

King Island Bush Blitz

Lepidoptera

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Nomenclature and taxonomy used in this report is consistent with:

[The Australian Faunal Directory \(AFD\)](#)



Whalebone Beach King Island

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List of contributors

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Abstract

A survey of Lepidoptera was conducted as part of the King Island Bush Blitz in October 2023. A total of 699 specimens have been recorded so far in TMAG's database, which comprise 180 taxa with most identified to species, 162 of these are new records for King Island and nine new families were recorded for the island. The survey was conducted over 23 sites on the property covering as many different vegetation types as possible. Coastal heathland and vegetation complexes returned the highest diversity of Lepidoptera. Four species recognised as most likely new to science were collected. Two species are new records for the state and 21 rare species with large range extensions were also collected, with several only known from historical records. Ten native and one exotic lepidopteran pests were recorded, but none are considered to be invasive. The extreme abundance of the southern armyworm during the survey does not seem to have resulted in an outbreak of caterpillars in the Autumn of 2024 on King Island.

This survey is notable for the number of uncommon, rare and new records for Tasmania.

1. Introduction

This Bush Blitz was conducted in October 2023 on King Island, Tasmania. King Island is part of the King Interim Bioregion, which also includes the Hunter Islands, Robbins Island, and the north-western tip of Tasmania. The island's flat undulating plains support forest and woodland communities, scrubs, grasslands, heathlands, wetlands, spray zone coastal complexes and salt marsh. However only 30% of its former native vegetation now remains with the rest cleared mainly for agriculture since European occupation. Around 14% of the island is Crown Land including several four State Reserves. Currently there are 50 plant species and 12 animal species on King Island that are listed as threatened. (TSS, 2012).

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 but this number is likely to be significantly higher. King Island has not been systematically surveyed for this or any other invertebrate groups; however approximately 80 species from 16 families of Lepidoptera have been recorded on the *Atlas of Living Australia* to date. This survey was expected to add many new records for King Island at least, species new to science and records of rare species to the Lepidoptera of the island.

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. Each species is closely affiliated with usually one host plant species. The diversity of Lepidoptera, 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, heavily modified 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 and details of 23 sites surveyed for Lepidoptera using light traps for the King Island Blitz conducted in October 2023.

Site code	Locality	Date	Latitude	Longitude
SSS1	King Island: Pegarah Nature Reserve	23/10/2023	-39.9441	143.9905
FL5	King Island: Pegarah State Forest: Blue Gum Road: roadside	23/10/2023	-39.9277	144.0699
FL7	King Island: Sea Elephant Road: inland from Fraser Beach: roadside	23/10/2023	-39.8649	144.0942
FL6	King Island: Sea Elephant Road: inland from Fraser Beach: roadside	23/10/2023	-39.8706	144.0943
SSS4	King Island: Colliers Swamp Conservation Area: near Seal River Road	24/10/2023	-40.0914	143.9597
He4	King Island: Colliers Swamp Conservation Area: South Road: roadside	24/10/2023	-40.0917	143.9259
FL5 (Pegarah SF)	King Island: Pegarah State Forest: Blue Gum Road: roadside	25/10/2023	-39.9286	144.0698
Pegarah SF, Battens Rd	King Island: Pegarah State Forest: Battens Road	25/10/2023	-39.9178	144.0799
Yarra Creek	King Island: Yarra Creek area: Milkwood Road crossing	26/10/2023	-40.0024	144.0892
FL9 near lookout	King Island: Nook Swamp Track near lookout	26/10/2023	-39.8221	144.1126
FL9	King Island: Nook Swamp Track_CB11 (terrestrial)	26/10/2023	-39.8209	144.1159
FL10	King Island: Nook Swamp Track at Sea Elephant River_CB12 (terrestrial)	26/10/2023	-39.8161	144.1041
SSS2	King Island: Martha Lavinia Road: heathland	27/10/2023	-39.6567	144.0678
Grasslands, FL13	King Island: Lavinia Beach: South of Martha Lavinia Road	27/10/2023	-39.6726	144.0898
Penny's Lagoon	King Island: Pennys Lagoon	27/10/2023	-39.6561	144.0785
Lavinia State Reserve	Swampy area between FL1 and FL8	27/10/23	-40.0874	143.8723
Kentford CA	King Island: Kentford Conservation Area	28/10/2023	-40.0391	143.9749

Site code	Locality	Date	Latitude	Longitude
Collier Swamp CA	King Island: Colliers Swamp Conservation Area: South Road: roadside	28/10/2023	-40.0828	143.9247
FL1	King Island: Seal Rocks Road: roadside	28/10/2023	-40.1009	143.8851
Gentle Annie CA	King Island: Gentle Annie Reserve	29/10/2023	-40.0387	144.0231
Sea Elephant River crossing	King Island: Sea Elephant River Crossing	29/10/2023	-39.8151	144.0612
Sea Elephant Bootlace ACCP	King Island: Sea Elephant Bootlace Reserve at Reekara Road	29/10/2023	-39.7905	144.0547
FI6 Counsel Hill	King Island: Counsel Hill	29/10/2023	-39.7743	144.0569

2.2 Survey techniques

Light traps for the collection of nocturnal moths consisted of portable bucket traps with a UV black light (Fig 1) and *LepiLed* LED lights powered by 12V batteries and lithium battery power banks respectively (Fig. 2). 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 Fig 1 to survey as many different plant communities as possible.



Fig 1. Bucket trap with UV black light used to collect moths overnight for the Bush Blitz conducted on King Island in October 2023.

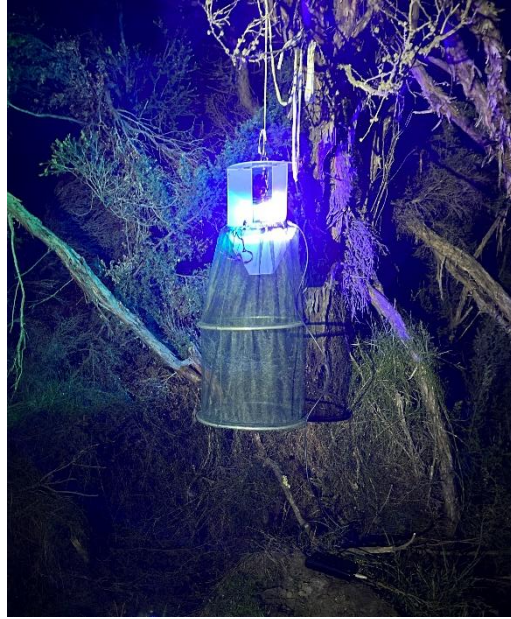


Fig. 2 *LepiLed* LED UV light with net trap used to collect moths overnight for the Bush Blitz conducted on King Island in October 2023.

Day-flying moths were collected opportunistically at some sites during the day using hand-held butterfly nets or beating trays. Live specimens were usually killed in ammonium hydroxide killing jar or tubes 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 were used to survey the two standard survey sites, SSS1, SSS2 and SSS4 *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 Spring. The weather also during this survey was generally cold and very windy, which usually has a negative affect on Lepidoptera abundance.

2.3 Identifying the collections

Lepidopteran specimens were identified either during or after the survey period by drawing on the author's expertise, referring to reference material and comparison with specimens held at the Australian National Insect Collection (ANIC) (CSIRO) in Canberra. Dr Marianne Horak (ANIC) provided identifications and advice on Tortricidae (bell moths) and Dr Peter McQuillan (University of Tasmania) also 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) and Cocking *et al.* (2022) and other reference books containing keys and information on families of Australian Lepidoptera. 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).

Not all specimens were identified by the date that the report was submitted due to time constraints and the large number of specimens collected on this survey. These will be identified in due course, databased and published on the Atlas of Living Australia.

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 ANIC, the author nominates 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”. Species that are identified as ‘new to science’ are primarily identified as such by searching collections and comparisons with species held in the ANIC and drawing on the knowledge of the author and other experts in the field. Rarities are established by referencing collections, searching for records such as on the *Atlas of Living Australia* and by advice from experts.

3. Results and Discussion

Appendix 1 lists all Lepidoptera recorded during the Bush Blitz. Collections made during this Bush Blitz will result in 699 specimens of 180 species being added to public collections and 699 records to publicly accessible databases. Twenty of these species have already been recorded on the ALA for King Island but the remaining are all new records for the island. Nine new family records have now been added to the King Island lepidopteran fauna. However over one hundred specimens from this survey are yet to be identified but will be included in the TMAG collection and on the Atlas of Living Australia in due course.

3.1 Un-named or not formalised taxa

Where possible species that are yet to be named are associated with a specimen in the TMAG or other collections. The associated registration numbers are also used in the epithet when possible. Specimens associated with a genus or higher classification for the first time are relegated an epithet with their registration number.

Un-named or unformalised Lepidoptera (48 taxa) are listed in Table 1. 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.

Taxon	Comment
Crambinae sp. TMAG_F149362	
<i>Euproctis</i> sp. TMAG_F141269	
nr <i>Philenora</i> sp. TMAG. F102002	
<i>Chlorocoma</i> sp. TMAG_F147053	
<i>Chlorocoma</i> sp. TMAG_F147061	
<i>Chlorocoma</i> sp. TMAG_F147066	
<i>Cymatophora</i> ANIC sp. 01 (Fig 3)	This geometrid species was collected from 16 specimens from six different sites on the island. I have never collected it before but Dr Peter McQuillan (University of Tasmania) has stated that it is widespread in Tasmania and also found in the Otways (Victoria). This name appears on the Barcode of Life Database for this species from specimens held in the ANIC. <i>Cymatophora</i> is definitely not the right genus and the diptychine <i>Amelora</i> has also been ruled out by Peter.

Table 1. Putatively un-named or not formalised taxa	
Taxon	Comment
<i>Nisista</i> sp. 4 Hewish et al. (2014)	Three specimens of this species were collected from three different sites. What appears to be the same species was included in this publication under this name.
<i>Agrotis</i> TFIC sp. 01	TFIC – Tasmanian Forestry Insect Collection
<i>Bathytricha</i> sp. TMAG_107988	
<i>Ectopatria</i> sp. TMAG_F140283	
<i>Ectopatria</i> sp. TMAG_F141291	
<i>Ectopatria</i> sp. TMAG_F146948	
Hadenini unplaced species inquirenda sp. TMAG_F141348	
Hadenini unplaced species inquirenda sp. TMAG_F146962	
Hadenini unplaced species inquirenda sp. TMAG_F147039	
<i>Proteuxoa</i> sp. TMAG_F141364	
<i>Thoracolopha</i> sp. nr <i>flexirena</i> TMAG_F058033	
<i>Thoracolopha</i> sp. TMAG_F146917 (Fig. 4)	
<i>Chezala</i> nr <i>cataxera</i> sp. TMAG_F149171	
<i>Eulechria</i> sp. TMAG_F149161	
<i>Eulechria</i> sp. TMAG_F149164	
<i>Hadrognatha</i> sp. TMAG_149173	
Oecophorinae sp. TMAG_F149346	
Oecophorinae sp. TMAG_F149365	
Oecophorinae sp. TMAG_F149367	
Oecophorinae sp. TMAG_F149368	
Oecophorinae sp. TMAG_F149369	
Oecophorinae sp. TMAG_F149370	
Oecophorinae sp. TMAG_F149371	
Oecophorinae sp. TMAG_F149372	
Oecophorinae sp. TMAG_F149373	
Oecophorinae sp. TMAG_F149374	
Oecophorinae sp. TMAG_F149375	
Oecophorinae sp. TMAG_F149376	
Oecophorinae sp. TMAG_F149377	
Oecophorinae sp. TMAG_F149378	
Oecophorinae sp. TMAG_F149379	
Oecophorinae sp. TMAG_F149381	
Oecophorinae sp. TMAG_F149382	

Table 1. Putatively un-named or not formalised taxa	
Taxon	Comment
Oecophorinae sp. TMAG_F149384	
<i>Philobota</i> sp. TMAG_F149358	
<i>Phloeocetis</i> sp. TMAG_F149168	
<i>Thema</i> sp. TMAG_F149163	
<i>Lepidoscia</i> sp. TMAG_F149349	
<i>Lepidoscia</i> sp. TMAG_F149348	
<i>Epiphyas</i> nr <i>balioptera</i> sp. TMAG_F149118	
<i>Hermenias</i> sp. TMAG_F147416	
Olethrutinae sp. TMAG_F149363	



Fig. 3 *Cymatophora* ANIC sp. 01. An uncommon undescribed species collected on the Bush Blitz survey on King Island, October 2023.



Fig. 4. *Thoracolopha* sp. nr *flexirena* TMAG_F058033, a known undescribed species, collected on the King Island Bush Blitz in October

3.2 Putative new species (new to science)

In this report, the phrase ‘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. Four species believed to be new to science were collected. The xyloryctid *Catoryctis* nr *tricrena* sp. TMAG_F149166 (Fig. 5) is notable as it is a moderately large, striking moth.

Table 2. Putative new species (new to science)	
Species	Comment
<i>Opostega</i> sp. TMAG_F149210	Only one specimen collected from the coastal complex vegetation in the Sea Elephant Bootlace ACCP. No specimens found at ANIC or in the TMAG collections.
<i>Epiphyas</i> nr <i>hyperacria</i> sp. TMAG_F149117	Only one specimen collected from coastal heathland in the Seal Rocks Reserve. No specimens found at ANIC or in the TMAG collections. Identified by M. Horak as possibly a new species but further work needed to confirm.
<i>Meritastis</i> sp. TMAG_F147417	Three specimens collected from two sites with remnant woodland, the Gentle Annie Reserve and a crossing on the Sea Elephant River. No specimens found at ANIC or in the TMAG collections. Identified by M. Horak as possibly a new species but further work needed to confirm.
<i>Catoryctis</i> nr <i>tricrena</i> sp. TMAG_F149166 (Fig. 5)	Three specimens collected from two coastal heathland and complexes sites at FL9 and the Seal Rocks Reserve. No specimens were found at ANIC or in the TMAG collections.



Fig. 5 Male of *Catoryctis* nr *tricrena* sp. TMAF_F149166, a putative new species collected on the King Island Bush Blitz in October 2023.

3.3 Exotic and pest species

A total of 10 native and one exotic species that are considered to be agricultural pests were recorded on King Island, six of which belong to the large family Noctuidae. All species occurred in low numbers except for southern armyworm (*Persectania ewingii*), which was extremely abundant and widespread across the property, bogong moths also widespread but less numerous and the geometrid *Pasiphilodes testulata*, which was observed 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 Spring do not seem to have resulted in an outbreak this Autumn on King Island, possibly because of unseasonably dry weather. The species listed of *Helicoverpa*, *Agrotis* and *Persectania* are known Spring migrants to Tasmania, including King Island (Hill 2007).

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. The only exotic Lepidoptera recorded in this Bush Blitz was *Plutella xylostella*, diamondback moth, which is now naturalised and widespread in Australia.

Table 3. Exotic and pest species recorded				
Exotic/pest species	Family	Location sighted/observed	Indication of abundance	Comments
<i>Chloroclystis approximata</i> (cherry looper)	Geometridae	FL1 - Seal Rocks Reserve	Only one specimen collected.	This is a native insect that is not considered to be a major pest of cherries and apples. Its native host is <i>Acacia</i> .

Table 3. Exotic and pest species recorded				
Exotic/pest species	Family	Location sighted/observed	Indication of abundance	Comments
<i>Pasiphilodes testulata</i> (pome looper)	Geometridae	Collected from four sites but observed at more including base camp.	High abundance	This is a native insect, known to attack apples. Although abundant its unlikely to be a serious problem. Its native host is <i>Acacia</i> .
<i>Agrotis infusa</i> (bogong moth)	Noctuidae	Widespread	Moderately high abundance	Native insect pest on a wide variety of agricultural crops, known to infest crops in Tasmania.
<i>Agrotis munda</i> (brown cutworm or pink cutworm)	Noctuidae	Widespread	Moderate abundance	Native insect pest on a variety of crops. Known to infest crops in Tasmania.
<i>Agrotis porphyricollis</i> (variable cutworm)	Noctuidae	Two specimens both from the Sea Elephant Bootlace Reserve.	Rare	Native insect pest in Tasmania on sugar beet and potato.
<i>Helicoverpa punctigera</i> (native budworm)	Noctuidae	Three specimens from Pennys Lagoon and Seal Rock Reserve.	Uncommon	Native agricultural pest feeding on the foliage of many crops and garden flowers.
<i>Neumichtis saliaris</i> (green cutworm)	Noctuidae	Only one specimen from the Gentle Annie Reserve	Rare	In Tasmania, this native species is a pest on turnips, sugar beet, clover and potato.
<i>Persectania ewingii</i> (southern army worm)	Noctuidae	Widespread	Very high abundance	In Tasmania, this native species is a pest of crops and pasture. It often migrates in large numbers to King Island and mainland Tasmania in the Spring (McQuillan <i>et al.</i> (2007)).
<i>Plutella xylostella</i> (diamondback moth)	Plutellidae	Six specimens, five from Pegarah State Forest and one from Seal Rocks Reserve	Uncommon	Exotic species but well-established in most parts of Australia. It is a serious pest of brassicas.
<i>Etiella behrii</i> (lucerne seed web moth)	Pyralidae	Seven specimens collected from four different sites	Uncommon	A native agricultural pest, feeding inside the developing seedpods of various members of Fabaceae.

Table 3. Exotic and pest species recorded				
Exotic/pest species	Family	Location sighted/observed	Indication of abundance	Comments
<i>Epiphyas xyloides</i>	Tortricidae	Only one specimen collected from coastal vegetation at FL9.	Rare	A native moth that is an occasional orchard pest in Tasmania.

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 for King Island are listed in Table 5, with the caveat that Lepidoptera in many areas in Tasmania are poorly surveyed. Two of these species are apparently new records for Tasmania. The other 21 are most likely range extensions of rare species previously recorded in Tasmania, often from decades ago.

This survey is notable for the number of uncommon, rare and new records for Tasmania.

Table 5. Range extensions or significant infill in distribution records for species				
Species	Family	Location sighted/observed	Distance from nearest known record (km)	Comments
<i>Gnathifera aphronesa</i>	Epermeniidae	Colliers Swamp CA	Approx. 700 km	Very rare. No other records on the ALA. Specimens in ANIC from the ACT (1971), NSW (1974) and SA (1999), and two Tasmanian specimens from Port Arthur (1979). (Gaedike, 2019). Also known from Meyrick's type, from "Tasmania".
<i>Trigonistis demonias</i>	Erebidae	Coastal heathland in FL9 near lookout	Approx. 100 km	One specimen. Rare. Only two other observational, records from Wesley Vale and Sandford.
<i>Aristotelia furtiva</i>	Gelechiidae	Four sites with coastal complex vegetation: inland from Fraser Beach, Seal Rocks R., Sea Elephant Bootlace ACCP, Counsel Hill.	Approx. 100 km	Six specimens. Uncommon in Tasmania. Only two records on the ALA from Queensland but widespread along the eastern seaboard (from specimens in ANIC). Type is from Hobart. ANIC

Table 5. Range extensions or significant infill in distribution records for species

Species	Family	Location sighted/observed	Distance from nearest known record (km)	Comments
				Tasmanian specimens are from Southport (1916), Montumana (1979) and Strahan (1981)
<i>Adeixis inostentata</i>	Geometridae	Coastal complex inland from Fraser Beach and Counsel Hill.	Approx. 100 km.	Seven specimens. Uncommon . Only nine records on the ALA, 4 of which are specimen-based.
<i>Syneora silicaria</i>	Geometridae	Pennys Lagoon	Approx. 350 km	Only one other specimen record in Tasmania from Flinders Island. Rare .
<i>Nola cycota</i>	Nolidae	Coastal complex vegetation from Sea Elephant Road: inland from Fraser Beach, Counsel Hill	Approx. 400 km.	One specimen. Rare . Only other records are observational from southeastern Tasmania.
<i>Scythrophanes stenoptera</i>	Notodontidae	Coastal heathland in Seal Rocks Reserve	Approx. 200 km.	Two specimens. Very rare . Only other record in Tasmania from Musselroe (one specimen).
<i>Arachnographa mesophthora</i>	Oecophoridae	Coastal complexes. Sea Elephant Bootlace ACCP	Approx. 300 km	Only one specimen. Rare . Tasmanian endemic. No records on the ALA. Previously only collected in Tasmania at high altitude sites at Franklin R. () 1962), a at Cradle Mt (1925, 1989) and Mt Field (1962).
<i>Arachnographa micrastrella</i>	Oecophoridae	Coastal complexes inland from Fraser Beach and FL9.	Approx. 200 km.	2 specimens. New record for Tasmania . Occurs in Victoria.
<i>Atheropla psammodes</i>	Oecophoridae	FL7, grasslands south of Martha Lavinia Rd, Sea Elephant Bootlace ACCP, Counsel Hill and SSS2 in coastal heathland.	Approx. 100 km	Uncommon. Abundant (14 collected) and moderately widespread in coastal complexes and heathlands. Recently also collected from Woolnorth in NW Tasmania.

Table 5. Range extensions or significant infill in distribution records for species

Species	Family	Location sighted/observed	Distance from nearest known record (km)	Comments
<i>Euthictis mamaraspis</i> (Fig. 6)	Oecophoridae	Coastal vegetation complexes at FL7 and Sea Elephant Bootlace ACCP	Approx. 100 km	20 specimens of this species were collected at two sites. Rare . The nearest record is an observational record at Cethana, Tasmania. Note that this is a valid name that is not yet entered into the Australian Faunal Directory. Occurs in Victoria.
<i>Haplodyta thoracta</i>	Oecophoridae	Coastal vegetation complexes and heathland at FL10, Sea Elephant Bootlace ACCP and Seal Rocks Reserve.	Approx. 300 km	Ten specimens. Rare . Many records from eastern seaboard in ANIC, a few records from Vic. but not Tas. on the ALA. Historical specimens from Tas. in ANIC from Eaglehawk Neck and Cradle Mt. from 1962.
<i>Pellopsis aerodes</i>	Oecophoridae	Eucalypt woodland sites at: Grassy basecamp (1), Pegarah State Forest (11), Kentford CA (1), Colliers Swamp (1) and SSS1 (5)	Approx. 200 km.	Rare , but numerous specimens collected here. In Tasmania, seems to be only known from the type, collected at Deloraine in 1882, one specimen collected in Waratah, in 1962 and two specimens collected in the Stony Head Bush Blitz in 2021.
<i>Philobota erebodes</i>	Oecophoridae	Colliers Swamp	Approx. 300 km	1 specimen. Rare . New record for Tasmania . Only three specimens collected from Black Mt. by Common in 1948 but six observational records from Vic. on the ALA.
<i>Atrophora anemarcha</i>	Tortricidae	Coastal complexes inland from Fraser Beach and FL9.	Approx. 500 kms.	5 specimens. Rare . Seems to be only known from the type (NSW) and possibly Kangaroo Island and

Table 5. Range extensions or significant infill in distribution records for species

Species	Family	Location sighted/observed	Distance from nearest known record (km)	Comments
				several recent observational records from Sandford and Calverts Lagoon.
<i>Epiphyas epichorda</i>	Tortricidae	Counsel Hill	Approx. 300 km	One specimen. Rare . Only one other record (specimen) on the ALA at all from Tas. at Cape Portland. No specimens from Tasmania in ANIC.
<i>Epiphyas eucyrta</i>	Tortricidae	Woodland and riparian vegetation at Sea Elephant River Crossing	Approx. 250 km.	2 specimens. Rare . One specimen-based record from Arthur-Pieman Reserve, three Tasmanian and one Victorian observational records. No specimens from Tasmania in ANIC.
<i>Epiphyas</i> nr <i>balioptera</i> sp. TMAG_F149118	Tortricidae	Kentford CA	Approx. 200 km	One specimen collected from eucalypt woodland at the Kentford CA. Rare . Three historic specimens collected from Deloraine and Pyengana in 1963 by Common and Upton.
<i>Bida radiosella</i>	Xyloryctidae	Coastal complexes inland from Fraser Beach	Approx. 300 km.	One specimen. Very rare in Tasmania . Only records are three specimens from heathlands at Musselroe Tasmania. Also occurs in Vic., SA and WA.
<i>Xylorycta paraboella</i>	Xyloryctidae	Coastal complexes inland from Fraser Beach, FL9 Seal Rocks and SSS2 Reserve	Approx. 250 km.	Five specimens. Uncommon . Only seven observational records previously from Tasmania, however there is one Tasmanian specimen at ANIC from Ridgeway in 1977.
<i>Xylorycta micracma</i>	Xyloryctidae	Coastal heath Seal Rocks Reserve	Approx. 150 km.	One specimen. Extremely rare . Four type specimens from

Table 5. Range extensions or significant infill in distribution records for species

Species	Family	Location sighted/observed	Distance from nearest known record (km)	Comments
				Deloraine, Tas. (late 1800s). There are only two records of this species on the ALA from Victoria. One specimen was collected at Stony Head in 2021, otherwise no other Tasmanian records. The Stony Head specimen is the first record for Tasmania.



Fig. 6. *Euthictis mamaraspis*, a rare oecophorid moth, but locally abundant in coastal complexes, collected Sea Elephant Bootlace Reserve at on the King Island Bush Blitz, October 2023.

3.6 Genetic information

No genetic sampling was undertaken on any lepidopteran specimens.

4. Information on species lists

A total of 180 taxa from 25 families of Lepidoptera were collected on the King Island Bush Blitz in October, 2023 (Appendix 1). The majority, 129, were identified to species. From the remainder, 30 were identified to genus, three to tribe and 20 to subfamily (See Appendix 1). There remain still a further approximately 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*.

The most speciose family collected on this survey was the Geometridae (loopers), which is no surprise as this family is recognised as one of the most diverse families of macro-Lepidoptera in Tasmania and it tends to dominate the tree canopy fauna in Australian vegetation systems. The micromoth family the Oecophoridae ranked second highest at 43 taxa. This family is the most diverse in Australia, but is poorly known, reflected, in this survey, by the number of species identified to subfamily only. They also predominate in the species yet to be identified.

5. Information for land managers

Despite the large amount of clearing of native vegetation on the island, protected areas have retained important natural values and biodiversity. Areas that were most important for lepidopteran biodiversity were the coastal heathlands and coastal vegetation complexes. One particularly significant site was the Sea Elephant Bootlace ACCP, which returned 110 specimens comprising 54 species. *Opostega* sp., new to science, was only collected from this site and also five rare species. The latter included the uncommon species *Atheropla psammodes* and *Arachnographa mesophthora* and *Haplodyta thoracta*, both of which have not been collected for 35 and 60 years respectively. This highlights the importance of these covenanted reserves for the conservation of biodiversity on the island. Lepidoptera are closely associated with plants, often host specific, so moth diversity is usually directly correlated to plant diversity.

6. Conclusions

This survey of Lepidoptera on King Island yielded a significant increase in knowledge of lepidopteran biodiversity, species new to science, many rare and substantial range extensions for species and nine new families to the King Island fauna. This is despite only 30% of native vegetation remaining on the island since European colonisation and largely inclement weather with high winds and cold temperatures that usually significantly impact the nocturnal activity of moths. The coastal heathland and vegetation complexes were particularly significant for Lepidoptera biodiversity. It is very important that these areas continue to be protected and that no more native vegetation be cleared on the island. As Lepidoptera are highly seasonal, there is no doubt that further surveys will discover more unrecorded biodiversity and new and rare species.

Acknowledgements

I would like to thank very much the Bush Blitz team and program for providing the opportunities and resourcing to conduct these valuable surveys. I am also very grateful for the support of Kirrily Moore and Nicole Zehntner who made our nocturnal forays much more pleasant with their invaluable logistical support, companionship and expertise. They also helped me enormously with the vast amount of work required in preparing moth specimens both in the field and back in the lab. Our team of volunteers at TMAG, especially Joanne Byrne, provided considerable assistance with processing and databasing specimens.

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Appendix 1. List of Lepidoptera recorded during the King Island Bush Blitz						
Family	Species	Common name	Putative new species	Threatened (EPBC Act)	Threatened (State Act)	Exotic/ pest
Anthelidae	<i>Anthela ocellata</i>		No	No	No	No/No
Anthelidae	<i>Anthela repleta</i>		No	No	No	No/No
Anthelidae	<i>Munychryia senicula</i>		No	No	No	No/No
Crambidae	<i>Crambinae</i> sp. TMAG_F149362		No	No	No	No/No
Crambidae	<i>Eudonia cleodorialis</i>		No	No	No	No/No
Crambidae	<i>Musotima nitidalis</i>		No	No	No	No/No
Crambidae	<i>Ptochostola microphaeellus</i>		No	No	No	No/No
Crambidae	<i>Scoparia axiolecta</i>		No	No	No	No/No
Crambidae	<i>Scoparia ochrophara</i>		No	No	No	No/No
Depressariidae	<i>Thudaca crypsidesma</i>		No	No	No	No/No
Eperminiidae	<i>Gnathifera aphronesa</i>		No	No	No	No/No
Erebidae	<i>Acyphas semiochrea</i>		No	No	No	No/No
Erebidae	<i>Ardices glatignyi</i>		No	No	No	No/No
Erebidae	<i>Artigisa lignicolaria</i>		No	No	No	No/No
Erebidae	<i>Crioa hades</i>		No	No	No	No/No
Erebidae	<i>Damias procrena</i>		No	No	No	No/No
Erebidae	<i>Euproctis</i> sp. TMAG_F141269		No	No	No	No/No
Erebidae	<i>Halone sejuncta</i>		No	No	No	No/No
Erebidae	nr <i>Philenora</i> sp. TMAG. F102002		No	No	No	No/No
Erebidae	<i>Pantydia diemeni</i>		No	No	No	No/No
Erebidae	<i>Philenora aspectalella</i>		No	No	No	No/No
Erebidae	<i>Praxis edwardsii</i>		No	No	No	No/No
Erebidae	<i>Praxis porphyretica</i>		No	No	No	No/No
Erebidae	<i>Trigonistis demonias</i>		No	No	No	No/No
Gelechiidae	<i>Aristotelia furtiva</i>		No	No	No	No/No
Geometridae	<i>Acodia pauper</i>		No	No	No	No/No
Geometridae	<i>Anachloris subochraria</i>		No	No	No	No/No
Geometridae	<i>Anachloris uncinata</i>		No	No	No	No/No
Geometridae	<i>Apodasmia rufonigraria</i>		No	No	No	No/No
Geometridae	<i>Bradycytena trychnoptila</i>		No	No	No	No/No

Family	Species	Common name	Putative new species	Threatened (EPBC Act)	Threatened (State Act)	Exotic/ pest
Geometridae	Capusa senilis		No	No	No	No/No
Geometridae	Chlenias banksiaria		No	No	No	No/No
Geometridae	Chloroclystis approximata	cherry looper	No	No	No	No/Yes
Geometridae	Chloroclystis filata		No	No	No	No/No
Geometridae	Chlorocoma sp. TMAG_F147053		No	No	No	No/No
Geometridae	Chlorocoma sp. TMAG_F147061		No	No	No	No/No
Geometridae	Chlorocoma sp. TMAG_F147066		No	No	No	No/No
Geometridae	Chrysolarentia insulsata		No	No	No	No/No
Geometridae	Chrysolarentia leucophanes		No	No	No	No/No
Geometridae	Chrysolarentia mecynata		No	No	No	No/No
Geometridae	Chrysolarentia trygodes		No	No	No	No/No
Geometridae	Cymatophora ANIC sp. 01		No	No	No	No/No
Geometridae	Adeixis inostentata		No	No	No	No/No
Geometridae	Dichromodes ainaria		No	No	No	No/No
Geometridae	Dichromodes confluaria		No	No	No	No/No
Geometridae	Dichromodes euscia		No	No	No	No/No
Geometridae	Dichromodes stilbiata		No	No	No	No/No
Geometridae	Didymoctenia exsuperata		No	No	No	No/No
Geometridae	Ectropis calida		No	No	No	No/No
Geometridae	Ectropis fractaria		No	No	No	No/No
Geometridae	Ectropis fractaria		No	No	No	No/No
Geometridae	Epyaxa subidaria		No	No	No	No/No
Geometridae	Euloxia leucochorda		No	No	No	No/No
Geometridae	Euphronarcha luxaria		No	No	No	No/No
Geometridae	Hydriomenini unplaced severata		No	No	No	No/No
Geometridae	Idiodes apicata		No	No	No	No/No
Geometridae	Idiodes siculoides		No	No	No	No/No
Geometridae	Melitulias graphicata		No	No	No	No/No
Geometridae	Microdes leptobrya		No	No	No	No/No
Geometridae	Microdes oriochaes		No	No	No	No/No
Geometridae	Microdes villosata		No	No	No	No/No
Geometridae	Nearcha curtaria		No	No	No	No/No

Family	Species	Common name	Putative new species	Threatened (EPBC Act)	Threatened (State Act)	Exotic/ pest
Geometridae	Neoteristis paraphanes		No	No	No	No/No
Geometridae	Nisista sp. 4 Hewish et al. (2014)		No	No	No	No/No
Geometridae	Pasiphilodes testulata	pome looper	No	No	No	No/Yes
Geometridae	Phrissogonus laticostata		No	No	No	No/No
Geometridae	Poecilasthena anthodes		No	No	No	No/No
Geometridae	Poecilasthena fragilis		No	No	No	No/No
Geometridae	Poecilasthena pulchraria		No	No	No	No/No
Geometridae	Poecilasthena urarcha		No	No	No	No/No
Geometridae	Psilosticha attacta		No	No	No	No/No
Geometridae	Psilosticha mactaria		No	No	No	No/No
Geometridae	Rhynchopsota delogramma		No	No	No	No/No
Geometridae	Scopula perlata		No	No	No	No/No
Geometridae	Syneora cheleuta		No	No	No	No/No
Geometridae	Syneora mundifera		No	No	No	No/No
Geometridae	Syneora silicaria		No	No	No	No/No
Geometridae	Thalaina selenaea		No	No	No	No/No
Gracillariidae	Conopomorpha helioplata		No	No	No	No/No
Gracillariidae	Polysoma eumetalla		No	No	No	No/No
Lasiocampidae	Aglaosoma periblepta		No	No	No	No/No
Lasiocampidae	Pararguda nasuta		No	No	No	No/No
Noctuidae	Agrotis infusa	bogong moth	No	No	No	No/Yes
Noctuidae	Agrotis munda	brown cutworm or pink cutworm	No	No	No	No/Yes
Noctuidae	Agrotis porphyricollis	variable cutworm	No	No	No	No/Yes
Noctuidae	Agrotis TFIC sp. 01		No	No	No	No/No
Noctuidae	Bathytricha sp. TMAG_107988		No	No	No	No/No
Noctuidae	Bathytricha truncata		No	No	No	No/No
Noctuidae	Cosmodes elegans		No	No	No	No/No
Noctuidae	Diarsia intermixta		No	No	No	No/No
Noctuidae	Ectopatria sp. TMAG_F140283		No	No	No	No/No
Noctuidae	Ectopatria sp. TMAG_F141291		No	No	No	No/No
Noctuidae	Ectopatria sp. TMAG_F146948		No	No	No	No/No
Noctuidae	Hadenini unplaced species inquirenda eugrapha		No	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/No
Noctuidae	Hadenini unplaced species inquirenda sp. TMAG_F141348		No	No	No	No/No
Noctuidae	Hadenini unplaced species inquirenda sp. TMAG_F146962		No	No	No	No/No
Noctuidae	Hadenini unplaced species inquirenda sp. TMAG_F147039		No	No	No	No/No
Noctuidae	Helicoverpa punctigera	native budworm	No	No	No	No/Yes
Noctuidae	Leucania exarans		No	No	No	No/No
Noctuidae	Neumichtis saliaris	green cutworm	No	No	No	No/Yes
Noctuidae	Persectania ewingii	southern armyworm	No	No	No	No/Yes
Noctuidae	Proteuxoa sp. TMAG_F141364		No	No	No	No/No
Noctuidae	Thoracolopha sp. nr flexirena TMAG_F058033		No	No	No	No/No
Noctuidae	Thoracolopha sp. TMAG_F146917		No	No	No	No/No
Nolidae	Nola cycota		No	No	No	No/No
Notodontidae	Gallaba eugraphes		No	No	No	No/No
Notodontidae	Scythrophanes stenoptera		No	No	No	No/No
Nymphalidae	Argynnina hobartia hobartia	Hobart brown	No	No	No	No/No
Oecophoridae	Arachnographa mesophthora		No	No	No	No/No
Oecophoridae	Arachnographa micrastrella		No	No	No	No/No
Oecophoridae	Atheropla psammodes		No	No	No	No/No
Oecophoridae	Chezala nr cataxera sp. TMAG_F149171		No	No	No	No/No
Oecophoridae	Eochrois callianassa		No	No	No	No/No
Oecophoridae	Euchaetis rhizobola		No	No	No	No/No
Oecophoridae	Euchaetis rhizobola		No	No	No	No/No
Oecophoridae	Eulechria sp. TMAG_F149161		No	No	No	No/No
Oecophoridae	Eulechria sp. TMAG_F149164		No	No	No	No/No
Oecophoridae	Eulechria xylopterella		No	No	No	No/No
Oecophoridae	Euthictis marmaraspis		No	No	No	No/No
Oecophoridae	Hadrognatha sp. TMAG_149173		No	No	No	No/No
Oecophoridae	Haplodyta thoracta		No	No	No	No/No
Oecophoridae	Hoplostega ochroma		No	No	No	No/No
Oecophoridae	Lepidotarsa aclea		No	No	No	No/No
Oecophoridae	Locheutis desmophora		No	No	No	No/No
Oecophoridae	Oecophorinae sp. TMAG_F149346		No	No	No	No/No

Family	Species	Common name	Putative new species	Threatened (EPBC Act)	Threatened (State Act)	Exotic/ pest
Oecophoridae	Oecophorinae sp. TMAG_F149365		No	No	No	No/No
Oecophoridae	Oecophorinae sp. TMAG_F149367		No	No	No	No/No
Oecophoridae	Oecophorinae sp. TMAG_F149368		No	No	No	No/No
Oecophoridae	Oecophorinae sp. TMAG_F149369		No	No	No	No/No
Oecophoridae	Oecophorinae sp. TMAG_F149370		No	No	No	No/No
Oecophoridae	Oecophorinae sp. TMAG_F149371		No	No	No	No/No
Oecophoridae	Oecophorinae sp. TMAG_F149372		No	No	No	No/No
Oecophoridae	Oecophorinae sp. TMAG_F149373		No	No	No	No/No
Oecophoridae	Oecophorinae sp. TMAG_F149374		No	No	No	No/No
Oecophoridae	Oecophorinae sp. TMAG_F149375		No	No	No	No/No
Oecophoridae	Oecophorinae sp. TMAG_F149376		No	No	No	No/No
Oecophoridae	Oecophorinae sp. TMAG_F149377		No	No	No	No/No
Oecophoridae	Oecophorinae sp. TMAG_F149378		No	No	No	No/No
Oecophoridae	Oecophorinae sp. TMAG_F149379		No	No	No	No/No
Oecophoridae	Oecophorinae sp. TMAG_F149381		No	No	No	No/No
Oecophoridae	Oecophorinae sp. TMAG_F149382		No	No	No	No/No
Oecophoridae	Oecophorinae sp. TMAG_F149384		No	No	No	No/No
Oecophoridae	Palimmece hemiphanes		No	No	No	No/No
Oecophoridae	Pellopsis aerodes		No	No	No	No/No
Oecophoridae	Philobota erebodes		No	No	No	No/No
Oecophoridae	Philobota moestella		No	No	No	No/No
Oecophoridae	Philobota sp. TMAG_F149358		No	No	No	No/No
Oecophoridae	Phloeocetis sp. TMAG_F149168		No	No	No	No/No
Oecophoridae	Thema sp. TMAG_F149163		No	No	No	No/No
Oecophoridae	Wingia hesperidella		No	No	No	No/No
Opostegidae	Opostega sp. TMAG_F149210		Yes	No	No	No/No
Plutellidae	Plutella xylostella	diamondback moth	No	No	No	Yes/Yes
Psychidae	Lepidoscia sp. TMAG_F149349		No	No	No	No/No
Psychidae	Lepidoscia sp. TMAG_F149348		No	No	No	No/No
Pterophoridae	Stenoptilia zophodactylus		No	No	No	No/No
Pyralidae	Endotricha ignealis		No	No	No	No/No
Pyralidae	Etiella behrii	lucerne seed web moth	No	No	No	No/Yes

Family	Species	Common name	Putative new species	Threatened (EPBC Act)	Threatened (State Act)	Exotic/ pest
Roeslerstammiid	Thereutis tanyceros		No	No	No	No/No
Saturniidae	Opodiphthera helena	Helena gum moth	No	No	No	No/No
Stathmopodidae	Stathmopoda melanochoa		No	No	No	No/No
Tineidae	Monopis ethelella	dead sheep's moth	No	No	No	No/No
Tineidae	Timaea bivittatella		No	No	No	No/No
Tineidae	Tinea corynephora		No	No	No	No/No
Tortricidae	Anisogona mediana		No	No	No	No/No
Tortricidae	Arotrophora anemarcha		No	No	No	No/No
Tortricidae	Arotrophora arcuatalis		No	No	No	No/No
Tortricidae	Epiphyas epichorda		No	No	No	No/No
Tortricidae	Epiphyas eucyrta		No	No	No	No/No
Tortricidae	Epiphyas nr balioptera sp. TMAG_F149118		No	No	No	No/No
Tortricidae	Epiphyas nr hyperacria sp. TMAG_F149117		Yes	No	No	No/No
Tortricidae	Epiphyas xylodes		No	No	No	No/Yes
Tortricidae	Hermenias sp. TMAG_F147416		No	No	No	No/No
Tortricidae	Holocola triangulana		No	No	No	No/No
Tortricidae	Meritastis sp. TMAG_F147417		Yes	No	No	No/No
Tortricidae	Olethrutinae sp. TMAG_F149363		No	No	No	No/No
Tortricidae	Tarachota dryina		No	No	No	No/No
Xyloryctidae	Bida radiosella		No	No	No	No/No
Xyloryctidae	Catoryctis nr tricrena sp. TMAG_F149166		Yes	No	No	No/No
Xyloryctidae	Xylorycta micracma		No	No	No	No/No
Xyloryctidae	Xylorycta parbolella		No	No	No	No/No