Forestry Corporation

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GDA_1994_MGA_Zone_55

FORESTRY CORPORATION OF NSW, HARDWOOD FORESTS DIVISION

HARVEST PLAN LOCALITY MAP

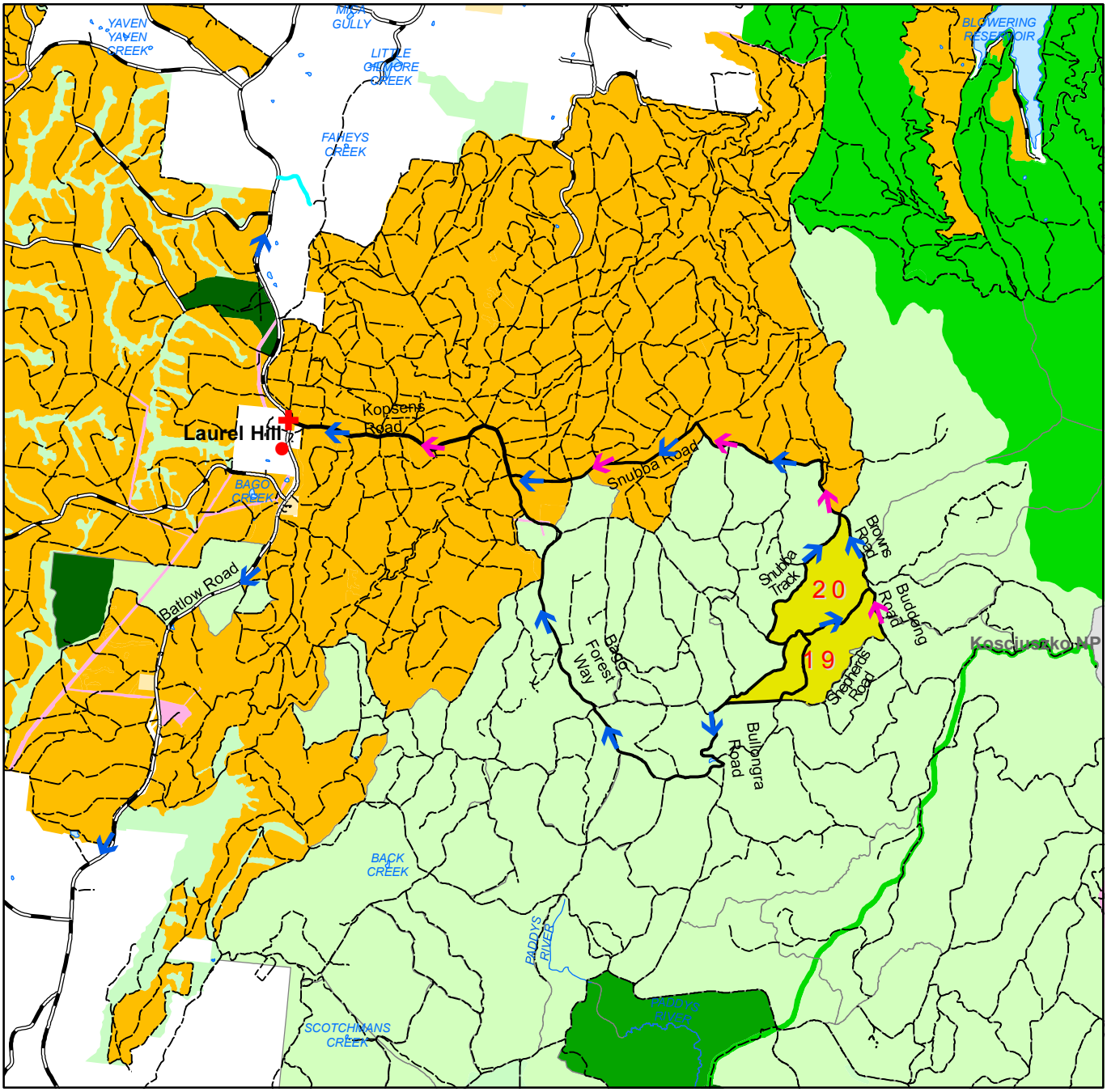
BAGO Forest
NO. 560
Cpt No:19A & 20A
Management Area:BAGO-MARAGLE
Mapsheet:BATLOW(8526-4N);COURABYRA(8526-4S)

Plan Name:HP_TU_19A_20A_19

Plan No:56899

VERSION: 2

Date Printed: 14/02/2019



- EMP & Helipad
- Towns
- Haulage Route
- Sealed Roads
- Major Forest Road
- Main Rivers
- WaterBodies
- Compartments of Interest
- Native Forests
- Special Protection (Zone 1)
- Special Management (Zone 2)
- Harvesting Exclusion (Zone 3A)
- Special Prescription (Zone 3B)
- General Management (Zone 4)
- Softwood Plantations (Zone 6)
- Non Forestry Use (Zone 7)
- National Park Estate
- Vacant Crown Land
- Evacuation Route
- Haluage Route

Kilometres

0 1 2 3 4 5 6 7

Forestry Corporation

1:15,000

Contour Interval 10m

GDA 1994 NSW Lambert

FORESTRY CORPORATION OF NSW, HARDWOOD FORESTS DIVISION
HARVEST PLAN OPERATIONAL MAP

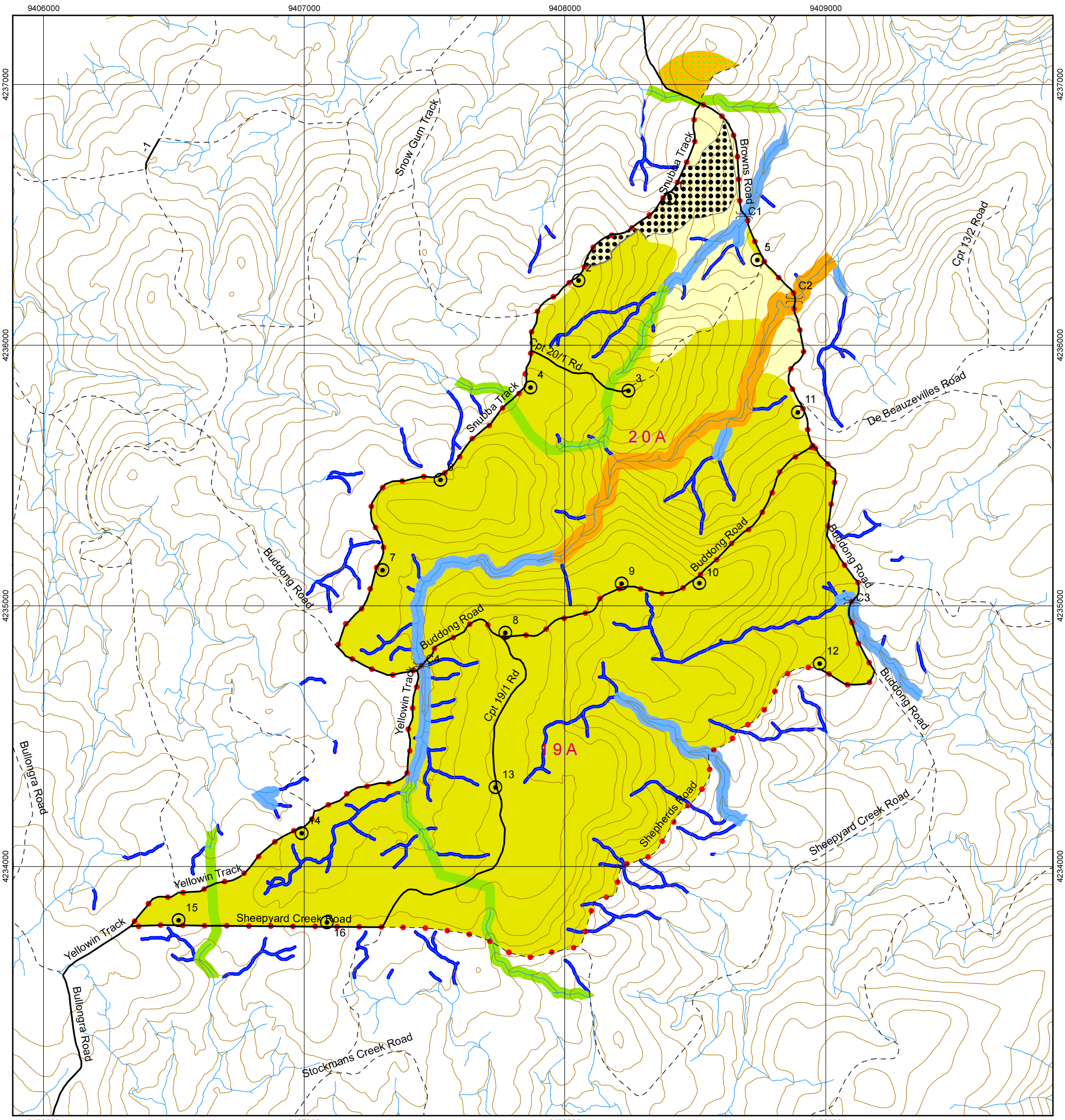
BAGO Forest
NO. 560
Cpt No:19A & 20A
Management Area:BAGO-MARAGLE
Mapsheet:BATLOW(8526-4N);COURABYRA(8526-4S)

Plan Name:HP_TU_19A_20A_19

Plan No:56899

VERSION: 2

Date Printed: 14/02/2019



- Temporary Dry Weather Dump
- Existing Crossing
- Haulage Roads
- Other Roads (non-haulage)
- LiDAR Corrected Drainage
- Compartment Boundary
- Shelterwood (FMZ 4) - Low YBG Habitat
- Shelterwood (FMZ 4) - Moderate YBG Habitat
- Shelterwood (FMZ 4) - High YBG Habitat
- Ridge and Headwater Habitat EZ
- Class 1 Drainage Lines (5m either side)
- Class 2 Drainage Lines (20m either side)
- Class 3 Drainage Lines (30m either side)
- Softwood Plantations (FMZ 6)

Kilometres
0 0.5 1 1.5

Forestry Corporation

1:15,000

Contour Interval 10m

GDA 1994 MGA Zone 55

FORESTRY CORPORATION OF NSW, HARDWOOD FORESTS DIVISION
REGENERATION TREATMENT MAP

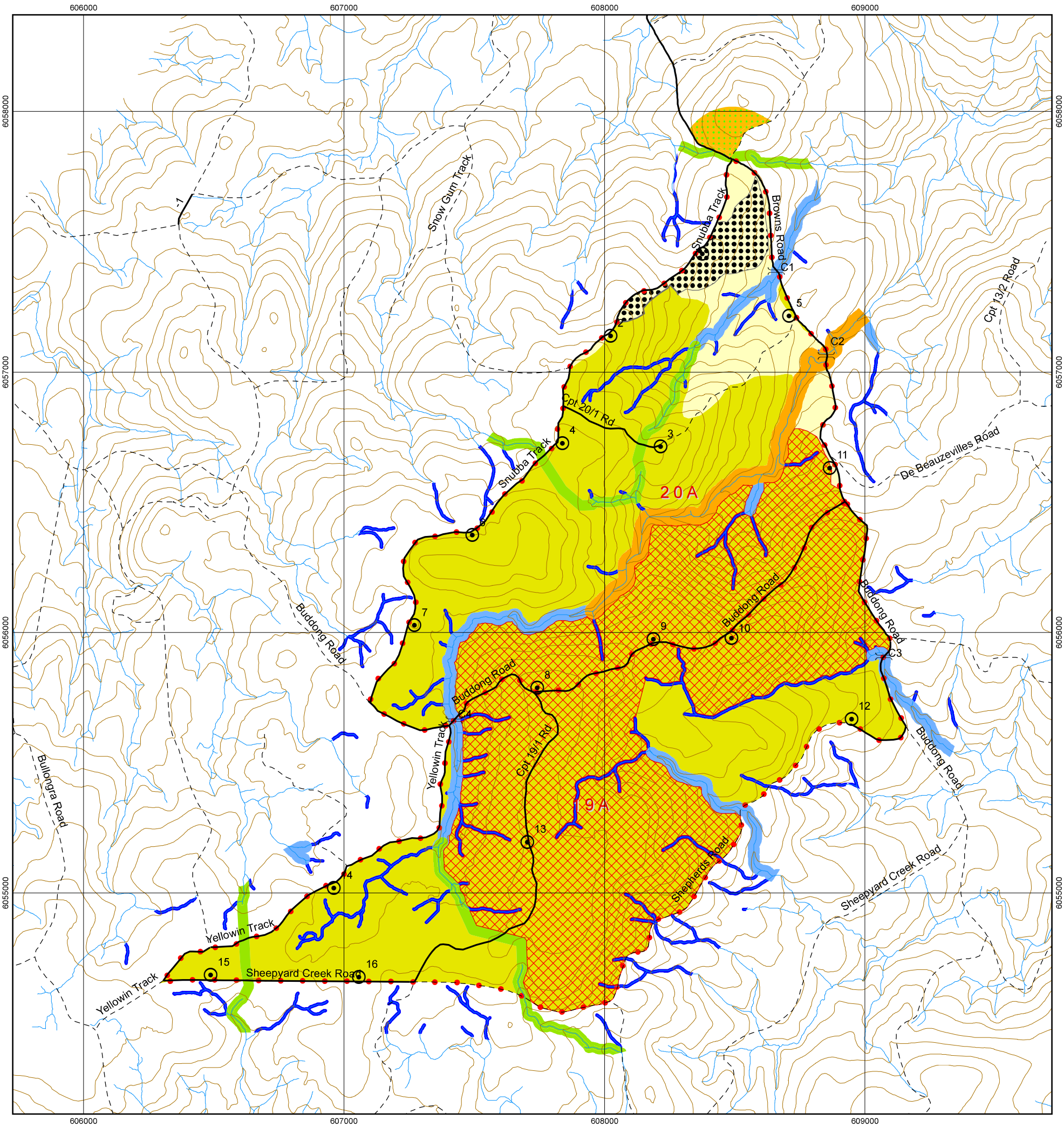
BAGO Forest
NO. 560
Cpt No:19A & 20A
Management Area:BAGO-MARAGLE
Mapsheet:BATLOW(8526-4N);COURABYRA(8526-4S)

Plan Name:HP_TU_19A_20A_19

Plan No:56899

VERSION: 1

Date Printed: 6/02/2019



- Compartment Boundary
- Temporary Dry Weather Dump
- Existing Crossing
- Haulage Roads
- Other Roads (non-haulage)
- LiDAR Corrected Drainage
- Regeneration Treatment Area
- Shelterwood (FMZ 4) - Low YBG Habitat
- Shelterwood (FMZ 4) - Moderate YBG Habitat
- Shelterwood (FMZ 4) - High YBG Habitat
- Ridge and Headwater Habitat EZ
- Class 1 Drainage Lines (5m either side)
- Class 2 Drainage Lines (20m either side)
- Class 3 Drainage Lines (30m either side)
- Softwood Plantations (FMZ 6)

Kilometres
0 0.5 1 1.5

Hardwood Forests Division

Harvest and Haul Plan

Operational Area Identification

Type of Forestry Operation		Harvesting and Roading Operation	
State Forest/s	Bago	Compartment/s	19A & 20A
Crown-timber Land	*NA*	Local Landscape Area	Bago_2
Harvesting Zone	Selective	Regrowth Zone	Regrowth Zone
Plan ID	56899		
Legal Conditions	Native Forest Harvesting in accordance with Coastal Integrated Forestry Operations Approval conditions. To implement this plan you must hold a current Contractor's Licence. Standard Operating Procedures apply. Survey expiry date for this plan is 24/10/2025.		
Certification	Responsible Wood Certificate 604224 and ISO14001 Certificate 604225 Timber products removed from the plan area are within the Defined Forest Area covered by the Australian Standard for Sustainable Forest Management (AS4708:2013) Certificate 604224.		
Prepared by	Shane Clohesy		Date: 07/02/2019
Approved by	Shane Clohesy		Date: 07/02/2019
Abbreviations	FT = Forest Technician, PA = Production Assistant, HC = Harvesting Coordinator, PtS= Protection Supervisor, HS = Harvesting Supervisor, RC = Roading Coordinator, Crew = Harvest Contractor/Forest Operators, CIFOA = Coastal Integrated Forestry Operations Approval, FMA = Fisheries Management Act, CH = Cultural Heritage, SOP = Standard Operating Procedure, WHC = Wildlife Habitat Clump, TRC = Tree Retention Clump, ESA = Environmentally Significant Area, PS = Planning Supervisor, OPM = Operational Planning Manager		

1. Harvesting Operation Details

	Cpt 19A	Cpt 20A	Total
Event ID	126411	126412	-
Gross Area	201.7	184.9	386.6
Base Net Area (BNA)	184.9	158.8	343.7
TRC area	9.2	7.9	17.2
Non-Treatment Area	-	-	-
Estimated NHA	175.7	150.9	326.6
Slope (% 0-20 degrees)	100%	99%	-
Slope (% 20-25 degrees)	0%	1%	-
Slope (% 25-30 degrees)	-	-	-

All areas are in hectares

2. Expected Species and Yield

Species for harvest	Species Mix % (sawlog)
ASH	85%
VIM	8%
DAL	5%
PEP	2%

Product Removal	Volume (m^3)
HQ Large Sawlog (Quota)	12,000
HQ Small Sawlog	3,200
Low Quality (Salvage)	6,500
Total	21,700

The Contractor must ensure timber removed is allocated to the correct compartment when entered into Electronic Delivery Docket.

3. Management Conditions

Boundary	Conditions
SMZ / FMZ	*FMZ 4 – General Management occurs within the compartment and is shown on the HPOM.*
Research	*Any inventory plots located during the harvesting operation are to be treated the same as the surrounding area.*
Cultural Heritage	
Haulage	*Route – North via Browns Road, then west on Snubba Road, west on Kopsens Road and then north or south on Batlow-Tumbarumba Road; or* *South via Bullongra Road, then north-west along Bago Forest Way, west on Kopsens Road and then north or south on Batlow-Tumbarumba Road.*
Community	*Notifications - All relevant notifications have been conducted. A notification list for FCNSW staff is available from the planner.*
Infrastructure	*Existing Fire Trails - Roads used for haulage should be left in a trafficable condition, free of harvesting debris and any installed rollovers must be trafficable.* *Traffic Control Plan – The crew is responsible for road closures when harvesting 2 tree lengths of any public use forest road.*

Pests/Weeds	*Blackberries*	*Blackberry infestation occurs within the compartments and surrounding area. All harvesting machinery, equipment and vehicles that come into contact with the weed must be inspected prior to leaving the compartment and cleaned of vegetative material. Also refer to special conditions in Regeneration Risk and Mitigation section below.*
Control Lines for Post Log Burning	*Existing compartment roads will act as control lines* *The PA must liaise with the harvesting crew to construct any additional control lines during harvesting.* *Any new tracks constructed for use as control lines must comply with SOP 8.*	

4. Harvesting & Regeneration Conditions

Silviculture Type	Harvesting Objectives and Stand Condition
Shelterwood Entire harvest area	The harvest area is predominately mature Alpine Ash and Manna Gum in predominately even-aged stands. The objective is to create canopy openings and ensure mechanical disturbance creates a suitable seed bed for regeneration. The objectives will be achieved by harvesting the compartment using a 2 stage shelterwood system. The 1st stage will involve removing merchantable trees throughout the compartment down to the minimum average retained BA of $10m^2$. The operator will select trees containing sawlog for retention to make up the $10m^2$ BA so as to ensure economic viability of the subsequent operation. Additional well-formed seed trees should be retained if required to ensure adequate regeneration. The 2nd stage will involve removal of the retained sawlog trees (shelterwood) and will be carried out approximately 5-10 years after the initial harvest.
BA Monitoring	The PA must conduct Basal Area monitoring as per CIFOA Protocol 7 in areas treated with the Shelterwood harvesting system. The minimum BA limits are shown below.
Regeneration Requirements	These forests generally comprise of non-lignotuberous eucalypt species that regenerate primarily from seed. Successful regeneration requires sufficient canopy removal, a good seed bed that is free from grass/shrub competition and adequate seed stock. Mechanical disturbance can promote regeneration in the Alpine Ash forest types.
Regeneration Risks and Mitigation	Sections of the forest that are heavily infested with blackberry have a high risk of regeneration failure. Areas of severe blackberry infestation are shown on the attached "Regeneration Treatment" map. In the areas with severe Blackberry infestation, scalping using a dozer must be carried out to clear blackberry bushes and expose mineral earth. The scalping is to be carried out after the area has been harvested, preferably in the autumn. The cleared blackberry vegetation should be heaped in piles away from retained trees. A regeneration assessment must be conducted no more than 3 years after harvesting to determine the effectiveness of the treatment.

	Cpt 19A	Cpt 20A
Harvest Intensity	Selective	Selective
Selective Harvesting Limits – Minimum BA (m^2)	10	10

5. Operational Responsibilities

Prescription	Condition/Responsibility
Mark-Up – the PA is responsible for marking up the forest ahead of harvesting operations consistent with SOP 4 – Tree Retention and Tree Retention Clumps, and SOP 3 – Broad Area Habitat Searches	
Broad Area Habitat Search	Broad Area Habitat Searches must be completed in a 10 hectare patch before harvesting operations can commence in that patch. Broad Area Habitat Searches must extend to cover areas up to 100m outside of the base net area and must search for threatened and protected species features as described in SOP 3.
Known or Potential Habitat	The following subject species have known or potential habitat in this operational area: • *Pterostylis foliata* (Slender Greenhood) – see attached species profile • *Thelymitra atronitida* (Black-hooded Sun Orchid) – see attached species profile • *Petaurus australis* (Yellow-bellied Glider) • *Ninox strenua* (Powerful Owl) • *Tyto tenebricosa* (Sooty Owl) • *Lophoictinia isura* (Square-tailed Kite) • *Callocephalon fimbriatum* (Gang-gang Cockatoo) • *Petaurus volans* (Greater Glider) • *Petroica boodang* (Scarlet Robin) • *Petroica phoenicea* (Flame Robin)
Marking Retained Trees	PA must select and mark trees to meet the requirements below. The location of retained trees must be recorded on FCMapApp. Hollow-bearing Trees • 8 per hectare must be retained where available in Low YBG Habitat. • 8 per hectare must be retained where available in Moderate YBG Habitat. Where less than 8 hollow-bearing trees are available, additional suitable montane gum species must be retained as recruitment trees. • 10 per hectare must be retained where available in High YBG Habitat. Where less than 10 hollow-bearing trees are available, additional suitable montane gum species must be retained as recruitment trees. Recruitment Trees • For each hollow-bearing tree retained, a recruitment tree must also be retained up to a maximum of 5 recruitment trees per hectare. Nectar feed tree condition – Does not apply Giant trees – 160cm (Alpine Ash) / 140cm (all other spp) at stump height

	Glider Sap feed trees – All YBG feed trees – 15 potential feed trees (>30cm DBH) must be retained within a 100m radius of a YBG sap feed tree. Suitable species are *E. viminalis,* and *E. dalrympleana*.
Tree Retention Clumps	PA must select and mark 5% of the BNA in each compartment (see Harvesting Operation Details) with pink tape and/or FCMapApp. Refer to SOP 4. During planning the area in the vicinity of the Browns Mill heritage site was identified as a suitable TRC. PA to implement a TRC in this location. Other suitable locations include the High YBG habitat areas near dump 1 and the strip of BNA between Yellowin Track and the Class 2 drainage line exclusion zone.
Identification of channel heads	PA will mark the location of channel heads in the field, and on FC MapApp; Refer to SOP 1.
Operational Management; The PA and Harvesting Crew are responsible for the management of operations consistent with SOP 1, SOP 4, Implementing Silvicultural prescriptions and monitoring BA.	
Protection of Retained Trees	Trees marked or selected for retention must not be felled or damaged. Damaged trees must be replaced with a comparable tree. Where a comparable tree is not available, it must be replaced with a mature tree, with healthy crown. Damaged and replaced trees must be recorded in the FCMapApp. Harvesting debris should not accumulate within 5 m of retained trees. Where debris does accumulate the crew must remove or flatten to <1m high. Where removal or flattening of debris will damage a retained tree, or deliver a worse outcome, this must be documented in the FCMapApp.
Dead Standing Tree Retention	Stags/dead standing trees must be retained where safe to do so.
Coarse Woody Debris	Coarse woody debris is not permitted to be removed from this compartment due to *Flame Robin records.*
Accidentally Felled Trees	The crew must record each tree accidentally felled into an ESA in accordance with SOP 4.
Dangerous Trees	The crew must record each dangerous tree or stag removed in accordance with SOP 4.
Impenetrable Understorey	In areas mapped by the PA as Impenetrable Understorey, the required number of retained trees identified must be retained and recorded in the FCMapApp by the Crew.

6. Riparian Protection

Prescription
See SOP 1 for instruction and guidance around marking of riparian zones. Table 6a below identifies exclusion zone and ground protection zone widths for all streams. Streams in compartments 19A and 20A will be managed as per Table 6b. Due to blackberry infestation in most drainage lines and depressions, the harvesting crew will locate and protect Class 1 Riparian Exclusion Zone boundaries with GPS and visual assessment. The crew will also located and protect drainage depressions and any unmapped drainage lines.

Table 6b

Drainage Category	Riparian Exclusion Zone		GPZ	Marking Responsibility
	Minimum width (m)	*ESA* Category	Minimum width (m)	
Drainage depression (mapped or unmapped)	n/a	n/a	5	Crew + GPS
Unmapped drainage line	5	*Category 1 ESA*	10	Crew + GPS
Class 1 *classified drainage line*	5	*Category 1 ESA*	10	Crew + GPS
Class 2 *classified drainage line*	20	*Category 2 ESA*	0	Crew + GPS
Class 3 *classified drainage line*	30	*Category 2 ESA*	0	Crew + GPS
Class 4 *(and above) classified drainage line*	50	*Category 2 ESA*	0	Crew + GPS

7. Ecologically Significant Areas

PA's are responsible for identifying; Harvesting Crews are responsible for protection of the following ESA's in line with requirements of SOP 2:

Condition	Mapped Known Features	Boundary ID
ESA 1 (hard boundary)	Tree retention clumps	GPS/Pink Tape
ESA 2 (soft boundary)	Ridge & headwater habitat	GPS
Features identified during broad area search / harvesting	Tree retention clumps and field identified ESA's will be marked on the FCMapApp. Harvesting contractors must synchronise their FCMapApp before commencing operations in each patch. All field identified features must be protected according to the relevant ESA Category boundary type.	

8. Soil & Water

Issue	Assessment	Conditions
Inherent hazard level	1	Nil
Soil regolith types	R1	Nil
Dispersible Soils	No	Nil
Existing or potential Mass Movement hazard	No	Nil
Historical or existing erosion	No	Nil
Seasonality Restrictions	No	Nil
Ground cover	>70%	Nil

Burning conditions	No	Nil
Log Dumps	SOP 5	PA is responsible for authorising moving the location of a log dump.
Roading management during harvesting	SOP 6	PA is responsible for monitoring road and crossing drainage and stability during haulage.
Wet Weather and Rutting	SOP 6	Crew is responsible for implementing automatic closures and following notified closures. PA is responsible for ensuring crew notified when notified closure is lifted.
Snigging	SOP 8	Crew is responsible for progressive drainage of snig tracks.
Track Crossings (snig or extraction tracks)	SOP 8	PA is responsible to ensure snig track crossings are approved prior to use and rehabilitated upon completion.

9. Snig Track Crossing Approvals

All crossing approvals are shown on the operational map – any other feature crossings must be assessed, recorded below and approved by the Operations Planning Manager before use.

Crossing Name	Crossing Type	Approval	Class 1 Aquatic Habitat	Site Specific Works and other conditions

10. Standard Operating Procedures: The following SOP's apply to this plan. FCNSW staff and the crew must hold a copy on site whilst operating and comply with the conditions set out in each SOP.

Procedure Number	Title
1	Riparian Protection
2	Management of ESAs
3	Broad-area habitat search
4	Tree Retention and Tree Retention Clumps
5	Log Dumps
6	General Soil and Water for harvesting contractors
7	Safety Requirements
8	Snigging & Snig Track Crossings
9	Tree Felling & Servicing of Logs & Products
10	Fire Precautions & Other Miscellaneous Requirements for Harvesting Contractors
14	Mass Movement

11. Roading Plan: Works not completed must be recorded and passed onto the PA for completion and documentation. The start and finish dates of all maintenance and construction must be recorded on the individual roading sheets within the PA Notes excel document in OneDrive, along with other relevant changes or explanations. All rubber flaps on minor forest roads must be removed and replaced with trafficable rollover banks on completion of operation.

Summary of roading requirements		
Feature	Details	Works Required
Existing roads to be used.	12,195m/8	Yes
New roads to be constructed	Nil	NA
Existing crossings used	4	Yes
New crossings to be constructed	Nil	NA
Borrow pits and gravel pits	0	NA
Mass movement prescriptions apply	No	NA
Dispersible soil conditions apply	No	NA
Seasonality provisions apply	No	NA
Potential or existing erosion	No	NA
Flora Road Management Plans apply	No	NA

Fish Habitat (Protocols 17 & 18)	*Nil*
There is no Class 1 Aquatic Habitat in this roading area.	

Roading Work Summary Table – *The following roads are to be constructed, upgraded or maintained in accordance with and to standards detailed within roading SOP.* *See HC/PA Notes documentation (on OneDrive) for Roading Works Completed information*		
Road Name	Existing or New	Site-specific works and other conditions
Snubba Track (2,800m)	Existing	• Grade and reshape entire length with crown and outfall. • Reinstate existing mitre drains. • Install additional drainage (mitre drains) as required to divert runoff from road. Refer to drain spacing guidelines in roading SOP. • Clear up to 3m either side (except near Heritage/Memorial Site).
Browns Road (1,300m)	Existing	• Nil works required.
Buddong Road (3,270m)	Existing	• Grade and reshape entire length with crown and outfall. • Reinstate existing mitre drains. • Install additional drainage (mitre drains) as required to divert runoff from road. Refer to drain spacing guidelines in roading SOP. • Clear up to 3m either side. • Install rock if required in boggy spots (E607145 N6055690; E607297 N6055627)
Shepherds Road (260m)	Existing	• Grade and reshape entire length with crown and outfall. • Clear up to 3m either side.
Sheepyard Creek Road (965m)	Existing	• Grade and reshape entire length with crown and outfall. • Clear up to 3m either side. • Install rock if required in boggy spots (E606779 N6054664)
Yellowin Track (1,670m)	Existing	• Grade and reshape entire length with crown and outfall. • Clear up to 3m either side. • Reinstate existing mitre drains.

		• Install rock if required in boggy spots (E607108 N6055146; 607404 N6055590; E607372 N6055408)
Cpt 19/1 Road (1,510m)	Existing	• Grade and reshape entire length with crown and outfall. • Reinstate existing mitre drains. • Install additional drainage (mitre drains) as required to divert runoff from road. Refer to drain spacing guidelines in roading SOP. • Clear up to 3m either side.
Cpt 20/1 Road (420m)	Existing	• Grade and reshape entire length with crown and outfall. • Reinstate existing mitre drains. • Install additional drainage (mitre drains) as required to divert runoff from road. Refer to drain spacing guidelines in roading SOP. • Clear up to 3m either side.

Road Crossing Summary Table – *The following crossings are to be constructed, upgraded or maintained in accordance with and to standards detailed within roading SOP.*
See HC/PA Notes documentation (on OneDrive) for Roading Works Completed information

Crossing Name	Existing or New	Type	Stability of structure and surface	Site-specific works and other conditions
C1	Existing	Culvert	Stable	• Install rock on running surface if required during wet conditions.
C2	Existing	Culvert	Structure and Surface Unstable	• Place large rocks or rock gabion to contain fill on the southern side of the crossing. • Place rock (~150mm diametre) at pipe outlet. • Install rock on running surface if required during wet conditions.
C3	Existing	Culvert	Stable	• Clean debris from pipe outlet. • Place rock (~150mm diameter) at outlet if required. • Install small lateral drain with small mitre at ~10m on eastern approach with a silt fence at outlet.
C4	Existing	Culvert	Stable	• Minimise disturbance to roadside vegetation. • Install mitre on southern approach @ ~10m. • Install rock on running surface if required during wet conditions.

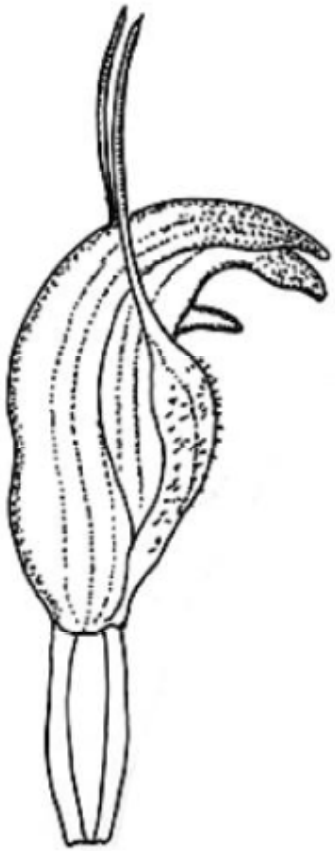


Image credit: New South Wales Flora Online

Slender Greenhood *Pterostylis foliata*

Description: A Greenhood orchid with 3-6 roughly ovate leaves 2-5 cm long. Flowering stem up to 30 cm high and is smooth. Flower is dark green and white with brown in the galea (hood). Has straight, erect lateral sepals with no gap between the lateral sepals and the galea. Flowering occurs August to January

Habitat: Grows on sheltered slopes in high rainfall forests

Distribution: Occurs in NSW mainly in the Southern Tablelands south from Batlow

TSL requirement: **Site-specific condition required, if found contact Ecologist immediately**

Pterostylis monticola (leaf arrangement)

Pterostylis monticola

Pterostylis foliata (TSCA-nominated)

Pterostylis foliata: Flowers mainly October; grows in open forest; similar to P. monticola, which usually flowers later (Dec-Jan); the main feature which distinguishes P. foliata from P. monticola and all other Pterostylis with similar growth habit in the area, is that it has straight, erect lateral sepals, with no gap between the lateral sepals and the galea (hood) (red arrow).

Black-hooded Sun Orchid *Thelymitra atronitida*

Description: A terrestrial orchid with a single flowering stem 30 to 50 cm tall. Flowers are 2 to 8 (rarely to 16) in number and are dark blue with darker veins. There is a tuft of white hairs in each flower's centre. There is a hooded lobe that is distinctly glossy black in colour with a yellow apex in the flower's centre. Flowering occurs August to December

Habitat: In Bago State Forest is recorded in open forest on well-drained sand or clay-loam soils

Distribution: Known to occur in southern Sydney and Bago State Forest

TSL requirements: Exclusion of specified forestry activities from 100% of individuals with a 10 metre exclusion zone and a further 10 metre buffer.

Photo credit: Colin and Mischa Rowan

Thelymitra atronitida (CE)

Thelymitra pauciflora (common)

Thelymitra atronitida: Flowers in Nov-early Dec; in open forest; distinguished by unspotted flowers and hooded column which has a strongly-contrasting black band below the yellow apex (white arrows); related common species have a lighter (usually brownish) less contrasting band.