

Stony Head Bush Blitz

Lepidoptera

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Nomenclature and taxonomy used in this report is consistent with:

The Australian Faunal Directory (AFD)

<http://www.environment.gov.au/biodiversity/abrs/online-resources/fauna/afd/home>

Contents

Contents.....	2
List of contributors.....	3
Abstract.....	4
1. Introduction.....	4
2. Methods.....	4
2.1 Site selection.....	4
2.2 Survey techniques.....	5
2.2.1 Methods used at standard survey sites.....	6
2.3 Identifying the collections.....	6
3. Results and Discussion.....	6
3.1 Un-named or not formalised taxa.....	7
3.2 Putative new species (new to science).....	8
3.3 Exotic and pest species.....	8
3.4 Threatened species.....	9
3.5 Range extensions.....	9
3.6 Genetic information.....	11
4. Information on species lists.....	11
5. Information for land managers.....	11
6. Other significant findings.....	11
7. Conclusions.....	11
Acknowledgements.....	12
References.....	13
Appendix 1. List of Lepidoptera recorded during the Stony Head Bush Blitz.....	14

List of contributors

List of contributors to this report.			
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Abstract

A survey of Lepidoptera was conducted as part of the Stony Head Bush Blitz in March 2021. A total of 1148 specimens have been recorded so far in TMAG's database, which comprise 283 taxa of 251 species with the rest identified to genus, tribe or family. The survey was conducted over 21 sites on the property covering as many different vegetation types as possible. Four species recognised as most likely new to science were collected. The same number of species were new records for the state and one for mainland Tasmania. Four rare species with large range extensions were also collected. This outstanding diversity of around 30% of the known Tasmanian lepidopteran fauna can be attributed to the significant ecological values of this property. Eleven native lepidopteran pests were recorded but none are considered to potentially invasive. The extreme abundance of the southern armyworm during the survey does not seem to have resulted in an outbreak of caterpillars this Spring in northern Tasmania.

1. Introduction

This Bush Blitz was conducted in March 2021 at the Stony Head Training Area (STHA), which is owned by the Department of Defence, and is located on the northern coast of Tasmania, almost due north of Launceston. It is part of the Flinders bioregion of Tasmania and consists of significant coastal regions and areas with gravel, sand and clay substrates. There is also a basalt fringe along the coast. The property contains a patchwork of vegetation types including dune, coastal heath and forested woodland.

The Lepidoptera, moths and butterflies, are one of the four most advanced and mega-diverse insect orders and comprises over 180,000 species of known species but at least that number again remain to be discovered or described. Australia's fauna are estimated at 10,000 described species but again at least that number again are believed to be undescribed. Tasmania's fauna is estimated at around 1000. In turn, the Geometridae are one of the largest families of the Lepidoptera with around 25,000 species globally and around 1300 species in about 300 genera in Australia. Known Tasmanian species number around 300. Stony Head has not been systematically surveyed for this or any other invertebrate groups.

Specimen-based distribution of Lepidoptera is important for our understanding of the diversity of geographical areas. These taxa are important bio-indicators for monitoring environmental effects such as climate change, which may alter the constituency of vegetation communities. The Geometridae, in particular, are widespread and abundant in southern Australia. Each species is closely affiliated with usually one host plant species. The diversity of this group, therefore, can be a direct estimate of the biodiversity of a geographical region.

This report covers the Lepidoptera component of the fauna survey conducted in this Bush Blitz.

2. Methods

2.1 Site selection

In general collection sites were selected to maximise representation of differing vegetation communities and land systems but recently burnt or logged sites were avoided. Site selection was refined to conform to the collecting schedule of other participating scientists and the availability of adequate roads to transport collecting equipment. Collection sites are listed in Table 1.

Table 1. List of 21 sites surveyed for Lepidoptera using light traps for the Stony Head Bush Blitz conducted in March 2021.

Site Name	Coordinates
Basalt quarry	-41.0153, 146.9617
Maitland Bay: western end	-40.9955, 147.0619
Majuba Track near junction with Strait Road SSS2	-41.0171, 147.0279
North East corner: Strait Road: roadside	-41.0171, 147.0279
North-South Road near junction with Majuba Track	-41.0446, 146.9774
North-South Road: 500 m N of Majuba Trail: vegetation edge	-41.0198, 147.0537
North-South Road: junction with Coastal Trail	-40.9906, 147.0207
North-South Road: North of gate before junction with Fuel Break Trail	-41.0171, 147.0279
North-South Road: South of gate before junction with Fuel Break Trail	-40.9859, 147.0029
North-South Road: 'Spider Plains South' to West	-41.0153, 146.9617
Perimeter Trail: junction with North-South Road	-40.9890, 147.0580
Perimeter Trail: Section 4	-41.0153, 146.9617
Quarry Road: East of Quarry Road	-41.0232, 147.0322
Quarry Road: Northeast of basalt quarry	-41.0153, 146.9617
Ryans East Trail: gully	-40.9943, 147.0564
Ryans Hill: summit area	-41.0299, 146.9812
Santa Barbara - North-South Rds junction - SSS1	-41.0438, 146.9862
Scale A Base Camp environs	-41.0310, 147.0080
Seaview Road: Sentry hut: dune hinterland	-41.0171, 147.0279
Strait Road: southern roadside	-41.0171, 147.0279
Southwest perimeter: gully	-41.0186, 147.0289

2.2 Survey techniques

Light traps for the collection of nocturnal moths consisted of portable bucket traps with an MV black light and *LepiLed* LED lights both powered by 12V batteries. The LED lights were operated for at least three hours, with a sheet as backdrop, to allow targeted collection of species before attaching a mesh net under the light to collect specimens until morning. The *LepiLed* lights emit light frequencies in the UV, blue and green part of the light spectrum, which correspond to peak sensitivity in most lepidopteran eye receptors. Light traps were deployed at night at the collection sites listed in **Table 1** to survey as many different plant communities as possible.

Day-flying moths were collected opportunistically at some sites during the day using hand-held butterfly nets. Live specimens were usually killed in an ammonium hydroxide killing jar before mounting them on setting boards. Specimens were then removed from the setting boards once fully set (after at least one week) and stored in temporary storage boxes before moving to the TMAG collection store.

2.2.1 Methods used at standard survey sites

The methods outlined above in Section 2.2 were used to survey the two standard survey sites, SSS1 and SSS2 *i.e.* *LepiLed* lights and sheet for approximately three hours, and then with a trap to collect specimens until morning, and a portable, black light, bucket trap left running overnight. The time of year greatly influences the suite of moth species collected so for any subsequent surveying to be replicable it would need to be conducted in autumn.

2.3 Identifying the collections

Moths were identified either during or after the survey period by drawing on the author's expertise, referring to reference material and comparison with the following reference insect collections: TMAG and the Department of Primary Industries, Parks, Water and the Environment (DPIPWE). Peter McQuillan (University of Tasmania) assisted with some identifications. Reference books and publications utilised were Common (1990), Semmens *et al.* (1992), Zborowski and Edwards (2007), Young (2008), Marriott (2008, -9, -11, -12, & -17), Byrne (2013), McMillan (2013), Hewish (2014, -16), Kallies (2015), Marriott *et al.* (2020). Photographs of many species were taken of species *in situ* by the author using a Canon PowerShot SX60 HS with a Raynox microscopic lens (model M-150).

Nomenclature of undescribed and new species

Undescribed or new species are annotated with a specific epithet. For example in cases where a species is known to be undescribed, but cannot be identified in other collections such as the Australian National Insect Collection (CSIRO, ACT) (ANIC), the author calls it a unique name such as, *Phaos* sp. TMAG_12345. In the other case, where it can be associated with other collection material, the same epithet will be adopted, e.g. "*Leucania* sp. ANIC No. 2". Note that I was not able to visit ANIC this year because of border restrictions to confirm species identifications and confidently identify some species as new to science. It is likely that once this occurs more will be identified as new in the future.

Specimens that can only be identified down to genus, at this stage, will be labelled as such with the genus name only, apart from species in this category that can be differentiated as different species. The latter will be given an epithet as above. However these species will all be listed in the new records table (as all species collected as far as I know are new records).

3. Results and Discussion

Appendix 1 lists all Lepidoptera taxa and Appendix 2 all specimens recorded during the Bush Blitz. Collections made during this Bush Blitz to date will result in 1148 specimens being added to public collections and an equivalent number of records added to publicly accessible databases.

3.1 Un-named or not formalised taxa

Un-named or unformalised Lepidoptera (33 taxa) are listed in Table 2. In most cases these are taxa that are widely recognised as undescribed but some assignments are tentative and putative because they have not been checked against other authoritative collections such as ANIC, or are from groups that are poorly known or those for which I have little experience or knowledge.

Table 2. Putatively un-named or not formalised taxa of Lepidoptera collected on the Tasmanian, Stony Head, Bush Blitz Survey, March 2021.	
Taxon	Comment
<i>Pterolocera</i> sp TMAG_F8027	Anthelidae
<i>Hednota</i> ANIC sp 08	Crambidae. Identified from specimens in ANIC
<i>Eutorna</i> sp TMAG_F120625	Depressariidae
Lithosiini unplaced sp TMAG_F120587	Erebidae
Lithosiini unplaced sp TMAG_F120588	Erebidae. This species is endemic to Tasmania and likely to be a new genus and species.
Lithosiini unplaced sp TMAG_F120599	Erebidae
<i>Palaeosia</i> sp. (1)	Erebidae. The epithet is taken from Marriott (2009).
<i>Scoliacma</i> sp TMAG_F030233	Erebidae
<i>Scoliacma</i> sp TMAG_F030235	Erebidae
<i>Pycnobathra</i> sp TMAG_F120546	Gelechiidae
Hydriomenini unplaced nr <i>severata</i>	Geometridae
<i>Scioglyptis</i> BB 2010 sp CB02	Geometridae
<i>Scioglyptis</i> BB Bruny sp CB01	Geometridae
<i>Neumichtis</i> DPILH <i>aplectoides</i>	Noctuidae. Identified from specimens held at the DPIPWE insect collection
Acronictinae unplaced sp TMAG_F120549	Noctuidae. This large acronictine has defied my attempts to identify it despite exhausting every reference available. It may be new, but I'm reluctant to assign it as such without investigating ANIC.
<i>Thoracolopha</i> sp nr <i>flexirena</i>	Noctuidae.
<i>Nola</i> sp TMAG_F019926	Nolidae
<i>Nola</i> sp TMAG_F029902	Nolidae
<i>Nola</i> sp TMAG_F030604	Nolidae
<i>Nola</i> sp TMAG_F099662	Nolidae
Notodontidae unplaced sp. (1)	This is a known, large, undescribed notodontid species. The epithet is taken from Marriott (2008)
<i>Agriophara</i> sp TMAG_F120582	Oecophoridae.
<i>Garrha</i> sp TMAG_F120585	Oecophoridae.
<i>Garrha</i> sp TMAG_F120612	Oecophoridae.

Table 2. Putatively un-named or not formalised taxa of Lepidoptera collected on the Tasmanian, Stony Head, Bush Blitz Survey, March 2021.

<i>Oxythecta</i> sp TMAG_F120624	Oecophoridae.
<i>Philobota</i> sp TMAG_F120598	Oecophoridae.
<i>Telanepsia</i> sp TMAG_F120618	Oecophoridae.
<i>Telanepsia</i> sp TMAG_F120621	Oecophoridae.
<i>Capua</i> sp TMAG_F058299	Tortricidae
<i>Holocola</i> ANIC sp10	Tortricidae. Identified from specimens in ANIC
<i>Holocola</i> sp TMAG_F120527	Tortricidae.
<i>Isochorista</i> sp TMAG_F120533	Tortricidae.
<i>Isochorista</i> sp TMAG_F120543	Tortricidae.

3.2 Putative new species (new to science)

In this report, 'putative new species' means an unnamed species that, as far as can be ascertained, was identified as a new species as a direct result of this Bush Blitz. The following four species were identified as probably new to science (Table 3).

Table 3. Putative new species (new to science) of Lepidoptera collected on the Tasmanian Stony Head, Bush Blitz Survey, March 2021.

Species	Comment
<i>Philenora</i> nr sp TMAG_F108002	Erebidae. Possibly new to science
<i>Pycnobathra</i> sp TMAG_F120546	Gelechiidae. Possibly new to science
<i>Xylorycta</i> cf. <i>micracma</i>	Xyloryctidae. This species is very similar to <i>X. micracma</i> but cannot be found in McMillan's comprehensive online descriptions of Australian Xyloryctidae (McMillan 2013). I am tentatively listing it here as new to science.
<i>Leistarcha</i> sp TMAG_F118192	Xyloryctidae. One other specimen of this species has been collected previously by this author on the East Coast of Tasmania but has not yet been recognised as new until this Bush Blitz. It was not found in McMillan's comprehensive online descriptions of Australian Xyloryctidae (McMillan 2013).

3.3 Exotic and pest species

A total of 11 native species that are considered to be agricultural pests were recorded at Stony Head five of which belong to the large family Noctuidae (five species). All species occurred in low numbers except for southern armyworm (*Persectania ewingii*), which was extremely abundant and widespread across the property, and the tortricid, Guava bud moth (*Strepsicrates ejectana*), which was collected in large numbers but was less widespread. Southern armyworm is a ubiquitous agricultural pest in Tasmania and its abundance came as no surprise. The high numbers of adults reported here in Autumn does not seem to have resulted in an outbreak this Spring in northern Tasmania. The bud moth was most likely feeding on a known host, *Leptospermum*, and is very unlikely to be considered a pest or exert any kind of ecological impact in this area. Similarly none of the other species are likely to cause any noticeable impact.

Fall armyworm (*Spodoptera frugiperda*), a highly damaging and invasive agricultural pest, which recently invaded northern Australia in 2020 and has now been recorded as far south as Victoria, was not detected. No other exotic Lepidoptera were recorded in this Bush Blitz.

Table 4. Agricultural pest Lepidoptera recorded on the Tasmanian Stony Head, Bush Blitz Survey, March 2021. For details of sites see Appendix 2. .

Exotic/pest species	Location sighted/observed	Indication of abundance	Comments
<i>Achyra affinalis</i> (cotton web spinner) (Crambidae)	Collected from four sites	9 specimens	This is a very common native species and is considered an agricultural pest in crops such as alfalfa, flax, cotton and sorghum. It is strongly migratory and specimens are likely to have originated from mainland Australia.
<i>Culladia cuneiferellus</i> (Crambidae)	Base Camp	Rare, only one specimen collected from one site	Native. Feeds on various grasses. Considered a pest in lawns and pastures.
<i>Pantylidia sparsa</i> (Erebidae)	Collected from three sites	Low (3 specimens)	Native. Larvae feed on Alfalfa/Lucerne (<i>Medicago sativa</i>)
<i>Agrotis infusa</i> (bogong moth) (Noctuidae)	Collected from three sites	Low (3 specimens)	Native. Pest on a wide variety of agricultural crops. Migratory.
<i>Bathytricha truncata</i> (sugarcane stem borer) (Noctuidae)	Collected from four sites	Low (5 specimens)	Native. Caterpillars are an agricultural pest, attacking a variety of plants from the family Poaceae.
<i>Diarsia intermixta</i> (chrebron cutworm) (Noctuidae)	Collected from four sites	Low (4 specimens)	Native. The caterpillar is a pest in Tasmania on turnips (<i>Brassica rapa</i>)
<i>Persectania ewingii</i> (southern armyworm) (Noctuidae)	Collected and/or observed at most sites. Widespread.	Extremely abundant	Native. The caterpillar is an agricultural pest, causing damage to many pastures and crops.
<i>Proteuxoa sanguinipuncta</i> (Noctuidae)	Collected from four sites	Low (5 specimens)	Native. Minor pasture pest.
<i>Philobota productella</i> (pasture tunnel moth) (Oecophoridae)	Base Camp	Low (5 specimens) from only on site	Native. The species is a pest because in large numbers the caterpillars are inclined to kill the plants on which they feed. Host plants include wheat, barley and rye grass.
<i>Epiphyas postvittana</i> (lightbrown applemoth) (Tortricidae)	North-South Road: 500m North of Majuba trail	Only 1 specimen	Native. The pest status of this insect in horticultural crops is very significant as it is extremely polyphagous and invasive. It is widespread in Australia.
<i>Strepsicrates ejectana</i> (Guava bud moth) (Tortricidae)	Collected from six sites	Abundant. 25 specimens collected.	Native. Considered to be a pest of Guava. Also feeds on <i>Leptospermum</i> , which would explain its abundance here.

3.4 Threatened species

No listed vulnerable, threatened or endangered species of Lepidoptera were observed or collected during the survey.

3.5 Range extensions

Range extensions and new records of Lepidoptera recorded at Stony Head are listed in Table 5, with the caveat that Lepidoptera in many areas in Tasmania are poorly surveyed. Five of

these species are apparently new records for Tasmania, with one a new record for mainland Tasmania only. The other four are most likely range extensions of rare species previously recorded in Tasmania.

Table 5. Range extensions or significant infill in distribution records for species of Lepidoptera recorded on the Tasmanian Stony Head, Bush Blitz Survey, March 2021. For details of sites see Appendix 3 .

Species	Location sighted/observed	Distance from nearest known record (km)	Comments
<i>Astrapometis saburalis</i> (Pyralidae)	Three sites (see Appendix 2)	Approx. 200 km	Three specimens. Probably first record for mainland Tasmania – rare. One record known from Flinders Island
<i>Calamotropha leptogrammellus</i> (grass webworm) (Crambidae)	Southwest perimeter: gully	Approx. 300 km	One specimen only. New record for Tasmania. Quite possibly a migratory species with vagrant status.
<i>Chiriphe dichotoma</i>	Base Camp, Stony Head	Approx. 300 km	One specimen only. New record for Tasmania. Nearest records are in Victoria.
<i>Chrysolarentia adornata</i> (Geometridae)	Base Camp, Stony Head	Approx. 200 km	One specimen only. One other record in TMAG collection at the Meredith Range, Tasmania in 2015.
<i>Copidoris dimorpha</i> (Xyloryctidae)	Four sites	Approx. 300 km	Six specimens. Most likely a new record for Tasmania. Nearest records are in Victoria.
<i>Discophlebia lucasii</i> (Oenosandridae)	Strait Road: southern roadside	Approx. 300 km	One specimen only. New record for Tasmania. Nearest records are in Victoria.
<i>Ectropis calida</i> (Geometridae)	Perimeter Trail - junction with North-South Road	Approx. 100 km	One specimen only. Appears to be rare with other records in Tasmania observational only
<i>Hednota hoplitellus</i> (Crambidae)	Widely spread at six sites	Approx. 150 km.	15 specimens collected. Records are very uncommon in Tasmania with apparently only one other, observational record, from Binalong Bay on the East Coast in March 2019.
<i>Xylorycta calligramma</i> (Xyloryctidae)	SSS1	Approx. 200 km.	One specimen only. This is a rare species that previously had only been collected in Hobart in 1934 and 1938, until

Table 5. Range extensions or significant infill in distribution records for species of Lepidoptera recorded on the Tasmanian Stony Head, Bush Blitz Survey, March 2021. For details of sites see Appendix 3 .

			2018 when it was collected by the author at Spring Bay on the east coast of Tasmania.
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3.6 Genetic information

No genetic sampling was undertaken on specimens collected.

4. Information on species lists

A total of 283 taxa from 26 families of Lepidoptera were collected at the Stony Head Bush Blitz in March, 2021 (Appendix 1). The majority, 251, were identified to species. From the remainder, 16 were identified to genus, three to tribe, one to subfamily and 12 to the family level only (See Appendix 1). Identifying species and confirming new species were especially challenging this year as I could not access the Lepidoptera section of ANIC. This is the most comprehensive collection in Australia, containing many Tasmanian records, and is invaluable as a voucher resource. Also, there are still a further approx. 100 specimens from the survey that I have not yet had time to examine and identify. This means that more new species and identifications of species in general will occur in the future. All of these updates will be captured in the *Atlas of Living Australia*.

5. Information for land managers

The Stony Head training Area has largely been protected for many decades from significant vegetation clearing and consequently has retained important natural values. Wetlands, heathlands and coastal habitats all are worthy of protection considering their high ecological value in Tasmania. Areas that showed the most diversity in Lepidoptera from this survey were firstly the patches of woodland around Base Camp (87 taxa) and secondly the heathy woodland around SSS1 (78). Lepidoptera diversity is directly proportional to plant diversity as many moths feed only on one plant species. This means that areas of floral diversity are extremely important in maintaining moth and other insect diversity.

6. Other significant findings

This snapshot of Lepidoptera of this area represents around 30% of the known Tasmania fauna, which is surprisingly rich, as a survey conducted mainly in Autumn, can only capture seasonal fauna. Having said that some species were collected on one night in November 2020 so some Spring fauna is represented here. Surveying in the north of the state seems to often yield a significant number of new and rare records for the state (Table 5), highlighting the importance of comprehensive surveys to attain a better understanding of Tasmanian biodiversity.

7. Conclusions

Stony Head is an area of outstanding lepidopteran diversity in Tasmania. With careful management, this property will continue to be an oasis for insect species in this state. The discovery of new and rare species, and new records for the state highlights the importance of biodiversity surveys such as Bush Blitz. The overall documentation of flora and fauna undertaken in this survey contributes enormously to our understanding of the biology of Tasmania.

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References

- Byrne, C. J. (2013) Geometridae. Australian Faunal Directory, Australian Biological Resources Study, Canberra. Available from: <http://www.environment.gov.au/biodiversity/abrs> (May 2014).
- Common, I. F. B. (1990) *Moths of Australia*. Melbourne University Press, Carlton, Victoria.
- Hewish, M. (2014) *Moths of Victoria – (Part 5) Satin Moths and Allies Geometroidea (A)*. Entomological Society of Victoria.
- Hewish, M. (2016) *Moths of Victoria – (Part 7) Bark Moths & Allies – Geometroidea (D) – Geometridae – Ennominae – Small Tribes Uraniidae*. Entomological Society of Victoria.
- Kallies, A. (2015) *Moths of Victoria – (Part 6) Ghost Moths – Hepialidae and Allies*. Entomological Society of Victoria.
- McMillan, I. (2013) *Xyloryctine Moths of Australia*. Imbil, Queensland.
<http://xyloryctinemothsofaustralia.blogspot.com/>. Accessed April-December 2021.
- Marriott, P. (2008) *Moths of Victoria – (Part 1) Silk Moths and Allies: Bombycoidea – Revised edition*. Entomological Society of Victoria.
- Marriott, P. (2009) *Moths of Victoria – (Part 2) Tiger Moths & Allies Noctuoidea (A)*. 2009. Entomological Society of Victoria.
- Marriott, P. (2011) *Moths of Victoria – (Part 3) Waves and Carpets and allies Geometroidea (C)*. Entomological Society of Victoria.
- Marriott, P. (2012) *Moths of Victoria – (Part 4) Emeralds and Allies Geometridae (B)*. Entomological Society of Victoria.
- Marriott, P. (2017) *Moths of Victoria – (Part 8) Night Moths and Allies – Noctuoidea (B) Aganidae, Erebidae (Part), Noctuidae (Part)*. Entomological Society of Victoria.
- Marriott, P., Hewish, M., Powers, C., Edwards, T., Kallies, A. and Williams, S. (2020) *Moths of Victoria – (Part 9) Cutworms & Allies — Noctuoidea (C)*. Entomological Society of Victoria.
- Zborowski, P. & Edwards, E. (2007) *A Guide to Australian Moths*. CSIRO Publishing, Collingwood, Victoria, Australia.

Appendix 1. List of Lepidoptera recorded during the Stony Head Bush Blitz						
Family	Species	Common name	Putative new species	Threatened (EPBC Act)	Threatened (State Act)	Exotic/pest
Anthelidae	<i>Anthela ferruginosa</i>		No	No	No	No
Anthelidae	<i>Anthela protocentra</i>		No	No	No	No
Anthelidae	<i>Pterolocera amplicornis</i>		No	No	No	No
Anthelidae	<i>Pterolocera</i> sp TMAG_F8027		No	No	No	No
Carposinidae	<i>Carposina latebrosa</i>		No	No	No	No
Carposinidae	<i>Carposina tanaoptera</i>		No	No	No	No
Cosmopterigidae	<i>Cosmopterigidae</i> unplaced sp TMAG_F120547		No	No	No	No
Cosmopterigidae	<i>Cosmopterigidae</i> unplaced sp TMAG_F120552		No	No	No	No
Cosmopterigidae	<i>Cosmopterigidae</i> unplaced sp TMAG_F120559		No	No	No	No
Cosmopterigidae	<i>Cosmopterigidae</i> unplaced sp TMAG_F120563		No	No	No	No
Cosmopterigidae	<i>Macrobathra nephelomorpha</i>		No	No	No	No
Cossidae	<i>Idioses littleri</i>		No	No	No	No
Crambidae	<i>Achyra affinitalis</i>	cotton web spinner	No	No	No	Yes/pest
Crambidae	<i>Calamotropha leptogrammellus</i>		No	No	No	No
Crambidae	<i>Corynophora lativittalis</i>		No	No	No	No
Crambidae	<i>Culladia cuneiferellus</i>		No	No	No	Yes/pest
Crambidae	<i>Eclipsiodes</i> unplaced		No	No	No	No
Crambidae	<i>Eudonia cleodoralis</i>		No	No	No	No
Crambidae	<i>Hednota acontophora</i>		No	No	No	No
Crambidae	<i>Hednota</i> ANIC sp 08		No	No	No	No
Crambidae	<i>Hednota bivittella</i>		No	No	No	No
Crambidae	<i>Hednota grammellus</i>		No	No	No	No
Crambidae	<i>Hednota hoplitellus</i>		No	No	No	No
Crambidae	<i>Hednota megalarcha</i>		No	No	No	No
Crambidae	<i>Hednota pedionoma</i>		No	No	No	No
Crambidae	<i>Hednota relatalis</i>		No	No	No	No
Crambidae	<i>Hygraula nitens</i>		No	No	No	No
Crambidae	<i>Metasia capnochroa</i>		No	No	No	No

Family	Species	Common name	Putative new species	Threatened (EPBC Act)	Threatened (State Act)	Exotic/pest
Crambidae	Musotima ochropteralis		No	No	No	No
Crambidae	Nechilo macrogona		No	No	No	No
Crambidae	Parapoynx euryscia		No	No	No	No
Crambidae	Ptochostola microphaeellus		No	No	No	No
Crambidae	Pyraustinae unplaced		No	No	No	No
Crambidae	Scoparia anaplecta		No	No	No	No
Crambidae	Scoparia exhibitalis		No	No	No	No
Crambidae	Scoparia ochrophara		No	No	No	No
Crambidae	Scoparia oxygona		No	No	No	No
Crambidae	Scoparia plagiotis		No	No	No	No
Crambidae	Scoparia spelaea		No	No	No	No
Crambidae	Scopariinae unplaced		No	No	No	No
Crambidae	Tawhitia pentadactylus		No	No	No	No
Crambidae	Tipanaea patulella	rush moth	No	No	No	No
Crambidae	Uresiphita ornithopteralis	tree lucerne moth	No	No	No	No
Depressariidae	Eutorna eurygramma		No	No	No	No
Depressariidae	Eutorna sp TMAG_F120625		No	No	No	No
Depressariidae	Pedois lewinella		No	No	No	No
Erebidae	Acyphas semiochrea		No	No	No	No
Erebidae	Ardices glatignyi	black and white tiger moth	No	No	No	No
Erebidae	Asura cervicalis		No	No	No	No
Erebidae	Castulo doubledayi		No	No	No	No
Erebidae	Chiriphe dichotoma		No	No	No	No
Erebidae	Dasypodia selenophora	southern old lady moth	No	No	No	No
Erebidae	Epicyrtica lichenophora		No	No	No	No
Erebidae	Halone sejuncta		No	No	No	No
Erebidae	Lithosiini unplaced sp TMAG_F120587		No	No	No	No
Erebidae	Lithosiini unplaced sp TMAG_F120588		No	No	No	No
Erebidae	Lithosiini unplaced sp TMAG_F120599		No	No	No	No
Erebidae	Palaeosia bicosta		No	No	No	No

Family	Species	Common name	Putative new species	Threatened (EPBC Act)	Threatened (State Act)	Exotic/pest
Erebidae	Palaeosia sp. (1)		No	No	No	No
Erebidae	Pantylidia sparsa		No	No	No	Yes/pest
Erebidae	Phaeophlebosia furcifera		No	No	No	No
Erebidae	Philenora nr sp TMAG_F108002		Yes	No	No	No
Erebidae	Praxis edwardsii		No	No	No	No
Erebidae	Rhapsa suscitatalis		No	No	No	No
Erebidae	Scoliacma sp TMAG_F030233		No	No	No	No
Erebidae	Scoliacma sp TMAG_F030235		No	No	No	No
Erebidae	Thallarcha jocularis		No	No	No	No
Erebidae	Utetheisa pulchelloides	heliotrope moth	No	No	No	No
Gelechiidae	Gelechiidae unplaced sp TMAG_F120564		No	No	No	No
Gelechiidae	Gelechiidae unplaced sp TMAG_F120565		No	No	No	No
Gelechiidae	Gelechiidae unplaced sp TMAG_F120569		No	No	No	No
Gelechiidae	Gelechiidae unplaced sp TMAG_F120570		No	No	No	No
Gelechiidae	Gelechiidae unplaced sp TMAG_F120571		No	No	No	No
Gelechiidae	Gelechiidae unplaced sp TMAG_F120572		No	No	No	No
Gelechiidae	Gelechiidae unplaced sp TMAG_F120573		No	No	No	No
Gelechiidae	Gelechiidae unplaced sp TMAG_F120574		No	No	No	No
Gelechiidae	Pycnobathra sp TMAG_F120546		Yes	No	No	No
Geometridae	Amelora leucaniata		No	No	No	No
Geometridae	Amelora zophopasta		No	No	No	No
Geometridae	Anachloris subochraria		No	No	No	No
Geometridae	Anachloris uncinata		No	No	No	No
Geometridae	Androchela milvaria		No	No	No	No
Geometridae	Authaemon stenonipha		No	No	No	No
Geometridae	Casbia melanops		No	No	No	No
Geometridae	Cassythaphaga macarta		No	No	No	No
Geometridae	Chlenias auctaria		No	No	No	No
Geometridae	Chloroclystis filata		No	No	No	No
Geometridae	Chlorocoma cadmaria		No	No	No	No

Family	Species	Common name	Putative new species	Threatened (EPBC Act)	Threatened (State Act)	Exotic/pest
Geometridae	<i>Chlorocoma carenaria</i>		No	No	No	No
Geometridae	<i>Chlorodes boisduvalaria</i>		No	No	No	No
Geometridae	<i>Chrysolarentia adornata</i>		No	No	No	No
Geometridae	<i>Chrysolarentia leucophanes</i>		No	No	No	No
Geometridae	<i>Chrysolarentia vicissata</i>		No	No	No	No
Geometridae	<i>Crypsiphona occultaria</i>		No	No	No	No
Geometridae	<i>Crypsiphona tasmanica</i>		No	No	No	No
Geometridae	<i>Dichromodes stilbiata</i>		No	No	No	No
Geometridae	<i>Didymoctenia exsuperata</i>		No	No	No	No
Geometridae	<i>Dissomorphia australiaria</i>		No	No	No	No
Geometridae	<i>Ectropis calida</i>		No	No	No	No
Geometridae	<i>Ectropis excursaria</i>		No	No	No	No
Geometridae	Ennominae unplaced tetramera		No	No	No	No
Geometridae	<i>Epidesmia hypenaria</i>		No	No	No	No
Geometridae	<i>Epyaxa centroneura</i>		No	No	No	No
Geometridae	<i>Epyaxa epia</i>		No	No	No	No
Geometridae	<i>Epyaxa subidaria</i>		No	No	No	No
Geometridae	<i>Eucyclodes insperata</i>		No	No	No	No
Geometridae	<i>Euloxia meandraria</i>		No	No	No	No
Geometridae	<i>Fisera dictyodes</i>		No	No	No	No
Geometridae	<i>Furcatrox furneauxi</i>		No	No	No	No
Geometridae	<i>Gastrinodes bitaeniaria</i>		No	No	No	No
Geometridae	Geometrinae unplaced melanoglypta		No	No	No	No
Geometridae	Hydriomenini unplaced nr severata		No	No	No	No
Geometridae	Hydriomenini unplaced severata		No	No	No	No
Geometridae	Hydriomenini unplaced trygodes		No	No	No	No
Geometridae	<i>Hypobapta percomptaria</i>		No	No	No	No
Geometridae	<i>Idaea costaria</i>		No	No	No	No
Geometridae	<i>Idaea inversata</i>		No	No	No	No
Geometridae	<i>Idiodes apicata</i>		No	No	No	No

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Geometridae	Lithinini unplaced ada		No	No	No	No
Geometridae	Lithinini unplaced biplaga		No	No	No	No
Geometridae	Melanodes anthracitaria		No	No	No	No
Geometridae	Melitulias glandulata		No	No	No	No
Geometridae	Microdes diplodonta		No	No	No	No
Geometridae	Microdes villosata		No	No	No	No
Geometridae	Mictodoca toxauta		No	No	No	No
Geometridae	Mixochroa gratiosata		No	No	No	No
Geometridae	Monoctenia falernaria		No	No	No	No
Geometridae	Niceteria macrocosma		No	No	No	No
Geometridae	Nisista serrata		No	No	No	No
Geometridae	Palleopa innotata		No	No	No	No
Geometridae	Paralaea taggorum		No	No	No	No
Geometridae	Phelotis cognata		No	No	No	No
Geometridae	Plesanemma fucata		No	No	No	No
Geometridae	Poecilasthena anthodes		No	No	No	No
Geometridae	Poecilasthena pulchra		No	No	No	No
Geometridae	Prasinocyma semicrocea		No	No	No	No
Geometridae	Psilosticha pristis		No	No	No	No
Geometridae	Rhynchopsota delogramma		No	No	No	No
Geometridae	Scioglyptis lyciaria		No	No	No	No
Geometridae	Scioglyptis sp CB01		No	No	No	No
Geometridae	Scioglyptis sp CB02		No	No	No	No
Geometridae	Scopula optivata		No	No	No	No
Geometridae	Scopula perlata		No	No	No	No
Geometridae	Scopula rubraria		No	No	No	No
Geometridae	Stibaroma melanotoxa		No	No	No	No
Geometridae	Syneora mundifera		No	No	No	No
Geometridae	Taxeotis intextata		No	No	No	No
Geometridae	Thalaina inscripta		No	No	No	No

Family	Species	Common name	Putative new species	Threatened (EPBC Act)	Threatened (State Act)	Exotic/pest
Geometridae	Thalaina selenaea		No	No	No	No
Geometridae	Xanthorhoe vacuaria		No	No	No	No
Glyphipterigidae	Glyphipterix unplaced		No	No	No	No
Gracillariidae	Acrocercops laciniella		No	No	No	No
Hepialidae	Abantiades hyalinatus		No	No	No	No
Hepialidae	Abantiades labyrinthicus		No	No	No	No
Hepialidae	Abantiades mcquillani		No	No	No	No
Hepialidae	Fraus nanus		No	No	No	No
Hepialidae	Fraus simulans	lesser ghost moth	No	No	No	No
Hepialidae	Fraus unplaced		No	No	No	No
Hypertrophidae	Thudaca obliquella		No	No	No	No
Lasiocampidae	Entometa apicalis		No	No	No	No
Lasiocampidae	Pararguda nana		No	No	No	No
Lasiocampidae	Pararguda nasuta		No	No	No	No
Lasiocampidae	Pararguda rufescens		No	No	No	No
Lasiocampidae	Porela albifinis		No	No	No	No
Lasiocampidae	Porela subfasciata		No	No	No	No
Lycaenidae	Theclinesstes serpentatus	chequered or saltbush blue	No	No	No	No
Lycaenidae	Zizina otis labradus	common grass-blue	No	No	No	No
Noctuidae	"Neumichtis DPILH aplectoides"		No	No	No	No
Noctuidae	Acronictinae unplaced sp TMAG_F120549		No	No	No	No
Noctuidae	Agrotis infusa	bogong moth	No	No	No	Yes/pest
Noctuidae	Agrotis porphyricollis		No	No	No	No
Noctuidae	Athetis tenuis		No	No	No	No
Noctuidae	Bathytricha truncata	sugarcane stem borer	No	No	No	Yes/pest
Noctuidae	Ctenoplusia albostriata		No	No	No	No
Noctuidae	Dasygaster melambaphes		No	No	No	No
Noctuidae	Diarsia intermixta	chrevron cutworm	No	No	No	Yes/pest
Noctuidae	Ectopatria unplaced		No	No	No	No
Noctuidae	Hadenini unplaced species inquirenda exarans		No	No	No	No

Family	Species	Common name	Putative new species	Threatened (EPBC Act)	Threatened (State Act)	Exotic/pest
Noctuidae	Hadenini unplaced species inquirenda ligniplena		No	No	No	No
Noctuidae	Neumichtis spumigera		No	No	No	No
Noctuidae	Persectania ewingii	southern armyworm	No	No	No	Yes/pest
Noctuidae	Proteuxoa atra		No	No	No	No
Noctuidae	Proteuxoa bistrigula		No	No	No	No
Noctuidae	Proteuxoa cinereicollis		No	No	No	No
Noctuidae	Proteuxoa cyanoloma		No	No	No	No
Noctuidae	Proteuxoa hydraecioides		No	No	No	No
Noctuidae	Proteuxoa melanographa		No	No	No	No
Noctuidae	Proteuxoa sanguinipuncta		No	No	No	Yes/pest
Noctuidae	Proteuxoa senta		No	No	No	No
Noctuidae	Proteuxoa tibiata		No	No	No	No
Noctuidae	Proteuxoa tortisigna		No	No	No	No
Noctuidae	Thoracolopha sp nr flexirena		No	No	No	No
Nolidae	Elesma subglauca		No	No	No	No
Nolidae	Nola sp TMAG_F019926		No	No	No	No
Nolidae	Nola sp TMAG_F029902		No	No	No	No
Nolidae	Nola sp TMAG_F030604		No	No	No	No
Nolidae	Nola sp TMAG_F099662		No	No	No	No
Nolidae	Uraba lugens		No	No	No	No
Notodontidae	Aglaosoma periblepta		No	No	No	No
Notodontidae	Epicoma melanospila		No	No	No	No
Notodontidae	Gallaba eugraphes		No	No	No	No
Notodontidae	Gallaba ochropepla		No	No	No	No
Notodontidae	Hobartina amblyiodes		No	No	No	No
Notodontidae	Notodontidae unplaced sp. (1)		No	No	No	No
Nymphalidae	Heteronympha merope	common brown	No	No	No	No
Nymphalidae	Heteronympha penelope	shouldered brown	No	No	No	No
Oecophoridae	Agriophara dyscapna		No	No	No	No
Oecophoridae	Agriophara platyscia		No	No	No	No

Family	Species	Common name	Putative new species	Threatened (EPBC Act)	Threatened (State Act)	Exotic/pest
Oecophoridae	Agriophara sp TMAG_F120582		No	No	No	No
Oecophoridae	Archaereta dorsivittella		No	No	No	No
Oecophoridae	Catoryctis unplaced		No	No	No	No
Oecophoridae	Copidoris dimorpha		No	No	No	No
Oecophoridae	Cosmaresta charaxias		No	No	No	No
Oecophoridae	Euchaetis parthenopa		No	No	No	No
Oecophoridae	Garrha leucerythra		No	No	No	No
Oecophoridae	Garrha miltopsara		No	No	No	No
Oecophoridae	Garrha pudica		No	No	No	No
Oecophoridae	Garrha sp TMAG_F120585		No	No	No	No
Oecophoridae	Garrha sp TMAG_F120612		No	No	No	No
Oecophoridae	Garrha unplaced		No	No	No	No
Oecophoridae	Guestia unplaced		No	No	No	No
Oecophoridae	Leistarcha sp TMAG_F118192		Yes	No	No	No
Oecophoridae	Oxythecta hieroglyphica		No	No	No	No
Oecophoridae	Oxythecta nephelonota		No	No	No	No
Oecophoridae	Oxythecta sp TMAG_F120624		No	No	No	No
Oecophoridae	Pellopsis aerodes		No	No	No	No
Oecophoridae	Philobota argotoxa		No	No	No	No
Oecophoridae	Philobota productella	pasture tunnel moth	No	No	No	Yes/pest
Oecophoridae	Philobota sp TMAG_F120598		No	No	No	No
Oecophoridae	Scatochresis episema		No	No	No	No
Oecophoridae	Scieropepla polyxesta		No	No	No	No
Oecophoridae	Stathmopoda melanochra		No	No	No	No
Oecophoridae	Telanepsia sp TMAG_F120618		No	No	No	No
Oecophoridae	Telanepsia sp TMAG_F120621		No	No	No	No
Oecophoridae	Wingia aurata		No	No	No	No
Xyloryctidae	Xylorycta calligramma		No	No	No	No
Xyloryctidae	Xylorycta cf micracma		Yes	No	No	No
Oecophoridae	Zonopetala quadripustulella		No	No	No	No

Family	Species	Common name	Putative new species	Threatened (EPBC Act)	Threatened (State Act)	Exotic/pest
Oenosandridae	Discophlebia lucasii		No	No	No	No
Oenosandridae	Oenosandra boisduvalii		No	No	No	No
Psychidae	Lepidoscia characota		No	No	No	No
Psychidae	Lepidoscia sp TMAG_F120499		No	No	No	No
Psychidae	Lepidoscia sp TMAG_F120502		No	No	No	No
Psychidae	Lepidoscia sp TMAG_F120507		No	No	No	No
Pyralidae	Astrapometis saburalis		No	No	No	No
Pyralidae	Crocydopora cinigerella		No	No	No	No
Pyralidae	Cryptoblabe unplaced		No	No	No	No
Pyralidae	Endotricha unplaced		No	No	No	No
Pyralidae	Faveria tritalis		No	No	No	No
Pyralidae	Mimaglossa crypserythra		No	No	No	No
Pyralidae	Ocrasa albidalis		No	No	No	No
Pyralidae	Orthaga thyrissalis		No	No	No	No
Pyralidae	Patagoniodes farinaria		No	No	No	No
Pyralidae	Salma marmorea		No	No	No	No
Pyralidae	Stericta bryomima		No	No	No	No
Pyralidae	Stericta carbonalis		No	No	No	No
Sphingidae	Hippotion scrofa	Coprosma hawkmoth	No	No	No	No
Tineidae	Mesophera unplaced		No	No	No	No
Tineidae	Mimoscopa ochetaula		No	No	No	No
Tineidae	Moerarchis australasiella		No	No	No	No
Tineidae	Niditinea fuscella		No	No	No	No
Tineidae	Opogona stenocraspeda		No	No	No	No
Tineidae	Opogona unplaced		No	No	No	No
Tortricidae	Acropolitis ergophora		No	No	No	No
Tortricidae	Acropolitis ptychosema (endemic)		No	No	No	No
Tortricidae	Acropolitis unplaced		No	No	No	No
Tortricidae	Ancylis synomotis		No	No	No	No
Tortricidae	Capua sp TMAG_F058299		No	No	No	No

Family	Species	Common name	Putative new species	Threatened (EPBC Act)	Threatened (State Act)	Exotic/pest
Tortricidae	Constrictana constrictana		No	No	No	No
Tortricidae	Epiphyas ashworthana		No	No	No	No
Tortricidae	Epiphyas postvittana	lightbrown apple moth	No	No	No	Yes/pest
Tortricidae	Epitymbia scotinopa		No	No	No	No
Tortricidae	Epitymbiini unplaced		No	No	No	No
Tortricidae	Holocola ANIC sp10		No	No	No	No
Tortricidae	Holocola sp TMAG_F120527		No	No	No	No
Tortricidae	Holocola triangulana		No	No	No	No
Tortricidae	Isochorista sp TMAG_F120533		No	No	No	No
Tortricidae	Isochorista sp TMAG_F120543		No	No	No	No
Tortricidae	Meritastis lythrodana		No	No	No	No
Tortricidae	Merophyas divulsana		No	No	No	No
Tortricidae	Olethreutinae unplaced		No	No	No	No
Tortricidae	Strepsicrates ejectana	Guava bud moth	No	No	No	Yes/pest
Zygaenidae	Pollanisus lithopastus	forester	No	No	No	No