From: Scott Jordan <scott@bobbrown.org.au> Sent: Thursday, 15 October 2020 10:28 AM

To: Compliance Admin

Subject: West Coast Council LPS Submission

Attachments: West Coast Council LPS - Appendix A.pdf; West Coast Council LPS submission.pdf

Please find attached our submission to the West Coast Council LPS.

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takayna / Tarkine Campaigner

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The Bob Brown Foundation Inc. ABN 51 634 785 002



Submission to West Coast Council LPS

Bob Brown Foundation is a conservation organisation based in Tasmania, with a focus on protection of Tasmania's wild and scenic landscapes and the species which inhabit those landscapes. Over the past six years, we have had a focus on takayna / Tarkine, including the portion of this land that lies within the West Coast Municipality.

The Draft LPS raises concerns for BBF concerning its treatment of public land within takayna / Tarkine and other wilderness and wild areas of the West Coast. While the application of 23.0 Environmental Management Zone is appropriate to areas that have been identified as such in the draft LPS, we believe the extensive use of the 20.0 Rural Zone is inappropriate and misapplied to areas more appropriately zoned 22.0 Landscape Conservation Zone or 23.0 Environmental Management Zone.

The application guidelines for 20.0 Rural Zone include:

RZ 1 The Rural Zone should be applied to land in non-urban areas with limited or no potential for agriculture as a consequence of topographical, environmental or other characteristics of the area, and which is not more appropriately included within the Landscape Conservation Zone or Environmental Management Zone for the protection of specific values.

We assert that the parcels of land encompassed by the Permanent Timber Production Zone, and the Future Potential Production Forest within the municipal boundary contain values and attributes that meet the application guidelines requirements of either 22.0 Landscape Conservation Zone or 23.0 Environmental Management Zone.

- LCZ 1 The Landscape Conservation Zone should be applied to land with landscape values that are identified for protection and conservation, such as bushland areas, large areas of native vegetation, or areas of important scenic values, where some small scale use or development may be appropriate.
- LCZ 2 The Landscape Conservation Zone may be applied to:
 - (a) large areas of bushland or large areas of native vegetation which are not otherwise reserved but contains threatened native vegetation communities, threatened species or other areas of locally or regionally important native vegetation;

- (b) land that has significant constraints on development through the application of the Natural Assets Code or Scenic Protection Code; or
- EMZ 1 The Environmental Management Zone should be applied to land with significant ecological, scientific, cultural or scenic values, such as:
 - (a) land reserved under the Nature Conservation Act 2002;
 - (b) land within the Tasmanian Wilderness World Heritage Area;
 - (c) riparian, littoral or coastal reserves;
 - (d) Ramsar sites;
 - (e) any other public land where the primary purpose is for the protection and conservation of such values; or
 - (f) any private land containing significant values identified for protection or conservation and where the intention is to limit use and development.

In presenting our arguments for reconsideration of the draft zones, we will present the evidence of values and qualities that we believe qualify these land parcels for zoning as 22.0 Landscape Conservation Zone or 23.0 Environmental Management Zone.

We will also make recommendations as to application of the *Scenic Protection Code* and the *Natural Assets Code* overlays.

1 Australian Heritage Council National Heritage recommendation (Tarkine).

In response to a nomination, the Australian Heritage Council assessed the National Heritage values of the Tarkine, with a final recommendation report being prepared for the Minister for the Environment in September 2012¹. The report recommended a 439,000ha area (including land within the West Coast Municipality) be listed as a National Heritage Place within the meaning of the *Environment Protection and Biodiversity Conservation Act 1999*². In its assessment, the AHC found that the heritage values of the Tarkine met:

- Criterion A: importance in the course, or pattern of Australia's natural or cultural history.
- Criterion B: Possession of uncommon, rare or endangered aspects of Australia's natural or cultural history.
- Criterion E: Demonstrating the place's importance in exhibiting particular aesthetic characteristics valued by a community or cultural group.³

In particular, the criteria were met based on findings that:

- the Tarkine has outstanding heritage value to the nation under criterion (a) as a relict of ancient vegetation and for its demonstration of links with Gondwanan flora.
- the Tarkine has outstanding heritage value to the nation under criterion (a) as one of the most important Tertiary fossil flora sites in Australia and for the evidence it provides of the evolution of the Australian flora.

- the Tarkine has outstanding heritage value to the nation under criterion (b) as the single largest tract of cool temperate rainforest in Australia.
- it is likely that the Tarkine has outstanding heritage value to the nation under criterion (b) for its high wilderness quality.
- it is likely that the Tarkine has outstanding heritage value to the nation under criterion (b) for its lichens.
- it is likely that the Tarkine has outstanding heritage value to the nation under criterion (b) for its magnesite karst.
- it is likely that the Tarkine has outstanding heritage value to the nation under criterion (e) for its aesthetic characteristics.⁴

Much of the area within the recommendation falls within formal CAR reserves. These areas are proposed in the draft zonings as 23.0 Environmental Management Zone. We concur with that zoning recommendation. An area outside the formal reserves has been suggested in the draft for a 20.0 Rural Zone. We disagree with this zoning. The recommendation of the AHC and the findings that National Heritage values exist over the area of their recommendation should be taken as evidence that:

- a 23.0 Environmental Management Zone consistent with purposes 23.1.1 and 23.1.2, and application guidelines EMZ 1(e) should apply to the part of the West Coast municipality within the part of the Tarkine nominated for NH listing.
- the Natural Assets Code should apply to the whole of the area, consistent with purposes C7.1.1, C7.1.4, C7.1.5 (and in the coastal area consistent with (C7.1.2 and C7.1.3), and application guidelines NAC 7, NAC 8, and NAC 10, and highly likely to be consistent with NAC 9, NAC 11 and NAC 12 on field verification, analysis or mapping undertaken on, or on behalf of, the planning authority.
- applying the Scenic Protection Code is consistent with purpose 8.1.1 and application guidelines SPC 1, SPC 2 and SPC 3.
- without prejudice, any area not zoned as such should default to 22.0 Landscape Conservation Zone consistent purpose 22.1.1 and 22.1.2, and with application guideline LCZ 2(a).

2 AHC National Estate (Tarkine).

In 2002, the Australian Heritage Commission (forerunner to the Australian Heritage Council) placed 350,000 hectares of the Tarkine on the register of the National Estate⁵. While the National Estate no longer applies, having been superseded in 2007, the Statement of Significance for the registration describes the values that led to its registration. The Statement of Significance records the following criteria as met:

- biogeographic values present in Tarkine are endemic flora, flora and fauna at the limit of their range, refugia from past processes and primitive and relictual fauna. These are important indicators of past evolutionary and biogeographic processes (Criterion A.1).
- the Tarkine is important for contemporary refugia. It contains communities that are strongly associated with climatic and topographic factors that confer a degree of protection from endangering processes such as fire and disease. These refugia have BOB BROWN FOUNDATION INC.

- two important roles: they provide locations for the conservation of species and communities and they provide sources for population expansion if limiting conditions prevail (Criterion A.2).
- the Tarkine is important for fauna species richness having a high diversity of fauna species within a restricted area (Criterion A.3).
- the Tarkine is important for flora species richness showing considerable diversity of plant species within a restricted area. It is also important for plant community richness. It has unusually diverse conjunctions or rapid transitions of forest community types (Criterion A.3).
- the Tarkine is important for old-growth forest communities that are rare or uncommon nationally or within Tasmania, or for common forest communities where the levels of disturbance are such that all remaining old-growth areas also have National Estate significance (Criterion B.1).
- the Tarkine is important for its value as a research, teaching or benchmark site. It is important as it provides information contributing to a wider understanding of natural history in the Tasmanian forest region (Criterion C.1).
- the Tarkine is important as it contains type localities for rare and threatened fauna species, encompassing mammals, birds and invertebrates, but excluding primitive and relictual species. This is important for information contributing to a wider understanding of natural history in the Tasmanian forest region (Criterion C.1)
- the Tarkine is significant as a forest place of aesthetic value, important to a community for aesthetic characteristics held in high esteem or otherwise valued by the community (Criterion E.1). The Pieman River is valued for the relationship of flanking rainforest vegetation, including Huon pine, sassafras and myrtle forests, to the river.
- it is also important as a forest place of social value, being highly valued by a community for reasons of religious, spiritual, cultural, educational, or social associations (Criterion G.1).⁶
- geoheritage in numerous sites meeting criteria A.1, A.2, B.1, C.1 and D.1.

As with the AHC's National Heritage recommendation, much of the area within the former National Estate registration falls within formal CAR reserves. These areas are proposed in the draft zonings as 23.0 Environmental Management Zone. We concur with that zoning recommendation. An area outside the formal reserves has been suggested in the draft for a 20.0 Rural Zone. We disagree with this zoning. The National Estate registration and statement of significance should be taken as evidence that:

- a 23.0 Environmental Management Zone should apply across the whole of the area, consistent with purposes 23.1.1 and 23.1.2, and application guidelines EMZ 1(e).
- the Natural Assets Code should apply to the whole of the area, consistent with purposes C7.1.1, C7.1.4, C7.1.5 (and in the coastal area consistent with (C7.1.2 and C7.1.3), and application guidelines NAC 7, NAC 8, and NAC 10, and highly likely to be consistent with NAC 9, NAC 11 and NAC 12 on field verification, analysis or mapping undertaken on, or on behalf of, the planning authority.
- applying the Scenic Protection Code is consistent with purpose 8.1.1 and application guidelines SPC 1, SPC 2 and SPC 3.

without prejudice, any area not zoned as such should default to 22.0 Landscape Conservation Zone consistent purpose 22.1.1 and 22.1.2, and with application guideline LCZ 2(a).

3 Independent Verification Group Reports

As part of the process leading to the Tasmanian Forests Agreement, the Commonwealth and Tasmanian governments commissioned a series of reports to verify claims by conservationists and the forest industry. Within this group of reports, there are a number that verified various aspects of the conservation significance of the proposed conservation reserves, including those in the Tarkine area. Although these areas did not become reserves, and largely are now designated as Future Potential Production Forests, the IVG reports are of use in the process of applying appropriate zonings, particularly in respect to *LCZ 2(a)*:

large areas of bushland or large areas of native vegetation which are not otherwise reserved, but contains threatened native vegetation communities, threatened species or other areas of locally or regionally important native vegetation.

I will address each relevant IVG report separately.

3.1 IVG Forest Conservation Report 2A, Validation of the ENGO proposed reserves for the conservation of priority flora species on public forest. March 2012

This report identifies the contribution that FPPF (referred to in the report as ENGO proposed reserves) make to the conservation of a number of priority threatened flora species. The map below, taken from the report, shows the improvement in conservation for the selected priority species for the FPPF (referred to in the report as ENGO proposed reserves). The area of now FPPF lands can be seen to hold a very high conservation value on this assessment⁸. Table 1 lists priority species particular to this area.

<u>Table 1. Priority Species by TSP & EPBC status and % of contribution of reservation in FPPF relevant to Circular Head Municipality.</u>

| Species | TSP | EPBC | % contribution of | % contribution |
|------------------|----------------|------|-------------------|----------------|
| | | | state reservation | of bioregional |
| | | | | reservation |
| Epicus Curtisiae | rare (endemic) | | 22% | |
| | | | | 16% (west) |
| Epicris glabella | Endangered | | 20% | 20% (west) |
| | (endemic) | | | |
| Micrantheum | rare (endemic) | | 49% | 49% (west) |
| serpentiniumtans | | | | |
| Persoonia | rare (endemic) | | 15% | 13% (west) |
| muelleri subsp. | | | | |
| Angustifolia | | | | |

Additionally the report asserts the following species would have a significant benefit from ENGO proposed reserves in Tasmania in a bioregion ⁹(in this case, the potrtion of the West bioregion that sits in the West Coast Municipality):

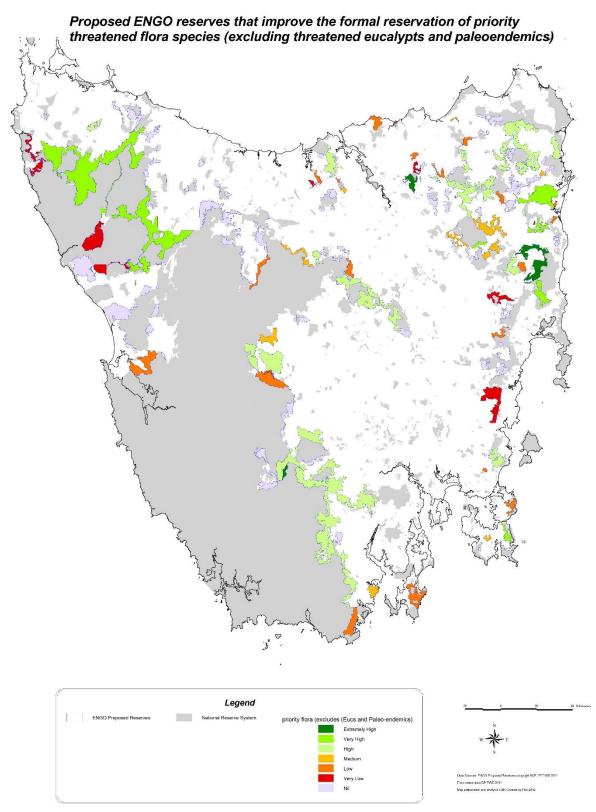
Calanenia caudata Calanenia congesta Calanenia pusilla Deyeuxia minor Orthoceras strictum Senecio velleiodes Stellaria multiflora

And *Pherosphaera hookeriana* (vulnerable on TSP Act, endemic to Tasmania) as a *threatened or* paleoendemic species that that are likely to benefit from the ENGO proposed reserves that were included in separate reports¹⁰.

This report should be seen as evidence that:

- a 23.0 Environmental Management Zone should apply for the FPPF areas contained in polygons 50, 52, 59, 61, 64, 69, 79, 80, 81, 85, 88, 89, 90, 92, 96, and 105 of the IVG reports consistent with purposes 23.1.1 and 23.1.2, and application guidelines EMZ 1(e).
- the Natural Assets Code should apply to FPPF polygons 50, 52, 59, 61, 64, 69, 79, 80, 81, 85, 88, 89, 90, 92, 96, and 105 of the IVG reports, consistent with purposes C7.1.1, C7.1.4, C7.1.5, and application guidelines NAC 7 and NAC 8, and highly likely to be consistent with NAC 9, NAC 11 and NAC 12 on field verification, analysis or mapping undertaken on, or on behalf of, the planning authority.
- without prejudice, any area not zoned as such should default to 22.0 Landscape Conservation Zone consistent purpose 22.1.1 and 22.1.2, and with application guideline LCZ 2(a).

Figure 1



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3.2 IVG Forest Conservation Report 2B, Validation of the ENGO proposed reserves for the conservation of priority fauna species on public forest. March 2012

This report identifies the contribution that FPPF (referred to in the report as ENGO proposed reserves) make to the conservation of a number of priority threatened fauna species. Overall, the report found that FPPF land in the takayna /Tarkine represented a medium or high improvement to reservation of area for protection of threatened species (figure 2), ¹¹, while areas south of the Tarkine as having 'key', 'core' or 'important' ranges for particular threatened species . Table 2 shows threatened fauna species by reserve importance relating to FPPF (polygons 50, 52, 59, 61, 64, 69, 79, 80, 81, 85, 88, 89, 90, 92, 96, and 105) Figures 2,3,4 & 5 show the relative importance for various priority threatened fauna species.

Large mammal carnivores were dealt with in a separate report (7A) discussed later in this submission.

The recommendations of this report, notwithstanding the absence of formal reservation, should be seen as evidence that:

- a 23.0 Environmental Management Zone should apply for the FPPF areas contained in polygons 50, 52, 59, 61, 64, 69, 79, 80, 81, 85, 88, 89, 90, 92, 96, and 105 of the IVG reports consistent with purposes 23.1.1 and 23.1.2, and application guidelines EMZ 1(e).
- the Natural Assets Code should apply to FPPF areas on polygons 50, 52, 59, 61, 64, 69, 79, 80, 81, 85, 88, 89, 90, 92, 96, and 105 of the IVG reports, consistent with purposes C7.1.1, C7.1.4, C7.1.5, and application guideline NAC 10, and highly likely to be consistent with NAC 11 on field verification, analysis or mapping undertaken on, or on behalf of, the planning authority.
- without prejudice, any area not zoned as such should default to 22.0 Landscape Conservation Zone consistent purpose 22.1.1 and 22.1.2, and with application guideline LCZ 2(a).

Table 2 Fauna species by reserve importance of FPPF.

| Species | TSP | EPBC | Polygon | Reserve importance |
|---|------------|--------------------------|---|--|
| Perameles gunnii gunnii Eastern barred bandicoot. | | Vulnerable | 94, 101 | Important ¹² |
| Accipiter novaehollandiae Grey Goshawk | Endangered | | 59, 61, 64, 85, 90, 96, 102, 105 52, 81, 111 | Core range Medium contribution ¹³ |
| Ceyx azureus Azure Kingfisher | Endangered | Endangered | 52, 81, 111 | Key reserve ¹⁴ |
| Lathamus discolor Swift Parrot | Endangered | Critically Endangered | 59, 61, 64, 81 | Core range |

| Hydrobiid snails spp. | | | 102 | Key ¹⁵ |
|-----------------------|--|--|-----|-------------------|
|-----------------------|--|--|-----|-------------------|

Figure 2

Map reproduced from https://www.environment.gov.au/system/files/resources/eefde0e6-0f83-486d-b0c3-8b1d25abc497/files/ivgconservation2bpriorityfauna.pdf

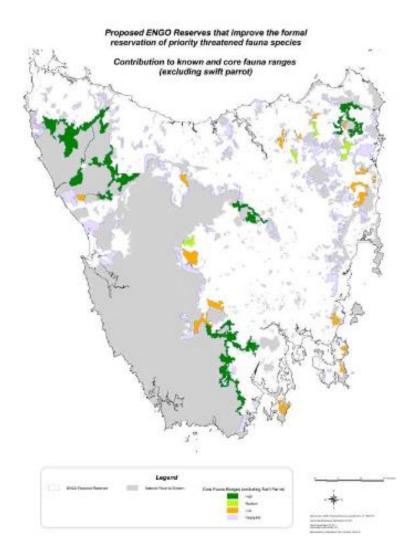


Figure 3

Map reproduced from https://www.environment.gov.au/system/files/resources/eefde0e6-0f83-486d-b0c3-8b1d25abc497/files/ivgconservation2bpriorityfauna.pdf

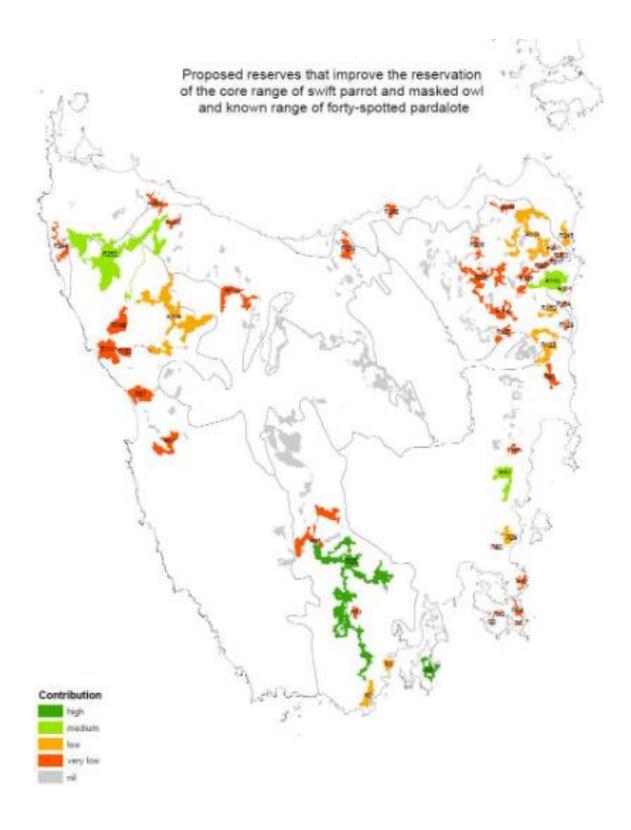
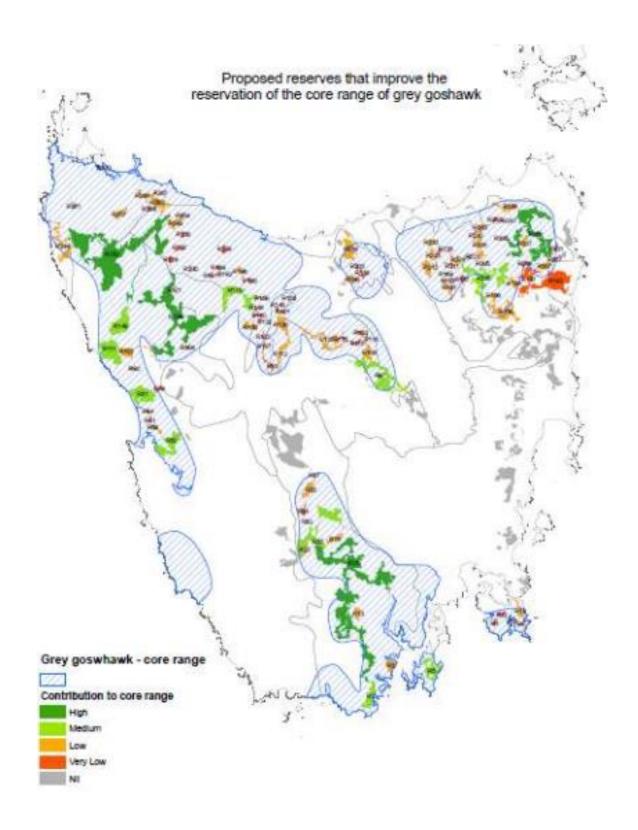


Figure 4

 $\label{lem:map:constraint} \begin{tabular}{ll} Map reproduced from $https://www.environment.gov.au/system/files/resources/eefde0e6-0f83-486d-b0c3-8b1d25abc497/files/ivgconservation2bpriorityfauna.pdf \\ \end{tabular}$

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3.3 IVG Forest Conservation Report 5A, Verification of Heritage Values of ENGO proposed reserves. February 2012

Peter Hitchcock AM was engaged to conduct an assessment of National and World Heritage Values of the ENGO proposed reserves¹⁶. In chapter five of his report, he assesses possible World Heritage values in the Tarkine against the criterion set out by the World Heritage Convention, being:

- (i) to represent a masterpiece of human creative genius;
- (ii) to exhibit an important interchange of human values, over a span of time or within a cultural area of the world, on developments in architecture or technology, monumental arts, town-planning or landscape design;
- (iii) to bear a unique or at least exceptional testimony to a cultural tradition or to a civilization which is living or which has disappeared;
- (iv) to be an outstanding example of a type of building, architectural or technological ensemble or landscape which illustrates (a) significant stage(s) in human history;
- (v) to be an outstanding example of a traditional human settlement, land-use, or seause which is representative of a culture (or cultures), or human interaction with the environment especially when it has become vulnerable under the impact of irreversible change;
- (vi) to be directly or tangibly associated with events or living traditions, with ideas, or with beliefs, with artistic and literary works of outstanding universal significance. (The Committee considers that this criterion should preferably be used in conjunction with other criteria);
- (vii) to contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance;
- (viii) to be outstanding examples representing major stages of Earth's history, including the record of life, significant on-going geological processes in the development of landforms, or significant geomorphic or physiographic features;
- (ix) to be outstanding examples representing significant on-going ecological and biological processes in the evolution and development of terrestrial, freshwater, coastal and marine ecosystems and communities of plants and animals;
- (x) to contain the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation.¹⁷

To qualify for World Heritage listing, one or more criterion must be met¹⁸.

In his report, he addresses the Tarkine as a whole, and not by the TFA polygons. This is unsurprising given that vastness, connectedness and scale are indicators and descriptors in identifying World Heritage values. For the purposes of this submission we have refer to

Hitchcock's findings and recommendation on the Tarkine as a whole, understanding that the West Coast local planning shedules are only attributable to that area of the Tarkine that sits within the West Coast municipality. Hitchcock also addressed the cultural heritage values (criterion i-vi) and natural heritage values (vii-x) separately.

Concerning the cultural heritage values, Hitchcock found that "the Tarkine can readily meet World Heritage Criterion (v) and very likely (iii) and (vii)"¹⁹, and that in relation to the natural heritage values "The Tarkine is considered to qualify against Criteria (vii), (ix) and (x)"²⁰ and "It does have some valuable contributions to make against Criterion (viii) but these would need to be further evaluated"²¹.

Of relevance to the zoning question, in assessing the Tarkine against the criterion (vii), (ix) and (x) Hitchcock found that the Tarkine has the following natural attributes:

Criterion (vii):

- vast expanses of largely treeless coastal plains
- long sandy ocean beaches backed by tracts of treeless heath
- very extensive tracts of well-developed temperate rainforest (the most extensive individual stand(s) in Australia) of exceptional natural beauty and aesthetic importance
- visually outstanding stands of tall eucalypt forest, often intimately associated with rainforest
- major tracts of apparently pristine natural landscapes recognised wilderness qualities
- the extraordinary visual impact of the complex granite landscape of the Meredith Range with its mosaic of moorland and scrub.²²

Criterion (ix):

- the Tarkine is a large tract of relatively undisturbed land where natural ecological and evolutionary processes are ongoing (indicators: wilderness mapping, wild river mapping)
- the products of those ongoing processes are evident in the maintenance of extensive temperate rainforest and associated Gondwanan flora and in the form of more recently evolved local endemic taxa, including species that are confined to the Tarkine
- ecosystems which are relatively free of introduced plant and animal species, the
 most extensive and least disturbed tract of cool temperate rainforest ecosystem in
 Australia and second largest in the world
- coastal plant communities free of exotic sand binding grasses which show natural processes of dune formation and erosion
- undisturbed catchments and streams.²³

Criterion(x):

- important habitat of rare local endemic crustacean *Astacopsis gouldi*, the world's largest freshwater crayfish.
- the largest example of Gondwanan cool temperate rainforest in outstanding natural condition.
- a significant habitat for in-situ conservation of E.obliqua tall eucalypt forest ecosystem.
- outstanding example of interaction between cool temperate rainforest and moorland/heath—both well represented in complex mosaic.
- extensive intact areas of native forest on Tertiary basalt is now rare and adds an important new dimension to the ecological diversity of the TWWHA. For example Eucalyptus brookeriana tall eucalypt forest.
- 'Rare and vulnerable endemic heath, *Epacris curtisiae*, which is concentrated in the Nelson Bay River area and is not known within any secure reserves.' TNC National Park Proposal. A local endemic and listed in Tasmania as 'Rare'.
- 'Representative sample of the 'Poa labillardieri—Trachymene humilistussock grassland' community, located within the Netherby plains region (Kirkpatrick et al.1988a). This community is poorly reserved (Kirkpatrick et al.1995).' (TNC National Park Proposal).
- Huon pine (*Lagarostrobus franklinii*) The Tarkine includes an outlier occurrence of this iconic long-lived coniferous tree species, here at its northern limit. See also subfossils of the species in the Stanley River.
- the Tasmanian whitebait and Tasmanian smelt (Retropinna tasmanica) are endemic.
- the Australian grayling is listed as threatened under state and Commonwealth threatened-species legislation. These uncommon species occur in significant numbers in the Pieman River (Slater 1992).' (Pullinger 2004).
- two threatened frog species, the green and golden frog (*Litoria raniformis*) and striped marsh frog (*Limnodynastes peronei*), are rare and have restricted distributions in Tasmania. The green and golden frog has been listed as vulnerable and its populations are declining in Tasmania; its range in Northern Tasmania has contracted (Bryant & Jackson 1999). The striped marsh frog can be found in the coastal North East, the far North West and King Island. Both these species occur in coastal lagoons, marshes and swamps of the Arthur–Pieman plains. (Pullinger 2004).
- eleven of Tasmania's twelve endemic birds live in the Tarkine (national park proposal).
- the nationally vulnerable ground parrot, represented as a Tasmanian endemic subspecies *Pezoporus wallicus leachi*, is concentrated in the buttongrass moorlands of western Tasmania, occupying moorland shared between the TWWHA and the Tarkine. The moorlands of western Tasmania represent some of the most important habitat of the species, being the most extensive relatively secure habitat of the species nationally.
- two migratory bird species that breed only in Tasmania, the swift parrot (*Lathamus discolor*) and the orange-bellied parrot (*Neophema chrysogaster*), forage in the Tarkine. The latter, a critically endangered species, breeds in South West Tasmania but migrates along the West coast and forages on coastal plants, especially

- samphire. Consequently the Tarkine's coastal vegetation is extremely important habitat.
- the endangered Swift Parrot breeds predominantly in South East Tasmania and feeds on the nectar from the Tasmanian blue gum (*Eucalyptus globulus-globulus*). In the Tarkine, the Swift Parrot forages on these trees during the post-breeding dispersal and migration season.
- Tasmania's largest diurnal raptors are the Tasmanian subspecies of the Wedge-Tailed eagle (Aquila audax fleayi)(listed as endangered under EPBC) and the White-bellied Sea-eagle (Heliaeetus leucogaster) (listed as migratory under CAMBA). The largest nocturnal predator is the masked owl (Tyto novaehollandiae castanops). The Tasmania population is listed under the EPBC as 'vulnerable'. The Tarkine provides significant habitat for some fifteen to twenty pairs of the Wedge-tailed Eagle and six pairs of White-bellied Sea-eagle and the Grey Goshawk as well as habitat for the Masked Owl
- Tasmania's three largest extant mammalian predators, in order of decreasing size, are the Tasmanian devil (Sarcophilus harrisii), the spotted-tailed quoll (Dasyurus maculatus maculatus), and the eastern quoll (Dasyurus viverrinus). The presence of these top predators in the Tarkine is a sign of a healthy ecosystem.
- the Tarkine is one of the highest centres of invertebrate diversity out of the 11 sites sampled for the Tasmanian component of the National Rainforest Conservation Program (AHC, 1989). The Savage River rainforest in the Tarkine is also the only known location of 15 invertebrate species:
 - two species of Pauropoda (Allopauropus convexusmss and Stylopauropoides erectusmss)
 - three species of Symphyla (Hanseniella pyrethrata, Hanseniella, Hanseniella pluvialis)
 - two species of Diplopoda
 - three species of Opiliones (Calliuncus vulsus, Mestoniasp. N. and Numioide ssp. N.)
 - two species of Collembola (*Phradmon tasmaniae, Paronellidessp. Nov*) (AHC, 1989).
- the Tarkine is particularly important for freshwater crustaceans, which are of global significance (PWS, 2001).
- among the crustaceans, there are at least 17 species of Amphipod (landhopper), making the Tarkine one of the richest centres of diversity for this invertebrate group in the world (PWS, 2001). National Park proposal
- one of the largest freshwater invertebrates in the world, *Astacopsis gouldi*, inhabits rivers in the north of Tasmania and the Arthur River catchment.

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While suggesting assessment against criterion viii requires further assessment, Hitchcock noted the internationally significant sites recorded in the Tasmanian Geoconservation Database included:

- Little Rapid River early Oligocene plant fossil site
- Hellyer River insect fossil locality

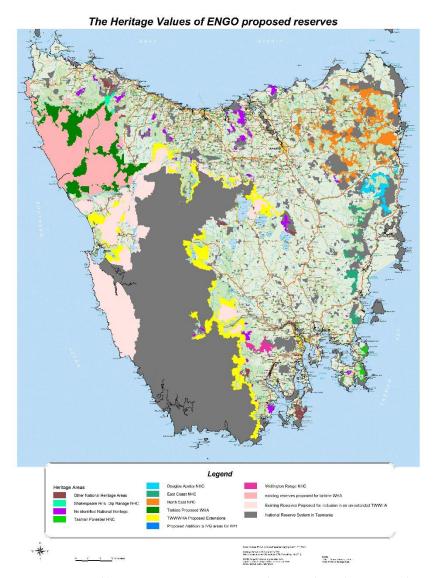
- Balfour–String of Beads fossil locality
- Western Tasmania blanket bogs (widespread in TWWHA and Tarkine).²⁵

And that nationally significant sites recorded on the Tasmanian Geoconservation Database included:

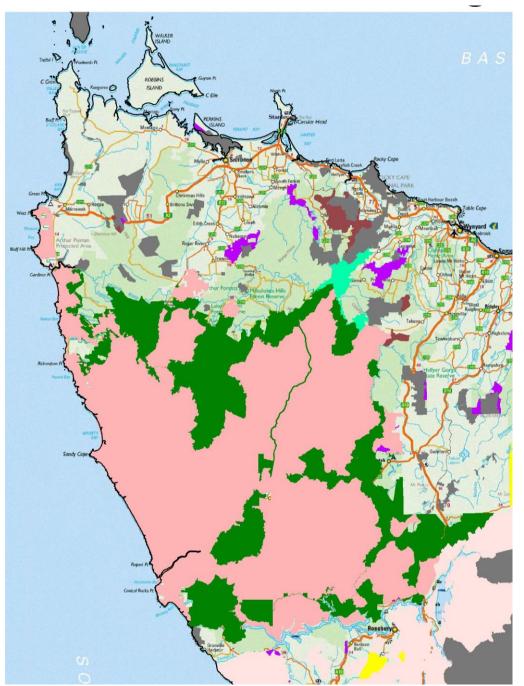
- Trowutta–Sumac Karst Systems
- Lyons River Magnesite Karst
- Keith–Arthur Rivers Magnesite Karst
- Arthur Lineament
- Main Rivulet-Bowry Creek Magnesite Karst.²⁶

The boundary applied to Hitchcock's recommendation can be seen in figure 6 and figure 7. Of note, he also included an area extending beyond the recommended Tarkine WHA boundary in the northeast corner, incorporating the area extending to Dip Range recommended National Heritage area.

Figure 5



Map reproduced from https://www.environment.gov.au/system/files/resources/eefde0e6-0f83-486d-b0c3-8b1d25abc497/images/ivgconservation5aheritagemapi.jpg



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Hitchcock also assessed the heritage values of areas within the West Coast municipality outside of the Tarkine. This assessment was undertakedn based on the polygons used in the Tasmanian Forest Agreement process. His recommendations are reproduced in the table below²⁷:

Polygon/FID Assessment and findings (reproduced from the Hitchcock report)

| FID 90 | Mostly forested. Some significant disturbance in western half. Eastern half appears to be intact. No identified geoconservation values. Contributes to connectivity between Mount Heemskirk and Meredith Range Regional Reserves. |
|--------|---|
| FID 88 | Some cultural heritage values appear to be within the site in the form of the remains of the historic Dundas Railway built in the 1890s. This deserves closer investigation. Preliminary investigation suggested this to be of some particular significance in the history of mining in the region. A 2ft.gauge railway in such difficult terrain and constructed in the 1890s may be of national heritage significance. The area contains a significant occurrence of King Billy Pine forest community of high heritage conservation value, a forest type officially classified within Tasmania as a threatened plant community. |
| FID 89 | Almost the whole of FID89 is threatened plant communities (King Billy Pine <i>Athrotaxis selaginoides</i> and <i>Banksia marginate</i> wet scrub) and so is of high heritage conservation value. These values are therefore readily verified. FID89 is strategically located between two regional reserves and a nature reserve, each of very high conservation value. As such it potentially provides a critical link for securing ecological connectivity between those three reserves, two of which have significant stands of King Billy Pine <i>Athrotaxis selaginoides</i> and the third globally important Huon pine. FID89 is of definite natural heritage conservation value and if added to the TWWHA, would contribute significantly to the integrity of the TWWHA. FID 89 is of definite high heritage conservation value. It is an integral part of a tract of land with high heritage values and which is worthy of permanent protection and addition to the TWWHA |
| FID 80 | FID 80 has multiple geoconservation values listed on the Tasmanian Geoconservation Database: •Central Plateau Terrain (global significance) •Central Highlands Cainozoic Glacial Area (national significance) •Tyndall Range Glacial Features (national significance) •Hamilton Moraine (lower extension). FID 80 contains a major stand of the threatened plant community, King Billy Pine Athrotaxis selaginoides and as such is of definite natural heritage conservation value. The stand occupies a lower elevation topographic position complementary to the more extensive higher mountain habitat in the region. FID 80 is a part of the Tyndall Range, which is highly regarded as one of the most spectacularly glaciated mountain ranges in Tasmania. The range is listed as a geoconservation site of continental significance (i.e. nationally significant). FID 80 was found to contain natural heritage conservation value of definite national significance. Also FID 80 is strategically located between two major |
| | regional reserves, each of very high heritage conservation value and therefore |

critically important for maintaining ecological connectivity between the two major reserves of very high heritage significance. The addition FID 80 and the two adjoining reserves to the adjoining TWWHA would contribute very significantly to the integrity of the adjacent TWWHA.

FID 81

It has considerable geoconservation values, including some fragile landforms. Identified Geoconservation values include:

- •Little Henty Raised Last Interglacial beaches
- Henty Dunes (regional)
- •Macquarie Harbour Graben (national significance)
- •Deeply Entrenched River Gorges on the Henty Surface (sub-regional)
- •Zeehan Region Strike Ridges and Valleys (regional)
- Professor Plateau Erosion Surface Remnant (sub-region)
- •Western Tasmania Blanket Bogs (global significance).

The main heritage significance comes from the existence of an intact transect from the strike ridges of the inland through to intact sandy estuary and beaches, including 'fossil' beaches from the last interglacial. The combination of these geoconservation attributes, the intact vegetation and the natural buffering of the coastal sand dunes from encroachment by vehicles, greatly complements that of the adjoining Mount Dundas Regional Reserve. If added to that reserve, FID 81 would contribute greatly to the ecological and geoconservation integrity of that reserve and further enhance the significance of the Mount Dundas Regional Reserve as a potential addition to the Tasmanian Wilderness World Heritage Area.

Only one Aboriginal site has been recorded within FID 81 (TAS12578).

FID 81 is of definite high heritage conservation value and if considered in the context of it adjoining the Mount Dundas Regional Reserve, would be of at least national significance. Mount Dundas Regional Reserve, together with FID 81 and Badger River Forest Reserve, would, if added to the adjacent Tasmanian Wilderness World Heritage Area, contribute significantly to the integrity of the TWWHA. Protectingthe natural vegetation of the area would help to maintainthe natural landscape associated with the Strahan–Zeehan Road and so contribute to presentation of the natural landscape or, if added to the TWWHA, contribute to the presentation of the TWWHA.

FID 59, 61, 62, 64, 67

The Mount Dundas Regional Reserve, together with these three parcels of ENGO-proposed reservesis of high heritage conservation value and would rate at least national significance. In addition these three parcels make an important contribution to the boundary of the adjoining Mount Dundas Regional Reserve. FID 59, a larger parcel, is particularly important for consolidating the boundary of Mount Dundas Regional Reserve as it more closely aligns the boundary with the Lyell Highway and so extends the visual protection along that road.

Significant opportunity exists to improve the integrity of the boundary by including the Henty Forest Reserve between FID 64 and FID 67. Together the three areas contribute to protecting the Henty River corridor, helping to protect the wilderness and wild river values of the river.

The following combination is of global heritage significance worthy of adding to the adjoining World Heritage Area:

- •Mount Dundas Regional Reserve
- •Nine ENGO-proposed reserves, including FID 81
- •Tyndall Regional Reserve and Lake Beatrice Conservation Area.

FID 52

Several geological features extending into the area are listed on the Tasmanian Geoconservation Database(TGD)including:

- •The Macquarie Harbour Graben of Geographical Significance. Significance is 'Continent', 'Statement of Significance: Possibly the clearest example of a late-stage trailing margin rift structure in Australia. Contains neotectonically significant features (including terraces and evidence for reactivation of Devonian structures) listed as separate sites.' (TGD) Assessed: national significance.
- •West Coast Range, geographical significance continental (national)
- Macquarie Graben Fluvial Geomorphic Systems, geographical significance, global significance.

FID 52 contains a group of stands of King Billy pine, *Athrotaxis selaginoides*, a listed threatened plant community. The cluster of forest stands of King Billy pine is very significant given the relative natural protection afforded by the mostly surrounding rainforest.

The West Coast Wilderness Railway connects Queenstown to Strahan and is a popular tourist attraction. It is undoubtedly also of important historical value and hence of cultural heritage significance.

FID 52 has significant natural and cultural heritage values, including stands of King Billy pine *Athrotaxis selaginoides* and a number of significant geoconservation values. Considered as an integral part of the landscape in the West Coast Range Regional Reserve, the combination is of at least national heritage significance and, if added to the adjoining TWWHA, would make an important contribution to the integrity of the TWWHA. FID 52 is of high heritage conservation significance.

FID 50

FID 50 is part of a mountain massif (Mount Jukes) that is rich in geoconservation values including:

- •Proprietary Peak Types Area, geographical significance, regional
- •Transect through Mt Read Volcanic, Mt Jukes Road, geographical significance at regional level:Statement of Significance: A representative transect through the hydrothermal alteration zone in the Central Volcanic Complex, including faulted boundary with the Eastern Sequence.
- •West Coast Range, geographical significance, continental (national significance).

Much of the lower slopes in FID 50 are wet woodlands of *Eucalyptus nitida* and moorland. The cirque contains a significant area of Huon pine *Lagarostrobos franklinii* rainforest and scrub. Further upslope the vegetation is mapped as 'Highland low rainforest and scrub'and 'western alpine sedgeland/herbland'.FID 50 includes a significant area of Huon pine *Lagarostrobos franklinii* 'rainforest and scrub'high up in the Jukes Cirque.

FID 50 is of definite high heritage conservation significance and is an integral part of a landform and landscape that canreadily qualify as a potential addition to the TWWHA. Further, FID 50 is an integral part of the West Coast Range massif and as such must be assessed accordingly. Together with the West Coast Range Regional Reserve, FID 50 would make a very significant contribution to the integrity of the adjoining Tasmanian Wilderness World Heritage Area.

On the basis of this report, it is reasonable to apply:

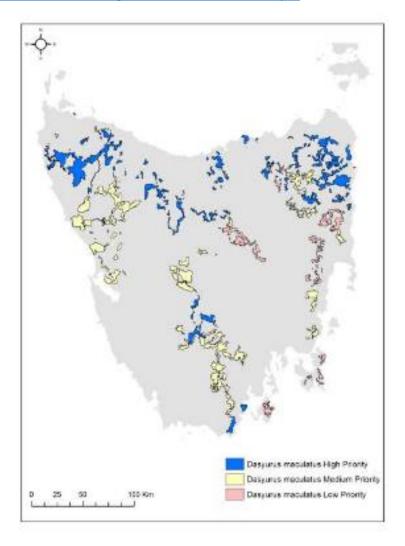
- a 23.0 Environmental Management Zone to the Tarkine WHA recommended area and the polygons 50, 52, 59, 61, 62, 64, 65, 80, 81, and 89 WHA recommended areas consistent with purposes 23.1.1 and 23.1.2, and application guidelines EMZ 1(e).
- the Natural Assets Code should apply to the whole of the areas above, consistent with purposes C7.1.1, C7.1.4, C7.1.5 (and in the coastal area consistent with (C7.1.2 and C7.1.3), and application guidelines NAC 7, NAC 8, and NAC 10, and highly likely to be consistent with NAC 9, NAC 11 and NAC 12 on field verification, analysis or mapping undertaken on, or on behalf of, the planning authority.
- applying the Scenic Protection Code is consistent with purpose 8.1.1 and application guidelines SPC 1, SPC 2 and SPC 3.
- without prejudice, any area not zoned as such should default to 22.0 Landscape Conservation Zone consistent purpose 22.1.1 and 22.1.2, and with application guideline LCZ 2(a).

3.4 IVG Forest Conservation Report 7A, Report for the Independent Verification Group of the Tasmanian Forests Intergovernmental Agreement (IGA) on the distribution of carnivore refugia within the proposed ENGO forest conservation areas: Distribution of large marsupial carnivores, locations of core habitat and population strongholds for the Tasmanian Devil, Spotted-tailed Quoll and Eastern Quoll in Tasmania.

IVG Report 7a assessed the contributions that would be made to the conservation of three species, Tasmanian Devil *Sarcophilus harrisii*, Spotted-tailed Quoll *Dasyurus maculatus*, and Eastern Quoll *Dasyurus viverrinus*, from the ENGO proposed reserves. The authors found that for the areas within West Coast Municipality, the ENGO proposed reserves would make a medium contribution to conservation of the Spotted-tailed Quoll (figure 8)²⁸.

Figure 7

Map reproduced from https://www.environment.gov.au/system/files/resources/eefde0e6-0f83-486d-b0c3-8b1d25abc497/files/ivgconservation7acarnivores.pdf



On the basis of this report, these areas should be zoned:

- 23.0 Environmental Management Zone should apply for the areas of FPPF land as marked in figure 8 consistent with purposes 23.1.1 and 23.1.2, and application guidelines EMZ 1(e).
- the *Natural Assets Code* should apply to areas of FPPF land as marked in figure 8, consistent with purposes *C7.1.1*, *C7.1.4*, *C7.1.5*, and application guideline *NAC 10*, and highly likely to be consistent with *NAC 11* on field verification, analysis or mapping undertaken on, or on behalf of, the planning authority.
- without prejudice, any area not zoned as such should default to 22.0 Landscape Conservation Zone consistent purpose 22.1.1 and 22.1.2, and with application guideline LCZ 2(a).

4 Threatened species distribution NVA

Searches using the online Natural Values Atlas search tool return a high level of threatened flora and fauna species observations across the PTPZ and FPPF lands in the Tarkine. This is unsurprising given the findings of the IVG and AHC reports that relied upon NVA data in making their recommendations. Due to the volume of material, these search tool results (in map form) are included in Appendix A.

The high number of threatened species observations, particularly given the remote nature of the area in question, supports the case for inclusion of FPPF and PTPZ lands in:

- a 23.0 Environmental Management Zone should apply for the areas contained in polygons 252 and 244 of the IVG reports consistent with purposes 23.1.1 and 23.1.2, and application guidelines EMZ 1(e).
- the Natural Assets Code should apply to polygons 252 and 244 of the IVG reports, consistent with purposes C7.1.1, C7.1.4, C7.1.5, and application guidelines NAC 7, NAC 8 and NAC10, and highly likely to be consistent with NAC 9, NAC 11 and NAC 12 on field verification, analysis or mapping undertaken on, or on behalf of, the planning authority.
- without prejudice, any area not zoned as such should default to 22.0 Landscape Conservation Zone consistent purpose 22.1.1 and 22.1.2, and with application guideline LCZ 2(a).

5 FPPF land.

FPPF land is administered through Crown land Services. It is not able to be harvested (except in limited circumstances) and requires Parliamentary approval to reallocate FPPF land to PTPZ land. The Department of State Growth in the *Rebuilding the Forest Industry Fact Sheet*²⁹ notes that:

• there will be a moratorium on native forest harvesting in the FPPF Land, except for limited special timbers harvesting and a small number of transitional forest coupes.

- the FPPF Land may not be sold, but it can be leased.
- land may be exchanged between FPPF Land and Permanent Timber Production Zone (PTPZ) Land.
- after April 2020, FPPF Land may be converted to PTPZ Land, with the approval of the Parliament, to enable native forest harvesting.

Any Special Species Management Plan (a prerequisite to any application to transfer FPPF land to PTPZ) an assessment of the:

- the management of conservation values and other environmental values in relation to the harvesting of special species timber on that land; and
- the management of cultural and heritage values in relation to the harvesting of special species timber on that land.³⁰

In the absence of Parliamentary approval and an approved Special Species Management Plan, the FPPF land is managed for its conservation values and excludes harvesting. As such, a 20.0 Rural Zone is insufficient. Given the similar management objectives to reserved land, the appropriate zoning would be:

- 23.0 Environmental Management Zone consistent with purposes 23.1.1 and 23.1.2, and application guidelines EMZ 1(e) is most
- without prejudice, any are not zoned as such should default to 22.0 Landscape Conservation Zone consistent purpose 22.1.1 and 22.1.2, and with application guideline LCZ 2(a).
- future decisions of Parliament may require zoning changes, but it is not within the scope of this exercise to pre-empt decisions of the current or future Parliaments.

6 Informal reserves and non-production forests on PTPZ land.

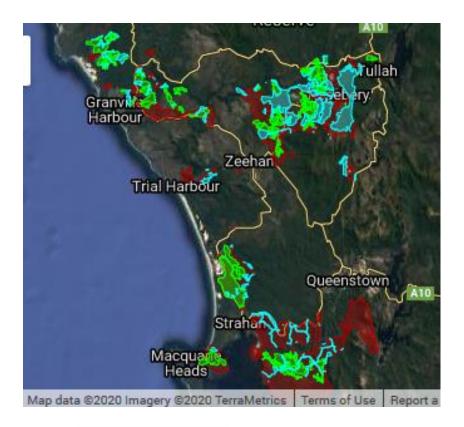
Within the Permanent Timber Production Zone, there are areas of forest designated as informal reserves or as areas outside of designated production forest, and as such consideration of all PTPZ land as production forests is flawed. There is a strong case that any PTPZ land not designated as production forest should be zoned 23.0 Environmental Management Zone or 22.0 Landscape Conservation Zone as a matter of course. Figure 9 shows the breakdown of land use within PTPZ land. The areas in turquoise are informal reserves on PTPZ land, and those in maroon are areas within the PTPZ but outside of designated production forests.

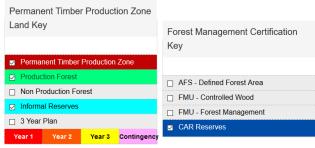
Additionally, Sustainable Timbers Tasmania as land manager claim to aspire to manage forests to "protect biodiversity", "maintain the landscape", "preserve cultural heritage", "protect soil and water"³¹. These goals would not seem to be inconsistent with zoning of 23.0 Environmental Management Zone or 22.0 Landscape Conservation Zone.

Figure 9

Map reproduced from Sustainable Timbers Tasmania's Interactive Map Viewer

https://www.sttas.com.au/forest-operations-management/interactive-map-viewer 29 September 2020.





7 Western Wilds touring routes

The Western Wilds touring routes, along with access roads to key tourist sites, warrant application of the Scenic Protection Code to areas within the visible skyline of the A10, B24, B27, B28, C248, C249 and C252 roads and the tourist sites accessed by these roads.

These designated tourism routes clearly meet the intent of a scenic road corridor under the purposes and application guidelines. Applying the *Scenic Protection Code* along these scenic

road corridors is consistent with purpose 8.1.1 and application guidelines SPC 1, SPC 2 and SPC 3.

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Takayna/Tarkine Campaigner
Bob Brown Foundation

scott@bobbrown.org.au

https://www.environment.gov.au/system/files/resources/eefde0e6-0f83-486d-b0c3-8b1d25abc497/files/ivgconservation2aflora.pdf

https://www.environment.gov.au/system/files/resources/eefde0e6-0f83-486d-b0c3-8b1d25abc497/files/ivgconservation2bpriorityfauna.pdf

13 ibid

14 ibid

15 ibid

8b1d25abc497/files/ivgconservation5aheritage.pdf

¹ Australian Heritage Council (2012), AHC Final Assessment Report: The Tarkine, https://www.environment.gov.au/system/files/pages/c4bc7b64-3da4-4f7f-bcf0-4fd0c1bb9c5d/files/final-assessment.pdf

² ibid

³ Ibid

⁴ Ibid

⁵ Australian Heritage Commission (2002), Register of the National Estate, http://www.environment.gov.au/cgi-bin/ahdb/search.pl?mode=place_detail;search=state%3DTAS%3Blist_code%3DRNE%3Blga_name%3DCircular%2520Head%3Bkeyword_PD%3Don%3Bkeyword_SS%3Don%3Bkeyword_PH%3Don%3Blatitude_1dir%3DS%3Blongitude_1dir%3DE%3Blongitude_2dir%3DE%3Blatitude_2dir%3DS%3Bin_region%3Dpart;place_id=17747
⁶ ibid

⁷ ibid

⁸ IVG Forest Conservation Report 2A, Validation of the ENGO proposed reserves for the conservation of priority flora species on public forest. 2012.

⁹ Ibid

¹⁰ ibid

¹¹ IVG Forest Conservation Report 2B, Validation of the ENGO proposed reserves for the conservation of priority fauna species on public forest. 2012

¹² ibid

¹⁶ https://www.environment.gov.au/system/files/resources/eefde0e6-0f83-486d-b0c3-

¹⁷ https://whc.unesco.org/en/criteria/

¹⁸ ibid

¹⁹ https://www.environment.gov.au/system/files/resources/eefde0e6-0f83-486d-b0c3-8b1d25abc497/files/ivgconservation5aheritage.pdf

²⁰ ibid

²¹ ibid

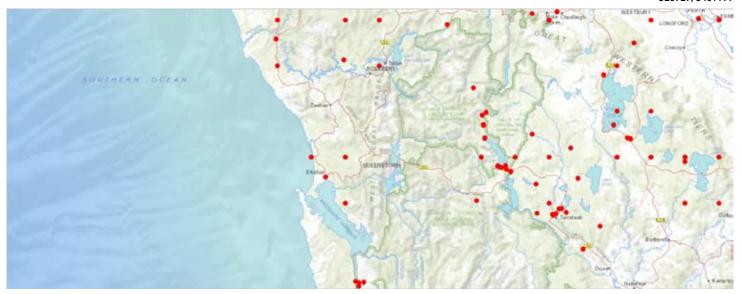
| ²² ibid |
|--|
| ²³ ibid |
| ²⁴ ibid |
| ²⁵ ibid |
| ²⁶ ibid |
| ²⁷ ibid |
| ²⁸ https://www.environment.gov.au/system/files/resources/eefde0e6-0f83-486d-b0c3- |
| 8b1d25abc497/files/ivgconservation7acarnivores.pdf |
| ²⁹ https://www.parliament.tas.gov.au/bills/Bills2014/pdf/notes/6_of_2014-Fact%20Sheet.pdf ³⁰ |
| https://www.stategrowth.tas.gov.au/data/assets/pdf_file/0014/152402/Conservation_Assessment_on_FPI |
| F_Land_Report_Final_July_2017.PDF |
| 31 https://www.sttas.com.au/sites/default/files/media/documents/annual- |
| reports/190339%20STT%20Annual%20Report%202019_WEB_1%20OCT%202019.pdf |
| |

Appendix A.

Natural Values Atlas analysis maps for threatened fauna and flora, and Huon Pine as a threatened forest community.

NVA Analysis Map Lathamus discolor

526929, 5401199



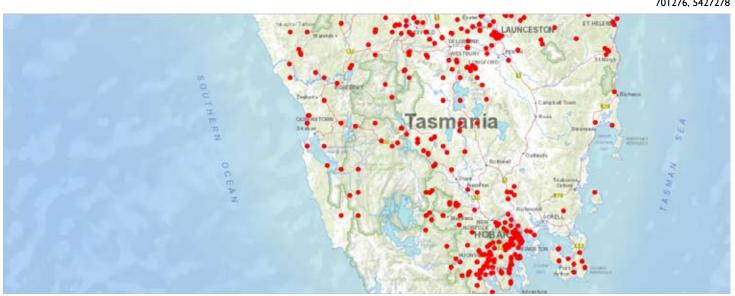
229318, 5282926

Please note that some layers may not display at all requested map scales

Map generated using data from www.naturalvaluesatlas.tas.gov.au and www.thelist.tas.gov.au for scottjordan at Wed Sep 30 16:31:25 AEST 2020

NVA Analysis Map Accipiter novaehollandiae

701276, 5427278



103647, 5193636

Please note that some layers may not display at all requested map scales

Map generated using data from www.naturalvaluesatlas.tas.gov.au and www.thelist.tas.gov.au for scottjordan at Wed Sep 30 16:22:02 AEST 2020

NVA Analysis Map Ceyx azurus

691909, 5447509



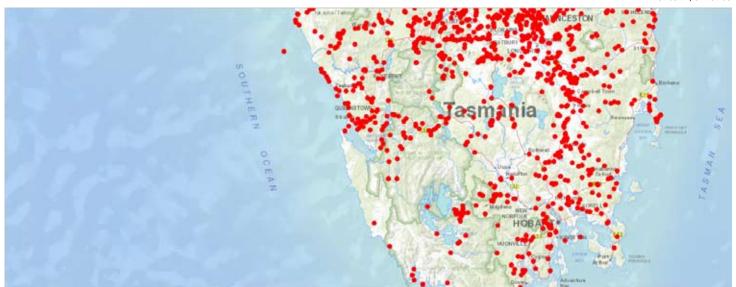
92636, 5212425

Please note that some layers may not display at all requested map scales

Map generated using data from www.naturalvaluesatlas.tas.gov.au and www.thelist.tas.gov.au for scottjordan at Wed Sep 30 16:29:07 AEST 2020

NVA Analysis Map Dasyurus maculatus

670579, 5423708



73298, 5187671

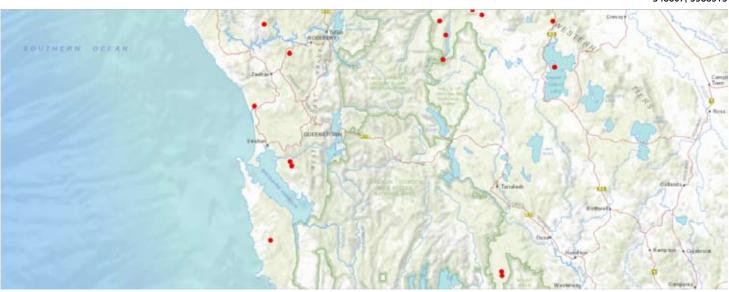
Please note that some layers may not display at all requested map scales

Map generated using data from www.naturalvaluesatlas.tas.gov.au and www.thelist.tas.gov.au for scottjordan at Wed Sep 30 15:59:04 AEST 2020



NVA Analysis Map Senecio velleiodes

548607, 5388315



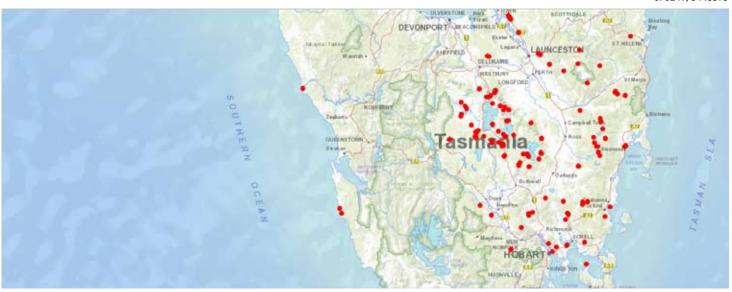
251527, 5271145

Please note that some layers may not display at all requested map scales

Map generated using data from www.naturalvaluesatlas.tas.gov.au and www.thelist.tas.gov.au for scottjordan at Tue Sep 29 16:29:43 AEST 2020

NVA Analysis Map Stellaria multiflora

676241, 5448593



76905, 5212195

Please note that some layers may not display at all requested map scales

Map generated using data from www.naturalvaluesatlas.tas.gov.au and www.thelist.tas.gov.au for scottjordan at Tue Sep 29 16:33:35 AEST 2020



NVA Analysis Map Orthoceras strictum

539681, 5387003



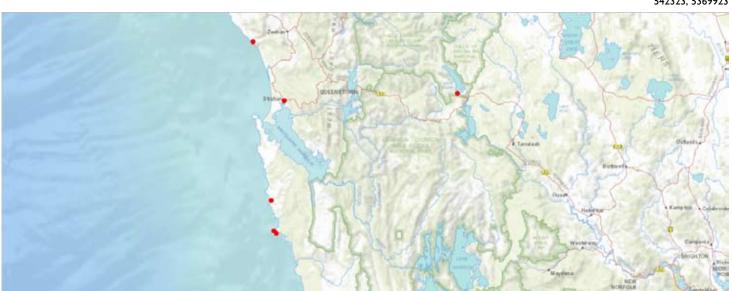
242656, 5269483

Please note that some layers may not display at all requested map scales

Map generated using data from www.naturalvaluesatlas.tas.gov.au and www.thelist.tas.gov.au for scottjordan at Tue Sep 29 16:26:28 AEST 2020

NVA Analysis Map Deyeuxia minor

542323, 5369923



246008, 5252786

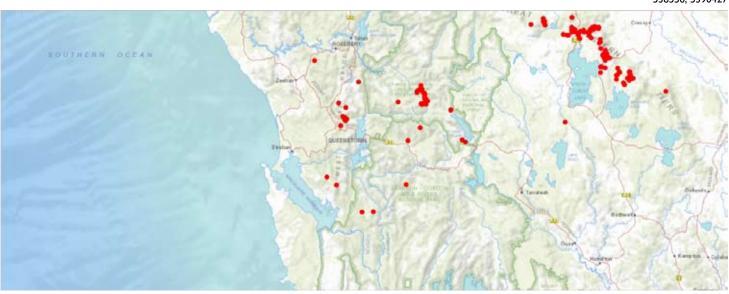
Please note that some layers may not display at all requested map scales

Map generated using data from www.naturalvaluesatlas.tas.gov.au and www.thelist.tas.gov.au for scottjordan at Tue Sep 29 16:23:37 AEST 2020



NVA Analysis Map Persoonia muelleri s.Angustifolia

538556, 5390427



241390, 5272806

Please note that some layers may not display at all requested map scales

Map generated using data from www.naturalvaluesatlas.tas.gov.au and www.thelist.tas.gov.au for scottjordan at Tue Sep 29 16:19:37 AEST 2020

NVA Analysis Map Epacris curtisiae

513282, 5455293



213443, 5335611

Please note that some layers may not display at all requested map scales

Map generated using data from www.naturalvaluesatlas.tas.gov.au and www.thelist.tas.gov.au for scottjordan at Tue Sep 29 15:56:11 AEST 2020



NVA Analysis Map Caladenia pusilla

457576, 5371057



309055, 5312029

Please note that some layers may not display at all requested map scales

Map generated using data from www.naturalvaluesatlas.tas.gov.au and www.thelist.tas.gov.au for scottjordan at Tue Sep 29 16:16:39 AEST 2020

NVA Analysis Map micrantheum serpentinium

457809, 5408089



308525, 5348781

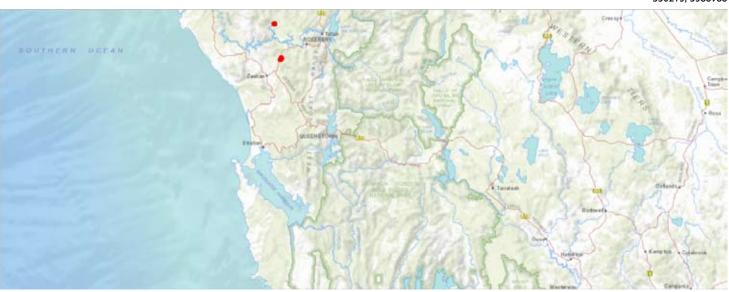
Please note that some layers may not display at all requested map scales

Map generated using data from www.naturalvaluesatlas.tas.gov.au and www.thelist.tas.gov.au for scottjordan at Tue Sep 29 16:02:31 AEST 2020



NVA Analysis Map Epacris glabella

550213, 5388988



253105, 5271873

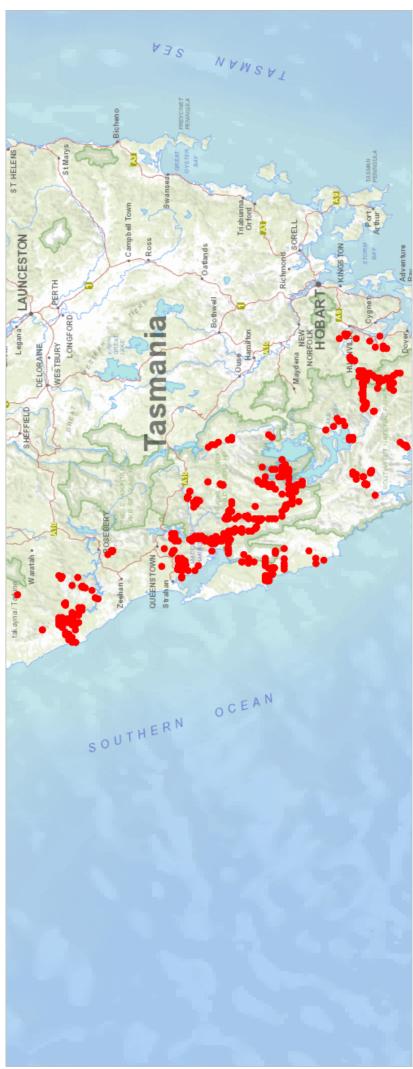
Please note that some layers may not display at all requested map scales

Map generated using data from www.naturalvaluesatlas.tas.gov.au and www.thelist.tas.gov.au for scottjordan at Tue Sep 29 15:59:25 AEST 2020



Natural Values Atlas Analysis Map Huon pine

683017, 5424322



85665, 5189284

Map generated using data from www.naturalvaluesatlas.tas.gov.au and www.thelist.tas.gov.au for scottjordan at Tue Sep 29 15:46:40 AEST 2020 Please note that some layers may not display at all requested map scales

