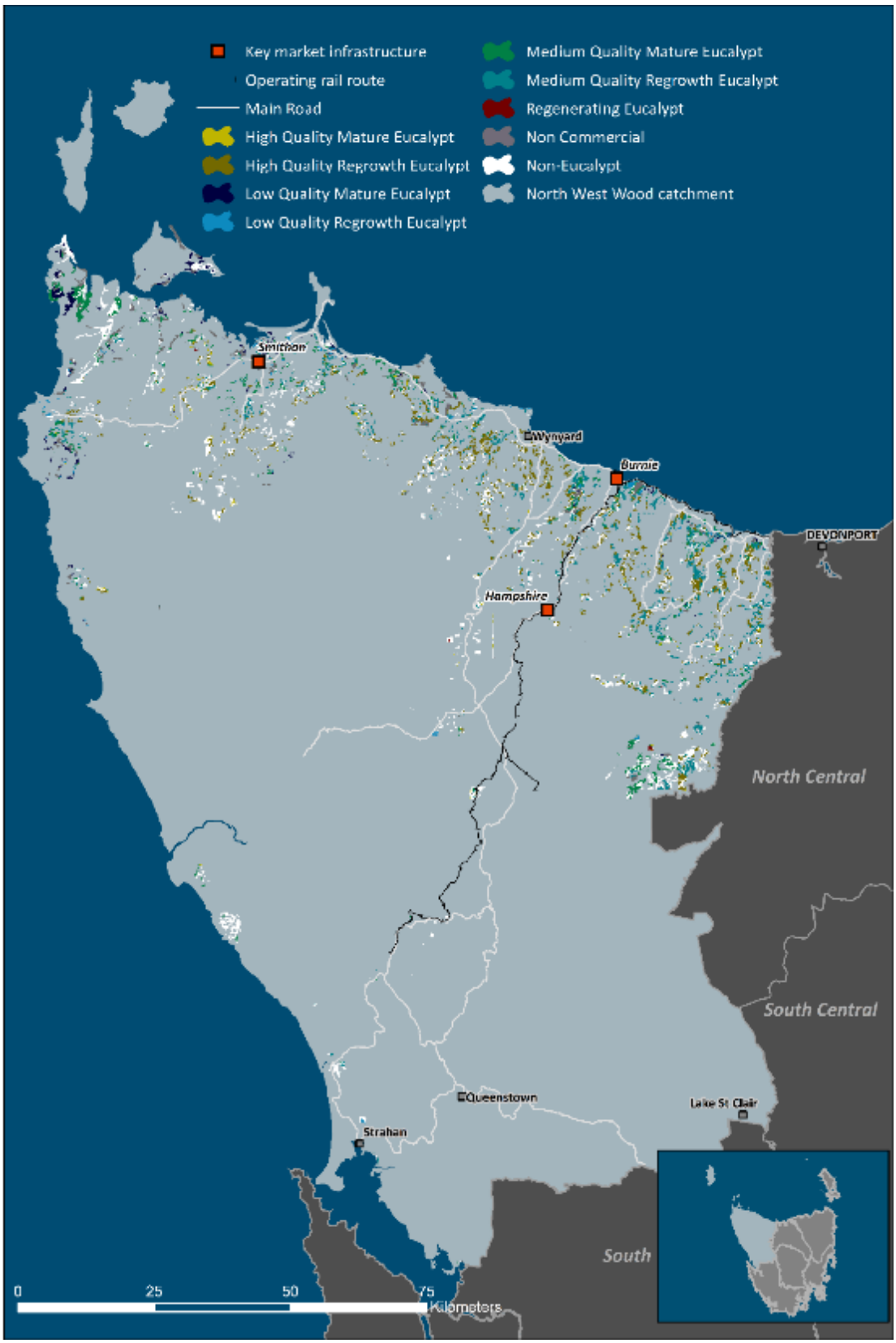
Figure 13: Area of Forest Classes Comprising the North West Private Independent Native Forest Resource



Analysis of these Forest Classes revealed 9,500ha of Mature Eucalypt forest and 19,500ha of Regrowth Eucalypt Forest have the height, crown density and quality to produce sufficient log products for commercial harvest across North West Tasmania. There is also 14,000ha of Non-Eucalypt Forest that has some commercial potential. The remaining 3,000ha was estimated to not have any current commercial potential.

The distribution of these Forest Classes across the North West (Mainland) is shown in Figure 14 below.

Figure 14: Map of North West Private Independent Native Forest Classes



Refer Appendix 12.3 for Forest Class map of North West (King Island)

Of the 43,000ha of forest identified as viable for commercial harvest only 32,000ha has been estimated to be available for harvest after legislated exclusions and discounts on harvesting were accounted for in the model (refer Section 4.1).

This available area carries up to 6.7M tonnes of standing harvestable timber, distributed across Mature Eucalypt Forest (1.5Mt), Regrowth Eucalypt Forest (3.8Mt) and Non-Eucalypt Forest (1.4Mt). A detailed breakdown of log products by Forest Class are shown in Table 12 below.

Table 12: Area and Current Standing Harvestable Log Product Estimates for North West Forest Classes

Forest Class	Area ('000ha)		Estimated Current Standing Harvestable Volume by Log Products ('000t)					
	Gross	Harvestable	Appearance Grade Veneer	Sawlog	Industrial Grade Peeler	Pulplog	Other Biomass	Grand Total
High Quality Mature Eucalypt	1	1	0	30	40	160	70	300
High Quality Regrowth Eucalypt	9	7	10	220	260	1,480	680	2,650
Medium Quality Mature Eucalypt	7	5	0	90	100	880	0	1,070
Medium Quality Regrowth Eucalypt	9	6	0	100	140	840	0	1,080
Low Quality Mature Eucalypt	2	1	0	0	0	140	0	140
Low Quality Regrowth Eucalypt	1	1	0	0	0	50	0	50
Regenerating Eucalypt	0	0	0	0	0	0	0	0
Non-Eucalypt	14	11	0	0	0	0	1,370	1,370
Non-Commercial Eucalypt	2	0	0	0	0	0	0	0
Non-Commercial Non-Eucalypt	0	0	0	0	0	0	0	0
Grand Total	46	32	10	440	550	3,560	2,120	6,680

6.2.3 Intent to Harvest

Of the 43,000ha of commercially viable private independent native forest in the North West only 6,000ha (15%) is covered by a Private Timber Reserve (PTR). Similarly, of the 32,000ha modelled as available for harvest, 5,000ha (15%) is under PTR.

Presence of a PTR strongly indicating intent to undertake forestry activities at some stage. Despite there only being a small area under PTR, there are many land holdings with significant scale of commercial native forests, as shown in Table 13 below.

Table 13: Scale and Current Standing Harvestable Volume of North West Private Independent Native Forest

Scale: Area (ha) of PINF on Property	Count of Properties (n)	Total Current Standing Harvestable Volume across all Properties ('000 t)*	Average Current Standing Harvestable Volume per Property (t)
< 1 ha	1,801	100	56
1-2 ha	533	100	188
2-5 ha	771	400	519
5-20 ha	1,161	2,100	1,809
20-50 ha	376	1,800	4,787
50-100 ha	84	800	9,524
100-150 ha	13	200	15,385
>150 ha	15	1,000	66,667
Total	4,754	6,500	1,367

**Note a small percentage of harvestable area is situated on easements outside of Title boundaries, so cannot be included in this analysis. As such, the volume figures in this table may vary slightly from other tables in this section.*

6.2.4 Proximity to Market Infrastructure

The road-based cartage distance to key market infrastructure was calculated for all properties across North West Tasmania which possess private independent native forest and used to generate distance-based catchment models of the available area or volume for each destination.

Table 14 describes the total harvestable volume of Mature Eucalypt Forest in the North West available for harvest in 25km cartage distance bands from each market infrastructure destination. To provide some commercial viability around the figures, properties with less than 5ha of native forest were excluded from the cumulative volume as they are less likely to be of the scale to be financially viable for harvest.

Table 14: Cumulative Harvestable Volume from North West Mature Forests by Cartage Distance Class and Destination

Destination	Cumulative Total Harvestable Volume ('000t) by Road Cartage Distance Range								
	<25km	<50km	<75km	<100km	<125km	<150km	<175km	<200km	<650km
Bell Bay				13	66	261	338	472	1,334
Branxholm							13	74	1,334
Brighton									1,334
Burnie	96	249	452	800	1,173	1,314	1,334	1,334	1,334
Exeter				24	229	300	414	723	1,334
Hampshire	75	219	499	661	847	1,268	1,334	1,334	1,334
Huon Valley									1,334
Long Reach				17	144	276	382	560	1,334
Longford					20	203	293	395	1,334
Macquarie Wharf									1,334
New Norfolk									1,334
Parattah									1,334
Scottsdale						13	74	262	1,334
Smithton	259	769	847	947	1,032	1,109	1,316	1,319	1,334

Note the volumes above exclude those derived from King Island private independent native forests.

Table 15 describes the corresponding figures for the North West Regrowth Eucalypt Forest.

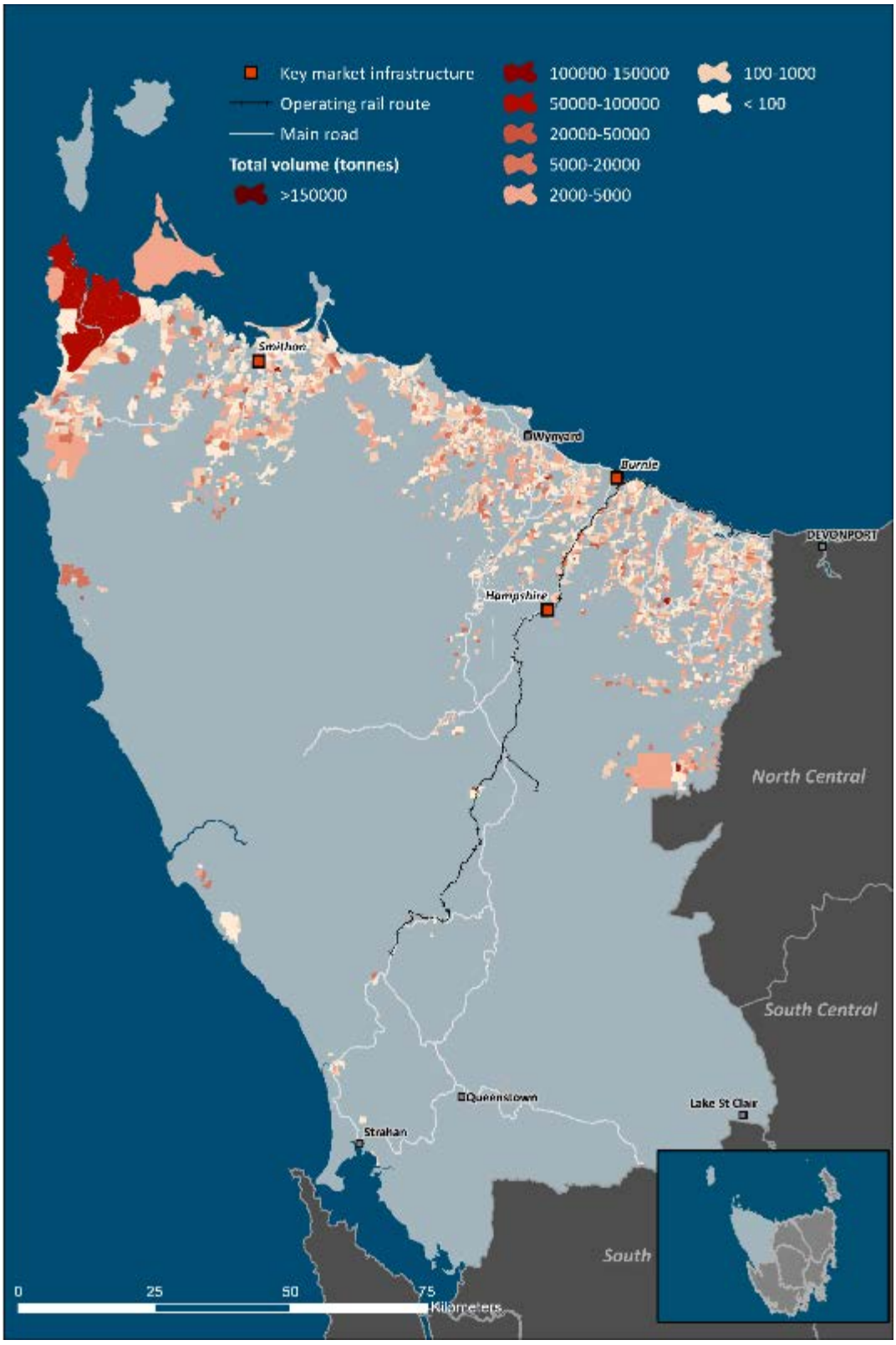
Table 15: Cumulative Harvestable Volume from North West Regrowth Forests by Cartage Distance Class and Destination

Destination	Cumulative Total Harvestable Volume ('000t) by Road Cartage Distance Range								
	<25km	<50km	<75km	<100km	<125km	<150km	<175km	<200km	<650km
Bell Bay				72	443	1,706	2,407	2,564	3,079
Branxholm							94	540	3,079
Brighton									3,079
Burnie	680	2,000	2,465	2,898	3,008	3,061	3,076	3,079	3,079
Exeter				218	1,266	2,289	2,480	2,731	3,079
Hampshire	283	1,620	2,334	2,592	2,964	3,077	3,079	3,079	3,079
Huon Valley									3,079
Long Reach				109	825	2,067	2,420	2,608	3,079
Longford					158	1,072	2,197	2,434	3,079
Macquarie Wharf									3,079
New Norfolk									3,079
Parattah									3,079
Scottsdale						94	522	1,746	3,079
Smithton	385	698	1,241	1,841	2,447	2,840	3,062	3,066	3,079

Note the volumes above exclude those derived from King Island private independent native forests.

The geographic distribution of the scale of volume per property across the North West is represented in Figure 15.

Figure 15: Map of the Scale of Harvestable Volume by Property across the North West



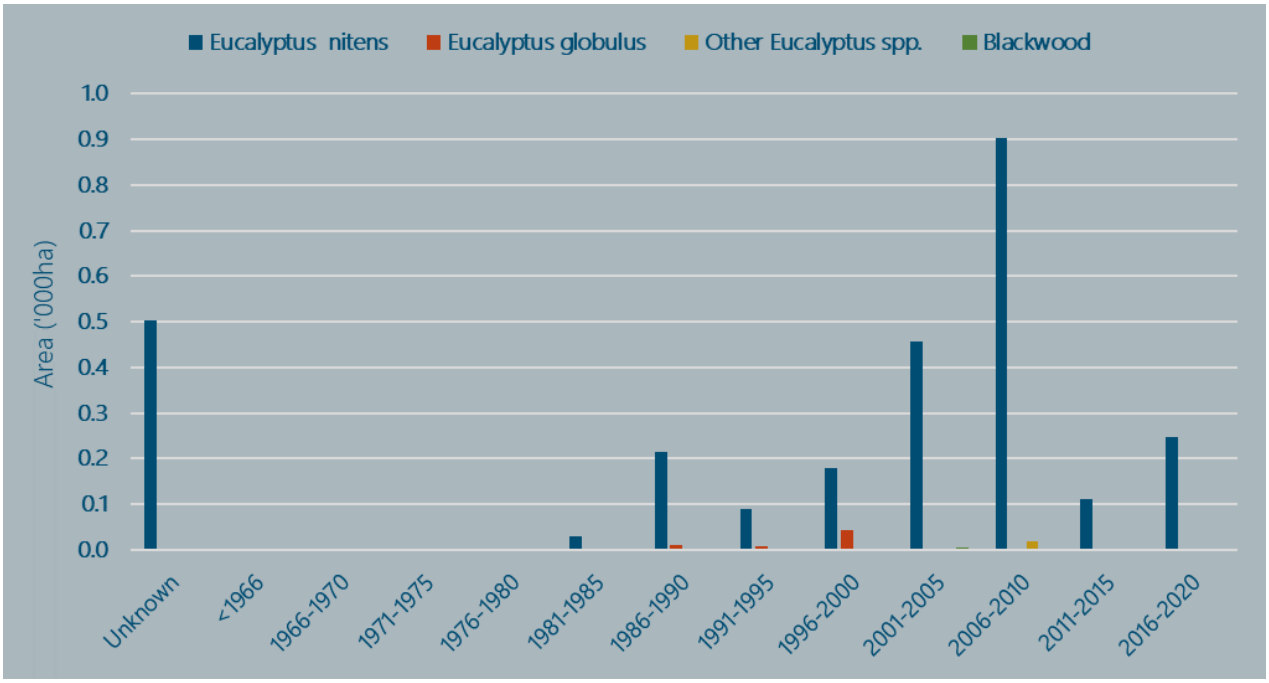
6.3 Private Independent Hardwood Plantations

6.3.1 Forest Description

There is some 2,800ha of private independently managed hardwood plantation currently standing within North West Tasmania, 97% of which is *Eucalyptus nitens*, 8% of which is *E. globulus* and the remaining 4% a mix of other eucalypt and non-eucalypt species.

Figure 16 shows the age and species structure of this hardwood plantation resource.

Figure 16: Five-Year Age Class by Area of North West Private Independent Hardwood Plantations



Based on the DPIPWE Enterprise Suitability Mapping, the North West 2001-2010 age class is distributed across 'Well Suited' (2%), Suitable (27%), Moderately Suitable (50%) and Unsuitable (22%) sites.

6.3.2 Resource Description

The private independent hardwood resource in North West Tasmania is distributed across 912 separate land holdings or properties, 200 of which possess more than 2ha.

Table 16 provides an indication of the scale at which these forests are distributed across these properties in terms of area and total harvestable volume at modelled harvest age, based on a single rotation unpruned unthinned regime. Typically, the larger the scale of the plantation on a property, the more financially viable will be harvest, ignoring distance from market.

Table 16: Scale and Harvestable Volume at Harvest Age of North West Private Independent Hardwood Plantations

Scale: Area (ha) of Hardwood Plantation on each Property	Count of properties (n)	Total Harvestable Volume ('000t) by Period								Average Harvestable Volume per Property (t)
		2016-2020	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	**Grand Total**	
< 1ha	629	16	2	0	0	0	0	0	**18**	**29**
1-2ha	79	12	2	0	1	0	0	0	**14**	**180**
2-5ha	66	23	3	0	1	0	0	0	**27**	**410**
5-20	96	67	47	17	14	0	0	0	**146**	**1,520**
20-50	33	50	35	14	24	3	1	0	**126**	**3,820**
50-100	7	13	31	3	5	1	0	0	**54**	**7,710**
100-150	2	8	0	0	10	0	0	0	**18**	**9,000**
>150	0	0	0	0	0	0	0	0	**0**	**0**
Grand Total	912	187	121	35	55	4	1	0	**403**	**440**

**Note a small percentage of harvestable area is situated on easements outside of Title boundaries, so cannot be included in this analysis. As such, the volume figures in this table may vary slightly from other tables in this section.*

About half the North West hardwood resource is spread across properties in stands less than 20ha in size, reducing likelihood of financial viability, especially if market infrastructure is distant.

6.3.3 Proximity to Market Infrastructure

The road-based cartage distance to key market infrastructure was calculated for all properties across North West Tasmania which possess private independent hardwood plantation and used to generate distance-based catchment models of the available area or volume for each destination.

Table 17 describes the total harvestable volume of North West private independent hardwood plantation available in 25km cartage distance bands from each market infrastructure destination.

To provide some commercial viability around the figures, properties with less than 1ha of plantation were excluded from the cumulative volume as they are less likely to be of the scale to be financially viable for harvest.

Table 17: Cumulative Harvestable Volume at Harvest Age of North West Private Independent Hardwood Plantations by Road Distance Class to Market Infrastructure

Destination	Cumulative Total Harvestable Volume ('000t) by Road Cartage Distance Range								
	<25km	<50km	<75km	<100km	<125km	<150km	<175km	<200km	<650km
Bell Bay				4	52	191	265	341	397
Branxholm							4	54	397
Brighton									397
Burnie	57	196	339	352	378	385	397	397	397
Exeter				14	135	239	317	343	397
Hampshire	32	217	296	340	368	397	397	397	397
Huon Valley									397
Long Reach				5	84	229	289	343	397
Longford					7	99	232	315	397
Macquarie Wharf									397
New Norfolk									397
Parattah									397
Scottsdale						4	53	194	397
Smithton	22	64	154	202	307	374	397	397	397

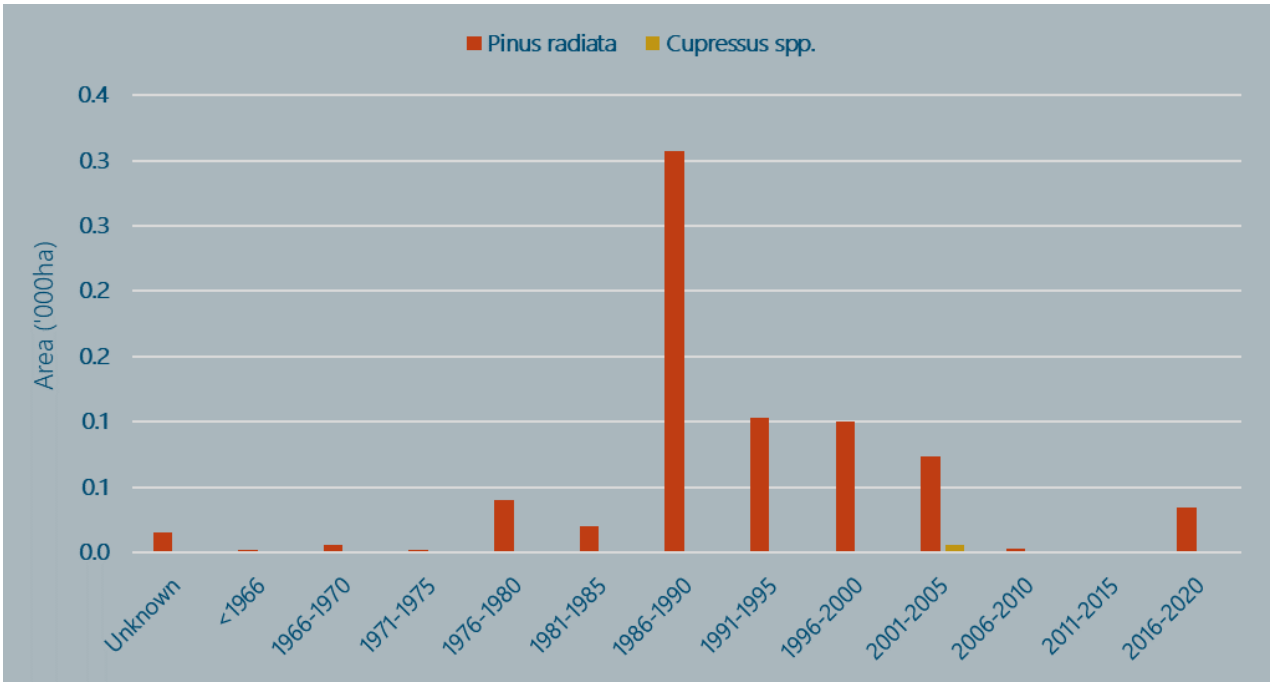
6.4 Private Independent Softwood Plantations

6.4.1 Forest Description

There is 700ha of private independently managed softwood plantation currently standing within North West, 98% of which is *Pinus radiata*.

Figure 17 describes the age structure of this softwood plantation resource. Most of the North West pine is 20 to 35 years in age, and if historic pulp market conditions were favourable for the area, the majority should have been thinned, some possibly pruned.

Figure 17: Five-Year Age Class by Area of North West Private Independent Softwood Plantations



6.4.2 Resource Description

The private independent softwood resource in North West Tasmania is distributed across 186 separate land holdings or properties, 65 of which possess more than 2ha.

Table 18 provides an indication of the scale at which these forests are distributed across land holdings in North West Tasmania in terms of area and total harvestable volume at modelled harvest age, based on a single rotation unpruned single-thinning regime.

Table 18: Scale and Harvestable Volume at Harvest Age of North West Private Independent Softwood Plantations

Scale: Area (ha) of Softwood Plantation on each Property	Count of properties (n)	Total Harvestable Volume ('000t) by Period								Average Harvestable Volume per Property (t)
		2016-2020	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	**Grand Total**	
< 1ha	101	7	1	2	1	0	0	0	**10**	**99**
1-2ha	20	6	3	1	0	0	0	0	**11**	**550**
2-5ha	26	16	4	7	1	1	0	1	**29**	**1,115**
5-20	25	34	18	21	0	1	0	0	**75**	**3,000**
20-50	11	40	22	6	8	0	9	0	**86**	**7,818**
50-100	2	23	4	0	0	0	5	0	**33**	**16,500**
100-150	1	37	0	1	0	0	0	0	**39**	**39,000**
>150	0	0	0	0	0	0	0	0	**0**	**0**
Grand Total	186	164	52	38	11	3	14	1	**284**	**1,527**

**Note a small percentage of harvestable area is situated on easements outside of Title boundaries, so cannot be included in this analysis. As such, the volume figures in this table may vary slightly from other tables in this section.*

About half the North West pine resource is spread across properties in stands less than 20ha in size, reducing likelihood of financial viability, especially if market infrastructure is distant.

6.4.3 Proximity to Market Infrastructure

The road-based cartage distance to key market infrastructure was calculated for all properties across North West Tasmania which possess private independent hardwood plantation and used to generate distance-based catchment models of the available area or volume for each destination.

Table 19 describes the total harvestable volume of private independent softwood plantation available in 25km cartage distance bands from each market infrastructure destination.

To provide some commercial viability around the figures, properties with less than 1ha of plantation were excluded from the cumulative volume as they are less likely to be of the scale to be financially viable for harvest.

Table 19: Cumulative Clearfell Harvestable Volume at Harvest Age of North West Private Independent Softwood Plantations by Road Distance Class to Market Infrastructure

Destination	Cumulative Total Clearfell Harvestable Volume ('000t) by Road Cartage Distance Range								
	<25km	<50km	<75km	<100km	<125km	<150km	<175km	<200km	<650km
Bell Bay					2	37	86	120	122
Branxholm								11	122
Brighton									122
Burnie	16	67	121	123	123	123	123	123	122
Exeter				1	21	50	120	120	122
Hampshire	5	50	118	120	122	122	122	122	122
Huon Valley									122
Long Reach					13	38	90	121	122
Longford					1	21	38	121	122
Macquarie Wharf									122
New Norfolk									122
Parattah									122
Scottsdale							11	37	122
Smithton	2	2	53	68	102	113	123	123	122

6.5 Private Industrial-scale Plantations

6.5.1 Forest Description

The North West private industrial-scale estate is 73,000ha in area of which 83% is managed on private freehold land, the other 17% on public land.

66,000ha is hardwood plantation, predominantly of the species *Eucalyptus nitens*. The 7,000ha of softwood plantation is predominantly *Pinus radiata*.

Figure 18 provides the overall species percentage breakdown, and Figure 19 the geographic distribution across the North West.

Figure 18: Breakdown of Species for North West Private Industrial-scale Plantations

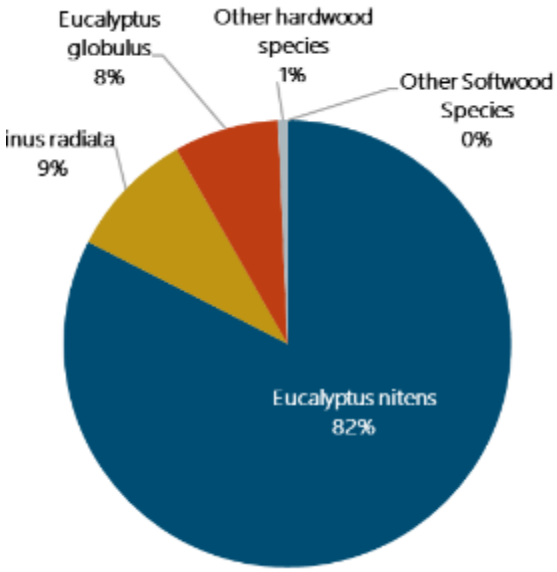
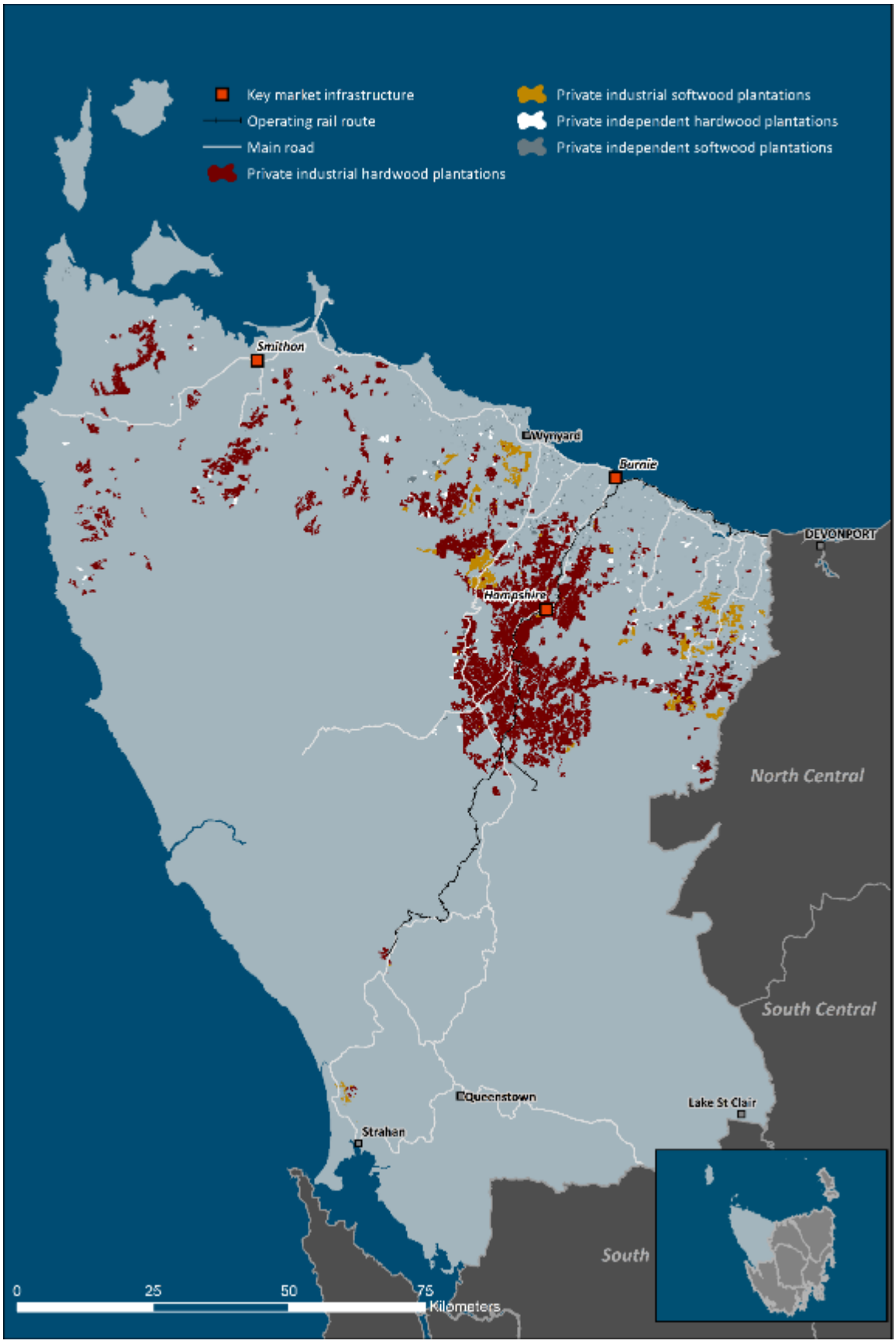
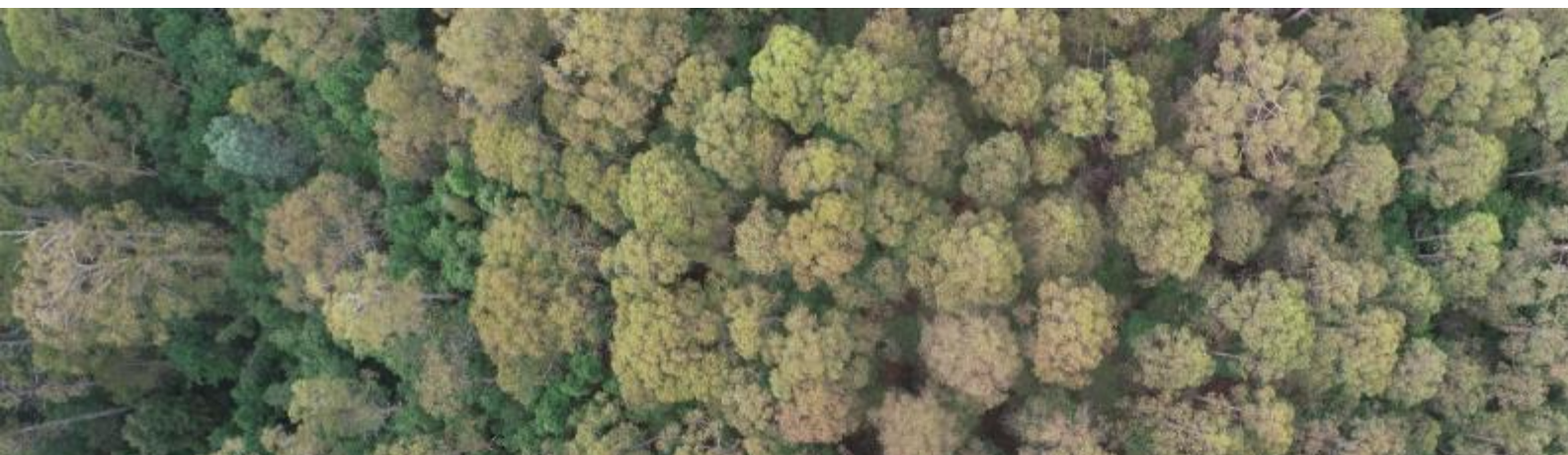


Figure 19: Map of North West Private Industrial-Scale Plantations



NORTH CENTRAL WOOD CATCHMENT

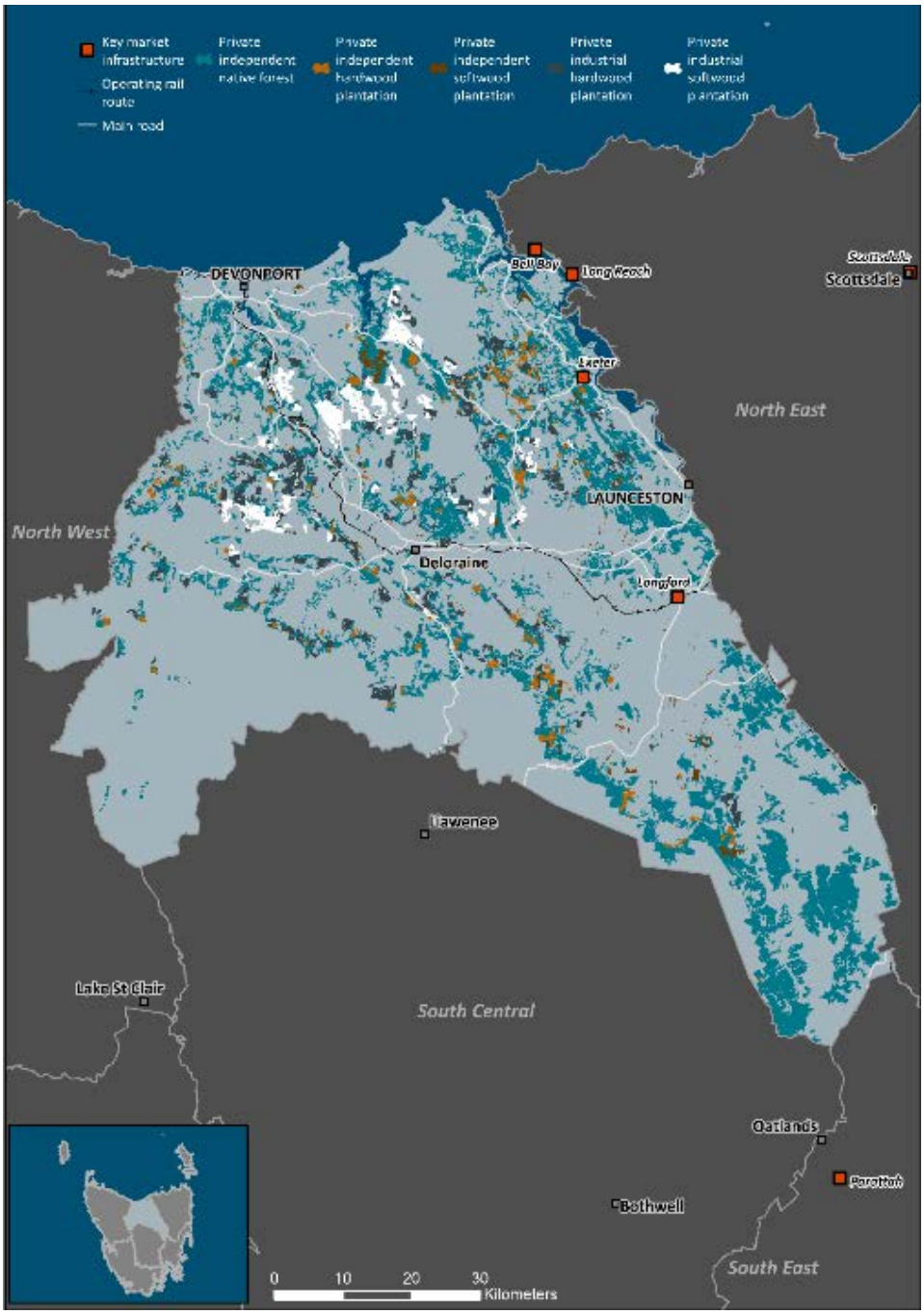


7 North Central Wood Catchment

7.1 North Central Overview

The North Central privately managed forest estate is comprised of some 109,000ha of native forest, 23,000ha of hardwood plantation and 13,000ha of softwood plantation as shown in Figure 20, which in total makes up 20% of the total land in the North Central.

Figure 20: Map of North Central Private Independent Forests



The 101,000ha of private independent native forest resource in the North Central is distributed across approximately 7,200 individual land holdings, though only 3,300 of these properties possess more than 5ha. The main commercial components of this resource are dominated by *Eucalyptus amygdalina* (50%), *Eucalyptus viminalis (17%) and Eucalyptus obliqua (13%)* vegetation communities based on analysis of the TASVEG 4.0 mapping.

Of the plantation resources in the North Central, some 76% of hardwood plantations and 84% of softwood plantations are within the 'industrial-scale' estates. The remaining 7,500ha of plantation resources managed by individual landowners are confined to private freehold land and are distributed across 650 individual land holdings.

The following sections describe in more detail the availability and distribution of the privately managed native forest, hardwood plantation and softwood plantation resources within the North Central.

7.2 Private Independent Native Forests

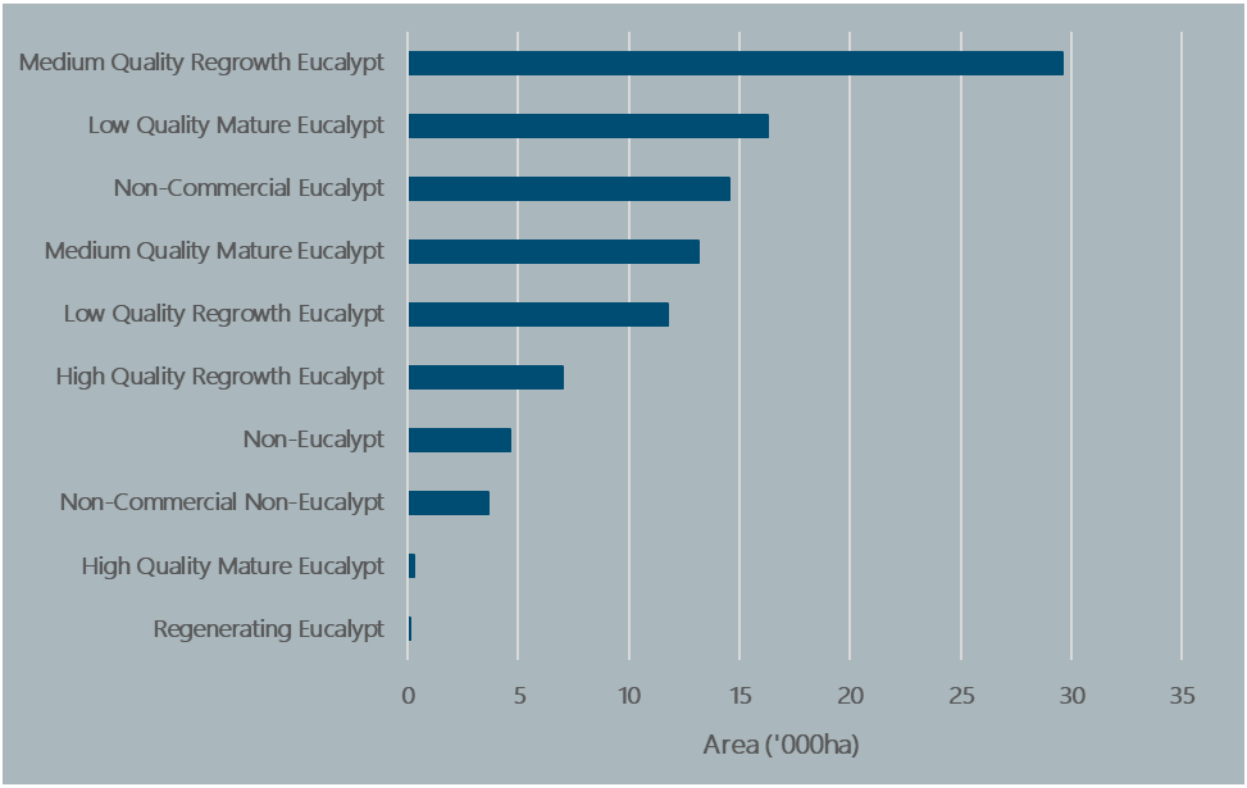
7.2.1 Forest Description

The North Central independent native forest resource of 101,000ha is dominated by Dry Eucalypt Forest (81%), which in general are of lower productive capacity than the wet forests which are more prevalent on public land. The remainder of the private independent native forest is comprised of Wet Eucalypt Forest (12%), Non-Eucalypt Forest (5%) and White Top Eucalypt Forest (3%).

7.2.2 Resource Description

The private independent native forest resource was modelled as aggregated PI-Type 'Forest Classes' against which state-wide average standing log product volume estimates could be assigned, the North Central breakdown of the Forest Classes expressed in Figure 21 below.

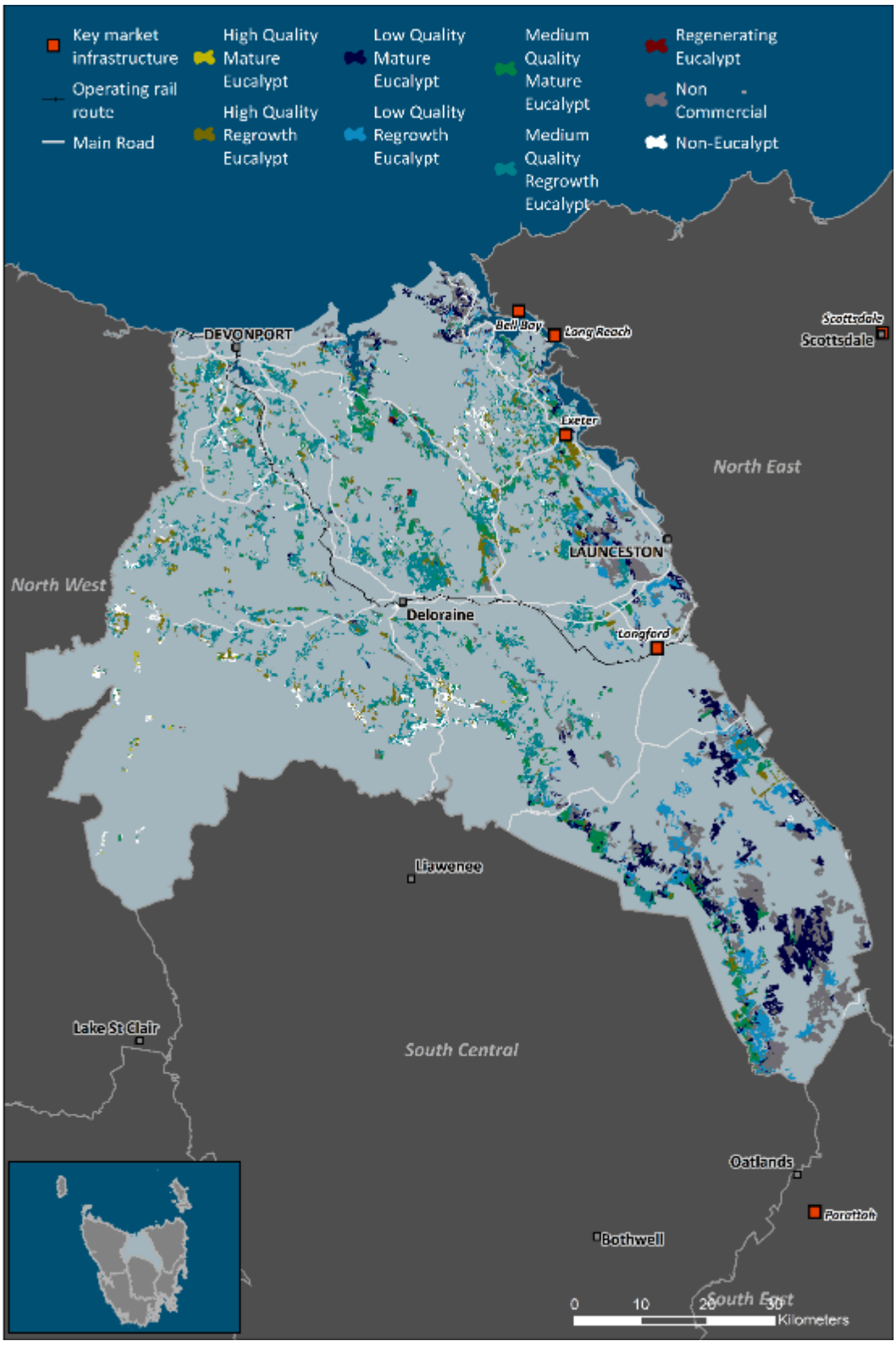
Figure 21: Area of Forest Classes Comprising the North Central Private Independent Native Forest Resource



Analysis of these Forest Classes revealed 48,000ha of Regrowth Eucalypt Forest and 30,000ha of Mature Eucalypt forest have the height, crown density and quality to produce sufficient log products for commercial harvest across North Central Tasmania. There is also 5,000ha of Non-Eucalypt Forest that has some commercial potential. The remaining 18,000ha was estimated to not have any current commercial potential.

The distribution of these Forest Classes across the North Central is shown in Figure 22 below.

Figure 22: Map of North Central Private Independent Native Forest Classes



Of the 83,000ha of forest identified as viable for commercial harvest only 45,000ha has been estimated to be available for harvest after legislated exclusions and discounts on harvesting were accounted for in the model (refer Section 4.1).

This available area carries up to 7.2M tonnes of standing harvestable timber, distributed across Mature Eucalypt Forest (2.9Mt), Regrowth Eucalypt Forest (4.0Mt) and Non-Eucalypt Forest (0.3Mt). A detailed breakdown of log products by Forest Class are shown in Table 20 below.

Table 20: Area and Current Standing Harvestable Log Product Estimates for North Central Forest Classes

Forest Class	Area ('000ha)		Estimated Current Standing Harvestable Volume by Log Products ('000t)					
	Gross	Harvestable	Appearance Grade Veneer	Sawlog	Industrial Grade Peeler	Pulplog	Other Biomass	Grand Total
High Quality Mature Eucalypt	0	0	0	10	10	40	20	80
High Quality Regrowth Eucalypt	7	4	0	60	100	590	260	1,010
Medium Quality Mature Eucalypt	13	8	0	170	200	1,590	0	1,960
Medium Quality Regrowth Eucalypt	30	16	10	230	330	2,100	0	2,670
Low Quality Mature Eucalypt	16	9	0	0	0	850	0	850
Low Quality Regrowth Eucalypt	12	5	0	0	20	310	0	330
Regenerating Eucalypt	0	0	0	0	0	0	0	0
Non-Eucalypt	5	3	0	0	0	0	350	350
Non-Commercial Eucalypt	15	0	0	0	0	0	0	0
Non-Commercial Non-Eucalypt	4	0	0	0	0	0	0	0
Grand Total	101	45	10	460	660	5,490	630	7,250

7.2.3 Intent to Harvest

Of the 83,000ha of commercially viable private independent native forest in the North Central only 14,000ha (16%) is covered by a Private Timber Reserve (PTR). Similarly, of the 45,000ha modelled as available for harvest, 8,000ha (18%) is under PTR.

Presence of a PTR strongly indicating intent to undertake forestry activities at some stage. Despite there only being a small area under PTR, there are many land holdings with significant scale of commercial native forests, as shown in Table 21 below.

Table 21: Scale and Current Standing Harvestable Volume of North Central Private Independent Native Forest

Scale: Area (ha) of PINF on Property	Count of Properties (n)	Total Current Standing Harvestable Volume across all Properties ('000 t)*	Average Current Standing Harvestable Volume per Property (t)
< 1 ha	3,128	100	32
1-2 ha	734	100	136
2-5 ha	1,050	300	286
5-20 ha	1,445	1,600	1,107
20-50 ha	502	1,500	2,988
50-100 ha	145	800	5,517
100-150 ha	59	500	8,475
>150 ha	104	2,300	22,115
Total	7,167	7,100	991

**Note a small percentage of harvestable area is situated on easements outside of Title boundaries, so cannot be included in this analysis. As such, the volume figures in this table may vary slightly from other tables in this section.*

7.2.4 Proximity to Market Infrastructure

The road-based cartage distance to key market infrastructure was calculated for all properties across North Central Tasmania which possess private independent native forest and used to generate distance-based catchment models of the available area or volume for each destination.

Table 22 describes the total harvestable volume of Mature Eucalypt Forest in the North Central available for harvest in 25km cartage distance bands from each market infrastructure destination. To provide some commercial viability around the figures, properties with less than 5ha of native forest were excluded from the cumulative volume as they are less likely to be of the scale to be financially viable for harvest.

Table 22: Cumulative Harvestable Volume from North Central Mature Forests by Cartage Distance Class and Destination

Destination	Cumulative Total Harvestable Volume ('000t) by Road Cartage Distance Range								
	<25km	<50km	<75km	<100km	<125km	<150km	<175km	<200km	<650km
Bell Bay	21	395	1,006	1,545	2,191	2,678	2,685	2,685	2,685
Branxholm				71	811	2,016	2,610	2,675	2,685
Brighton				245	731	1,109	1,521	2,002	2,685
Burnie		4	285	688	1,233	1,552	1,863	2,346	2,685
Exeter	425	1,009	1,482	2,147	2,681	2,685	2,685	2,685	2,685
Hampshire			4	128	573	1,167	1,503	1,844	2,685
Huon Valley							254	810	2,685
Long Reach	99	641	1,129	1,805	2,339	2,685	2,685	2,685	2,685
Longford	227	1,206	2,406	2,650	2,685	2,685	2,685	2,685	2,685
Macquarie Wharf					253	741	1,214	1,557	2,685
New Norfolk				3	609	838	1,411	1,814	2,685
Parattah		266	752	1,027	1,443	1,820	2,279	2,622	2,685
Scottsdale			40	654	1,744	2,560	2,660	2,686	2,685
Smithton					3	78	527	1,155	2,685

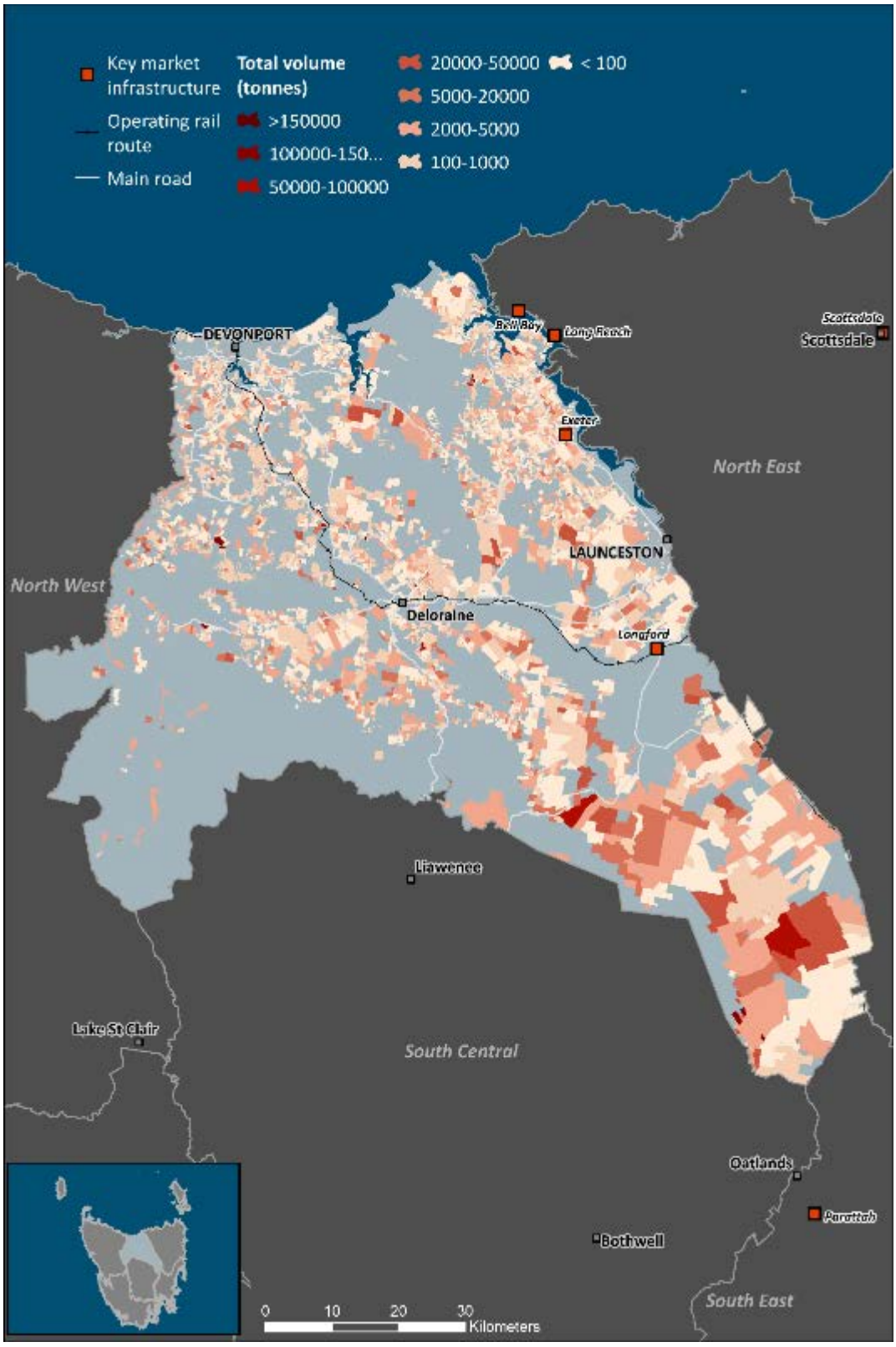
Table 23 describes the corresponding figures for the North Central Regrowth Eucalypt Forest.

Table 23: Cumulative Harvestable Volume from North Central Regrowth Forests by Cartage Distance Class and Destination

Destination	Cumulative Total Harvestable Volume ('000t) by Road Cartage Distance Range								
	<25km	<50km	<75km	<100km	<125km	<150km	<175km	<200km	<650km
Bell Bay	35	477	1,341	2,743	3,219	3,387	3,388	3,388	3,388
Branxholm				87	1,025	2,096	3,159	3,385	3,388
Brighton				82	158	436	916	2,068	3,388
Burnie		87	585	1,324	2,721	3,032	3,180	3,306	3,388
Exeter	599	1,284	2,683	3,213	3,388	3,388	3,388	3,388	3,388
Hampshire			23	507	1,148	2,586	3,027	3,170	3,388
Huon Valley							85	213	3,388
Long Reach	134	701	1,644	2,990	3,302	3,388	3,388	3,388	3,388
Longford	296	1,481	2,453	3,309	3,387	3,388	3,388	3,388	3,388
Macquarie Wharf					84	168	499	950	3,388
New Norfolk				9	112	239	673	1,666	3,388
Parattah		85	168	349	689	1,498	2,380	3,157	3,388
Scottsdale			56	903	1,937	3,122	3,363	3,388	3,388
Smithton					1	472	1,089	2,535	3,388

The geographic distribution of the scale of volume per property across the North Central is represented in Figure 23.

Figure 23: Map of the Scale of Harvestable Volume by Property across the North Central



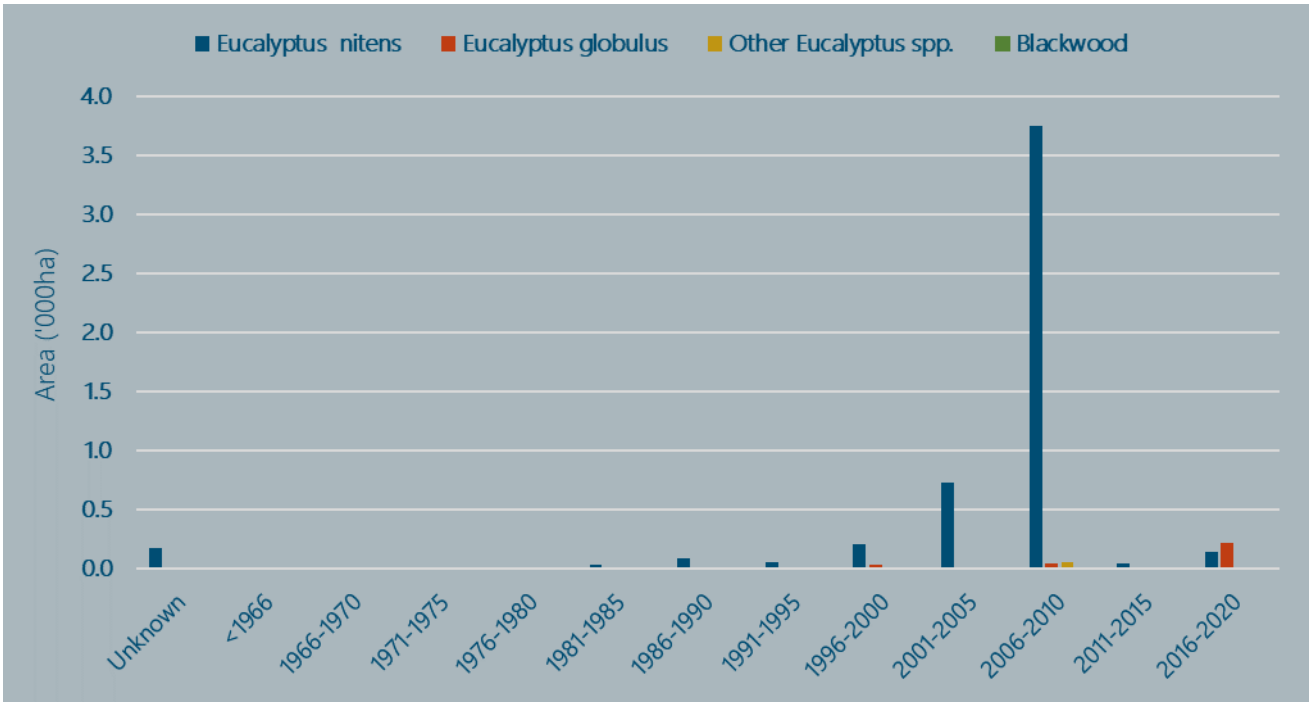
7.3 Private Independent Hardwood Plantations

7.3.1 Forest Description

There is some 5,500ha of private independently managed hardwood plantation currently standing within North Central, 94% of which is *Eucalyptus nitens*, 5% of which is *E. globulus* and the remaining 1% a mix of other eucalypt and non-eucalypt species.

Figure 24 describes the age structure of this hardwood plantation resource.

Figure 24: Five-Year Age Class by Area of North Central Private Independent Hardwood Plantations



Based on the DPIPWE Enterprise Suitability Mapping, the North Central 2001-2010 age class is distributed across 'Well Suited' (16%), Suitable (51%), Moderately Suitable (18%) and Unsuitable (15%) sites.

7.3.2 Resource Description

The private independent hardwood resource in North Central Tasmania is distributed across 471 separate land holdings or properties, 228 of which possess more than 2ha.

Table 24 provides an indication of the scale at which these forests are distributed across these properties in terms of area and total harvestable volume at modelled harvest age, based on a single rotation unpruned unthinned regime. Typically, the larger the scale of the plantation on a property, the more financially viable will be harvest, ignoring distance from market.

Table 24: Scale and Harvestable Volume at Harvest Age of North Central Private Independent Hardwood Plantations

Scale: Area (ha) of Hardwood Plantation on each Property	Count of properties (n)	Total Harvestable Volume ('000t) by Period								Average Harvestable Volume per Property (t)
		2016-2020	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	**Grand Total**	
< 1ha	216	3	1	0	0	0	0	0	**5**	**24**
1-2ha	27	3	2	1	0	0	0	0	**6**	**227**
2-5ha	44	12	5	0	1	0	0	0	**19**	**442**
5-20	93	43	113	14	13	0	1	0	**189**	**2,036**
20-50	59	76	196	17	13	0	1	0	**309**	**5,238**
50-100	19	38	106	23	50	0	1	0	**223**	**11,742**
100-150	8	40	115	2	1	0	0	0	**163**	**20,340**
>150	5	27	48	1	13	0	0	0	**91**	**18,216**
Grand Total	471	243	587	58	93	0	2	0	**1,006**	**2,136**

**Note a small percentage of harvestable area is situated on easements outside of Title boundaries, so cannot be included in this analysis. As such, the volume figures in this table may vary slightly from other tables in this section.*

Most of the North Central hardwood plantation resource is within stands of 20ha or more, which suggests a high likelihood it will of scale to be financially viable to harvest if within reasonable distance of market infrastructure.

7.3.3 Proximity to Market Infrastructure

The road-based cartage distance to key market infrastructure was calculated for all properties across North Central Tasmania which possess private independent hardwood plantation and used to generate distance-based catchment models of the available area or volume for each destination.

Table 25 describes the total harvestable volume of North Central private independent hardwood plantation available in 25km cartage distance bands from each market infrastructure destination.

To provide some commercial viability around the figures, properties with less than 1ha of plantation were excluded from the cumulative volume as they are unlikely to be of the scale to be financially viable for harvest.

Table 25: Cumulative Harvestable Volume at Harvest Age of North Central Private Independent Hardwood Plantations by Road Distance Class to Market Infrastructure

Destination	Cumulative Total Harvestable Volume ('000t) by Road Cartage Distance Range								
	<25km	<50km	<75km	<100km	<125km	<150km	<175km	<200km	<650km
Bell Bay		252	488	854	977	1,000	1,000	1,000	1,000
Branxholm				6	407	807	948	1,000	1,000
Brighton				1	15	159	295	638	1,000
Burnie		3	90	415	794	940	978	999	1,000
Exeter	318	484	852	978	1,000	1,000	1,000	1,000	1,000
Hampshire				73	336	757	926	978	1,000
Huon Valley							1	62	1,000
Long Reach	41	365	561	948	995	1,000	1,000	1,000	1,000
Longford	34	502	841	982	1,000	1,000	1,000	1,000	1,000
Macquarie Wharf					1	15	190	303	1,000
New Norfolk					1	67	259	496	1,000
Parattah		1	15	61	211	436	827	958	1,000
Scottsdale			5	364	791	947	1,000	1,000	1,000
Smithton						44	307	725	1,000

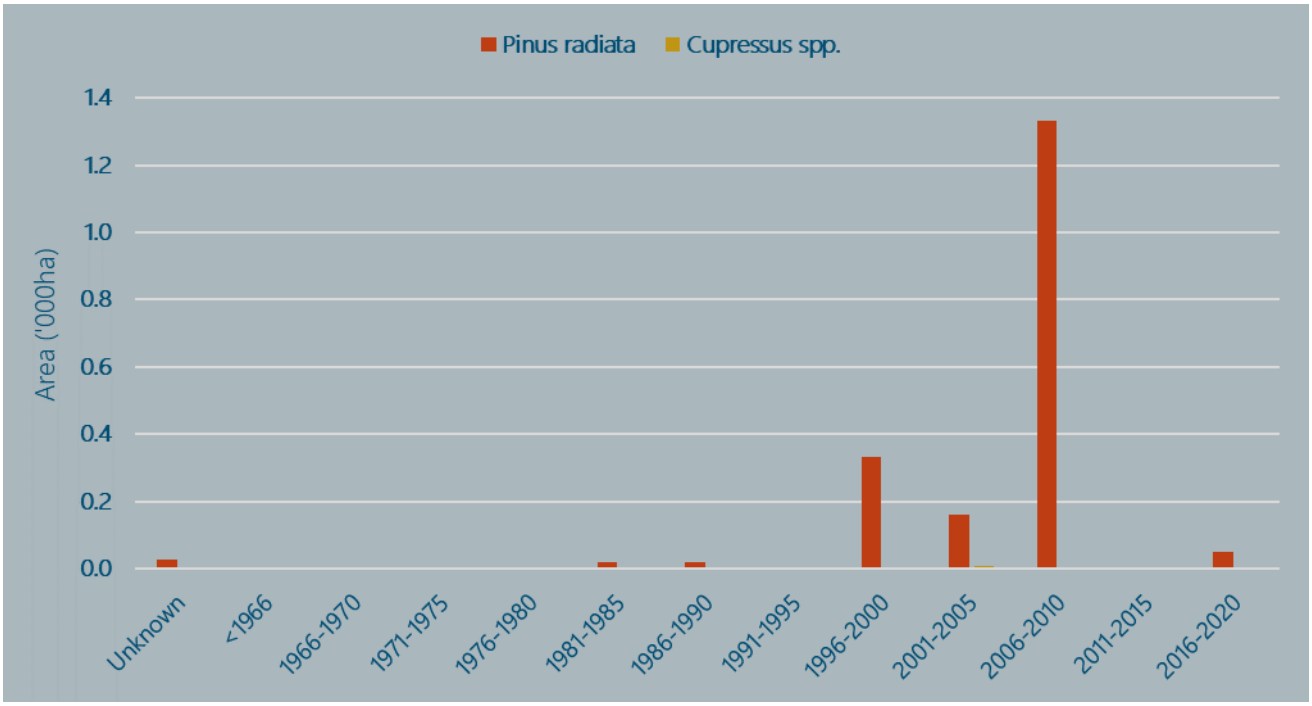
7.4 Private Independent Softwood Plantations

7.4.1 Forest Description

There is 2,000ha of private independently managed softwood plantation currently standing within North Central, almost 100% of which is *Pinus radiata*.

Figure 25 describes the age structure of the softwood plantation resource in the North Central, the 2006-2010 age class dominating.

Figure 25: Five-Year Age Class by Area of North Central Private Independent Softwood Plantations



Based on the DPIPWE Enterprise Suitability Mapping, the North Central 2006-2010 age class is distributed across 'Well Suited' (39%), Suitable (41%), Moderately Suitable (20%) and Unsuitable (1%) sites.

7.4.2 Resource Description

The private independent softwood resource in North Central Tasmania is distributed across 177 separate land holdings or properties, 90 of which possess more than 2ha.

Table 26 provides an indication of the scale at which these forests are distributed across land holdings in North Central Tasmania in terms of area and total harvestable volume at modelled harvest age, based on a single rotation unpruned single-thinning regime.

Table 26: Scale and Harvestable Volume at Harvest Age of North Central Private Independent Softwood Plantations

Scale: Area (ha) of Softwood Plantation on each Property	Count of properties (n)	Total Harvestable Volume ('000t) by Period								Average Harvestable Volume per Property (t)
		2016-2020	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	Grand Total	
< 1ha	68	2	1	3	0	0	0	0	6	88
1-2ha	19	4	1	4	1	0	0	0	11	579
2-5ha	28	8	7	15	5	0	0	0	35	1,250
5-20	35	14	20	83	29	5	0	0	152	4,343
20-50	12	2	6	18	22	38	1	0	87	7,250
50-100	6	0	2	6	92	10	22	0	131	21,833
100-150	4	0	26	14	82	48	0	0	170	42,500
>150	5	0	16	3	169	33	2	0	222	44,400
Grand Total	177	30	79	147	400	134	25	0	815	4,605

**Note a small percentage of harvestable area is situated on easements outside of Title boundaries, so cannot be included in this analysis. As such, the volume figures in this table may vary slightly from other tables in this section.*

A considerable proportion of the North Central pine resource is within stands of 20ha or more, which suggests a high likelihood it will of scale to be financially viable to harvest if within reasonable distance of market infrastructure.

7.4.3 Proximity to Market Infrastructure

The road-based cartage distance to key market infrastructure was calculated for all properties across North Central Tasmania which possess private independent hardwood plantation and used to generate distance-based catchment models of the available area or volume for each destination.

Table 27 describes the total harvestable volume of private independent softwood plantation available in 25km cartage distance bands from each market infrastructure destination.

To provide some commercial viability around the figures, properties with less than 1ha of plantation were excluded from the cumulative volume as they are less likely to be of the scale to be financially viable for harvest.

Table 27: Cumulative Clearfell Harvestable Volume at Harvest Age of North Central Private Independent Softwood Plantations by Road Distance Class to Market Infrastructure

Destination	Cumulative Total Clearfell Harvestable Volume ('000t) by Road Cartage Distance Range								
	<25km	<50km	<75km	<100km	<125km	<150km	<175km	<200km	<650km
Bell Bay		119	502	703	803	804	804	804	804
Branxholm				47	263	775	804	804	804
Brighton					72	245	306	476	804
Burnie			279	351	522	612	730	804	804
Exeter	172	492	696	803	804	804	804	804	804
Hampshire				53	306	500	599	731	804
Huon Valley								73	804
Long Reach	45	200	537	731	804	804	804	804	804
Longford	127	388	771	804	804	804	804	804	804
Macquarie Wharf						73	251	315	804
New Norfolk						98	278	396	804
Parattah			73	200	290	419	533	803	804
Scottsdale			40	221	695	801	803	803	804
Smithton						28	304	465	804

7.5 Private Industrial-scale Plantations

7.5.1 Forest Description

The North Central private industrial-scale estate is 28,000ha in area of which 67% is managed on private freehold land, the other 33% on public land.

17,000ha is hardwood plantation, predominantly of the species *Eucalyptus nitens*. The 11,000ha of softwood plantation is predominantly *Pinus radiata*.

Figure 26 provides the overall species percentage breakdown, and Figure 27 the geographic distribution across the North Central.

Figure 26: Breakdown of Species for North Central Private Industrial-scale Plantations

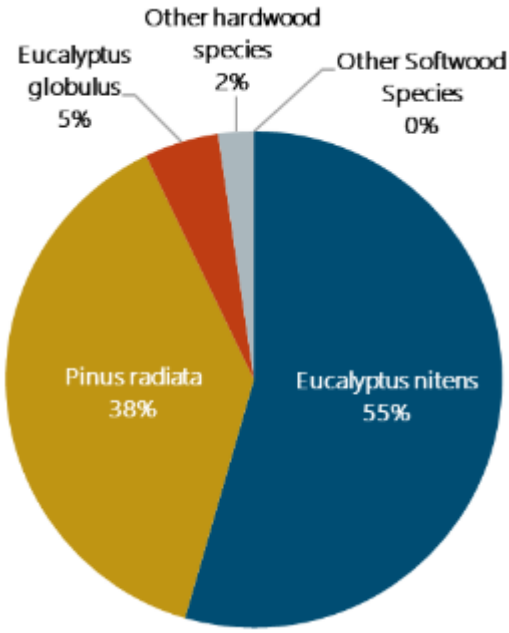
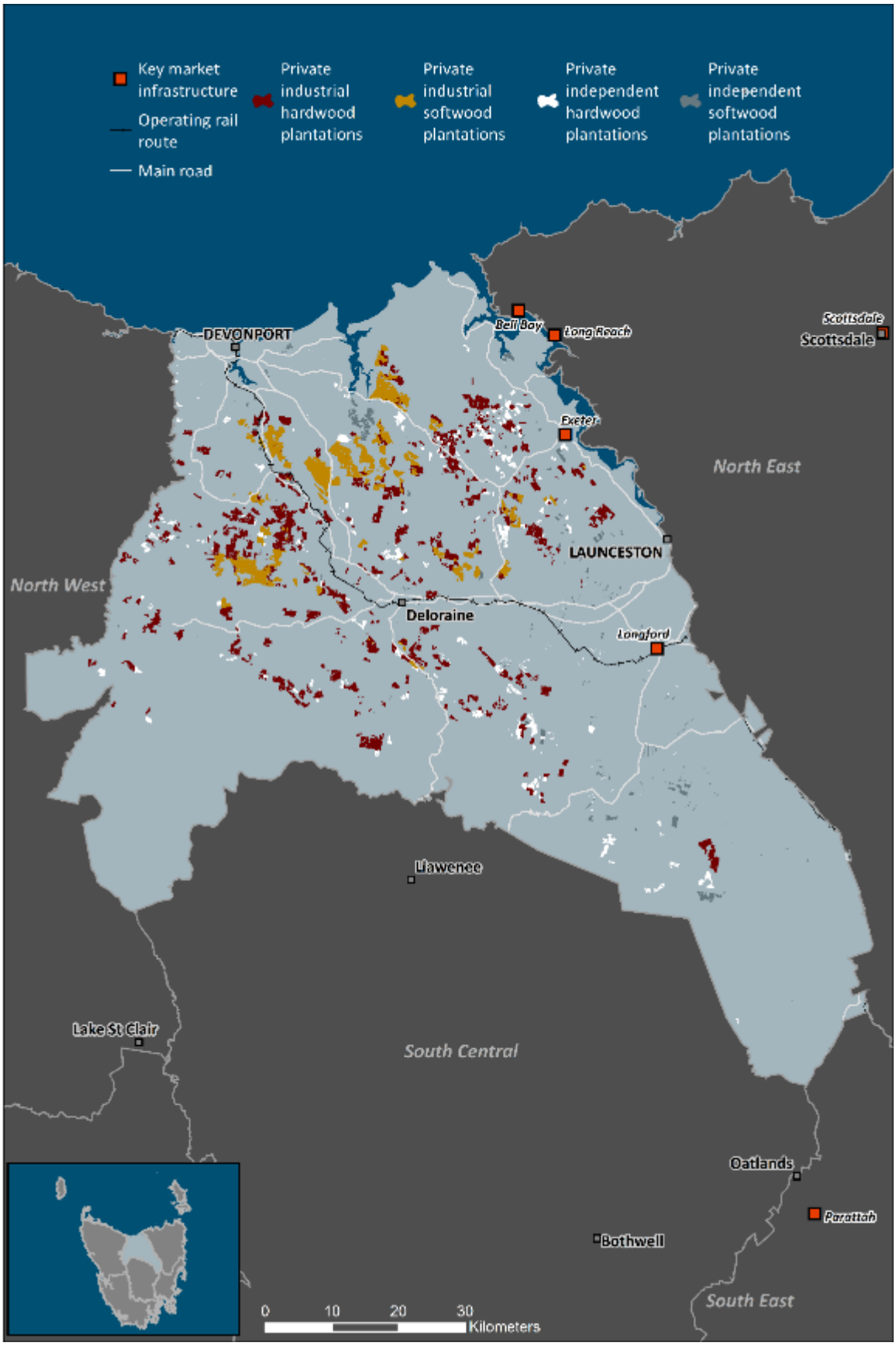


Figure 27: Map of North Central Private Industrial-scale Plantations



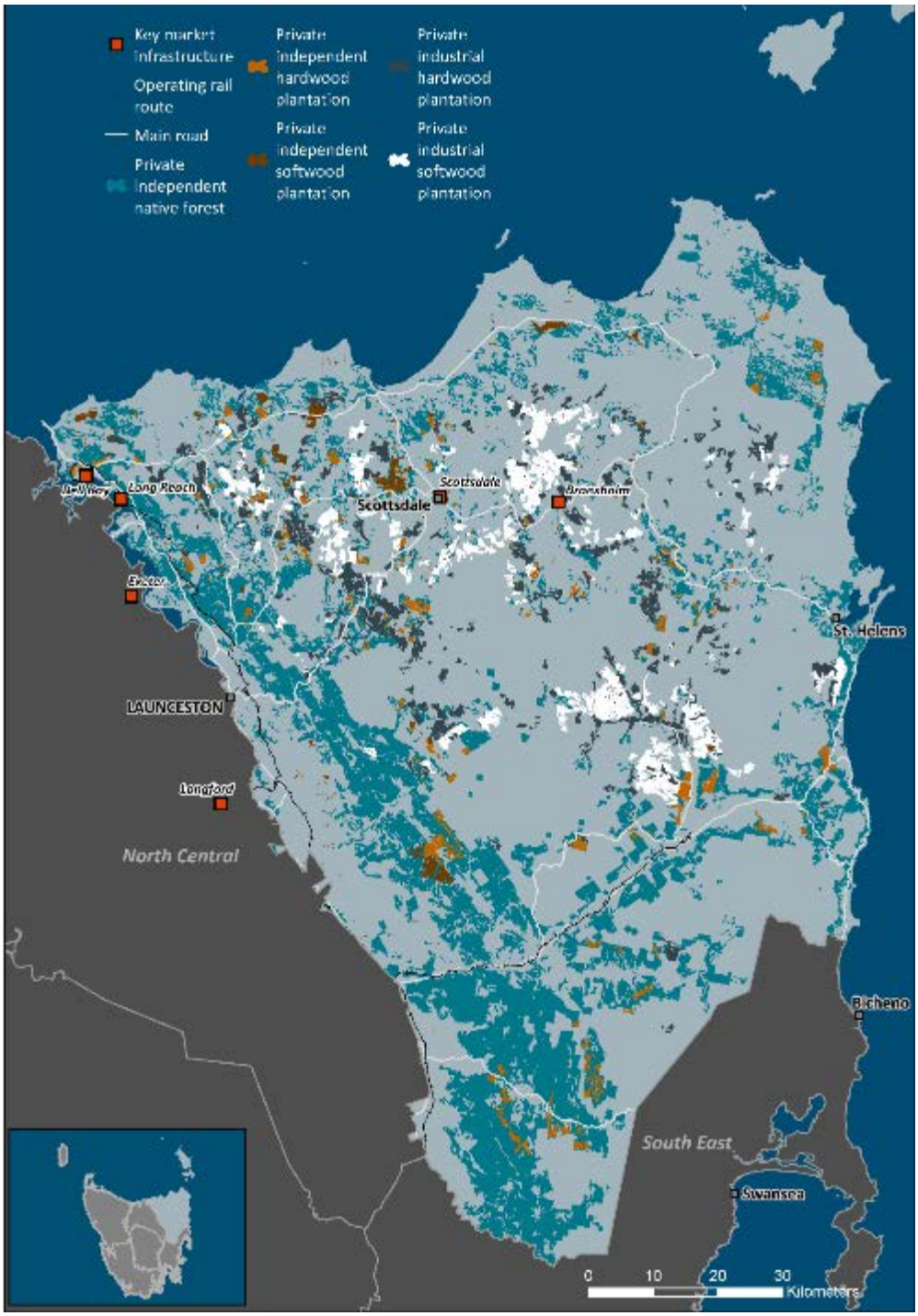
NORTH EAST WOOD CATCHMENT

8 North East Wood Catchment

8.1 North East Overview

The North East privately managed forest estate is comprised of some 213,000ha of native forest, 43,000ha of hardwood plantation and 35,000ha of softwood plantation as shown in Figure 28, which in total makes up 22% of the total land in the North East.

Figure 28: Map of North East Private Independent Forests



The 213,000ha of private independent native forest resource in the North East is distributed across approximately 5,900 individual land holdings, though only 2,300 of these properties possess more than 5ha. The main commercial components of this resource are dominated by *Eucalyptus amygdalina* (47%), *E. delegatensis (14%), E. viminalis (14%) and E. obliqua (7%)* vegetation communities based on analysis of the TASVEG 4.0 mapping.

Of the plantation resources in the North East, some 74% of hardwood plantations and 88% of softwood plantations are within the 'industrial-scale' estates. The remaining 16,000ha of plantation resources managed by individual landowners are confined to private freehold land and are distributed across 1,200 individual land holdings.

The following sections describe in more detail the availability and distribution of the privately managed native forest, hardwood plantation and softwood plantation resources within the North East.

8.2 Private Independent Native Forests

8.2.1 Forest Description

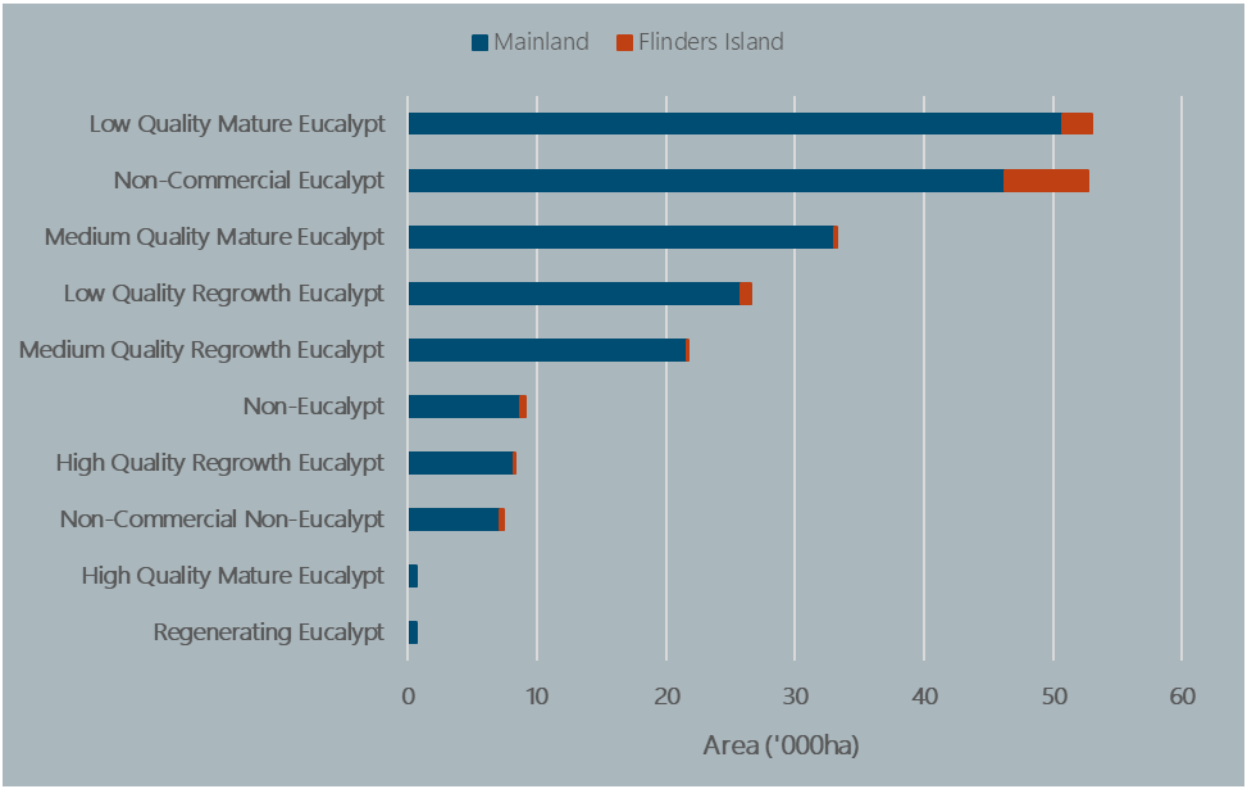
The North East independent native forest resource of 213,000ha is dominated by Dry Eucalypt Forest (81%), which in general are of lower productive capacity than the wet forests which are more prevalent on public land. The remainder of the private independent native forest is comprised of White Top Eucalypt Forest (10%), Wet Eucalypt Forest (5%) and Non-Eucalypt Forest (4%).

Note that 10,000ha of this resource is located on Flinders Island, the majority not having current commercial potential and was excluded from the cartage distance analysis.

8.2.2 Resource Description

The private independent native forest resource was modelled as aggregated PI-Type 'Forest Classes' against which state-wide average standing log product volume estimates could be assigned, the North East breakdown for Mainland and Flinders Island of the Forest Classes displayed in Figure 29.

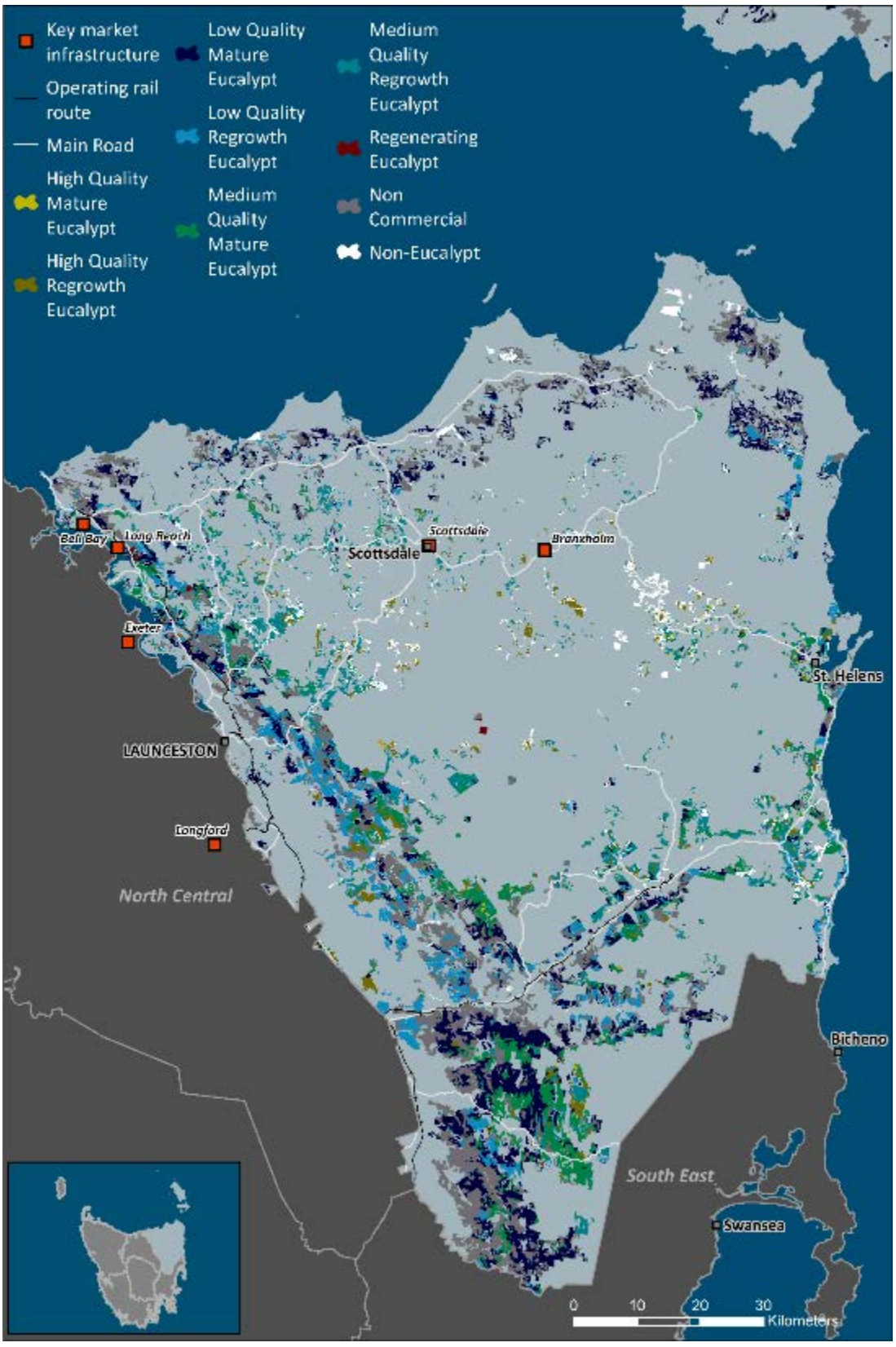
Figure 29: Area of Forest Classes Comprising the North East Private Independent Native Forest Resource



Analysis of these Forest Classes revealed 87,000ha of Mature Eucalypt forest and 56,000ha of Regrowth Eucalypt Forest have the height, crown density and quality to produce sufficient log products for commercial harvest across North East Tasmania. There is also 9,000ha of Non-Eucalypt Forest that has some commercial potential. The remaining 61,000ha was estimated to not have any current commercial potential.

The distribution of these Forest Classes across the North East (Mainland) is shown in Figure 30.

Figure 30: Map of North East (Mainland) Private Independent Native Forest Classes



Refer Appendix 12.4 for Forest Class map of North East (Flinders Island)

Of the 153,000ha of forest identified as viable for commercial harvest only 85,000ha has been estimated to be available for harvest after legislated exclusions and discounts on harvesting were accounted for in the model (refer Section 4.1).

This available area carries up to 12.6M tonnes of standing harvestable timber, distributed across Mature Eucalypt Forest (8.2Mt), Regrowth Eucalypt Forest (3.7Mt) and Non-Eucalypt Forest (0.7Mt). A detailed breakdown of log products by Forest Class are shown in Table 28.

Table 28: Area and Current Standing Harvestable Log Product Estimates for North East Forest Classes

Forest Class	Area ('000ha)		Estimated Current Standing Harvestable Volume by Log Products ('000t)					
	Gross	Harvestable	Appearance Grade Veneer	Sawlog	Industrial Grade Peeler	Pulplog	Other Biomass	Grand Total
High Quality Mature Eucalypt	1	0	0	20	30	120	50	220
High Quality Regrowth Eucalypt	8	4	0	70	120	680	300	1,170
Medium Quality Mature Eucalypt	33	20	10	450	570	4,010	0	5,040
Medium Quality Regrowth Eucalypt	22	11	0	160	210	1,420	0	1,790
Low Quality Mature Eucalypt	53	33	0	0	0	2,990	0	2,990
Low Quality Regrowth Eucalypt	27	11	0	0	30	730	0	760
Regenerating Eucalypt	1	0	0	0	0	0	0	0
Non-Eucalypt	9	6	0	0	0	0	660	660
Non-Commercial Eucalypt	53	0	0	0	0	0	0	0
Non-Commercial Non-Eucalypt	7	0	0	0	0	0	0	0
Grand Total	213	86	10	690	960	9,950	1,020	12,630

8.2.3 Intent to Harvest

Of the 153,000ha of commercially viable private independent native forest in the North East only 33,000ha (21%) is covered by a Private Timber Reserve (PTR). Similarly, of the 85,500ha modelled as available for harvest, 20,500ha (24%) is under PTR.

Presence of a PTR strongly indicating intent to undertake forestry activities at some stage. Despite there only being a small area under PTR, there are many land holdings with significant scale of commercial native forests, as shown in Table 29.

Table 29: Scale and Current Standing Harvestable Volume of North East Private Independent Native Forest

Scale: Area (ha) of PINF on Property	Count of Properties (n)	Total Current Standing Harvestable Volume across all Properties ('000 t)*	Average Current Standing Harvestable Volume per Property (t)
< 1 ha	2,241	0	0
1-2 ha	570	100	175
2-5 ha	771	200	259
5-20 ha	1,183	1,200	1,014
20-50 ha	535	1,300	2,430
50-100 ha	256	1,200	4,688
100-150 ha	92	700	7,609
>150 ha	227	7,600	33,480
Total	5,875	12,300	2,094

**Note a small percentage of harvestable area is situated on easements outside of Title boundaries, so cannot be included in this analysis. As such, the volume figures in this table may vary slightly from other tables in this section.*

8.2.4 Proximity to Market Infrastructure

The road-based cartage distance to key market infrastructure was calculated for all properties across North East Tasmania which possess private independent native forest and used to generate distance-based catchment models of the available area or volume for each destination.

Table 30 describes the total harvestable volume of Mature Eucalypt Forest in the North East available for harvest in 25km cartage distance bands from each market infrastructure destination. To provide some commercial viability around the figures, properties with less than 5ha of native forest were excluded from the cumulative volume as they are less likely to be of the scale to be financially viable for harvest.

Table 30: Cumulative Harvestable Volume from North East Mature Forests by Cartage Distance Class and Destination

Destination	Cumulative Total Harvestable Volume ('000t) by Road Cartage Distance Range								
	<25km	<50km	<75km	<100km	<125km	<150km	<175km	<200km	<650km
Bell Bay	293	797	1,266	1,825	3,179	6,612	7,532	7,757	7,759
Branxholm	42	493	1,431	2,821	3,719	6,643	7,720	7,759	7,759
Brighton					1,443	3,750	4,985	6,048	7,758
Burnie					242	837	1,508	2,549	7,759
Exeter	109	841	1,607	2,645	5,810	7,242	7,740	7,758	7,759
Hampshire						140	758	1,374	7,759
Huon Valley							66	1,891	7,758
Long Reach	385	894	1,437	1,917	4,565	7,077	7,657	7,759	7,759
Longford	53	961	2,960	6,249	7,012	7,547	7,759	7,759	7,759
Macquarie Wharf					66	1,518	3,860	5,254	7,759
New Norfolk					427	3,359	4,544	5,462	7,759
Parattah		66	2,014	3,982	5,296	6,308	6,916	7,113	7,759
Scottsdale	112	517	2,101	2,982	5,762	7,364	7,759	7,759	7,759
Smithton								112	7,759

Note the volumes above exclude those derived from Flinders Island private independent native forests.

Table 31 describes the corresponding figures for the North East Regrowth Eucalypt Forest.

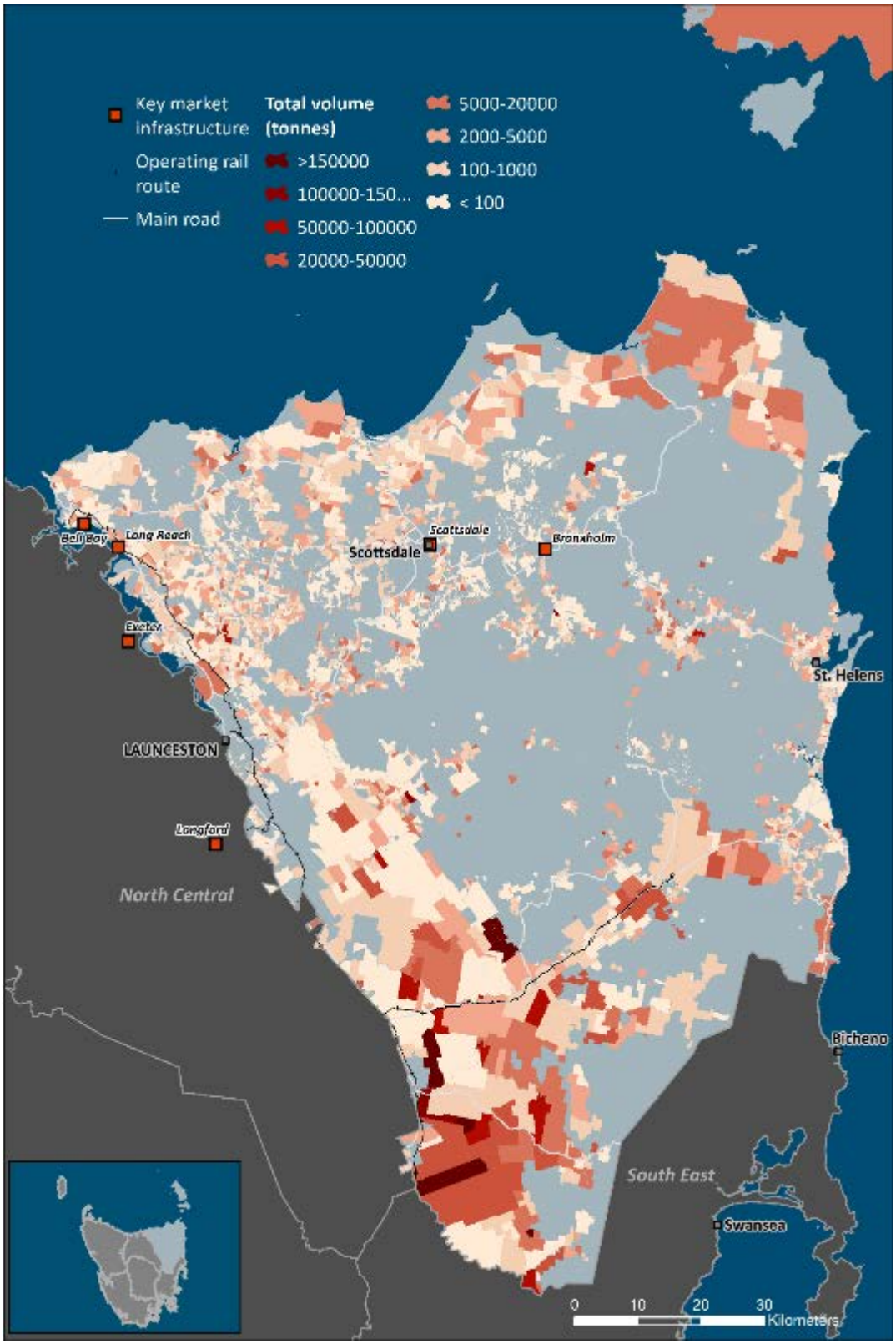
Table 31: Cumulative Harvestable Volume from North East Regrowth Forests by Cartage Distance Class and Destination

Destination	Cumulative Total Harvestable Volume ('000t) by Road Cartage Distance Range								
	<25km	<50km	<75km	<100km	<125km	<150km	<175km	<200km	<650km
Bell Bay	141	628	1,226	1,749	2,207	2,909	3,268	3,356	3,356
Branxholm	306	662	1,711	2,282	2,659	3,198	3,356	3,356	3,356
Brighton					101	468	908	1,833	3,356
Burnie					128	675	1,436	1,897	3,356
Exeter	36	610	1,565	1,892	2,601	3,104	3,341	3,356	3,356
Hampshire						75	602	1,349	3,356
Huon Valley							3	140	3,355
Long Reach	211	704	1,398	1,967	2,402	2,977	3,321	3,356	3,356
Longford	35	829	1,773	2,572	3,113	3,317	3,356	3,356	3,356
Macquarie Wharf					3	107	483	1,081	3,356
New Norfolk					31	331	719	1,295	3,356
Parattah		3	161	546	1,135	2,082	2,935	3,118	3,356
Scottsdale	210	1,128	2,083	2,390	2,858	3,321	3,355	3,356	3,356
Smithton								48	3,356

Note the volumes above exclude those derived from Flinders Island private independent native forests.

The geographic distribution of the scale of volume per property across the North East is represented in Figure 31.

Figure 31: Map of the Scale of Harvestable Volume by Property across the North East



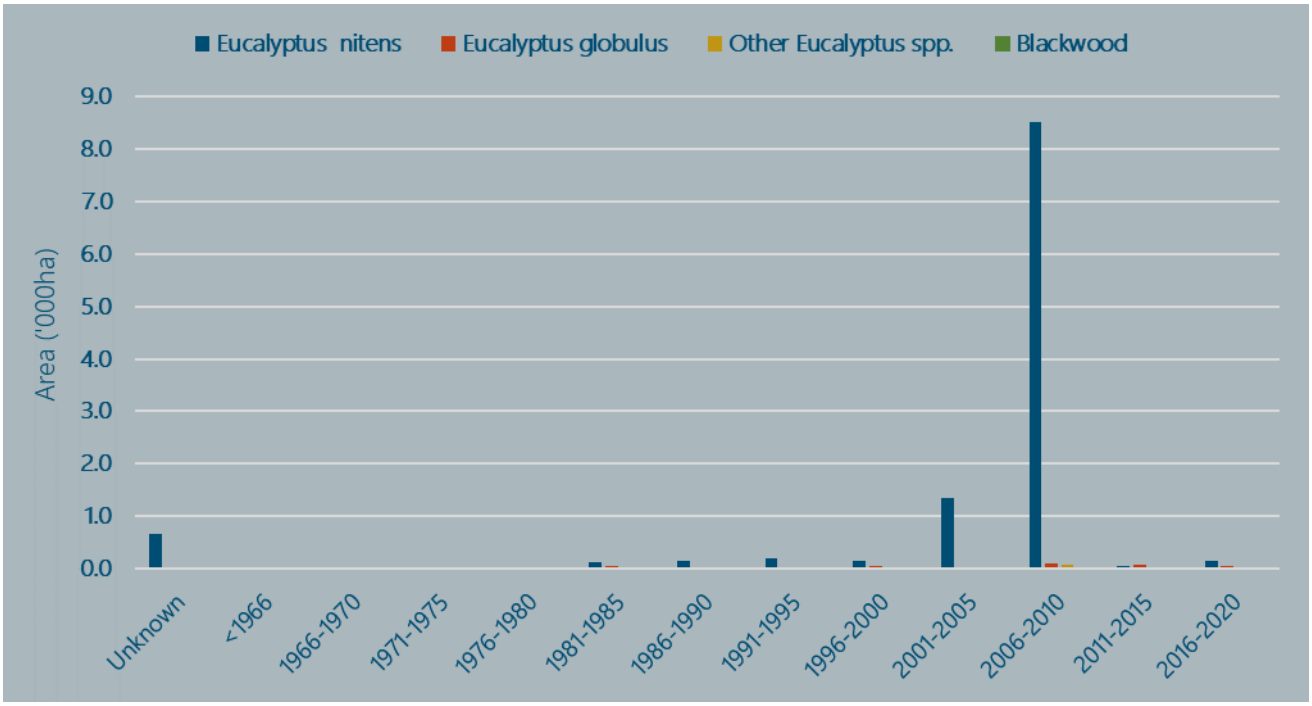
8.3 Private Independent Hardwood Plantations

8.3.1 Forest Description

There is some 12,000ha of private independently managed hardwood plantation currently standing within North East, 97% of which is *Eucalyptus nitens*, 2% of which is *E. globulus* and the remaining 1% a mix of other eucalypt and non-eucalypt species.

Figure 16 shows the age and species structure of this hardwood plantation resource the 2006-2010 age class dominating the North East.

Figure 32: Five-Year Age Class by Area of North East Private Independent Hardwood Plantations



Based on the DPIPWE Enterprise Suitability Mapping, the North East 2001-2010 age class is distributed across 'Well Suited' (5%), Suitable (41%), Moderately Suitable (30%) and Unsuitable (22%) sites.

8.3.2 Resource Description

The private independent hardwood resource in North East Tasmania is distributed across 425 separate land holdings or properties, 219 of which possess more than 2ha.

Table 32 provides an indication of the scale at which these forests are distributed across these properties in terms of area and total harvestable volume at modelled harvest age, based on a single rotation unpruned unthinned regime. Typically, the larger the scale of the plantation on a property, the more financially viable will be harvest, ignoring distance from market.

Table 32: Scale and Harvestable Volume at Harvest Age of North East Private Independent Hardwood Plantations

Scale: Area (ha) of Hardwood Plantation on each Property	Count of properties (n)	Total Harvestable Volume ('000t) by Period								Average Harvestable Volume per Property (t)
		2016-2020	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	**Grand Total**	
< 1ha	185	3	2	0	0	0	0	0	**5**	**27**
1-2ha	21	2	1	0	0	0	0	0	**4**	**190**
2-5ha	31	9	5	1	1	0	0	0	**15**	**480**
5-20	72	56	42	18	10	1	0	0	**127**	**1,760**
20-50	58	81	156	31	29	0	0	0	**296**	**5,100**
50-100	26	35	191	14	29	0	0	0	**269**	**10,350**
100-150	10	11	88	7	38	1	1	0	**146**	**14,600**
>150	22	222	476	182	75	0	0	0	**954**	**43,360**
Grand Total	425	418	960	253	182	1	2	0	**1,816**	**4,270**

**Note a small percentage of harvestable area is situated on easements outside of Title boundaries, so cannot be included in this analysis. As such, the volume figures in this table may vary slightly from other tables in this section.*

Most of the North East hardwood plantation resource is within stands of 20ha or more, which suggests a high likelihood it will of scale to be financially viable to harvest if within reasonable distance of market infrastructure.

8.3.3 Proximity to Market Infrastructure

The road-based cartage distance to key market infrastructure was calculated for all properties across North East Tasmania which possess private independent hardwood plantation and used to generate distance-based catchment models of the available area or volume for each destination.

Table 33 describes the total harvestable volume of North East private independent hardwood plantation available in 25km cartage distance bands from each market infrastructure destination.

To provide some commercial viability around the figures, properties with less than 1ha of plantation were excluded from the cumulative volume as they are less likely to be of the scale to be financially viable for harvest.

Table 33: Cumulative Harvestable Volume at Harvest Age of North East Private Independent Hardwood Plantations by Road Distance Class to Market Infrastructure

Destination	Cumulative Total Harvestable Volume ('000t) by Road Cartage Distance Range								
	<25km	<50km	<75km	<100km	<125km	<150km	<175km	<200km	<650km
Bell Bay	83	327	544	907	1,082	1,705	1,838	1,838	1,838
Branxholm	85	447	833	1,145	1,387	1,781	1,838	1,838	1,838
Brighton		0	0	0	91	433	600	974	1,838
Burnie		0	0	0	68	318	600	901	1,838
Exeter	0	250	748	885	1,355	1,743	1,839	1,839	1,839
Hampshire		0	0	0	0	0	299	484	1,839
Huon Valley		0	0	0	0	0	0	118	1,839
Long Reach	139	359	644	929	1,118	1,706	1,839	1,839	1,839
Longford	2	308	701	1,317	1,742	1,778	1,838	1,838	1,838
Macquarie Wharf		0	0	0	0	91	433	782	1,839
New Norfolk		0	0	0	30	223	488	807	1,838
Parattah		0	123	434	794	1,091	1,507	1,694	1,839
Scottsdale	210	592	1,077	1,192	1,471	1,838	1,838	1,838	1,838
Smithton		0	0	0	0	0	0	0	1,839

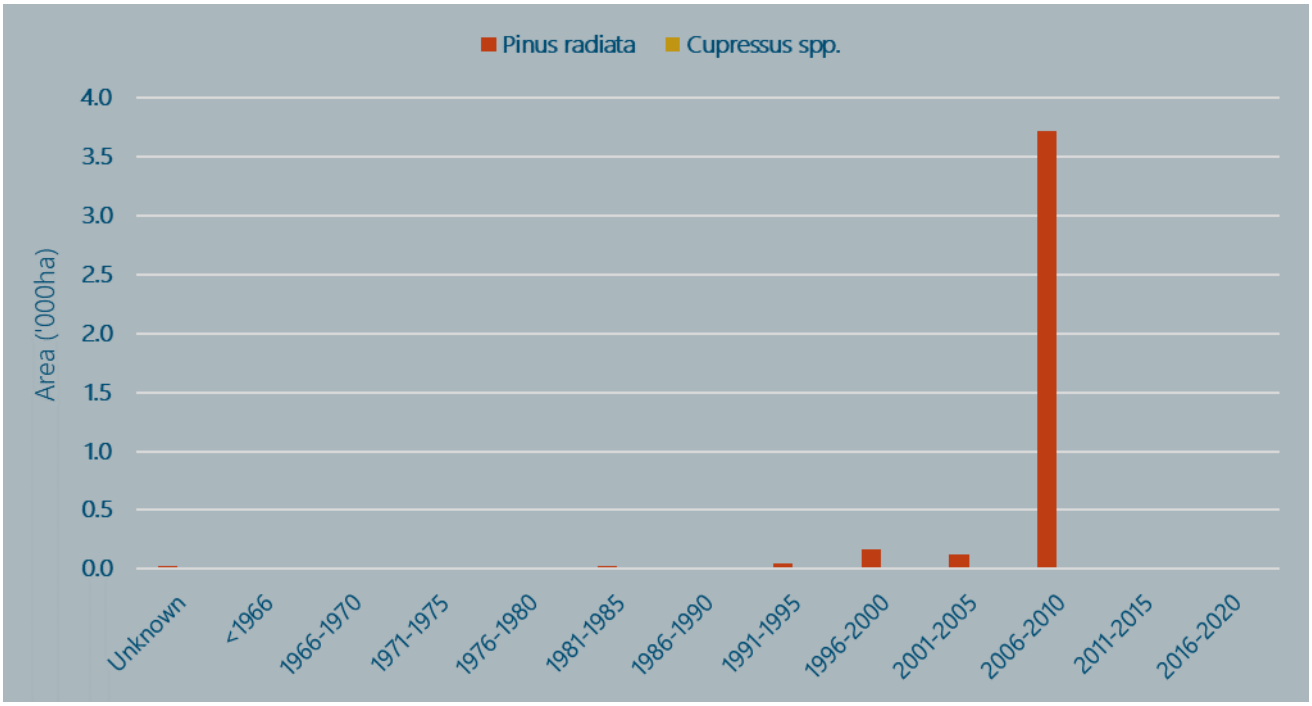
8.4 Private Independent Softwood Plantations

8.4.1 Forest Description

There is 4,000ha of private independently managed softwood plantation currently standing within North East, 99% of which is *Pinus radiata*.

Figure 33 describes the age structure of the softwood plantation resource in the North East, the 2006-2010 age class dominating, which will be approaching optimal thinning age soon if not now.

Figure 33: Five-Year Age Class by Area of North East Private Independent Softwood Plantations



Based on the DPIPWE Enterprise Suitability Mapping, the North East 2006-2010 age class is distributed across 'Well Suited' (22%), Suitable (73%), Moderately Suitable (2%) and Unsuitable (3%) sites.

8.4.2 Resource Description

The private independent softwood resource in North East Tasmania is distributed across 133 separate land holdings or properties, 64 of which possess more than 2ha.

Table 18 provides an indication of the scale at which these forests are distributed across land holdings in North East Tasmania in terms of area and total harvestable volume at modelled harvest age, based on a single rotation unpruned single-thinning regime.

Table 34: Scale and Harvestable Volume at Harvest Age of North East Private Independent Softwood Plantations

Scale: Area (ha) of Softwood Plantation on each Property	Count of properties (n)	Total Harvestable Volume ('000t) by Period								Average Harvestable Volume per Property (t)
		2016-2020	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	**Grand Total**	
< 1ha	56	1	0	1	1	0	0	0	**4**	**71**
1-2ha	13	3	1	1	1	0	0	0	**7**	**538**
2-5ha	11	5	0	6	3	0	0	0	**14**	**1,273**
5-20	27	21	23	19	19	9	0	0	**92**	**3,407**
20-50	8	5	11	8	38	21	1	0	**84**	**10,500**
50-100	4	0	0	60	18	7	0	0	**86**	**21,500**
100-150	5	0	0	0	253	7	0	0	**261**	**52,200**
>150	9	0	0	7	546	575	18	0	**1,146**	**127,333**
Grand Total	133	35	36	102	880	621	20	0	**1,694**	**12,737**

**Note a small percentage of harvestable area is situated on easements outside of Title boundaries, so cannot be included in this analysis. As such, the volume figures in this table may vary slightly from other tables in this section.*

Most of the North East softwood plantation resource is within stands of 20ha or more, which suggests a high likelihood it will of scale to be financially viable to harvest if within reasonable distance of market infrastructure.

8.4.3 Proximity to Market Infrastructure

The road-based cartage distance to key market infrastructure was calculated for all properties across North East Tasmania which possess private independent hardwood plantation and used to generate distance-based catchment models of the available area or volume for each destination.

Table 19 describes the total harvestable volume of private independent softwood plantation available in 25km cartage distance bands from each market infrastructure destination.

To provide some commercial viability around the figures, properties with less than 1ha of plantation were excluded from the cumulative volume as they are less likely to be of the scale to be financially viable for harvest.

Table 35: Cumulative Clearfell Harvestable Volume at Harvest Age of North East Private Independent Softwood Plantations by Road Distance Class to Market Infrastructure

Destination	Cumulative Total Harvestable Volume ('000t) by Road Cartage Distance Range								
	<25km	<50km	<75km	<100km	<125km	<150km	<175km	<200km	<650km
Bell Bay	134	623	1,043	1,649	1,655	1,662	1,676	1,676	1,676
Branxholm	29	580	1,135	1,655	1,663	1,675	1,676	1,676	1,676
Brighton						334	381	479	1,676
Burnie						441	1,103	1,606	1,676
Exeter		195	1,317	1,448	1,655	1,676	1,676	1,676	1,676
Hampshire							157	987	1,676
Huon Valley								1	1,676
Long Reach	140	624	1,082	1,652	1,656	1,663	1,676	1,676	1,676
Longford	43	460	680	1,455	1,639	1,675	1,676	1,676	1,676
Macquarie Wharf						1	333	450	1,676
New Norfolk						1	346	450	1,676
Parattah			1	338	450	479	721	1,485	1,676
Scottsdale	372	1,067	1,641	1,657	1,676	1,676	1,676	1,676	1,676
Smithton									1,676

8.5 Private Industrial-scale Plantations

8.5.1 Forest Description

The North East private industrial-scale estate is 61,000ha in area of which 38% is managed on private freehold land, the other 62% on public land.

30,000ha is hardwood plantation, predominantly of the species *Eucalyptus nitens*. The 31,000ha of softwood plantation is predominantly *Pinus radiata*.

Figure 34 provides the overall species percentage breakdown, and Figure 35 their geographic distribution across the North East.

Figure 34: Breakdown of Species for North East Private Industrial-scale Plantations

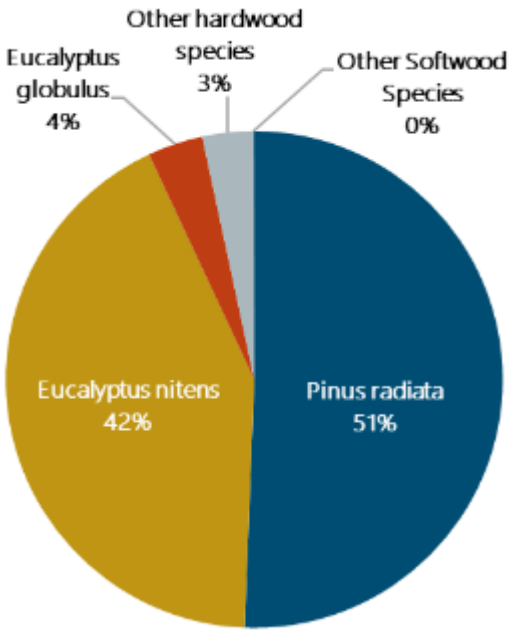
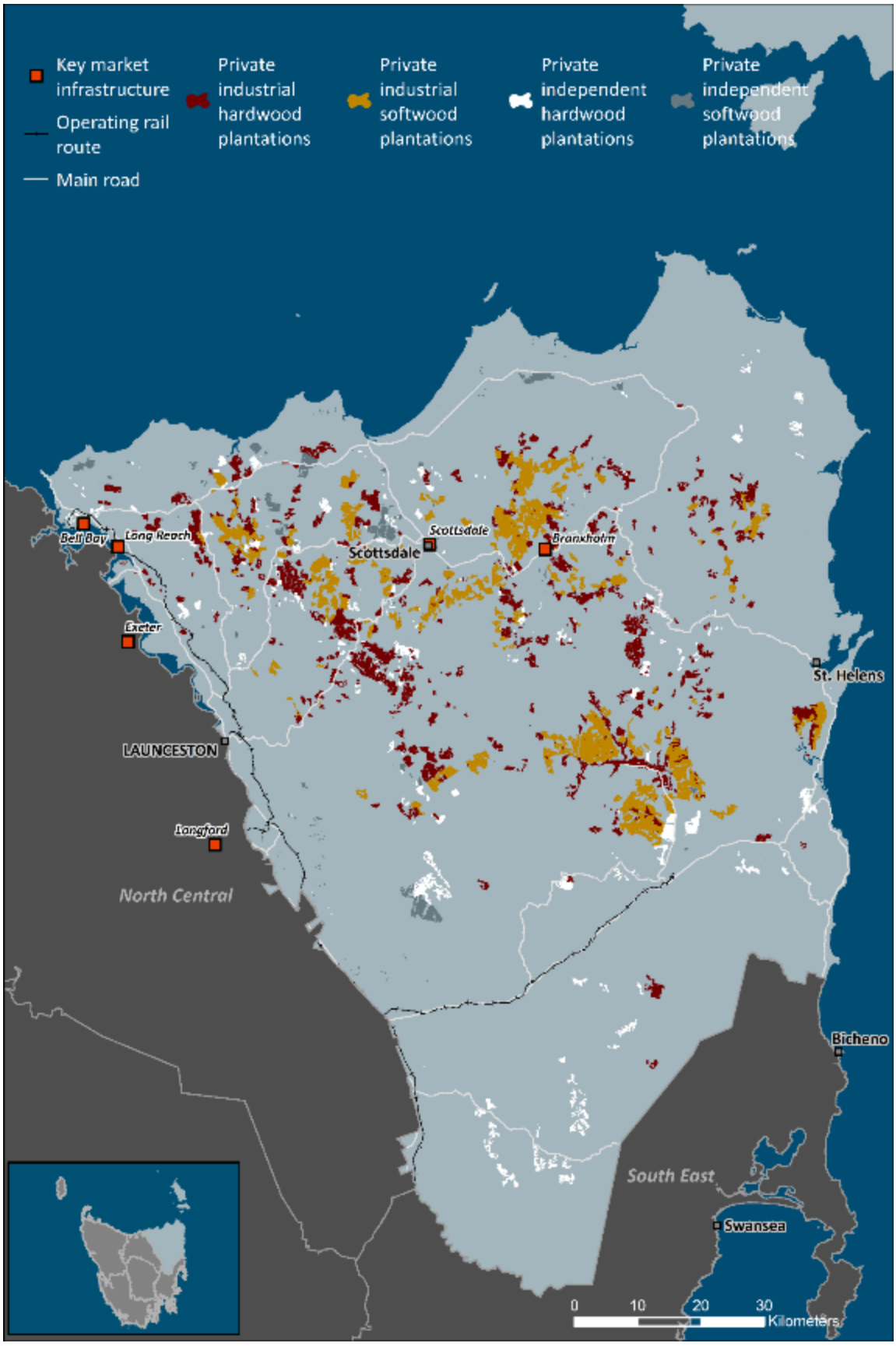


Figure 35: Map of North East Private Industrial-Scale Plantations



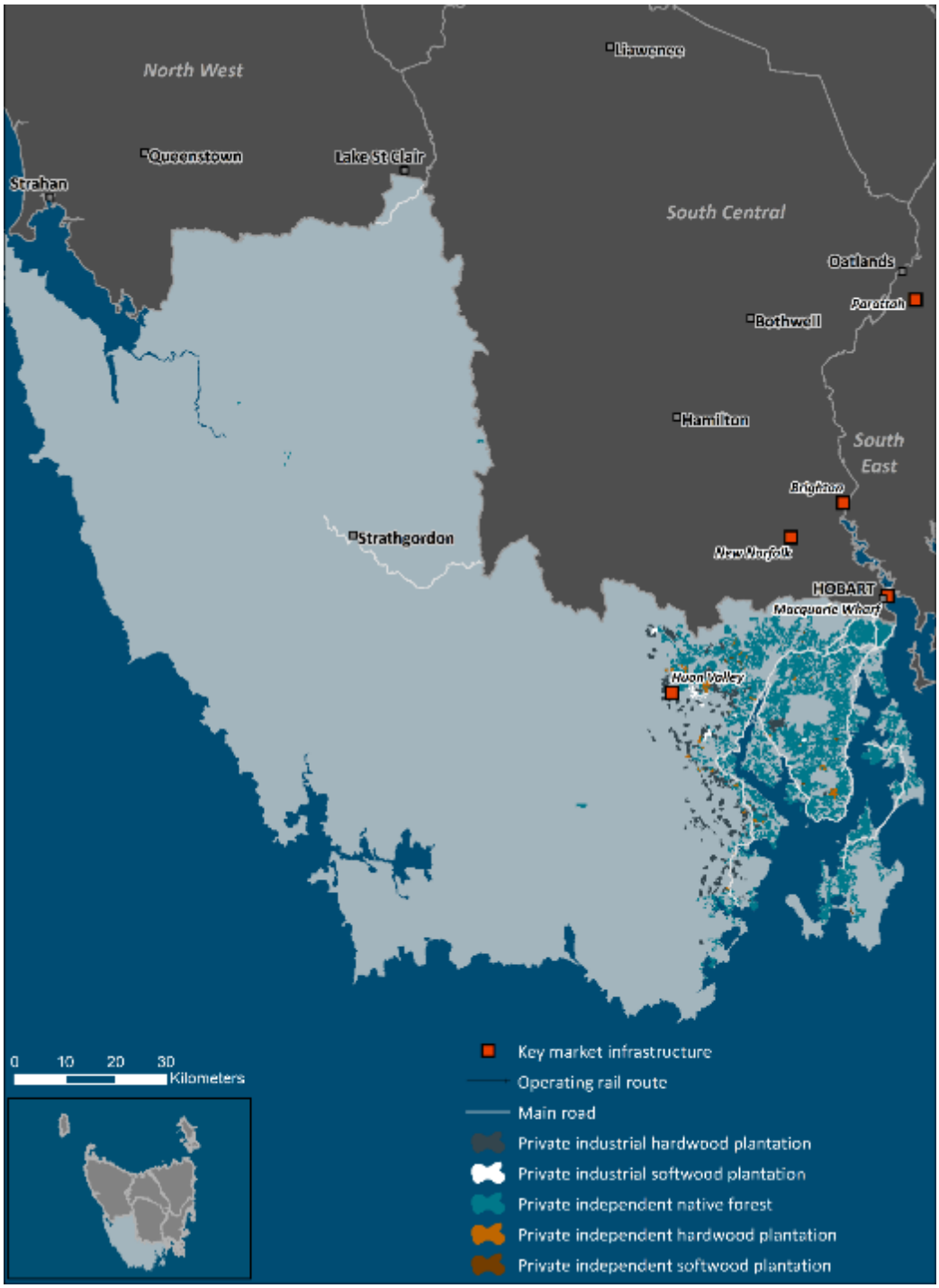
SOUTH WEST WOOD CATCHMENT

9 South West Wood Catchment

9.1 South West Overview

The South West privately managed forest estate is comprised of some 58,000ha of native forest, 8,000ha of hardwood plantation and 1,000ha of softwood plantation as shown in Figure 36, which in total makes up 5% of the total land in the South West.

Figure 36: Map of South West Private Independent Forests



The 56,000ha of private independent native forest resource in the South West is distributed across approximately 7,900 individual land holdings, though only 2,000 of these properties possess more than 5ha. The main commercial components of this resource are dominated by *Eucalyptus obliqua* (57%), *Eucalyptus pulchella* (16%) and *Eucalyptus globulus (9%)* vegetation communities based on analysis of the TASVEG 4.0 mapping.

Of the plantation resources in the South West, some 87% of hardwood plantations and 86% of softwood plantations are within the 'industrial-scale' estates. The remaining 1,000ha of plantation resources managed by individual landowners are confined to private freehold land and are distributed across 150 individual land holdings.

The following sections describe in more detail the availability and distribution of the privately managed native forest, hardwood plantation and softwood plantation resources within the South West.

9.2 Private Independent Native Forests

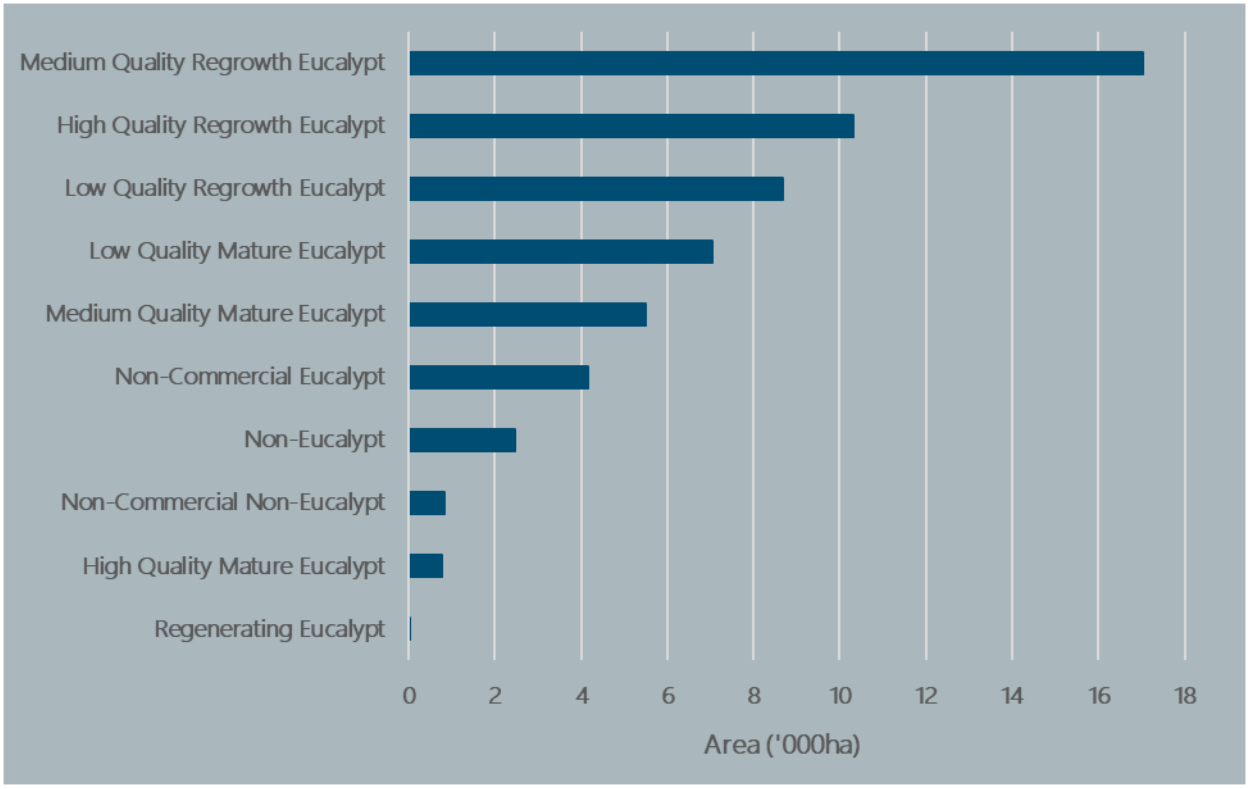
9.2.1 Forest Description

The South West independent native forest resource of 56,000ha is dominated by Dry Eucalypt Forest (59%), which in general are of lower productive capacity than the wet forests which are more prevalent on public land. The remainder of the private independent native forest is comprised of Wet Eucalypt Forest (35%), Non-Eucalypt Forest (4%) and White Top Eucalypt Forest (2%).

9.2.2 Resource Description

The private independent native forest resource was modelled as aggregated PI-Type 'Forest Classes' against which state-wide average standing log product volume estimates could be assigned, the South West breakdown of the Forest Classes expressed in Figure 37 below.

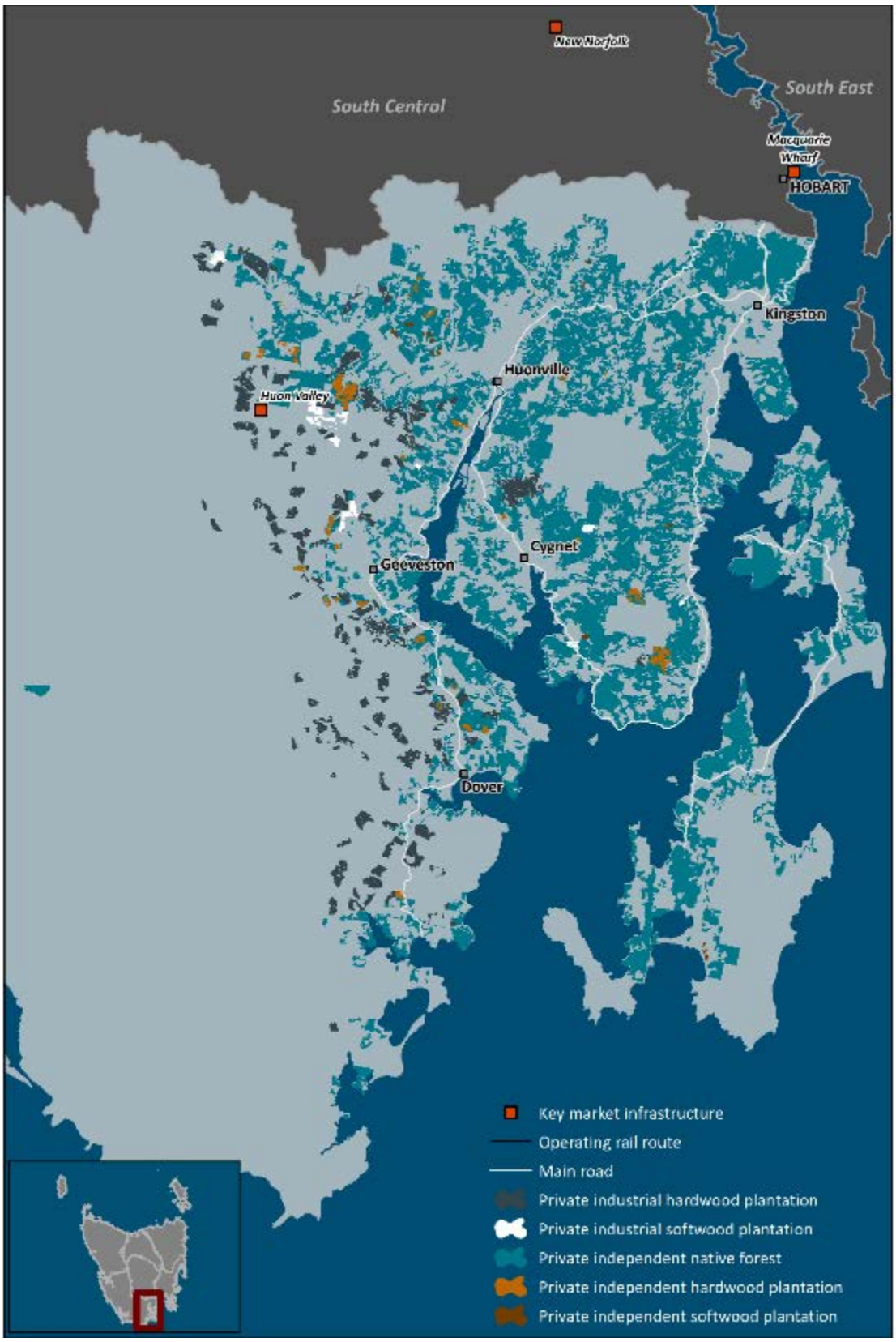
Figure 37: Area of Forest Classes Comprising the South West Private Independent Native Forest Resource



Analysis of these Forest Classes revealed 13,500ha of Mature Eucalypt forest and 36,000ha of Regrowth Eucalypt Forest have the height, crown density and quality to produce sufficient log products for commercial harvest across South West Tasmania. There is also 2,500ha of Non-Eucalypt Forest that has some commercial potential. The remaining 5,000ha was estimated to not have any current commercial potential.

The distribution of these Forest Classes across the South West is shown in Figure 38 below.

Figure 38: Map of South West Private Independent Native Forest Classes



Of the 52,000ha of forest identified as viable for commercial harvest 33,000ha has been estimated to be available for harvest after legislated exclusions and discounts on harvesting were accounted for in the model (refer Section 4.1).

This available area carries up to 5.7M tonnes of standing harvestable timber, distributed across Mature Eucalypt Forest (1.4Mt), Regrowth Eucalypt Forest (4.1Mt) and Non-Eucalypt Forest (0.2Mt). A detailed breakdown of log products by Forest Class are shown in Table 36. 460,000t of this volume is situated on Bruny Island.

Table 36: Area and Current Standing Harvestable Log Product Estimates for South West Forest Classes

Forest Class	Area ('000ha)		Estimated Current Standing Harvestable Volume by Log Products ('000t)					
	Gross	Harvestable	Appearance Grade Veneer	Sawlog	Industrial Grade Peeler	Pulplog	Other Biomass	Grand Total
High Quality Mature Eucalypt	1	1	0	20	30	130	60	240
High Quality Regrowth Eucalypt	10	8	0	140	220	1,290	540	2,190
Medium Quality Mature Eucalypt	5	3	0	60	70	640	0	770
Medium Quality Regrowth Eucalypt	17	11	0	110	190	1,350	0	1,650
Low Quality Mature Eucalypt	7	4	0	0	0	390	0	390
Low Quality Regrowth Eucalypt	9	4	0	0	10	250	0	260
Regenerating Eucalypt	0	0	0	0	0	0	0	0
Non-Eucalypt	2	2	0	0	0	0	180	180
Non-Commercial Eucalypt	4	0	0	0	0	0	0	0
Non-Commercial Non-Eucalypt	1	0	0	0	0	0	0	0
Grand Total	56	33	10	330	520	4,050	780	5,680

9.2.3 Intent to Harvest

Of the 51,000ha of commercially viable private independent native forest in the South West only 6,500ha (12%) is covered by a Private Timber Reserve (PTR). Similarly, of the 33,000ha modelled as available for harvest, 4,000ha (13%) is under PTR.

Presence of a PTR strongly indicating intent to undertake forestry activities at some stage. Despite there only being a small area under PTR, there are many land holdings with significant scale of commercial native forests, as shown Table 37 below.

Table 37: Scale and Current Standing Harvestable Volume of South West Private Independent Native Forest

Scale: Area (ha) of PINF on Property	Count of Properties (n)	Total Current Standing Harvestable Volume across all Properties ('000 t)*	Average Current Standing Harvestable Volume per Property (t)
< 1 ha	3,337	100	30
1-2 ha	1,047	100	96
2-5 ha	1,443	400	277
5-20 ha	1,489	1,700	1,142
20-50 ha	420	1,400	3,333
50-100 ha	91	600	6,593
100-150 ha	47	500	10,638
>150 ha	29	700	24,138
Total	7,903	5,500	696

**Note a small percentage of harvestable area is situated on easements outside of Title boundaries, so cannot be included in this analysis. As such, the volume figures in this table may vary slightly from other tables in this section.*

9.2.4 Proximity to Market Infrastructure

The road-based cartage distance to key market infrastructure was calculated for all properties across South West Tasmania which possess private independent native forest and used to generate distance-based catchment models of the available area or volume for each destination.

Table 38 describes the total harvestable volume of Mature Eucalypt Forest in the South West available for harvest in 25km cartage distance bands from each market infrastructure destination. To provide some commercial viability around the figures, properties with less than 5ha of native forest were excluded from the cumulative volume as they are less likely to be of the scale to be financially viable for harvest.

Table 38: Cumulative Harvestable Volume from South West Mature Forests by Cartage Distance Class and Destination

Destination	Cumulative Total Harvestable Volume ('000t) by Road Cartage Distance Range								
	<25km	<50km	<75km	<100km	<125km	<150km	<175km	<200km	<650km
Bell Bay									927
Branxholm									927
Brighton		136	746	898	924	927	927	927	927
Burnie									927
Exeter									927
Hampshire									927
Huon Valley	267	698	927	927	927	927	927	927	927
Long Reach									927
Longford								27	927
Macquarie Wharf	58	536	865	920	927	927	927	927	927
New Norfolk		446	817	907	927	927	927	927	927
Parattah				18	469	843	901	927	927
Scottsdale									927
Smithton									927

The volume on Bruny Island was excluded from the above table, and contributes an additional

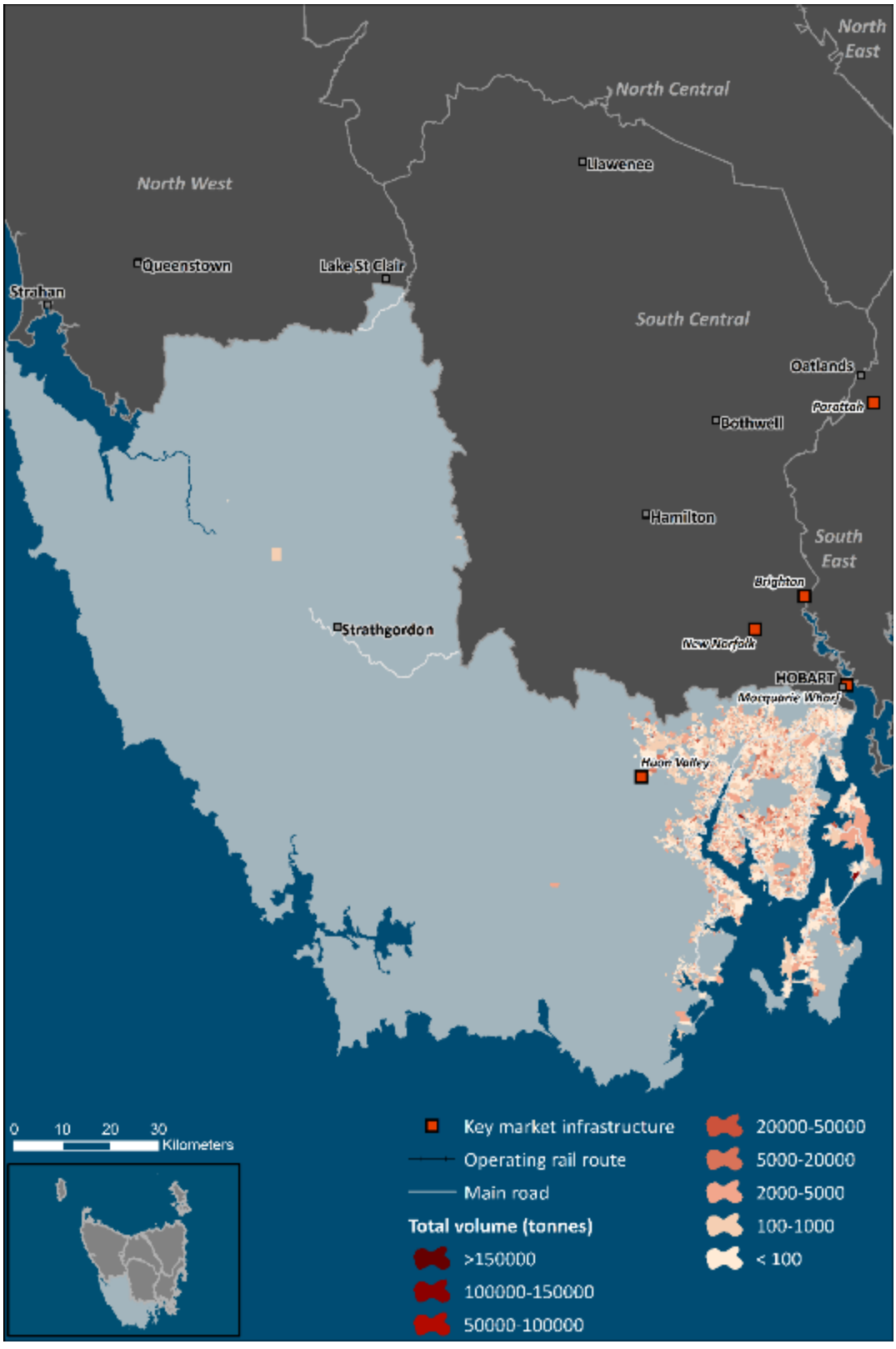
Table 39 describes the corresponding figures for the South West Regrowth Eucalypt Forest.

Table 39: Cumulative Harvestable Volume from South West Regrowth Forests by Cartage Distance Class and Destination

Destination	Cumulative Total Harvestable Volume ('000t) by Road Cartage Distance Range								
	<25km	<50km	<75km	<100km	<125km	<150km	<175km	<200km	<650km
Bell Bay									3,172
Branxholm									3,172
Brighton		539	2,468	3,067	3,164	3,172	3,172	3,172	3,172
Burnie									3,172
Exeter									3,172
Hampshire									3,172
Huon Valley	557	1,972	3,172	3,172	3,172	3,172	3,172	3,172	3,172
Long Reach									3,172
Longford								131	3,172
Macquarie Wharf	234	2,048	2,995	3,164	3,172	3,172	3,172	3,172	3,172
New Norfolk		1,023	2,641	3,137	3,172	3,172	3,172	3,172	3,172
Parattah				76	1,376	2,891	3,117	3,172	3,172
Scottsdale									3,172
Smithton									3,172

The geographic distribution of the scale of volume per property across the South West is represented in Figure 39.

Figure 39: Map of the Scale of Harvestable Volume by Property across the South West



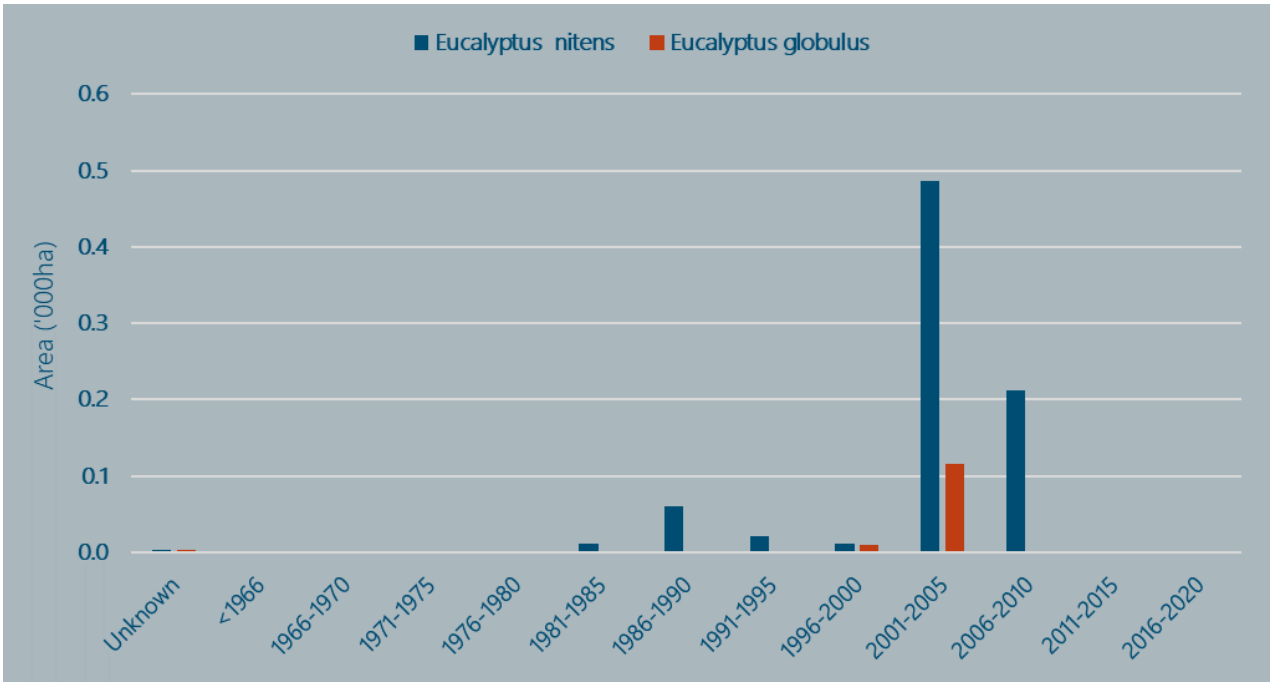
9.3 Private Independent Hardwood Plantations

9.3.1 Forest Description

There is some 900ha of private independently managed hardwood plantation currently standing within South West, 86% of which is *Eucalyptus nitens* and 14% of which is *E. globulus*.

Figure 40 shows the age and species structure of this hardwood plantation resource, this region being dominated by the 2001-2005 age class.

Figure 40: Five-Year Age Class by Area of South West Private Independent Hardwood Plantations



Based on the DPIPWE Enterprise Suitability Mapping, the South West 2001-2010 age class is distributed across 'Well Suited' (4%), Suitable (45%), Moderately Suitable (33%) and Unsuitable (18%) sites.

9.3.2 Resource Description

The private independent hardwood resource in South West Tasmania is distributed across 126 separate land holdings or properties, 48 of which possess more than 2ha.

Table 40 provides an indication of the scale at which these forests are distributed across these properties in terms of area and total harvestable volume at modelled harvest age, based on a single rotation unpruned unthinned regime. Typically, the larger the scale of the plantation on a property, the more financially viable will be harvest, ignoring distance from market.

Table 40: Scale and Harvestable Volume at Harvest Age of South West Private Independent Hardwood Plantations

Scale: Area (ha) of Hardwood Plantation on each Property	Count of properties (n)	Total Harvestable Volume ('000t) by Period								Average Harvestable Volume per Property (t)
		2016-2020	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	**Grand Total**	
< 1ha	64	1	0	0	0	0	0	0	1	16
1-2ha	14	2	0	0	0	0	0	0	2	140
2-5ha	11	3	1	0	0	0	0	0	4	360
5-20	21	16	13	1	1	0	0	0	30	1,430
20-50	12	19	21	4	1	0	0	0	45	3,750
50-100	3	21	6	1	1	0	0	0	29	9,670
100-150	0	0	0	0	0	0	0	0	0	0
>150	1	25	7	3	0	0	0	0	34	34,000
Grand Total	126	86	48	9	2	0	0	0	146	1,160

**Note a small percentage of harvestable area is situated on easements outside of Title boundaries, so cannot be included in this analysis. As such, the volume figures in this table may vary slightly from other tables in this section.*

Most of the South West independently managed hardwood plantation resource is within stands of 20ha or more, which suggests a high likelihood they will be of sufficient scale to be financially viable to harvest if within reasonable distance of market infrastructure.

9.3.3 Proximity to Market Infrastructure

The road-based cartage distance to key market infrastructure was calculated for all properties across South West Tasmania which possess private independent hardwood plantation and used to generate distance-based catchment models of the available area or volume for each destination.

Table 41 describes the total harvestable volume of South West private independent hardwood plantation available in 25km cartage distance bands from each market infrastructure destination.

To provide some commercial viability around the figures, properties with less than 1ha of plantation were excluded from the cumulative volume as they are less likely to be of the scale to be financially viable for harvest.

Table 41: Cumulative Harvestable Volume at Harvest Age of South West Private Independent Hardwood Plantations by Road Distance Class to Market Infrastructure

Destination	Cumulative Total Harvestable Volume ('000t) by Road Cartage Distance Range								
	<25km	<50km	<75km	<100km	<125km	<150km	<175km	<200km	<650km
Bell Bay								146	146
Branxholm								146	146
Brighton		1	107	142	146	146	146	146	146
Burnie								146	146
Exeter								146	146
Hampshire								146	146
Huon Valley	79	108	146	146	146	146	146	146	146
Long Reach								146	146
Longford								146	146
Macquarie Wharf		28	141	146	146	146	146	146	146
New Norfolk		54	110	146	146	146	146	146	146
Parattah					54	132	146	146	146
Scottsdale								146	146
Smithton								146	146

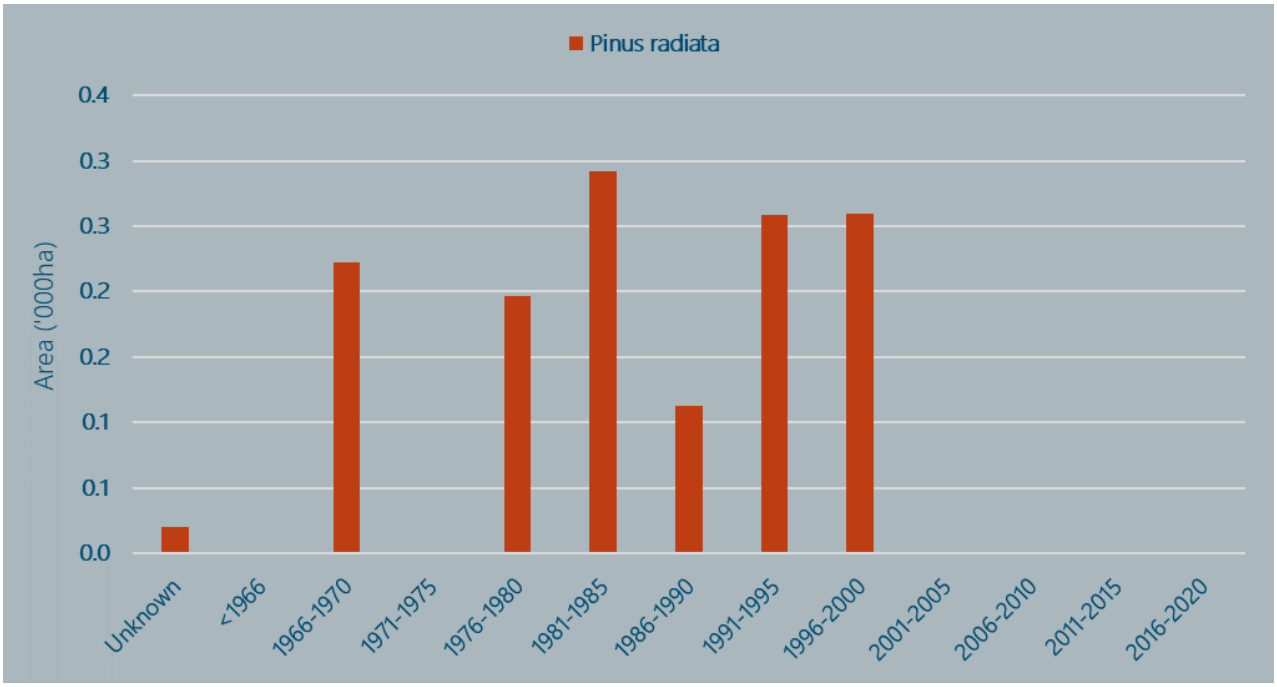
9.4 Private Independent Softwood Plantations

9.4.1 Forest Description

There is 130ha of private independently managed softwood plantation currently standing within South West, 100% of which is *Pinus radiata*.

Figure 41 describes the age structure of this softwood plantation resource.

Figure 41: Five-Year Age Class by Area of South West Private Independent Softwood Plantations



The South West pine spread over a range of age classes, the resource over 35 years old are beyond standard harvest age and likely to be remnants from larger plantings suggesting they may be difficult to harvest.

9.4.2 Resource Description

The private independent softwood resource in South West Tasmania is distributed across 39 separate land holdings or properties, 14 of which possess more than 2ha.

Table 42 provides an indication of the scale at which these forests are distributed across land holdings in South West Tasmania in terms of area and total harvestable volume at modelled harvest age, based on a single rotation unpruned single-thinning regime.

Table 42: Scale and Harvestable Volume at Harvest Age of South West Private Independent Softwood Plantations

Scale: Area (ha) of Softwood Plantation on each Property	Count of properties (n)	Total Harvestable Volume ('000t) by Period								Average Harvestable Volume per Property (t)
		2016-2020	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	**Grand Total**	
< 1ha	**19**	1	0	0	0	0	0	0	**2**	**105**
1-2ha	**6**	3	0	0	0	0	0	0	**3**	**500**
2-5ha	**5**	6	0	0	0	0	0	0	**6**	**1,200**
5-20	**7**	23	5	0	0	0	0	0	**28**	**4,000**
20-50	**2**	14	8	1	0	0	0	0	**23**	**11,500**
50-100	**0**	0	0	0	0	0	0	0	**0**	**0**
100-150	**0**	0	0	0	0	0	0	0	**0**	**0**
>150	**0**	0	0	0	0	0	0	0	**0**	**0**
Grand Total	**39**	47	13	1	1	0	0	0	**62**	**1,590**

**Note a small percentage of harvestable area is situated on easements outside of Title boundaries, so cannot be included in this analysis. As such, the volume figures in this table may vary slightly from other tables in this section.*

The majority of the South West independently managed softwood plantation resource is within stands of 20ha or more, which suggests a high likelihood they will be of a scale to be financially viable to harvest if within reasonable distance of market infrastructure.

9.4.3 Proximity to Market Infrastructure

The road-based cartage distance to key market infrastructure was calculated for all properties across South West Tasmania which possess private independent hardwood plantation and used to generate distance-based catchment models of the available area or volume for each destination.

Table 43 describes the total harvestable volume of private independent softwood plantation available in 25km cartage distance bands from each market infrastructure destination.

To provide some commercial viability around the figures, properties with less than 1ha of plantation were excluded from the cumulative volume as they are less likely to be of the scale to be financially viable for harvest.

Table 43: Cumulative Clearfell Harvestable Volume at Harvest Age of South West Private Independent Softwood Plantations by Road Distance Class to Market Infrastructure

Destination	Cumulative Total Clearfell Harvestable Volume ('000t) by Road Cartage Distance Range								
	<25km	<50km	<75km	<100km	<125km	<150km	<175km	<200km	<650km
Bell Bay									46
Branxholm									46
Brighton		4	40	46	46	46	46	46	46
Burnie									46
Exeter									46
Hampshire									46
Huon Valley	27	35	46	46	46	46	46	46	46
Long Reach									46
Longford									46
Macquarie Wharf	4	40	46	46	46	46	46	46	46
New Norfolk		31	45	46	46	46	46	46	46
Parattah					39	45	46	46	46
Scottsdale									46
Smithton									46

Note that Bruny Island was not analysed in the above, so some 16,000t of volume is missing.

9.5 Private Industrial-scale Plantations

9.5.1 Forest Description

The South West private industrial-scale estate is 7,000ha in area of which 37% is managed on private freehold land, the other 63% on public land.

6,500ha is hardwood plantation, predominantly a mix of *Eucalyptus nitens and E. globulus* species. The 500ha of softwood plantation is predominantly *Pinus radiata*.

Figure 42 provides the overall species percentage breakdown, and Figure 43 the geographic distribution across the South West.

Figure 42: Breakdown of Species for South West Private Industrial-scale Plantations

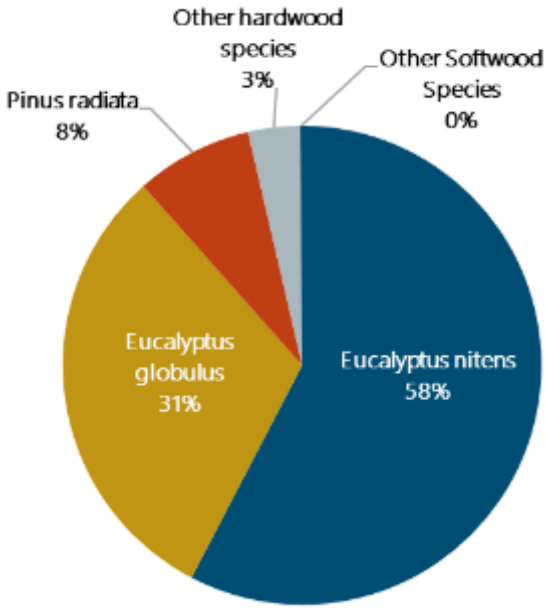
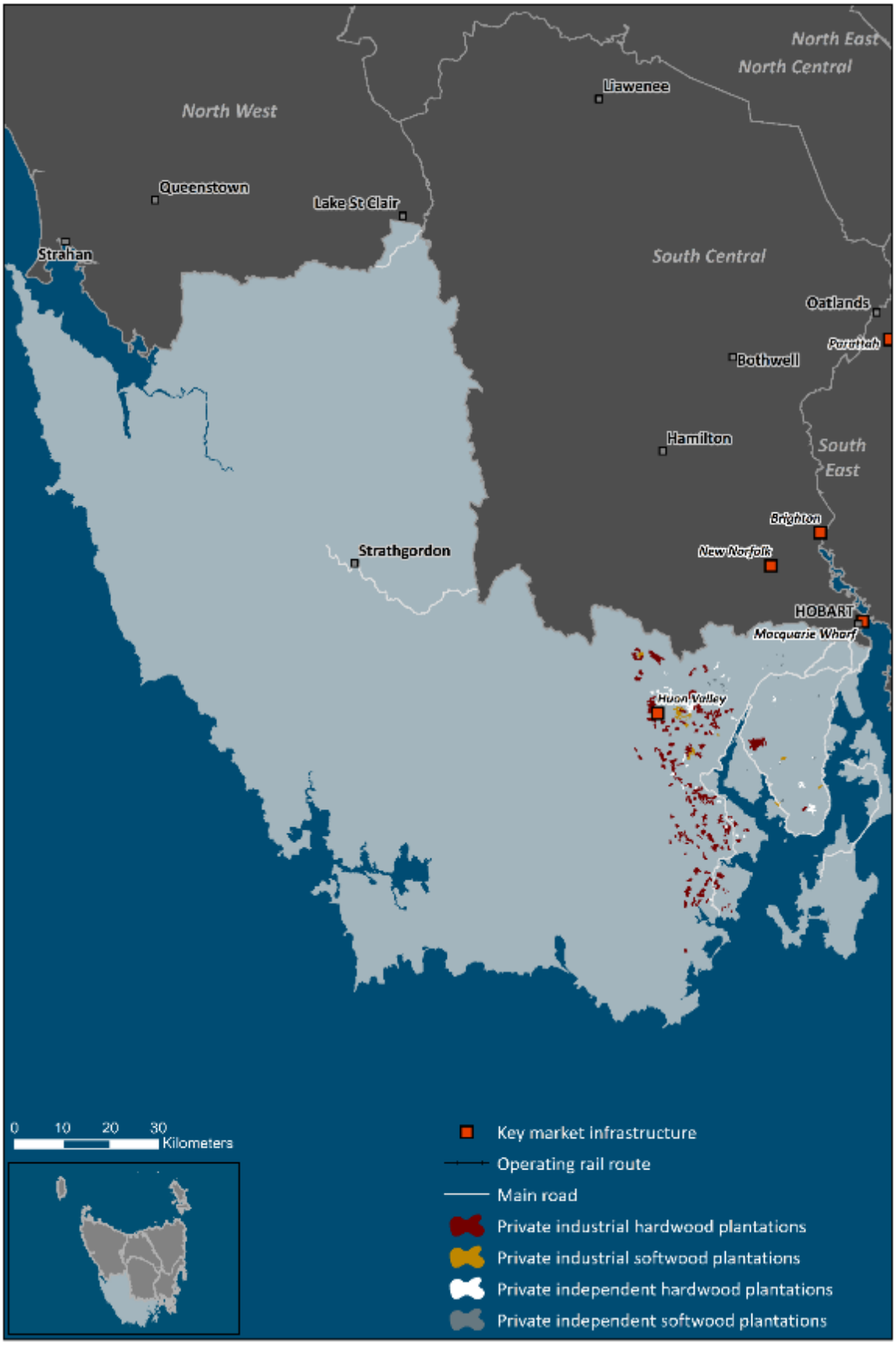


Figure 43: Map of South West Private Industrial-Scale Plantations



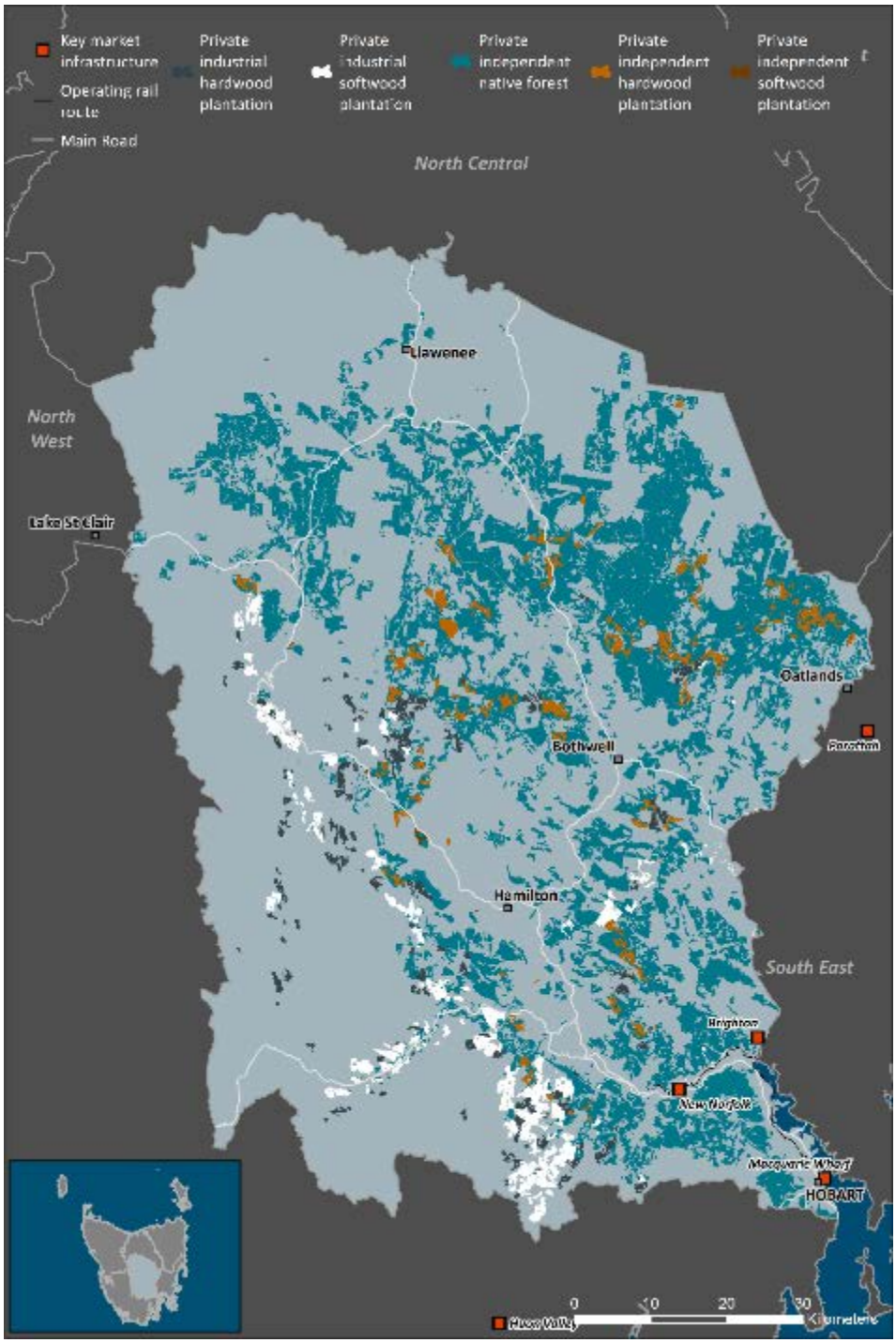
SOUTH CENTRAL WOOD CATCHMENT

10 South Central Wood Catchment

10.1 South Central Overview

The South Central privately managed forest estate is comprised of some 192,000ha of native forest, 18,000ha of hardwood plantation and 15,000ha of softwood plantation as shown in Figure 44, which in total makes up 24% of the total land in the South Central.

Figure 44: Map of South Central Private Independent Forests



The 184,000ha of private independent native forest resource in the South Central is distributed across approximately 5,200 individual land holdings, though only 1,600 of these properties possess more than 5ha. The main commercial components of this resource are a mix of *Eucalyptus delegatensis* (34%), *E. tenuiramis (15%), E. pauciflora (7%), E. viminalis (6%)* and *E. obliqua (5%)* vegetation communities based on analysis of the TASVEG 4.0 mapping.

Of the plantation resources in the South Central, some 48% of hardwood plantations and 98% of softwood plantations are within the 'industrial-scale' estates. The remaining 9,800ha of plantation resources managed by individual landowners are confined to private freehold land and are distributed across 170 individual land holdings.

The following sections describe in more detail the availability and distribution of the privately managed native forest, hardwood plantation and softwood plantation resources within the South Central.

10.2 Private Independent Native Forests

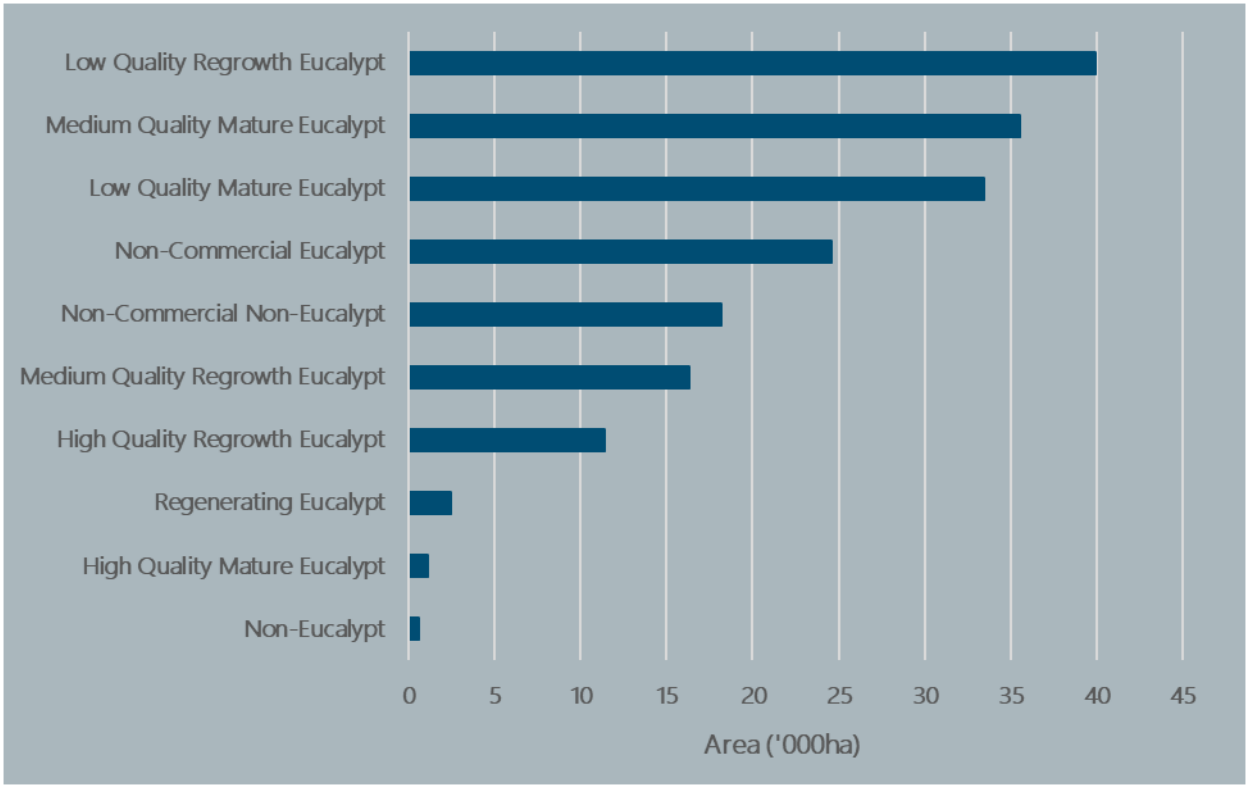
10.2.1 Forest Description

The South Central independent native forest resource of 184,000ha is dominated by Dry Eucalypt Forest (70%), which in general are of lower productive capacity than the wet forests which are more prevalent on public land. The remainder of the private independent native forest is comprised of White Top Eucalypt Forest (28%), Wet Eucalypt Forest (2%) and Non-Eucalypt Forest (<1%).

10.2.2 Resource Description

The private independent native forest resource was modelled as aggregated PI-Type 'Forest Classes' against which state-wide average standing log product volume estimates could be assigned, the South Central breakdown of the Forest Classes expressed in Figure 45.

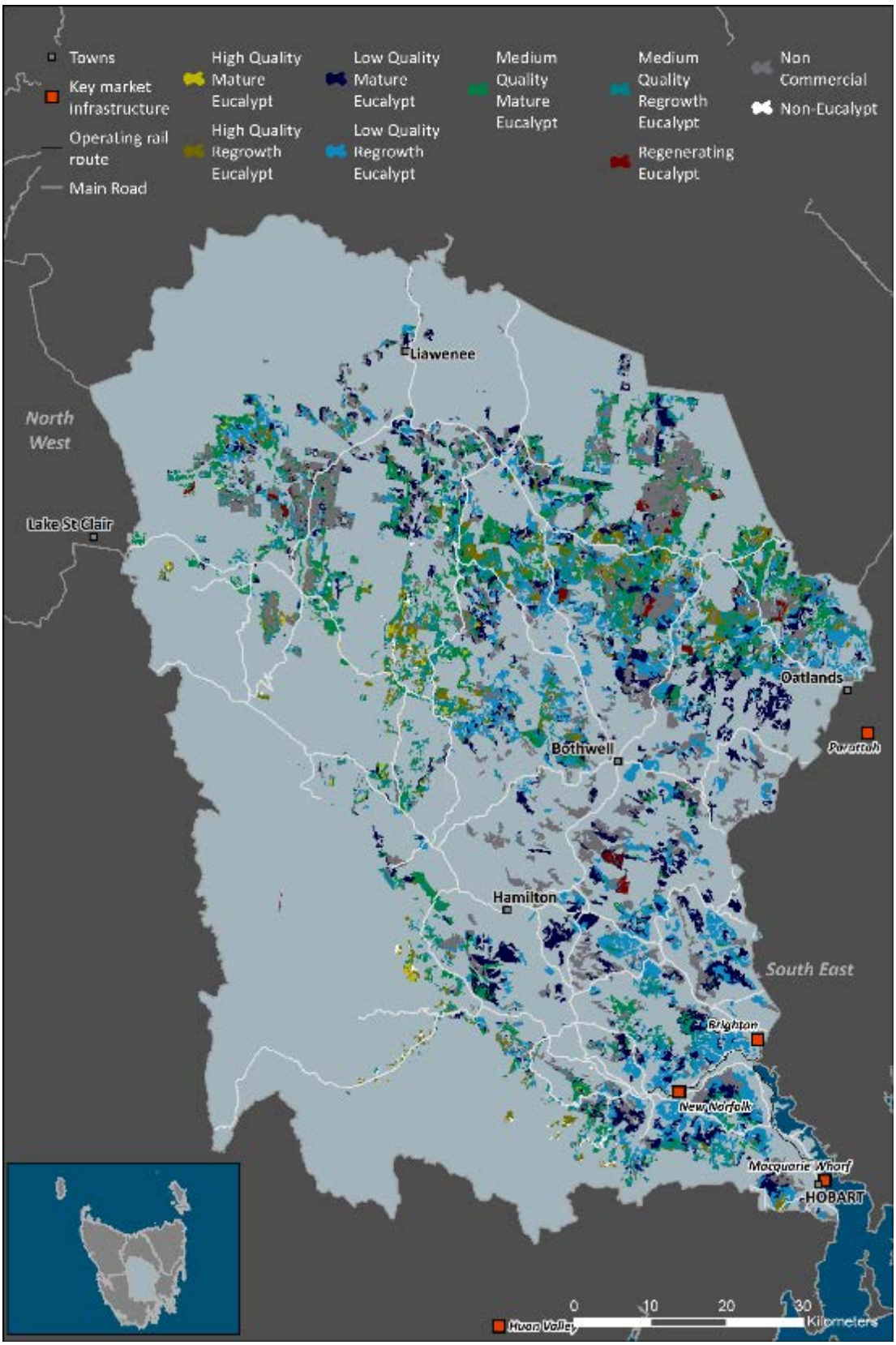
Figure 45: Area of Forest Classes Comprising the South Central Private Independent Native Forest Resource



Analysis of these Forest Classes revealed 70,000ha of Mature Eucalypt forest and 68,000ha of Regrowth Eucalypt Forest have the height, crown density and quality to produce sufficient log products for commercial harvest across South Central Tasmania. There is also 500ha of Non-Eucalypt Forest that has some commercial potential. The remaining 45,000ha was estimated to not have any current commercial potential.

The distribution of these Forest Classes across the South Central is shown Figure 46.

Figure 46: Map of South Central Private Independent Native Forest Classes



Of the 138,500ha of forest identified as viable for commercial harvest 66,500ha has been estimated to be available for harvest after legislated exclusions and discounts on harvesting were accounted for in the model (refer Section 4.1).

This available area carries up to 10.0M tonnes of standing harvestable timber, distributed across Mature Eucalypt Forest (6.6Mt) and Regrowth Eucalypt Forest (3.4Mt). A detailed breakdown of log products by Forest Class are shown in Table 44.

Table 44: Area and Current Standing Harvestable Log Product Estimates for South Central Forest Classes

Forest Class	Area ('000ha)		Estimated Current Standing Harvestable Volume by Log Products ('000t)					
	Gross	Harvestable	Appearance Grade Veneer	Sawlog	Industrial Grade Peeler	Pulplog	Other Biomass	Grand Total
High Quality Mature Eucalypt	1	1	0	30	40	180	70	320
High Quality Regrowth Eucalypt	11	5	0	40	130	720	300	1,190
Medium Quality Mature Eucalypt	36	19	10	380	460	3,640	0	4,490
Medium Quality Regrowth Eucalypt	16	7	0	70	140	900	0	1,110
Low Quality Mature Eucalypt	33	18	0	0	0	1,760	0	1,760
Low Quality Regrowth Eucalypt	40	16	0	0	40	1,040	0	1,080
Regenerating Eucalypt	2	0	0	0	0	0	0	0
Non-Eucalypt	1	0	0	0	0	0	40	40
Non-Commercial Eucalypt	25	0	0	0	0	0	0	0
Non-Commercial Non-Eucalypt	18	0	0	0	0	0	0	0
Grand Total	184	67	10	510	810	8,230	420	9,980

10.2.3 Intent to Harvest

Of the 138,600ha of commercially viable private independent native forest in the South Central only 36,500ha (26%) is covered by a Private Timber Reserve (PTR). Similarly, of the 66,500ha modelled as available for harvest, 20,000ha (29%) is under PTR.

Presence of a PTR strongly indicating intent to undertake forestry activities at some stage. Despite there only being a small area under PTR, there are many land holdings with significant scale of commercial native forests, as shown in Table 45.

Table 45: Scale and Current Standing Harvestable Volume of South Central Private Independent Native Forest

Scale: Area (ha) of PINF on Property	Count of Properties (n)	Total Current Standing Harvestable Volume across all Properties ('000 t)*	Average Current Standing Harvestable Volume per Property (t)
< 1 ha	2,730	0	0
1-2 ha	369	0	0
2-5 ha	561	100	178
5-20 ha	772	600	777
20-50 ha	353	700	1,983
50-100 ha	170	800	4,706
100-150 ha	68	500	7,353
>150 ha	225	7,200	32,000
Total	5,248	9,900	1,886

**Note a small percentage of harvestable area is situated on easements outside of Title boundaries, so cannot be included in this analysis. As such, the volume figures in this table may vary slightly from other tables in this section.*

10.2.4 Proximity to Market Infrastructure

The road-based cartage distance to key market infrastructure was calculated for all properties across South Central Tasmania which possess private independent native forest and used to generate distance-based catchment models of the available area or volume for each destination.

Table 46 describes the total harvestable volume of Mature Eucalypt Forest in the South Central available for harvest in 25km cartage distance bands from each market infrastructure destination. To provide some commercial viability around the figures, properties with less than 5ha of native forest were excluded from the cumulative volume as they are less likely to be of the scale to be financially viable for harvest.

Table 46: Cumulative Harvestable Volume from South Central Mature Forests by Cartage Distance Class and Destination

Destination	Cumulative Total Harvestable Volume ('000t) by Road Cartage Distance Range								
	<25km	<50km	<75km	<100km	<125km	<150km	<175km	<200km	<650km
Bell Bay					9	985	3,387	4,816	6,358
Branxholm							389	3,074	6,358
Brighton	431	1,279	2,508	4,873	6,007	6,358	6,358	6,358	6,358
Burnie							23	1,118	6,358
Exeter				23	1,097	3,387	4,835	5,266	6,358
Hampshire									6,358
Huon Valley		232	1,098	1,538	1,891	3,966	6,226	6,358	6,358
Long Reach					116	1,849	3,883	4,934	6,358
Longford			215	2,519	4,170	4,981	5,456	6,290	6,358
Macquarie Wharf	128	854	1,545	2,624	4,995	6,226	6,358	6,358	6,358
New Norfolk	750	1,365	1,968	3,741	6,096	6,358	6,358	6,358	6,358
Parattah	391	1,629	3,375	5,015	6,082	6,358	6,358	6,358	6,358
Scottsdale						46	2,097	3,979	6,358
Smithton									6,358

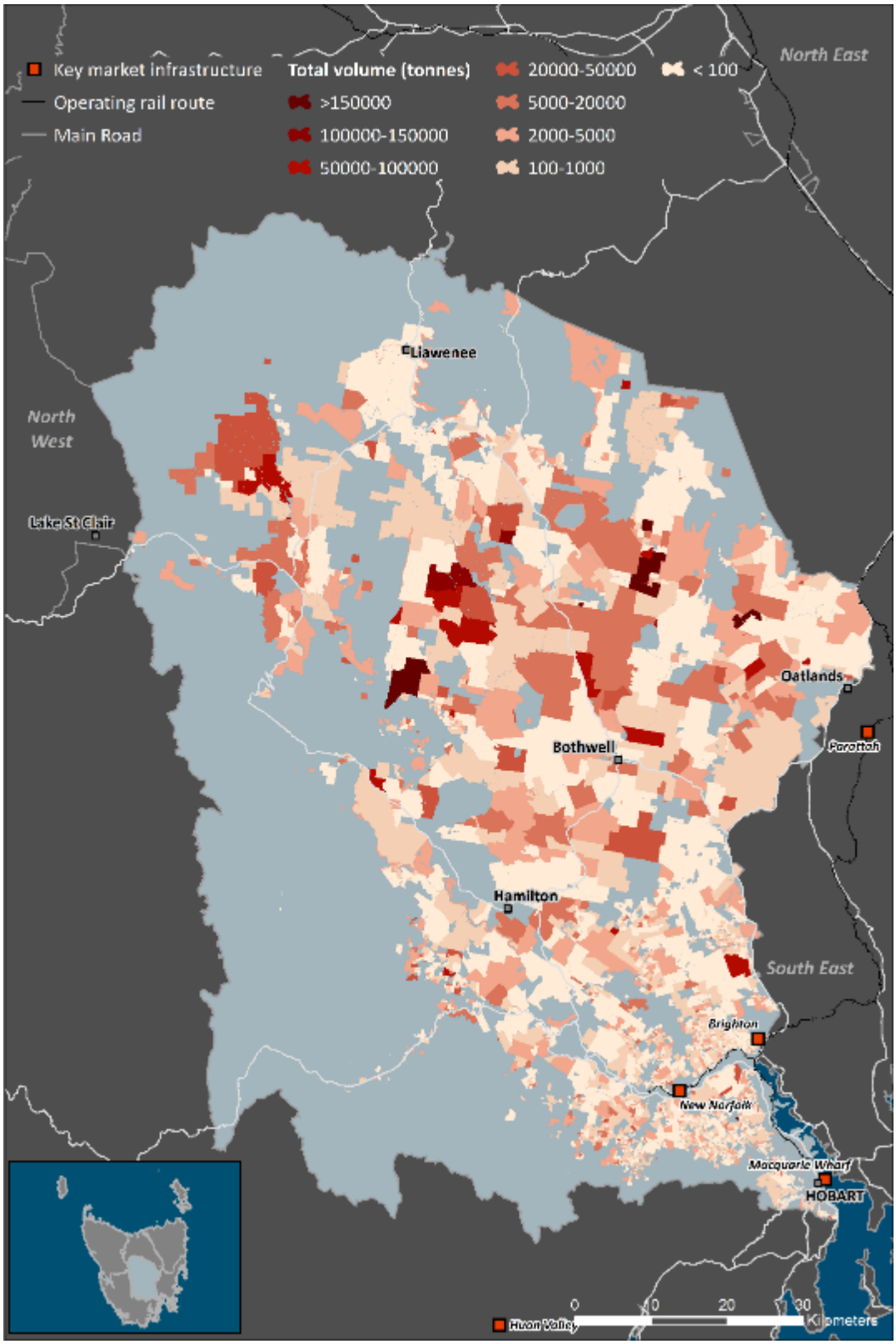
Table 47 describes the corresponding figures for the South Central Regrowth Eucalypt Forest.

Table 47: Cumulative Harvestable Volume from South Central Regrowth Forests by Cartage Distance Class and Destination

Destination	Cumulative Total Harvestable Volume ('000t) by Road Cartage Distance Range								
	<25km	<50km	<75km	<100km	<125km	<150km	<175km	<200km	<650km
Bell Bay					0	403	1,659	2,320	3,230
Branxholm							181	1,386	3,230
Brighton	367	775	1,321	2,621	3,149	3,230	3,230	3,230	3,230
Burnie							2	511	3,230
Exeter				2	467	1,716	2,341	2,586	3,230
Hampshire									3,230
Huon Valley		159	718	898	1,010	2,440	3,217	3,230	3,230
Long Reach					28	855	1,820	2,388	3,230
Longford			56	1,113	1,939	2,422	2,718	3,194	3,230
Macquarie Wharf	136	580	867	1,421	2,700	3,213	3,230	3,230	3,230
New Norfolk	480	837	1,020	2,172	3,200	3,231	3,230	3,230	3,230
Parattah	193	777	1,750	2,511	3,062	3,230	3,230	3,230	3,230
Scottsdale						8	1,052	1,852	3,230
Smithton									3,230

The geographic distribution of the scale of volume per property across the South Central is represented in Figure 47.

Figure 47: Map of the Scale of Harvestable Volume by Property across the South Central



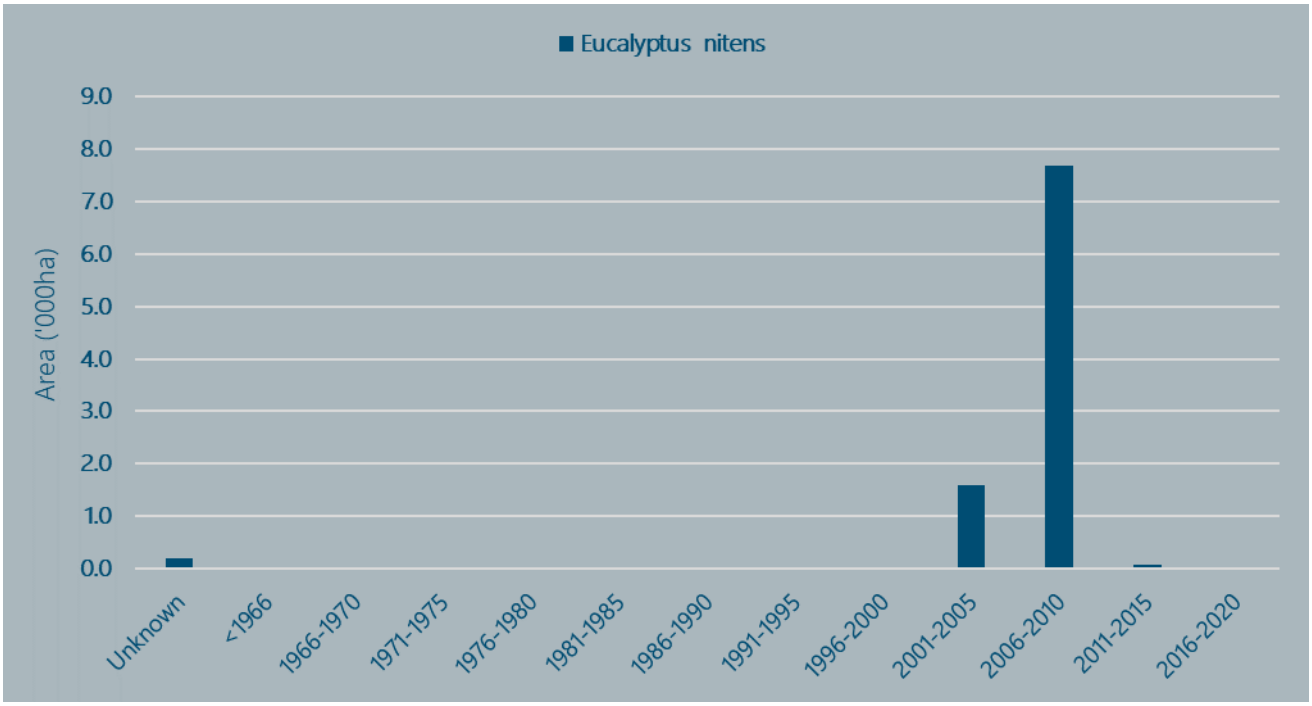
10.3 Private Independent Hardwood Plantations

10.3.1 Forest Description

There is some 9,600ha of private independently managed hardwood plantation currently standing within South Central, 100% of which is *Eucalyptus nitens*.

Table 47 shows the age and species structure of this hardwood plantation resource, this region being dominated by the 2006-2010 age class.

Figure 48: Five-Year Age Class by Area of South Central Private Independent Hardwood Plantations



Based on the DPIPWE Enterprise Suitability Mapping, the South Central 2001-2010 age class is distributed across Suitable (8%), Moderately Suitable (27%) and Unsuitable (64%) sites.

10.3.2 Resource Description

The private independent hardwood resource in South Central Tasmania is distributed across 133 separate land holdings or properties, 78 of which possess more than 2ha.

Table 48 provides an indication of the scale at which these forests are distributed across these properties in terms of area and total harvestable volume at modelled harvest age, based on a single rotation unpruned unthinned regime. Typically, the larger the scale of the plantation on a property, the more financially viable will be harvest, ignoring distance from market.

Table 48: Scale and Harvestable Volume at Harvest Age of South Central Private Independent Hardwood Plantations

Scale: Area (ha) of Hardwood Plantation on each Property	Count of properties (n)	Total Harvestable Volume ('000t) by Period								Average Harvestable Volume per Property (t)
		2016-2020	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	**Grand Total**	
< 1ha	51	0	0	0	0	0	0	0	1	20
1-2ha	4	0	0	0	0	0	0	0	1	250
2-5ha	4	1	0	0	1	0	0	0	2	500
5-20	9	1	7	0	4	0	0	0	13	1,440
20-50	13	9	17	18	11	0	0	0	54	4,150
50-100	18	17	42	34	47	0	0	0	139	7,720
100-150	13	45	64	17	58	0	0	0	184	14,150
>150	21	32	152	118	308	1	0	0	611	29,100
Grand Total	133	104	281	187	430	2	0	0	1004	7,550

**Note a small percentage of harvestable area is situated on easements outside of Title boundaries, so cannot be included in this analysis. As such, the volume figures in this table may vary slightly from other tables in this section.*

Most of the South Central hardwood plantation resource is within stands of 20ha or more, which suggests a high likelihood it will of scale to be financially viable to harvest if within reasonable distance of market infrastructure.

10.3.3 Proximity to Market Infrastructure

The road-based cartage distance to key market infrastructure was calculated for all properties across South Central Tasmania which possess private independent hardwood plantation and used to generate distance-based catchment models of the available area or volume for each destination.

Table 49 describes the total harvestable volume of South Central private independent hardwood plantation available in 25km cartage distance bands from each market infrastructure destination.

To provide some commercial viability around the figures, properties with less than 1ha of plantation were excluded from the cumulative volume as they are less likely to be of the scale to be financially viable for harvest.

Table 49: Cumulative Harvestable Volume at Harvest Age of South Central Private Independent Hardwood Plantations by Road Distance Class to Market Infrastructure

Destination	Cumulative Total Harvestable Volume ('000t) by Road Cartage Distance Range								
	<25km	<50km	<75km	<100km	<125km	<150km	<175km	<200km	<650km
Bell Bay						65	456	820	1,003
Branxholm							84	397	1,003
Brighton	5	168	408	762	952	1,003	1,003	1,003	1,003
Burnie								65	1,003
Exeter					65	501	820	897	1,003
Hampshire									1,003
Huon Valley		48	106	183	215	726	1,003	1,003	1,003
Long Reach						259	587	830	1,003
Longford				293	625	855	935	1,002	1,003
Macquarie Wharf		48	181	440	802	1,003	1,003	1,003	1,003
New Norfolk	57	150	220	679	1,003	1,003	1,003	1,003	1,003
Parattah	82	266	538	764	910	1,002	1,003	1,003	1,003
Scottsdale							240	573	1,003
Smithton									1,003

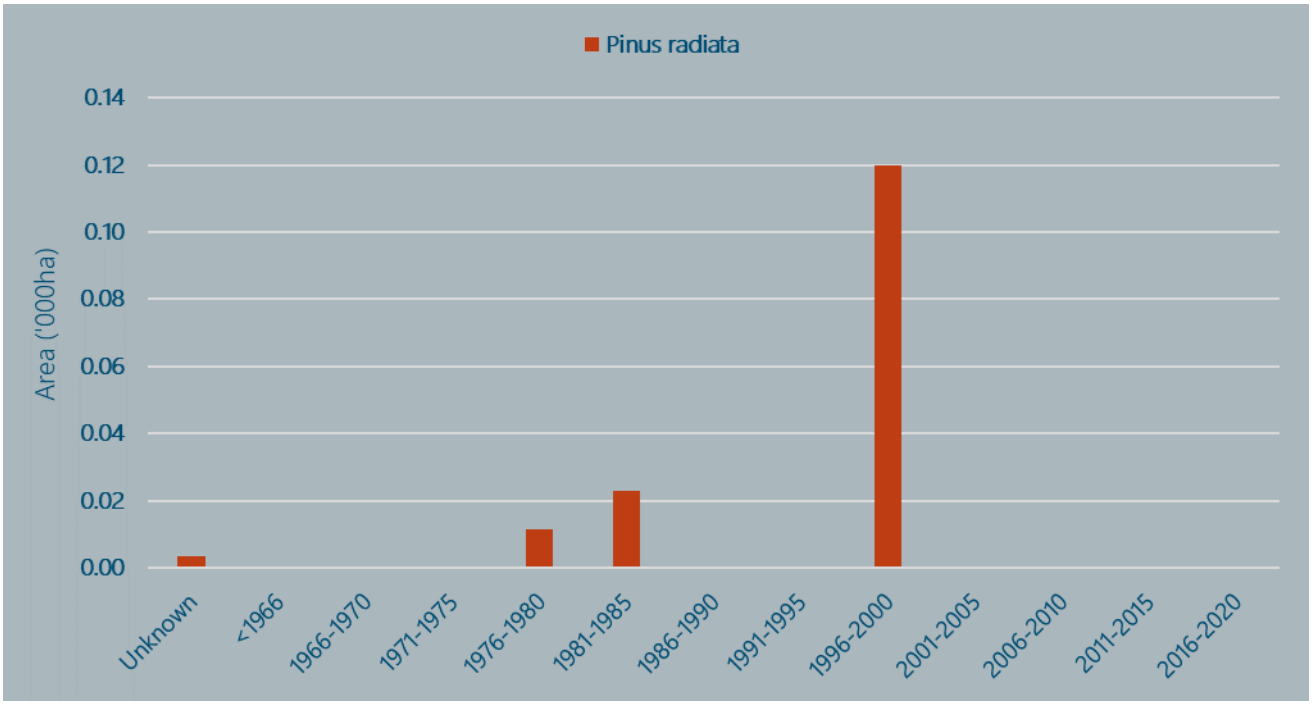
10.4 Private Independent Softwood Plantations

10.4.1 Forest Description

There is only 160ha of private independently managed softwood plantation currently standing within South Central, all of which is *Pinus radiata*.

Figure 49 describes the age structure of this softwood plantation resource.

Figure 49: Five-Year Age Class by Area of South Central Private Independent Softwood Plantations



10.4.2 Resource Description

The private independent softwood resource in South Central Tasmania is distributed across 39 separate land holdings or properties, 14 of which possess more than 2ha.

Table 50 provides an indication of the scale at which these forests are distributed across land holdings in South Central Tasmania in terms of area and total harvestable volume at modelled harvest age, based on a single rotation unpruned single-thinning regime.

Table 50: Scale and Harvestable Volume at Harvest Age of South Central Private Independent Softwood Plantations

Scale: Area (ha) of Softwood Plantation on each Property	Count of properties (n)	Total Harvestable Volume ('000t) by Period								Average Harvestable Volume per Property (t)
		2016-2020	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	Grand Total	
< 1ha	19	1	0	0	0	0	0	0	2	105
1-2ha	6	3	0	0	0	0	0	0	3	500
2-5ha	5	6	0	0	0	0	0	0	6	1,200
5-20	7	23	5	0	0	0	0	0	28	4,000
20-50	2	14	8	1	0	0	0	0	23	11,500
50-100	0	0	0	0	0	0	0	0	0	0
100-150	0	0	0	0	0	0	0	0	0	0
>150	0	0	0	0	0	0	0	0	0	0
Grand Total	39	47	13	1	1	0	0	0	62	1,590

**Note a small percentage of harvestable area is situated on easements outside of Title boundaries, so cannot be included in this analysis. As such, the volume figures in this table may vary slightly from other tables in this section.*

10.4.3 Proximity to Market Infrastructure

The road-based cartage distance to key market infrastructure was calculated for all properties across South Central Tasmania which possess private independent hardwood plantation and used to generate distance-based catchment models of the available area or volume for each destination.

Table 51 describes the total harvestable volume of private independent softwood plantation available in 25km cartage distance bands from each market infrastructure destination.

To provide some commercial viability around the figures, properties with less than 1ha of plantation were excluded from the cumulative volume as they are less likely to be of the scale to be financially viable for harvest.

Table 51: Cumulative Clearfell Harvestable Volume at Harvest Age of South Central Private Independent Softwood Plantations by Road Distance Class to Market Infrastructure

Destination	Cumulative Total Clearfell Harvestable Volume ('000t) by Road Cartage Distance Range								
	<25km	<50km	<75km	<100km	<125km	<150km	<175km	<200km	<650km
Bell Bay						13	14	72	72
Branxholm								72	72
Brighton	1	10	72	72	72	72	72	72	72
Burnie								72	72
Exeter					13	14	63	72	72
Hampshire								72	72
Huon Valley		9	58	58	71	71	71	71	71
Long Reach						13	14	72	72
Longford				13	14	63	72	72	72
Macquarie Wharf		1	58	71	72	72	72	72	72
New Norfolk	9	58	71	72	72	72	72	72	72
Parattah			13	22	71	71	71	71	71
Scottsdale							13	72	72
Smithton								72	72

10.5 Private Industrial-scale Plantations

10.5.1 Forest Description

The South Central private industrial-scale estate is 24,000ha in area of which 56% is managed on private freehold land, the other 44% on public land.

8,000ha is hardwood plantation, predominantly of the species *Eucalyptus nitens*. The 15,000ha of softwood plantation is predominantly *Pinus radiata*.

Figure 50 provides the overall species percentage breakdown, and Figure 51 the geographic distribution across the South Central.

Figure 50: Breakdown of Species for South Central Private Industrial-scale Plantations

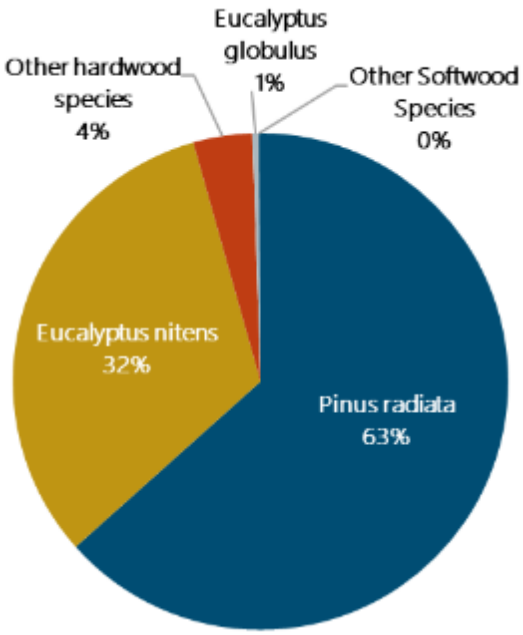
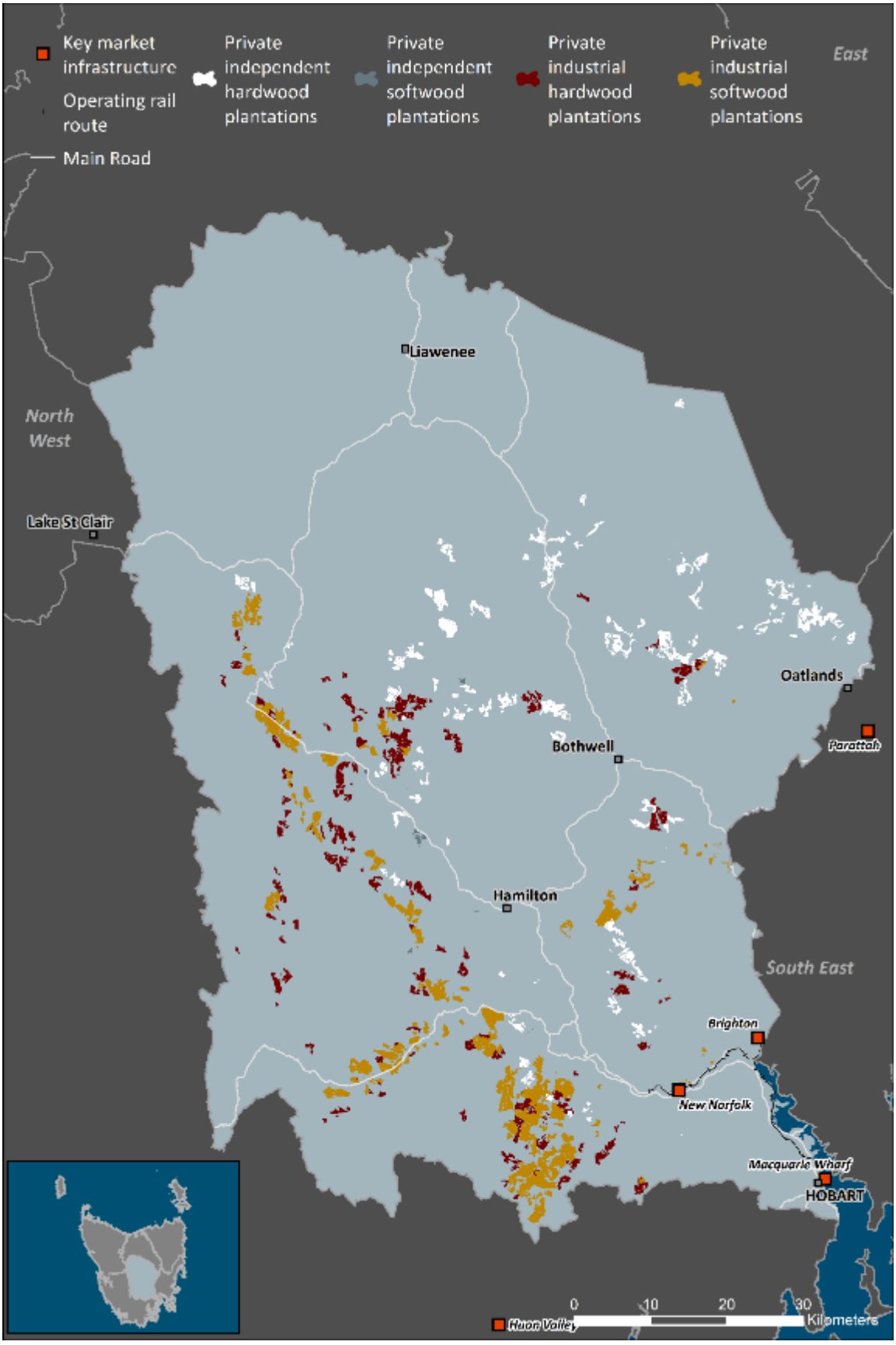


Figure 51: Map of South Central Private Industrial-Scale Plantations



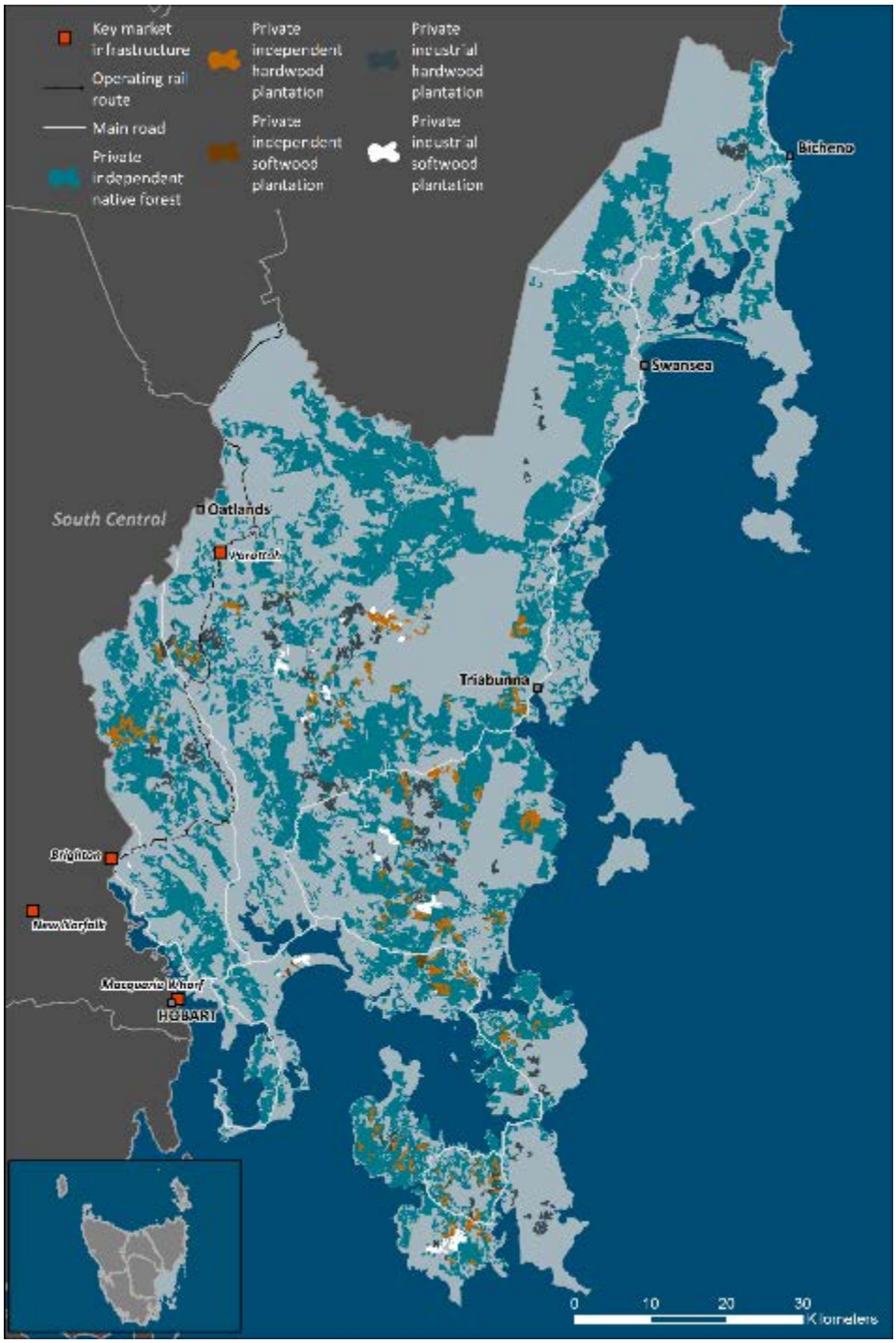
SOUTH EAST WOOD CATCHMENT

11 South East Wood Catchment

11.1 South East Overview

The South East privately managed forest estate is comprised of some 192,000ha of native forest, 16,000ha of hardwood plantation and 2,000ha of softwood plantation as shown in Figure 52, which in total makes up 33% of the total land in the South East.

Figure 52: Map of South East Private Independent Forests



The 185,000ha of private independent native forest resource in the South East is distributed across approximately 7,000 individual land holdings, though only 2,000 of these properties possess more than 5ha. The main commercial components of this resource are dominated by *Eucalyptus pulchella* (34%), *E. amygdaluna (22%), E. viminalis (11%), E.s obliqua (10%) and E. globulus (8%)* vegetation communities based on analysis of the TASVEG 4.0 mapping.

Of the plantation resources in the South East, some 55% of hardwood plantations and 87% of softwood plantations are within the 'industrial-scale' estates. The remaining 3,800ha of plantation resources managed by individual landowners are confined to private freehold land and are distributed across 244 individual land holdings.

The following sections describe in more detail the availability and distribution of the privately managed native forest, hardwood plantation and softwood plantation resources within the South East.

11.2 Private Independent Native Forests

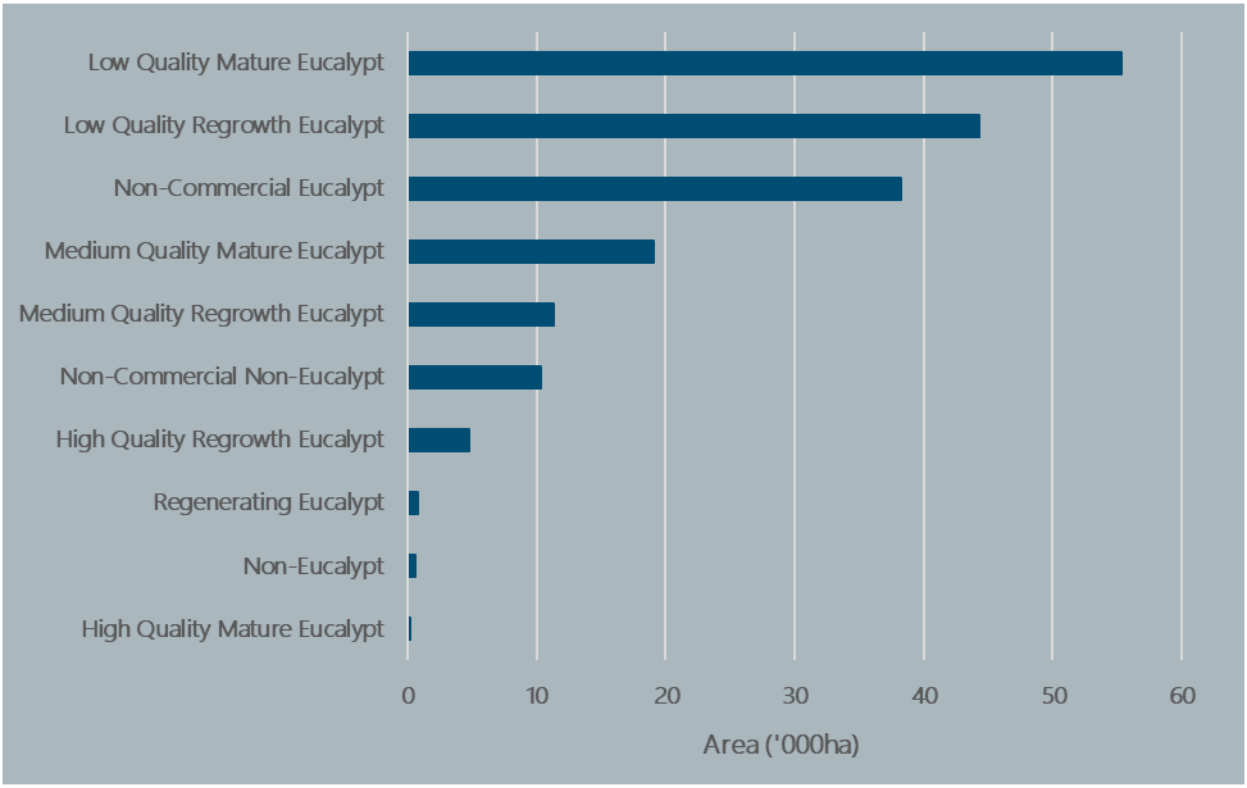
11.2.1 Forest Description

The South East private independent native forest resource of 185,000ha is dominated by Dry Eucalypt Forest (96%), which in general are of lower productive capacity than the wet forests which are more prevalent on public land. The remainder of the private independent native forest is comprised of Wet Eucalypt Forest (3%), White Top Eucalypt Forest (1%) and Non-Eucalypt Forest (<1%).

11.2.2 Resource Description

The private independent native forest resource was modelled as aggregated PI-Type 'Forest Classes' against which state-wide average standing log product volume estimates could be assigned, the South East breakdown of the Forest Classes expressed in Figure 53.

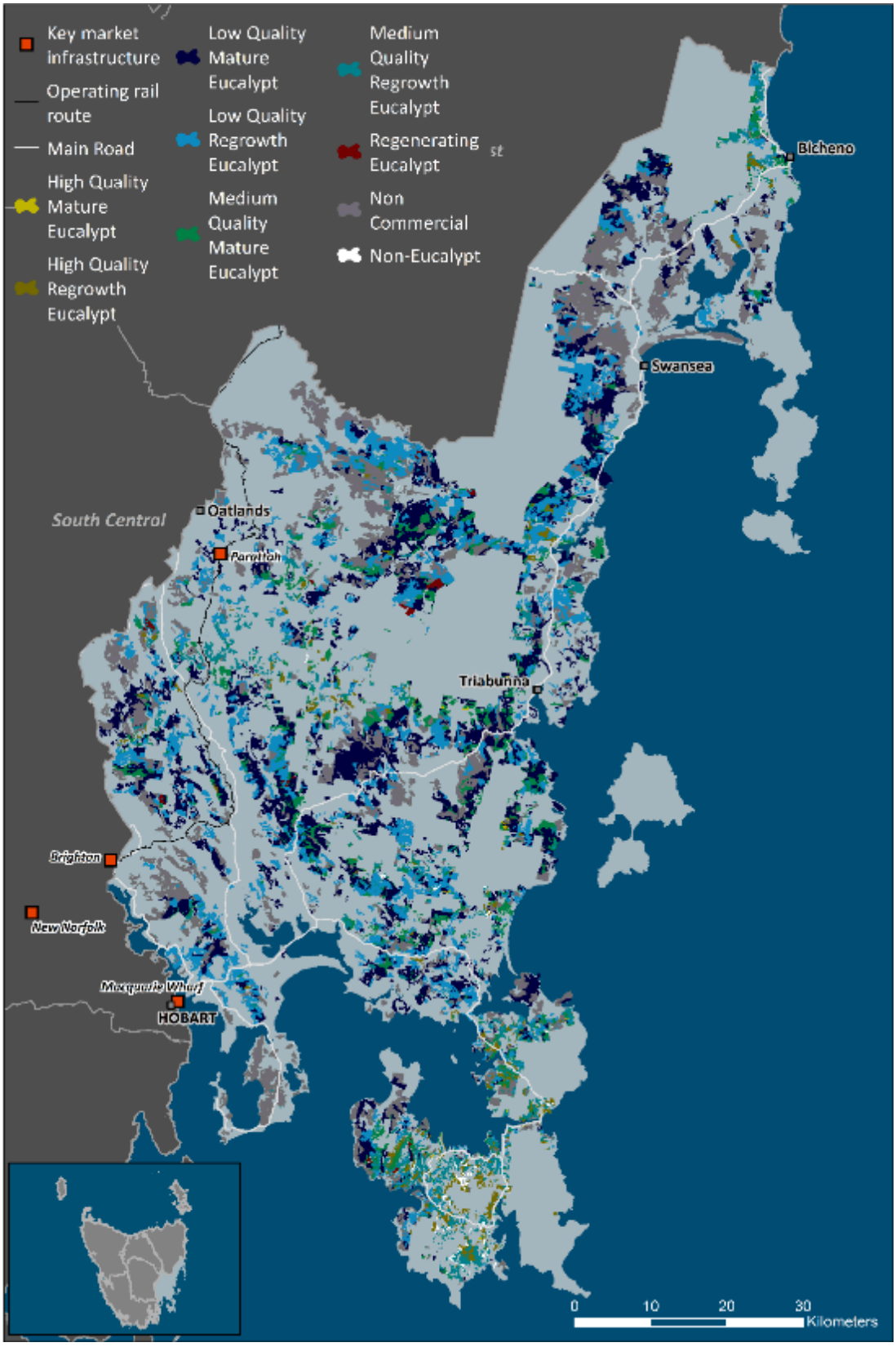
Figure 53: Area of Forest Classes Comprising the South East Private Independent Native Forest Resource



Analysis of these Forest Classes revealed 74,500ha of Mature Eucalypt forest and 60,000ha of Regrowth Eucalypt Forest have the height, crown density and quality to produce sufficient log products for commercial harvest across South East Tasmania. There is also 500ha of Non-Eucalypt Forest that has some commercial potential. The remaining 49,500ha was estimated to not have any current commercial potential.

The distribution of these Forest Classes across the South East is shown in Figure 54.

Figure 54: Map of South East Private Independent Native Forest Classes



Of the 135,500ha of forest identified as viable for commercial harvest 66,500ha has been estimated to be available for harvest after legislated exclusions and discounts on harvesting were accounted for in the model (refer Section 4.1).

This available area carries up to 8.9M tonnes of standing harvestable timber, distributed across Mature Eucalypt Forest (6.0Mt) and Regrowth Eucalypt Forest (2.8Mt). A detailed breakdown of log products by Forest Class are shown in Table 52.

Table 52: Area and Current Standing Harvestable Log Product Estimates for South East Forest Classes

Forest Class	Area ('000ha)		Estimated Current Standing Harvestable Volume by Log Products ('000t)					
	Gross	Harvestable	Appearance Grade Veneer	Sawlog	Industrial Grade Peeler	Pulplog	Other Biomass	Grand Total
High Quality Mature Eucalypt	0	0	0	10	10	40	20	80
High Quality Regrowth Eucalypt	5	3	0	40	70	420	180	710
Medium Quality Mature Eucalypt	19	10	10	280	370	2,270	0	2,930
Medium Quality Regrowth Eucalypt	11	6	0	80	130	760	0	970
Low Quality Mature Eucalypt	55	29	0	0	0	3,000	0	3,000
Low Quality Regrowth Eucalypt	44	18	0	0	40	1,130	0	1,170
Regenerating Eucalypt	1	0	0	0	0	0	0	0
Non-Eucalypt	1	0	0	0	0	0	40	40
Non-Commercial Eucalypt	38	0	0	0	0	0	0	0
Non-Commercial Non-Eucalypt	10	0	0	0	0	0	0	0
Grand Total	185	66	10	400	620	7,610	240	8,880

11.2.3 Intent to Harvest

Of the 136,000ha of commercially viable private independent native forest in the South East only 15,500ha (11%) is covered by a Private Timber Reserve (PTR). Similarly, of the 66,500ha modelled as available for harvest, 9,000ha (14%) is under PTR.

Presence of a PTR strongly indicating intent to undertake forestry activities at some stage. Despite there only being a small area under PTR, there are many land holdings with significant scale of commercial native forests, as shown in Table 53.

Table 53: Scale and Current Standing Harvestable Volume of South East Private Independent Native Forest

Scale: Area (ha) of PINF on Property	Count of Properties (n)	Total Current Standing Harvestable Volume across all Properties ('000 t)*	Average Current Standing Harvestable Volume per Property (t)
< 1 ha	2,899	0	0
1-2 ha	823	0	0
2-5 ha	1,032	100	97
5-20 ha	1,102	800	726
20-50 ha	512	1,000	1,953
50-100 ha	227	900	3,965
100-150 ha	99	600	6,061
>150 ha	242	5,400	22,314
Total	6,936	8,800	1,269

**Note a small percentage of harvestable area is situated on easements outside of Title boundaries, so cannot be included in this analysis. As such, the volume figures in this table may vary slightly from other tables in this section.*

11.2.4 Proximity to Market Infrastructure

The road-based cartage distance to key market infrastructure was calculated for all properties across South East Tasmania which possess private independent native forest and used to generate distance-based catchment models of the available area or volume for each destination.

Table 54 describes the total harvestable volume of Mature Eucalypt Forest in the South East available for harvest in 25km cartage distance bands from each market infrastructure destination. To provide some commercial viability around the figures, properties with less than 5ha of native forest were excluded from the cumulative volume as they are less likely to be of the scale to be financially viable for harvest.

Table 54: Cumulative Harvestable Volume from South East Mature Forests by Cartage Distance Class and Destination

Destination	Cumulative Total Harvestable Volume ('000t) by Road Cartage Distance Range								
	<25km	<50km	<75km	<100km	<125km	<150km	<175km	<200km	<650km
Bell Bay							783	2,165	5,748
Branxholm							504	1,535	5,748
Brighton	280	947	2,104	3,932	4,595	4,942	5,346	5,748	5,748
Burnie									5,748
Exeter						661	2,038	4,306	5,748
Hampshire									5,748
Huon Valley				382	1,070	2,351	4,174	4,623	5,748
Long Reach						47	1,172	3,205	5,748
Longford				46	1,104	3,205	4,566	5,241	5,748
Macquarie Wharf		359	1,041	2,266	4,174	4,623	4,968	5,378	5,748
New Norfolk	9	477	1,366	3,086	4,402	4,719	5,138	5,528	5,748
Parattah	546	2,342	3,930	4,708	5,264	5,490	5,748	5,748	5,748
Scottsdale						204	978	2,212	5,748
Smithton									5,748

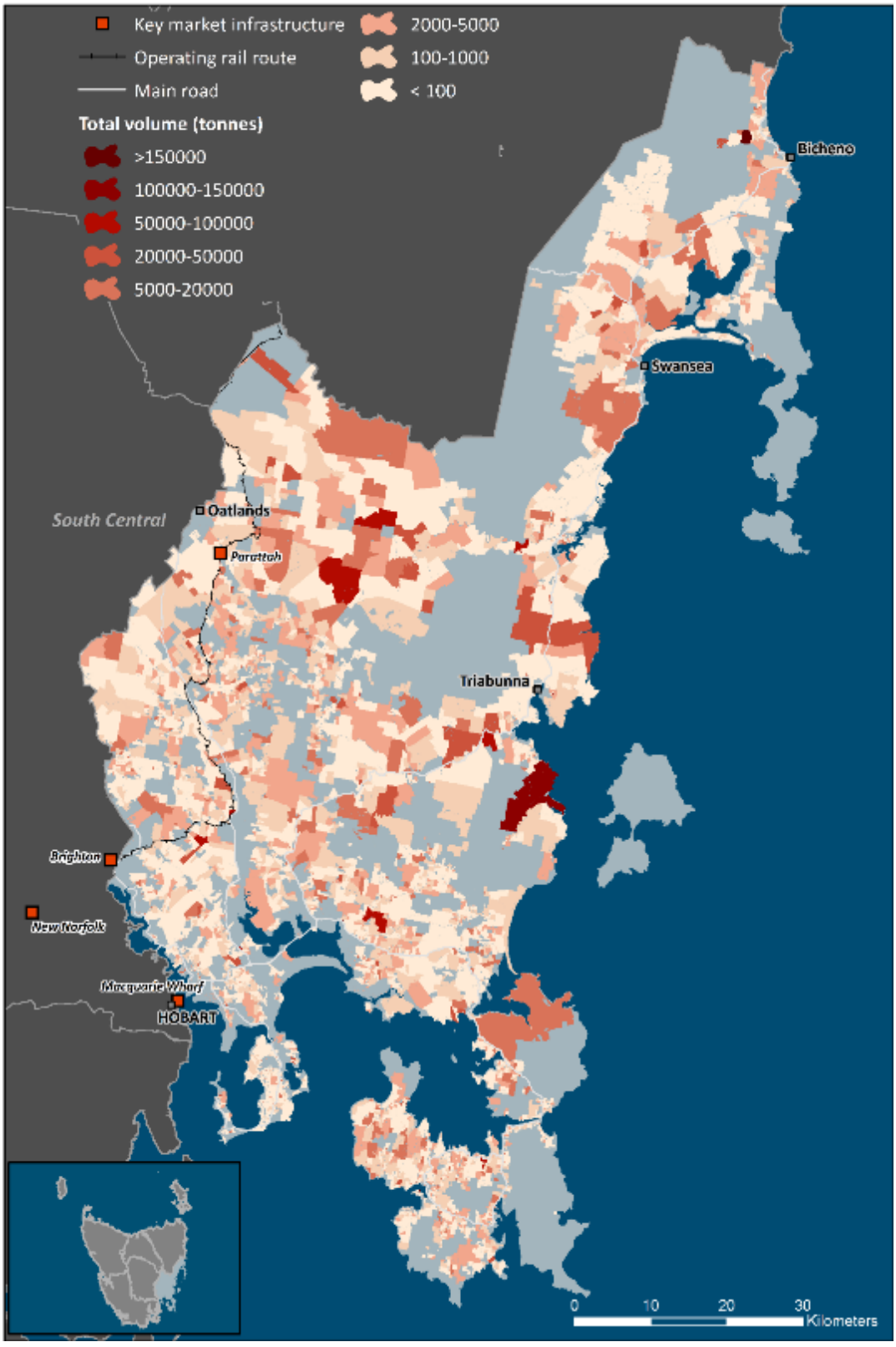
Table 55 describes the corresponding figures for the South East Regrowth Eucalypt Forest.

Table 55: Cumulative Harvestable Volume from South East Regrowth Forests by Cartage Distance Class and Destination

Destination	Cumulative Total Harvestable Volume ('000t) by Road Cartage Distance Range								
	<25km	<50km	<75km	<100km	<125km	<150km	<175km	<200km	<650km
Bell Bay							277	866	2,637
Branxholm							175	630	2,637
Brighton	97	334	778	1,137	1,373	1,542	1,912	2,637	2,637
Burnie									2,637
Exeter						208	816	1,240	2,637
Hampshire									2,637
Huon Valley				132	393	839	1,179	1,399	2,637
Long Reach						55	449	1,068	2,637
Longford				53	430	1,064	1,363	1,589	2,637
Macquarie Wharf		126	377	808	1,179	1,398	1,573	1,986	2,637
New Norfolk	1	177	566	963	1,287	1,425	1,677	2,287	2,637
Parattah	267	747	1,174	1,435	1,620	2,045	2,637	2,637	2,637
Scottsdale						34	369	905	2,637
Smithton									2,637

The geographic distribution of the scale of volume per property across the South East is represented in Figure 55.

Figure 55: Map of the Scale of Harvestable Volume by Property across the South East



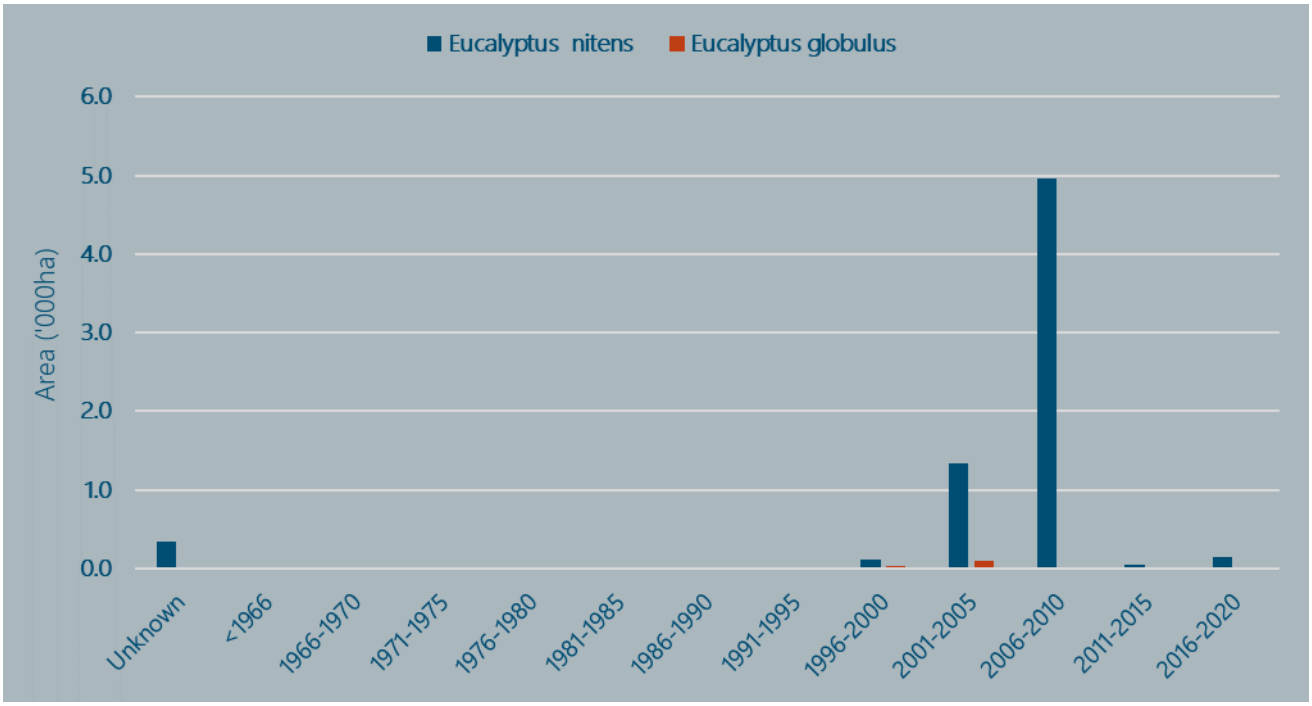
11.3 Private Independent Hardwood Plantations

11.3.1 Forest Description

There is some 7,000ha of private independently managed hardwood plantation currently standing within South East, 98% of which is *Eucalyptus nitens* and 2% of which is *E. globulus*.

Figure 56 shows the age and species structure of this hardwood plantation resource, this region being dominated by the 2006-2010 age class.

Figure 56: Five-Year Age Class by Area of South East Private Independent Hardwood Plantations



Based on the DPIPWE Enterprise Suitability Mapping, the South East 2001-2010 age class is distributed across 'Well Suited' (1%), Suitable (10%), Moderately Suitable (59%) and Unsuitable (31%) sites.

11.3.2 Resource Description

The private independent hardwood resource in South East Tasmania is distributed across 215 separate land holdings or properties, 116 of which possess more than 2ha.

Table 56 provides an indication of the scale at which these forests are distributed across these properties in terms of area and total harvestable volume at modelled harvest age, based on a single rotation unpruned unthinned regime. Typically, the larger the scale of the plantation on a property, the more financially viable will be harvest, ignoring distance from market.

Table 56: Scale and Harvestable Volume at Harvest Age of South East Private Independent Hardwood Plantations

Scale: Area (ha) of Hardwood Plantation on each Property	Count of properties (n)	Total Harvestable Volume ('000t) by Period								Average Harvestable Volume per Property (t)
		2016-2020	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	**Grand Total**	
< 1ha	**92**	1	1	0	0	0	0	0	**2**	**22**
1-2ha	**7**	0	1	0	0	0	0	0	**1**	**140**
2-5ha	**10**	2	2	1	0	0	0	0	**4**	**400**
5-20	**33**	12	29	10	4	0	0	0	**55**	**1,670**
20-50	**33**	25	76	19	17	0	0	0	**138**	**4,180**
50-100	**18**	52	90	8	28	0	0	0	**179**	**9,940**
100-150	**9**	2	79	31	24	0	0	0	**135**	**15,000**
>150	**13**	14	191	81	66	1	8	0	**361**	**27,770**
Grand Total	**215**	109	467	151	139	1	8	0	**876**	**4,070**

**Note a small percentage of harvestable area is situated on easements outside of Title boundaries, so cannot be included in this analysis. As such, the volume figures in this table may vary slightly from other tables in this section.*

Most of the South Central hardwood plantation resource is within stands of 20ha or more, which suggests a high likelihood it will of scale to be financially viable to harvest if within reasonable distance of market infrastructure.

11.3.3 Proximity to Market Infrastructure

The road-based cartage distance to key market infrastructure was calculated for all properties across South East Tasmania which possess private independent hardwood plantation and used to generate distance-based catchment models of the available area or volume for each destination.

Table 57 describes the total harvestable volume of South East private independent hardwood plantation available in 25km cartage distance bands from each market infrastructure destination.

To provide some commercial viability around the figures, properties with less than 1ha of plantation were excluded from the cumulative volume as they are less likely to be of the scale to be financially viable for harvest.

Table 57: Cumulative Harvestable Volume at Harvest Age of South East Private Independent Hardwood Plantations by Road Distance Class to Market Infrastructure

Destination	Cumulative Total Harvestable Volume ('000t) by Road Cartage Distance Range								
	<25km	<50km	<75km	<100km	<125km	<150km	<175km	<200km	<650km
Bell Bay				4	52	191	265	341	397
Branxholm							4	54	397
Brighton									397
Burnie	57	196	339	352	378	385	397	397	397
Exeter				14	135	239	317	343	397
Hampshire	32	217	296	340	368	397	397	397	397
Huon Valley									397
Long Reach				5	84	229	289	343	397
Longford					7	99	232	315	397
Macquarie Wharf									397
New Norfolk									397
Parattah									397
Scottsdale						4	53	194	397
Smithton	22	64	154	202	307	374	397	397	397

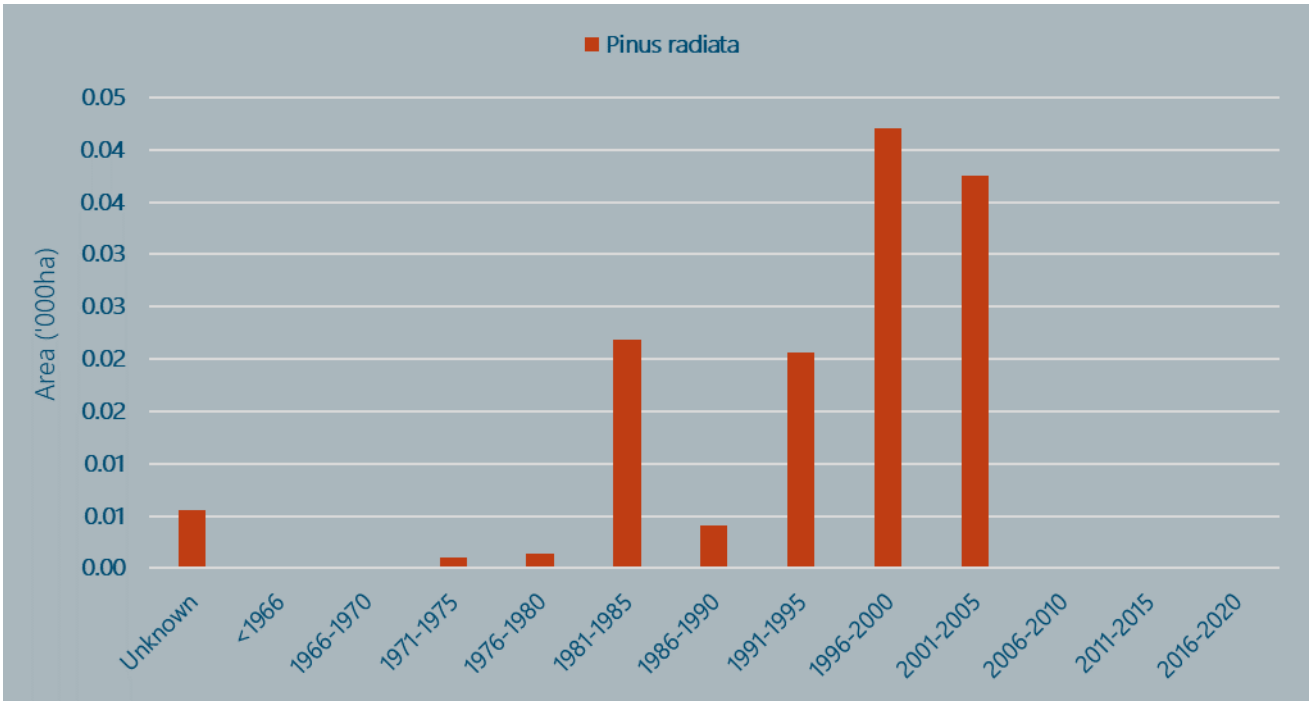
11.4 Private Independent Softwood Plantations

11.4.1 Forest Description

There is only 130ha of private independently managed softwood plantation currently standing within South East, all of which is *Pinus radiata*.

Figure 57 describes the age structure of this softwood plantation resource.

Figure 57: Five-Year Age Class by Area of South East Private Independent Softwood Plantations



11.4.2 Resource Description

The private independent softwood resource in South East Tasmania is distributed across 29 separate land holdings or properties, 13 of which possess more than 2ha.

Table 58 provides an indication of the scale at which these forests are distributed across land holdings in South East Tasmania in terms of area and total harvestable volume at modelled harvest age, based on a single rotation unpruned single-thinning regime.

Table 58: Scale and Harvestable Volume at Harvest Age of South East Private Independent Softwood Plantations

Scale: Area (ha) of Softwood Plantation on each Property	Count of properties (n)	Total Harvestable Volume ('000t) by Period								Average Harvestable Volume per Property (t)
		2016-2020	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	Grand Total	
< 1ha	12	2	0	0	0	0	0	0	2	167
1-2ha	4	1	0	1	0	0	0	0	3	750
2-5ha	3	1	1	2	0	0	0	0	4	1,333
5-20	5	5	4	13	0	0	0	0	22	4,400
20-50	4	0	1	20	0	0	0	0	21	5,250
50-100	0	0	0	0	0	0	0	0	0	0
100-150	0	0	0	0	0	0	0	0	0	0
>150	1	9	0	0	0	0	0	0	9	9,000
Grand Total	29	18	6	36	0	0	0	0	60	2,069

**Note a small percentage of harvestable area is situated on easements outside of Title boundaries, so cannot be included in this analysis. As such, the volume figures in this table may vary slightly from other tables in this section.*

11.5 Proximity to Market Infrastructure

The road-based cartage distance to key market infrastructure was calculated for all properties across South East Tasmania which possess private independent hardwood plantation and used to generate distance-based catchment models of the available area or volume for each destination.

Table 59 describes the total harvestable volume of private independent softwood plantation available in 25km cartage distance bands from each market infrastructure destination.

To provide some commercial viability around the figures, properties with less than 1ha of plantation were excluded from the cumulative volume as they are less likely to be of the scale to be financially viable for harvest.

Table 59: Cumulative Clearfell Harvestable Volume at Harvest Age of South East Private Independent Softwood Plantations by Road Distance Class to Market Infrastructure

Destination	Cumulative Total Clearfell Harvestable Volume ('000t) by Road Cartage Distance Range								
	<25km	<50km	<75km	<100km	<125km	<150km	<175km	<200km	<650km
Bell Bay							1	30	64
Branxholm								26	64
Brighton		3	47	48	48	49	51	64	64
Burnie									64
Exeter							30	31	64
Hampshire									64
Huon Valley					10	48	49	49	64
Long Reach							26	30	64
Longford					26	30	31	48	64
Macquarie Wharf			3	47	48	48	49	51	64
New Norfolk			18	48	48	48	49	64	64
Parattah	30	31	31	48	49	51	64	64	64
Scottsdale								30	64
Smithton									64

11.6 Private Industrial-scale Plantations

11.6.1 Forest Description

The South East private industrial-scale estate is 10,000ha in area of which 82% is managed on private freehold land, the other 18% on public land.

8,000ha is hardwood plantation, predominantly of the species *Eucalyptus nitens*. The 2,000ha of softwood plantation is predominantly *Pinus radiata*.

Figure 58 provides the overall species percentage breakdown, and Figure 59 the geographic distribution across the South East.

Figure 58: Breakdown of Species for South East Private Industrial-scale Plantations

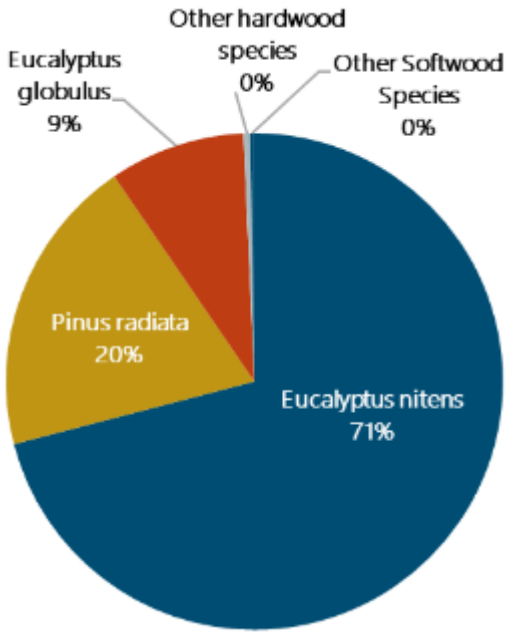
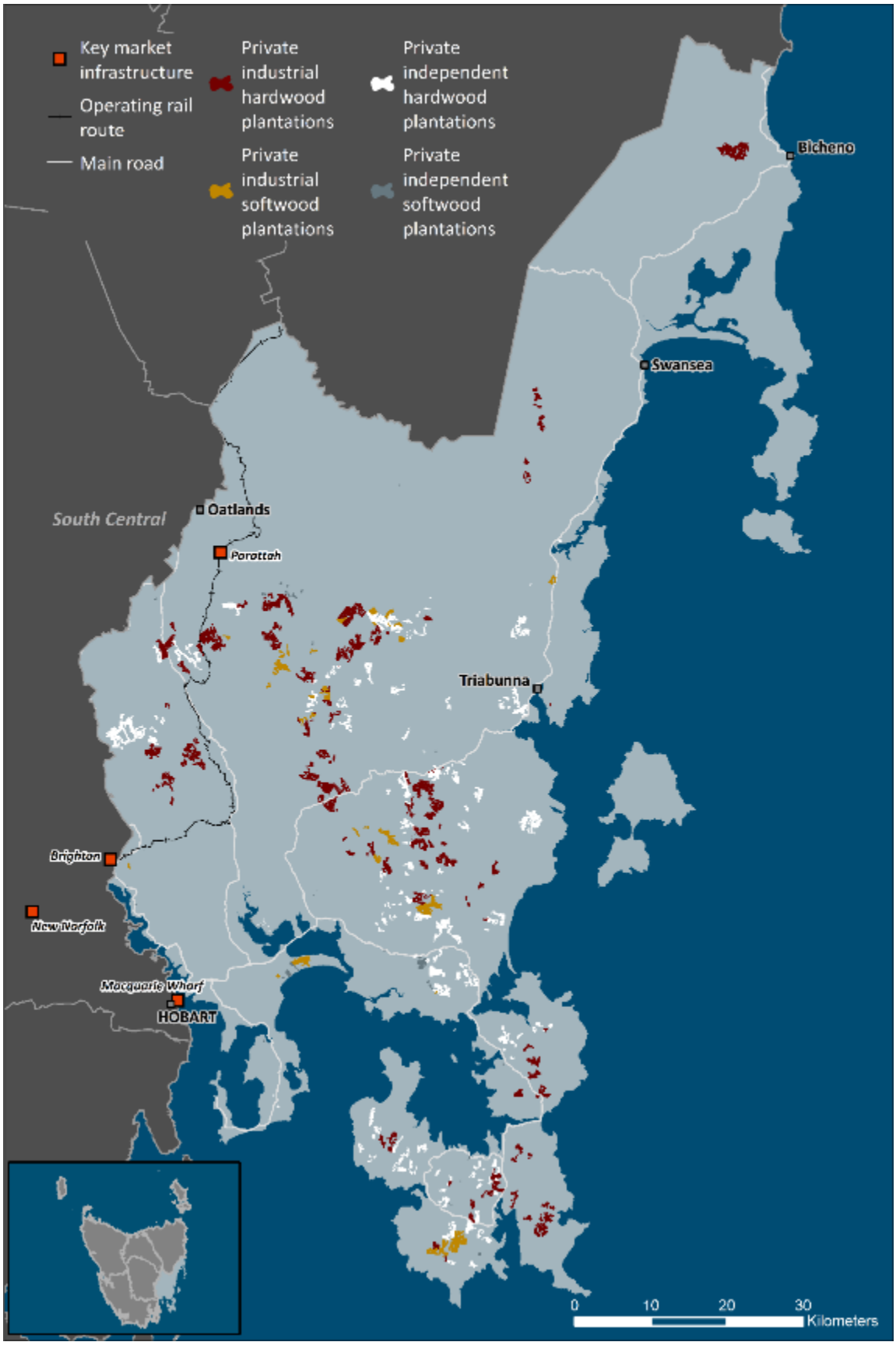


Figure 59: Map of South East Private Industrial-Scale Plantations



12 Appendices

12.1 Native Forest Classes

Forest Classes aggregate native forest PI-Typing based on similar structure and yield ranges and were assigned as per Table 60, further aggregated into Reporting Groups for the ease of interpretation in the main report.

Table 60: Forest Class Definition

PI-Type Group	Forest Class Name	Forest Class Reporting Group
E1,2abc	High Quality Mature 1	High Quality Mature Eucalypt
E1,2d	High Quality Mature 2	High Quality Mature Eucalypt
E3a	Medium Quality Mature 1	Medium Quality Mature Eucalypt
E3b	Medium Quality Mature 2	Medium Quality Mature Eucalypt
E3c	Medium Quality Mature 3	Medium Quality Mature Eucalypt
E3d	Medium Quality Mature 4	Medium Quality Mature Eucalypt
E4ab	Low Quality Mature 1	Low Quality Mature Eucalypt
E4c	Low Quality Mature 2	Low Quality Mature Eucalypt
<=E4(d)	Low Quality Mature 3: Non-Commercial	Non-Commercial Eucalypt
E5	Low Quality Mature 4: Non-Commercial	Non-Commercial Eucalypt
ER5,6/1,2	High Quality Regrowth 1	High Quality Regrowth Eucalypt
ER3,4/1,2	High Quality Regrowth 1	High Quality Regrowth Eucalypt
ER3,4/3	Medium Quality Regrowth 1	Medium Quality Regrowth Eucalypt
ER2/1,2	High Quality Regrowth 2	High Quality Regrowth Eucalypt
ER2/3	Medium Quality Regrowth 2	Medium Quality Regrowth Eucalypt
ER2/4	Low Quality Regrowth	Low Quality Regrowth Eucalypt
ER1/1,2	High Quality Regrowth 2	High Quality Regrowth Eucalypt
ER1/3	Medium Quality Regrowth 2	Medium Quality Regrowth Eucalypt
ER1/4	Low Quality Regrowth	Low Quality Regrowth Eucalypt
ER1/3 (Dry)	Medium Quality Regrowth 2: Below Commercial	Non-Commercial Eucalypt
ER1/4 (Dry)	Low Quality Regrowth: Below Commercial	Non-Commercial Eucalypt
RN/1,2	High Quality Regeneration	Regenerating Eucalypt
RN/3	Medium Quality Regeneration	Regenerating Eucalypt
RN/4	Low Quality Regeneration	Regenerating Eucalypt
Other	Other Non-Commercial	Non-Commercial Non-Eucalypt
Mr	Regrowth Myrtle: Below Commercial	Non-Commercial Non-Eucalypt
M+	High Quality Myrtle	Non-Eucalypt
M-	Low Quality Myrtle	Non-Eucalypt
T	Commercial Secondary Species (No Euc or Wattle)	Non-Eucalypt
Tb	Commercial Secondary Species (No Euc but containing Blackwood)	Non-Eucalypt
Tw	Commercial Secondary Species (No Euc but containing Wattle)	Non-Eucalypt
Tt	Commercial Secondary Species (No Euc but containing Tea-tree)	Non-Eucalypt
K, S, V, etc	Other Non-Commercial	Non-Commercial Non-Eucalypt

12.2 State-wide Area Statistics for Proximity to Market Infrastructure

Table 61 summarises the net harvestable area of Mature Eucalypt Forest available in 25km cartage distance bands from each market infrastructure destination. To provide some commercial viability around the figures, properties with less than 5ha of forest were excluded from the cumulative area as they are less likely to be of the scale to be financially viable for harvest.

Table 61: Cumulative Net Harvestable Area of State-wide Private Independent Mature Eucalypt by Road Distance Class to Market Infrastructure

Destination	Cumulative Net Harvestable Area (ha) by Road Cartage Distance Range								
	< 25km	< 50km	< 75km	< 100km	< 125km	< 150km	< 175km	< 200km	< 650km
Bell Bay	2,346	7,884	14,975	21,626	36,074	65,670	90,159	109,371	150,395
Branxholm	235	3,559	9,872	19,537	31,282	54,403	70,993	94,630	150,395
Brighton	5,090	15,889	34,291	60,904	85,417	106,212	118,712	129,243	150,395
Burnie	389	966	2,995	6,546	12,802	19,789	26,691	44,127	150,395
Exeter	2,835	11,769	18,996	31,330	61,208	87,680	108,254	127,482	150,395
Hampshire	279	826	1,995	3,247	5,988	12,054	18,933	25,475	150,395
Huon Valley	1,211	4,440	11,051	16,769	24,263	44,148	69,781	91,251	150,395
Long Reach	3,418	10,023	16,561	23,689	45,603	73,937	96,562	117,102	150,395
Longford	2,279	13,683	36,174	70,467	91,951	113,930	128,598	138,637	150,395
Macquarie Wharf	1,285	10,446	21,751	36,942	63,866	87,382	107,599	120,438	150,395
New Norfolk	4,511	14,349	26,209	48,547	76,187	99,983	113,634	123,789	150,395
Parattah	5,653	27,911	67,258	95,334	116,081	127,931	135,675	139,275	150,395
Scottsdale	883	3,426	14,825	24,510	47,808	64,210	84,493	104,901	150,395
Smithton	1,004	3,580	3,940	4,324	4,665	5,276	8,247	12,066	150,395

Table 62 summarises the net harvestable area of Regrowth Eucalypt Forest available in 25km cartage distance bands from each market infrastructure destination. To provide some commercial viability around the figures, properties with less than 5ha of forest were excluded from the cumulative area as they are less likely to be of the scale to be financially viable for harvest.

Table 62: Cumulative Net Harvestable Area of State-wide Private Independent Regrowth Eucalypt by Road Distance Class to Market Infrastructure

Destination	Cumulative Net Harvestable Area ('000ha) by Road Cartage Distance Range								
	< 25km	< 50km	< 75km	< 100km	< 125km	< 150km	< 175km	< 200km	< 650km
Bell Bay	1,519	7,542	17,870	29,771	37,076	51,753	70,696	83,085	125,289
Branxholm	1,023	2,759	9,301	15,769	25,647	37,120	48,920	66,492	125,289
Brighton	5,590	16,266	36,082	54,746	62,740	71,467	81,069	98,047	125,289
Burnie	2,331	7,531	12,186	18,125	27,220	33,594	41,413	50,004	125,289
Exeter	4,154	13,510	28,335	34,791	48,887	69,045	82,220	91,590	125,289
Hampshire	1,011	5,726	8,510	12,257	17,147	26,291	33,084	40,682	125,289
Huon Valley	2,647	11,199	23,317	27,587	31,865	47,807	59,303	64,475	125,289
Long Reach	2,836	9,638	20,819	32,501	40,679	58,237	74,644	86,653	125,289
Longford	2,791	17,498	31,006	49,905	65,766	81,230	92,475	100,949	125,289
Macquarie Wharf	3,329	19,970	29,885	40,797	56,370	63,807	72,301	82,795	125,289
New Norfolk	4,739	16,910	31,276	48,646	61,121	66,703	76,168	90,041	125,289
Parattah	4,400	16,830	34,523	50,701	71,112	92,253	106,290	111,487	125,289
Scottsdale	1,032	5,333	13,836	22,435	33,180	44,979	60,549	77,897	125,289
Smithton	1,402	2,594	4,359	6,514	8,741	12,875	17,289	25,603	125,289

Table 63 summarises the net harvestable area of Private Independent Hardwood Plantation available in 25km cartage distance bands from each market infrastructure destination. To provide some commercial viability around the figures, properties with less than 1ha of plantation were excluded from the cumulative area as they are less likely to be of the scale to be financially viable for harvest.

Table 63: Cumulative Net Harvestable Area of State-wide Private Independent Hardwood Plantation by Road Distance Class to Market Infrastructure

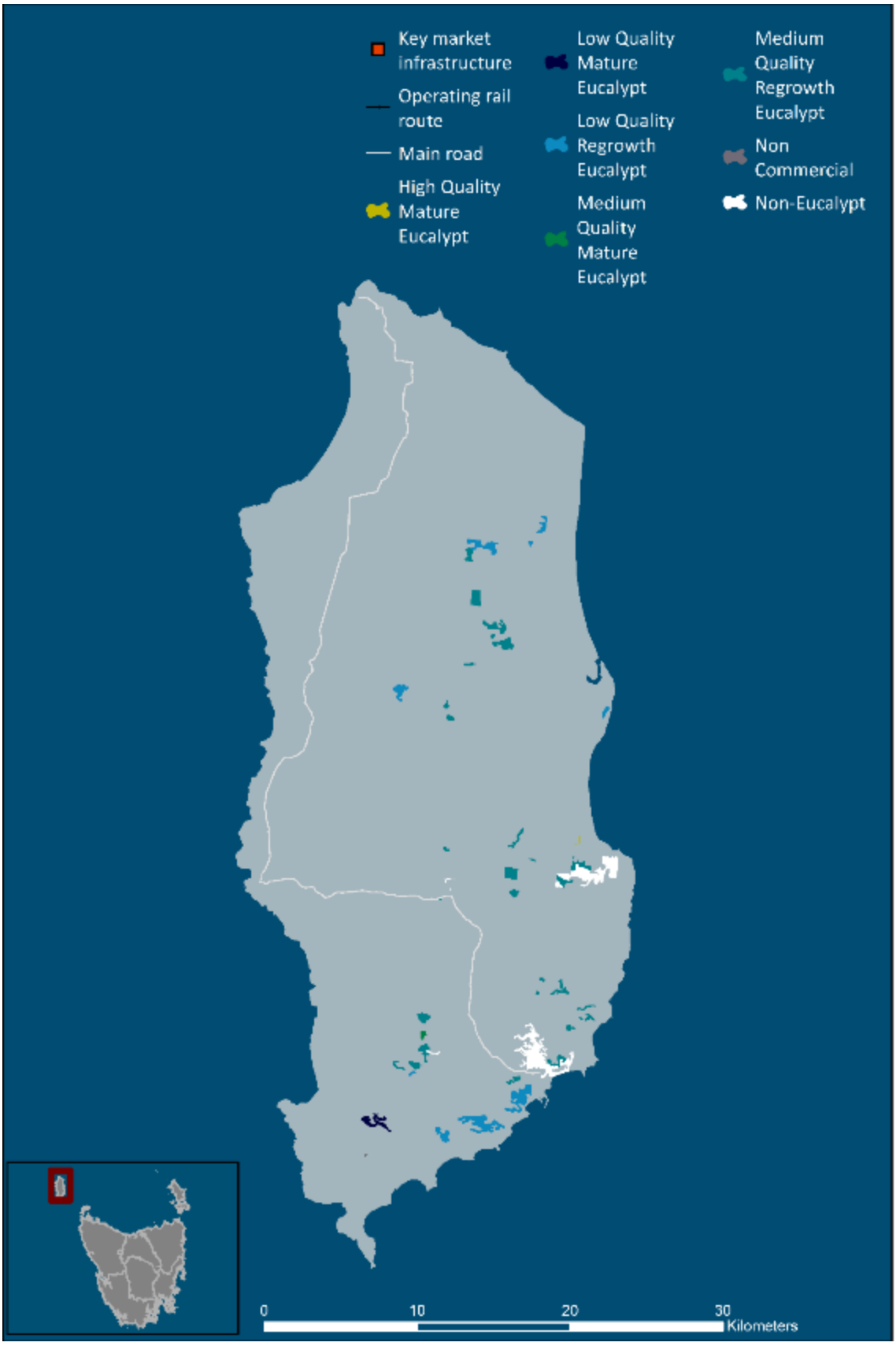
Destination	Cumulative Net Harvestable Area ('000ha) by Road Cartage Distance Range								
	< 25km	< 50km	< 75km	< 100km	< 125km	< 150km	< 175km	< 200km	< 650km
Bell Bay	480	3,198	5,632	9,811	12,210	18,441	23,737	29,265	37,352
Branxholm	520	2,718	5,136	6,912	10,617	15,502	17,848	22,033	37,352
Brighton	296	2,739	8,116	12,883	16,295	20,168	22,373	27,356	37,352
Burnie	384	1,329	2,807	4,629	7,216	9,425	11,433	14,304	37,352
Exeter	1,628	3,837	8,852	10,680	15,760	23,346	28,866	31,829	37,352
Hampshire	216	1,504	2,010	2,719	4,334	6,710	9,244	10,790	37,352
Huon Valley	487	1,001	1,704	3,103	4,614	11,533	15,323	17,209	37,352
Long Reach	996	3,946	6,725	10,582	12,858	20,653	25,156	30,136	37,352
Longford	215	4,529	8,740	16,891	23,098	28,359	31,856	34,073	37,352
Macquarie Wharf		1,204	4,179	8,548	13,668	16,814	20,366	23,599	37,352
New Norfolk	441	2,397	5,015	12,032	16,022	17,943	21,236	25,212	37,352
Parattah	1,418	5,077	11,269	16,550	21,602	25,969	31,512	33,379	37,352
Scottsdale	1,195	3,556	6,474	9,050	13,456	16,820	20,225	26,006	37,352
Smithton	168	446	1,012	1,321	2,069	2,790	4,372	6,536	37,352

Table 64 summarises the net harvestable area of Private Independent Softwood Plantation available in 25km cartage distance bands from each market infrastructure destination. To provide some commercial viability around the figures, properties with less than 1ha of plantation were excluded from the cumulative area as they are less likely to be of the scale to be financially viable for harvest.

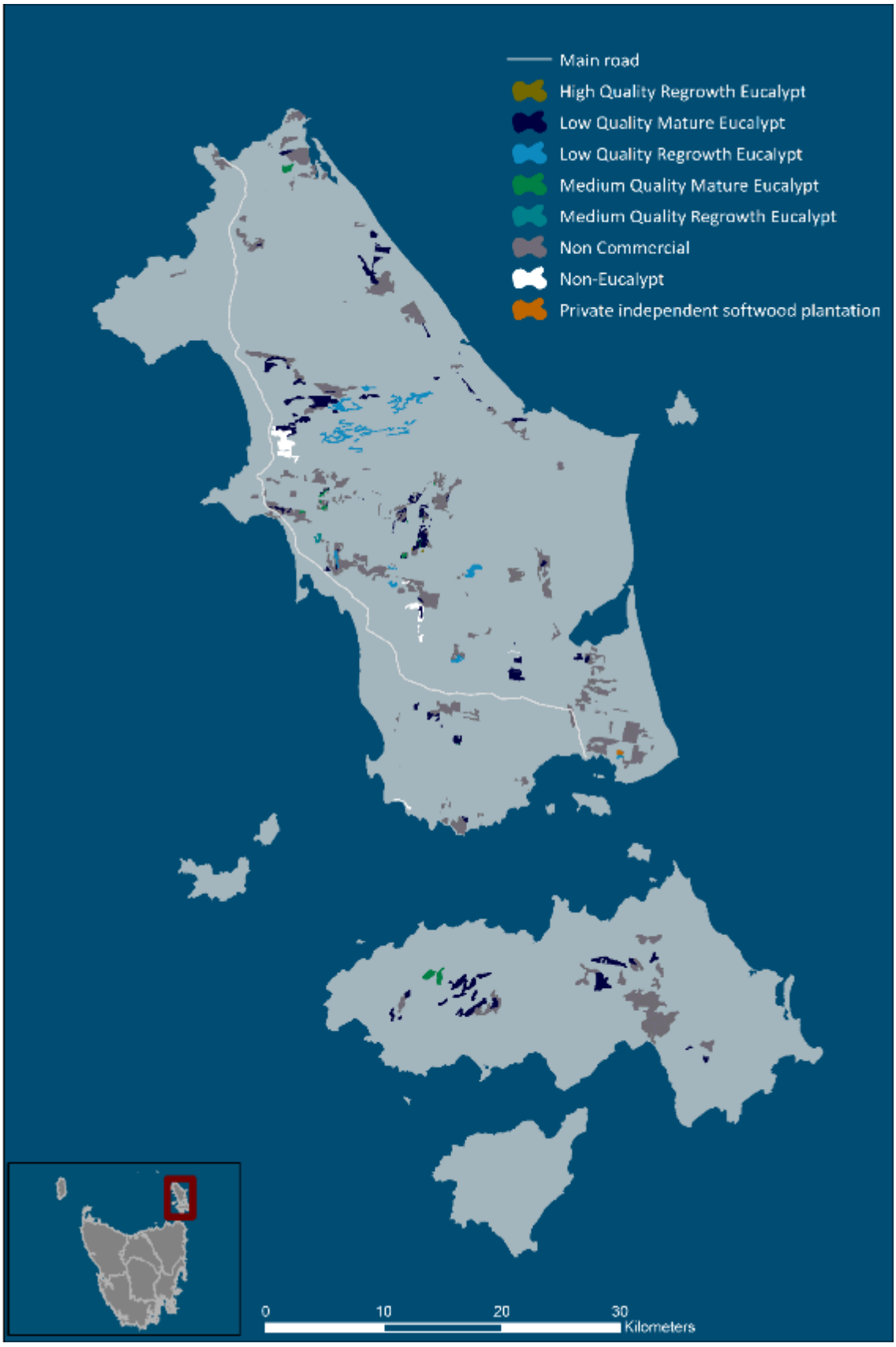
Table 64: Cumulative Net Harvestable Area of State-wide Private Independent Softwood Plantation by Road Distance Class to Market Infrastructure

Destination	Cumulative Net Harvestable Area ('000ha) by Road Cartage Distance Range								
	< 25km	< 50km	< 75km	< 100km	< 125km	< 150km	< 175km	< 200km	< 650km
Bell Bay	347	1,804	3,525	5,640	6,004	6,241	6,518	6,696	7,028
Branxholm	65	1,342	2,667	4,156	4,714	5,962	6,021	6,137	7,028
Brighton		19	221	376	576	2,018	2,247	2,862	7,028
Burnie	123	402	1,150	1,332	1,720	2,977	4,874	6,437	7,028
Exeter	392	1,551	4,806	5,436	6,122	6,423	6,696	6,802	7,028
Hampshire	39	357	552	678	1,220	1,673	2,289	4,626	7,028
Huon Valley	62	82	128	230	257	376	379	581	7,028
Long Reach	474	1,995	3,674	5,776	6,045	6,313	6,593	6,696	7,028
Longford	377	2,174	3,541	5,442	6,041	6,222	6,558	6,861	7,028
Macquarie Wharf	9	92	119	340	378	581	2,029	2,405	7,028
New Norfolk		91	272	376	379	698	2,112	2,627	7,028
Parattah	70	75	277	1,694	2,230	2,705	3,552	5,927	7,028
Scottsdale	792	2,503	4,112	4,540	5,753	6,021	6,074	6,376	7,028
Smithton	6	19	232	344	497	618	1,229	1,594	7,028

12.3 North West (King Island) Forest Class Map



12.4 North East (Flinders Island) Forest Class Map



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