

Collection care program report – Eumundi Museum

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Photo: Joseph Hextal

Introduction

The Eumundi Museum is a rich source of local history. Most of the museum's collection contains human centric historical information and artifacts, but the collection also houses an impressive display of 385 ecological specimens. These specimens represent the natural history of the area that may have preceded settlement and should be preserved and maintained for generations to come.

The ecological specimen collection is thought to be over 20 years old but there is no record of where the collection came from or when the specimens were collected.

This report aims to:

1. Determine how much of the collection is endemic to the Eumundi area and how those species may have been impacted by the settlement of the town and early timber industry.
2. Assess the condition of the specimens and advise on long term storage and display options

Methodology

The data for this report was gathered using the collection inventory report alongside physical specimens. Most species were identified on accompanying labels, though some only to genus, and this information was used to determine species distributions. Analysis was performed on a subset of 173 of the total 385 specimens due to the availability of information on distribution, life cycle, and conservation status of identifiable specimens. Analysis conducted were basic plots on the ratio of regional distributions to determine how local the collection is. Majority of the specimens were invertebrates, with some mammals, marsupials, reptiles and plants (Figure 1). There are rock samples in the ecological collection, but they are mostly related to the gold mining history of the area and are outside the scope of this report.

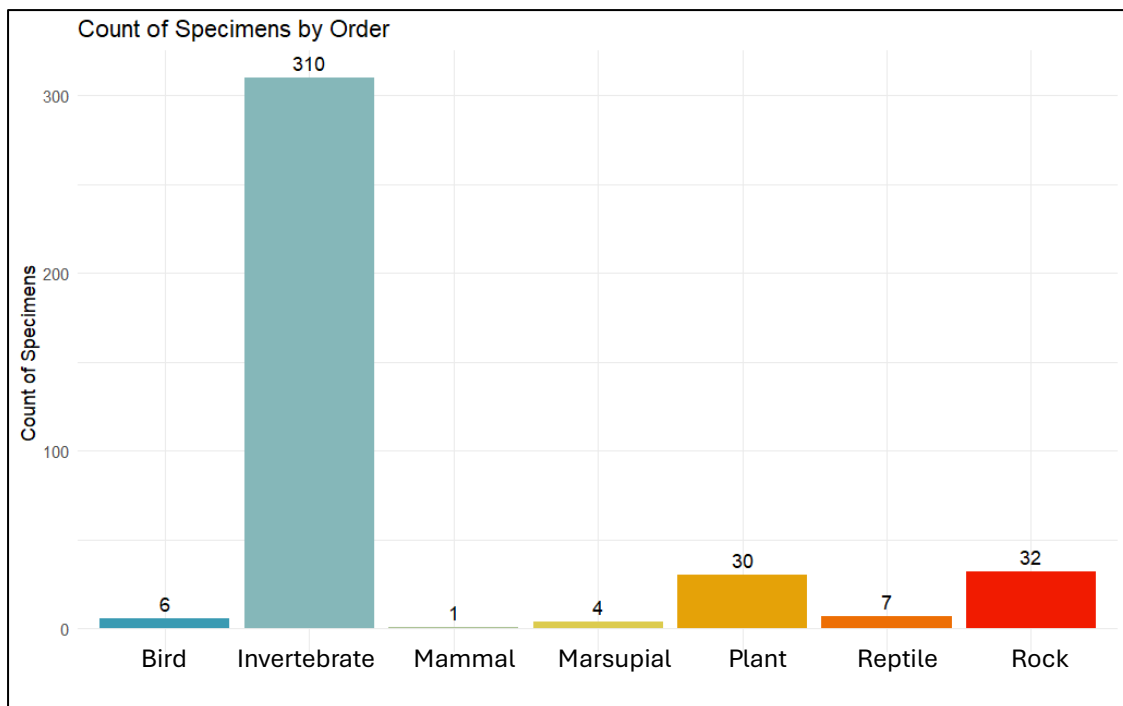
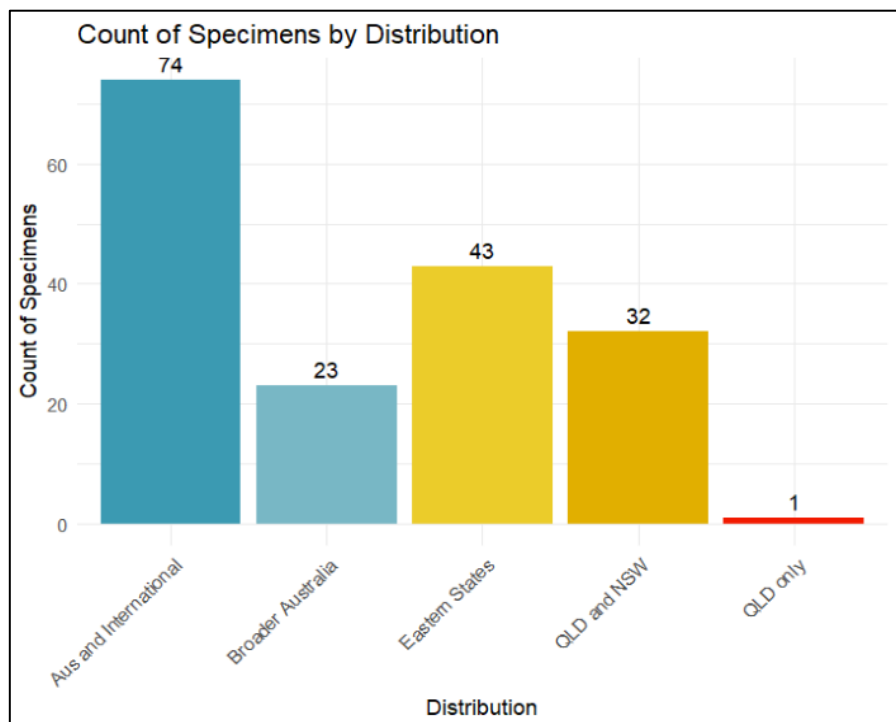


Figure 1. Tally of specimens by taxonomic order. Invertebrates far outweigh all other orders and consist mostly of Coleoptera (beetles) and Lepidoptera (moths and butterflies).

Results

I split the distribution regions into six categories; Eumundi endemic, Queensland only, Queensland and New South Wales, Eastern states (comprising QLD, NSW, ACT, VIC and sometimes SA), Broader Australia where species also occurred in TAS, WA or the NT, and



Australia and International when species also occurred overseas.

Of the subset of specimens analysed, 99 individuals were endemic to Australia with the remaining 74 occurring in Australia and internationally (Figure 2). There were no species endemic exclusively to Eumundi and no species that occurred overseas but not in Australia.

Figure 2. Distribution of specimens in collection by region.

Eumundi is home to 175 individuals of the subset of species. There are 4 that occur in the surrounding areas and in similar ecosystems so, although there were no recorded sightings in Eumundi itself, it is likely they occur locally. There were only 6 specimens that did not occur in Eumundi (Figure 3). I was unable to determine the distribution of many species due to lack of information online or in peer reviewed articles. Entomological taxonomy is a field of study with many unknowns as numerous invertebrate species have not been fully described or studied.

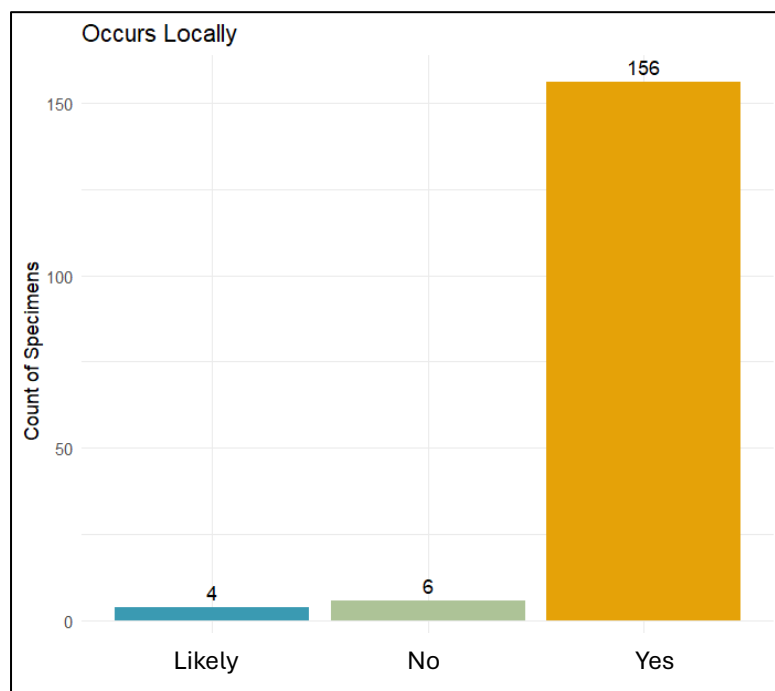


Figure 3. Count of species that occur locally.

Though majority of the collection occurs locally, none were endemic exclusively to the Eumundi area. Due to similar climate and habitat types, most species that occur on the Sunshine Coast can be found all the way down into mid NSW.

There were, however, some species with extremely limited ranges such as the Grey Christmas Beetle *Trioplognathus griseopilosus* which has only been recorded between Eumundi and Lismore, and the Australian Fritillary, a critically endangered butterfly with recorded sightings on the sunshine coast, Coffs Harbor, and Port Macquarie (ala.org 2025). The one QLD exclusive species is a cricket in the genus *Nunkeria* which occurs up around Cairns (Rentz, 1990).

A few species of note to the Eumundi area can be found in Table 1. These species provide different ecological services. The Richmond birdwing and Australian fritillary are generalist pollinators that visit a wide variety of flowering plants, including crops (Collins & Morris 1985, Geyle et al. 2021). Christmas beetle larva are important for breaking down decaying plant

matter and returning nutrients to the soil (DCCEWW 2013), as well as providing a nutrient rich food source for larger animals.

Across the species of note, habitat loss is the main impact on species decline (McAlpine et al. 2002). The pre-settlement habitats around Eumundi were a mix of vine forests, wet to dry eucalypt forest, woodland, and open shrubland (Neldner et al. 2023). With the arrival of Europeans and the need for land and timber, many of the ecosystems were impacted by growing settlements. The area surrounding Eumundi has lost a substantial amount of native vegetation (Figure 4). due to the early logging industry and continued urban development (Ngugi et al. 2022, Neldner et al. 2023). It is unclear the specific effect this has had on Eumundi's fauna as we don't have an extensive list of what was here pre-settlement. It is likely that the continued loss of habitat has affected most species in the area, however this is not an issue isolated to Eumundi or the sunshine coast, but widespread across the whole of Australia.

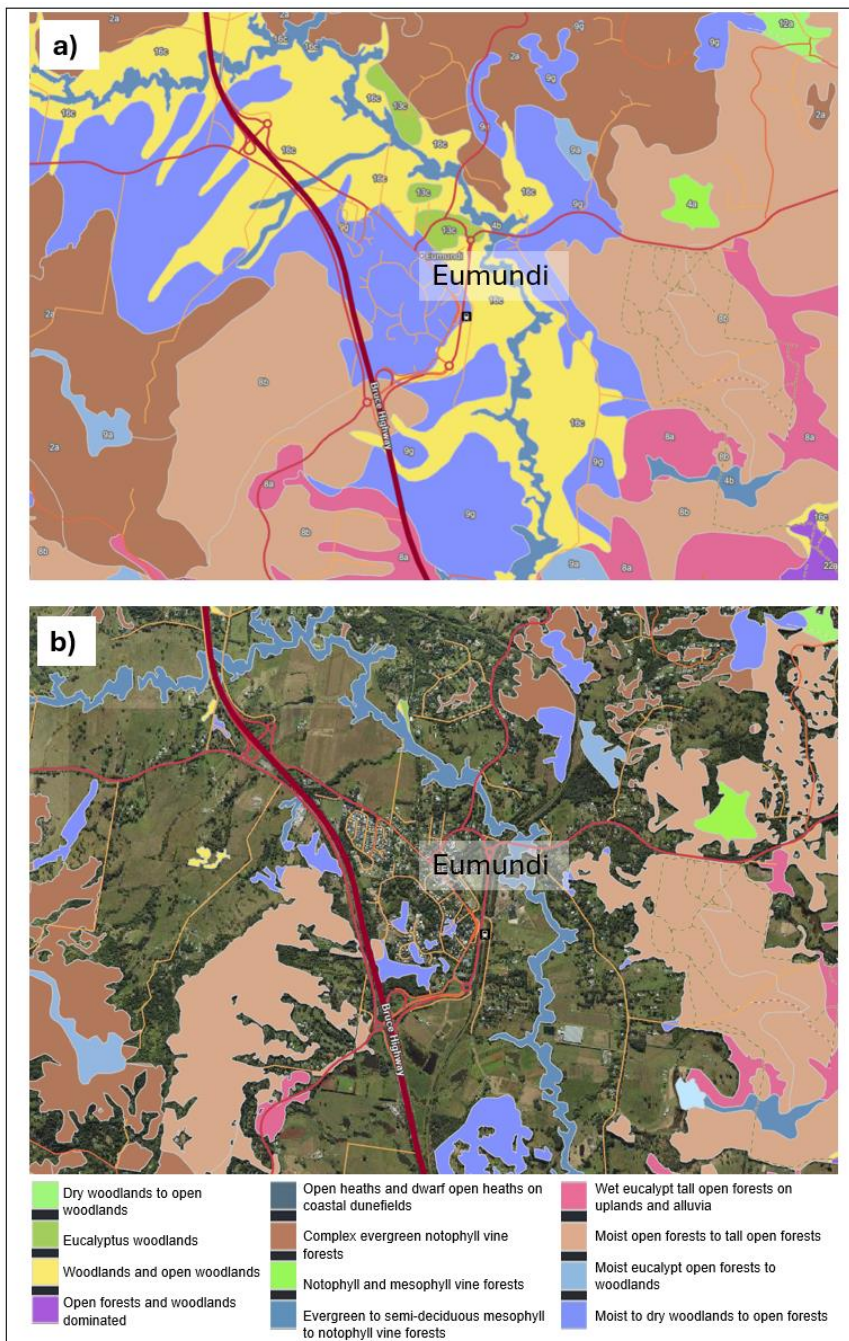


Figure 4. Map of native vegetation pre and post colonisation. Panel a) shows the distribution of native ecosystems before European colonisation. In panel b) we see much of that vegetation has been cleared for farmland and urbanisation. Created with imagery and information provided by Neldner et al. 2023 and qldglobe.information.qld.gov.au

Species	Status	Distribution	Main food source	Main threats
Australian fritillary	Critically endangered	East coast from Gympie to Port Macquarie. Predicted 95% likelihood of going extinct in the next 20 years (Geyle et al. 2021)	Adults feed on various plants. Caterpillars depend on the Arrowhead violet (<i>Viola betonicifolia</i>), a small flowing plant that favours poorly drained, swampy soil.	Habitat loss as swamps are drained for agriculture and urban growth. Weed invasion crowding out Arrowhead violet.
Brush tailed phascogale	Vulnerable	Occurs in every state and territory except Tasmania. Though still present, its distribution is thought to be fragmented and roughly half of what it was historically.	Mainly insects though also small mammals, birds, reptiles and nectar.	Habitat loss, cats and foxes.
Christmas beetle <i>Anoplognathus boisduvalii</i>	Not officially endangered. Studies are still being conducted to confirm conservation status	Far north QLD down to Sydney	Adults predominantly eat eucalyptus leaves. Larva feed on roots and decaying plant matter underground.	Habitat loss. Many Christmas beetle species lay eggs in grasslands adjacent to eucalypt forests. As both grasslands and forests are cleared, they lose vital habitat.
Christmas beetle <i>Trioplognathus griseopilosus</i>	Limited distribution	Sunshine coast to Tweed Heads		
Richmond Birdwing	Near threatened	Kin Kin to Ballina	Adults feed on various flowers. Caterpillars feed only on two species of endemic Aristolochia vine (<i>A. pravenosa</i> and <i>A. laheyana</i>). Caterpillars can also survive on introduced <i>A. tagala</i> but not if they started life on a native host plant.	Loss of remnant rainforest and fragmented distribution of caterpillar host plant. There are two invasive Aristolochia species the butterfly will lay eggs on, one of which (<i>A. littoralis</i>) contains toxins that kill the caterpillars.

Table 1. Species of the Eumundi area, notable due to their conservation status. Table references: Collins et al. 1985, DCCEEW 2013, Geyle et al. 2021, inaturalist.org 2025, McAlpine et al. 2002, Neldner et al. 2023, Ngugi et al. 2022, Rentz 1990 and Scarff et al. 1998.

Recommendations for advancing Museum practice

Storage and maintenance

The vast majority of the collection is in good condition and the specimens have been well preserved. With the proper care they will last many more exhibitions or even permanent display. There are a few specimens in poor condition, particularly the large female Richmond birdwing and the giant wood moth, which each have a sizable tear in one wing. Some, like the stick insects, are in good condition but very fragile. My recommendations for the future storage and maintenance of the collection are as follows:

- Move degrading and fragile specimens as little as possible and do so with care. Considers supporting fragile limbs in storage.
- Keep specimens stored in the display drawers or other sealed containers, this will prevent mites and such from eating them. There is evidence of mite damage in the past and the collection is aged and well stored now so it's unlikely to happen again, but adding mothballs or similar insect deterrents to the drawers would be wise.
- Store at a consistent, dry temperature and add desiccant sachets to drawers to prevent moisture build up and mold.
- Avoid prolonged exposure to UV light.
- I would also advise to provide information along side the display to encourage the public to report fauna and flora sightings on the websites iNaturalist and Atlas of Living Australia. Researchers use these large public databases to collect knowledge of species life history and distribution.

Display

It is safe to have the collection on permanent display, provided direct exposure to UV light is kept to a minimum as this will degrade the specimens long term.

Gaps

There is a broad and diverse range of species that accurately represents the local fauna and I could not determine any obvious gaps in the spread of species in the collection.

There is room for further identification however, the other 190 specimens not used in the analysis for this report were left out due to lack of available information or because I could not confidently determine the species of the individual. Many of the specimens have been previously identified to species and we do not know by who. However, even knowing the species doesn't always help as insect taxonomy is a vast field with many gaps and there are large numbers of undescribed species, or species with names but no known life history information.

Concluding remarks

The Eumundi Museum has a diverse and interesting ecological collection. It is important to maintain local regional collections such as this one, as they provide a snapshot of the fauna of the local area to use as a reference point when monitoring biodiversity. Knowing the distribution of half the collection is a great start and hopefully somewhere in the archives will be information regarding when and where the specimens were obtained. It would be good to confirm if the specimens were collected locally as this would suggest that species determined not to be local today, were so in the past.

References

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