



AUSTRALIAN
GEOGRAPHIC SOCIETY
EXPEDITION REPORT

HOWE MAGNIFICENT

Volunteers on the third annual Australian Geographic Society Lord Howe Island scientific expedition helped discover insect species previously unknown to science.

STORY AND PHOTOGRAPHY BY LAUREN SMITH

Armed with a butterfly net, this volunteer kept watch for flying insects while enjoying the spectacular view.



Revering in the island's spoils, our volunteers walked the sparkling coastline between the base of Mt Lidgbird and Lovers Bay (left), met juvenile phasmids (above) and hunted for insects in verdant kentia palm forests (right).



Removing a threat

Lord Howe is the world's largest populated island to attempt a full-scale eradication of rodents.

The Lord Howe Island Rodent Eradication Project is aimed at ridding this World Heritage site of the ship rat and house mouse. Both arrived on the first ships to visit the island in 1788 and have been implicated in more than 20 extinctions there. Various control measures have been used for the rodents during the past 200 years, including the 1920s introduction of the masked owl, which has since become a pest. The Lord Howe Island Board plans to eradicate the rodents this winter, funded by the National Landcare Program and NSW Environmental Trust.

The Plan

The first of two bait drops will occur in June. Twelve kilograms of bait (cereal-based pellets of Pestoff 20R laced with brodifacoum) will be delivered per hectare by hand at bait stations and by helicopter. The second drop two to three weeks later, will use 8kg of bait per hectare. In total, 42t of bait (containing a nominal 840g of the active ingredient) will be used on the main island and nearby islands.

potential pollution impacts and how the program may affect non-target species. The two bird species at greatest risk are the woodhen and currawong; about 350 of these will be caught and held in captivity throughout the program as a safety measure. The baits themselves are coloured green to discourage birds from eating them. Other animals, such as lizards, may be affected but populations are expected to recover after the program.

Expected outcomes

Biosecurity dogs will search accessible areas within a month of the second bait drop, and again two years later. If no rodents are located, the project can then be declared a success. Benefits will include recovery of species at risk of extinction and an increase in populations of birds, reptiles and insects and in the abundance of plants, seeds and seedlings. A key hope is that the eradication will allow the reintroduction of species such as the Lord Howe Island phasmid, or ecological equivalents for locally extinct species such as the grey fantail.

Risks

The potential impact on humans of exposure to brodifacoum has been assessed as negligible by the Australian Pesticide and Veterinary Medicines Authority. The Lord Howe Island Board has also examined

Eradications elsewhere

Similar pest-eradication operations have occurred on more than 700 islands around the world, including Pinzón Island and Plaza Sur in the Galapagos, where a specially designed rodenticide was used and success declared in 2012. Nearer to home, Macquarie Island was successfully cleared by 2014 of rabbits, rats and mice using brodifacoum. South Georgia was declared pest-free in 2018, in a project covering an area of 1087sq.km, also using brodifacoum. Altogether, 80 per cent of all island pest eradication programs have been successful. One notable failure was on Henderson Island in the Pitcairn Islands Group in the south Pacific Ocean, where 80t of bait laced with brodifacoum was dropped. While the rat population declined enormously, 60–80 rats survived and multiplied back to a pre-eradication-sized population of up to 100,000 rats within a few years. Study programs suggest the failure was in part due to unexpected rainfall that led to a boom of new plant growth, which was more appealing to the rats than the pellets.



WE WERE MEANT to be collecting wasps, millipedes and soldier flies. But our group of keen citizen scientists on last year's scientific expedition to Lord Howe Island turned out to also be good at collecting spiders and crustaceans.

Our scientific mentors – Drs Juanita Rodriguez and Bryan ‘The Fly Guy’ Lessard, both entomologists from the Australian National Insect Collection, a Canberra-based CSIRO facility – were nevertheless endlessly good-natured about the array of minibeasts with which we enthusiastically filled our sample tubes.

It wasn't just small, industrious spiders or tiny freshwater prawns that split our focus. As well as collecting samples during the week-long expedition, we also counted anemonefish and sooty terns; hiked through kentia forest; swam in turquoise waters; looked for turtles at Old Settlement Beach; ate three-course

meals of fresh seafood and home-grown produce; and enjoyed drinks at sundown on the lagoon as mutton birds clumsily landed before ducking into their underground nests.

Lord Howe is described by visitors with all kinds of paradise-related terminology, and rightly so. But what also struck me was the sheer abundance on the island – of birds, fish and turtles, of palms and ferns, of beaches, walks and food...an abundance of delight.

OUR GROUP OF 13 volunteers was led by the CSIRO entomologists and Luke Hansen, an ecologist who, with his wife, Dani, a sixth-generation Lord Howe Islander, runs the island's eco-resort Pinetrees Lodge. Early on our first full day, Pinetrees staff dropped us off at Lord Howe's southern end to scramble up a lush gully at Mt Lidgbird's base. Here, equipped with butterfly nets and ethanol-filled sample tubes, we worked on setting up malaise and pan traps for collecting later in the week. The former are large mesh tent-like ethanol traps placed where insects are likely to fly through. Pan traps are small cups with soapy water, placed at intervals in key areas.

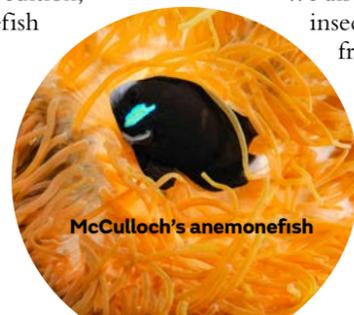
We also began collecting insects and other minibeasts from the creek, trees, rocks and dirt around us, all proudly filling up and comparing our sample tubes with one another.

We left pan traps along the coast as we headed back up the beach towards the lodge, eating packed lunches and stopping for a quick swim among nudibranch molluscs and a school of lined catfish at Lovers Bay. When the sand got too hot for bare feet, we clambered up the beach, emerging on the manicured greens of the nine-hole golf course, which provides access and clubs through an honesty system. This is also the case for the snorkelling equipment at Neds Beach and drinks at the Pinetrees boatshed.

Later that afternoon, most in our group hired bicycles and set out to explore the island, spotting woodhens and currawongs, visiting the general store, or cycling up to Old Settlement Beach to look for the large turtles that appear there around dusk. We regrouped to eat dinner together, swapping travel stories and declaring our new-found affection for the island. That was the general pattern of our (mostly) sun-drenched days.

The next day, we exchanged the south for the north end of the island and took the 200m vertical hike up to Kims Lookout from Old Settlement Beach, stopping first to collect orchid wasps. The view from here is one of the most spectacular of the island: you look south to see Mt Lidgbird and Mt Gower in all their glory.

We then walked east along the ridge towards Malabar Hill, stopping to inspect the underside of leaves for insects, pick out stingrays and turtles in



McCulloch's anemonefish

PHOTO CREDIT, PREVIOUS PAGE: LUKE HANSEN. THIS PAGE: SEAPICS.COM. SCIENTIFIC NAMES, CLOCKWISE FROM TOP LEFT: *Dryococcus australis*; *Amphiprion mccullochi*.

PHOTO CREDIT, CURRAWONG: JOHN PICKRELL. SCIENTIFIC NAMES FROM TOP: *Mus musculus*; *Strepera graculina crissalis*.



There we had the surreal experience of an up-close viewing of juvenile, adolescent and adult phasmids, one of the world's rarest insect species.

A VISIT TO North Beach isn't complete without walking through the valley to Old Gulch, a rocky cove on the island's windward side.

During lunch Bryan caught soldier flies in the shrubs beside the picnic tables as well as one perched on my leg.

We then walked carefully over rocks to the Herring Pools, a set of pools only accessible at low tide, lined with coral and occasionally filled with fish.

A quick swim and we were back on the glass-bottom boat, scouting for green and hawksbill turtles on our trip back to the lagoon. We found and circled over some, including a green turtle nicknamed Sumo who measured more than a metre in diameter.

The next day, after a morning of looking for millipedes off Smoking Tree Ridge Road, ecologist Dean Hiscox took us back to the lagoon to snorkel and survey the McCulloch's anemonefish. They live in climate-sensitive anemones, which makes them a vital indicator of reef health. The reef here boasts the world's most southerly-growing hard corals, but has begun experiencing the impacts of climate change – coral bleaching. Locals such as Dean survey the reef regularly to track the situation.

We snorkelled in circles around bommies near Erscoffs Hole, watched for Galapagos whaler sharks and turtles, and tried to count the small, darting anemonefish. Our counts ranged from ones and twos to 20.

Our average of 11 was consistent with the previous year, which pleased Dean.

He's an ex-ranger who led the 2001 climb of sea stack Balls Pyramid, 20km south-east of the island, when the Lord Howe Island phasmid, previously presumed extinct, was rediscovered.

Back on dry land, we headed inland to a captive-breeding population of the phasmids maintained by the Lord Howe Island Board, which manages this World Heritage-listed island. There we had the surreal experience of an up-close



viewing of juvenile, adolescent and adult phasmids, one of the world's rarest insect species.

We also learnt the history of the phasmid and the island's planned rodent eradication project that's due to begin this winter. Rats are thought to be the main cause of the extinction of the phasmid on the island in the 1920s.

The eradication program should allow for re-release of the rare insect onto the island and bolster populations of other native species.

(L-R) Expedition leader Luke Hansen; dancing sooty terns; entomologist Juanita Rodriguez with citizen scientists and the island's insect collection.

ON THE EXPEDITION'S final day, with rain bucketing down and putting our mountain climbing on hold, we began examining and categorising the insects we'd collected.

Using torches and microscopes, we attempted to identify and separate out the different species and gathered excitedly to look at particularly interesting specimens that had been found.

Bryan and Juanita were enthusiastic, confident that a few new species were among the collection. I felt an inordinate amount of pride later when Bryan emailed me to confirm that the fly he collected from my left leg was indeed a new species.

As the rain eased, the sun appeared and so did Dani to confirm that my flight was going ahead as scheduled. I suppose it was good news, but I'd been half-hoping for a delay and a chance to spend an extra day on this paradise that's so abundant in nature's gifts.

TRAVEL TO LORD HOWE ISLAND

This stunning World Heritage-listed island is a short flight from Sydney or Brisbane. Because of the island's ecological sensitivity, visitor numbers are restricted but demand is lowest in winter, meaning this can be the ideal time to experience the island's extraordinary natural features, including its remarkable biodiversity. For volunteering opportunities join the next AGS scientific survey in 2020, or register for the island's Conservation Volunteer Program. For more on this and travelling to and staying on Lord Howe see: lordhoweisland.info or visitnsw.com.