



Summary Report of Cooloola Citizen Science BioBlitz Weekend of 24th to 26th August 2018

Ninety seven people signed on for this first BioBlitz in Cooloola to document as much of the Cooloola area's living natural resources — plants, animals, invertebrate, fungi and more, as possible. Seven target areas were defined for close scrutiny selected because they represented distinctive habitat types that were all easily accessible from Rainbow Beach, the administrative hub and centre of operations. The sites ranged from the mangrove forests of Bullock Point to the Lake Poona perched in the high dunes; from the littoral forests of the Inskip Point Peninsula to the rainforest at Bymien; from the wallum heathlands to the eucalypt forests adjacent to Carlo Sandblow; and from the fens to Searys Creek. It is an extremely rich and diverse area all within 12 kilometres of Rainbow Beach and all accessible by conventional vehicles.

Surprisingly there has been little documentation of the biological resources of an area that has already been included on the World Heritage Tentative List. Apart from the objective of building citizen science to better record essential base-line data, this exercise was also helping build the case to enable Cooloola to join its sister sandmass, K'gari (Fraser Island), across the Great Sandy Strait as a fully recognized part of the Natural World Heritage.

The BioBlitz was the result of a partnership between the Fraser Island Defenders Organisation (FIDO) that organized its first BioBlitz at Dilli Village in 2016 and Cooloola Coastcare, another active community-based organization with a strong record in environmental protection. Due to the time between the granting of the Permit and the event, there was no time to procure other financial support via grants so FIDO underwrote the administrative costs which exceeded \$5,000.

Venue and timing: The August date was chosen in February because it was expected that the bush would be blooming with new life. The two very dry months leading up to the event however meant that it didn't fully live up to expectations. Rainbow Beach was chosen for its location in close proximity to the study sites and the accessibility of those sites

and the availability of a venue for the administrative headquarters. This is the first of a planned series of Cooloola BioBlitzes over the next three years and other BioBlitzes will be held in different seasons. The date has already been set for the next full scale BioBlitz on the weekend of 17th to 19th May, 2019. However specialist groups are anticipating special surveys that are at optimum times for their speciality and these specialized surveys for frogs, fungi and particular insect groups are likely to add enormously to our knowledge of Cooloola and its ecosystems.



Photo during the BioBlitz by Suzanne Wilson

Methodology: The success of the BioBlitz was greatly due to the outstanding team leaders. Some of Australia's most highly regarded specialists in their respective fields took part leading small groups of citizen scientists into the field and supporting the identification at headquarters. The great wealth of experience from the experts helped to raise the skills of the citizen scientists both in the field and back in the debriefings. This assisted the identification and gathering data on plants, vertebrate and invertebrate fauna, birds, plants and fungi.

The data so far gained: Within days of the conclusion volunteers had entered a total of almost 700 individual observations but that is less than half the anticipated total entries. For example,

there are still additional data sheets turning up and botanist extraordinaire, Lui Weber, who could only get into the field for an hour, is still defining his list of 200 observations ready for data entry.

Many plant specimens are being prepared to be submitted to the Queensland Herbarium for identification while many spiders and insects will be sent to the Queensland Museum for confirmation and this takes time. In the meantime, our database continues to grow thanks to dedicated efforts to enter the data by IT savvy volunteers, Randy Orwin (Cooloola Coastcare's Digital Content Manager and Webmaster) and Dr. Charles Worringham.

Spider expert Robert Whyte said that, after narrowing down the number of spider specimens to 350, he expected about a 30% (100) to be new species not previously described. Many of the spiders are so small that they need to be identified under a microscope, but they still play a vital role in the ecosystem. He assessed the spiders coming from 35 different families but he will be poring over the specimens for weeks to identify them more precisely with the assistance from the Queensland Museum. He said that having collected all over Australia, Cooloola was amongst the top spots for biodiversity he had encountered.

The bird observers listed 99 different species seen over the weekend but because Cooloola is regarded as one of Australia's top sites for bird-watching, all had been previously recorded for the area.

Botanists were more than busy as they scoured the bush and mangroves adding many new species to the wide array of plants that were previously recorded for Cooloola. In the Inskip Point peninsula area, where previously only three species of plants were recorded, Glen Leiper and his team recorded 60 species in very short time. Within the botanical teams was a grass expert, Dr. Melodina Fabillo from the Queensland Herbarium, who is still to confirm the identification of all 40 specimens collected but this will add greatly to the list of grass species previously recorded from Cooloola.

Naturalist Ian Morris came down from Darwin to lend a hand. No better observer of nature can be found. He was able to illustrate the presence of *Melomys* and dingos from the evidence the left behind. The evidence of the giant earth worm *Digaster keastii* was all around the Bymien day-use area. Although nobody saw these subterranean worms over 30 mm in diameter and up to 60cms long, there obvious castings confirmed their presence.

Citizen Scientists: Participants ranged in age from 7 to 81 and came from many parts of South East Queensland and beyond. They included complete

novices to experts with specialists helping the less experienced identify and learn more about nature in the process. Their quests were enhanced by the discoveries made by the invertebrate teams and the presentations by experts.

Presentations: Bioblitz participants heard presentations from a range of experts, with one of the important themes being the complexity and uniqueness of the Cooloola ecosystem.

The features of the soils and the dune systems were emphasized by Prof. Susanna Schmidt in her description of microbial-plant interactions beneath the dunes and how this changes between the youngest and most ancient dunes.

Dr. Don Sands described the critical role of moth larvae in breaking down leaf litter, the under-appreciated role of many insects as pollinators, and their susceptibility to inappropriate fire management regimes. His presentation helped shift the BioBlitz focus to give a broader vision of the total ecosystem.

Robert Whyte, a nationally acclaimed spider expert, presented some amazing photos and facts that made the audience rethink attitudes about these most maligned and misunderstood creatures. The fact that the consumption of animal protein by spiders is only exceeded by humans and whales added to the new realization of the importance of these overlooked invertebrates.

The Nature of Cooloola was described by passionate local naturalist Kelvin Nielsen who has spent more than 50 years observing and studying every part of the ecosystems. Although his primary interest is in birds, we ended up with an appreciation of the total environment of the Gympie region.

Dr. Melodina Fabillo from the Queensland Herbarium provided an excellent explanation of preparing specimens to be sent to the Herbarium. It prompted planning to incorporate briefing citizen scientists at future BioBlitzes on lots of practical sessions to build up basic skills and expertise so that the data collected is more useful and relevant.

Organization: A large measure of the success of the BioBlitz is due to the dedication and organizing ability of the Coordinator, Dr. Lindy Orwin and the small team from Cooloola Coastcare and FIDO.

Follow-up: There is already a BioBlitz Facebook Group for those interested to interact and this will be a vehicle for those specialists wishing to pursue mini-BioBlitzes under the auspices of FIDO and Cooloola Coastcare.

Discovery of the Boronia moth — *Pseliastis* sp. (Heliozelidae).

Scientists participating in the Cooloola BioBlitz over the weekend were excited to discover a small moth new to science crucial for pollinating Boronias. The moth that excited such interest is only a few millimetres long, but CSIRO entomologist Dr. Don Sands said that it may hold the key to saving threatened Boronias including the endangered Wide Bay Boronia.

During his brilliantly illustrated presentation on the importance of invertebrate in the ecosystem on Friday night Don Sands had drawn attention to the nexus between pollinators and the survival of plant species. Little did he realize how that would result in one of the BioBlitz's most fascinating discoveries.

One of the botanical team leaders, Shelley Gage (Goomborian) is a local in the Cooloola region. She described how she paid attention to Don's words to help a most exciting discovery:

'On the 25th August 2018, during the Cooloola BioBlitz my team was recording plants on the slope between the sand track and the fens.

During our lunch break I wandered near the road taking more photos and noticed many small insects flying around a Boronia rosmarinifolia, They were not settling so it was difficult to see what they looked like but I had the impression they had chrome covered wings. The team all came over and tried to capture them with cameras but the insects were too fast.

On arrival at the BioBlitz base, I spoke to Don Sands who became quite excited and we organized to go back on the Sunday morning to collect some of the insects.

On examination Don said he believed they were in the family, Heliodinidae (metal moths) which contains many insects about which little is known. He will have the moths identified or described if they have not already been identified. Many of these moths are believed to be pollinators of Boronia and each one may be specific for a particular Boronia.

We are now excited to start looking at not only the plants for identification and recording but also associated insects to have them identified and their function in the insect's life cycle determined.

Shelley's observations led to one of the most exciting finds of the BioBlitz. Don Sands sent the specimen away and soon discovered that the moths were of a new species to science. They were provisionally identified by Prof. Doug Hilton (a specialist in the group) as an undescribed species of moth, *Pseliastis* sp. (Heliozelidae).

The exciting discovery is stimulating new research projects, forums and discussions to follow up this

discovery and also how implications for the survival of several Boronia species.

The discovery in Cooloola has also revived interest in the occurrence of a genus primitive moths *Agathiphaga* known as kauri moths that were only discovered in 1952. They have been recorded from Cooloola and it is now hoped to seek them out again for further research. The caterpillars feed only on "kauri" (*Agathis*) and are currently considered the second most primitive living lineage of moths after *Micropterigoidea*. The larva has been reported to be able to survive for 12 years in diapause.



Dr Don Sands CSIRO entomologist collects the Boronia moth that turns out to be new to science from a *Boronia rosmarinifolia*. This discovery is triggering research that may help to save local rare and threatened Boronias (*B. rivularis* [Wide Bay Boronia] and *B. keysii* [restricted to a very small area in southern Cooloola])