



Tarkine Tasmania

27 January–6 February 2015

Bush Blitz Species Discovery Program



Australian Government

Department of the Environment and Energy



bhpbilliton

Sustainable Communities



Australian
Biological
Resources
Study

What is Bush Blitz?

Bush Blitz is a multi-million dollar partnership between the Australian Government, BHP Billiton Sustainable Communities and Earthwatch Australia to document plants and animals in selected properties across Australia.

This innovative partnership harnesses the expertise of many of Australia's top scientists from museums, herbaria, universities, and other institutions and organisations across the country.

Abbreviations

ABRS

Australian Biological Resources Study

ANIC

Australian National Insect Collection

CSIRO

Commonwealth Scientific and Industrial Research Organisation

DPIPWE

Department of Primary Industries, Parks, Water and Environment (Tasmania)

EPBC Act

Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)

QM

Queensland Museum

TMAG

Tasmanian Museum and Art Gallery

TSP Act

Threatened Species Protection Act 1995 (Tasmania)

UNSW

University of New South Wales

Summary

A Bush Blitz survey was conducted in various reserves in the Tarkine region in north-western Tasmania between 27 January and 6 February 2015.

The Tarkine region can be defined roughly as the area bounded by the Southern Ocean to the west, the Arthur River to the north, the Pieman River to the south, and the Murchison Highway to the east. Reserves in the region that were surveyed included: Arthur-Pieman Conservation Area, Donaldson River Nature Recreation Area, Meredith Range Regional Reserve, Pieman River State Reserve, Savage River National Park, Savage River Pipeline Regional Reserve, and Savage River Regional Reserve. The Bush Blitz also extended slightly to the south of this area, with some surveys conducted in Mount Dundas Regional Reserve and Mount Heemskirk Regional Reserve.

The Tarkine includes a diverse array of vegetation communities, among them button-grass plains and moorlands, tall eucalypt forests, eucalypt woodlands and heathlands. It encompasses the largest tract of temperate rainforest in Australia and provides habitat for more than 60 listed threatened species, including the Tasmanian Giant Freshwater Crayfish (the world's largest freshwater crustacean), the Tasmanian Wedge-tailed Eagle and the Tasmanian Devil.

The Bush Blitz recorded 1430 species (885 fauna and 545 flora species), of which 34 species are putatively new to science, including two vascular plants, one lichen, 20 spiders and 11 other invertebrates. No fauna or flora listed under the *Environment Protection and Biodiversity Conservation Act 1999* were encountered. However, the survey did record four species of vascular plants that are listed as protected under the Tasmanian *Threatened Species Protection Act 1995*.

Twenty-three exotic or pest fauna species were recorded, including one fish (Brown Trout). The survey found 23 pest or exotic flora species; however, no declared weeds listed under Tasmanian legislation (*Tasmanian Weed Management Act 1999*) were recorded within the reserves. Two species of significant environmental weeds, *Euphorbia paralias* and *Cakile maritima*, were widespread and common in coastal areas. The lack of exotic species at inland sites highlights the pristine condition of much of the Tarkine. An exception was the Arthur-Pieman Conservation Area, where exotic species were common: the majority of these were herbaceous annuals and perennials recorded from the Dago Plains area, which has a history of cattle grazing and recreational use.

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Introduction

This is a report for the Bush Blitz program, which aims to improve our knowledge of Australia's biodiversity. Bush Blitz is an initiative of the Australian Government, through the Australian Biological Resources Study (ABRS), in partnership with BHP Billiton Sustainable Communities and Earthwatch Australia. Bush Blitz aims to:

- promote, publicise and demonstrate the importance of taxonomy through species discovery
- undertake a national species discovery program
- support the science of taxonomy in Australia through training of students and early career researchers, and by providing grants for species description and resolution of taxonomically problematic, nationally important groups
- promote partnerships between scientific institutions, government, industry and non-government organisations
- inform reserve managers and other stakeholders of the results of Bush Blitz projects.

The Tarkine Bush Blitz

The Tarkine Bush Blitz ran from 27 January to 6 February 2015. It involved surveys in the following reserves: Arthur-Pieman Conservation Area, Donaldson River Nature Recreation Area, Meredith Range Regional Reserve, Mount Dundas Regional Reserve, Mount Heemskirk Regional Reserve, Pieman River State Reserve, Savage River National Park, Savage River Pipeline Regional Reserve, and Savage River Regional Reserve.

The 14-strong scientific team included representatives from the Tasmanian Museum and Art Gallery (TMAG); the Tasmanian Department of Primary Industries, Parks, Water and Environment; the University of New South Wales; and the Queensland Museum.

Conditions during the survey were mild and unusually dry. The weather station at Strahan Aerodrome, a little south of the study area, recorded an average daily maximum of 20.4°C (range 17.5°C – 25.4°C), an average daily minimum of 8.7°C (range 3.9°C – 12.8°C), and a rainfall of 0.6 mm during the survey period.

Acknowledgements

The ABRS acknowledges the traditional owners of country throughout Australia and their continuing connection to land, sea and community. We pay our respects to them and their cultures and to their elders both past and present.

The Bush Blitz organising team comprised Kate Gillespie, Brian Hawkins and Bella Miras. They would like to thank the Tasmania Parks and Wildlife Service for advice, assistance, and access to the reserves; the owners and managers of Corinna, particularly Euan Wiseman and Peter Stuart, are thanked for a fruitful and enjoyable stay; and Tim Cain (helicopter pilot) of Osborne Aviation is thanked for his participation.

Reserve overview¹

Reserve names: Arthur-Pieman Conservation Area, Donaldson River Nature Recreation Area, Meredith Range Regional Reserve, Mount Dundas Regional Reserve, Mount Heemskirk Regional Reserve, Pieman River State Reserve, Savage River National Park, Savage River Pipeline Regional Reserve, and Savage River Regional Reserve

Area: These reserves have a combined area of approximately 447,000 ha.

Description

The Tarkine region is located in coastal north-western Tasmania, and may be roughly defined as the area bounded by the Southern Ocean to the west, the Arthur River to the north, the Pieman River to the south, and the Murchison Highway to the east. The Tarkine Bush Blitz also extended slightly south of this area, with some surveys conducted in Mount Dundas Regional Reserve and Mount Heemskirk Regional Reserve. The elevations span from sea level to over 800 m.

The region is bounded by farmland to the north, forestry activity to the east, mining and water impoundment to the south and the Great Southern Ocean to the west. Although affected in some parts by roads and mines, the area encompasses significant tracts of wilderness. A history of Indigenous burning and wildfires has led to the development of a mosaic of vegetation types.

Conservation values

The Tarkine is an area of great biological and historical significance. It includes a diverse array of vegetation communities, among them button-grass plains and moorlands, tall eucalypt forests, eucalypt woodlands, heathlands, and the largest tract of temperate rainforest in Australia. Other vegetation types include sandy littoral communities, wetlands, grasslands and sphagnum swamps. The Tarkine provides habitat for more than 60 listed threatened species, including the Tasmanian Giant Freshwater Crayfish (the world's largest freshwater crustacean), the Tasmanian Wedge-tailed Eagle and the Tasmanian Devil.

¹ Information sourced from NRS information and assessments, www.discovertasmania.com.au.

Methods

Taxonomic groups studied and personnel

A number of taxonomic groups were selected as targets for study. [Table 1](#) lists the groups surveyed and the specialists who undertook the fieldwork.

Table 1 Taxonomic groups surveyed and personnel

Group	Common name	Expert	Affiliation
Pisces	Fishes	Scott Hardie	DPIPWE
		Chris Bobbi	
Lepidoptera	Butterflies	Abbey Throssell	TMAG
Lepidoptera	Moths	Catherine Byrne	TMAG
		Kirrily Moore	
Coleoptera	Beetles, general	Simon Grove	TMAG
Chrysomelidae	Leaf beetles	David de Little	TMAG
Heteroptera	True bugs	Anna Namyatova	UNSW
Odonata	Damselflies and dragonflies	Abbey Throssell	TMAG
	Other insects	Simon Grove	TMAG
Arachnida	Spiders and harvestmen	Robert Raven	QM
Gastropoda	Snails and slugs	Kevin Bonham	TMAG
Vascular plants	Vascular plants	Matthew Baker	TMAG
		Miguel de Salas	
Bryophytes	Liverworts and mosses	Lynette Cave	TMAG
Lichens	Lichens	Gintaras Kantvilas	TMAG

Site selection

Aside from the two standard survey sites selected by Bush Blitz using CSIRO modelling, site selection was at the discretion of survey participants. In general, participants selected sites based on habitat type, accessibility and suitability for trapping; the use of a helicopter enabled access to remote areas. Prior to the survey, CSIRO modelling was used to select a suite of sites that sampled the full range of biophysical characteristics in the study area (i.e. soil properties, elevation, temperature, moisture etc.); some participants surveyed some of these sites. Site locations were recorded in the field using global positioning systems.

Standard survey sites

Bush Blitz used CSIRO modelling to select two standard survey sites—one in rainforest by the Pieman River, the other in button-grass moorland near the Western Explorer Road. The sites were chosen to represent the diversity of environmental conditions in the study area. The centre of each site was marked by a star picket; the area surveyed varied between groups, but was restricted to the nominated habitat type (rainforest or button-grass). Apart from fish, all the groups in Table 1 were surveyed at these sites, using standard methodologies for the particular taxon.

The use of standard survey sites provides a unique opportunity to examine broad-spectrum biodiversity. Among other benefits, this will enable our partners at CSIRO to test assumptions (e.g. about relationships between the diversity of different taxa) that underpin many conservation decisions; it also provides a basis for monitoring by reserve managers.

Survey techniques

A suite of survey techniques were used:

- **Freshwater fish** were collected by backpack electrofishing with a 250 mm anode ring; on average, 16 minutes were spent electrofishing over an average of 116 m of riverbank at each site. At sites with deep water, electrofishing was confined to shallower backwater and snag-dominated habitat on the sides of the river channel.
- A range of **invertebrates** were collected at the standard survey sites using flight intercept traps (triangular window intercept traps), a malaise trap, pitfall traps made of plastic cups, and yellow pan traps.
- **Butterflies, dragonflies and damselflies** were collected mainly by opportunistic aerial netting of active adults, with occasional sweeping of vegetation near water. Standard sites were surveyed by aerial netting for one hour per site, during the day. The standard sites proved unproductive for butterflies and odonates with no nettings or sightings for either group. Windy conditions at site 1 (open button-grass area) may have prevented some insects from flying.
- **Moths** were collected using portable bucket traps fitted with an MV black light, and at a light with a 160W MV lamp, white sheet and portable generator. Light traps were deployed at night with bucket traps distributed over as many different plant communities as possible. Effort was concentrated on Geometridae, but members other families were also collected. Day-flying moths were collected opportunistically at some sites during the day using hand-held butterfly nets.

- **Beetles** were collected by various methods, including hand collecting from microhabitats such as litter, dung, carcasses, rocks and logs; hand netting; collecting from moth traps; beating of foliage (for leaf-beetles); and spotlighting with a head-torch.
- **True bugs** were collected by beating, sweeping and hand collecting, focusing on flowers, fruits and seeds. Pyrethrum knockdown was used to collect cryptic Heteroptera. Most true bugs were collected from seed plants; they were collected from 23 host plant species.
- **Spiders and harvestmen** were collected by pitfall trapping and a range of hand-collecting techniques, including log-rolling, bark-brushing, sorting through leaf litter, inspecting curls of bark, moss-pulling and spotlighting.
- **Snails and slugs** were collected by hand, typically over a small area (50–100 m). Both standard survey sites were surveyed by searching of litter, logs, bark, rocks, button-grass bases, moss on trees, and other available microhabitats.
- **Vascular plants** were pressed in newspaper. All plant material was allowed to dry at room temperature before transfer to the laboratory, where standard drying procedures were implemented.
- **Lichens** were collected as mixed samples and later sorted with the aid of a dissecting microscope.
- **Bryophytes** were placed directly into pre-folded packets as they were collected, with some later sorting using a microscope.

Identification

The specimens collected were identified using available literature and the holdings of museums and herbaria to provide final confirmation of identifications. Fauna specimens were deposited with TMAG with the exception of true bugs, which were lodged with UNSW. Plant specimens were deposited with the Tasmanian Herbarium. Records for all specimens are available to the public through the Atlas of Living Australia.

Results

At least 1067 species were new records for the reserves, including 34 putative species new to science—these await formal description. Four threatened vascular plant species, 23 exotic or pest animal species and 23 weed species were recorded. Locational data for all collection or observation records are available to reserve managers. [Table 2](#) provides a summary of the records.

Table 2 Summary of flora and fauna records

Group	Common name	Number of species collected or observed	Newly recorded for the region	Putative new species	Threatened species*	Exotic and pest species**
Aves	Birds	53				
Pisces	Fishes	6	0	0	0	1
Hymenoptera	Ants, bees and wasps	63	63	0	0	3
Lepidoptera	Butterflies	10	9	0	0	1
Lepidoptera	Moths	169	169	5	0	8
Diptera	Flies	64	64	0	0	1
Coleoptera	Beetles	257	257	1	0	3
Heteroptera	True bugs	68	68	4	0	1
Orthoptera	Grasshoppers, crickets and katydids	10	10	0	0	0
Odonata	Damselflies and dragonflies	15	14	0	0	0
Other insects		23	23	0	0	0
Arachnida	Spiders and harvestmen	106	106	20	0	3
Crustacea	Freshwater crayfish	2	1	0	0	0
Gastropoda	Snails and slugs	39	6	1	0	2
Vascular plants	Vascular plants	244	138 [^]	2	4	22
Bryophytes	Liverworts and mosses	161	122 [^]	0	0	1
Lichens	Lichens	140	17 [^]	1	0	0
Total		1430	1067	34	4	46

[^] See Appendix A for the new records found within each of the reserve areas.

* Species listed as threatened under the Commonwealth EPBC Act or an equivalent listing under the TSP Act.

** Includes native species that are at times pests or are exotic to this region.

Species lists

Species lists for the Tarkine are provided in [Appendix A](#). Species lists were compiled using data from participating institutions.

Some specimens have been identified only to family or genus level. This is partly because identification of specimens is very time-consuming, with detailed microscopic examination needed in many cases. Also, some groups are 'orphans': currently no experts are working on them, or are available to work on them, and the taxonomic literature is out of date; species-level identification is not possible for these groups. Unidentified Bush Blitz specimens are held in institutional collections where they are available for future study. Collections hold many such specimens, among them species not yet described (i.e. unnamed species) as well as described species that have not been identified. For example, ANIC holds tens of thousands of unidentified specimens. Specimens often wait decades before the resources become available for their study. A key component of Bush Blitz is the funding of studies of specimens collected on Bush Blitz surveys.

Nomenclature and taxonomic concepts used in this report are consistent with the Australian Faunal Directory, Australian Plant Name Index, Australian Plant Census, AusMoss and the Catalogue of Australian Liverworts and Hornworts.

Discussion

Putative new species

Here we use the term ‘putative new species’ to mean an unnamed species that, as far as can be ascertained, was collected for the first time during this Bush Blitz. It is confirmed as a new species once it is named and its description published. Specimens collected during the Bush Blitz also include unidentified taxa that are already known from museum and herbarium collections—these are not counted as putative new species.

Fauna

Invertebrates

Moths

Five putatively new moth species were collected on the Bush Blitz: three oecophorids (*Coesyra* sp. "BBTarkCB16", *Tachystola* sp. "BBTarkAT25" and *Artiastis* sp. "BBTarkCB09"), a geometrid (*Chloroclystis* sp. "TarkCB33") and a glyphipterigid (*Glyphipterix* "BBTarkAT01"). *Coesyra* sp. "BBTarkCB16", which was collected in *Eucalyptus obliqua* woodland, probably represents the first Tasmanian record of this genus. Apart from the geometrid, the putative new species are all ‘microlepidoptera’, a blanket term for the tiny moths that are often overlooked and under-collected in surveys.

This Bush Blitz was distinguished by the large number of un-named or undescribed species collected. A total of 23 known undescribed species were recorded. These were spread almost evenly over 13 families. Ten of the known undescribed species—*Eutorna* sp. "TarkCB04" (Depressariidae), four oecophorids, two Nolids, two cosmopterigids and *Opostega* sp. "BBTarkCB25"—are microlepidoptera. Overall the number of undescribed and new species in this group is high.

Species of note included the striking day-flying endemic arctiid *Phaos* sp. "BBTarkFish12", which was collected on the North Pedder River in the Arthur-Pieman Conservation Area. Previously this uncommon species was recorded only from specimens collected in 1991 at Pelion Hut, in the Cradle Mountain-Lake St Clair National Park of the Central Highlands of Tasmania.

Two specimens of the undescribed oecophorid, *Agriophara* sp. ANIC 28, were collected in *Eucalyptus obliqua* woodland in the Arthur-Pieman Conservation Area. Only a single specimen of this species was collected previously in Tasmania, from Waratah in the north-west. It occurs outside Tasmania at Barrington Tops in NSW.

Similarly, the endemic *Xylorycta* sp. ANIC 1 is very rare and previously was known only from three specimens collected in 1963 between Rosebery and Strahan on the Tasmanian west coast. Two specimens of this oecophorid were taken in the Arthur-Pieman Conservation Area, one during the day in semi-alpine heath and rock outcrops on Mount Edith and the other at night in wet eucalypt forest.

Another rare endemic from the Crambidae, *Hednota* ANIC sp. 8, previously was recorded only from south-west Tasmania in 1991. One specimen was collected during the Bush Blitz in Meredith Range Regional Reserve in *Eucalyptus nebulosa* woodland. Three specimens of the tiny, uncommon *Opostega* sp. "BBTarkCB25" from the family Opostegidae were collected at light traps in eucalypt woodland in Savage River National Park.

Another interesting find was the collection of two specimens of a species from the primitive monotrysian family Palaephatidae, *Ptysoptera* sp. "BBTarkCB34". Previously this undescribed species was collected from only one site, Mt Ossa in the Cradle Mountain-Lake St Clair National Park of the Central Highlands; and a second individual was reared from a caterpillar collected on *Bellendena montana* (mountain rocket, Proteaceae) at Wombat Moor, Mt Field National Park. On this Bush Blitz two further specimens were taken at disjunct sites, one at high elevation (525 m) button-grass sedgeland in the Meredith Range Regional Reserve, and the other in rainforest in the Pieman River Reserve. Similar Gondwanan distributions of host plant family and this interesting moth family are recognised.

Beetles

One new species of leaf beetle, *Ethomela* sp., was collected during the Bush Blitz. This poorly understood genus² is rarely collected due to its relatively small size and cryptic habits. Only two species of *Ethomela* have been recorded from Tasmania (*Ethomela hursti* and *E. luteicornis*). Further work is needed to confirm whether the Tarkine *Ethomela* is a new species.

Over 100 taxa could not be identified; on further investigation many of these are likely to prove to be described species. Forty-two of the unidentified taxa relate to specimens already collected from elsewhere in Tasmania and held in the Tasmanian Forest Insect Collection, and another 40 taxa have been newly added to the TMAG insect collection. The institutional code-names in the species lists (see Appendix) will remain in use until the taxon's full identity is determined, or the taxon is described.

True bugs

Four putative new species of true bugs were collected. These included three species from the family Miridae and one from the family Acanthosomatidae. Over 40 species are un-named or not formalised and their identification requires further taxonomic study.

Spiders

As with many parts of Tasmania, no published surveys of spiders were available for the Tarkine. Of the 105 species collected, 20 were putatively new, including 4 new genera. Of the rest, only 20 species could be named; most of the remaining species are also likely to be new, but years of work would be required to confirm their status.

By far the highest diversity (59 species) occurred in the Pieman River State Reserve, the reserve that was surveyed most intensively. The richest site was the Nothofagus forest around Corinna, where bark-spraying yielded seven species representing three families. Many species collected were represented only by juvenile specimens, from which they cannot be identified; thus the tally of species collected is possibly an underestimate. More extensive surveys in different seasons are required to establish the full diversity of the Tarkine spider fauna.

Snails and slugs

A major highlight of the Bush Blitz was the discovery of one completely new charopid genus (Charopidae n. gen. "Reticulate" n. sp. "Fish-4"). The four live specimens were found at a single remote site near the upper reaches of the Donaldson River, in Savage River Pipeline Regional Reserve; two were collected. These snails were living under bark and in detritus on the trunks of *Melaleuca* trees growing in the

² de Little, D.W. 2011. A revised key and notes on the Tasmanian genera of Chrysomelinae (Coleoptera: Chrysomelidae). *Papers and Proceedings of the Royal Society of Tasmania* **145**: 17–26.

middle of a small button-grass plain surrounded by rainforest. The site was highly unusual and appeared to be pristine, without a recent history of fire.

The new genus is distinguished by an unusual combination of spiral and radial shell morphology not seen in other Tasmanian charopids. The collection of new land snail species in Tasmania is a common event but it is highly unusual to discover a new genus in the field. The species may be locally common but the habitat type has not been thoroughly surveyed. With intensive collection, more specimens might be found, including in areas that are more accessible.

Table 3 Putative new invertebrate species

Family	Species
Moths	
Geometridae	<i>Chloroclystis</i> sp. "TarkCB33"
Glyphipterigidae	<i>Glyphipterix</i> sp. "BBTarkAT01"
Oecophoridae	<i>Artiastis</i> sp. "BBTarkCB09"
Oecophoridae	<i>Coesyra</i> sp. "BBTarkCB16"
Oecophoridae	<i>Tachystola</i> sp. "BBTarkAT25"
Beetles	
Chrysomelidae	<i>Ethomela</i> n. sp. 01
True Bugs	
Acanthosomatidae	<i>Eupolemus</i> n. sp. 01
Miridae	gn_Orthotyilnae_gen_n. sp 01
Miridae	gn_Orthotyilnae_gen_n. sp 02
Miridae	<i>Phyllofulvius</i> n. sp. 01
Spiders	
Agelenidae	Agelenidae n. gen n. sp.
Amaurobiidae	<i>Midgee</i> n. sp. 01
Anyphaenidae	<i>Amaurobioides</i> n. sp.
Clubionidae	<i>Clubiona</i> n. sp. 01
Clubionidae	<i>Clubiona</i> n. sp. 02
Clubionidae	<i>Clubiona</i> n. sp. 03
Clubionidae	<i>Clubiona</i> n. sp. 04
Cyatholipidae	<i>Matilda</i> n. sp.
Desidae	Desidae n. gen. n. sp.

Family	Species
Desidae	Desidae n. gen. Ndesi n. sp.
Desidae	<i>Tuakana</i> n. sp. 01
Eutichuridae	Eutichuridae n. gen. n. sp.
Eutichuridae	Eutichuridae n. gen. n. sp. 02!
Gnaphosidae	Gnaphosidae n. sp. 01
Migidae	<i>Migas</i> n. sp.
Miturgidae	<i>Hestimodema</i> n. sp. 02.2
Stiphidiidae	Stiphidiidae n. gen. n. sp.
Theridiosomatidae	<i>Baalzebub</i> n. sp. 01
Toxopidae	<i>Toxopoides</i> n. sp. 01
Toxopidae	<i>Toxopoides</i> n. sp. 02
Snails and slugs	
Charopidae	Charopidae n. gen. "Reticulate" n. sp. "Fish-4"

Flora

Vascular plants

Two putative new vascular plant taxa were collected during the survey: a violet (*Viola* sp.), and a pepperbush (*Tasmannia* aff. *lanceolata* (Poir) A.C. Sm.) with distinctive narrow bronze leaves. Both taxa were collected from an area of unusual geology (serpentinite) on the Meredith Range.

Lichens

One putative new species of lichen (*Trapelia* sp.) was collected on the Tarkine Bush Blitz from the Arthur-Pieman Conservation Area and the Savage River Pipeline Regional Reserve.

Another notable record was the collection, from twigs of Horizontal Scrub (*Anodopetalum biglandulosum*), of what eventually became the type specimen of *Lithothelium kantvilasii*. The species was described by Pat McCarthy in 2015 and named in honour of its collector³. As this species had previously been collected elsewhere, it is not regarded as a new species.

Five undescribed lichen taxa known prior to the Bush Blitz ("*Leprocaulon*" sp., *Micarea* sp., *Rimularia?* sp., *Coenogonium* sp., and *Stirtoniella* sp.), were collected from the Savage River National Park and the Savage River Pipeline Regional Reserve.

³ McCarthy, P., 2015. A new species of *Lithothelium* (lichenized Ascomycota, Pyrenulaceae) from the Tarkine region, north-western Tasmania. *Telopea, Journal of Plant Systematics*. Vol 18: 167–170.

Table 4 Putative new flora species

Family	Species
Vascular plants	
Violaceae	<i>Viola</i> sp.
Winteraceae	<i>Tasmannia</i> aff. <i>lanceolata</i> (Poir) A.C. Sm.
Lichens	
Trapeliaceae	<i>Trapelia</i> sp.

Threatened species

Australia is home to an estimated 580,000–680,000 species, most of which have not been described. Approximately 92% of Australian plants, 87% of mammals, 93% of reptiles and 45% of birds are endemic. Changes to the landscape resulting from human activity have put many of these unique species at risk. Over the last 200 years, many species have become extinct; many others are considered to be threatened, i.e. at risk of extinction.⁴

Fauna

Vertebrates

Fish

No fish species listed under Commonwealth or Tasmanian legislation were recorded. This is despite previous records of the threatened Australian Grayling (*Prototroctes maraena*) from some rivers within the region⁵. The rivers surveyed on the Bush Blitz were not prime habitat for Australian Grayling (i.e. the substrates included too many boulders and flow velocities were too high), so this does not discount its presence in the area.

Invertebrates

Snails

No species listed as threatened at Commonwealth or State level were recorded during the survey. None are likely to occur with the exception of small populations of Keeled Snail (*Tasmaphena lamproides*), listed as rare at state level and found in the extreme north of Arthur-Pieman Conservation Area, but not recorded during the Bush Blitz.

⁴ Chapman, A. D. 2009, *Numbers of Living Species in Australia and the World*, 2nd edn. Australian Biological Resources Study, Canberra.

⁵ Edgar GJ, Barrett NS, Graddon DJ. 1999. A Classification of Tasmanian Estuaries and Assessment of their Conservation Significance using Ecological and Physical Attributes, Population and Land Use. Tasmanian Aquaculture and Fisheries Institute, Hobart, Tasmania.

Flora

Vascular plants

No plants listed under the *Environment Protection and Biodiversity Conservation Act 1999* were recorded. However, four species of vascular plants are listed as rare and protected under the *Tasmanian Threatened Species Protection Act 1995*.

Table 5 Threatened plant species

Family	Species	Indication of abundance
Vascular plants		
Euphorbiaceae	<i>Micrantheum serpentinum</i>	Common
Fabaceae	<i>Lotus australis</i>	Rare
Proteaceae	<i>Persoonia muelleri</i> subsp. <i>angustifolia</i>	Occasional
Ranunculaceae	<i>Ranunculus acaulis</i>	Rare

Exotic and pest species

Invasive species can have a major impact on already vulnerable species and ecosystems, as well as having economic, environmental and social impacts. The inclusion of exotic and pest species records as part of this report is designed to provide land managers with baseline information to assist with further pest management programs.

Fauna

Vertebrates

Fish

Brown Trout (*Salmo trutta*) was the only introduced species captured during the Bush Blitz. Its distribution in the Tarkine region was of particular interest. While it is an important species for recreational angling in Tasmania, the presence of Brown Trout has ecological consequences due to its ability to prey on small native fishes and compete for resources. The State Government has developed fisheries management strategies and policies relating to maintenance of trout-free waters, especially in wilderness areas⁶.

Brown Trout was recorded for the first time in the Arthur-Pieman Conservation Area, albeit in the Toner River on the eastern boundary of the reserve. The Toner River is a tributary of the Donaldson River (Pieman River catchment) which supports an abundant Brown Trout population; therefore, this result is not unexpected and aligns with the hypothesis that Brown Trout are in rivers in the Pieman River system. The occurrence of Brown Trout and the most abundant native species in the survey, Climbing

⁶ IFS, 2002. Western Lakes – Fishery Management Plan. Inland Fisheries Service, Hobart, Tasmania.

Galaxias (*Galaxias brevipinnis*) was mutually exclusive, with these species co-existing only at one site (Toner River) where Brown Trout were in low abundance. This finding re-enforces the thesis that Brown Trout have a detrimental impact on small native fishes such as galaxiid species⁷ in Tasmania. Of greater interest, however, is the fact that Brown Trout were not recorded in any of the five coastal-draining rivers on the western boundary of the Arthur-Pieman Conservation Area.

As expected, Brown Trout were recorded in the Mount Dundas Regional Reserve and Savage River Pipeline Regional Reserve. Rivers in these reserves were already known to contain this species (i.e. Arthur River, Henty River and Pieman River).

No Brown Trout were recorded at sites in the Meredith Range Regional Reserve and Mount Heemskirk Regional Reserve during this survey. Brown Trout are, however, known to occur in the Meredith Range Regional Reserve (e.g. in the Whyte River, tributary of the Pieman River). In this survey only two upland river sites were sampled, and Brown Trout appear not to have moved upstream into some of the streams draining off the Meredith Range. Only one site on the Tasman River in the Mount Heemskirk Regional Reserve was surveyed; therefore, it is difficult to assess whether Brown Trout occur in any of the waterways in this reserve, but it appears that the Tasman River is trout-free.

Table 6 Pest vertebrate species

Group	Species	Common name	Comments
Pisces	<i>Salmo trutta</i>	Brown Trout	Within the broad range of its known distribution in Tasmania. Found in the Toner, Henty, Donaldson and Rapid river systems. Absent from several rivers in the region.

Invertebrates

Butterflies

The only introduced species recorded was the Cabbage White Butterfly (*Pieris rapae*), a very common and widespread pest of brassica crops. It is not known to feed on native plants, and is unlikely to have any ecological impact. It was collected only in Arthur-Pieman Conservation Area.

Moths

Eight pest species of moth were observed or collected during the survey. Most are native to Australia but all are known agricultural pests. Cabbage Centre Grub (*Hellula hydralis*) and Lucerne Seed Web Moth (*Etiella behrii*) were collected in the Arthur-Pieman Conservation Area. Three specimens of the tortricid, *Epiphyas xyloides*, were collected from three different sites in the Arthur-Pieman Conservation Area. This native moth is widespread and common in Tasmania and is a serious pest of orchard fruit. Three noctuids—Southern Armyworm (*Persectania ewingii*), Brown Cutworm (*Agrotis munda*) and Bogong Moth or Common Cutworm (*Agrotis infusa*)—are common pasture pests. In Tasmania, the population of Bogong Moths is almost entirely derived from migratory individuals that are blown across Bass Strait, mainly in spring.

⁷ Hardie SA, Jackson JE, Barmuta LA, White RWG. 2006. Status of galaxiid fishes in Tasmania, Australia: conservation listings, threats and management issues. *Aquatic Conservation: Marine and Freshwater Ecosystems*, 16: 235–250.

Two exotic moth pests were recorded. Diamondback Moth (*Plutella xylostella*) was observed but not collected. This species is a serious pest of brassicas in Tasmania. The record from Corinna, Pieman Reserve, close to human habitation, most likely implies that it has not penetrated far into the reserve, particularly as it is entirely dependent on brassicas. Cotton Bollworm (*Helicoverpa armigera*) was collected in the Savage River Pipeline Reserve. This species is widespread in Australia and is considered a serious pest of a wide range of crops.

Beetles

One introduced species of beetle, the Eleven-spotted Lady Beetle (*Coccinella undecimpunctata*), was recorded. It is unlikely to cause severe ecological impacts and, in any case, it would be unrealistic to attempt controls. Two of the species of leaf beetle (*Paropsisterna agricola* and *Paropsisterna bimaculata*) recorded, occur naturally in Tasmania and can be pests for Tasmanian commercial forests⁸.

Other insects

Several feral insect species were recorded. All are likely to be widespread in the region. Most ecologically significant is European Wasp (*Vespula germanica*), followed by Buff-tailed Bumblebee (*Bombus terrestris*). Local control of wasps is feasible, for example around Corinna, but eradication of any of these species would be unrealistic.

True bugs

The only pest species recorded was the widespread Rutherglen Bug (*Nysius vinitor*), a native insect that can damage crops and pastures. It was collected within the Arthur-Pieman Conservation Area near the mouth of Interview River and at Dago Plains.

Spiders

Three species of exotic spider were recorded. These species are either known to be or likely to be cosmopolitan. They belong to larger genera for which the taxonomic literature is out of date, and consequently cannot be identified to species level with any certainty. These spiders are not listed on any national or state list.

Snails and slugs

Remarkably few exotic snails or slugs were recorded in the entire survey. No control measures are recommended.

Table 7 Exotic or pest invertebrate species

Family	Species	Common name	Comments
Butterflies			
Pieridae	<i>Pieris rapae</i>	Cabbage White Butterfly	Low abundance – found in coastal area between Italian Creek and Lagoon River.

⁸ de Little, D.W. 2011. A revised key and notes on the Tasmanian genera of Chrysomelinae (Coleoptera: Chrysomelidae). *Papers and proceedings of the Royal Society of Tasmania* **145**: 17–26.

Family	Species	Common name	Comments
Moths			
Crambidae	<i>Hellula hydralis</i>	Cabbage Centre Grub	Unlikely to be abundant. Found in Arthur-Pieman CA. Australian native. Agricultural pest of brassicas. Widespread throughout Australia.
Noctuidae	<i>Agrotis infusa</i>	Bogong Moth, Common Cutworm	Unlikely to be abundant. Found in Arthur-Pieman CA, Savage River NP and Pieman Reserve. Australian native. Pest of pasture and broad-leaved plants.
Noctuidae	<i>Agrotis munda</i>	Brown Cutworm	Unlikely to be abundant. Found in Arthur-Pieman CA. Australian native. Pest of pasture and broad-leaved plants.
Noctuidae	<i>Helicoverpa armigera</i>	Cotton Bollworm	Unlikely to be abundant. Found in Savage River Pipeline Reserve. Exotic serious pest on a wide variety of crops.
Noctuidae	<i>Persectania ewingii</i>	Southern Armyworm	Unlikely to be abundant. Found in Arthur-Pieman CA and Meredith RR. Australian native. Pasture pest.
Plutellidae	<i>Plutella xylostella</i>	Diamondback Moth	Unlikely to be abundant. Found in Pieman Reserve. Exotic species. Agricultural pest of brassicas. Widespread across Australia.
Pyralidae	<i>Etiella behrii</i>	Lucerne Seed Web Moth	Unlikely to be abundant. Found in Savage River Pipeline Reserve. Migratory species. The larvae are considered an agricultural pest.
Tortricidae	<i>Epiphyas xyloides</i>		Unlikely to be abundant. Found in Arthur-Pieman CA. Australian native. Pest of orchard fruit.
Beetles			
Coccinellidae	<i>Coccinella undecimpunctata</i>	Eleven-spotted Lady Beetle	Ecological impact not likely to be severe.
Chrysomelidae	<i>Paropsisterna agricola</i>		Native to Australia; can cause significant defoliation and achieve pest status in Tasmanian commercial forests.

Family	Species	Common name	Comments
Chrysomelidae	<i>Paropsisterna bimaculata</i>		Endemic to Tasmania; can cause significant defoliation and achieve pest status in Tasmanian commercial forests.
Other insects			
Apidae	<i>Apis mellifera</i>	European Honey Bee	Widespread throughout the region; control unrealistic.
Apidae	<i>Bombus terrestris</i>	Buff-tailed Bumblebee	Ecological impact probably significant; control unrealistic.
Syrphidae	<i>Eristalis tenax</i>	Drone Fly	Ecological impact not likely to be severe.
Vespidae	<i>Vespula germanica</i>	European Wasp	Severe ecological impact; local control desirable but eradication unrealistic.
True Bugs			
Lygaeidae	<i>Nysius vinitor</i>	Rutherglen Bug	Found in the Arthur-Pieman CA.
Spiders			
Linyphiidae	<i>Diplocephalus cristatus</i>	money spider	
Theridiidae	<i>Cryptachaea veruculata</i>	comb-footed spider	
Theridiidae	<i>Steatoda</i> sp. 01	comb-footed spider	
Snails and slugs			
Arionidae	<i>Arion intermedius</i>	Hedgehog Slug	McGinty's Creek in Savage River RR.
Helicidae	<i>Cornu aspersum</i>	Common Garden Snail	Near Pedder River in Arthur-Pieman CA.

Flora

No declared weeds listed under Tasmanian legislation (*Tasmanian Weed Management Act 1999*) were encountered within the surveyed reserves. Two species considered significant environmental weeds (*Euphorbia paralias* and *Cakile maritima*) were widespread and common in coastal areas. The lack of exotic species at inland sites highlights the pristine condition of much of the Tarkine.

Exotic species were common in the Arthur-Pieman Conservation Area. The majority of these were herbaceous annuals and perennials recorded from the vicinity of Dago Plains. The abundance of exotic species in this area was unsurprising, given its history of cattle grazing and recreational use.

Table 8 Exotic or pest flora species

Family	Species	Common name	Comments
Flowering plants			
Actinidiaceae	<i>Actinidia chinensis</i> var. <i>deliciosa</i>	Fuzzy Kiwifruit	Donaldson River Nature RA
Asteraceae	<i>Cirsium vulgare</i>	Scotch Thistle, Spear Thistle	Arthur-Pieman CA
Asteraceae	<i>Leontodon saxatilis</i>		Arthur-Pieman CA
Asteraceae	<i>Sonchus asper</i>		Arthur-Pieman CA
Brassicaceae	<i>Cakile maritima</i> subsp. <i>maritima</i>		Arthur-Pieman CA
Chenopodiaceae	<i>Chenopodium glaucum</i>		Arthur-Pieman CA
Euphorbiaceae	<i>Euphorbia paralias</i>		Arthur-Pieman CA
Fabaceae	<i>Medicago lupulina</i>		Arthur-Pieman CA
Fabaceae	<i>Melilotus indicus</i>		Arthur-Pieman CA
Fabaceae	<i>Trifolium dubium</i>		Arthur-Pieman CA
Fabaceae	<i>Trifolium repens</i>		Arthur-Pieman CA
Gentianaceae	<i>Centaurium erythraea</i>		Arthur-Pieman CA and Donaldson River Nature RA
Juncaceae	<i>Juncus articulatus</i>		Arthur-Pieman CA
Juncaceae	<i>Juncus bulbosus</i>		Arthur-Pieman CA
Lamiaceae	<i>Prunella vulgaris</i>		Arthur-Pieman CA
Plantaginaceae	<i>Plantago australis</i>		Arthur-Pieman CA
Plantaginaceae	<i>Plantago coronopus</i> subsp. <i>coronopus</i>		Arthur-Pieman CA
Poaceae	<i>Aira praecox</i>		Donaldson River Nature RA
Poaceae	<i>Catapodium rigidum</i>		Arthur-Pieman CA
Poaceae	<i>Holcus lanatus</i>		Arthur-Pieman CA
Primulaceae	<i>Lysimachia arvensis</i>		Arthur-Pieman CA
Rosaceae	<i>Prunus</i> sp. indet		Arthur-Pieman CA
Bryophytes			
Rhytidiaceae	<i>Rhytidiadelphus squarrosus</i>		Donaldson River Nature RA

Range extensions

Fauna

Moths

For moths two range extensions were recorded. One specimen of the acronictine, *Epicyrtica lichenophora* (Noctuidae) named for the ‘lichen-like scales’ on its fore wings, was collected in the Arthur-Pieman Conservation Area and was a new record for the state. A new oecophorid, *Coesyra* sp. “BBTarkCB16”, was also collected in the Arthur-Pieman Conservation Area and probably represents a new record for this genus in Tasmania.

Beetles

A range extension was recorded for one species of leaf beetle (*Paropsis deboeri*). These types of beetles are strong fliers so large distances between recorded locations may not be particularly significant, even for rarely collected species.

True Bugs

There were no previous records for Heteroptera in the Tarkine. For all the taxa identified all records in this report represent minor range extensions which are not considered significant because of a lack of background data.

Snails and slugs

Six substantial range extensions were recorded for snails. These included large and greatly unexpected range extensions for *Allocharopa tarravillensis*, *Planilaoma luckmanii* and *Tasmaphena sinclairi*. The fifth known collection of a rare species (*Planilaoma* sp. “Surrey Hills”) was made at a single remote site near Donaldson River in Savage River Pipeline RR, extending its range by 30 km. Numerous infills were recorded but these were typically of 20 km distance or less and are not considered significant.

Table 9 Range extensions

Family	Species	Distance from nearest known record	Comments
Moths			
Noctuidae	<i>Epicyrtica lichenophora</i>		New record for Tasmania.
Oecophoridae	<i>Coesyra</i> sp. “BBTarkCB16”		New record for the genus in Tasmania.

Family	Species	Distance from nearest known record	Comments
Beetles			
Chrysomelidae	<i>Paropsis deboeri</i>	East Ridgley 100 km	Record from Donaldson River Nature Conservation Area. Although uncommon this species has been recorded previously from Flinders Island to southern Tasmania.
Snails and slugs			
Charopidae	<i>Allocharopa tarravillensis</i>	75 km	Found at Interview River, Arthur-Pieman CA. Recorded from Victoria, King Island and far NW Tas. Greatly extends range southward.
Charopidae	<i>Geminoropa</i> cf (antialba)	20 km	Found at Mt Edith, Arthur-Pieman CA. Minor extension of known range to north and west of previous records.
Charopidae	<i>Planilaoma luckmanii</i>	60 km	Found at Corinna, Pieman River SR. Mainly eastern/northern species. Range extension from Jessie Gorge and Julius River. As many Tasmanian species with eastern/northern ranges do not occur in west (except far north-west) this could be an introduction from elsewhere.
Charopidae	<i>Planilaoma</i> sp. "Surrey Hills"	30 km	Found at Upper Donaldson, Savage River Pipeline RR. Westernmost of only five records. Nearest record at Mt Bischoff.
Punctidae	<i>Magilaoma</i> sp. "Tasmania"	85 km	Found at Dago Plains, Arthur-Pieman CA. Extension of confirmed range from far NW Tasmania but may have been collected in this reserve before.
Rhytididae	<i>Tasmaphena sinclairi</i>	45 km	Dead juvenile specimen found at Lovers Falls, Pieman River SR. Not proven species is living in area. Extends known range west, nearest records at Waratah and Strahan. A surprising range extension as snail is large and likely to have been found before in area if present in numbers.

Flora

Table 10 Range extensions

Family	Species	Comments
Vascular		
Asteraceae	<i>Leptinella longipes</i>	Recorded at Arthur-Pieman CA. First west coast record.
Asteraceae	<i>Ozothamnus rodwayi</i> var. <i>rodwayi</i>	Recorded at Arthur-Pieman CA. North westernmost record for the species.
Blechnaceae	<i>Blechnum fluviatile</i>	Recorded at Savage River Pipeline RR. Significant NW range extension.
Boraginaceae	<i>Cynoglossum australe</i>	Recorded at Arthur-Pieman CA. First west coast record and significant range extension.
Crassulaceae	<i>Crassula helmsii</i>	Recorded at Arthur-Pieman CA. Southernmost record for west coast.
Cyperaceae	<i>Oreobolus oligocephalus</i>	Recorded at Arthur-Pieman CA. Significant range extension; endemic.
Droseraceae	<i>Drosera murfetii</i>	Recorded at Arthur-Pieman CA. Significant NW range extension.
Epacridaceae	<i>Epacris corymbiflora</i>	Recorded at Savage River NP, Meredith Range RR, and Donaldson River Nature RA. Significant NW range extension; endemic.
Epacridaceae	<i>Leucopogon oreophilus</i>	Recorded at Arthur-Pieman CA. North westernmost record for Tasmania.
Escalloniaceae	<i>Tetracarpaea tasmannica</i>	Recorded at Savage River NP. Significant NW-ward range extension; endemic.
Fabaceae	<i>Melilotus indicus</i>	Recorded at Arthur-Pieman CA. First west coast record, significant range extension.
Fabaceae	<i>Oxylobium ellipticum</i>	Recorded at Donaldson River Nature RA. Significant NW range extension.
Gentianaceae	<i>Sebaea albidiflora</i>	Recorded at Arthur-Pieman CA. First west coast record.
Goodeniaceae	<i>Goodenia ovata</i>	Recorded at Arthur-Pieman CA. Significant NW range extension.
Juncaceae	<i>Juncus bulbosus</i>	Recorded at Arthur-Pieman CA. Significant NW range extension; exotic.

Family	Species	Comments
Liliaceae	<i>Astelia alpina</i> var. <i>alpina</i>	Recorded at Arthur-Pieman CA. Significant range extension, most westerly record.
Oleaceae	<i>Notelaea ligustrina</i>	Recorded at Arthur-Pieman CA. Westernmost record and first record from the west coast.
Oxalidaceae	<i>Oxalis magellanica</i>	Recorded at Savage River Pipeline RR. Significant NW range extension.
Poaceae	<i>Deyeuxia monticola</i>	Recorded at Arthur-Pieman CA and Savage River Pipeline RR. Westernmost record for Tasmania, significant NW range extension.
Poaceae	<i>Dichelachne rara</i>	Recorded at Arthur-Pieman CA. First record from the west coast.
Potamogetonaceae	<i>Potamogeton cheesemanii</i>	Recorded at Arthur-Pieman CA. First record from the west coast.
Rubiaceae	<i>Coprosma nitida</i>	Recorded at Arthur-Pieman CA. Westernmost record for Tasmania.
Rubiaceae	<i>Nertera granadensis</i>	Recorded at Arthur-Pieman CA. Significant NW range extension.
Bryophytes		
Amblystegiaceae	<i>Cratoneuropsis relaxa</i>	Recorded at Arthur-Pieman CA. Range extension.
Andreaeaceae	<i>Andreaea acuminata</i>	Recorded at Arthur-Pieman CA. Range extension.
Andreaeaceae	<i>Andreaea subulata</i>	Recorded at Meredith Range RR and Donaldson River Nature RA. Range extension.
Balantiopsidaceae	<i>Isotachis riparia</i>	Recorded at Meredith Range RR. Significant range extension (all other Tasmanian specimens from Cradle Mountain); endemic.
Bryaceae	<i>Gemmabryum clavatum</i>	Recorded at Arthur-Pieman CA. Range extension.
Calomniaceae	<i>Calomnion complanatum</i>	Recorded at Pieman River State Reserve. Range extension, uncommon in Tasmania.
Cephaloziellaceae	<i>Allisoniella nigra</i>	Recorded at Arthur-Pieman CA. Significant range extension.
Dicranaceae	<i>Campylopus appressifolius</i>	Recorded at Donaldson River Nature RA. Range extension.

Family	Species	Comments
Dicranaceae	<i>Campylopus bicolor</i>	Recorded at Donaldson River Nature RA. Range extension.
Fissidentaceae	<i>Fissidens leptocladus</i>	Recorded at Arthur-Pieman CA and Pieman River State Reserve. Range extension.
Geocalyceae	<i>Chiloscyphus cuspidatus</i>	Recorded at Pieman River State Reserve. Range extension, not well known in Tasmania.
Geocalyceae	<i>Heteroscyphus cymbalifer</i>	Recorded at Meredith Range RR. Range extension.
Herbertaceae	<i>Herbertus oldfieldianus</i>	Recorded at Arthur-Pieman CA. Range extension.
Hookeriaceae	<i>Calyptrochaeta brownii</i>	Recorded at Pieman River State Reserve. Very uncommon in Tasmania.
Lepidoziaceae	<i>Lepidozia serrulata</i>	Recorded at Arthur-Pieman CA, Pieman River State Reserve, and Savage River Pipeline RR. Range extension, only recently documented for Tasmania.
Seligeriaceae	<i>Blindia robusta</i>	Recorded at Arthur-Pieman CA. Range extension.
Lichens		
Arthoniaceae	<i>Arthonia sytnikii</i>	Recorded at Arthur-Pieman CA. New record for Tasmania.
Megalariaceae	<i>Megalaria planocarpa</i>	Recorded at Savage River NP and Savage River Pipeline RR. Locally common in the Tarkine rainforests; a new record for Tasmania, described from Bush Blitz Grant.
Parmeliaceae	<i>Menegazzia sanguinascens</i>	Recorded at Savage River Pipeline RR. Only the second record for Australasia; the first record was from the Tarkine (1981).
Roccellaceae	<i>Enterographa subgelatinosa</i>	Recorded at Arthur-Pieman CA. New record for Tasmania.
Roccellaceae	<i>Opegrapha spodopolia</i>	Recorded at Arthur-Pieman CA. Appears to be a first record for Australia of a NZ endemic.
Strigulaceae	<i>Strigula</i> sp.	Recorded at Arthur-Pieman CA.

Other points of interest

Fauna

Vertebrates

Fish

The remoteness of much of the Tarkine has meant that aquatic ecosystems in the region, particularly medium-sized river systems and upland reaches of larger rivers, have not been surveyed previously. In most instances, remote sites were accessed via helicopter and sites where fish have previously been sampled were accessible by 4WD vehicles.

The findings of the Bush Blitz indicate that rivers and streams which do not connect with the Arthur River, Pieman River or Henty River systems contain only native fish species (i.e. are trout-free). It appears that all of the coastal draining rivers north of the Pieman River and south of the Arthur River in the Arthur-Pieman Conservation Area (e.g. Lagoon River, Thornton River, etc.) are trout-free and contain only native fish species. A similar pattern is also likely in the coastal-draining streams between Trial Harbour and Granville Harbour, in Mount Heemskirk Regional Reserve (e.g. Tasman River). In addition, some upland streams in the Arthur River, Pieman River and Henty River systems (e.g. Yellow Creek and Rock River in the Meredith Range) appear to be trout-free. This appears the case particularly in reaches where high gradients or natural barriers to the upstream movement of Brown Trout (e.g. steep cascades or waterfalls) have prevented this species from establishing in these areas.

The absence of introduced Brown Trout and lack of substantial barriers to fish migration in many rivers in the region have provided suitable conditions for diverse (for Tasmania) native populations to persist in rivers in the Tarkine. A distinct longitudinal variation in fish community composition is apparent across the region, with more diverse and abundant fish communities present in the lower reaches of rivers. Larger-sized, older Climbing Galaxias (*Galaxias brevipinnis*) were more common at greater elevations, a pattern observed in other populations of Climbing Galaxias in western Tasmania⁹.

The natural status of the fish communities in these areas can be viewed as an environmental value; this natural status should be preserved. The translocation of introduced species, especially Brown Trout, into the Tarkine region should be avoided proactively. Similarly, longitudinal patterns in community composition will be influenced if fish passage in river systems is restricted by barriers that prevent species with migratory life histories and obligatory estuarine/marine life phases from moving up and down rivers to complete their life cycles.

Invertebrates

Butterflies, dragonflies and damselflies

The Tarkine area reserves offer a wide range of suitable habitat for both butterflies and odonates. Although there will have been some previous collecting of butterflies and odonates in the reserves, it is difficult to find precise and reliable records. Both groups include numerous species that are widespread in the west of the state, some of which favour habitats common in the reserves such as button-grass and rainforest edges. While some of the species recorded on the Bush Blitz are endemic to Tasmania, all are widespread.

⁹ Howland M, Davies P, Blühdorn D, Andrews D. 2001. Basslink Integrated Impact Assessment Statement – Potential Effects of Changes to Hydro Power Generation. Appendix 8: Gordon River Fish Assessment. Hydro Tasmania, Hobart, Tasmania.

Moths

The diversity of moths was moderately high, considering that they are seasonal and sampling at different times of year is needed to capture their full richness. Geometrids were the most numerous group collected on the Bush Blitz, which is not surprising given their dominance in the forest canopy.

The high diversity of Oecophoridae collected (22 species in 14 genera) may represent only a small proportion of this extremely abundant and rich group. Land managers should be aware of the sensitivity of oecophorids to fire, as this family plays an extremely important role in Australian forest ecosystems (i.e. leaf litter decomposition). Oecophorid diversity could be compromised by frequent fires.

A significant number of uncommon and rare species were collected during the survey. Uncommon geometrids included: *Drymoptila temenitis*, *Adeixis inostentata*, *Casbia rhodosceles* and *Austrocidaria erasta*. Two rarely seen species from other families included a member of the primitive family, Hepialidae, Splendid Ghost Moth (*Aenetus splendens*) and the striking hypertrophid, *Thudaca obliquella*.

An important find was that of the Tasmanian endemic tortricid *Epiphyas eucyrta*. This species is rare, seldom recorded since the original series of specimens were collected by A. J. Turner in the 1920s, and is the type species for the genus. It is therefore pivotal for the taxonomy of this economically important genus. The larvae are known to feed on *Melaleuca*.

Beetles

A relatively diverse Chrysomelinae fauna was encountered, representing 24% of the known Tasmanian fauna. However 35% of the Tasmanian beetle fauna with eucalypt hosts was encountered, including 50% of the Tasmanian *Paropsis* fauna. This is a high diversity considering the relative lack of diversity in the region's host plant flora.

Snails and slugs

An intact transitional and apparent hybrid zone was detected between *Pernagera kingstonensis* and an adjacent population of the coastal species *Pernagera officeri* near the mouth of the Interview River. This was not recorded before the Bush Blitz.

Flora

The high number of specimens collected reflected the wide variety of habitats, geology and aspect. Many new records were documented for each reserve, increasing the botanical knowledge of the area.

Within the reserves surveyed, the highest number of collections (280 taxa) was from Arthur-Pieman Conservation Area and the lowest (66 taxa) from the Pieman River State Reserve. This largely reflected the extent of survey effort in each reserve, as well as the relatively high diversity of habitats in the Arthur-Pieman Conservation Area.

Glossary

Bryophyte: a collective term for mosses, hornworts and liverworts.

Cryptic species (cryptospecies): species that are physically similar but genetically different and reproductively isolated from each other.

Ecological communities: unique and naturally occurring groups of plants and animals. Their presence can be determined by factors such as soil type, position in the landscape, climate and water availability.

Endemic: native to or limited to a certain region.

Exotic species: a species occurring outside its normal range.

Host plant: a species of plant that is used by larvae of insects as a place to feed and grow up.

Liverwort: a flowerless, spore-producing plant with the spores produced in small capsules.

Pest species: a species that has the potential to have a negative environmental, social or economic impact.

Putative new species: an unnamed species that, as far as can be ascertained, was collected for the first time during the Bush Blitz.

Range extension: increase in the known distribution or area of occurrence of a species.

Species range: the geographical area within which a particular species can be found.

Taxon (plural taxa): a member of any particular taxonomic group (e.g. a species, genus, family).

Taxonomy: the categorisation and naming of species. The science of identifying and naming species, as well as grouping them based on their relatedness.

Threatened: fauna or flora that are listed under Section 178 of the EPBC Act in any one of the following categories—extinct, extinct in the wild, critically endangered, endangered, vulnerable, conservation dependent.

Type locality: the location where the holotype (type specimen) was found.

Type specimen(s) (holotype, syntypes): the specimen, or set of specimens, on which the description and name of a new species is based.

Undescribed taxon: a taxon (usually a species) that has not yet been formally described or named.

Vascular plants: A lineage of plants that possess well-developed veins (vascular tissue) in their stems, roots and leaves. Vascular plants include the majority of familiar land plants: flowering plants, ferns, conifers, cycads and fern allies, but not mosses, liverworts or algae.

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Wildlife Recovery Program

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Tasmania

27 January–6 February 2015



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