

Coral Sea Marine Park



Coral Sea Marine Park
Environmental Assessment of Islands,
Islets, Cays and Reefs of the Central Reef System
June 2025

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Acknowledgements

The participants acknowledge and thank the following people for their contribution to the success of the voyage:

We gratefully acknowledge the contributions of Joy Brushe and Larry Brushe (volunteer botanists), Andrew McDougall (QPWS), Maële Brisset (parc naturel de la mer de Corail, New Caledonia), Morgan Pratchett, Andy Hoey, Victor Huertas, Cecilia Martin (JCU) and Guy Weerasinghe (DAFF) for their expertise, dedication, and the positive spirit, humour, and goodwill they brought to the work.

Eliza Anwar and Emily Jensen-Woof for their hospitality during our stay on South Islet, their support with weed management, and their ongoing contributions to the restoration project.

The captain and crew of *Strait Shooter* for transporting us safely to and from the Coral Sea Marine Park and for looking after us during the voyage.

The Queensland Herbarium for plant identification and forwarding specimens to the National Herbarium and the Cairns Tropical Herbarium.

Finally, we thank Ben Hoffmann for ant species identification.



Figure 1. Expeditioners of the June 2025 CSMP voyage.

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Top left to right: Morgan Pratchett, Andy Hoey, Fiona Hagger, Darren Phillip, Victor Huertas, Maële Brisset, Larry Brushe, Andrew McDougall, Joy Brushe, Martin Russell and Guy Weerasinghe. Bottom left to right: Eliza Anwar, Shaun James, Michelle Schiffer, Emily Jensen-Woof and Cecilia Martin.

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Executive Summary

In June 2025, Parks Australia undertook an 11-day voyage in the Coral Sea Marine Park (CSMP) as part of the CSMP Island Health Project, to assess the condition of islands, islets and cays (hereafter referred to as islands) in the central region of the park.

The islands visited and assessed:

- South West Cay (Herald Cays)
- North East Cay (Herald Cays)
- South West Islet (Coringa Islets)
- North Islet (Willis Islets)
- South Islet (Willis Islets)
- South West Cay (Lihou Reef)
- Georgina Cay (Lihou Reef)
- Dianna Cay (Lihou Reef)
- Hermit Crab Islet (Lihou Reef)
- Turtle Islet (Lihou Reef)
- Lorna Cay (Lihou Reef)
- Betty Cay (Lihou Reef)
- South Diamond Islet (Tregrosse Reef)
- East Diamond Islet (Tregrosse Reef).

The CSMP Island Health Project is a collaborative effort involving multiple agencies and subject-matter experts, combining specialist skills to assess ecosystem health and identify changes and emerging pressures across key indicators. The June 2025 assessments build on previous Coral Sea Island Health voyages conducted in November–December 2019, July 2021, May–June 2022, July 2023, and July 2024, forming part of an ongoing monitoring program that underpins adaptive management of these island ecosystems.

The key assessments and activities undertaken on the June 2025 voyage include:

- Assessment of vegetation communities
- Establishment and monitoring of permanent vegetation BioCondition monitoring sites to provide benchmarks for CSMP vegetation and to assess structure, floristic composition and ecosystem function over time
- Compilation of comprehensive plant species, inventories and collection of plant species for incorporation into State and National herbaria
- Collection of data on seabird breeding, population demographics and species diversity
- Surveys for introduced and invasive species
- Monitoring of threats and pressures to natural values, including human activity
- Removal and recording of marine debris
- Testing and monitoring for highly pathogenic avian influenza
- Surveys for introduced ant and other invertebrate species
- Assessment of island geomorphology and detection of change over time
- Assessment of the current condition of reef benthic, fish, and invertebrate communities.

Key findings from the June 2025 voyage:

Vegetation

Ipomoea violacea (moon flower) was identified on South Diamond Islet, a new species record for this island. Two additional species were recorded for the first time on the Willis Islets: *I. violacea*, a native species on North Cay and *Physalis angulata* (wild gooseberry), a weed on South Islet. Notably, *P. angulata* has not previously been recorded on any of the CSMP islands.

Specimens of seven species from South West Islet (Coringa Islets), two species from South Islet (Willis Islets), one species from Turtle Islet (Lihou Reef) and their associated specimen records were incorporated into the pressed collections and associated records databases of the Queensland Herbarium in Brisbane, the National Herbarium in Canberra and the Australian Tropical Herbarium in Cairns.

Two additional permanent BioCondition monitoring sites have been established, bringing the total to 27 sites across 16 islands. These sites are distributed across a range of vegetation communities that are representative of the vegetation found on the CSMP Islands.

Island Watch/Health Checks

Islands visited during the June 2025 voyage were generally in good condition. No weeds were detected on any island, except South Islet (Willis), where introduced species have previously been recorded. There was no evidence of rodents or significant human activity.

The invasive soft scale insect *Pulvinaria urticae* was recorded on several islands. Of particular concern were infestations on North East Cay (Herald Cays), where scale was observed at five sites actively attended by ants within *Pisonia grandis* communities.

There was an increase in *Achyranthes aspera* (chaff flower) on the easterly vegetated Lihou cays, with Hermit Crab Islet, Turtle Islet, Lorna Cay all exhibiting far more extensive *A. aspera* communities at sites compared to 2021. South West Cay had greater extents of *Abutilon albescens* (lantern bush) across the island, and Georgina Cay featured more *Lepturus repens* (stalky grass) in the west/south-west of the island.

Ipomoea pes-caprae brasiliensis (goat's-foot morning glory) was recorded on Turtle Islet for the first time since 1984. A small but healthy population was also observed on the southeastern shoreline of East Diamond Islet, where it was mapped in 2021.

Birds

Twenty-three bird species were recorded during this voyage; 15 seabird species (of which 11 were breeding), three migratory shorebird species and five land/wetland species, including the resident Coral Sea subspecies of the buff-banded rail (*Gallirallus philippensis tounelieri*).

The Vulnerable (IUCN) New Caledonian fairy terns (*Sternula nereis exsul*) were observed nesting, or preparing to nest on Georgina Cay (known site), Dianna Cay (new site), Betty Cay (new site) and Lorna Cay (new site).

Record numbers of sooty terns (*Onychoprion fuscatus*) were observed nesting on North Islet (Willis Islets) with evidence of over 40,000 breeding pairs present.

No obvious adverse threats to birds were detected.

Ants

In total, 101 bait points were established across 11 islands and 43 samples were collected for species-level identification. Seven ant species were identified, three of which are introduced but all have been previously recorded within the CSMP. Ants were the only taxa observed, with no evidence of predation by other species.

The native *Cardiocondyla atalanta* was the most widely distributed species, while the highest densities were recorded on North East Cay (Herald) and South Diamond Islet.

Ecological Restoration Project

On South Islet, *Euphorbia cyathophora* (dwarf poinsettia) and *Cenchrus echinatus* (Mossman river grass) continue to spread although regular weeding in the managed areas (North-west end) by the Bureau of Meteorology's on-island crews over the past 12 months has significantly reduced the abundance of dwarf poinsettia in these areas, improving habitat availability for ground-nesting seabirds. Further efforts by the on-island crew have focused on removing *Gynandropsis gynandra*

(cat's whiskers) emerging around the Operational Area boundary and containing the large infestations of *Amaranthus viridis* (green amaranth) dominating sections in the Operational Area.

Five additional weed species were detected in natural areas beyond the operational zone. These were removed and marked for ongoing monitoring and treatment.

During a 5-day visit, Parks Australia and Bureau of Meteorology crews undertook restoration works, removing approximately 1030 kg of *Euphorbia cyathophora*, treating 12 outlying weed infestations (nine *Cenchrus echinatus*, and three *Dactyloctenium aegypticum* outliers) and installing a cover over the compost pile to prevent weed spread by birds.

Highly Pathogenic Avian Influenza

Northern Australia Quarantine Strategy undertook sampling to continue monitoring for avian influenza within the Coral Sea seabird population and to characterise any influenza types that may be circulating within these populations. A total of 231 environmental samples were collected from the central Coral Sea region all of which came back negative for avian influenza, however three were positive for Avian paramyxovirus-1 which will be further explored in future surveys.

Marine Debris

A total of 161 kg of marine debris (excluding FADs and floats) were removed from the islands. Plastic bottles were the most frequently collected marine debris item. Lorna Cay (Lihou Reef), followed by Georgina Cay (Lihou Reef), had the greatest marine debris loads during this voyage, at 40 and 30 kg respectively. Overall, marine debris loads on islands visited in 2025 were lower than those recorded during previous surveys.

Sand Temperature Loggers

Nine Bluetooth data loggers were deployed across three habitat types on South Islet (Willis Islets) to measure current sand temperatures at green turtle nesting depth. The data will help assess how vegetation influences thermal extremes and buffers against climate-driven warming, informing adaptive management actions such as nest shading or relocation, while contributing to long-term regional monitoring in Australia.



Figure 2: Martin Russell maintaining Parks Australia signage.

Guy Weerasinghe ©

Recommendations

All biosecurity protocols and other recommendations contained in previous reports Hemson et al. (2020), Chapman et al. (2022), McDougall and Brushe (2023), Director of National Parks (2024) and Director of National Parks (2025) are also relevant to this report.

Vegetation

- Continue to undertake regular Health Checks (Melzer 2024) on all islands visited during Parks Australia voyages. Particularly important for monitoring the condition of the *Pisonia grandis* forests and the *Cordia subcordata* (sea trumpet) communities.
- If insect predation is present on *Cordia subcordata*, identify the insect (or insects) responsible if possible, or take a sample for professional identification.
- When undertaking Health Checks, look for the presence of scale insects, exotic ants and sooty mould, noting trends in abundance of scale insects and exotic ants if these have been observed in previous visits. If scale is present, note also whether predator lady beetles and evidence of parasitoid wasp activity are also present, and whether ants are actively attending scale.
- As a precaution, take samples of live *Cryptolaemus montruzii* (predator lady beetle) on each visit to cays with *Pisonia* forests for release if any scale outbreaks are encountered.
- If a scale outbreak occurs in a *Pisonia* forest, in addition to release of predator lady beetles, ant baiting may also be required. Consult the QPWS ecological assessment unit and the references cited in this report on management recommendations for scale outbreaks.
- Continue to implement, assist and manage the South Islet (Willis Islets) Ecological Restoration Project according to the Willis Island Weed Management Plan and associated Statement of Intent between Parks Australia and the Bureau of Meteorology and on-ground methods detailed in the On-Island Crew Instructions.
- Finalise contemporary collections of all plant specimens currently present on each of the 21 vegetated islands.
- Over a number of voyages, trial transplanting of *Pisonia grandis* cuttings (manageable numbers at a time) from North East Cay (Herald Cays) to South West Islet (Coringa Islets) in areas where the *Pisonia* forests were decimated by scale outbreaks in the 1990's. It is very important to build the populations of *Pisonia grandis* back up to its former extent and safe guard the presence of *Pisonia grandis* communities in the CSMP. This could easily be done using the methodology developed by QPWS during trials on Tryon Island in the Great Barrier Reef to successfully reinstate the Tryon Island *P. grandis* forests. While transplanting success rates of up to 100% were achieved during optimal weather conditions, success rates will vary depending on timing and amount of follow up rain.

Birds

- Implement seasonal closures to known (and likely) breeding sites of the New Caledonian fairy terns. The very small global population of these birds is susceptible to population-wide threats, including high pathogenic bird flu, sea level rise (nest site inundation), and more localised threats including human-caused nest disturbance or destruction. Any management tools available to increase resilience within the population should be investigated.
- Continue gathering baseline spatial and temporal data for all islands. The timing of New Caledonian fairy tern breeding is becoming better understood, however, a marine park-wide census of total birds is not known, nor is the extent of nesting locations.

- As resources allow, or other technologies become available, conducting surveys outside the usual June to August voyages will enhance our understanding of birds and their use of the marine park.
- When resources and weather conditions allow, supplement ground surveys with appropriate drone imagery.
- Refine and implement survey methods that reduce disturbance to nesting and roosting birds. Particularly during critical stages of their breeding cycle.
- Continue gathering pelagic seabird data.
- Continue to collate audio and photographic reference material for all species (including age classes) and their habitat.
- When resources and available vessel berths allow, investigate collaborative research with other institutions. Possible research that may fit within the limited duration of voyages, includes bird genetic information through blood and feather samples.

Island Watch & Health Checks

- Continued monitoring of high priority cays is essential to understand change over time and for early detection of introduced/invasive species. At a minimum, the Island Watch tool must be utilised on each island visited by Parks Australia staff, as well as Health Checks and ant surveys on vegetated cays wherever possible. Include photographs of sites at known locations for comparisons over time.
- The inclusion of experienced personnel to undertake scale and hawkmoth surveys and biocontrol agent surveys (native predatory ladybird *Cryptolaemus montrouzieri* and parasitic wasp *Coccophagus ceroplastae*) on North East Cay (Herald) on the next visit by Parks Australia, given the sites of scale and attending ants observed during this trip. Prior to departure, there should be a plan in place for which transects/areas of the Cay should be surveyed, and a plan for management action if there is evidence of a potential or actual scale outbreak. The same surveys should be undertaken for the smaller and vulnerable *P.grandis* communities on Magdelaine Cay South. The use of a drone would be helpful to assess the health of the more inaccessible patches of *P.grandis* on Magdelaine Cay South.
- Continue to monitor for introduced, pest and problematic invertebrate species, and develop a contingency plan for management action if an outbreak occurs or a new, problematic introduced species is detected.
- Development of a communications strategy, outlining outreach strategies to island visitors, to help communicate and educate on biosecurity principles to help reduce the spread of introduced and invasive species, or to advise if there is a newly detected outbreak (link to contingency plan above).
- Islands with introduced species should be the last location visited during a Coral Sea voyage. Alternately, biosecurity measures leaving this island should be enhanced to ensure these species are not introduced to other cays subsequently visited.
- Use (and make available to other CSMP island value surveyors) recently obtained high-resolution aerial photogrammetry of CSMP islands to help identify Health Check/ BioCondition assessment sites on future CSMP Island Health Voyages, to compare geomorphological changes over time, and help assess shifts in vegetation communities.
- Consider ways to house and share data collected each voyage, to maximise usage and assist external researchers.
- The collection of rock slabs and clam shells which signifies some kind of historic site on Georgina Cay (Lihou) should be surveyed by an archaeologist to ascertain its creation and usage. Georgina Cay may need to be given higher protection status if this site is significant.

Ant surveys

- Continued collection and monitoring of ant species on islands, including presence of invasive ant species.
- Further investigation of association between ants and broken bird eggs, possible impacts on nesting seabirds.

HPAI sampling

- Continued surveillance to occur in the Coral Sea in collaboration with DAFF/NAQS/BOM and other research and compliance groups visiting the region.

Marine debris

- Continued collection of marine debris to support the goal of maintaining island environments as close to their natural state as possible.

Collaboration with New Caledonia's parc naturel de la mer de Corail management team

- The inclusion of Maële Brisset on this voyage provided a unique and valuable opportunity for neighbouring marine park managers to exchange knowledge and share experiences. It is recommended that whenever possible a berth is offered to a member of the New Caledonia's parc naturel de la mer de Corail management team.

Introduction

The Coral Sea Marine Park (CSMP) is in Commonwealth waters, immediately east of the Great Barrier Reef Marine Park, and abuts Papua New Guinea, Solomon Islands and New Caledonia waters. It extends from Cape York Peninsula to just north of Bundaberg in Queensland, Australia, encompassing an area of 989,836 km². There are over 1500 reefs in 34 vast reef areas and over 60 islands in the CSMP.

The islands play a significant ecosystem service role in the broader health of the CSMP region. As an example, the islands support globally significant seabird breeding populations that in turn service the health and requirements of the adjacent coral and fish ecosystem communities by providing a nutrient source (guano) that is critical to maintaining the diversity in these systems. Twenty-one islands are vegetated containing rare habitats, and about 24 islands are within the Coringa-Herald and Lihou Reefs and Cays Ramsar site. The sand-cay habitats are used for nesting by the globally endangered and migratory green turtle (*Chelonia mydas*), and possibly other species of marine turtle.

Parks Australia manages the CSMP under the Coral Sea Marine Park Management Plan 2018. Parks Australia and the Great Barrier Reef Marine Park Authority (GBRMPA) have a Memorandum of Understanding (MOU) to enable management efficiencies between the two marine parks. As part of this MOU, the GBRMPA/Queensland Parks and Wildlife Service Joint Field Management Program (JFMP) has been assisting Parks Australia with monitoring and managing island ecosystems.

In 2022, The Bureau and Parks Australia co-signed an Occupation Licence providing formal approval for the Bureau to continue to maintain its weather station and conduct its year-round occupation and essential weather data collection and forecasting operations on Willis Island. The Licence also contains requirements around adhering to environmental law and against the introduction of species. Since the establishment of the Occupation License, Parks Australia and the Bureau have been working in close collaboration to enable the ecological restoration project that is now underway on South Islet.

This was the first expedition led by Parks Australia that included a member of the New Caledonia's parc naturel de la mer de Corail management team, Maële Brisset. In 2010, Australia and France-New Caledonia signed the 'Declaration of Intentions between France-New Caledonia and Australia for the Sustainable Management of the Coral Sea'. The Declaration, signed in 2010, confirms the intention for Australia and France-New Caledonia to work collaboratively to:

- Strengthen the scientific framework for collaboration on the conservation and management of the Coral Sea and its environs.
- Establish long term collaboration between the bodies and institutions responsible for the management of ocean, reef and lagoon areas of the Coral Sea.
- Strengthen regional capacity building efforts to ensure a comprehensive trans-boundary approach to the conservation of biological diversity of the Coral Sea, including natural resources, in a cooperative and complementary manner.

Maële's participation on the voyage was a welcomed and very valuable step in improving the ongoing collaboration with our New Caledonian counterparts.

Since 2019 (excluding 2020), under the CSMP Island Health Project, Parks Australia have undertaken annual voyages to the CSMP. These voyages use relatively consistent monitoring methods to assess ecosystem indicators and determine overall island health. Reports of these voyages are available at Australian Marine Parks website.

Over the 4th - 14th June 2025 voyage, utilising the chartered vessel *Strait Shooter* (Figure 3), Parks Australia undertook island health assessments at the following islands (Figure 4):

- South West Cay (Herald Cays)
- North East Cay (Herald Cays)
- South West Islet (Coringa Islets)
- North Islet (Willis Islets)
- South Islet (Willis Islets)
- South West Cay (Lihou Reef)
- Georgina Cay (Lihou Reef)
- Dianna Cay (Lihou Reef)
- Hermit Crab Islet (Lihou Reef)
- Turtle Islet (Lihou Reef)
- Lorna Cay (Lihou Reef)
- Betty Cay (Lihou Reef)
- South Diamond Islet (Tregrosse Reef)
- East Diamond Islet (Tregrosse Reef).

Of all voyages undertaken to date, this was the most cross-disciplinary. Participants included three CSMP managers, a staff member from the Department of Agriculture, Fisheries and Forestry (DAFF), a bird expert from Queensland Parks and Wildlife Service (QPWS), a marine park officer from New Caledonia's parc naturel de la mer de Corail, researchers from James Cook University (JCU), and volunteer botanists. Researchers from JCU assessed the current condition of reef benthic, fish, and invertebrate communities. A report on this work is available on the Australian Marine Parks website.



Figure 3. The voyage ship *Strait Shooter* at mooring off South Willis, June 2025.

Maële Brisset ©

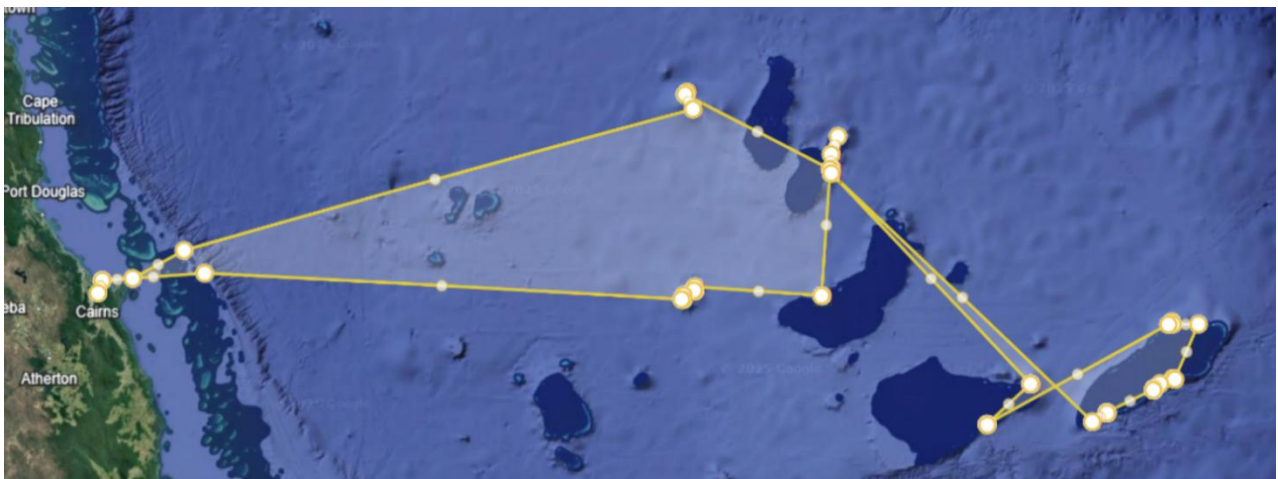


Figure 4. Map of islands visited during the June 2025 Coral Sea Island health voyage.

Part I - Methods, General Results and Discussion

1.1 Vegetation - Joy Brushe, Larry Brushe and Fiona Hagger

Methods

General vegetation assessment

The cays were traversed on foot searching for weeds, documenting plant species present and noting changes in vegetation.

Permanent BioCondition Sites

The purpose of permanent BioCondition monitoring sites is to:

- Provide benchmark reference data for ecological restoration projects and BioCondition¹ assessment for the same vegetation communities elsewhere on other Coral Sea Marine Parks islands.
- Document changes in vegetation over time.
- Assess the impact of climate change and other disturbances on vegetation.

BioCondition benchmarks are obtained by averaging survey data for each vegetation attribute from replicate benchmark reference sites located in pristine representative locations within each vegetation community within the CSMP. It is also desirable to include benchmark data obtained across different seasons to capture seasonal variation in the benchmarks.

Sites were permanently marked with galvanised star pickets located at the start (0m) and end of the 50m transect. The star pickets at the start (0m) ends of the transects were labelled with engraved identification tags made of 316 grade stainless steel firmly attached with a 316 grade stainless steel cable tie to prevent movement in strong winds (Figure 5). To minimise visual impact, posts were driven deeply into the ground to an above ground height of approximately 0.7 metre.

The secondary site survey methodology of Neldner et al. (2023), with some slight modifications to accommodate island vegetation, was used to survey the sites. The methodology used is described in [Appendix 1. Plot Orientation and Data Recorded at](#)

[Permanent BioCondition Monitoring Sites](#) and Neldner et al. (2023). Data was recorded digitally onto iPhones and was backed up daily onto a laptop computer during the voyage.



Figure 5. BioCondition monitoring sites were marked using star pickets labelled with stainless steel identification tags. Joy Brushe ©

¹ BioCondition is a site-based, quantitative, and repeatable, condition assessment methodology that provides a measure (expressed as a BioCondition score between 0 and maximum of 1 and BioCondition Class of 1, 2, 3 or 4 - one being the best) of how well a terrestrial ecosystem is functioning for biodiversity values. A suite of attributes (e.g., canopy cover, coarse woody debris, native plant species richness, litter cover) are assessed at a site and evaluated against benchmarks for those attributes. The benchmarks for attributes are derived from a reference state for the ecosystem, reference state being the natural variability in attributes of an ecosystem relatively unmodified since the time of European settlement (Eyre et al. 2015).

To ensure long term secure data storage and accessibility, data and photographs recorded at the permanent monitoring sites will be stored digitally by Parks Australia and in the Queensland Herbarium QBEIS database.

The data obtained from the permanent BioCondition monitoring sites established on the 2019 to 2025 voyages will be used to obtain reference data for BioCondition assessment of Coral Sea Marine Park vegetation communities according to the methodologies of Eyre et al, 2015 and Eyre et al, 2017.

Results

Plant collections

A new weed species, *Physalis angulata* (gooseberry), was found growing on South Islet (Willis Islets) during the June 2025 voyage. A small number of this weed was removed from the natural area adjacent to the North track, behind the Hogen building. This was the only location this species was observed on the island. Specimens were collected along with plant description and habitat information and sent for identification and incorporation into State and National herbariums. *P. angulata* is typically dispersed by humans or fruit eating birds. It is relatively common on the adjacent coastal mainland but has not previously been recorded on any Coral Sea islands.

A single juvenile plant of *Ipomoea violacea* (moon flower) was collected from North Cay (Willis Islets). This species is present on South Magdelaine Cay, the Coringa Islets, the Herald cays and the Tregrosse Reef cays, but has not previously been recorded on any of the Willis Islets.

Another specimen of *I. violacea* was collected from South Diamond Islet. This species has not been previously recorded from South Diamond Islet.

The identification of each of the two collections of *I. violacea* was confirmed by the Queensland Herbarium but the specimens were not retained for their collection. Better specimens, if available, should be collected on a future visit for incorporation into the State and National herbariums.

A specimen of *Ipomoea pes-caprae* subsp. *brasiliensis* (goats-foot morning glory) was collected from Turtle Islet (Lihou Reef) where it has not been observed since 1984.

In addition, specimens of seven species from South West Islet (Coringa Islets) were collected to complement collections made on the 2019 voyage. One specimen of a species from South Islet (Willis Islets) which was not kept by Qld Herbarium during a previous collection was also collected.

A total of 199 specimens and associated specimen records have now been collected from the Coral Sea Marine Park during the 2019 to 2025 voyages for lodgment in State and National herbariums. These specimens provide a permanent verified record of all species currently or formerly growing on each of the islands.

Permanent BioCondition monitoring sites

Two additional permanent BioCondition monitoring sites were established and surveyed during the 2025 voyage:

- Site M27 in an area of *Abutilon albescens* (lantern bush) shrubland on North East Cay (Herald Cays).
- Site M28 in an area of *A. albescens* closed shrubland with a ground layer of *Plumbago zeylanica* (native plumbago) on South West Islets (Coringa Islets).

Discussion

The *A. albescens* closed shrubland at Site M28 was mapped as *P. zeylanica* shrubland to closed shrubland in 2019 (Hemson et al 2020). The *P. zeylanica* is still abundant in the ground layer at the site. Transitions in structure and floristic dominance between and within grasslands, herblands and *A. albescens* shrublands are a feature of the Coral Sea island vegetation. This is another example

of similar climate related transitions in structure and floristic dominance observed on previous voyages and discussed in the 2023 and 2024 Island Health Voyage reports (Director of National Parks 2024; Director of National Parks 2025). These transitions are also reflected in variations between real time on ground observations and the 2006/7 to 2023 mapped extent of these communities.

Digital Data

All digital BioCondition monitoring site photographs have been sent to Parks Australia.

1.2 Island Watch/Health Checks – *Fiona Hagger*



Figure 6. The historic site on Georgina Cay (Lihou Reef).

Fiona Hagger ©

Methods

Health Checks, designed by QPWS (Melzer 2019), are qualitative tools for efficiently and routinely monitoring the condition of key values. They use criteria that can be applied across a diversity of values and are based on threatening processes and their impacts (e.g. weeds, cyclone impacts, dieback), or parameters (e.g. ground cover), that are good indications of condition. The assessor scores the condition of the value, at representative sites, using simple, predetermined visual cues. The Health Check report uses the International Union for Conservation of Nature condition categories (Good, Good with Some Concern, Significant Concern, Critical) and definitions to describe the overall condition of a value based on all the Health Check indicators relevant to the value (Osipova et al., 2014).

The Island Watch tool was developed by QPWS as an early warning system for pest incursions (biosecurity surveillance) and the detection of other threats or changes to natural values, so that early management intervention can be undertaken (Armstrong, 2017). Modified QPSW Island Watch templates have been incorporated into a purpose designed Parks Australia methodology for basic monitoring and assessment of CSMP island ecosystems.

Value Assessments have been undertaken for the islands within the CSMP, and under this process the four key natural values of CSMP islands have been defined as island vegetation, birds, nesting turtles, and geomorphology. The CSMP-specific Island Watch assessment tool focuses on providing a high-level assessment of the condition of these four value areas, as well as the presence of any threats (for instance introduced/invasive species and human impacts). Each island has a dedicated assessment sheet, with sections attributed to high value vegetation communities and major threats to look out for on that specific island. Other surveys being undertaken simultaneously (such as bird or marine debris) were recorded, as well as the condition of any island infrastructure or maintenance work being undertaken on Parks Australia signage.

The presence of soft scale insect *Pulvinaria urticae* on *Pisonia grandis* was noted during the traverse to and around health check sites on North East Cay (Herald). Any observations of scale and attending ants were visually assessed and assigned abundance scores/infestation categories (number of scale per 10 leaves): 0; 1-50; 50-500; and >500. This categorisation was based on the 10-branch-end method developed by Chris Freebairn for monitoring scale in 2007 at North East Cay (Olds 2018). There was insufficient time to undertake a dedicated scale survey, with the last occurring in 2019 by QPWS Officers. The methodology for the 10-branch-end method is detailed in the 2019 Coral Sea Island Health Voyage Report (Hemson et al., 2020).

Islands were circumnavigated on foot and as much area covered as time permitted (Figure 7). All vegetation species recorded over time on each island were searched for and their presence, or lack thereof, recorded.



Figure 7. Fiona Hagger undertaking Island Health Check assessments.

Guy Weerasinghe ©

Previous CSMP Island Health Voyages have included the use of a drone to assist in tracking geomorphological changes in CSMP islands. A drone was not used on the 2025 voyage, so any shifts in island size and shape were considered by the naked eye and by the use of GPS tracking. Changes were investigated through comparisons against previous island photographs.

Photos were taken of key sites (BioCondition sites, previous Health Check sites, and other sites of key value vegetation communities), which have been used to compare the condition against previous years recordings (and will be used for future comparative studies).

Health Checks

The Health Check methodology described in Melzer 2024 was followed.

A map of each island was created on QGIS showing previous Health Check site coordinates and the latest vegetation map boundaries overlying the high-resolution drone image used to create the vegetation map. The map was loaded onto the Avenza maps App on an iPhone to locate the Health Check sites in the field. This method ensured that the sites were located as close as possible to the previous sites.

Health Check photographs were taken in 4 directions (North, East, South and West) using the Context Camera App on an iPhone with a stamp showing:

- Latitude
- Longitude
- Datum
- Island name
- Site
- Date and time taken.

Results

The islands visited during the June 2025 voyage were mostly in good condition. No weeds were found on the cays visited except for South Islet (Willis) on which introduced species have been previously recorded. No signs of rodents were discovered. There were no obvious, detrimental signs of human activity. The marine debris collected mostly consisted of plastic bottles (~80%), with approximately 12% collected from fish aggregating devices (floats, PVC pipe, GPS units and netting), and 8% was 'other' including thongs, glass bottles, shoes, bottle caps and miscellaneous plastic items.

The notoriously destructive soft scale insect *Pulvinaria urbicola* was found on a number of islands visited. Of concern is the scale found on North East Cay (Heralds). There is detail regarding the history and presence of scale on the *Pisonia grandis* communities in the CSMP, including North East Cay, in the 2019 Island Health Report (Hemson et al. (2020)). The rapid scale assessment undertaken on *P. grandis* communities on North East Cay, while completing Health Checks, found five sites of scale being actively attended by ants (Table 1). As Figures 8 and 9 below demonstrates, Sites 1 and 2 had between 50-100 scale per 10 branch ends, with between 300-400 attending ants present. No insects predating or parasitizing the scale bugs (namely the biological control agents released in 2001 and 2002: Mealybug ladybird (*Cryptolaemus montrouzieri*) and the parasitic wasp (*Coccophagus ceroplastae*)) were detected (Table 1). Sites 3,4 and 5 had between 1-50 scale, with approximately 60, 70 and 150 attending ants (Figure 10).

Table 1. Site, location and approximate number of scale, biocontrol agents (insects that control scale) and attending ants present on North East Cay (Herald Cays).

Island name: North East Cay (Herald) Date: 5/6/2025 Surveyors: Fiona Hagger											
Site	Non Transect		Scale per 10 branch ends				<i>Cryptolaemus montrouzieri</i> (Mealybug ladybird) Y/N	<i>Coccophagus ceroplastae</i> (Parasitic wasp) Y/N	% scale impacted by parasitoids	Ants	Hawkmoth Canopy % Impact
Site #	Lat. (DD)	Long. (DD)	0	1-50	50-100	500+					
1	-16.94254	149.19866			x		N	N	-	~400	0
2	-16.94335	149.19866			x		N	N	-	~300	0
3	-16.94399	149.19882		x			N	N	-	~70	0
4	-16.94161	149.19933		x			N	N	-	~60	0
5	-16.94152	149.19942		x			N	N	-	~150	0



Figure 8. Scale and attending ant at Site 2, North East Cay (Herald Cays).

Fiona Hagger ©



Figure 9. Left: Site location The two red points are the sites where between 50-100 scale were present. The three orange points are where the was between 1-50 scale. The transect lines are taken from a map of historic transects (established 1982) that has been used on previous scale surveys. Right: Active scale and attending ant site from site 1, North East Cay (Herald Cays).

Fiona Hagger ©



Figure 10. Scale and attending ant at Site 4, North East Cay (Herald Cays).

Fiona Hagger ©

Mealey bug was also found on the vegetated cays South West Cay and Hermit Crab Islet in the Lihou Reef on *Achyranthes aspera* (chaff flower). It was present in patches of senescing and dying plants and most healthy *A. aspera* in the vicinity were free of the scale. Three areas of mealey bug were also found on *A. aspera* communities on South Diamond Islet during the assessment of Health Check sites, and on *Boerhavia albiflora* var. *albiflora* on North Islet (Willis Islets).

Some consumption of *Pisonia grandis* and *Cordia subcordata* (sea trumpet) leaves by insects was evident on North East Cay (Herald Cays).

Comparisons of photos and records at Health Check and BioCondition Monitoring sites between visits reveal shifts in vegetation communities on CSMP cays. This was particularly evident on the vegetated cays in Lihou Reef, which were last visited collectively in 2021. There was an increase in *A. aspera* on the easterly vegetated Lihou cays, with Hermit Crab Islet, Turtle Islet, Lorna Cay all exhibiting far more extensive *A. aspera* communities at sites compared to 2021. South West Cay had greater extents of *Abutilon albescens* (lantern bush) across the island, and Georgina Cay featured more *Lepturus repens* (stalky grass) in the west/south-west of the island.

Ipomoea pes-caprae subsp. *brasiliensis* (goats-foot morning glory) was found on Turtle Islet, not having been recorded there since 1984. A small but healthy community of *Ipomoea pes-caprae* subsp. *brasiliensis* was also found on the southeastern shoreline on East Diamond Islet, where it was last mapped in 2021 (and observed in 2022 and 2023).

As is often found on CSMP islands, *Argusia argentea* (octopus bush) communities growing along the very periphery of the vegetation, exposed to the elements (particularly on the south-eastern weather side of cays), experience die-back from exposure or saltwater inundation. This was particularly the case on South West Cay (Herald Cays), North East Cay (Herald Cays), and South West Islet (Coringa Islets). North Cay (Willis Islets) exhibited patches of dead vegetation at areas of low elevation, likely to be periodically inundated by storm/cyclonic wave surges.

Discussion

Origin, dispersal and turnover of the CSMP island plant species have been described by Batianoff et al. (2009a) and previously summarized by Joy Brushe in the 2021 and 2022 Island Health reports (Chapman et al. (2022), McDougall and Brushe (2023)). Brushe notes in the 2023 Island Health report that the vegetation on a number of islands is very dynamic, transitioning between grasslands, herblands and ephemeral lantern bush shrublands, depending on timing, duration and amount of rainfall. Consistent monitoring of Health Check sites and BioCondition Monitoring sites helps track the shifts and changes of vegetation communities over time.

The scale observations also highlight how Health Check site monitoring is helpful in noticing detrimental insect activity – whether that be ongoing, increased or decreased.

Since the early 1990's, outbreaks of the introduced soft scale insect *Pulvinaria urbicola* have significantly impacted on *P. grandis* forests globally. Australia's *P. grandis* communities are internationally significant as the majority are on protected islands and beyond Australia it has largely been cleared for guano mining and plantations. *P. grandis* communities on Coral Sea islands provide high-density seabird nesting habitat area and the roots of *P. grandis* trees help to stabilise wedge-tailed shearwater burrows.

All cases of global scale outbreak on *P. grandis* were exacerbated by introduced ants. Ants can form mutually beneficial relationships with scale by protecting scale from predators and parasitoid wasps in return for using the carbohydrates in the honeydew the scale excretes after consuming plant sap. An outbreak of the scale *P. urbicola* caused the complete destruction of the 16ha of *P. grandis* forest on South West Islet (Coringa) in the CSMP from 1992–2001. The tending ant is suspected to have been the introduced Pharaoh ant, *Monomorium pharaonis*. Scale outbreaks were also a problem on the South West and North East Cays (Herald Cays) and Magdelaine Cay South at the time. Insect surveys at the time of outbreak revealed no effective natural predators of

the scale on the effected CSMP islands, and after consultation with experts a biological control program was implemented in 2001-2002. Following establishment of the biocontrol agents, scale numbers fell to low, manageable levels, saving the remaining CSMP *P. grandis* forests.

The current status of the biocontrol agents *Cryptolaemus montrouzieri* (a native predatory ladybird) and *Coccophagus ceroplastae* (parasitic wasp) populations on North East Cay (Herald Cays) is uncertain. *C. montrouzieri* is regarded as being the most effective predator. It tends to act in a 'boom and bust' situation: with heavy infestation of *Pulvinaria* scale, larval numbers of the ladybird explode and destroy the host within weeks. Within about 2 months it reaches high numbers which totally consume the prey, the high beetle concentration then subsides, and the adult beetles are at risk of going to extinction when prey levels are very low.

Only a small section of the *P. grandis* community was searched for scale on the June 2025 voyage, with none of the biocontrol agents observed in that section. In 2019, scale surveys undertaken by QPWS officers found that the only evidence of the predatory beetle *C. montrouzieri* was a single larva and a few eaten egg masses at one of the sites on North East Cay (Herald Cays). An insect survey focusing on the biocontrol agents should be undertaken at the same time as a scale survey on the next visit to North East Cay to ascertain whether any have survived. This will be critical knowledge for management if a scale outbreak re-occurs.

The scale observed on *Achyranthes aspera* at South Diamond Islet was not present during the 2021 visit so may have been introduced since 2021 and should continue to be monitored with potential consideration for management intervention if it is found to have spread on the next visit.

Access to recent high-resolution aerial imagery of islands is critical to help identify and monitor shifts in the size and shape of CSMP islands. The islands in the CSMP provide important substrate habitat for vegetation to grow on, underpinning the health of natural island values. Monitoring the shape and change of CSMP islands is important to help predict a likely trajectory for island size and movement changes. This, in turn, will inform management actions. Furthermore, high-resolution imagery is of great help in locating previously recorded Health Check or BioCondition site coordinates. GIS generated maps with high resolution island imagery overlaid with accurate GPS coordinates used with a real time mapping app on a mobile phone or tablet greatly assists efficient and accurate on-ground location of previous sites. It is not practical or aesthetically desirable to permanently mark each of the large numbers of health check sites and use of these real time maps makes traversing and locating sites much easier in the field. Achieving good image spatial accuracy can be difficult on the remote islands and high-resolution aeroplane mosaic imagery needs to be further trialed and refined to obtain improved spatial accuracy.

Finally, as is covered elsewhere in this report and has been consistently highlighted in previous CSMP Island Health voyage reports, following strict biosecurity practices is critical for all island visitors, whether they be government, tourist, recreational or researchers, to reduce the spread of introduced/invasive species. The Parks Australia signs on vegetated cays must be maintained and cleaned at each visit by Parks Australia staff, with the attached logbooks reviewed to get an estimation of visitors. Consideration should be given to ongoing communication with CSMP visitors regarding the importance of biosecurity requirements.

Digital Data

Beyond the records and information contained in this report, the following has been retained by Parks Australia for future comparative usage:

- Photos of key vegetation sites and condition
- Photos of health check sites
- Photos of present or potential threats, pressures and human impacts
- Identification guides for vegetation (both native and introduced) and birds
- Photos of geomorphological shifts and cyclone impacts.

1.3 Birds – Andrew McDougall (QPWS)

Methods

Island survey data were collected through on ground observations. Incidental pelagic (at sea) data were collected by observations from the vessel. Full island surveys were conducted when possible. Surveys on larger islands, or islands with limited survey time, were modified to concentrate on one, or a few, key species.

Island surveys were conducted as follows:

- Record species on beaches while enroute to island from the main vessel. Birds in the vicinity of vessel access points often disperse and are not recorded again. Photographic recording is preferred when conditions allow.
- Check for nesting birds susceptible to disturbance and alert other members of the shore party of their presence. These areas are designated as exclusion zones and are to be avoided. This protects small species such as black-naped terns (*Sterna sumatrana*) which have cryptic, easily disturbed or destroyed nests.
- Circumnavigate the island, collect data on breeding and non-breeding species. Data include total numbers of adolescents and adults, and breeding effort i.e., nil, nests, chicks and young.
- Island interiors were surveyed if time permitted, and traversing vegetation did not unduly disturb birds and their breeding effort.
- Photographs were reviewed to look for leg flags and bands on shorebirds or bands on seabirds.

Field survey equipment included 12x50 binoculars, notebook, mechanical pencil, hand-held GPS (global positioning system), tally counters, mobile phone and a full-frame DSLR camera with lens options from 16mm to 600mm.

Data from the field notebook was summarised, counts tallied and transferred to digital spreadsheet tables for incorporation to this report.

Results

Bird data were collected across 15 islands. A total of 23 species were recorded, including; 15 seabird species (of which 11 were breeding), three migratory shorebird species and five land/wetland species, including the resident Coral Sea subspecies of the buff-banded rail.

For each island summary in this document, a standard species table is presented with information on species diversity and breeding effort.

Notable observations:

- The discovery of new breeding sites for New Caledonian fairy terns at Dianna Cay, Betty Cay and Lorna Cay, all within the Lihou Reef.
- A third record of New Caledonian fairy terns nesting on Georgina Cay (Lihou Reef).
- Over 40,000 pairs of sooty terns and 25,000 pairs of brown noddies (*Anous stolidus*) at North Islet (Willis Islets).

Discussion

Survey results were influenced by:

- Survey time – time allocated in itinerary, tide cycle affecting island access and egress.

- Cay size – in combination with survey time, determines how much survey effort is possible.
- Presence, type and amount of vegetation – thick vegetation reduces visibility. Traversing these areas may cause unnecessary disturbance to nests, chicks, young, adolescents and adults.
- Condition and type of substrate – lithified shorelines are often difficult to survey completely in time-restricted surveys. Safely traversing soil/sand based, under-forest areas of wedge-tailed shearwater burrows is time consuming and restricts observation to the immediate area of the observer (as each footprint needs to be assessed as to not collapse shearwater burrows).
- Adverse weather – strong winds and heavy rain causes birds to go to ground, making observations more difficult. Rain on camera and binocular lenses restricts their use or renders them obsolete.
- Species composition – if one or two species dominate a site and are deemed to be the selected species for survey, the time taken to collect data may restrict the ability to gather information on other species. If time is limited, other species records may be as simple as present or absent.

A thorough overview of brown noddy breeding effort is often not possible due to their tendency to nest in a variety of habitats, particularly when nesting in thick vegetation. Brown noddy breeding effort and age class is simplified to 'present' for locations where total counts were not possible. This also applies to other species found in dense ground vegetation, or forest vegetation when the allotted survey time restricted surveys to beach and strand species.

The total number of breeding New Caledonian fairy terns was fewer than the total number observed on Georgina Cay in 2022. It is suggested that the breeding colonies in 2025 were fragmented and included islands not visited during this voyage – most likely other islands within the Lihou Reef.

No introduced vertebrate/invertebrate species or weed species appeared to be adversely affecting seabird breeding effort.

This voyage has highlighted the ongoing need to manage these important seabird populations.

Digital Data

- Reference photographs have been provided to Parks Australia.
- Breeding and diversity data was lodged with Birdlife Australia's Birddata platform.

1.4 Ant Surveys – *Maële Brisset*

The islands of the CSMP are particularly vulnerable to invasive species. These can impact environments directly (for example, through predation or the destruction of critical habitats such as nesting sites), or indirectly (notably through competition with native species for food and habitat).

Previous studies have documented the presence of introduced ant species in the CSMP (Table 2). North East Cay (Herald) and East Diamond Islet had revealed multiple invasive ant species, while other islands (including South Diamond Islet, North Islet (Willis) and the Lihou Reef cays) remained unassessed prior to 2025.

Table 2. Introduced ant species detected prior to the 2025 survey on selected islets of the CSMP.

Scientific name	Island
<i>Cardiocondyla atalanta</i>	South West Islet (Coringa), North East Cay (Herald), East Diamond Islet
<i>Nylanderia bourbonica</i>	East Diamond Islet, North East Cay (Herald)
<i>Tetramorium bicarinatum</i>	North East Cay & South West Cay (Herald)
<i>Tetramorium simillimum</i>	East Diamond Islet
<i>Tetramorium lanuginosum</i>	Magdelaine Cay South
<i>Monomorium pharaonis</i>	South West Islet (Coringa), Chilcott Islet, Magdelaine Cay South
<i>Pheidole megacephala</i>	South Islet (Willis), Cato Island

Methods

A field survey was conducted in June 2025 on 11 islands located in the central zone of the CSMP to establish a baseline assessment of ant species presence and distribution.

Baits were evenly distributed (in shaded areas) across all sites to cover the various vegetation types, and whenever possible, were placed inland (Figure 11). To attract a wide variety of ant species, a bait mixture composed of peanut butter, jam, and tuna was used. This combination was selected to maximize attraction across food resource preferences (Figure 12b).

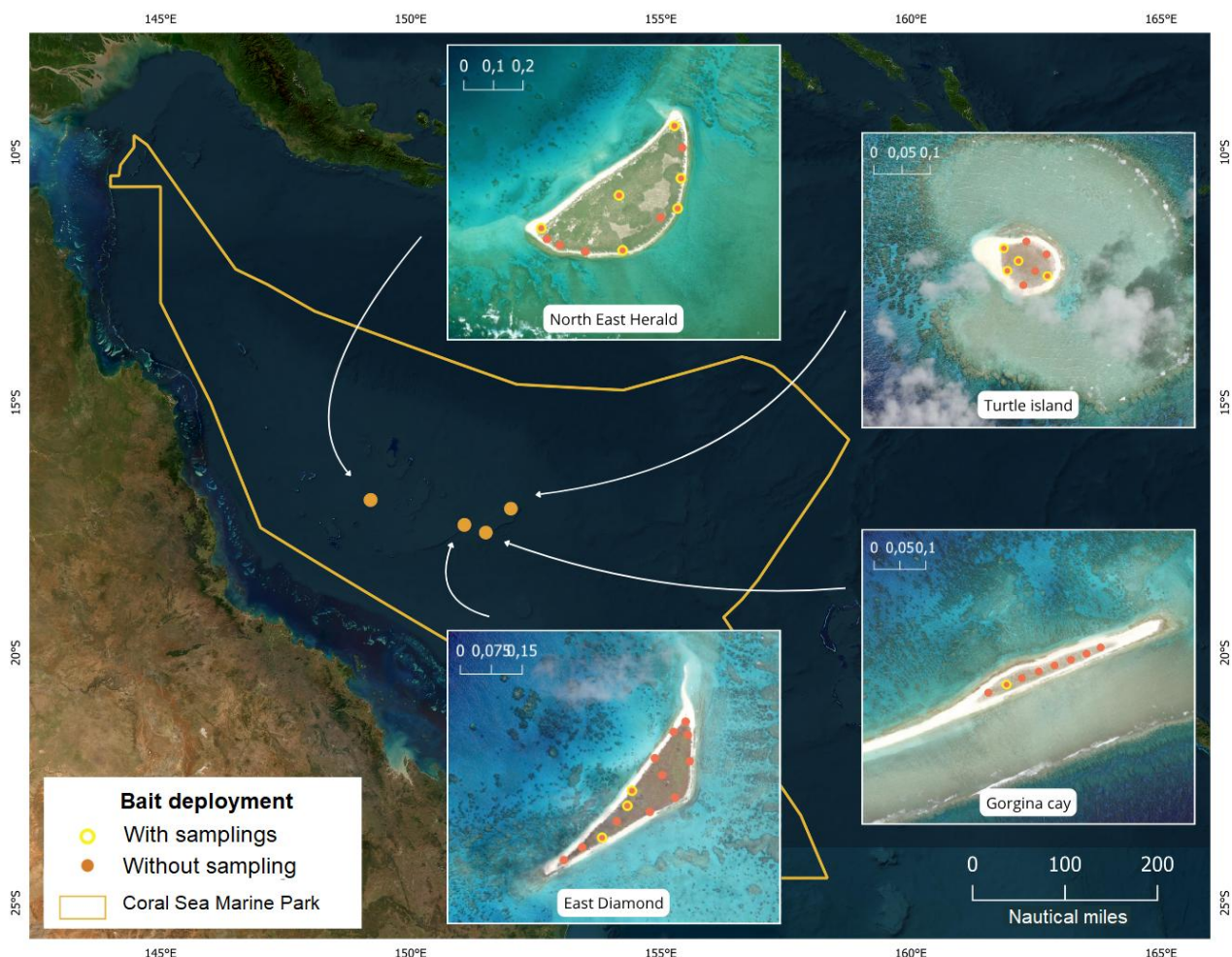


Figure 11. Ant monitoring efforts carried out on four islets of the CSMP: bait points (orange) and sampling points (yellow) during the 2025 survey campaign. Government of New Caledonia / Coral Sea Natural Park and Fisheries Department ©

Where dense vegetation or large bird colonies were present, bait placement was adapted to reduce disturbance. Each bait point remained on-site for 1 to 2 hours, a duration deemed sufficient to allow ants to discover and recruit to the bait. Baits were placed directly on the ground, with flagged bamboo stakes placed nearby to facilitate later identification (Figure 12a).

Ant specimens were preserved in ethanol. Identifications were provided by Dr Ben Hoffmann (in addition to identifications made by M. Brisset).

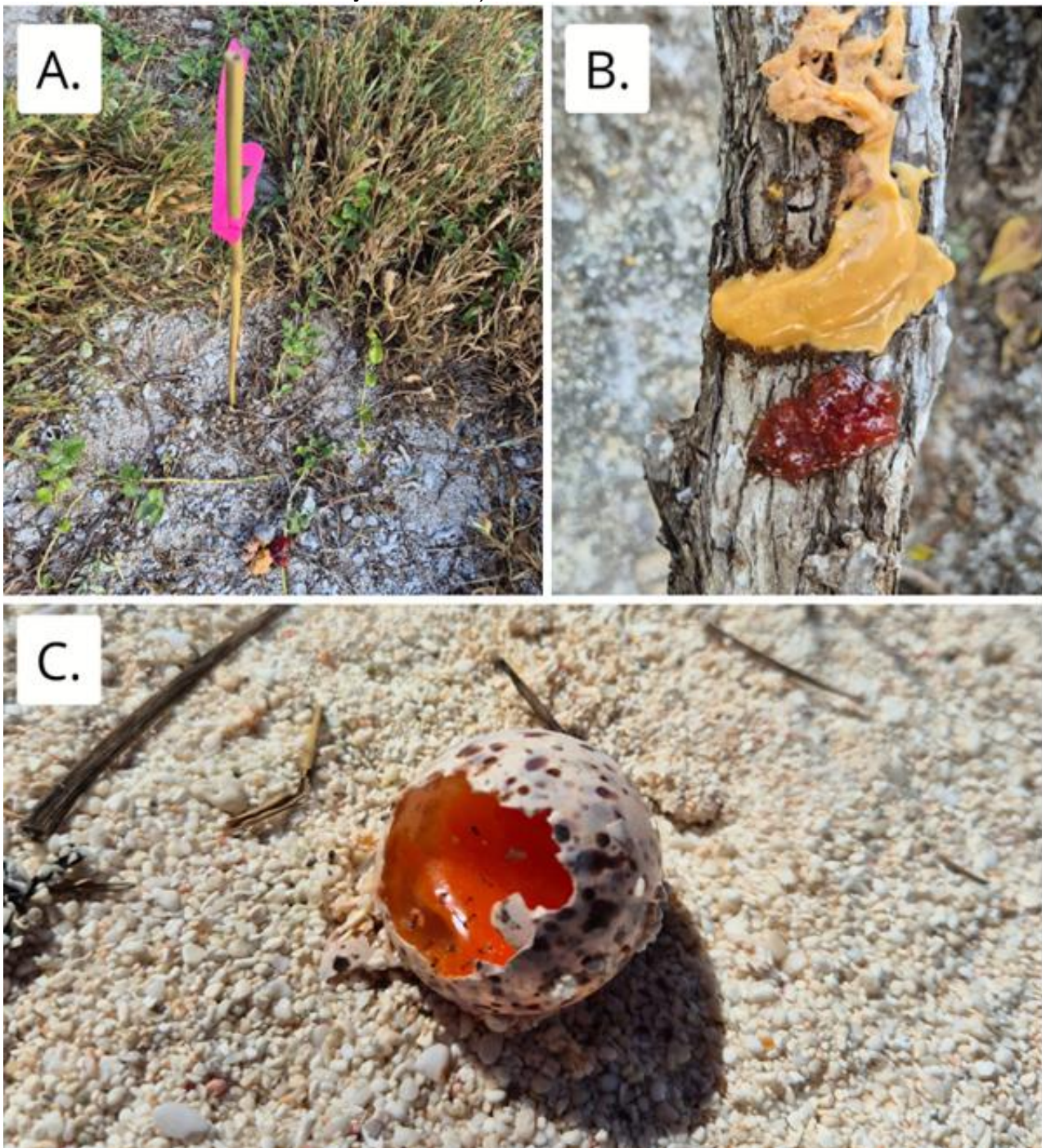


Figure 12. Photographs taken during the ant population monitoring. **A.** Pink-flagged bamboo stake marking location of an adjacent bait point (North Islet, Willis). **B.** Peanut butter and jam bait on a branch. **C.** Ants attracted to broken bird egg (Coringa Islet).
Maële Brisset ©

Results

In total, 101 bait points were established across 11 islets, and 43 samples were collected for species-level identification in the laboratory.

Key results:

- The most widely distributed ant species recorded was the Australian native *Cardiocondyla atalanta*.
- The highest ant densities were observed on North East Cay (Herald) and South Diamond Islet.
- Ants were the only taxa observed; no evidence of predation by other species was detected.
- Several broken bird eggs were documented, frequently with ants present nearby or inside the eggshells (Figure 12c), indicating a possible interaction or disturbance by ants.

Ant identifications from Dr Ben Hoffmann confirmed 7 different species of ant from 10 islands (Table 3).

Table 3. Ant identifications for islands from the June 2025 CSMP voyage.

Species [native/introduced]	Site	Notes
<i>Cardiocondyla atalanta</i> [Native]	North East Cay (Herald) (1 sample), South West Islet (Coringa) (2), North Islet (Willis) (4), South West Cay (Lihou) (2), Georgina Cay (Lihou) (1), Hermit Crab Islet (Lihou) (4) Lorna Cay (Lihou) (3), Turtle Islet (Lihou) (1), South Diamond Islet (Tregrosse) (2).	Most widespread.
<i>Tetramorium bicarinatum</i> (Bicoloured pennant ant) [Introduced]	North East Cay (Herald) (6 samples)	
<i>Monomorium pharaonis</i> (Pharaoh ant) [Introduced]	South West Islet (Coringa) (4 samples)	
<i>Tetramorium lanuginosum</i> (Wooly ant) [Introduced]	North Islet (Willis) (1 sample)	
<i>Monomorium</i> sp. <i>laeve</i> gp (Yellow mono ant) [Native]	Turtle Islet (Lihou) (4 samples)	<i>Monomorium</i> cf. <i>intrudens</i> , was previously identified on Turtle Islet in 2021 survey.
<i>Tetramorium wroughtonii</i> [Native]	East Diamond Islet (3 samples)	<i>Tetramorium simillimum</i> was previously identified on East Diamond Islet in 2021, 2022, and 2023 surveys.
<i>Nylanderia</i> sp. <i>obscura</i> gp. [Native]	East Diamond Islet (Tregrosse) (1 sample), South Diamond Islet (Tregrosse) (3 samples)	<i>Nylanderia bourbonica</i> was recorded on East Diamond in 2016 but has not been detected subsequently. This earlier records may have been confused with <i>N. obscura</i> which has been identified during surveys conducted between 2021 and 2025.

Discussion

This survey fills important knowledge gaps by providing the first systematic inventory of ants on several key islets of the CSMP. The presence of invasive species previously unrecorded on some of these sites highlights the need for continued monitoring and biosecurity measures.

The most widespread ant species documented was the Australian native *Cardiocondyla atalanta*, which has previously been recorded across multiple CSMP islands (Director of National Park 2023; Director of National Park 2024). This species is considered native to the CSMP.

Pheidole megacephala (African big-headed ant), previously recorded on two islands (South Islet and Cato Island – neither of which underwent invertebrate sampling on this voyage), was not recorded on any of the islands surveyed in June 2025. With this exception, all introduced species identified on islands prior to 2025 have been recorded in the June 2025 voyage. As discussed at length in the 2023 Island Health report (Director of National Park 2024), these introduced ant species have been recorded in the CSMP for some time.

The association between introduced ants and broken bird eggs observed on this voyage, while anecdotal at this stage, may warrant further investigation to assess potential impacts on nesting seabirds.

There is evidence of conflicting species-level identifications across survey years, with different species within the same genus recorded from the same locations in different years. Examples include East Diamond Islet records of *Tetramorium simillimum* and *T. wroughtonii*, and *Nylanderia obscura* and *N. bourbonica*, as well as Turtle Islet records of *Monomorium leave* and *M. intrudens*. These discrepancies highlight the need for a standardised reference collection of ant specimens for the CSMP islands.

Digital Data

Copies of ant identification data (provided by Ben Hoffman) are held by Parks Australia.

1.5 Ecological Restoration Project on South Islet (Willis Island)

– Joy Brushe, Larry Brushe, Darren Phillips

The South Islet (commonly referred to as Willis Island) Ecological Restoration project is guided by the 'Willis Island Weed Management Plan' and informs management actions for Parks Australia and the Bureau of Meteorology (the Bureau). The Bureau operates an occupied weather observation station on South Islet (Willis Island). The Willis Island Weather Station remains an important weather and atmospheric observation and forecasting station within the Bureau's network of occupied and automatic weather stations around Australia, operated under the Meteorology Act 1955.

In recent years, Parks Australia and the Bureau have established a collaborative approach to support each agency in fulfilling its respective management responsibilities (Figure 13). This approach recognises the Bureau's operational requirements for the Willis Island Weather Station and other automatic weather stations within the CSMP, alongside Parks Australia's statutory management role for the CSMP. An Occupation Licence was formalised in December 2022, and a Statement of Intent has also been agreed. One of the key management actions under this arrangement is the monitoring, control, and reporting of weeds on Willis Island.



Figure 13: The Bureaus on-island crew working in collaboration with Parks Australia and their expert botanists. Darren Phillips ©

Methods

The June 2025 expedition to South Islet (Willis Island) involved the deployment of three Parks Australia representatives (one Parks Australia officer and two botanist volunteers) to the island for a five-day period. During this time, the remainder of the expedition team continued reef and island health assessments at Tregrosse Reef and Lihou Reef. On-ground restoration work was undertaken with the assistance of two on-island Bureau staff.

The Bureau on-island staff received a detailed briefing on the weeds across the island and activities that have been conducted to date on these weeds. This briefing included a demonstration of herbicide use and dilution rates. The focus of the visit was to:

- Map the area of the weeds so a comparison and rate of spread/reduction could be assessed against the 2023 mapped extent.
- Survey the island for new invasive species
- Remove *Euphorbia cyathophora* (dwarf poinsettia) and any other weeds encountered from areas being maintained by the on-island Bureau of Meteorology staff below the shearwater burrow contour that are important breeding areas for other seabirds.
- Remove outliers of *Cenchrus echinatus* (Mossman river grass) on the south-east and north-west ends of the island that had established away from the main populations to contain the current infestation and keep the grass from spreading further downslope.
- Removal of *Gynandropsis gynandra* (cat's whiskers or spiderwisp) from natural areas of the island.
- Increase the size of the weed compost heap and construct a cover to prevent birds from accessing seeding weeds for nesting material.

Euphorbia cyathophora was thoroughly weeded in the northwestern natural area between the Larc Track and the North Track, downslope of the wooden stakes marking the seaward boundary of the shearwater burrows and the *C. echinatus*. Directly behind the Hogen shed upslope on the flat), a small patch of 3-4 mature *G. gynandra* was removed. Additional several small *G. gynandra* were

also cleared halfway down the north track near the concrete pad. Most material was removed manually, with the exception of a few small, dense patches of seedlings, which were treated with a 1% glyphosate solution to ensure thorough control.

Small outliers of *C. echinatus* seaward of the main infestations, in both the north-western and south-eastern ends of the island, were treated to keep *C. echinatus* infestations contained to the upper slopes and prevent outward spread. Prior to hand pulling mature *C. echinatus*, mature seeds were removed by pressing sheets of hessian over the surface of the seedheads. Hessian was also used to remove seeds on the ground after hand pulling. The hessian with adhering seeds was placed into weed bags together with the pulled plants and the sealed bags taken back to the operational area for incineration. The treated areas were sprayed with 1% Glyphosate with 0.1% penetrant to kill any newly germinated plants and marked with painted wooden stakes to easily locate the sites for monitoring and treating any regrowth. Figure 14 shows one of the treated outliers. At the time of preparation of this report, no *C. echinatus* germination had occurred in the treated outliers.



Figure 14. Photograph taken ~6 weeks after weeding and spraying of a small outlier of Mossman river grass. Emily Jensen-Woof ©

Additionally, in the north-western part of the natural area, a number of small patches of *Dactyloctenium aegypticum* (coast button grass), the exotic grass dominating the mown operational area, and *Amaranthus viridis* (green amaranth) were weeded and sprayed with 1% Glyphosate. These areas were also marked with painted stakes to monitor and treat regrowth if required.

A. viridis in the mown operational area was sprayed with 1% Glyphosate.

A 160m² infestation of *Gynandropsis gynandra* in the natural area behind the diesel tanks was hand pulled and a small track, currently free of shearwater burrows, was cleared to allow access from the operational area to treat regrowth. Plants in this infestation had already dropped seed, The weed *Physalis angulata* (wild gooseberry), was found for the first time on South Islet (Willis) during the June 2025 voyage. Several *P. angulata* were growing adjacent to the North Track, behind the Hogen building, but nowhere else on the cay.



Figure 15. Utilising the Bureau's Polaris and Trailer to transport pulled weeds.

Darren Phillips ©

The size of the weed compost pile was increased and a shade cloth cover weighted down with wooden planks on two sides was constructed to cover the weed compost pile to prevent birds removing material containing seeds for nests (Figure 16).



Figure 16. Shade cloth cover for the compost heap made during the June visit.

Emily Jensen-Woof ©

Results

A cumulative total of 206 bags weighing approximately 5kg per bag indicates roughly 1030 kgs of weeds (mostly *Euphorbia cyathophora*) was removed and added to the hot compost pile. Nearly all of the *E. cyathophora* were removed prior to dropping seed.



Figure 17. Adding pulled weeds to the compost pile.

Eliza Anwer ©

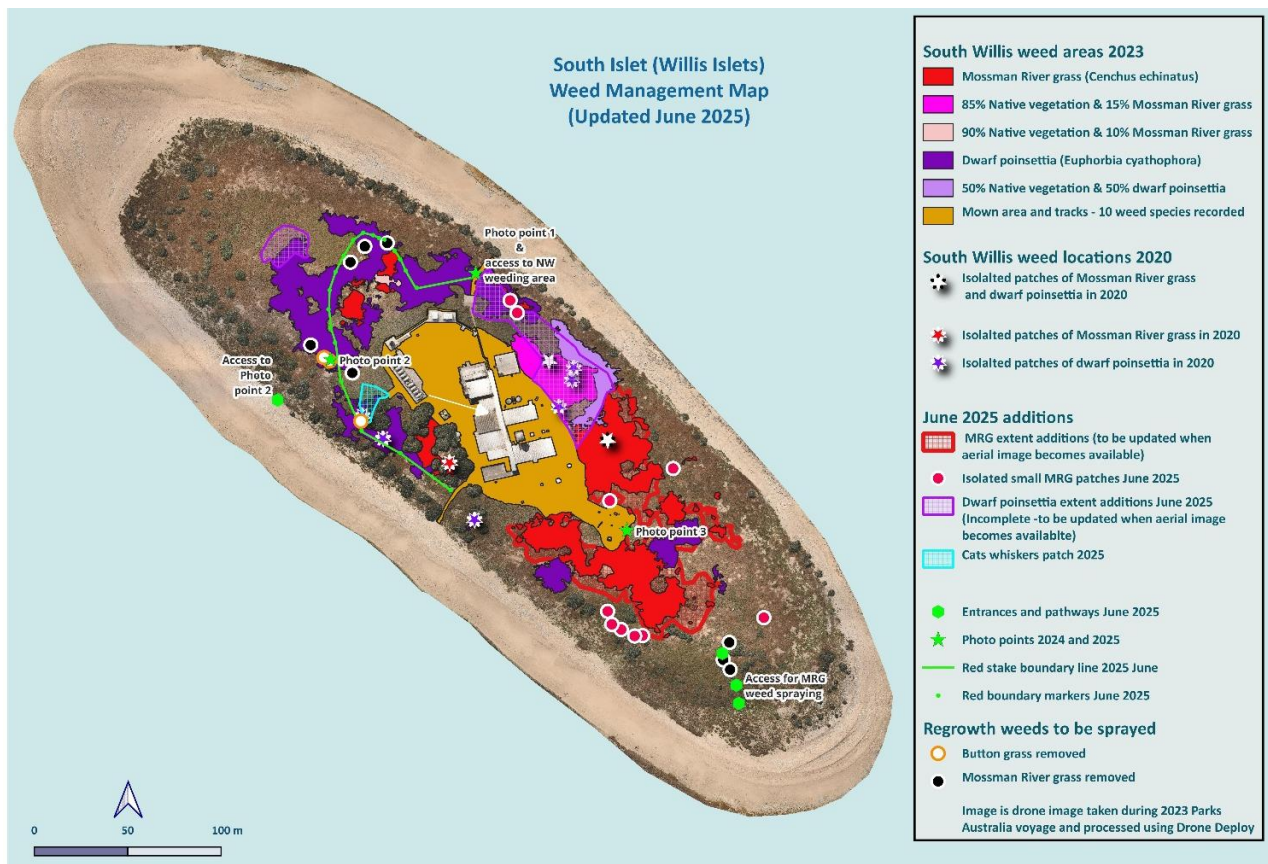


Figure 18. 2025 updated weed management map showing increased extent of weeds in the operational area compared to their extent in 2023 and the information required for weed management over the next 12 months.

Discussion

Weed management work that commenced during the 2024 voyage has been continued by the on-island Bureau of Meteorology staff during the past 12 months, focusing on removal of *Euphorbia cyathophora* (dwarf poinsettia) from the lower slopes between the LARC Track and the North Track in the North west end of the island.

E. cyathophora was generally present at lower abundance within its previously mapped extent compared to 2023, particularly in areas that have been subject to regular weeding. The effectiveness of ongoing weed control by the on-island crew was evident, with a clear contrast between regularly weeded areas on the lower slopes and unweeded areas further upslope, where weed abundance was significantly higher.

High monthly rainfall in 2024/2025 resulted in mass germination and loss of control of *E. cyathophora* in the regularly weeded area late in 2024. On-ground work during the 2025 visit was focused on removal of all *E. cyathophora* from this area and was successful in removal of nearly all plants before they dropped seed.

Sooty terns were not nesting in the areas of dense *E. cyathophora* upon arrival to the island but following removal of all the *E. cyathophora*, large numbers of sooty terns moved into these areas within 24 hours of weed clearing (Figure 19).



Figure 19. Sooty terns nesting in an area from which weeds had been removed the previous day.

Joy Brushe ©

Cenchrus echinatus (Mossman river grass) was still present in dense swaths throughout its previously mapped extent. The outer extent of both *C. echinatus* and *E. cyathophora* have both increased between 2023 and 2025 as shown on the weed management map in Figure 18. The increased extent of *E. cyathophora* could not be mapped in areas thoroughly weeded just prior to the Parks Australia visit.

Removal of *Gynandropsis gynandra* (cat's whiskers) around the boundary of the mown area (operational area), along with other weed species, has also been undertaken over the past 12 months. Although no seeding *G. gynandra* plants were present along the boundary at the time of the 2025 visit, a large number of new seedlings were observed. There was however a small patch of seeding cat's whiskers recorded behind the Hogen and hydrogen shed, which were removed. On-island staff are currently not permitted by the Bureau to access these locations, meaning it is

likely that regrowth of cat's whiskers may reach the seeding stage before the next Parks Australia visit.

Other species that were present, albeit in low abundance at only a few locations outside the operational area were:

- *Dactyloctenium aegypticum* (coast button grass)
- *Amaranthus viridis* (green amaranth)
- *Euphorbia prostrata* (red caustic creeper)
- *Physalis angulata* (wild gooseberry).

D. aegypticum is the grass that dominates the mown operational area. *A. viridis* and *E. prostrata* are also abundant in the mown operational area.

1.6 HPAI sampling – Guy Weerasinghe (DAFF)

The Northern Australia Quarantine Strategy (NAQS) is a mature surveillance program within the Department of Agriculture, Fisheries and Forestry (DAFF). It takes a multidisciplinary and collaborative approach to survey for the incursion of exotic diseases, pests and weeds that may enter northern Australia through both unregulated and regulated pathways. Historically, NAQS has had a focus on the 10,000km coastline of northern Australia (from Broome to Cairns, including the Torres Strait). Yet, over the past few years, the NAQS Animal Health team has sought to address surveillance gaps in remote parts of northern Australia as well as the External territories of Australia. These gaps include the movement of pelagic seabirds and the risk of virus spread at breeding sites.

Highly Pathogenic Avian Influenza (HPAI H5N1 (clade 2.3.4.4b)) has had a significant spread around most continents of the world, excluding the Australasian continent (as of 2025). It has caused mass mortality in a wide range of wild bird populations as well as impacted both wild and domesticated mammalian populations. Australia has only recorded this clade of H5N1 in Heard Island in the sub Antarctic region, and has maintained an elevated level of surveillance and awareness to enable early detection and warning. NAQS has previously contributed HPAI surveillance on the 2024 CSMP voyage, maintained a year's worth of surveillance at South Islet (Willis Islet), and participated in the 2025 CSMP voyage to continue a broad spread of environmental sampling in this niche environment.

Additionally, Avian paramyxovirus-1 (APMV-1) is a highly contagious and infectious viral disease of all avian species, including poultry. As wild birds are considered the reservoir of the virus and there is a poor understanding of the role of seabirds as a pathway for introducing the virus into Australia, NAQS has trialled APMV-1 testing in 2025 and also conducted APMV-1 retrospective testing of historic samples collected between July 2024 - June 2025. There are 2 classes of APMV-1, Class I are predominantly isolated from wild birds with occasional spillover events into poultry, Class II are responsible for poultry mortality events and have also been found in wild birds.

The objectives were:

- To continue monitoring for avian influenza in the Coral Sea within the seabird population.
- To characterise any influenza types that may be circulating within the Coral Sea bird populations.

Ongoing surveillance will be a combination of single site surveillance via the only habited island (South islet/Willis Island) as well as opportunistic surveillance by research and compliance groups visiting the region.

NAQS contributed in-kind funding towards the diagnostic work conducted at the CSIRO Australian Centres for Disease Preparedness (ACDP), Geelong, Victoria, as well as the supply of sampling

consumables and transport of the samples to the laboratory. Advice was sought within DAFF regarding the permit status of environmental samples brought over from an external territory for influenza surveillance and guidance was provided by the Animal and Biological Imports office (under the Biosecurity Animal Division of DAFF). The CSIRO ACDP Permit was utilised to enable effective biosecurity risk management.

Methods

Environmental sampling for avian influenza surveillance was conducted on each island visited as well as general population health (in consultation with Andrew McDougall (QPWS) –bird specialist).

Sample size per island was determined by several factors including abundance and diversity of birds present on each island, availability of fresh faeces and accessibility to sites for collection.

A total of 30 samples were planned to be collected per each island visited. This was determined using the following approach. An estimated prevalence of 1.7% influenza prevalence was used (based on Hall et al. 2019). The following equation was used to determine the planned sample size per island:

$$n = (Z^2 \times P \times (1 - P)) / e^2$$

Where:

- Z = value from standard normal distribution corresponding to desired confidence level (Z=1.96 for 95% CI)
- P is expected true proportion
- e is desired precision (half desired CI width).

The desired precision (e) was 5% and a 95% confidence level was selected. With an unknown population of mixed bird species, an infinite population size was used.

Sample collection

Each island site was circumnavigated on foot and opportunistic fresh environmental faecal samples were collected with a flocked swab. Only fresh faeces were collected, usually on larger rocks where birds were perched, close to the water's edge. Bird identification was also conducted, and population estimates were made (and corroborated with Andrew McDougall (QPWS) – voyage bird specialist).

Once the sample was collected, the swab was placed in either a virus transport media (VTM) or Copan eNAT media. The planned approach was to collect an even mix swabs in VTM and eNAT media per island, however this varied based on logistics and time constraints. Once collected, media and swabs were maintained chilled until returned to the vessel and maintained in the fridge at 4 degrees Celsius.

Influenza testing

Upon return to the mainland, the samples were packaged and sent to ACDP for testing. Swabs were pooled into groups of 3 and tested with a Type A influenza qPCR. Any reactors were then tested individually. Positive swabs were then tested across a panel of influenza A PCRs including H5, H7, H9 and Australasian H5 lineage. If the cycle threshold (CT) value was sufficiently low enough, sequencing was attempted using a minion sequencer.

Briefly, Next Generation sequencing was performed using universal influenza A primers and a Rapid Barcoding library preparation compatible to the Oxford Nanopore MinION.

To compare, general sequencing analysis was also conducted using universal influenza A primers and a Nextera XT library preparation compatible to the Illumina NexSeq2000. Any detections from VTM media could also be tested with haemagglutination inhibition test and virus isolation.

Avian paramyxovirus (APMV-1)

Swabs were pooled into groups of 3 and tested with two different APMV-1 PCRs – an F-gene Taqman Assay and an L/M Gene multiplex Taqman Assay. Any pools that had a reactor were then tested individually. Any positive PCR swabs with sufficiently low CT values had sequencing attempted, in the same approach as the influenza methods, except for the primers used, which were fusion (F) gene pathotyping primers and an ACDP in-house fusion (F) gene primer.

Results

A total of 231 environmental samples (n=228 in eNAT media and n=185 in VTM media) were collected from the Coral Sea region during the June 2025 voyage.

All swabs returned negative results to the Type A Influenza PCR.

There were three swabs that were positive to the APMV-1 F gene PCR (swabs 346, 347, 348 – all in eNAT media) and two that were positive to the APMV-1 L/M gene multiplex PCR (swabs 347 and 348 – both class II). Sequence pathotyping was attempted on the 3 positive swabs and were unsuccessful.

Discussion

In June 2025, there were no detections of avian influenza in the central section of the External Territory of the Coral Sea. This is considered consistent with previous surveys conducted by NAQS and other collaborators, low pathogenic avian influenza tends to circulate in a low prevalence in the environment. These findings are consistent with this hypothesis, given that an H6N8 low pathogenic avian influenza was detected in south Willis islet the month (May) prior to the CSMP collection (from a sampling of 79 swabs in eNAT media).

The detection of APMV-1 (class II) is of interest and may be worth further exploration in future surveys. Through some unpublished work, it has been noted that there are risks with using RNA preserving media (instead of VTM) for sequencing capability – in-house communication with molecular specialists have indicated that RNA fragmentation occurs the longer the swab sits in the media, preventing the ability to attain full or partial sequences. The use of this media was primarily to remove the challenge around cold chain maintenance by third parties, particularly Indigenous rangers in remote parts of Australia, that is required for VTM use. For the ongoing purpose of surveillance in the Coral Sea, sampling will now be conducted using VTM – with samples being maintained in -20 degree (Celsius) freezer (or even lower if possible) until delivered to the laboratory for testing.

1.7 Marine debris – *Martin Russell*

Methods

Marine debris was collected and removed from each island, with the aim of maintaining island environments as close to their natural state as possible. The exception was South Islet (Willis Islets), because the Bureau of Meteorology's 'Willis Island' on-island crew regularly collect and dispose of marine debris from that island.

Collected marine debris was bagged, fumigated, sealed with a cable tie and tagged before being removed from each island. Items too large to be bagged (e.g. fish aggregating devices (FADS), ship ropes, fishing nets, floats, etc.) were washed in the sea in situ and then sprayed/fumigated on shore before being taken to the vessel. An estimate of the percentage type of debris was recorded.

Results

In the June 2025 voyage 161 kg of marine debris collected (excluding FADs and floats) (Table 4).

Table 4. Summary of marine debris removed from islands in 2025 voyage, and comparison to previous cleanup efforts.

Location	Bags marine debris	Weight	Additional debris items collected	Last marine debris cleanup and amount
South West Cay (Herald Cays)	3 Bags	11 kg* Exclude FAD	1 FAD	July 2024 [116 kg, 307 items] May-June 2022 [280 items]
North East Cay (Herald Cays)	3 Bags	16 kg		July 2024 [314 kg, 380 items] May-Jun 2023 [891 items]
South West Islet (Coringa Islets)	2 Bags	10 kg		July 2024 [100.7 kg, 447 items]
North Islet (Willis Islets)	3 Bags	15 kg* Exclude FAD + Floats	1 FAD + some floats	May-June 2022 [4328 items]
South West Cay (Lihou Reef)	1 Bag	6 kg		Nov 2022 [78.1 kg]
Georgina Cay (Lihou Reef)	2 Bags	30 kg		July 2024 [35.2 kg, 240 items] Nov 2022 [120.9 kg]
Dianna Cay (Lihou Reef)	0	0		Nov 2022 [159.8 kg]
Hermit Crab Islet (Lihou Reef)	2 Bags	10 kg		Nov 2022 [41.5 kg]
Turtle Islet (Lihou Reef)	2 Bags	15 kg		Nov 2022 [20 kg]
Lorna Cay (Lihou Reef)	4 Bags	40 kg		Nov 2022 [136.4]
Betty Cay (Lihou Reef)	0	0		Nov 2022 [25.9 kg]
South Diamond Islet (Tregrosse Reef)	1 Bag	4 kg		July 2021 [43.7 kg, 90 items]
East Diamond Islet (Tregrosse Reef)	1 Bag	4 kg		July 2024 [49.5 kg] May-Jun 2023 [135 kg]
Total	24 Bags	161 kg		

Discussion

Plastic bottles were the most frequently collected marine debris item. This is consistent with trends observed in previous years, during which plastic bottles consistently represented a significant proportion of marine debris (32% in 2024, 22% in 2023, and 88.5% in 2022).

Lorna Cay (Lihou Reef) followed by Georgina Cay (Lihou Reef) had the greatest marine debris loads during this voyage, at 40 and 30 kg respectively. Together these sites contributed 43% of the total debris by weight. Similar marine debris loads were observed during the last clean up on Georgina cay (35.2 kg 2024).

Overall, marine debris loads on the remaining islands visited in 2025 were lower than those recorded during previous surveys. Marine debris collected from the Herald Cays dropped significantly, from 116 kg (307 items) (South West Cay) and 314 kg (380 items) (North East Cay) in 2022 and 2024, to just 11 kg and 16 kg in 2025, indicating a much lower accumulation rate over a similar timeframe (1-2 years).

Similarly, the quantities of marine debris collected from islands in the Diamond and Lihou reef systems (excluding Turtle Islet) in 2025 were substantially less than those collected in 2022 (on the Tangaroa Blue marine debris voyage). On the Lihou Reef islands, debris weights recorded in 2022 were at least double, and in some cases more than ten times, the amounts collected in 2025. This may reflect reduced debris accumulation, or differences in survey effort, as the November 2022 voyage was a dedicated clean-up operation.



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1.8 Sand temperature loggers – Roberta Johnson & Darren Phillips

Sand temperature is a critical environmental parameter influencing the reproductive success of sea turtles, which exhibit temperature-dependent sex determination. Incubation temperatures of eggs above the pivotal threshold of approximately 29.3°C result in female-biased hatchling sex ratios, potentially threatening population stability over time (Mrosovsky and Yntema, 1980). Climate change is expected to exacerbate these challenges, making long-term monitoring of sand temperature essential for conservation planning (Laloë et al., 2017; Fuentes and Porter, 2013).

Vegetation cover can influence sand temperature by providing shading and reducing thermal extremes, which may help buffer nests against climate-driven warming (Staines et al., 2019). Understanding these dynamics is critical for designing adaptive management strategies such as nest shading or relocation.

The CSMP Island Strategy Workshop held in 2023 to develop a 5-year island research strategy, attended by a range of subject-matter experts, identified 'long-term (4-5 year) sand temperature monitoring at green turtle nest depth' as a critical priority monitoring activity. The green sea turtle (*Chelonia mydas*) nests in the CSMP and it is critical to understand the potential effects of sand temperature on future populations. Sand temperature data is collected by other government agencies, including QWPS and GBRMPA, and this project provides an opportunity for DCCEEW and Parks Australia to contribute to regional long-term monitoring in Australia.

Methods

In June 2025, 9 HOBO MX2203 TidbiT Bluetooth data loggers (Figure 19) were deployed across three distinct habitat types on South Islet (Willis Islets): bare sand sediment, native vegetation, and the ecotone between beach and dune vegetation (approximately 50% sand and 50% vegetation). Each site contained three loggers, one in each habitat type and each logger spaced 5–10 meters apart to capture microhabitat variability.

Prior to deployment, all loggers were configured to record temperature every four hours. Each logger was attached to a 150-pound nylon line with a stainless-steel Parks Australia monitoring site identification tag for retrieval.



Figure 19. HOBO MX2203 TidbiT Bluetooth data logger.

Loggers were deployed at three sites on South Islet (Willis Islets). At each site, a hole was excavated to a depth of 50 cm. Loggers were lowered to the bottom of the hole and some slack was left in the line. The hole was partially filled, and the identification tag was left approximately 10 cm from the top of the hole to allow for easy retrieval. The remaining 10 cm of the hole was filled and compacted to restore to the natural surface conditions and level. GPS coordinates were recorded for each logger with an accuracy of 4-8 meters (Table 5), a map was developed (Figure 20) and images taken with permanent landmarks to facilitate easy relocation in future visits (Figure 21-23).

Results

Table 5. Sand Temperature Logger Locations on South Islet (Willis Islet).

Site #	Location	GPS point No.	Logger No.	Lat	Long	Datum
Site 1	Bare sand sediment	13	22099960	16.286017	149.963854	WGS84
	Beach/ vegetation (~50% sand and ~50% vegetation)	14	22099970	16.286101	149.963789	WGS84
	Native vegetation (unshaded)	15	22137714	16.286146	149.963763	WGS84
Site 2	Bare sand sediment	18	22099961	16.287397	149.963681	WGS84
	Beach/ vegetation (~50% sand and ~50% vegetation)	17	22137715	16.287353	149.963711	WGS84
	Native vegetation (unshaded)	16	22099959	16.287316	149.96374	WGS84
Site 3	Bare sand sediment	19	22099967	16.288983	149.965784	WGS84
	Beach/ vegetation (~50% sand and ~50% vegetation)	20	22099954	16.288938	149.965808	WGS84
	Native vegetation (partial shade from a nearby <i>Argusia</i> bush)	21	22099969	16.288891	149.965817	WGS84



Figure 20. Sand temperature logger locations on South Islet.



Figure 21. Sand temp loggers - Site 1 facing southwest from beach (left) facing northeast (right). Darren Phillips ©



Figure 22. Sand temp loggers - Site 2 facing northeast from beach (left) facing southwest (right). Darren Phillips ©



Figure 23. Sand temp loggers - Site 3 facing northeast from beach (left) facing southwest (right). Darren Phillips ©



Ernst H. J. van der Zant

Part II: Island Summaries

2.1 South West Cay – Herald Cays

South West Cay was visited on the 5th of June 2025 (2 hours on island).

2.1.1 Vegetation

The entire perimeter of the island was traversed and some easily accessible locations adjacent to the coastline were also examined. No plant species were observed that had not been recorded during the 2019, 2022, or 2024 visits. The interior vegetation was dominated by the short-lived shrub, *Abutilon albescens* (lantern bush).

As the 2024 visit found, the *Argusia argentea* (octopus bush) along the vegetation perimeter of the south eastern side of the island were mostly dead with no signs of re-shooting (Figure 24).



Figure 24. Dead *Argusia* along the south south-east side of South West Cay.

Fiona Hagger ©

Stenotaphrum micranthum (beach buffalo grass), has previously been recorded on South West Cay (Herald Cays) and was last collected there in 2006. This species was not found during the 2019, 2022, 2024 or 2025 surveys. If this species is observed on this cay on future voyages, it should be collected for incorporation into State and National Herbarium collections.

No weeds were detected.

Table 6. Vegetation species found on South West Cay (Herald) in June 2025.

Scientific name/community	Common name
<i>Abutilon albescens</i>	lantern bush
<i>Achyranthes aspera</i>	chaff flower
<i>Argusia argentea</i>	octopus bush
<i>Boerhavia albiflora</i> var. <i>albiflora</i>	tar vine
<i>Boerhavia mutabilis</i>	pink flower tar vine
<i>Ipomoea violacea</i>	moon flower

<i>Lepidium englerianum</i>	beach peppergrass
<i>Lepturus repens</i>	stalky grass
<i>Plumbago zeylanica</i>	native plumbago
<i>Portulaca oleracea</i>	pig weed
<i>Sporobolus virginicus</i>	marine couch
<i>Tribulus cistoides</i>	bull's head burr

2.1.2 Island Watch

An Island Watch summary for South West Cay (Herald Cays) was completed by Fiona Hagger (Table 7).

Table 7. June 2025 Island Watch summary for South West Cay, Herald Cays.

Island Watch category	
South West Cay (Herald Cays)	
Key Natural Value Assessments	
Birds	
Formal bird survey by A. McDougall?	Yes
Any new or unusual sightings, or any changes to condition of nesting/roosting habitat?	No
Island Geomorphology	
Significant island changes?	No
Severe storm/cyclone damage?	No
Turtles	
Turtles seen on island?	No live turtles (outside common breeding season)
Number of nests/body pits:	Not counted due to time constraints
Any new or unusual sightings, or any changes to the condition of nesting habitat?	No
Native vegetation	
Condition of key veg value: <i>Argusia argentea</i> (octopus bush):	The <i>Argusia</i> along the vegetation perimeter of the east south-eastern side of the island were mostly dead with no signs of re-shooting.
Condition of key veg value: herb/grassland/abutilon:	Good condition, more lush and abundant than the July 2024 visit. The interior of the cay was more abundant in lantern bush (<i>Abutilon albescens</i>).
Anything else of interest, and changes or concerns (dieback, drought – all veg communities)?	N/A
Threats	
Weeds	
Does the island appear weed free?	No weeds detected.
Species observed and brief description:	N/A
Any future actions needed?	No - other than continued biosecurity procedures for all visitors to island.
Pest/Invasive animals	
Any signs of pest animals? Includes invertebrates like ants, grasshopper, scale insect etc.	N/A
Species observed and brief description:	No (note ant survey wasn't undertaken due to time constraints)
Any future actions needed (eg pest monitoring or control work)?	Ant survey to be undertaken at next visit
Human impacts/ threats	
Any evidence of fires?	No
Trampling, digging by humans?	No
Marine debris:	3 bags of marine debris collected plus one fish aggregating device (FAD), total equating to 11kg. Majority plastic bottles.

Other	
Infrastructure	
Condition of infrastructure, any work required?	Sign maintenance carried out – sign scrubbed to remove bird faeces, and a waterproof coat was also applied. This will need to be carried out each visit by Parks Australia staff.
Cultural values	
Anything observed, anything new or of concern?	The previous Commonwealth Gov signage is still standing but is very sun-faded and largely covered with guano.
Monitoring and collections	
Any other monitoring or surveys undertaken:	Debris removal, testing for signs of Highly Pathogenic Avian Influenza (HPAI) – Guy Weerasinghe (DAFF), vegetation and weed checks carried out by botanist Joy and assistant Larry Brushe.
By whom and where is information to be stored?	Parks Australia to retain and be keeper of data.
Areas of island visited	
Sites (locations) or whole island:	Vegetation adjacent to the shoreline was inspected during a walk around the entire cay, some forays into the interior – limited time available so only about 2 hours spent on island.

2.1.3 Birds

As survey time on South West Cay (Herald Cays) was limited, birds breeding on the beach and adjacent habitats were targeted for this survey.

The number of breeding pairs of red-tailed tropicbirds is likely underestimated, as nests were more difficult to detect within low vegetation on the eastern side of the island. Cyclone and storm activity has altered the vegetation structure, from low *Argusia* shrubland to a more open, grassy habitat. The tropicbirds continue to exhibit strong site fidelity to the island and were observed nesting in shallow depressions in otherwise open habitat (with some protection from grasses and low vegetation). The lithified shoreline also provides nesting habitat, however, the rock coverage and structures are less suitable than that found on North East Cay (Herald Cays).

The interior of the island was not traversed. No drone footage was available to aid counts for other parts of the island.

Observations of the eastern reef egret and sacred kingfisher are noteworthy, as these species are less frequently encountered during the Coral Sea surveys.

Table 8. Bird species and breeding effort on South West Cay, Herald Cays.

Key: P= Present, U= Unknown, NR= Not recorded

South West Cay, Herald Cays 05/06/2025		Breeding effort and life stages				
common name	scientific name	Nests	Chicks	Young	Breeding pairs	Adolescents and adults
red-tailed tropicbird	<i>Phaethon rubricauda roseotinctus</i>	121	10	0	131	140+
lesser frigatebird	<i>Fregata ariel</i>	P	0	0	P	P
great frigatebird	<i>Fregata minor</i>	P	0	0	0	P
masked booby	<i>Sula dactylatra dactylatra</i>	2	0	0	0	18
brown booby	<i>Sula leucogaster</i>	0	0	0	0	40
red-footed booby	<i>Sula sula</i>	P	0	0	P	P
black noddy	<i>Anous minutus</i>	0	0	0	0	P
brown noddy	<i>Anous stolidus</i>	0	0	0	0	10
bridled tern	<i>Onychoprion anaethetus</i>	0	0	0	0	0
sooty tern	<i>Onychoprion fuscatus</i>	P	0	0	0	0
roseate tern	<i>Sterna dougallii</i>	0	0	0	0	0
black-naped tern	<i>Sterna sumatrana</i>	0	0	0	0	4
New Caledonian fairy tern	<i>Sternula nereis exsul</i>	0	0	0	0	0
crested tern	<i>Thalasseus bergii</i>	4	16	0	20	34
Herald petrel	<i>Pterodroma heraldica</i>	0	0	0	0	0
Australian pelican	<i>Pelecanus conspicillatus</i>	0	0	0	0	0
ruddy turnstone	<i>Arenaria interpres</i>	0	0	0	0	0
red-necked stint	<i>Calidris ruficollis</i>	0	0	0	0	0
lesser sand plover	<i>Charadrius mongolus</i>	0	0	0	0	0
Pacific golden plover	<i>Pluvialis fulva</i>	0	0	0	0	4
wandering tattler	<i>Tringa incana</i>	0	0	0	0	0
buff-banded rail	<i>Gallirallus philippensis tounelieri</i>	0	0	0	0	0
eastern reef egret	<i>Egretta sacra</i>	0	0	0	0	1
nankeen night-heron	<i>Nycticorax caledonicus</i>	0	0	0	0	0
purple swamphen	<i>Porphyrio melanotus</i>	0	0	0	0	0
sacred kingfisher	<i>Todiramphus sanctus</i>	0	0	0	0	1
welcome swallow	<i>Hirundo neoxena</i>	0	0	0	0	0

2.1.4 Ant Surveys

Ant surveys were not conducted.

2.2 North East Cay – Herald Cays

North East Cay was visited on the 5th June 2025 (5 hours on island).

2.2.1 Vegetation

Permanent BioCondition monitoring sites

During the June 2025 voyage, a BioCondition monitoring site, M27, was established and surveyed on North East Cay (Herald Cays) in an area of *Abutilon albescens* (lantern bush) closed shrubland (Figure 25).



Figure 25. Location of permanent BioCondition monitoring sites on North East Cay (Herald Cays) including M27 established and surveyed during the June 2025 voyage.

Table 99 contains the BioCondition attribute data recorded at site M27 during the June 2025 voyage. The BioCondition site photographs in

Figure 6 are four of the 10 site photographs taken at site M27 during the June 2025 voyage. These photographs are all taken from the centre point of the 50X10 metre plot (at the centre of the central transect), the first facing the direction of the transect bearing and then consecutively facing 90°, 180° and 270° from the direction of the centre transect bearing.

The vegetation at M27 is typical of the interior glades on the cay mapped as *A. albescens* shrubland in both the 2019 (Hemsen et al., 2020) and the 2008 reports (Batianoff et al., 2008).

No soil samples were collected from Site M27 as comprehensive soil analysis of the Coringa, Herald and Magdelaine vegetated cays had been previously done by George Batianoff (Batianoff et al., 2008 and 2010).

Table 9. BioCondition attribute data recorded at monitoring site M27 on North East Cay (Herald Cays) in June 2025.

Site	Site M27
Cay	North East Cay (Herald Cays)
Date	05/06/2025
Landform	Interior plain
Soil	Coarse white sandy soil (calcareous sand)
Vegetation community description	<i>Abutilon albescens</i> closed shrubland with a mid-dense ground layer dominated by <i>Boerhavia mutabilis</i> ; <i>Ipomoea violacea</i> is abundant in the shrub layer.
Transect start (WGS 84)	16.940469 S 149.201989 E
Transect centre (WGS84)	16.940497 S 149.201756 E
Transect end (WGS 84)	16.940517 S 149.201547 E
Transect bearing (degrees)	259 degrees
Median canopy height/range (metres)	1.5m (0.5-1.7 m)
Tree canopy cover %	N/A
Shrub canopy cover %	88.0%
Basal area m ² /ha	N/A
Total number of large trees/ha	N/A
Total no of trees per ha	N/A
Total number of tree stems/ha	N/A
Total no. live shrubs/ha	98,000/ha (based on count in a 5m x 1m subset)
Recruitment of ecologically dominant layer (%)	N/A
Tree species richness	N/A
Tree species present	N/A
Shrub species richness	1
Shrub species present (layer in brackets)	<i>Abutilon albescens</i> (S1)
Median ground layer height/range (metres)	0.3 m (0.1-0.5 m)
Total ground layer cover of native cay species (%)	54.2%
Grass species richness	0
Grass cover (%)	0.0%
Grass species present in order of decreasing cover - most abundant first (cover in brackets)	N/A
Forb (including vines) species richness	2
Forb species cover (%)	52.4%
Forb species present in order of decreasing cover - most abundant first (cover in brackets)	<i>Ipomoea violacea</i> (23.4% in S1, 3.4% in G), <i>Boerhavia mutabilis</i> (49% in G)
Native shrub ground cover (%)	1.8% (<i>Abutilon albescens</i>)
Non-native plant cover (all strata) (%)	0.0%
Litter cover (%)	43.6%
Bare ground (%)	2.2%
Woody debris (m/ha of logs >0.5m long and >10cm wide)	N/A
Notes: Lesser frigatebirds nesting in vicinity, wedge-tailed shearwater burrows present.	

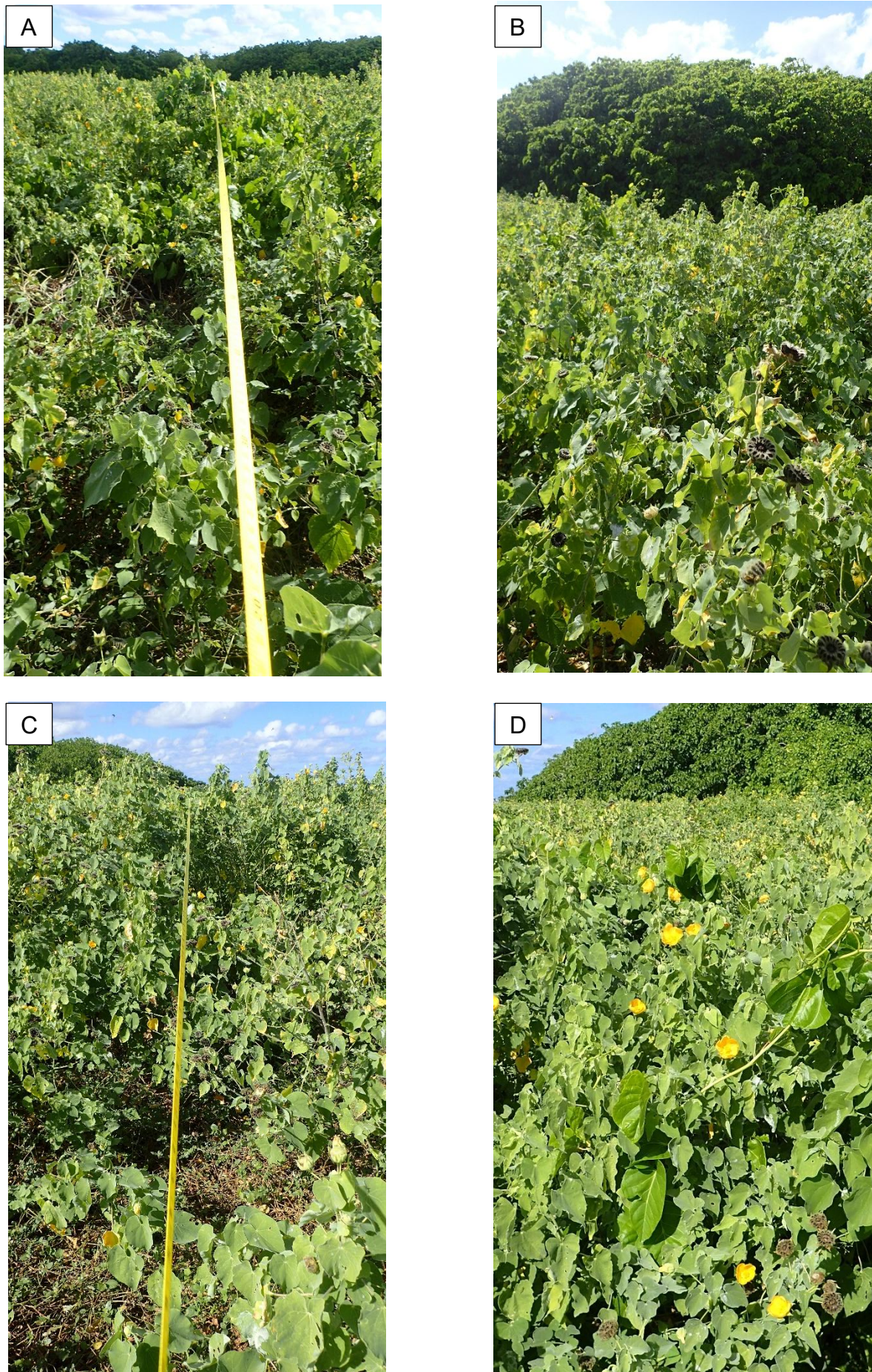


Figure 26. BioCondition monitoring site M27, North East Cay (Herald Cays) taken on 5th June 2025. **A.** Facing West, **B.** Facing North, **C.** Facing East, **D.** Facing South.
Joy Brushe ©

Plant Species

The entire perimeter of the island was traversed. All plant species recorded during the 2019, 2022, 2023 and 2024 visits were also observed during the 2025 visit. No additional species and no weed species were observed in June 2025.

Species that have been recorded on North East Cay (Herald Cay) previously but not recorded or collected during the 2019 to 2025 voyages are:

- *Achyranthes aspera* (last collected 2007)
- *Calophyllum inophyllum* (last collected 1996) – transient species
- *Digitaria ctenantha* (last collected 1997)
- *Guilandina bonduc* (last collected 1997 – transient species (one seedling only))
- *Lepturus repens* (last collected 2006)
- *Stenotaphrum micranthum* (last collected 2006)
- *Ximenia americana* (last collected 1997).

If the above species are observed on North East Cay (Herald Cays) on future trips, they should be collected for incorporation into State and National herbariums.

Argusia argentea (octopus bush) seedlings were present on the shoreline in places (Figure 27).



Figure 27. *Argusia argentea* seedlings on shoreline of North East Cay (Herald Cays) in June 2025.

Table 10. Vegetation species found on North East Cay (Herald Cays) on the June 2025 voyage.

Scientific name/community	Common name
<i>Abutilon albescens</i>	lantern bush
<i>Achyranthes aspera</i>	chaff flower
<i>Argusia argentea</i>	octopus bush
<i>Boerhavia albiflora</i> var. <i>albiflora</i>	tar vine
<i>Boerhavia mutabilis</i>	pink flower tar vine
<i>Cordia subcordata</i>	sea trumpet
<i>Ipomoea violacea</i>	moon flower
<i>Lepidium englerianum</i>	beach peppergrass
<i>Pisonia grandis</i>	Pisonia
<i>Portulaca oleracea</i>	pig weed
<i>Sporobolus virginicus</i>	marine couch
<i>Tribulus cistoides</i>	bull's head burr

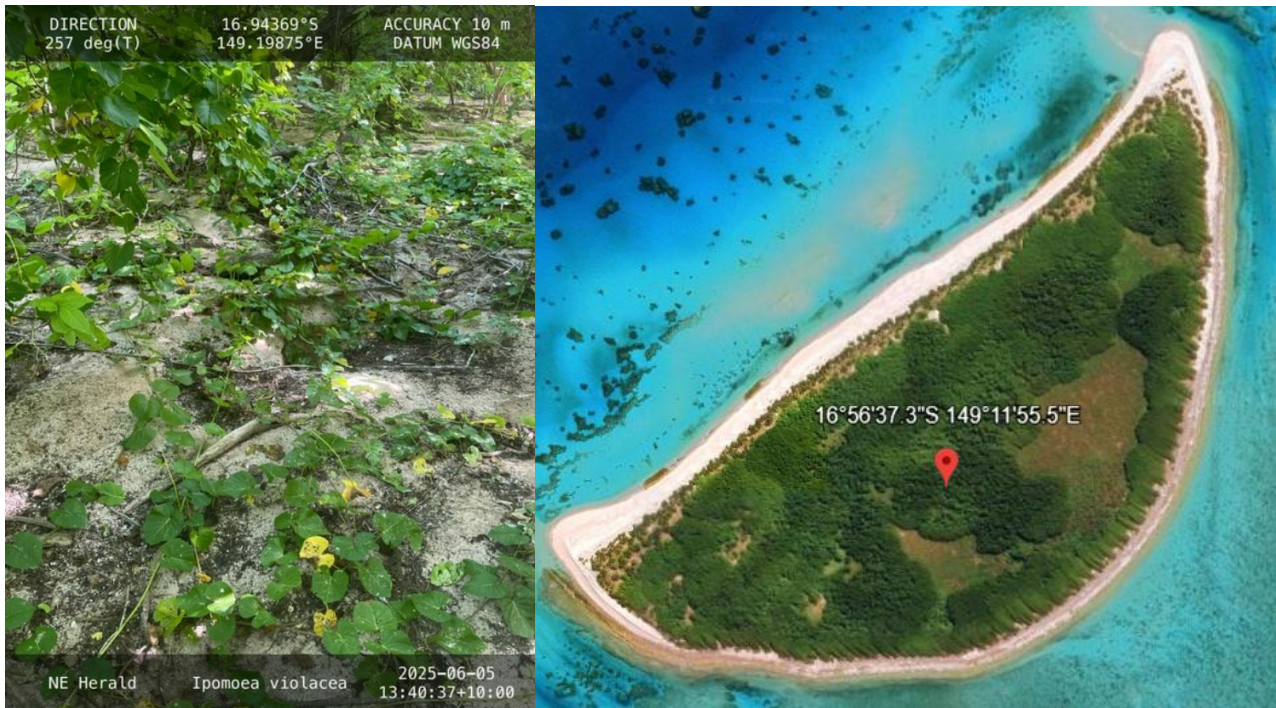


Figure 28. Left: *Ipomoea violacea* located deep within the *P. grandis* closed scrub to low closed forest. Right: Red dot shows the location of the left image.

Fiona Hagger ©



Figure 29. Lush and healthy *Abutilon albescens* dominated shrublands (mixed with *Ipomoea violacea* vine), in one of the *Abutilon albescens* 'glades' (as referenced by Batianoff et al. 2008) located in the south-easterly interior of North East Cay, *P. grandis* community in the background.

Fiona Hagger ©

Of potential concern is the presence of the destructive soft scale *Pulvinaria urticae* and attending ants on *Pisonia grandis* communities. The rapid scale assessment undertaken on *P. grandis* communities on North East Cay while traversing the island to complete Health Checks found five sites of scale being actively attended by the ant species *Tetramorium bicarinatum* (bicoloured pennant ant).

Other Observations

Permanent BioCondition monitoring site M24, located in a regenerating *Cordia subcordata* (sea trumpet) shrubland, was visited briefly and photographs taken for comparison with previous photos. An occasional scale insect was observed on the regenerating *C. subcordata* (Figure 30). There was less evidence of chewing insect leaf damage than in 2023 and 2024. The vegetation at this site was mapped in 2019 as *Abutilon albescens* open shrubland to shrubland with emergent dead *Cordia*

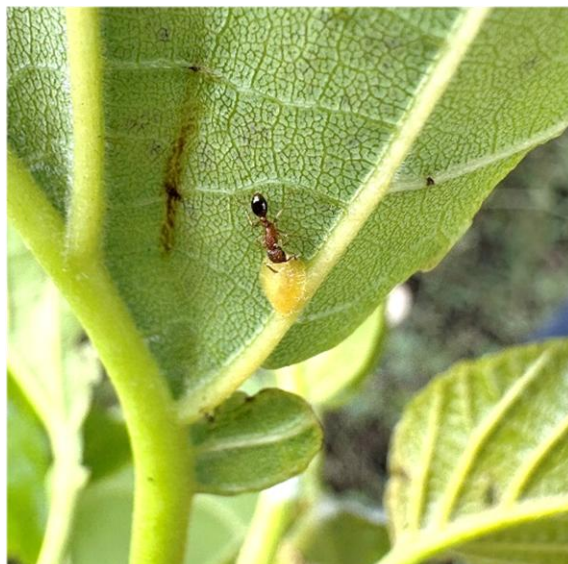


Figure 30. Ant and scale insect on *Cordia subcordata* at BioCondition monitoring site M24 on North East Cay (Herald Cays).
Joy Brushe ©

subcordata Reshooting from the base of many of the apparently dead *Cordia* plants has occurred since then and it is now a *Cordia subcordata*/*Abutilon albescens* shrubland. The regenerating *Cordia* at this site appeared to be healthy with increase in height and cover compared to the previous visit. Some were flowering. Numerous dead *Cordia* plants with no evidence of reshooting are still present. No seedling regeneration of *Cordia* was observed at this site.

2.2.2 Island Watch/Heath Checks

A Parks Australia Island Watch summary proforma for North East Cay (Herald Cays) was completed by Fiona Hagger (Table 11).

Table 11. June 2025 Island Watch summary for North East Cay, Herald Cays.

Island Watch category North East Cay (Herald)	
Key Natural Value Assessments	
Birds	
Formal bird survey by A. McDougall?	Yes
Any new or unusual sightings, or any changes to condition of nesting/roosting habitat?	No
Island Geomorphology	
Significant island changes?	No
Severe storm/cyclone damage?	No
Turtles	
Turtles seen on island:	No live turtles (outside common breeding season)
Number of nests/body pits:	Not counted due to time constraints
Any new or unusual sightings, or any changes to the condition of nesting habitat?	No
Native vegetation	
Condition of key veg value: <i>Pisonia grandis</i>	Overall condition was good with some concern. There was some evidence of insect consumption of leaves, and some patches of scale with tending ants.
Condition of key veg value: <i>Argusia argentea</i>	Overall in good condition. Some exposed branches on the periphery of the vegetation were dead.

Condition of key veg value: <i>Cordia subcordata</i>	Some insect consumption of leaves evident. Previously recorded deceased patch on the western side of the island has not re-shooted (HC_Cord_01).
Condition of key veg value: herb/grassland/abutilon	Good condition
Anything else of interest, and changes or concerns? Eg dieback, drought – all veg communities	No
Threats	
Weeds	
Does the island appear weed free?	No weeds detected.
Species observed and brief description. -	N/A
Any future actions needed?	No - other than continued biosecurity procedures for all visitors to island.
Pest/Invasive animals	
Any signs of pest animals? Includes invertebrates like ants, grasshopper, scale insect etc.	Yes
Species observed and brief description:	Scale (<i>Pulvinaria urbicola</i>) and tending ant bicoloured pennant ant (<i>Tetramorium bicarinatum</i>). <i>Cardiocondyla atalanta</i> also found at one site on the very northern tip of the Cay. No parasitoids seen (though may be present).
Any future actions needed? (eg pest monitoring or control work)	Continued ant and scale surveys at every visit. Expert opinion of current scale & tending ant levels and future management responses. Continued biosecurity procedures paramount for all visitors to island.
Human impacts/ threats	
Any evidence of fires?	No
Trampling, digging by humans?	None detected
Marine debris notes	3 bags of marine debris collected, total equating to 16kg. Majority plastic bottles.
Other	
Infrastructure	
Condition of infrastructure, any work required?	Sign maintenance carried out – sign scrubbed to remove bird faeces, and a waterproof coat was also applied. This will need to be carried out each visit by Parks Australia staff.
Cultural values	
Anything observed, anything new or of concern?	No
Monitoring and collections	
Any other monitoring or surveys undertaken	Debris removal, testing for signs of Highly Pathogenic Avian Influenza (HPAI) – Guy Weerasinghe (DAFF), vegetation and weed checks carried out by botanist Joy and assistant Larry Brushe, Health Checks, scale checks and Island Watch carried out by Fiona Hagger (PA), ant surveys – carried out by Maële Brisset (New Caledonia), reef surveys – led by Andrew Hoey (JCU).
By whom and where is information to be stored?	Parks Australia to retain and be keeper of data.
Areas of island visited	
Sites (locations) or whole island	The perimeter of the island was transversed, with forays into the centre to undertake specific surveys (scale, Health Check, vegetation checks, ant survey).

Health checks were undertaken for three previously surveyed sites of *Argusia argentea*, three sites of *Cordia subcordata* and one site of *P. grandis*.

Due to time constraints, the only health check site for *P. grandis* that was undertaken was for previously surveyed health check site NE_Herald_Pis_02, which was deep within the *P. grandis* forest. The numerous shearwater burrows throughout the *P. grandis* forest made progress very slow-going and precarious. However, considerable time was spent within the *P. grandis* closed scrub to low closed forest while also checking for scale, and the general condition of the community was noted.

Health checks were not undertaken at previous *Abutilon albescens* mixed shrubland sites due to time constraints.

Table 12. Health check results – *Argusia argentea* (octopus bush) shrublands on North East Cay.

Key: **G** = good; **GC** = good with some concerns; **SC** = significant concern; **C** = critical; **NA** = not applicable.

Health Check Indicator	Condition Class			General impression
	Site 1	Site 2	Site 3	
1. Infestations of ecosystem-changing pest plants	G	G	G	G
2. Infestations of pest plants other than ecosystem-changers	G	G	G	G
3. Risk of future invasion by significant pest plants not already present	G	G	G	G
4. Rainforest invasion	G	G	G	G
5. Woody thickening (other than by rainforest species)	G	G	G	G
6. Overgrazing/browsing by feral animals, stray stock or natives	G	G	G	G
7. Trampling, digging or rooting by animals or trampling by visitors	G	G	G	G
8. Impacts on wetlands	NA	NA	NA	NA
9. Vehicle impacts	G	G	G	G
10. Dumping	G	G	G	G
11. Ground cover	G	G	G	G
12. Fire damage to fire-sensitive and non fire-dependent ecosystems	NA	NA	NA	NA
13. Fire damage to fire-adapted peat-based ecosystems	NA	NA	NA	NA
14. Age class distribution in fire-adapted ecosystems in conservation	NA	NA	NA	NA
15. Severe bushfire in fire-adapted wooded ecosystems	NA	NA	NA	NA
16. Severe storm, cyclone or tornado in wooded ecosystems	G	GC	G	NA
17. Overtopping, erosion and associated impacts resulting... from...	G	G	G	G
18. Ecosystem health and dieback	G	GC ¹	GC ²	G
19. Key features for faunal biodiversity in terrestrial ecosystems	G	G	G	G
20. Recruitment of canopy species	NA	NA	NA	NA
Overall Condition Class				G

¹ Some of the *A. argentea* branches at health check sites NE_Herald_Arg_02 and NE_Herald_Arg_03 were bare and dead, these were on the very periphery of the vegetation and exposed to the elements. *A. argentea* plants typically adapt to such conditions, so it is unlikely to significantly impact the shrubland community. The unexposed *A. argentea* was in good health.

² The *A. argentea* at health check site NE_Herald_Arg_03 were surrounded by *Abutilon albescens*, some of which also appeared to be affected by exposure.

Table 13. Health check results – *Cordia subcordata* (sea trumpet) shrublands on North East Cay.
 Key: **G** = good; **GC** = good with some concerns; **SC** = significant concern; **C** = critical; **NA** = not applicable.

Health Check Indicator	Condition Class			General impression
	Site 1	Site 2	Site 3*	
1. Infestations of ecosystem-changing pest plants	G	G	G	G
2. Infestations of pest plants other than ecosystem-changers	G	G	G	G
3. Risk of future invasion by significant pest plants not already present	G	G	G	G
4. Rainforest invasion	G	G	G	G
5. Woody thickening (other than by rainforest species)	G	G	G	G
6. Overgrazing/browsing by feral animals, stray stock or natives	G	G	G	G
7. Trampling, digging or rooting by animals or trampling by visitors	G	G	G	G
8. Impacts on wetlands	NA	NA	NA	NA
9. Vehicle impacts	G	G	G	G
10. Dumping	G	G	G	G
11. Ground cover	G	G	G	G
12. Fire damage to fire-sensitive and non fire-dependent ecosystems	NA	NA	NA	NA
13. Fire damage to fire-adapted peat-based ecosystems	NA	NA	NA	NA
14. Age class distribution in fire-adapted ecosystems in conservation	NA	NA	NA	NA
15. Severe bushfire in fire-adapted wooded ecosystems	NA	NA	NA	NA
16. Severe storm, cyclone or tornado in wooded ecosystems	NA	NA	NA	NA
17. Overtopping, erosion and associated impacts resulting... from...	G	G	G	G
18. Ecosystem health and dieback	C¹	GC²	GC³	SC
19. Key features for faunal biodiversity in terrestrial ecosystems	SC	G	G	G
20. Recruitment of canopy species	NA	NA	NA	NA
Overall Condition Class				SC

¹ *Cordia* communities at Health check site NE_Herald_Cord_01, which was previously mapped as '*Cordia subcordata* closed scrub to low closed forest' (Batianoff et al., 2008) are now dead, and have been recorded as dead since the CSMP Island Health voyage in 2019 (Hemson et al., 2020). During this visit in 2019, Hemson et al., (2020) described this specific community as being replaced with *Abutilon albescens* shrublands or consisting of bare patches containing fallen dead *C. subcordata*. The area now also supports *Argusia* and the bare patches are increasingly covered by *Portulaca oleracea* (pig weed) (which at the time of visit was dry) (Figure 31).

² An occasional scale insect was observed on the regenerating *C. subcordata*, though there was less evidence of chewing insect leaf damage than in 2023 and 2024 (Figure 30).

³ An additional site of *Cordia* was found (NE_Herald_Cord_03) that has not previously been assessed. This community was in good health with new shoots, however had obvious signs of insect consumption (Figure 32).



Figure 31. Health Check site NE_Herald_Cord_1. The *Cordia* community has died and not re-shooted. The site is now hosting *Argusia argentea*, *Abutilon albescens* and *Portulaca oleracea* communities. Fiona Hagger ©



Figure 32: Left: Health Check site at NE_Herals_Cord_2 (permanent monitoring site M24) showing regenerating *C. subcordata* in 2022. Right: same site in 2025. Joy Brushe ©



Figure 33. Left: *Cordia subcordata* community found on the northwest side of North East Cay (NE_Herald_Cord_03). Right: Note some insect consumption of some of the leaves. Fiona Hagger ©

Table 14. Health check results – *Pisonia* (*Pisonia grandis*) communities on North East Cay.
 Key: **G** = good; **GC** = good with some concerns; **SC** = significant concern; **C** = critical; **NA** = not applicable.

Health Check Indicator	Condition Class			General impression
	Site 1	Site 2	Site 3	
1. Infestations of ecosystem-changing pest plants		G		G
2. Infestations of pest plants other than ecosystem-changers		G		G
3. Risk of future invasion by significant pest plants not already present		G		G
4. Rainforest invasion		G		G
5. Woody thickening (other than by rainforest species)		G		G
6. Overgrazing/browsing by feral animals, stray stock or natives		G		G
7. Trampling, digging or rooting by animals or trampling by visitors		G		G
8. Impacts on wetlands		NA		NA
9. Vehicle impacts		G		G
10. Dumping		G		G
11. Ground cover		G		G
12. Fire damage to fire-sensitive and non fire-dependent ecosystems		NA		NA
13. Fire damage to fire-adapted peat-based ecosystems		NA		NA
14. Age class distribution in fire-adapted ecosystems in conservation		NA		NA
15. Severe bushfire in fire-adapted wooded ecosystems		NA		NA
16. Severe storm, cyclone or tornado in wooded ecosystems		NA		NA
17. Overtopping, erosion and associated impacts resulting... from...		G		G
18. Ecosystem health and dieback		GC ¹		GC ²
19. Key features for faunal biodiversity in terrestrial ecosystems		G		G
20. Recruitment of canopy species		G		G
Overall Condition Class				GC

¹ Some leaves at Health Check site NE_Herald_Pis_02 were completely eaten by insects. No probable insects were found at the scene. The rest of the leaves and trees were otherwise in good condition (Figure 34).

² Due to time constraints, the only health check site for *P. grandis* that was undertaken was for NE_Herald_Pis_02. However, considerable time was spent within the *P. grandis* closed scrub to low closed forest observing scale sites. Overall, the condition of the *P. grandis* communities were good with some concern – there were patches of scale with tending ants which will require follow-up monitoring and potentially management action, and occasional evidence of insects having consumed leaves.



Figures 34: The red arrows highlight the remnant midrib of the *P. grandis* leaves at site NE_Herald_Pis_02, with the surrounding leaf blade having been consumed by insects. Fiona Hagger ©

A scale survey was conducted on the *Pisonia* forests on North East Cay (Herald Cays). Further information and results can be found in the results of Section 1.2 Island Watch/Health Checks – *Fiona Hagger*

2.2.3 Birds

Survey time on North East Cay was restricted to 3 hours 50 minutes, so a rapid count of red-tailed tropicbirds and presence/absence of other species was recorded. There was not adequate time to explore internal parts of the island.

The 441 pairs of tropicbirds is an estimate, through a combination of thorough searches in a limited area and extrapolated counts for the remainder of the island. Limited survey time necessitated the extrapolated counts.

Black-naped terns were seen prospecting for a nest site on the northern sand spit. The birds concentrated on a patch of pumice washed into a depression. Several times they sat as though they were on a nest and then walked to a nearby patch to do the same. The birds had a breeding flush of pink through their feathers, which indicates breeding is imminent.

No purple swamphens were observed on the beach or beach fringes. Brown noddies were occasionally seen roosting on black noddy nests.

Table 15. Bird species and breeding effort on North East Cay, Herald Cays.

Key: P= Present, U= Unknown, NR= Not recorded

North East Cay, Herald Cays		05/06/2025		Breeding effort and life stages				
common name	scientific name	Nests	Chicks	Young	Breeding pairs	Adolescents and adults		
red-tailed tropicbird	<i>Phaethon rubricauda roseotinctus</i>	441			441	490		
lesser frigatebird	<i>Fregata ariel</i>	P	0	0	P	P		
great frigatebird	<i>Fregata minor</i>	P	0	0	P	P		
masked booby	<i>Sula dactylatra dactylatra</i>	P	0	0	P	P		
brown booby	<i>Sula leucogaster</i>	P	0	0	P	P		
red-footed booby	<i>Sula sula</i>	P	0	0	P	P		
black noddy	<i>Anous minutus</i>	P	0	0	P	P		
brown noddy	<i>Anous stolidus</i>	P	0	0	P	P		
bridled tern	<i>Onychoprion anaethetus</i>	0	0	0	0	0		
sooty tern	<i>Onychoprion fuscatus</i>	0	0	0	0	P		
roseate tern	<i>Sterna dougallii</i>	0	0	0	0	0		
black-naped tern	<i>Sterna sumatrana</i>	0	0	0	0	2		
New Caledonian fairy tern	<i>Sternula nereis exsul</i>	0	0	0	0	0		
crested tern	<i>Thalasseus bergii</i>	0	0	0	0	P		
Herald petrel	<i>Pterodroma heraldica</i>	0	0	0	0	0		
Australian pelican	<i>Pelecanus conspicillatus</i>	0	0	0	0	0		
ruddy turnstone	<i>Arenaria interpres</i>	0	0	0	0	0		
red-necked stint	<i>Calidris ruficollis</i>	0	0	0	0	0		
lesser sand plover	<i>Charadrius mongolus</i>	0	0	0	0	0		
Pacific golden plover	<i>Pluvialis fulva</i>	0	0	0	0	0		
wandering tattler	<i>Tringa incana</i>	0	0	0	0	1		
buff-banded rail	<i>Gallirallus philippensis tounelieri</i>	0	0	0	0	P		
eastern reef egret	<i>Egretta sacra</i>	0	0	0	0	0		
nankeen night-heron	<i>Nycticorax caledonicus</i>	0	0	0	0	0		
purple swamphen	<i>Porphyrio melanotus</i>	0	0	0	0	0		
sacred kingfisher	<i>Todiramphus sanctus</i>	0	0	0	0	4		
welcome swallow	<i>Hirundo neoxena</i>	0	0	0	0	0		

2.2.4 Ant Surveys

Bicoloured Pennant ant (*Tetramorium bicarinatum*) identified from 6 samples, observed tending scale bug (*Pulvinaria urbicola*). Second ant species *Cardiocondyla atalanta* found at one site on the northern tip of the Cay.

2.3 South West Islet – Coringa Islets

Visited on the 6th of June 2025 (full day on island).

2.3.1 Vegetation

Permanent BioCondition monitoring sites

During the June 2025 voyage, a permanent BioCondition monitoring site, M28, was established and surveyed in an area of *Abutilon albescens* (lantern bush) shrubland on South West Islet (Coringa Islets). The location of Site M28 relative to the 2019 mapped vegetation communities is shown in Figure 35.

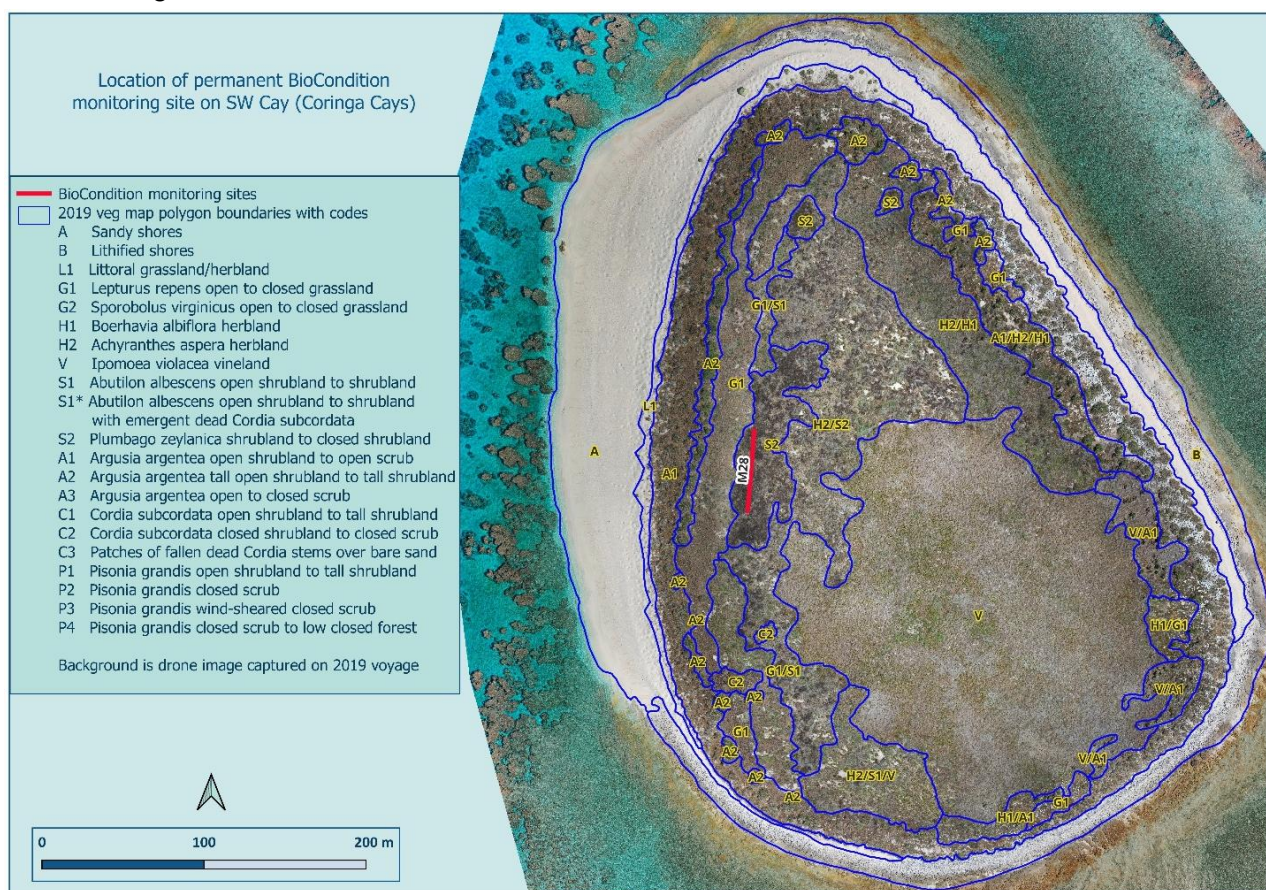


Figure 35. Location of permanent BioCondition monitoring site M28 relative to 2019 vegetation map polygons on South West Islet (Coringa Islets).

Table 16 contains the BioCondition attribute data recorded at site M28 during the June 2025 voyage. The BioCondition site photographs in Figure 36 are four of the 10 site photographs taken at site M28 in June 2025. These photographs are all taken from the centre point of the centre transect, the first facing in the direction of the transect bearing and then consecutively facing 90°, 180° and 270° from the direction of the centre transect bearing.

No soil samples were collected from Site M28 as comprehensive soil analysis of the Coringa, Herald and Magdelaine vegetated cays had been previously done by George Batianoff (Batianoff et al., 2008 and Batianoff et al., 2010).

Table 16. BioCondition attribute data recorded at monitoring site M28 on South West Islet, Coringa Islets.

Site	Site M28
Cay	South West Cay (Coringa Cays)
Date	06/06/2025
Landform	Depression in interior plain adjacent to coastal ridges
Soil	Dark brown organic soil (calcareous sand)
Vegetation community description	<i>Abutilon albescens</i> closed shrubland with a dense ground layer dominated by <i>Plumbago zeylanica</i> .
Transect start (WGS 84)	16.968582 S 149.907410
Transect centre (WGS84)	16.968405 S 149.907429
Transect end (WGS 84)	16.968162 S 149.907449
Transect bearing (degrees)	359 degrees
Median canopy height/range (metres)	1.6m (1.2-1.8 m)
Tree canopy cover %	N/A
Shrub canopy cover %	83%
Basal area m ² /ha	N/A
Total number of large trees/ha	N/A
Total no of trees per ha	N/A
Total number of tree stems/ha	N/A
Total no. live shrubs/ha	36,000/ha (based on count 5m x 1m subset)
Recruitment of ecologically dominant layer (%)	N/A
Tree species richness	N/A
Tree species present	N/A
Shrub species richness	2
Shrub species present (layer in brackets)	<i>Abutilon albescens</i> (S1), <i>Plumbago zeylanica</i> (G)
Median ground layer height/range (metres)	0.7 m (0.5-1.2 m)
Total ground layer cover of native cay species (%)	80.2%
Grass species richness	1
Grass cover (%)	7.0%
Grass species present in order of decreasing cover - most abundant first (cover in brackets)	<i>Lepturus repens</i>
Forb (including vines) species richness	3
Forb species cover (%)	19.8%
Forb species present in order of decreasing cover - most abundant first (cover in brackets)	<i>Achyranthes aspera</i> (12.8%), <i>Boerhavia mutabilis</i> (6.2%), <i>Boerhavia albiflora</i> var <i>albiflora</i> (0.8%)
Native shrub ground cover (%)	53.4% (<i>Plumbago zeylanica</i>)
Non-native plant cover (all strata) (%)	0.0%
Litter cover (%)	19.8%
Bare ground (%)	0.0%
Woody debris (m/ha of logs >0.5m long and >10cm wide)	N/A
Notes: Interior plain was previously <i>Pisonia</i> forest, prior to death of forest caused by scale insects. Brown noddies and sooty terns were nesting in and adjacent to the site.	

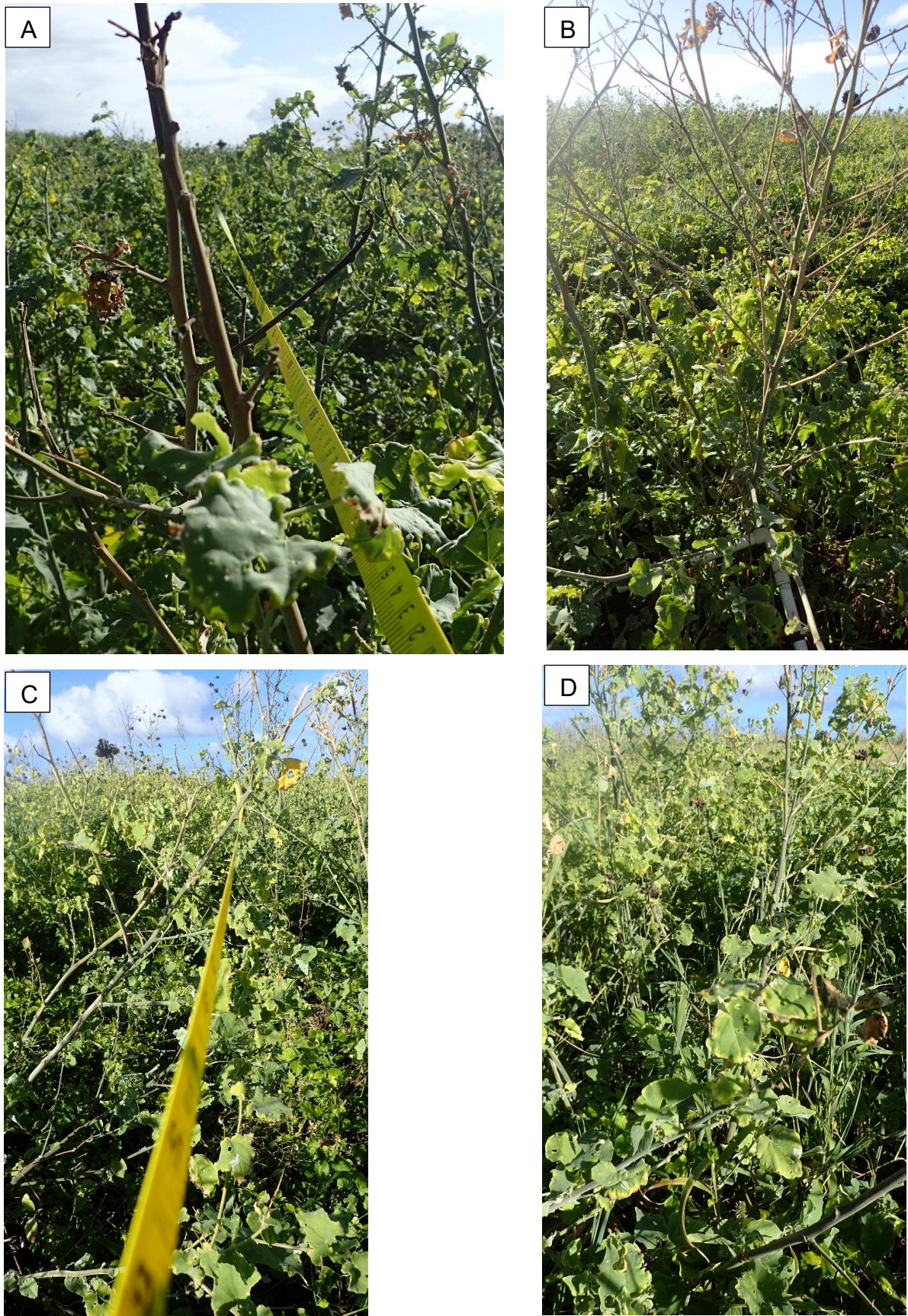


Figure 36. BioCondition monitoring site M28, South West Islet (Coringa Islets) taken on 6th June 2025 . A. Facing North, B. Facing East, C. Facing South, D. Facing West.
Joy Brushe ©

The vegetation at site M28 was previously mapped as *Plumbago zeylanica* shrubland in 2008 (Batianoff et al., 2008) and 2019 (Hemson et al., 2020). The vegetation at the site is now *Abutilon albescens* shrubland with *P. zeylanica* still abundant in the ground layer (Figure 37). This change in structure and species dominance is typical of climate related transitions between herbland/grassland and *Abutilon albescens* shrubland that have been observed in the interior of the more well-developed cays in the CSMP Islands during the 2021 to 2025 voyages. *A. albescens* germinates and grows quickly following wet conditions and then dies back after a couple of years, leaving a large seedbank in the soil, ready to recommence the cycle when conditions are favourable.



Figure 37. *Plumbago zeylanica* (native plumbago) at BioCondition monitoring site M28, South West Islet (Coringa Islets). Joy Brushe ©

Note *Plumbago zeylanica* has variable growth forms under different conditions, with descriptions varying from a non-woody herb to a sub-shrub to a small woody shrub.

Plant species

Specimens of 7 plant species were collected from South West Islet (Coringa Islets) for incorporation into the pressed collections and associated specimen records database of the Queensland Herbarium in Brisbane, the National Herbarium in Canberra and the Australian Tropical Herbarium in Cairns (Table 17).

These specimens were collected to complement the collections made during the December 2019 voyage. Good specimens of these species could not be obtained during the 2019 voyage due to the dry conditions at that time.

Table 17. Vegetation species collected from South West Islet (Coringa Islets).

Scientific name/community	Common name
<i>Abutilon albescens</i>	lantern bush
<i>Achyranthes aspera</i>	chaff flower
<i>Argusia argentea</i>	octopus bush
<i>Boerhavia mutabilis</i>	pink flower tar vine
<i>Cordia subcordata</i>	sea trumpet
<i>Lepturus repens</i>	stalky grass
<i>Portulaca oleracea</i>	pig weed

2.3.2 Island Watch/Heath Checks

A Parks Australia Island Watch summary proforma for South West Islet (Coringa Islets) was completed by Fiona Hagger (Table 18).

Table 18. June 2025 Island Watch summary for South West Islet, Coringa Islets.

Island Watch category South West Islet (Coringa)	
Key Natural Value Assessments	
Birds	
Formal bird survey by A. McDougall?	Yes
Any new or unusual sightings, or any changes to condition of nesting/roosting habitat?	No
Island Geomorphology	
Significant island changes?	No
Severe storm/cyclone damage?	No
Turtles	
Turtles seen on island?	No live turtles (outside common breeding season).
Number of nests/body pits:	Not counted due to time constraints
Any new or unusual sightings, or any changes to the condition of nesting habitat?	No
Native vegetation	
Condition of key veg value: <i>Argusia argentea</i> (octopus bush)	Overall good - some dead/dieback of <i>Argusia</i> shrubs on the east/south-east of the Islet, due to exposure/salt water inundation.
Condition of key veg value: <i>Cordia subcordata</i>	Good with some concern – far more green growth than seen in previous assessments of recent years, however still some browning/drying of leaves and some dead shrubs that have not re-shooted.
Condition of key veg value: herb/grassland/abutilon	Good
Anything else of interest, and changes or concerns? Eg dieback, drought – all veg communities	No
Threats	
Weeds	
Does the island appear weed free?	No weeds detected.
Species observed and brief description.	N/A
Any future actions needed?	No - other than continued biosecurity procedures for all visitors to island.
Pest/Invasive animals	
Any signs of pest animals? Includes invertebrates like ants, grasshopper, scale insect etc.	Ant surveys: four sites surveyed in the northern half of the islet collected only <i>Monomorium pharaonis</i> specimens. Two sites in the southern half collected only <i>Cardiocondyla atalanta</i> .
Species observed and brief description.	<i>Monomorium pharaonis</i> has previously been found on South West Islet, first picked up in 2019. Likely the ant species associated with soft scale <i>P. urbicola</i> outbreak and loss of <i>Pisonia</i> communities on this islet. <i>Cardiocondyla atalanta</i> was picked up on the Islet in 2016. Currently not a species of concern.

Any future actions needed? (e.g. pest monitoring or control work)	Yes. Continued ant monitoring recommended, across whole Islet (to check spread). Also monitoring on closest island, Chilcott Islet. Continued biosecurity procedures for all visitors to island
Human impacts/ threats	
Any evidence of fires?	No
Trampling, digging by humans:	None detected
Marine debris notes:	2 bags of marine debris collected, total equating to 10kg. Majority plastic bottles.
Other	
Infrastructure	
Condition of infrastructure, any work required?	Sign maintenance carried out – sign scrubbed to remove bird faeces, and a waterproof coat was also applied. This will need to be checked and potentially carried out each visit by Parks Australia staff.
Cultural values	
Anything observed, anything new or of concern?	No
Monitoring and collections	
Any other monitoring or surveys undertaken?	Debris removal, testing for signs of Highly Pathogenic Avian Influenza (HPAI) – Guy Weerasinghe (DAFF), health checks and Island Watch carried out by Fiona Hagger (PA) vegetation assessments, BioCondition site establishment and weed checks carried out by botanist Joy and assistant Larry Brushe, ant surveys – carried out by Maële Brisset (New Caledonia), reef surveys – led by Andrew Hoey (JCU).
By whom and where is information to be stored?	Parks Australia to retain and be keeper of island data, JCU to store reef survey data.
Areas of island visited	
Sites (locations) or whole island:	Five health check sites were assessed to cover major vegetation communities. Lack of time prevented further health check assessments. Most of the island was traversed, however the centre was dense, almost impenetrable herb/shrubland dominated by <i>Abutilon</i> .

Health checks were undertaken for one previously surveyed site of *Argusia argentea*, two sites of *Cordia subcordata* and two sites of Mixed Herb/shrubland.

Table 19. Health check results – *Argusia argentea* (octopus bush) shrublands on South West Islet, Coringa Islets.

Key: **G** = good; **GC** = good with some concerns; **SC** = significant concern; **C** = critical; **NA** = not applicable.

Health Check Indicator						
	Site 1	Site 2	Site 3	Site 4	Site 5	
1. Infestations of ecosystem-changing pest plants	G					G
2. Infestations of pest plants other than ecosystem-changers	G					G
3. Risk of future invasion by significant pest plants not already present	G					G
4. Rainforest invasion	G					G
5. Woody thickening (other than by rainforest species)	G					G
6. Overgrazing/browsing by feral animals, stray stock or natives	G					G
7. Trampling, digging or rooting by animals or trampling by visitors	G					G
8. Impacts on wetlands	NA					NA
9. Vehicle impacts	G					G

10. Dumping	G					G
11. Ground cover	G					G
12. Fire damage to fire-sensitive and non fire-dependent ecosystems	NA					NA
13. Fire damage to fire-adapted peat-based ecosystems	NA					NA
14. Age class distribution in fire-adapted ecosystems in conservation	NA					NA
15. Severe bushfire in fire-adapted wooded ecosystems	NA					NA
16. Severe storm, cyclone or tornado in wooded ecosystems	NA					NA
17. Overtopping, erosion and associated impacts resulting... from...	G					G
18. Ecosystem health and dieback	G					GC
19. Key features for faunal biodiversity in terrestrial ecosystems	G					G
20. Recruitment of canopy species	NA					NA
Overall Condition Class						G

Some dead/dieback of *Argusia argentea* shrubs on the east/south-east of the Islet, on the very periphery of the vegetation. Likely due to exposure or saltwater inundation. These shrubs were mostly re-sprouting. Overall, condition of *A. argentea* on South West Islet was good.

Table 20. Health check results – *Cordia subcordata* (sea trumpet) shrublands on South West Islet, Coringa Islets.

Key: G = good; GC = good with some concerns; SC = significant concern; C = critical; NA = not applicable.

Health Check Indicator	Condition Class					General impression
	Site 1	Site 2	Site 3	Site 4	Site 5	
1. Infestations of ecosystem-changing pest plants	G	G				G
2. Infestations of pest plants other than ecosystem-changers	G	G				G
3. Risk of future invasion by significant pest plants not already present	G	G				G
4. Rainforest invasion	G	G				G
5. Woody thickening (other than by rainforest species)	G	G				G
6. Overgrazing/browsing by feral animals, stray stock or natives	G	G				G
7. Trampling, digging or rooting by animals or trampling by visitors	G	G				G
8. Impacts on wetlands	NA	NA				NA
9. Vehicle impacts	G	G				G
10. Dumping	G	G				G
11. Ground cover	G	G				G
12. Fire damage to fire-sensitive and non fire-dependent ecosystems	NA	NA				NA
13. Fire damage to fire-adapted peat-based ecosystems	NA	NA				NA
14. Age class distribution in fire-adapted ecosystems in conservation	NA	NA				NA
15. Severe bushfire in fire-adapted wooded ecosystems	NA	NA				NA
16. Severe storm, cyclone or tornado in wooded ecosystems	NA	NA				NA
17. Overtopping, erosion and associated impacts resulting... from...	G	G				G
18. Ecosystem health and dieback	GC	SC				GC
19. Key features for faunal biodiversity in terrestrial ecosystems	GC	GC				GC
20. Recruitment of canopy species	GC	GC				GC
Overall Condition Class						GC

Site 1 showed some signs of drying/browning of leaves, especially on the topmost branches (Table 20). No obvious insect damage was present, and two different types of ladybirds were observed on the fruit (Figures 38). The larger, yellow ladybird is likely *Microcaria mulsanti* (formerly *Coelophora mulsanti*) which has been collected from South West Islet and other CSMP cays before. The smaller, red and black ladybird was not identified, however has been deemed unlikely to be of biosecurity concern by DAFF entomologists. Compared to previous assessments, Site 1 was in much better condition, with new growth. Some patches were still dead with no signs of regrowth.



Figures 38. Two different types of ladybirds present on the *C. subcordata* fruit.

Fiona Hagger ©

Previously, in 2019, stands of *C. subcordata* at Site 1 appeared to be struggling to survive, most were defoliated and appeared to be almost completely dead, and smothered by *Ipomoea* vines. In 2024 some of the *C. subcordata* at Site 1 were resprouting, with evidence of insects consuming new leaves (Figure 39). Other areas of the *C. subcordata* patch were dead with no signs of regrowth.



Figure 39. Comparison of *Cordia subcordata* site 1. Left above: the site at the time of the 2024 visit. Left below: the site at the time of the 2025 visit. Right: Example of condition of leaves on *C. subcordata* communities in site 2. Fiona Hagger ©

Site 2 has not been previously assessed. This community of *C. subcordata* was in a very dense almost impenetrable thicket, surrounded by *Abutilon albescens* and *Argusia* shrubs, with no room to grow sideways. As a result, it has grown upwards with almost bare, spindly branches. The site had some browning of leaves (particularly on the top) and some dead patches which displayed no signs of regrowth. There was some insect munching on the leaves (Figure 39).

Table 21. Health check results – Mixed Herb/shrubland on South West Islet, Coringa Islets.

Site 1 species present: *Tribulus cistoides*, *Lepturus repens*, *Plumbago zeylanica*, *Abutilon albescens*, *Achyranthes aspera*

Site 2 species present: *Achyranthes aspera*, *Lepturus repens*, *Boerhavia albiflora*, *Portulaca oleracea*, *Argusia*

Key: **G** = good; **GC** = good with some concerns; **SC** = significant concern; **C** = critical; **NA** = not applicable.

Health Check Indicator	Condition Class					General impression
	Site 1	Site 2	Site 3	Site 4	Site 5	
1. Infestations of ecosystem-changing pest plants	G	G				G
2. Infestations of pest plants other than ecosystem-changers	G	G				G
3. Risk of future invasion by significant pest plants not already present	G	G				G
4. Rainforest invasion	G	G				G
5. Woody thickening (other than by rainforest species)	G	G				G
6. Overgrazing/browsing by feral animals, stray stock or natives	G	G				G
7. Trampling, digging or rooting by animals or trampling by visitors	G	G				G
8. Impacts on wetlands	NA	NA				NA
9. Vehicle impacts	G	G				G
10. Dumping	G	G				G
11. Ground cover	G	G				G
12. Fire damage to fire-sensitive and non fire-dependent ecosystems	NA	NA				NA
13. Fire damage to fire-adapted peat-based ecosystems	NA	NA				NA

14. Age class distribution in fire-adapted ecosystems in conservation	NA	NA				NA
15. Severe bushfire in fire-adapted wooded ecosystems	NA	NA				NA
16. Severe storm, cyclone or tornado in wooded ecosystems	NA	NA				NA
17. Overtopping, erosion and associated impacts resulting... from...	G	G				G
18. Ecosystem health and dieback	G	G				G
19. Key features for faunal biodiversity in terrestrial ecosystems	G	G				G
20. Recruitment of canopy species	NA	NA				NA
Overall Condition Class						G

2.3.3 Birds

On the eastern and south eastern parts of the islet, sooty terns were flying in a similar manner as they do when chicks are present i.e. low hovering over a site. On this occasion I did not observe any chicks or nests and concluded these birds were prospecting nest sites. Other areas of the island had sooty tern nests with eggs. No chicks or young were recorded.

As with North East Cay (Herald Cays), brown noddies were observed roosting in black noddy nests, an observation not noted on earlier surveys. Only great frigatebirds were observed nesting on South West Islet, Coringa Islets.

Table 22. Bird species and breeding effort on South West Islet, Coringa Islets.

Key: P= Present, U= Unknown, NR= Not recorded

South West Islet, Coringa Islets		06/06/2025		Breeding effort and life stages		
common name	scientific name	Nests	Chicks	Young	Breeding pairs	Adolescents and adults
red-tailed tropicbird	<i>Phaethon rubricauda roseotinctus</i>	0	0	0	0	2
lesser frigatebird	<i>Fregata ariel</i>	0	0	0	0	0
great frigatebird	<i>Fregata minor</i>	6	1	0	7	19
masked booby	<i>Sula dactylatra dactylatra</i>	26	0	0	26	33
brown booby	<i>Sula leucogaster</i>	3	1	0	4	29
red-footed booby	<i>Sula sula</i>	P	0	0	P	P
black noddy	<i>Anous minutus</i>	1240		0	1240	P
brown noddy	<i>Anous stolidus</i>	0	0	0	0	P
bridled tern	<i>Onychoprion anaethetus</i>	0	0	0	0	0
sooty tern	<i>Onychoprion fuscatus</i>	7170	0	0	7170	11200
roseate tern	<i>Sterna dougallii</i>	0	0	0	0	0
black-naped tern	<i>Sterna sumatrana</i>	0	0	0	0	2
New Caledonian fairy tern	<i>Sternula nereis exsul</i>	0	0	0	0	0
crested tern	<i>Thalasseus bergii</i>	0	0	0	0	18
Herald petrel	<i>Pterodroma heraldica</i>	0	0	0	0	0
Australian pelican	<i>Pelecanus conspicillatus</i>	0	0	0	0	0
ruddy turnstone	<i>Arenaria interpres</i>	0	0	0	0	0
red-necked stint	<i>Calidris ruficollis</i>	0	0	0	0	0
lesser sand plover	<i>Charadrius mongolus</i>	0	0	0	0	0
Pacific golden plover	<i>Pluvialis fulva</i>	0	0	0	0	0
wandering tattler	<i>Tringa incana</i>	0	0	0	0	0
buff-banded rail	<i>Gallirallus philippensis tounelieri</i>	0	0	0	0	P
eastern reef egret	<i>Egretta sacra</i>	0	0	0	0	0
nankeen night-heron	<i>Nycticorax caledonicus</i>	0	0	0	0	0
purple swamphen	<i>Porphyrio melanotus</i>	0	0	0	0	0
sacred kingfisher	<i>Todiramphus sanctus</i>	0	0	0	0	0
welcome swallow	<i>Hirundo neoxena</i>	0	0	0	0	0

2.3.4 Ant Surveys

The native *Cardiocondyla atalanta* and the introduced *Monomorium pharaonis* (Pharaoh ant) was recorded on South West Islet. The introduced Pharaoh ant is likely the ant species associated with soft scale *P. urbicola* outbreak and loss of *Pisonia* communities on this island.

2.4 North Islet (cay) – Willis Islets

Visited on the 7th of June 2025 (4 hours on island).

2.4.1 Vegetation

Less *Portulaca oleracea* (pig weed) and more *Tribulus cistoides* (bull's head burr) were apparent on North Islet compared with the 2022 vegetation.

It appeared that the surface sand had recently been eroded away either by wind or waves as large numbers of *Boerhavia albiflora* var. *albiflora* (tar vine) plants had their underground tubers exposed on the surface of the ground (Figure 40). There was also egg scale (Figure 41) present on many of the *Boerhavia albiflora* var. *albiflora* plants, confirming the presence of *Pulvinaria urbicola* on the cay. No attending ants present at scale sites.



Figure 40. Exposed tubers of *Boerhavia albiflora* var. *albiflora* on surface of the ground on North Islet (Willis Islets) in June 2025. Joy Brushe ©



Figure 41. Egg scale on *Boerhavia albiflora* var. *albiflora* on North Cay (Willis Islets).

Joy Brushe ©



Figure 42. Location of *Ipomoea violacea* growing on North Cay (Willis Islets).

A single plant of *Ipomoea violacea* (moon flower) was growing on the southern coastline at the location shown on Figure 42. This species was not present on North Islet during the 2022 survey. It is present on the South Magdelaine Cay and the Coringa, Herald and Tregrosse Reef cays but has not been previously recorded on any of the Willis Islets. A specimen was collected, and its identification was confirmed by Qld Herbarium. It is likely that the plant will not survive in its current position on the shoreline. If it becomes established on North Islet, new specimens should be sent to the State and National Herbariums as there was insufficient suitable material in the June 2025 collection for incorporation into the herbarium collections.

Of note, two coconuts were located, sprouted and with roots put down (Figure 43). Based on other coconuts that have been found across CSMP islands over time, it is unlikely that this plant will establish and grow.



Figure 43. Sprouted coconut (*Cocos nucifera*).
Fiona Hagger ©

Some parts of the vegetated areas on North Islet are at quite low elevation and are likely to be periodically inundated by storm/cyclonic wave surges. Patches of vegetation appeared dead, possibly due to saltwater inundation from cyclone Jasper that occurred in February. In most areas new growth was present.

2.4.2 Island Watch/Health Checks

A Parks Australia Island Watch summary proforma for North Islet (Willis Islets) was completed by Fiona Hagger (Table 23).

Table 23. June 2025 Island Watch summary for North Islet, Willis Islets.

Island Watch category North Islet (Willis)	
Key Natural Value Assessments	
Birds	
Formal bird survey by A. McDougall?	Yes
Any new or unusual sightings, or any changes to condition of nesting/roosting habitat?	No
Island Geomorphology	
Significant island changes?	No
Severe storm/cyclone damage?	Yes – but effects are more seen to island vegetation than island geomorphology (with the naked eye).
Turtles	
Turtles seen on island?	No live turtles (outside common breeding season)
Number of nests/body pits:	Not counted due to time constraints
Any new or unusual sightings, or any changes to the condition of nesting habitat?	No
Native vegetation	
Condition of key veg value: herb/grassland/abutilon	Mostly good condition
Anything else of interest, and changes or concerns? Eg dieback, drought – all veg communities.	Some areas of drying or dieback, especially among the <i>Boerhavia albiflora</i> and <i>Tribulus cistoides</i> communities, most likely due to exposure to elements and seawater incursion – potentially from Cyclone Jasper that occurred in February 2025. Also, some areas of scale, see below.
Threats	
Weeds	
Does the island appear weed free?	No weeds detected.
Species observed and brief description:	N/A
Any future actions needed?	No - other than continued biosecurity procedures for all visitors to island.
Pest/Invasive animals	
Any signs of pest animals? Includes invertebrates like ants, grasshopper, scale insect etc.	Yes
Species observed and brief description:	Ant surveys undertaken: <i>Cardiocondyla atalanta</i> was observed up at 4 sites, <i>Tetramorium lanuginosum</i> at 1 site. Scale and mealybug present at some sites, particularly on <i>Boerhavia albiflora</i> - no attending ants. Both species have been found elsewhere in the CSMP and are not currently of concern. No previous ant surveys have been undertaken on North Islet. Scale found on <i>Boerhavia albiflora</i> . No attending ants.
Any future actions needed? (eg pest monitoring or control work)	Scale and ants warrant further monitoring. Continued biosecurity procedures for all visitors to island.
Human impacts/ threats	
Any evidence of fires?	No

Trampling, digging by humans?	None detected
Marine debris notes:	3 bags of marine debris collected total equating to 15kg. Majority plastic bottles. A fish aggregating device (FAD) and some floats were also collected.
Other	
Infrastructure	
Condition of infrastructure, any work required?	Sign maintenance carried out – sign scrubbed to remove bird faeces, and a waterproof coat was also applied. This will need to be checked and potentially carried out each visit by Parks Australia staff.
Cultural values	
Anything observed, anything new or of concern?	No
Monitoring and collections	
Any other monitoring or surveys undertaken?	Debris removal, testing for signs of Highly Pathogenic Avian Influenza (HPAI) – Guy Weerasinghe (DAFF), health checks and Island Watch carried out by Fiona Hagger (PA), vegetation assessments and weed checks carried out by botanist Joy and assistant Larry Brushe, ant surveys – carried out by Maële Brisset (New Caledonia), reef surveys – led by Andrew Hoey (JCU).
By whom and where is information to be stored?	Parks Australia to retain and be keeper of island data
Areas of island visited	
Sites (locations) or whole island:	Five health check sites were assessed to cover major vegetation species/communities. BioCondition site 20 visited. Most of the island was traversed.

Health checks were undertaken at five sites.

Table 24. Health Check results – Mixed Herb/shrubland on North Islet, Willis Islets.

Site 1 species present: *Stenotaphrum micranthum*, *Boerhavia albiflora*

Site 2 species present: *Boerhavia albiflora*, *Tribulus cistoides*

Site 3 species present: *Boerhavia albiflora*, *Tribulus cistoides*, *Stenotaphrum micranthum*

Site 4 species present: *Boerhavia albiflora*, *Tribulus cistoides*

Site 5 species present: *Lepturus repens*, *Tribulus cistoides*, *Boerhavia albiflora*

Key: **G** = good; **GC** = good with some concerns; **SC** = significant concern; **C** = critical; **NA** = not applicable.

Health Check Indicator	Condition Class					General impression
	Site 1	Site 2	Site 3	Site 4	Site 5	
1. Infestations of ecosystem-changing pest plants	G	G	G	G	G	G
2. Infestations of pest plants other than ecosystem-changers	G	G	G	G	G	G
3. Risk of future invasion by significant pest plants not already present	G	G	G	G	G	G
4. Rainforest invasion	G	G	G	G	G	G
5. Woody thickening (other than by rainforest species)	G	G	G	G	G	G
6. Overgrazing/browsing by feral animals, stray stock or natives	G	G	G	G	G	G
7. Trampling, digging or rooting by animals or trampling by visitors	G	G	G	G	G	G
8. Impacts on wetlands	NA	NA	NA	NA	NA	NA
9. Vehicle impacts	G	G	G	G	G	G
10. Dumping	G	G	G	G	G	G
11. Ground cover	G	G	G	G	G	G

12. Fire damage to fire-sensitive and non-fire-dependent ecosystems	NA	NA	NA	NA	NA	NA
13. Fire damage to fire-adapted peat-based ecosystems	NA	NA	NA	NA	NA	NA
14. Age class distribution in fire-adapted ecosystems in conservation	NA	NA	NA	NA	NA	NA
15. Severe bushfire in fire-adapted wooded ecosystems	NA	NA	NA	NA	NA	NA
16. Severe storm, cyclone or tornado in wooded ecosystems	NA	NA	NA	NA	NA	NA
17. Overtopping, erosion and associated impacts resulting... from...	G	G	G	G	G	G
18. Ecosystem health and dieback	G ¹	GC ²	GC ³	GC ⁴	G ⁵	G
19. Key features for faunal biodiversity in terrestrial ecosystems	G	G	G	G	G	G
20. Recruitment of canopy species	NA	NA	NA	NA	NA	NA
Overall Condition Class						G

¹ Some drying/exposure to the *Stenotaphrum micranthum* in Site 1, though overall in good condition.

² Some dieback of *Boerhavia albiflora* and *T. cistoides* in Site 2, though overall in good condition.

³ Some dieback of *B. albiflora* and *T. cistoides* in Site 3.

⁴ Dieback of *B. albiflora* and *T. cistoides* in Site 4. Likely due to saltwater inundation. Some new growth present (Figure 44).

⁵ Some dieback of *B. albiflora* and *T. cistoides* in Site 2, though overall in good condition and new growth present.



Figure 44. Left: Health check site 4 on North Islet looking north in 2022. Right: Same site in 2025. Note some dieback of *Boerhavia albiflora* and *Tribulus cistoides*, likely due to saltwater inundation.

Fiona Hagger ©

2.4.3 Birds

All stages of sooty tern breeding effort (nests, chicks and young) were in progress during the survey (Figure 45). Young birds roamed freely throughout the island. Adolescents were present and are likely to be progeny from North Islet despite them not being attributed as breeding effort to this survey. The total of over 40,000 pairs (>80,000 adults assuming each nest has two parents) is one of the highest counts for the Coral Sea Islands Territory. The count of >43,000 adolescents and adults at the time of the survey indicates one of the breeding pair was likely out fishing away from the island.

The count of over 25,000 pairs of brown noddies is also significant.

Without drone confirmation, these counts are the best indication of breeding effort from ground counts. Seasons and previous counts are variable, so comparing counts from small, survey sample sizes should be done with caution, and with the understanding that there is not enough data to know what the normal population parameters might be.



Figure 45. Part of the huge sooty tern colony on North Islet, Willis Islets. Andrew McDougall © Queensland Government



Figure 46. One of the crested tern colonies on North Islet, Willis Islets. Andrew McDougall © Queensland Government

Table 25. Bird species and breeding effort on North Islet, Willis Islets.

Key: P= Present, U= Unknown, NR= Not recorded

North Islet, Willis Islets		07/06/2025		Breeding effort and life stages				
common name	scientific name	Nests	Chicks	Young	Breeding pairs	Adolescents and adults		
red-tailed tropicbird	<i>Phaethon rubricauda roseotinctus</i>	0	0	0	0	0		
lesser frigatebird	<i>Fregata ariel</i>	0	0	0	0	0		
great frigatebird	<i>Fregata minor</i>	0	0	0	0	0		
masked booby	<i>Sula dactylatra dactylatra</i>	30	0	0	30	50		
brown booby	<i>Sula leucogaster</i>	1	0	0	1	167		
red-footed booby	<i>Sula sula</i>	0	0	0	0	0		
black noddy	<i>Anous minutus</i>	0	0	0	0	0		
brown noddy	<i>Anous stolidus</i>	27.5K			27.5K	30K+		
bridled tern	<i>Onychoprion anaethetus</i>	0	0	0	0	0		
sooty tern	<i>Onychoprion fuscatus</i>	42.5K			42.5K	43K+		
roseate tern	<i>Sterna dougallii</i>	0	0	0	0	0		
black-naped tern	<i>Sterna sumatrana</i>	0	0	0	0	0		
New Caledonian fairy tern	<i>Sternula nereis exsul</i>	0	0	0	0	0		
crested tern	<i>Thalasseus bergii</i>	24	0	13	37	59		
Herald petrel	<i>Pterodroma heraldica</i>	0	0	0	0	0		
Australian pelican	<i>Pelecanus conspicillatus</i>	0	0	0	0	0		
ruddy turnstone	<i>Arenaria interpres</i>	0	0	0	0	5		
red-necked stint	<i>Calidris ruficollis</i>	0	0	0	0	0		
lesser sand plover	<i>Charadrius mongolus</i>	0	0	0	0	0		
Pacific golden plover	<i>Pluvialis fulva</i>	0	0	0	0	4		
wandering tattler	<i>Tringa incana</i>	0	0	0	0	1		
buff-banded rail	<i>Gallirallus philippensis tounelierii</i>	0	0	0	0	0		
eastern reef egret	<i>Egretta sacra</i>	0	0	0	0	0		
nankeen night-heron	<i>Nycticorax caledonicus</i>	0	0	0	0	0		
purple swampphen	<i>Porphyrio melanotus</i>	0	0	0	0	0		
sacred kingfisher	<i>Todiramphus sanctus</i>	0	0	0	0	0		
welcome swallow	<i>Hirundo neoxena</i>	0	0	0	0	0		

2.4.4 Ant Surveys

Two ant species were recorded: *Cardiocondyla atalanta* was observed at four sites, while the woolly ant (*Tetramorium lanuginosum*) was detected at a single site. Scale bugs and mealybug were present at some sites, particularly on *Boerhavia albiflora* but without attending ants.

2.5 South Islet – Willis Islets

This island was visited on the 7th of June 2025 (4 hours on island).

2.5.1 Vegetation

As in the 2024 visit, the 9 species of weeds recorded previously were still present in and immediately adjacent to the mown operational area. The most abundant weed species in the mown areas were *Dactyloctenium aegyptium* (coast button grass), *Euphorbia prostrata* (red caustic creeper) and *Amaranthus viridus* (green amaranth).

Euphorbia cyathophora (dwarf poinsettia) and *Cenchrus echinatus* (Mossman river grass) were present in large parts of the natural areas. The spatial extent of both has increased compared to their 2023 mapped extents. Native grasses and forbs were also growing in many places where *E. cyathophora* was present within its mapped extent, *C. echinatus* formed dense swathes which excluded native species, as observed in previous visits.

A patch of *Gynandropsis gynandra* (cat's whiskers) was removed from an area of approximately 160m² extending downslope from the mown area boundary behind the diesel tanks as well as several additional isolated plants throughout the natural areas. Coast button grass, green amaranth and red caustic creeper were also removed in small numbers outside the mown area.

The weed *Physalis angulata* (wild gooseberry), was found for the first time on South Islet (Willis) during the June 2025 voyage (see Sections 1.1 & 1.5). Several *P. angulata* were growing adjacent to the North Track, behind the Hogen building, but nowhere else on the cay. This weed is common in Coastal Northern Australia but has never been recorded on cays in the CSMP. Specimens of this new weed record were collected for the collections of the Queensland Herbarium, the National Herbarium and the Australian Tropical Herbarium. Specimens of *Trianthema portulacastrum* (black pigweed) were also collected for incorporation into the herbariums as the previous specimens were unsuitable. In places where weeds were absent, the native cay vegetation was in good condition.

Refer to Section 1.5 for more information on the extent of weeds, weed management undertaken during the 2025 voyage and updates to the ongoing ecological restoration project.

2.5.3 Health Checks

Health Checks were conducted by Joy Brushe to assess the health of Key Values in the following communities.

- Shrublands - *Argusia argentea* (octopus bush), *Cordia subcordata* (sea trumpet) and *Ximenia americana* (yellow plum) shrublands. For South Islet all sites for this value are in *A. argentea* shrublands. There are no *C. subcordata* or *X. americana* shrublands on South Islet.
- Herblands/grasslands/*Abutilon albescens* (lantern bush) shrublands (for South Islet all sites for this value are in grasslands or communities that transition between grassland and herblands. There are no *A. albescens* shrublands on South Islet.

Locations of the Health Check sites are shown in Figure 47. GPS coordinates are contained in Appendix 2.



Figure 47. South Islet (Willis Islets) Health Check and BioCondition monitoring site locations.

Table 26. Health Check results - *Argusia argentea* shrublands on South Islet, Willis Islets.

Key: **G** = good; **GC** = good with some concerns; **SC** = significant concern; **C** = critical; **NA** = not applicable.

Health Check indicator	Condition Class			General Impression
	Site1	Site 2	Site3	
1. Infestations of ecosystem-changing pest plants	G	G	SC	SC
2. Infestations of pest plants other than ecosystem-changers	G	G	GC	SC
3. Risk of future invasion by significant pest plants not already present	SC	SC	SC	SC
4. Rainforest invasion	G	G	G	G
5. Woody thickening (other than by rainforest species)	G	G	G	G
6. Overgrazing/browsing by feral animals, stray stock or natives	G	G	G	G
7. Trampling, digging or rooting by animals or trampling by visitors	G	G	G	G
9. Vehicle impacts	G	G	G	G
10. Dumping	G	G	G	G
11. Ground cover	G	GC	G	G
12. Fire damage to fire-sensitive and non fire-dependent ecosystems	G	G	G	G
16. Severe storm, cyclone or tornado in wooded ecosystems	G	G	G	G
17. Overtopping, erosion and associated impacts resulting from.....	G	GC	G	G
18. Tree/shrub health and dieback	GC	GC	G	GC
19. Key features for faunal biodiversity in terrestrial ecosystems	G	G	G	G
20. Recruitment of canopy species	-	-	-	-
Overall Condition class				SC

The Health Check assessment undertaken for *Argusia argentea* shrublands found *Cenchrus echinatus* (Mossman river grass) is invading some patches of this vegetation community and *Euphorbia cyathophora* (dwarf poinsettia) infestations are in close proximity to other patches. Dieback in some plants and some dead plants are present in Site 1 probably due to over wash or salt water incursion in swales landward of dunes – not a concern in this environment. No recruitment at present. *Argusia* are producing good quantity of seed.

Table 27. Health check condition classes for Key Value = grasslands/herblands on South Islet, Willis Islets.

Site 1 species present: *Sporobolus virginicus*, *Tribulus cistoides*

Site 2 species present: *Sporobolus virginicus*, *Tribulus cistoides* (BioCondition monitoring site M03)

Site 3 species present: *Sporobolus virginicus*, *Tribulus cistoides* (BioCondition monitoring site M01)

Site 4 species present: *Lepturus repens*

Site 5 species present: *Stenotaphrum micranthum*

Site 6 species present: *Sporobolus virginicus*/*Ipomoea pes-caprae* subsp. *brasiliensis* grassland/vineland (BioCondition monitoring site M02 (Site of grey water outlet)).

Key: **G** = good; **GC** = good with some concerns; **SC** = significant concern; **C** = critical; **NA** = not applicable

Health Check indicator	General Impression						General Impression
	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	
1. Infestations of ecosystem-changing pest plants	GC	SC	SC	G	G	SC	SC
2. Infestations of pest plants other than ecosystem-changers	G	GC	G	G	G	G	GC
3. Risk of future invasion by significant pest plants not already present	SC	SC	SC	SC	SC	SC	SC
4. Rainforest invasion	G	G	G	G	G	G	G
5. Woody thickening (other than by rainforest species)	G	G	G	G	G	G	G
6. Overgrazing/browsing by feral animals, stray stock or natives	G	G	G	G	G	G	G
7. Trampling, digging or rooting by animals or trampling by visitors	G	G	G	G	G	G	G
9. Vehicle impacts	G	G	G	G	G	G	G
10. Dumping	G	G	G	G	G	SC	G
11. Ground cover	G	G	G	G	GC	G	G
12. Fire damage to fire-sensitive and non fire-dependent ecosystems	G	G	G	G	G	G	G
16. Severe storm, cyclone or tornado in wooded ecosystems	G	G	G	G	G	G	G
17. Overtopping, erosion and associated impacts resulting from....	G	G	G	G	G	G	G
19. Key features for faunal biodiversity in terrestrial ecosystems	GC	SC	SC	G	G	SC	SC
Overall Condition Class							SC
Notes: Large areas are infested with <i>Cenchrus echinatus</i> (Mossman river grass) and/or <i>Euphorbia cyathophora</i> (dwarf poinsettia). Other weeds have also spread (lower abundance and extent than Mossman river grass and dwarf poinsettia) from the adjoining Operational Area which has 9 weed species. The areas of weed infestation are increasing in extent and reducing available habitat for ground nesting seabirds (particularly sooty tern common noddies, brown booby, wedge-tailed shearwater and crested terns). Site 6 is the site of the grey water outlet (which regularly receives water and nutrient). This site has high levels of metals in the soil – may be a previous dump site. Where no weeds are present, these grassland/herbland communities are in good condition. Low numbers of seabirds nest in the weed infested areas -mainly wedge-tailed shearwater and some brown noddies. Much larger numbers of seabirds (particularly sooty terns and brown noddies) nest in the weed free areas. Sooty terns do not nest in the densely weed infested areas.							

All 2025 health check site photographs taken at South Islet (Willis Islands) and comparative photos for 2023, 2024 and 2025 from each site have been supplied to Parks Australia.

2.5.4 Birds

Due to time limitations, records from South Islet (Willis Islet) was more of an unofficial observation rather than a thorough survey. Of note were the masked boobies on South Islet, a seldom recorded bird here. A small colony of crested terns was observed. Counts are from a distance to avoid disturbance.



Figure 48. brown noddie chick.

Andrew McDougall © Queensland Government

Table 28. Bird species and breeding effort on South Islet, Willis Islets.

Key: P= Present, U= Unknown, NR= Not recorded

South Islet, Willis Islets		12/06/2025		Breeding effort and life stages				
common name	scientific name	Nests	Chicks	Young	Breeding pairs	Adolescents and adults		
red-tailed tropicbird	<i>Phaethon rubricauda roseotinctus</i>	0	0	0	0	0		
lesser frigatebird	<i>Fregata ariel</i>	0	0	0	0	0		
great frigatebird	<i>Fregata minor</i>	0	0	0	0	2		
masked booby	<i>Sula dactylatra dactylatra</i>	2	0	0	2	2		
brown booby	<i>Sula leucogaster</i>	P	0	0	P	P		
red-footed booby	<i>Sula sula</i>	P	P	P	P	P		
black noddy	<i>Anous minutus</i>	P	0	0	P	P		
brown noddy	<i>Anous stolidus</i>	P	P	P	P	P		
bridled tern	<i>Onychoprion anaethetus</i>	0	0	0	0	0		
sooty tern	<i>Onychoprion fuscatus</i>	P	0	0	P	P		
roseate tern	<i>Sterna dougallii</i>	0	0	0	0	0		
black-naped tern	<i>Sterna sumatrana</i>	0	0	0	0	3		
New Caledonian fairy tern	<i>Sternula nereis exsul</i>	0	0	0	0	0		
crested tern	<i>Thalasseus bergii</i>	9	0	9	18	36		
Herald petrel	<i>Pterodroma heraldica</i>	0	0	0	0	0		
Australian pelican	<i>Pelecanus conspicillatus</i>	0	0	0	0	0		
ruddy turnstone	<i>Arenaria interpres</i>	0	0	0	0	6		
red-necked stint	<i>Calidris ruficollis</i>	0	0	0	0	0		
lesser sand plover	<i>Charadrius mongolus</i>	0	0	0	0	0		
Pacific golden plover	<i>Pluvialis fulva</i>	0	0	0	0	2		
wandering tattler	<i>Tringa incana</i>	0	0	0	0	0		
buff-banded rail	<i>Gallirallus philippensis tounelierii</i>	0	0	0	0	P		
eastern reef egret	<i>Egretta sacra</i>	0	0	0	0	0		
nankeen night-heron	<i>Nycticorax caledonicus</i>	0	0	0	0	0		
purple swamphen	<i>Porphyrio melanotus</i>	0	0	0	0	0		
sacred kingfisher	<i>Todiramphus sanctus</i>	0	0	0	0	0		
welcome swallow	<i>Hirundo neoxena</i>	0	0	0	0	P		

2.5.5 Ant Surveys

Ant surveys were not conducted.

2.6 South West Cay – Lihou Reef

Island visited on the 8th June 2025 (3.5 hours on island).

2.6.1 Vegetation

Table 29. Vegetation species found on South West Cay (Lihou) on the June 2025 voyage.

Scientific name/community	Common name
<i>Abutilon albescens</i>	lantern bush
<i>Achyranthes aspera</i>	chaff flower
<i>Boerhavia albiflora</i> var. <i>albiflora</i>	tar vine
<i>Lepturus repens</i>	stalky grass
<i>Portulaca oleracea</i>	pig weed
<i>Stenotaphrum micranthum</i>	beach buffalo grass
<i>Tribulus cistoides</i>	bull's head burr

As was the case in the previous visit (2021), scale was present on *Achyranthes aspera* (chaff flower), though no attending ants were found. It was present in patches of senescing and dying plants. Most healthy *A. aspera* in the vicinity were free of the scale (Figure 49). It is not clear whether the scale was causing the decline of the infested plants or whether the scale was attacking plants that were naturally senescing or dying from some other cause. The scale did not extend onto surrounding healthy vegetation.



Figures 49. scale present on *Achyranthes aspera*, South West Cay, Lihou.

Fiona Hagger ©

In comparison to the last visit in 2021, *Abutilon albescens* was in higher abundance across the island. This was particularly obvious at Health Check sites 2 (previously site 48) and 9 (previously site 55) (Figure 50).

Overall, the condition of vegetation on South West Cay was good, and no weeds were detected.



Figures 50. Health check site 9 (previously site 55), left in 2021, was a mixed community of *Achyranthes aspera* and *Abutilon albescens*. In 2025, right, the area was dense *A. albescens* shrubland facing north and east. Fiona Hagger ©

2.6.2 Island Watch/Health Checks

A Parks Australia Island Watch summary proforma for South West Cay (Lihou Reef) was completed by Fiona Hagger (Table 30).

Table 30. June 2025 Island Watch summary for South West Cay, Lihou Reef.

Island Watch category South West Cay (Lihou)	
Key Natural Value Assessments	
Birds	
Formal bird survey by A. McDougall?	Yes
Any new or unusual sightings, or any changes to condition of nesting/roosting habitat?	No
Island Geomorphology	
Significant island changes?	No
Severe storm/cyclone damage?	No
Turtles	
Turtles seen on island?	No live turtles (outside common breeding season)
Number of nests/body pits:	Not counted due to time constraints
Any new or unusual sightings, or any changes to the condition of nesting habitat?	No
Native vegetation	
Condition of key veg value: herb/grassland/abutilon	Good
Anything else of interest, and changes or concerns? Eg dieback, drought – all veg communities	No, aside from scale mentioned below.
Threats	
Weeds	
Does the island appear weed free?	No weeds detected.
Species observed and brief description.	N/A
Any future actions needed?	No - other than continued biosecurity procedures for all visitors to island.

Pest/Invasive animals	
Any signs of pest animals? Includes invertebrates like ants, grasshopper, scale insect etc.	Ant surveys: Of the six sites surveyed, only two sites had attending ants: <i>Cardiocondyla atalanta</i> . Soft scale insect present on some <i>Achyranthes aspera</i> .
Species observed and brief description.	<i>Cardiocondyla atalanta</i> were present in 2021 and is native to Australia though at some point would have been introduced to the Coral Sea islands. Currently not of concern. Scale was found at the last visit by Parks Australia in 2021. No attending ants, and compared with the 2021 observation does not appear to be spreading across the island.
Any future actions needed? (eg pest monitoring or control work)	Continued monitoring recommended, and continued biosecurity procedures for all visitors to island.
Human impacts/ threats	
Any evidence of fires?	No
Trampling, digging by humans	None detected
Marine debris notes	1 bag of marine debris collected, total equating to 6kg. Majority plastic bottles.
Other	
Infrastructure	
Condition of infrastructure, any work required?	Sign maintenance carried out – sign scrubbed to remove bird faeces, and a waterproof coat was also applied. This will need to be checked and potentially carried out each visit by Parks Australia staff.
Cultural values	
Anything observed, anything new or of concern?	No
Monitoring and collections	
Any other monitoring or surveys undertaken?	Debris removal, testing for signs of Highly Pathogenic Avian Influenza (HPAI) – Guy Weerasinghe (DAFF), health checks and Island Watch carried out by Fiona Hagger (PA), ant surveys – carried out by Maële Brisset (New Caledonia).
By whom and where is information to be stored?	Parks Australia to retain and be keeper of island data, JCU to store reef survey data
Areas of island visited	
Sites (locations) or whole island:	Twelve health check sites were assessed to cover major vegetation communities. The whole island was traversed.

Health checks were undertaken at 12 sites.

Table 31. Health check results – Mixed Herb/shrubland on South West Cay (Lihou Reef).

Site 1 (previously site 47) species present: *Lepturus repens*, *Stenotaphrum micranthum*, *Boerhavia albiflora*, *Portulaca oleracea*

Site 2 (previously site 48) species present: *Abutilon albescens*, *Achyranthes aspera*, *Boerhavia albiflora*, *Lepturus repens*

Site 3 (previously site 49) species present: *Lepturus repens*, *Achyranthes aspera*, *Boerhavia albiflora*, *Tribulus cistoides*

Site 4 (previously site 50) species present: *Boerhavia albiflora*, *Tribulus cistoides*, *Achyranthes aspera*, *Lepturus repens*

Site 5 (previously site 51) species present: *Lepturus repens*, *Achyranthes aspera*, *Boerhavia albiflora*, *Portulaca oleracea*, *Abutilon albescens*

Site 6 (previously site 52) species present: *Boerhavia albiflora*, *Achyranthes aspera*, *Portulaca oleracea*, *Abutilon albescens*

Site 7 (previously site 53) species present: *Boerhavia albiflora*, *Portulaca oleracea*, *Lepturus repens*

Site 9 (previously site 55) species present: *Achyranthes aspera*, *Lepturus repens*, *Abutilon albescens*

Site 11 (previously site 57) species present: *Achyranthes aspera*, *Lepturus repens*, *Tribulus cistoides*, *Portulaca oleracea*

Site 12 (previously site 58) species present: *Achyranthes aspera*, *Lepturus repens*

Key: **G** = good; **GC** = good with some concerns; **SC** = significant concern; **C** = critical; **NA** = not applicable.

Health Check Indicator	Condition Class										General impression
	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7	Site 9	Site 11	Site 12	
1. Infestations of ecosystem-changing pest plants	G	G	G	G	G	G	G	G	G	G	G
2. Infestations of pest plants other than ecosystem-changers	G	G	G	G	G	G	G	G	G	G	G
3. Risk of future invasion by significant pest plants not already present	G	G	G	G	G	G	G	G	G	G	G
4. Rainforest invasion	G	G	G	G	G	G	G	G	G	G	G
5. Woody thickening (other than by rainforest species)	G	G	G	G	G	G	G	G	G	G	G
6. Overgrazing/browsing by feral animals, stray stock or natives	G	G	G	G	G	G	G	G	G	G	G
7. Trampling, digging or rooting by animals or trampling by visitors	G	G	G	G	G	G	G	G	G	G	G
8. Impacts on wetlands	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
9. Vehicle impacts	G	G	G	G	G	G	G	G	G	G	G
10. Dumping	G	G	G	G	G	G	G	G	G	G	G
11. Ground cover	G	G	G	G	G	G	G	G	G	G	G
12. Fire damage to fire-sensitive and non fire-dependent ecosystems	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
13. Fire damage to fire-adapted peat-based ecosystems	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
14. Age class distribution in fire-adapted ecosystems in conservation	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
15. Severe bushfire in fire-adapted wooded ecosystems	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
16. Severe storm, cyclone or tornado in wooded ecosystems	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
17. Overtopping, erosion and associated impacts resulting... from...	G	G	G	G	G	G	G	G	G	G	G
18. Ecosystem health and dieback	G	G	G	G	G	G	G	G	G	G	G
19. Key features for faunal biodiversity in terrestrial ecosystems	G	G	G	G	G	G	G	G	G	G	G
20. Recruitment of canopy species	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Overall Condition Class											G

2.6.3 Birds

Only lesser frigatebirds were observed breeding on this island (Figure 50). Most islands offering a range of vegetation types will host both great frigatebirds and lesser frigatebirds. There are a small number of cays that have single species breeding, usually lesser frigatebirds favouring islands with no shrub or tree layer.

Small numbers of migratory shorebirds were recorded across many of the islands during this voyage. Pacific golden plover, wandering tattler and ruddy turnstone are the most recorded species.



Figure 51. Lesser frigatebird (female).

Andrew McDougall © Queensland Government

Table 32. Bird species and breeding effort on South West Cay, Lihou Reef.

Key: P= Present, U= Unknown, NR= Not recorded

South West Cay, Lihou Atoll		08/06/2025		Breeding effort and life stages				
common name	scientific name	Nests	Chicks	Young	Breeding pairs	Adolescents and adults		
red-tailed tropicbird	<i>Phaethon rubricauda roseotinctus</i>	0	0	0	0	0		
lesser frigatebird	<i>Fregata ariel</i>	845		0	845	875		
great frigatebird	<i>Fregata minor</i>	0	0	0	0	0		
masked booby	<i>Sula dactylatra dactylatra</i>	21	0	0	21	47		
brown booby	<i>Sula leucogaster</i>	3	0	0	3	159		
red-footed booby	<i>Sula sula</i>	0	0	0	0	0		
black noddy	<i>Anous minutus</i>	0	0	0	0	0		
brown noddy	<i>Anous stolidus</i>	P			P	P		
bridled tern	<i>Onychoprion anaethetus</i>	0	0	0	0	0		
sooty tern	<i>Onychoprion fuscatus</i>	1330	0	0	1330	1880		
roseate tern	<i>Sterna dougallii</i>	0	0	0	0	0		
black-naped tern	<i>Sterna sumatrana</i>	0	0	0	0	0		
New Caledonian fairy tern	<i>Sternula nereis exsul</i>	0	0	0	0	0		
crested tern	<i>Thalasseus bergii</i>	0	0	0	0	2		
Herald petrel	<i>Pterodroma heraldica</i>	0	0	0	0	0		
Australian pelican	<i>Pelecanus conspicillatus</i>	0	0	0	0	0		
ruddy turnstone	<i>Arenaria interpres</i>	0	0	0	0	0		
red-necked stint	<i>Calidris ruficollis</i>	0	0	0	0	0		
lesser sand plover	<i>Charadrius mongolus</i>	0	0	0	0	0		
Pacific golden plover	<i>Pluvialis fulva</i>	0	0	0	0	P		
wandering tattler	<i>Tringa incana</i>	0	0	0	0	0		
buff-banded rail	<i>Gallirallus philippensis tounelieri</i>	0	0	0	0	P		
eastern reef egret	<i>Egretta sacra</i>	0	0	0	0	0		
nankeen night-heron	<i>Nycticorax caledonicus</i>	0	0	0	0	0		
purple swamphen	<i>Porphyrio melanotus</i>	0	0	0	0	0		
sacred kingfisher	<i>Todiramphus sanctus</i>	0	0	0	0	0		
welcome swallow	<i>Hirundo neoxena</i>	0	0	0	0	0		

2.6.4 Ant Surveys

One ant species was recorded - *Cardiocondyla atalanta*, this species was also present in 2021. Scale was found at the last visit by Parks Australia in 2021 without attending ants, and was largely unchanged in June 2025.

2.7 Georgina Cay – Lihou Reef

Island visited on the 8th of June 2025 (4 hours on island).

2.7.1 Vegetation

Table 33. Vegetation species found on Georgina Cay (Lihou Reef) on the June 2025 voyage.

Scientific name/community	Common name
<i>Abutilon albescens</i>	lantern bush
<i>Achyranthes aspera</i>	chaff flower
<i>Boerhavia albiflora</i> var. <i>albiflora</i>	tar vine
<i>Lepturus repens</i>	stalky grass
<i>Portulaca oleracea</i>	pig weed
<i>Stenotaphrum micranthum</i>	beach buffalo grass

On the whole, the vegetation was in good health at the time of the visit. No weeds were detected.

An *Abutilon albescens* community on the southern side of the island around Health check site 1 had some dieback, however new growth was present (Figure 52).

In the west/south-west part of the Cay, the plant communities feature a greater extent of *Lepturus repens* (stalky grass) that was previously recorded at Health Check sites 3 (previously site 62) and 4 (previously site 63) in 2021, and less *Achyranthes aspera* (chaff flower) (Figure 53).



Figure 52. Dieback of *Abutilon albescens* at site 1. Fiona Hagger ©



Figures 53. Left: Facing west at Health Check site 4 (previously site 65) on Georgina Cay, the vegetation composition in 2021 was largely dominated by *A. aspera*, with some *A. albescens* and a very small amount of *L. repens*. Right: On the 2025 visit the same site was mixed *A. aspera* and *L. repens* dominated community, with some *A. albescens* dieback in the background. Fiona Hagger ©

2.7.2 Island Watch/Health Checks

A Parks Australia Island Watch summary proforma for Georgina Cay (Lihou Reef) was completed by Fiona Hagger (Table 34).

Table 34. June 2025 Island Watch summary for Georgina Cay, Lihou Reef.

Island Watch category Georgina Cay (Lihou)	
Key Natural Value Assessments	
Birds	
Formal bird survey by A. McDougall?	Yes
Any new or unusual sightings, or any changes to condition of nesting/roosting habitat?	No
Island Geomorphology	
Significant island changes?	No
Severe storm/cyclone damage?	No
Turtles	
Turtles seen on island?	No
Number of nests/body pits:	Not counted due to time constraints
Any new or unusual sightings, or any changes to the condition of nesting habitat?	No
Native vegetation	
Condition of key veg value: herb/grassland/abutilon:	Good
Anything else of interest, and changes or concerns? Eg dieback, drought – all veg communities	Some dieback of <i>Abutilon albescens</i> at Health Check site 1, new growth present. Some drying of the <i>Stenotaphrum micranthum</i> at Health Check site 1 and dieback at site 2.
Threats	
Weeds	
Does the island appear weed free?	No weeds detected.
Species observed and brief description.	N/A
Any future actions needed?	No - other than continued biosecurity procedures for all visitors to island.
Pest/Invasive animals	
Any signs of pest animals? Includes invertebrates like ants, grasshopper, scale insect etc.	Ant surveys: <i>Cardiocondyla atalanta</i> picked up at one survey location. Currently not a species of concern.
Species observed and brief description.	N/A
Any future actions needed? (eg pest monitoring or control work)	Continued ant surveys and monitoring of other natural values. Continued biosecurity procedures for all visitors to island.
Human impacts/ threats	
Any evidence of fires?	No
Trampling, digging by humans	None detected
Marine debris notes	2 bags of marine debris collected, total equating to 30kg.
Other	
Infrastructure	
Condition of infrastructure, any work required?	Sign maintenance carried out – sign scrubbed to remove bird faeces, and a waterproof coat was also applied. This will need to be checked and potentially carried out each visit by Parks Australia staff.

Cultural values	
Anything observed, anything new or of concern?	The collection of rock slabs and clam shells which signifies some kind of historic site is still in sound condition.
Monitoring and collections	
Any other monitoring or surveys undertaken	Debris removal, testing for signs of Highly Pathogenic Avian Influenza (HPAI) – Guy Weerasinghe (DAFF), Health Checks, Island Watch, vegetation and weed checks carried out by Fiona Hagger (PA), ant surveys – carried out by Maële Brisset (New Caledonia), reef surveys – led by Andrew Hoey (JCU).
By whom and where is information to be stored?	Parks Australia to retain and be keeper of island data, JCU to store reef survey data.
Areas of island visited	
Sites (locations) or whole island	Seven health check sites were assessed to cover major vegetation communities. Most of the island was traversed. cover major vegetation communities. Most of the island was traversed.

Health checks were undertaken at seven sites.

Table 35. Health check results – Mixed Herb/shrubland on Georgina Cay (Lihou Reef)

Site 1 (previously site 60) species present: *Stenotaphrum micranthum*, *Boerhavia albiflora*, *Abutilon albescens*

Site 2 (previously site 61) species present: *Abutilon albescens*, *Achyranthes aspera*, *Boerhavia albiflora*, *Stenotaphrum micranthum*

Site 3 (previously site 62) species present: *Boerhavia albiflora*, *Stenotaphrum micranthum*

Site 4 (previously site 65) species present: *Boerhavia albiflora*, *Lepturus repens*; *Stenotaphrum micranthum*, *Portulaca oleracea*, *Abutilon albescens*

Site 5 (previously site 59) species present: *Lepturus repens*, *Achyranthes aspera*, *Boerhavia albiflora*, *Portulaca oleracea*, *Abutilon albescens*, *Stenotaphrum micranthum*

Site 6 (previously site 63) species present: *Boerhavia albiflora*, *Stenotaphrum micranthum*

Site 7 (previously site 64) species present: *Boerhavia albiflora*, *Stenotaphrum micranthum*

Key: **G** = good; **GC** = good with some concerns; **SC** = significant concern; **C** = critical; **NA** = not applicable.

Health Check Indicator	Condition Class							General impression
	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7	
1. Infestations of ecosystem-changing pest plants	G	G	G	G	G	G	G	G
2. Infestations of pest plants other than ecosystem-changers	G	G	G	G	G	G	G	G
3. Risk of future invasion by significant pest plants not already present	G	G	G	G	G	G	G	G
4. Rainforest invasion	G	G	G	G	G	G	G	G
5. Woody thickening (other than by rainforest species)	G	G	G	G	G	G	G	G
6. Overgrazing/browsing by feral animals, stray stock or natives	G	G	G	G	G	G	G	G
7. Trampling, digging or rooting by animals or trampling by visitors	G	G	G	G	G	G	G	G
8. Impacts on wetlands	NA	NA	NA	NA	NA	NA	NA	NA
9. Vehicle impacts	G	G	G	G	G	G	G	G
10. Dumping	G	G	G	G	G	G	G	G
11. Ground cover	G	G	G	G	G	G	G	G
12. Fire damage to fire-sensitive and non fire-dependent ecosystems	NA	NA	NA	NA	NA	NA	NA	NA

13. Fire damage to fire-adapted peat-based ecosystems	NA	NA	NA	NA	NA	NA	NA	NA
14. Age class distribution in fire-adapted ecosystems in conservation	NA	NA	NA	NA	NA	NA	NA	NA
15. Severe bushfire in fire-adapted wooded ecosystems	NA	NA	NA	NA	NA	NA	NA	NA
16. Severe storm, cyclone or tornado in wooded ecosystems	NA	NA	NA	NA	NA	NA	NA	NA
17. Overtopping, erosion and associated impacts resulting... from...	G	G	G	G	G	G	G	G
18. Ecosystem health and dieback	G ¹	G ²	G	G	G	G	G	G
19. Key features for faunal biodiversity in terrestrial ecosystems	G	G	G	G	G	G	G	G
20. Recruitment of canopy species	NA	NA	NA	NA	NA	NA	NA	NA
Overall Condition Class								G

¹ Some dieback of the *Abutilon albescens*, new growth present. Some drying of the *Stenotaphrum micranthum*, perhaps due to exposure.

² Some dieback of *S. micranthum* at this site. Healthy *S. micranthum* communities surrounding site.

2.7.3 Birds

Georgina Cay was split into a smaller, unvegetated western section and a vegetated eastern section. The fairy terns were only found after I crossed the low tide beach rock area to gain access to the far western shoreline. Four bonded pairs were observed. No scrapes or eggs were located during the survey time. The adults were in full breeding plumage indicating nesting was current or imminent (Figure 54).

An Australian pelican (Figure 55) was observed. A single bird was observed in July 2021 and on adjacent islands in November 2024.

Despite the seemingly abundant birdlife, not a lot of breeding was observed during this survey. No active sooty tern nests were located.



Figure 54. "New Caledonian" fairy tern in breeding plumage, Georgina Cay. Andrew McDougall © Queensland Government



Figure 55. Australian pelican, Georgina Cay.

Andrew McDougall © Queensland Government

Table 36. Bird species and breeding effort on Georgina Cay, Lihou Reef.

Key: P= Present, U= Unknown, NR= Not recorded

Georgina Cay, Lihou Atoll 08/06/2025		Breeding effort and life stages				
common name	scientific name	Nests	Chicks	Young	Breeding pairs	Adolescents and adults
red-tailed tropicbird	<i>Phaethon rubricauda roseotinctus</i>	0	0	0	0	0
lesser frigatebird	<i>Fregata ariel</i>	0	0	0	0	0
great frigatebird	<i>Fregata minor</i>	0	0	0	0	0
masked booby	<i>Sula dactylatra dactylatra</i>	24	0	0	24	37
brown booby	<i>Sula leucogaster</i>	5	0	0	5	140
red-footed booby	<i>Sula sula</i>	2	0	0	2	5
black noddy	<i>Anous minutus</i>	0	0	0	0	P
brown noddy	<i>Anous stolidus</i>	P	P	P	P	780
bridled tern	<i>Onychoprion anaethetus</i>	0	0	0	0	0
sooty tern	<i>Onychoprion fuscatus</i>	0	0	0	0	110
roseate tern	<i>Sterna dougallii</i>	0	0	0	0	0
black-naped tern	<i>Sterna sumatrana</i>	0	0	0	0	135
New Caledonian fairy tern	<i>Sternula nereis exsul</i>	4*	0	0	4	8
crested tern	<i>Thalasseus bergii</i>	0	0	0	0	8
Herald petrel	<i>Pterodroma heraldica</i>	0	0	0	0	0
Australian pelican	<i>Pelecanus conspicillatus</i>	0	0	0	0	1
ruddy turnstone	<i>Arenaria interpres</i>	0	0	0	0	3
red-necked stint	<i>Calidris ruficollis</i>	0	0	0	0	0
lesser sand plover	<i>Charadrius mongolus</i>	0	0	0	0	0
Pacific golden plover	<i>Pluvialis fulva</i>	0	0	0	0	0
wandering tattler	<i>Tringa incana</i>	0	0	0	0	0
buff-banded rail	<i>Gallirallus philippensis tounelieri</i>	0	0	0	0	0
eastern reef egret	<i>Egretta sacra</i>	0	0	0	0	0
nankeen night-heron	<i>Nycticorax caledonicus</i>	0	0	0	0	0
purple swamphen	<i>Porphyrio melanotus</i>	0	0	0	0	0
sacred kingfisher	<i>Todiramphus sanctus</i>	0	0	0	0	0
welcome swallow	<i>Hirundo neoxena</i>	0	0	0	0	0

2.7.4 Ant Surveys

One ant species, *Cardiocondyla atalanta* recorded at one survey location.

2.8 Dianna Cay – Lihou Reef

Island visited on 9th June 2025 (4 hours on island).

Dianna Cay is an unvegetated sand cay, with an extensive beach rock platform along the south side of the cay.

There was limited time available on the cay and focus was on finding and assessing potential nesting habitat for New Caledonian fairy terns. To minimise disturbance to the terns, which were present in the north-eastern part of the cay, assessments were restricted to Health Check Site 1, located in the far south-western corner.

Fresh turtle tracks, approximately 1-2 weeks old, were found close to Health Check site 1 (Figure 56).



Figure 56. Fresh turtle tracks on Dianna Cay, near site 1.

Fiona Hagger © (left) and Guy Weerasinghe © (right).

2.8.1 Island Watch/Health Checks

A Parks Australia Island Watch summary proforma for Dianna Cay (Lihou Reef) was completed by Fiona Hagger (Table 37).

Table 37. June 2025 Island Watch summary for Dianna Cay, Lihou Reef.

Island Watch category	
Dianna Cay (Lihou)	
Key Natural Value Assessments	
Birds	
Formal bird survey by A. McDougall?	Yes
Any new or unusual sightings, or any changes to condition of nesting/roosting habitat?	No
Island Geomorphology	
Significant island changes?	No
Severe storm/cyclone damage?	No
Turtles	
Turtles seen on island?	No
Number of nests/body pits:	Not counted due to time constraints

Any new or unusual sightings, or any changes to the condition of nesting habitat?	Fresh tracks on the south-eastern part of the Cay, approximately 1-2 weeks old.
Native vegetation	
Condition of key veg value: herb/grassland/abutilon	N/A – unvegetated cay
Anything else of interest, and changes or concerns? Eg dieback, drought – all veg communities	N/A – unvegetated cay
Threats	
Weeds	
Does the island appear weed free?	No weeds detected.
Species observed and brief description:	N/A
Any future actions needed?	No - other than continued biosecurity procedures for all visitors to island.
Pest/Invasive animals	
Any signs of pest animals? Includes invertebrates like ants, grasshopper, scale insect	No ants observed during ant survey.
Species observed and brief description.	N/A
Any future actions needed? (eg pest monitoring or control work)	Continued ant surveys and monitoring of other natural values. Continued biosecurity procedures for all visitors to island.
Human impacts/ threats	
Any evidence of fires?	No
Trampling, digging by humans	None detected
Marine debris notes	2 bags of marine debris collected, total equating to 10kg.
Other	
Infrastructure	
Condition of infrastructure, any work required?	N/A
Cultural values	
Anything observed, anything new or of concern?	No
Monitoring and collections	
Any other monitoring or surveys undertaken	Debris removal, testing for signs of Highly Pathogenic Avian Influenza (HPAI) – Guy Weerasinghe (DAFF), Health Checks, carried out by Fiona Hagger (PA), ant surveys – carried out by Maële Brisset (New Caledonia).
By whom and where is information to be stored?	Parks Australia to retain and be keeper of island data.
Areas of island visited	
Sites (locations) or whole island	One health check site (turtle nesting habitat) was assessed. Most of the island was traversed.

Health checks were undertaken at one site.

Table 38. Health check results – Turtle nesting area, Dianna Cay (Lihou Reef)

Key: **G** = good; **GC** = good with some concerns; **SC** = significant concern; **C** = critical; **NA** = not applicable.

Health Check Indicator	Condition Class	General impression
	Site 1	
1. Infestations of ecosystem-changing pest plants	G	G
2. Infestations of pest plants other than ecosystem-changers	G	G
3. Risk of future invasion by significant pest plants not already present	G	G
4. Rainforest invasion	G	G

5. Woody thickening (other than by rainforest species)	G	G
6. Overgrazing/browsing by feral animals, stray stock or natives	G	G
7. Trampling, digging or rooting by animals or trampling by visitors	G	G
8. Impacts on wetlands	NA	NA
9. Vehicle impacts	G	G
10. Dumping	G	G
11. Ground cover	NA	NA
12. Fire damage to fire-sensitive and non fire-dependent ecosystems	NA	NA
13. Fire damage to fire-adapted peat-based ecosystems	NA	NA
14. Age class distribution in fire-adapted ecosystems in conservation	NA	NA
15. Severe bushfire in fire-adapted wooded ecosystems	NA	NA
16. Severe storm, cyclone or tornado in wooded ecosystems	NA	NA
17. Overtopping, erosion and associated impacts resulting... from...	G	G
18. Ecosystem health and dieback	G	G
19. Key features for faunal biodiversity in terrestrial ecosystems	G	G
20. Recruitment of canopy species	NA	NA
Overall condition		G



Figure 57. Andrew McDougall (QPWS) and Martin Russell (PA) in the foreground, Fiona Hagger (PA) and Maele Brisset (New Caledonia Government) in the background on Dianna Cay. The white bags are used to collect marine debris.
Guy Weerasinghe ©

2.8.2 Birds

This is a new breeding location for the New Caledonian fairy tern (Figure 58). The cays of the Lihou atoll appear to be the stronghold for the overall Coral Sea Islands Territory population. Specific nesting locations are variable across years, as is the timing of nesting. The timing of nesting across locations within a single season also seems variable.

The preferred nesting substrate on Dianna Cay was predominantly weather-worn coral and shell fragments, larger in size to the finer “sand” composition used on Georgina Cay in 2024 (Director of National Park 2025). The first nesting record on Georgina Cay in 2021 included nests in substrate similar to that on Dianna Cay.

Adult birds favoured the same area of island to “roost” and it wasn’t until a single bird sat on a nest scrape that the scrapes and eggs were discovered. These unobtrusive and well camouflaged nests are a reason to protect known breeding locations during likely breeding months.

The crested tern breeding record comprised a creche of 18 chicks and young. For the purposes of this survey, it was deemed one chick/young represented one breeding pair, which is the common clutch size for crested terns.



Figure 58. New Caledonian fairy tern colony, Dianna Cay, Lihou Reef.
Andrew McDougall © Queensland Government



Figure 59. Size comparison of black-naped tern (larger) and New Caledonia fairy tern.
Andrew McDougall © Queensland Government



Figure 60. New Caledonian fairy tern egg in situ at nest. This photo was taken at a distance with a 600mm lens. Andrew McDougall © Queensland Government.

Table 39. Bird species and breeding effort on Dianna Cay, Lihou Reef.

Key: P= Present, U= Unknown, NR= Not recorded

Dianna Cay, Lihou Atoll		09/06/2025		Breeding effort and life stages				
common name	scientific name	Nests	Chicks	Young	Breeding pairs	Adolescents and adults		
red-tailed tropicbird	<i>Phaethon rubricauda roseotinctus</i>	0	0	0	0	0		
lesser frigatebird	<i>Fregata ariel</i>	0	0	0	0	0		
great frigatebird	<i>Fregata minor</i>	0	0	0	0	0		
masked booby	<i>Sula dactylatra dactylatra</i>	0	0	0	0	0		
brown booby	<i>Sula leucogaster</i>	0	0	0	0	30		
red-footed booby	<i>Sula sula</i>	0	0	0	0	0		
black noddy	<i>Anous minutus</i>	0	0	0	0	23		
brown noddy	<i>Anous stolidus</i>	0	0	0	0	73		
bridled tern	<i>Onychoprion anaethetus</i>	0	0	0	0	0		
sooty tern	<i>Onychoprion fuscatus</i>	0	0	0	0	0		
roseate tern	<i>Sterna dougallii</i>	0	0	0	0	0		
black-naped tern	<i>Sterna sumatrana</i>	0	0	0	0	70		
New Caledonian fairy tern	<i>Sternula nereis exsul</i>	20	0	0	20	34		
crested tern	<i>Thalasseus bergii</i>	0	18		18	7		
Herald petrel	<i>Pterodroma heraldica</i>	0	0	0	0	0		
Australian pelican	<i>Pelecanus conspicillatus</i>	0	0	0	0	0		
ruddy turnstone	<i>Arenaria interpres</i>	0	0	0	0	8		
red-necked stint	<i>Calidris ruficollis</i>	0	0	0	0	0		
lesser sand plover	<i>Charadrius mongolus</i>	0	0	0	0	0		
Pacific golden plover	<i>Pluvialis fulva</i>	0	0	0	0	2		
wandering tattler	<i>Tringa incana</i>	0	0	0	0	0		
buff-banded rail	<i>Gallirallus philippensis tounelierii</i>	0	0	0	0	0		
eastern reef egret	<i>Egretta sacra</i>	0	0	0	0	0		
nankeen night-heron	<i>Nycticorax caledonicus</i>	0	0	0	0	0		
purple swamphen	<i>Porphyrio melanotus</i>	0	0	0	0	0		
sacred kingfisher	<i>Todiramphus sanctus</i>	0	0	0	0	0		
welcome swallow	<i>Hirundo neoxena</i>	0	0	0	0	0		

2.8.3 Ant Surveys

No ant species recorded.

2.9 Hermit Crab Islet – Lihou Reef

Island visited on the 9th June 2025 (4 hours on island).

2.9.1 Vegetation

Table 40. Vegetation species found on Hermit Crab Islet on the June 2025 voyage.

Scientific name/community	Common name
<i>Abutilon albescens</i>	lantern bush
<i>Achyranthes aspera</i>	chaff flower
<i>Boerhavia albiflora</i> var. <i>albiflora</i>	tar vine
<i>Lepturus repens</i>	stalky grass
<i>Portulaca oleracea</i>	pig weed
<i>Stenotaphrum micranthum</i>	beach buffalo grass
<i>Tribulus cistoides</i>	bull's head burr

The vegetation on Hermit Crab Islet was generally in good condition at the time of visiting. No weeds were detected.

As was the case at the time of the last assessment on the 19 July 2021, scale insects were present on dead and senescing patches of *Achyranthes aspera* (chaff flower). Like the scale patches on South West Cay (Lihou Reef), it is not clear whether the scale was causing the decline of the infested plants or whether the scale was attacking plants that were naturally senescing or dying from some other cause (Figure 61). The scale did not extend onto surrounding healthy vegetation.



Figure 61. Evidence of scale on dead *Achyranthes aspera*, Hermit Crab Islet.

Fiona Hagger ©

BioCondition Monitoring site M10, established on the 2021 visit, was at the time a closed herbland dominated by *A. aspera*. In 2025, a visit to site M10 revealed an increase in *A. albescens*, and the site at the time of visit was a mixed shrubland/herbland of *A. albescens* and *A. aspera* (Figure 62).



Figures 62. BioCondition Monitoring site M10 on Hermit Crab Islet in 2021 (left) and in 2025 (right), facing west. The community composition at the time of the 2025 visit included more *A. albescens*. Fiona Hagger ©

BioCondition Monitoring site M11, when established in 2021, was a closed grassland dominated by *Lepturus repens* and *Achyranthes aspera*. At the time of visit in 2025, the vegetation community at site M11 was largely dominated by *A. aspera*, with less *L. repens* present (Figure 63).



Figures 63. BioCondition Monitoring site M11 on Hermit Crab Islet in 2021 (left) and in 2025 (right), facing west. The community composition at the time of the 2025 visit included more *A. aspera* and less *L. repens*. Fiona Hagger ©

2.9.2 Island Watch/Health Checks

A Parks Australia Island Watch summary proforma for Hermit Crab Islet (Lihou Reef) was completed by Fiona Hagger (Table 41).

Table 41. June 2025 Island Watch summary for Hermit Crab Islet, Lihou Reef.

Island Watch category Hermit Crab Islet (Lihou)	
Key Natural Value Assessments	
Birds	
Formal bird survey by A. McDougall?	Yes
Any new or unusual sightings, or any changes to condition of nesting/roosting habitat?	No
Island Geomorphology	
Significant island changes	No
Severe storm/cyclone damage?	No
Turtles	
Turtles seen on island	No
Number of nests/body pits	Not counted due to time constraints
Any new or unusual sightings, or any changes to the condition of nesting habitat?	No
Native vegetation	
Condition of key veg value: herb/grassland/abutilon	Good

Anything else of interest, and changes or concerns? Eg dieback, drought – all veg communities	Some patches of scale on senescing/dead patches of <i>Achyranthes aspera</i> – similar state to what was observed in 2021.
Threats	
Weeds	
Does the island appear weed free?	No weeds detected.
Species observed and brief description.	N/A
Any future actions needed?	No - other than continued biosecurity procedures for all visitors to island.
Pest/Invasive animals	
Any signs of pest animals? Includes invertebrates like ants, grasshopper, scale insect etc.	Ant surveys: <i>Cardiocondyla atalanta</i> specimens collected from four survey sites. Some patches of scale infestation on <i>Achyranthes aspera</i> (no tending ants present).
Species observed and brief description.	<i>Cardiocondyla atalanta</i> currently not a species of concern in the CSMP.
Any future actions needed? (eg pest monitoring or control work)	Continue monitoring of scale and of tending ants. Continued biosecurity procedures for all visitors to island.
Human impacts/ threats	
Any evidence of fires?	No
Trampling, digging by humans?	None detected
Marine debris notes	2 bags of marine debris collected, total equating to 10kg.
Other	
Infrastructure	
Condition of infrastructure, any work required?	Sign maintenance carried out – sign scrubbed to remove bird faeces, and a waterproof coat was also applied. This will need to be checked and potentially carried out each visit by Parks Australia staff.
Cultural values	
Anything observed, anything new or of concern?	N/A
Monitoring and collections	
Any other monitoring or surveys undertaken	Debris removal, testing for signs of Highly Pathogenic Avian Influenza (HPAI) – Guy Weerasinghe (DAFF), Health Checks, vegetation assessments and Island Watch carried out by Fiona Hagger (PA), ant surveys – carried out by Maële Brisset (New Caledonia), reef surveys led by Andrew Hoey (JCU).
By whom and where is information to be stored?	Parks Australia to retain and be keeper of island data, JCU to store reef data.
Areas of island visited	
Sites (locations) or whole island	One health check site (turtle nesting habitat) was assessed. Most of the island was traversed.

Health checks were undertaken at six sites.

Table 42. Health check results – Mixed Herb/shrubland, Hermit Crab Islet (Lihou)

Site 1 species present: *Lepturus repens*, *Boerhavia albiflora*, *Achyranthes aspera*.

Site 2 species present: *Lepturus repens*, *Abutilon albescens*, *Achyranthes aspera*, *Tribulus cistoides*.

Site 3 species present: *Achyranthes aspera*

Site 4 species present: *Boerhavia albiflora*, *Lepturus repens*; *Tribulus cistoides*, *Portulaca oleracea*

Site 5 species present: *Lepturus repens*, *Achyranthes aspera*, *Abutilon albescens*, *Tribulus cistoides*

Site 6 species present: *Boerhavia albiflora*, *Lepturus repens*, *Tribulus cistoides*, *Achyranthes aspera*, *Stenotaphrum micranthum*

Key: **G** = good; **GC** = good with some concerns; **SC** = significant concern; **C** = critical; **NA** = not applicable.

Health Check Indicator	General impression						General impression
	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	
1. Infestations of ecosystem-changing pest plants	G	G	G	G	G	G	G
2. Infestations of pest plants other than ecosystem-changers	G	G	G	G	G	G	G
3. Risk of future invasion by significant pest plants not already present	G	G	G	G	G	G	G
4. Rainforest invasion	G	G	G	G	G	G	G
5. Woody thickening (other than by rainforest species)	G	G	G	G	G	G	G
6. Overgrazing/browsing by feral animals, stray stock or natives	G	G	G	G	G	G	G
7. Trampling, digging or rooting by animals or trampling by visitors	G	G	G	G	G	G	G
8. Impacts on wetlands	NA	NA	NA	NA	NA	NA	NA
9. Vehicle impacts	G	G	G	G	G	G	G
10. Dumping	G	G	G	G	G	G	G
11. Ground cover	G	G	G	G	G	G	G
12. Fire damage to fire-sensitive and non fire-dependent ecosystems	NA	NA	NA	NA	NA	NA	NA
13. Fire damage to fire-adapted peat-based ecosystems	NA	NA	NA	NA	NA	NA	NA
14. Age class distribution in fire-adapted ecosystems in conservation	NA	NA	NA	NA	NA	NA	NA
15. Severe bushfire in fire-adapted wooded ecosystems	NA	NA	NA	NA	NA	NA	NA
16. Severe storm, cyclone or tornado in wooded ecosystems	NA	NA	NA	NA	NA	NA	NA
17. Overtopping, erosion and associated impacts resulting... from...	G	G	G	G	G	G	G
18. Ecosystem health and dieback	G	GC ₁	G	G	G	G	G
19. Key features for faunal biodiversity in terrestrial ecosystems	G	G	G	G	G	G	G
20. Recruitment of canopy species	NA	NA	NA	NA	NA	NA	NA
Overall Condition Class							G

¹ Scale present on *Achyranthes aspera* at Site 2.



Figure 64. Scale present on the *Achyranthes aspera* community at Health Check site 2, Hermit Crab Islet.
Fiona Hagger ©

2.9.3 Birds

Lesser frigatebirds were distributed across Hermit Crab Islet in loose colonies. These ground nesting birds were often nestled within and below the tops of the *Achyranthes aspera* that dominated the nesting areas. An accurate count was not possible without traversing the island and causing unnecessary disturbance. The use of a drone for full counts would have been ideal in this circumstance.

Two variations of bill colour were noted among the female lesser frigatebirds (Figures 65 and 66).

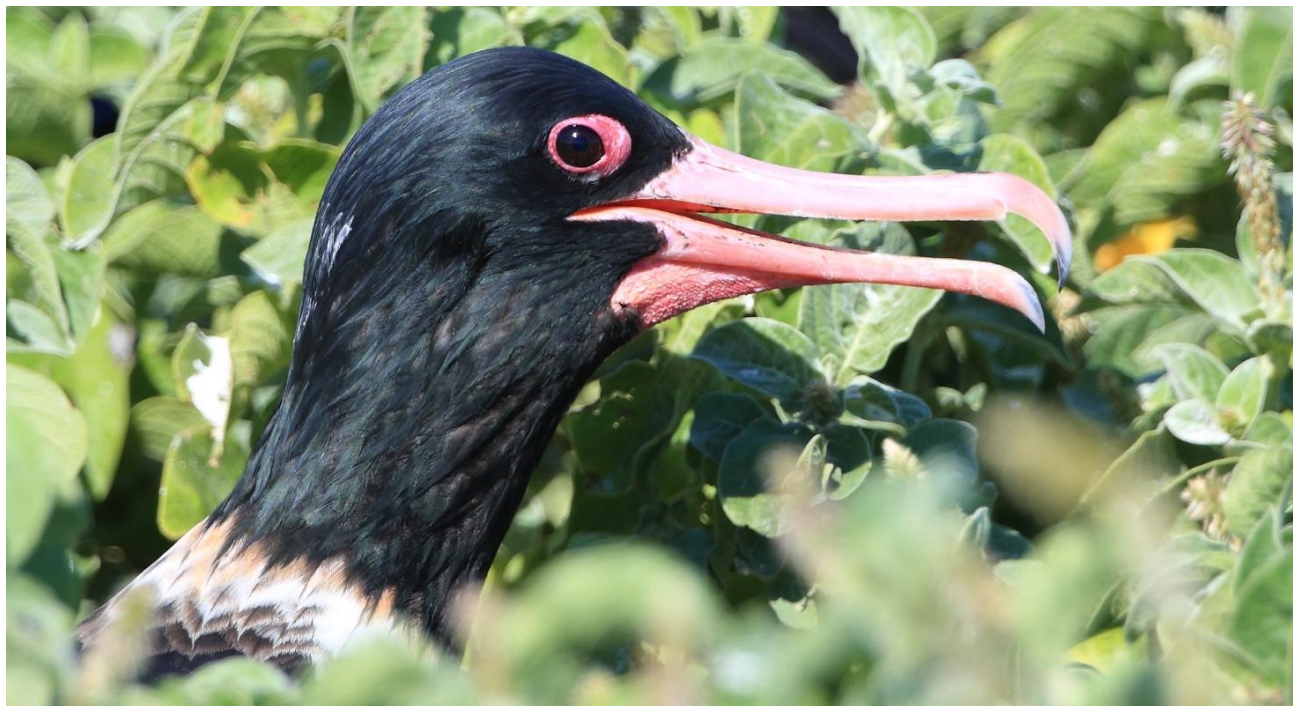


Figure 65. Lesser frigatebird (female) with a red bill variation.

Andrew McDougall © Queensland Government



Figure 66. Lesser frigatebird (female) with a blue/bone coloured bill variation.
Andrew McDougall © Queensland Government

An accurate count of masked boobies and brown boobies nesting on the beach and adjacent vegetation was the focus of this survey.

An adult masked booby with what looked to be a red dye (Figure 67) through its plumage was observed on rocks on the southern beach. The bird did not seem otherwise incapacitated and was preening contentedly. It is unlikely the bird had been covered in dye for some sort of research purpose away from the Coral Sea. There were no leg bands present. It is more likely the bird was displaying a rare phenomenon called erythrism, where light-coloured plumage displays a rusty or red/pink hue, through either a genetic mutation or results of diet.



Figure 67. A masked booby with an unusual red/pink hue through its plumage. A rare condition called erythrism (changed plumage through genetic variation or through diet) may be an explanation.
Andrew McDougall © Queensland Government

Table 43. Bird species and breeding effort on Hermit Crab Islet, Lihou Reef.

Key: P= Present, U= Unknown, NR= Not recorded

Hermit Crab Islet, Lihou Atoll 09/06/2025		Breeding effort and life stages				
common name	scientific name	Nests	Chicks	Young	Breeding pairs	Adolescents and adults
red-tailed tropicbird	<i>Phaethon rubricauda roseotinctus</i>	0	0	0	0	0
lesser frigatebird	<i>Fregata ariel</i>	P	P	0	P	P
great frigatebird	<i>Fregata minor</i>	0	0	0	0	0
masked booby	<i>Sula dactylatra dactylatra</i>	131	19	0	150	179
brown booby	<i>Sula leucogaster</i>	310	5	0	315	320+
red-footed booby	<i>Sula sula</i>	P	0	0	0	P
black noddy	<i>Anous minutus</i>	0	0	0	0	0
brown noddy	<i>Anous stolidus</i>	0	0	0	0	0
bridled tern	<i>Onychoprion anaethetus</i>	0	0	0	0	0
sooty tern	<i>Onychoprion fuscatus</i>	P	0	0	P	P
roseate tern	<i>Sterna dougallii</i>	0	0	0	0	0
black-naped tern	<i>Sterna sumatrana</i>	0	0	0	0	0
New Caledonian fairy tern	<i>Sternula nereis exsul</i>	0	0	0	0	0
crested tern	<i>Thalasseus bergii</i>	0	0	0	0	0
Herald petrel	<i>Pterodroma heraldica</i>	0	0	0	0	0
ruddy turnstone	<i>Arenaria interpres</i>	0	0	0	0	0
red-necked stint	<i>Calidris ruficollis</i>	0	0	0	0	0
lesser sand plover	<i>Charadrius mongolus</i>	0	0	0	0	0
Pacific golden plover	<i>Pluvialis fulva</i>	0	0	0	0	0
wandering tattler	<i>Tringa incana</i>	0	0	0	0	0
buff-banded rail	<i>Gallirallus philippensis tounelierii</i>	0	0	0	0	0
eastern reef egret	<i>Egretta sacra</i>	0	0	0	0	0
nankeen night-heron	<i>Nycticorax caledonicus</i>	0	0	0	0	0
purple swamphen	<i>Porphyrio melanotus</i>	0	0	0	0	0
sacred kingfisher	<i>Todiramphus sanctus</i>	0	0	0	0	0
welcome swallow	<i>Hirundo neoxena</i>	0	0	0	0	0

2.9.4 Ant Surveys

One ant species, *Cardiocondyla atalanta* was collected from four survey sites.

2.10 Turtle Islet – Lihou Reef

Island visited on the 10th of June 2025 (3 hours on island).

2.10.1 Vegetation

Table 44. Vegetation species found on Turtle Islet on the June 2025 voyage.

Scientific name/community	Common name
<i>Abutilon albescens</i>	lantern bush
<i>Achyranthes aspera</i>	chaff flower
<i>Boerhavia albiflora</i> var. <i>albiflora</i>	tar vine
<i>Ipomoea pes-caprae</i> subsp. <i>brasiliensis</i>	goats-foot morning glory
<i>Lepturus repens</i>	stalky grass
<i>Portulaca oleracea</i>	pig weed
<i>Stenotaphrum micranthum</i>	beach buffalo grass
<i>Tribulus cistoides</i>	bulls head burr

The vegetation on Turtle Islet was in good condition at the time of assessment. No weeds were detected.

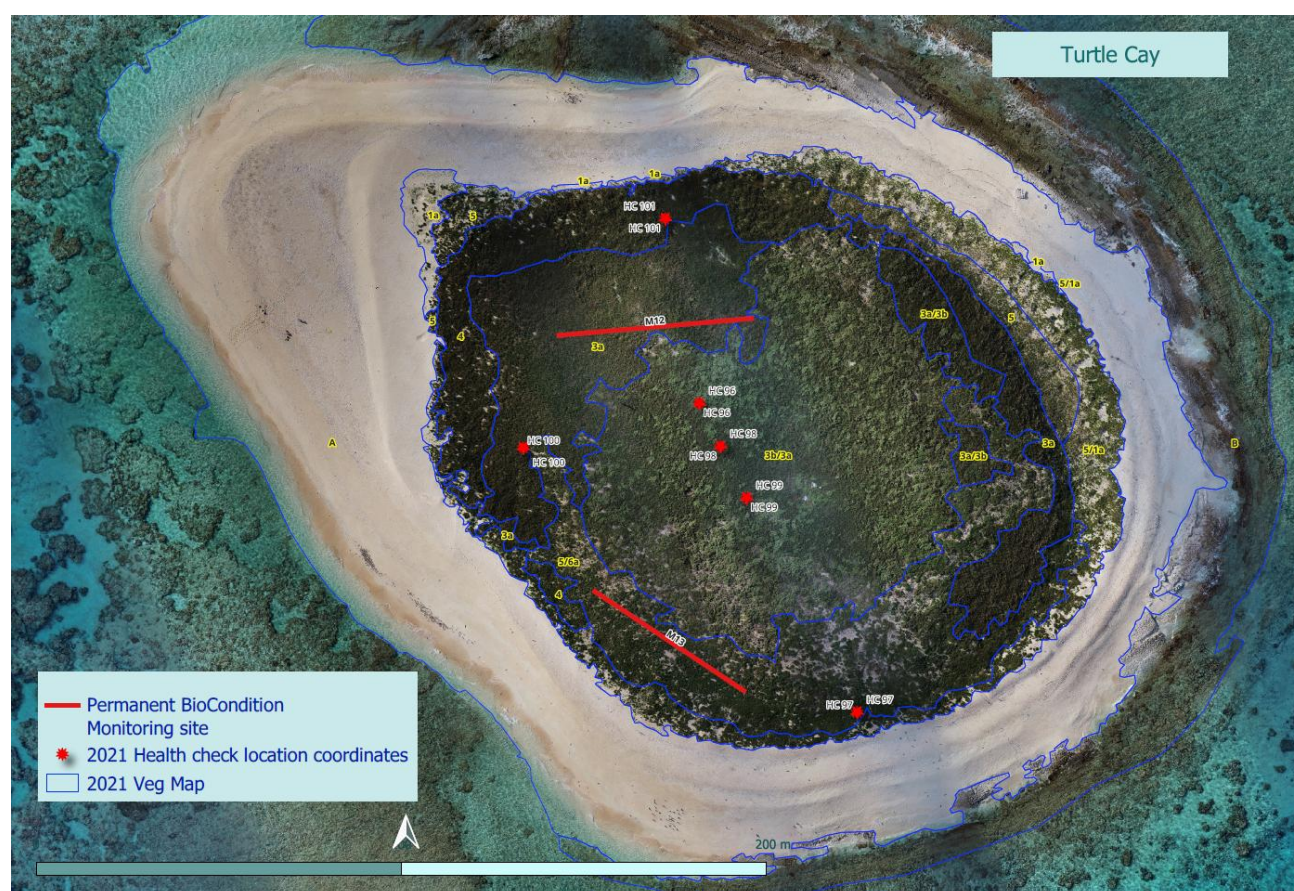


Figure 68. Location of permanent BioCondition monitoring sites on Turtle Islet (Lihou Reef) including M12 and M13, and positions of health check locations.

There was some evidence of insects having eaten holes in *Achyranthes aspera* leaves (Figure 69 Left), though this was very localised and only observed in a small section of the island (south-west, interior). There were no insects at the site that the leaf consumption could be attributed to.

Ipomoea pes-caprae brasiliensis (goats-foot morning glory) was found (Figure 69 Right), which has not been recorded on Turtle Islet since 1984. It was not found in a 1994 survey or the Parks Australia 2021 survey despite thorough searching of its previous location in the vicinity of the former site of the automated weather station. The favourable weather conditions at the time of visit

may explain its resurgence. No flowers or buds were evident, but it was otherwise in good health and had forged itself space creeping through the surrounding dense *Achyranthes aspera* (chaff flower) and *Lepturus repens* (stalky grass) communities.

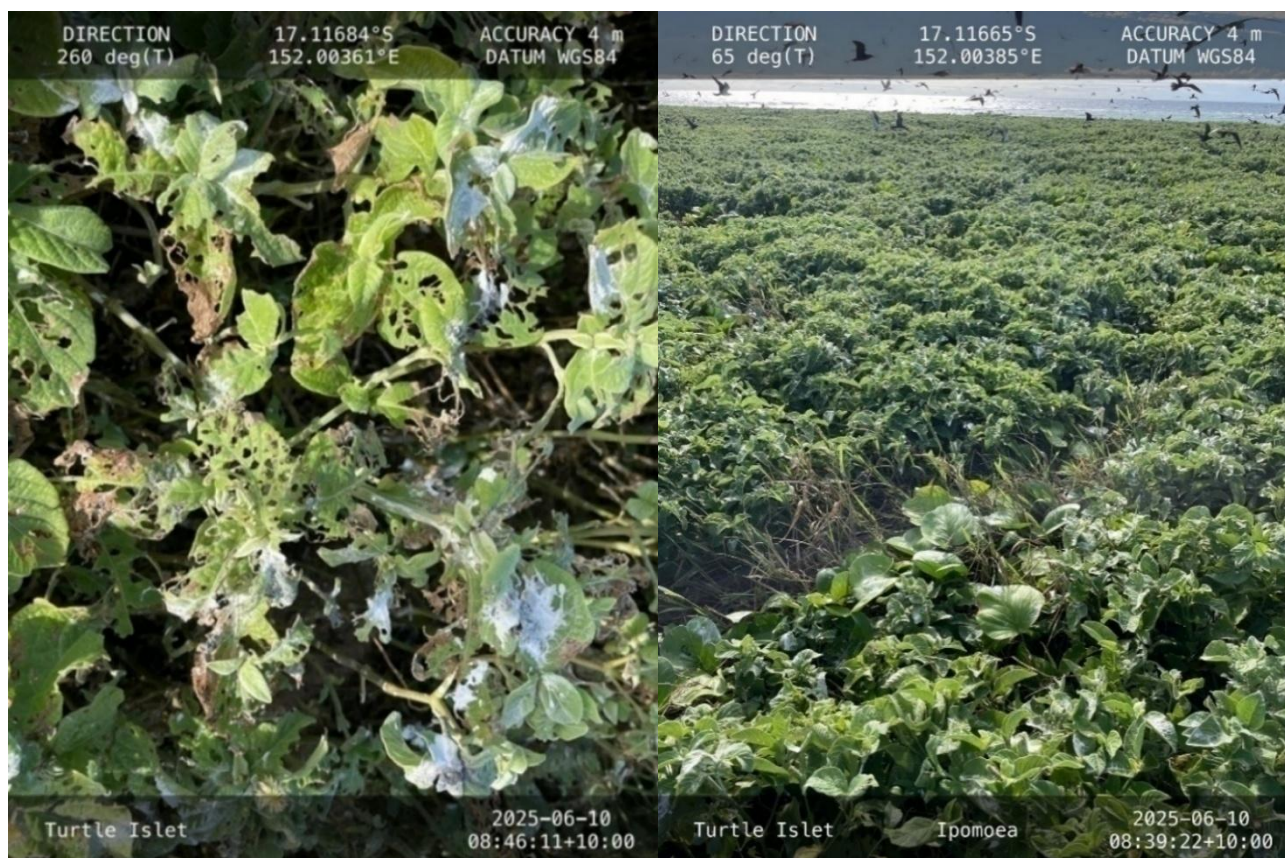


Figure 69. Left: *Achyranthes aspera* leaves with insect damage. Right: *Ipomoea pes-caprae* subsp. *brasiliensis* in central area of Turtle Islet.

Fiona Hagger ©



Figure 70. Map marking location of *Ipomoea pes-caprae*.

In the central interior of the Islet, there was an increased presence of *Achyranthes aspera* (chaff flower) in the mixed grassland/herbland community than was documented during the 2021 visit. This was evident through comparing photos of Health Check sites 1 (previously site 96) (Figure 71), site 3 (previously site 98) (Figure 72), and site 4 (previously site 99) (Figure 73).



Figure 71. Left: 2021 photo of grassland/herbland from Health Check site 1 (previously site 96), facing west. Right: the same site in 2025 with increased presence of *Achyranthes aspera*.
Fiona Hagger ©



Figure 72. Left: 2021 photo of grassland/herbland from Health Check site 3 (previously site 98), facing west. Right: the same site in 2025 with increased presence of *Achyranthes aspera*.
Fiona Hagger ©



Figure 73. Left: 2021 image of grassland/herbland at Health Check site 4 (previously site 99), facing east. Right: the same site in 2025 with increased presence of *Achyranthes aspera*.
Fiona Hagger ©

As was the case at the last Parks Australia visit to Turtle Islet (July 2021), there were once again large numbers of locusts present (Figure 73 Left). It was not obvious at that time nor on this current visit whether the locusts are having any effect on the plants or the ecosystem more generally.

There was also a number of moths (likely *Spoladea Recurvalis*) found on Turtle Islet (Figure 74 Right). This same moth was seen across islands during this visit to the CSMP and were first recorded in the CSMP in 2016 by a Bush Blitz expedition. It is not native to the CSMP. Impacts on the ecology of the CSMP islands by this moth is not known.



Figure 74. Left: Locust (*Valanga*) amongst *Achyranthes aspera*. Right: Moth species (likely *Spoladea recurvalis*) on *A. aspera*, Turtle Islet.

2.10.2 Island Watch/Health Checks

A Parks Australia Island Watch summary proforma for Turtle Islet (Lihou Reef) was completed by Fiona Hagger (Table 45).

Table 45. June 2025 Island Watch summary for Turtle Islet, Lihou Reef.

Island Watch category	
Turtle Islet (Lihou)	
Key Natural Value Assessments	
Birds	
Formal bird survey by A. McDougall?	Yes
Any new or unusual sightings, or any changes to condition of nesting/roosting habitat?	No
Island Geomorphology	
Significant island changes?	No
Severe storm/cyclone damage?	No
Turtles	
Turtles seen on island?	No
Number of nests/body pits:	Not counted due to time constraints
Any new or unusual sightings, or any changes to the condition of nesting habitat?	No
Native vegetation	
Condition of key veg value: herb/grassland/abutilon	Good
Anything else of interest, and changes or concerns? Eg dieback, drought – all veg communities	Some insect consumption of <i>Achyranthes aspera</i> leaves, localised spot.
Threats	
Weeds	
Does the island appear weed free?	No weeds detected.
Species observed and brief description:	N/A
Any future actions needed?	No - other than continued biosecurity procedures for all visitors to island.
Pest/Invasive animals	
Any signs of pest animals? Includes invertebrates like ants, grasshopper, scale insect etc.	Some insect (unknown) consumption of <i>Achyranthes aspera</i> leaves, localised spot. Ant surveys found four sites of <i>Monomorium</i> sp. <i>laeve</i> gp and one site of <i>Cardiocondyla atalanta</i> . The last ant survey on Turtle Islet was in 2021, and only <i>Monomorium</i> cf. <i>intrudens</i> was recorded. This may have been <i>Monomorium</i> sp. <i>laeve</i> gp.
Species observed and brief description.	Large locusts (<i>Valanga</i>) and moths (likely <i>Spoladea recurvalis</i>).
Any future actions needed? (eg pest monitoring or control work)	Continue monitoring of locusts and moths and any potential effects of their presence. Continue monitoring of ants. Continued biosecurity procedures for all visitors to island.
Human impacts/ threats	
Any evidence of fires?	No
Trampling, digging by humans:	None detected
Marine debris notes	2 bags of marine debris collected, total equating to 15kg.
Other	
Infrastructure	
Condition of infrastructure, any work required?	Sign maintenance carried out – sign scrubbed to remove bird faeces, and a waterproof coat was also applied. This will need to be checked and potentially carried out each visit by Parks Australia staff.
Cultural values	
Anything observed, anything new or of concern?	No

Monitoring and collections	
Any other monitoring or surveys undertaken:	Debris removal, testing for signs of Highly Pathogenic Avian Influenza (HPAI) – Guy Weerasinghe (DAFF), Health Checks, Island Watch, vegetation assessments and Island Watch carried out by Fiona Hagger (PA), ant surveys – carried out by Maële Brisset (New Caledonia).
By whom and where is information to be stored?	Parks Australia to retain and be keeper of island data.
Areas of island visited	
Sites (locations) or whole island:	Six health check sites were assessed, and 2 BioCondition monitoring sites visited. Most of the island was traversed.

Health checks were undertaken at six sites.

Table 46. Health check results – Mixed Herb/shrubland, Turtle Islet (Lihou Reef)

Site 1 species present (previously site 96): *Achyranthes aspera*, *Lepturus repens*

Site 2 species present (previously site 97): *Portulaca oleracea*, *Stenotaphrum micranthum*, *Boerhavia albiflora*

Site 3 species present (previously site 98): *Abutilon albescens*, *Achyranthes aspera*, *Lepturus repens*

Site 4 species present (previously site 99): *Achyranthes aspera*, *Lepturus repens*, *Ipomoea pes-caprae*

Site 5 species present (previously site 100): *Lepturus repens*

Site 6 species present (previously site 101): *Boerhavia albiflora*, *Portulaca oleracea*, *Lepturus repens*

Key: **G** = good; **GC** = good with some concerns; **SC** = significant concern; **C** = critical; **NA** = not applicable.

Health Check Indicator	General impression						General impression
	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	
1. Infestations of ecosystem-changing pest plants	G	G	G	G	G	G	G
2. Infestations of pest plants other than ecosystem-changers	G	G	G	G	G	G	G
3. Risk of future invasion by significant pest plants not already present	G	G	G	G	G	G	G
4. Rainforest invasion	G	G	G	G	G	G	G
5. Woody thickening (other than by rainforest species)	G	G	G	G	G	G	G
6. Overgrazing/browsing by feral animals, stray stock or natives	G	G	G	G	G	G	G
7. Trampling, digging or rooting by animals or trampling by visitors	G	G	G	G	G	G	G
8. Impacts on wetlands	NA	NA	NA	NA	NA	NA	NA
9. Vehicle impacts	G	G	G	G	G	G	G
10. Dumping	G	G	G	G	G	G	G
11. Ground cover	G	G	G	G	G	G	G
12. Fire damage to fire-sensitive and non fire-dependent ecosystems	NA	NA	NA	NA	NA	NA	NA
13. Fire damage to fire-adapted peat-based ecosystems	NA	NA	NA	NA	NA	NA	NA
14. Age class distribution in fire-adapted ecosystems in conservation	NA	NA	NA	NA	NA	NA	NA
15. Severe bushfire in fire-adapted wooded ecosystems	NA	NA	NA	NA	NA	NA	NA
16. Severe storm, cyclone or tornado in wooded ecosystems	NA	NA	NA	NA	NA	NA	NA
17. Overtopping, erosion and associated impacts resulting... from...	G	G	G	G	G	G	G
18. Ecosystem health and dieback	G	G	G	G	G	G	G
19. Key features for faunal biodiversity in terrestrial ecosystems	G	G	G	G	G	G	G
20. Recruitment of canopy species	NA	NA	NA	NA	NA	NA	NA
Overall Condition Class							G

2.10.3 Birds

The sooty tern and brown noddy counts are taken from accurate beach and strand counts, and extrapolated inland counts. The island vegetation was very thick, and nests were not visible until you were nearly on top of them. To minimise disturbance, extrapolated counts were favoured. Sooty tern nests are usually on bare ground or on thin vegetative matter at ground level. Some sooty tern nests on Turtle Islet were formed on matted beds of grass above ground level.

Table 47. Bird species and breeding effort on Turtle Islet, Lihou Reef.

Key: P= Present, U= Unknown, NR= Not recorded

Turtle Islet, Lihou Atoll		10/06/2025		Breeding effort and life stages		
		Nests	Chicks	Young	Breeding pairs	Adolescents and adults
common name	scientific name					
red-tailed tropicbird	<i>Phaethon rubricauda roseotinctus</i>	0	0	0	0	0
lesser frigatebird	<i>Fregata ariel</i>	0	0	0	0	0
great frigatebird	<i>Fregata minor</i>	0	0	0	0	0
masked booby	<i>Sula dactylatra dactylatra</i>	29	0	0	29	37
brown booby	<i>Sula leucogaster</i>	78	15	0	93	83
red-footed booby	<i>Sula sula</i>	0	0	0	0	3
black noddy	<i>Anous minutus</i>	0	0	0	0	0
brown noddy	<i>Anous stolidus</i>	16065			16065	16500+
bridled tern	<i>Onychoprion anaethetus</i>	0	0	0	0	0
sooty tern	<i>Onychoprion fuscatus</i>	13210	0	0	13210	13500+
roseate tern	<i>Sterna dougallii</i>	0	0	0	0	0
black-naped tern	<i>Sterna sumatrana</i>	0	0	0	0	12
New Caledonian fairy tern	<i>Sternula nereis exsul</i>	0	0	0	0	0
crested tern	<i>Thalasseus bergii</i>	0	0	0	0	3
Herald petrel	<i>Pterodroma heraldica</i>	0	0	0	0	0
Australian pelican	<i>Pelecanus conspicillatus</i>	0	0	0	0	0
ruddy turnstone	<i>Arenaria interpres</i>	0	0	0	0	0
red-necked stint	<i>Calidris ruficollis</i>	0	0	0	0	0
lesser sand plover	<i>Charadrius mongolus</i>	0	0	0	0	0
Pacific golden plover	<i>Pluvialis fulva</i>	0	0	0	0	0
wandering tattler	<i>Tringa incana</i>	0	0	0	0	0
buff-banded rail	<i>Gallirallus philippensis tounelieri</i>	0	0	0	0	0
eastern reef egret	<i>Egretta sacra</i>	0	0	0	0	0
nankeen night-heron	<i>Nycticorax caledonicus</i>	0	0	0	0	0
purple swamphen	<i>Porphyrio melanotus</i>	0	0	0	0	0
sacred kingfisher	<i>Todiramphus sanctus</i>	0	0	0	0	0
welcome swallow	<i>Hirundo neoxena</i>	0	0	0	0	0

2.10.4 Ant Surveys

The yellow mono ant (*Monomorium sp. laeve*) was recorded at four sites, while *Cardiocondyla atalanta* was recorded at a single site.

2.11 Lorna Cay – Lihou Reef

Island visited on the 10th of June 2025 (5 hours on island).

2.11.1 Vegetation

Table 48. Vegetation species found on Lorna Cay on the June 2025 voyage.

Scientific name/community	Common name
<i>Achyranthes aspera</i>	chaff flower
<i>Boerhavia albiflora</i> var. <i>albiflora</i>	tar vine
<i>Lepturus repens</i>	stalky grass
<i>Portulaca oleracea</i>	pig weed
<i>Stenotaphrum micranthum</i>	beach buffalo grass
<i>Tribulus cistoides</i>	bull's head burr

The vegetation was generally in good condition at the time of assessment. Interestingly, as was noted in the 2021 CSMP Island Health report, Grant et al. noted in 1986 that Lorna Cay was unvegetated. The small single plant of *Argusia argentea* found on the interior of the cay in 2021 was not found. No weeds were detected.

In addition to the above species in Table 48, one coconut (*Cocos nucifera*) had sprouted (Figure 75). Based on other coconuts that have been found across CSMP islands over time, it is unlikely that this plant will establish and grow.



Figure 75. Sprouted *Cocos nucifera* on Lorna Cay. Fiona Hagger ©

The BioCondition Monitoring sites set up in 2021 were visited. Site M14, open herbland dominated by *Boerhavia albiflora* var. *albiflora*, had more groundcover (Figure 76-79). Site M15, herbland dominated by *Lepturus repens* and *Achyranthes aspera*, had a species shift with the community dominated by *Achyranthes aspera* (Figure 79).



Figure 76. Left: BioCondition site M14 in 2021 facing SW. Right: Same site in 2025. Note the increased ground cover. Fiona Hagger ©



Figure 77. Left: BioCondition site M14 from 2021 facing NE. Right. Same position in 2025. Note the increased ground cover. Fiona Hagger ©



Figure 78. Left: BioCondition site M15 from 2021 facing NE. Right: Same position in 2025. Fiona Hagger ©



Figure 79. Left: BioCondition site M15 from 2021 facing SW. Right: Same position in 2025, note the increased cover of *Achyranthes aspera*.
Fiona Hagger ©

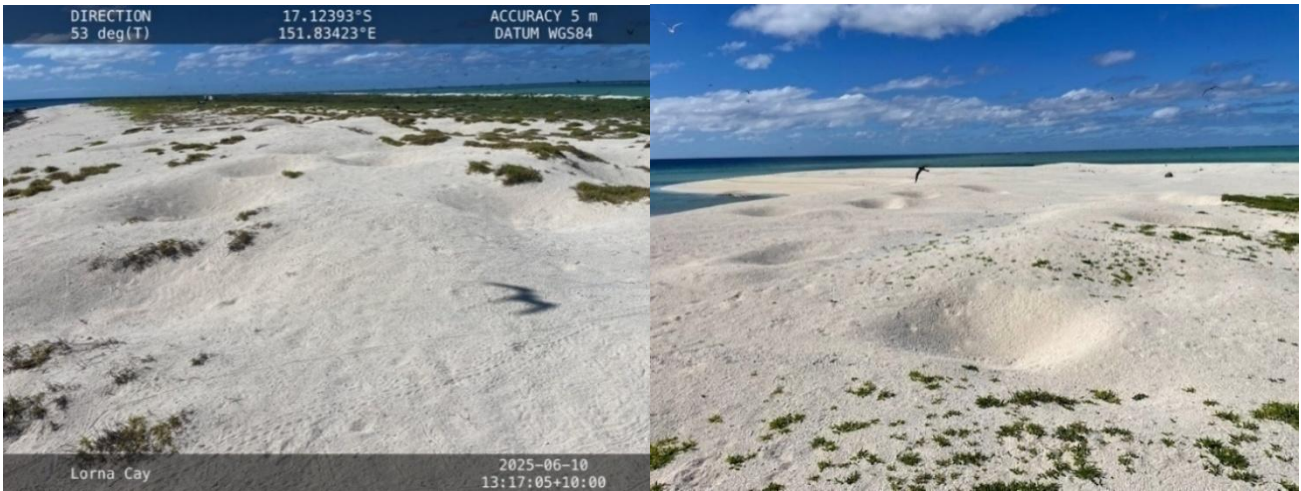
2.11.2 Island Watch/Health Checks

A Parks Australia Island Watch summary proforma for Lorna Cay (Lihou Reef) was completed by Fiona Hagger (Table 49).

Table 49. June 2025 Island Watch summary for Lorna Cay, Lihou Reef.

Island Watch category	
Lorna Cay (Lihou Reef)	
Key Natural Value Assessments	
Birds	
Formal bird survey by A. McDougall?	Yes
Any new or unusual sightings, or any changes to condition of nesting/roosting habitat?	No
Island Geomorphology	
Significant island changes?	No
Severe storm/cyclone damage?	No
Turtles	
Turtles seen on island?	No
Number of nests/body pits:	Numerous body pits across the islet, with most on the north/north-west section, as well as the south/south-west tail. See Figures 80 & 81 below
Any new or unusual sightings, or any changes to the condition of nesting habitat?	No
Native vegetation	
Condition of key veg value:	Good
Herb/grassland/abutilon	

Anything else of interest, and changes or concerns? Eg dieback, drought – all veg communities	One coconut (<i>Cocos nucifera</i>) was found, sprouted. Unlikely to survive. The small, single <i>Argusia argentea</i> observed in 2021 was not found.
Threats	
Weeds	
Does the island appear weed free?	No weeds detected.
Species observed and brief description:	N/A
Any future actions needed?	No - other than continued biosecurity procedures for all visitors to island.
Pest/Invasive animals	
Any signs of pest animals? Includes invertebrates like ants, grasshopper, scale insect etc.	Ant surveys: <i>Cardiocondyla atalanta</i> was collected at three survey sites. This species is currently not of concern in the CSMP.
Species observed and brief description.:	N/A
Any future actions needed? (eg pest monitoring or control work)	Ant surveys undertaken every visit. Continued biosecurity procedures for all visitors to island.
Human impacts/ threats	
Any evidence of fires?	No
Trampling, digging by humans:	None detected
Marine debris notes:	4 bags of marine debris collected, total equating to 40kg.
Other	
Infrastructure	
Condition of infrastructure, any work required?	Sign maintenance carried out – sign scrubbed to remove bird faeces, and a waterproof coat was also applied. This will need to be checked and potentially carried out each visit by Parks Australia staff.
Cultural values	
Anything observed, anything new or of concern?	No
Monitoring and collections	
Any other monitoring or surveys undertaken?	Debris removal, testing for signs of Highly Pathogenic Avian Influenza (HPAI) – Guy Weerasinghe (DAFF), Health Checks, vegetation assessments and Island Watch carried out by Fiona Hagger (PA), ant surveys – carried out by Maële Brisset (New Caledonia), reef surveys – led by Andrew Hoey (JCU).
By whom and where is information to be stored?	Parks Australia to retain and be keeper of island data.
Areas of island visited	
Sites (locations) or whole island:	Six health check sites were assessed, and 2 BioCondition monitoring sites visited. Most of the island was traversed.



Figures 80. Turtle body pits in the north-west and northern sections of Lorna Cay, respectively.

Fiona Hagger ©



Figure 81. Turtle body pits on the south-southwest tail of Lorna Cay.

Fiona Hagger ©

Table 50. Health check results – Mixed Herb/shrubland, Lorna Cay (Lihou Reef)

Site 1 species present (previously site 103): *Stenotaphrum micranthum*, *Boerhavia albiflora*,

Site 2 species present (previously site 104): *Lepturus repens*, *Boerhavia albiflora*, *Achyranthes aspera*, *Tribulus cistoides*

Site 3 species present (previously site 105): *Achyranthes aspera*, *Boerhavia albiflora*, *Lepturus repens*

Site 4 species present (previously site 106): *Achyranthes aspera*, *Boerhavia albiflora*, *Portulaca oleracea*

Site 5 species present (previously site 107): *Tribulus cistoides*, *Boerhavia albiflora*, *Portulaca oleracea*, *Stenotaphrum micranthum*

Site 6 species present (previously site 108): *Boerhavia albiflora*, *Portulaca oleracea*, *Stenotaphrum micranthum*

Key: **G** = good; **GC** = good with some concerns; **SC** = significant concern; **C** = critical; **NA** = not applicable.

Health Check Indicator	General impression						General impression
	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	
1. Infestations of ecosystem-changing pest plants	G	G	G	G	G	G	G
2. Infestations of pest plants other than ecosystem-changers	G	G	G	G	G	G	G
3. Risk of future invasion by significant pest plants not already present	G	G	G	G	G	G	G
4. Rainforest invasion	G	G	G	G	G	G	G
5. Woody thickening (other than by rainforest species)	G	G	G	G	G	G	G
6. Overgrazing/browsing by feral animals, stray stock or natives	G	G	G	G	G	G	G
7. Trampling, digging or rooting by animals or trampling by visitors	G	G	G	G	G	G	G
8. Impacts on wetlands	NA	NA	NA	NA	NA	NA	NA
9. Vehicle impacts	G	G	G	G	G	G	G
10. Dumping	G	G	G	G	G	G	G
11. Ground cover	G	G	G	G	G	G	G
12. Fire damage to fire-sensitive and non fire-dependent ecosystems	NA	NA	NA	NA	NA	NA	NA
13. Fire damage to fire-adapted peat-based ecosystems	NA	NA	NA	NA	NA	NA	NA
14. Age class distribution in fire-adapted ecosystems in conservation	NA	NA	NA	NA	NA	NA	NA
15. Severe bushfire in fire-adapted wooded ecosystems	NA	NA	NA	NA	NA	NA	NA
16. Severe storm, cyclone or tornado in wooded ecosystems	NA	NA	NA	NA	NA	NA	NA
17. Overtopping, erosion and associated impacts resulting... from...	G	G	G	G	G	G	G
18. Ecosystem health and dieback	G	G	G	G	G	G	G
19. Key features for faunal biodiversity in terrestrial ecosystems	G	G	G	G	G	G	G
20. Recruitment of canopy species	NA	NA	NA	NA	NA	NA	NA
Overall Condition Class G							

2.11.3 Birds

Lorna Cay was the third New Caledonian fairy tern nesting site, newly discovered, during this voyage (the second being Betty Cay, see [Section 2.12.1 Birds](#)).

The fairy terns remained undetected until the full extent of the south west spit was explored. Nine adult birds were in full breeding plumage with the tenth bird an adolescent that appeared not long fledged. Lorna Cay and Georgina Cay are similar in size and shape (Figures 82 and 83), with both recording breeding pairs this voyage, and both being found in the far western end of their

respective spits. The common denominator for all breeding sites, however, appears to be an island with no vegetation, or an unvegetated spit far from vegetation.

Two masked boobies were observed aggressively bill bashing each other. The confrontation was loud and persistent. After sustained effort, both birds stood apart from each other and dizzily looked skyward and waved their heads from side to side as if to get rid of a bad headache.



Figure 82. Lorna Cay approximately 1670m (shown to scale with Georgina Cay)

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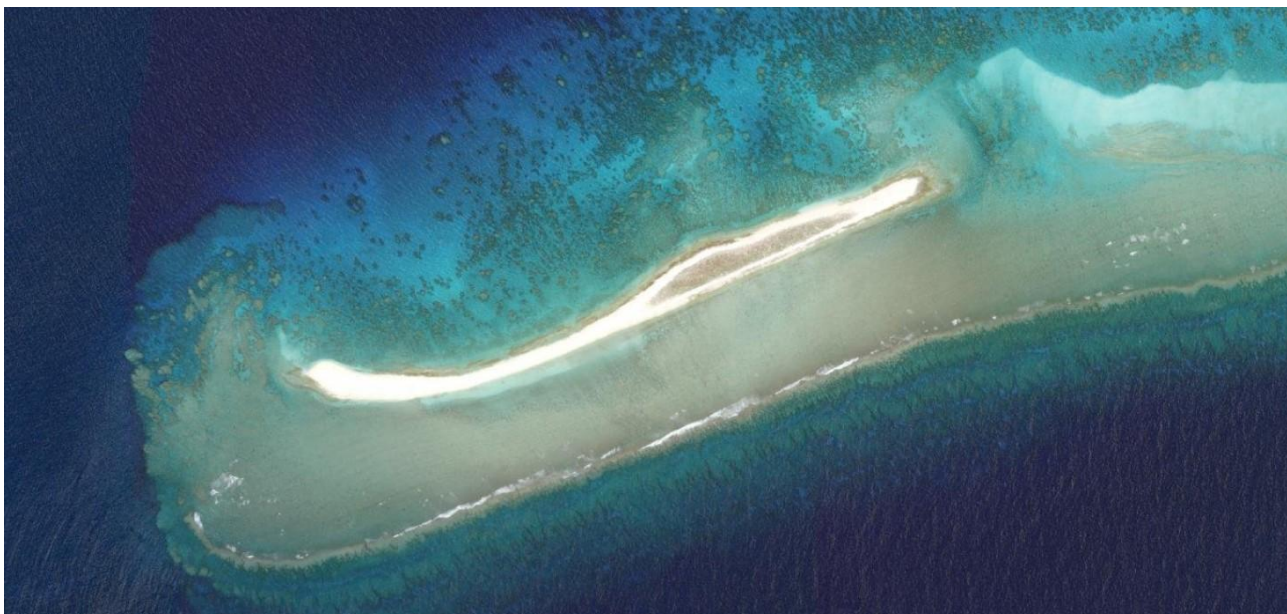


Figure 83. Georgina Cay approximately 1640m (shown to scale with Lorna Cay)

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Table 51. Bird species and breeding effort on Lorna Cay, Lihou Reef.

Key: P= Present, U= Unknown, NR= Not recorded

Lorna Cay, Lihou Atoll		10/06/2025		Breeding effort and life stages		
common name	scientific name	Nests	Chicks	Young	Breeding pairs	Adolescents and adults
red-tailed tropicbird	<i>Phaethon rubricauda roseotinctus</i>	0	0	0	0	0
lesser frigatebird	<i>Fregata ariel</i>	0	0	0	0	0
great frigatebird	<i>Fregata minor</i>	0	0	0	0	0
masked booby	<i>Sula dactylatra dactylatra</i>	44	2	0	46	102
brown booby	<i>Sula leucogaster</i>	146	6	2	154	138
red-footed booby	<i>Sula sula</i>	2	0	0	2	5
black noddy	<i>Anous minutus</i>	0	0	0	0	0
brown noddy	<i>Anous stolidus</i>	2150			2150	2200+
bridled tern	<i>Onychoprion anaethetus</i>	0	0	0	0	0
sooty tern	<i>Onychoprion fuscatus</i>	14800		0	14800	27300
roseate tern	<i>Sterna dougallii</i>	0	0	0	0	0
black-naped tern	<i>Sterna sumatrana</i>	0	0	0	0	0
New Caledonian fairy tern	<i>Sternula nereis exsul</i>	4	0	0	4	10
crested tern	<i>Thalasseus bergii</i>	0	0	0	0	0
Herald petrel	<i>Pterodroma heraldica</i>	0	0	0	0	0
Australian pelican	<i>Pelecanus conspicillatus</i>	0	0	0	0	0
ruddy turnstone	<i>Arenaria interpres</i>	0	0	0	0	19
red-necked stint	<i>Calidris ruficollis</i>	0	0	0	0	0
lesser sand plover	<i>Charadrius mongolus</i>	0	0	0	0	0
Pacific golden plover	<i>Pluvialis fulva</i>	0	0	0	0	14
wandering tattler	<i>Tringa incana</i>	0	0	0	0	0
buff-banded rail	<i>Gallirallus philippensis tounelieri</i>	0	0	0	0	0
eastern reef egret	<i>Egretta sacra</i>	0	0	0	0	0
nankeen night-heron	<i>Nycticorax caledonicus</i>	0	0	0	0	0
purple swamphen	<i>Porphyrio melanotus</i>	0	0	0	0	0
sacred kingfisher	<i>Todiramphus sanctus</i>	0	0	0	0	0
welcome swallow	<i>Hirundo neoxena</i>	0	0	0	0	0

2.11.4 Ant Surveys

Cardiocondyla atalanta was recorded at 3 survey sites.

2.12 Betty Cay – Lihou Reef

Betty Cay is a small, unvegetated sand cay. The island was visited briefly on 9 June 2025 on an opportunistic basis to determine whether New Caledonian Dairy Terns were present.

The island was traversed but no health check or island watch assessments were undertaken, and no ants (or pests) were recorded. Fresh turtle tracks and turtle body pits were observed (Figure 84).



Figure 84. Turtle body pits on Betty Cay.

Fiona Hagger ©

2.12.1 Birds

This opportunistic visit revealed another two pairs of bonded New Caledonia fairy terns, and one adult in non-breeding plumage. No eggs or scrapes were observed, however, the birds' behaviour suggested current or imminent breeding.

Table 52. Bird species and breeding effort on Betty Cay, Lihou Reef.

Key: P= Present, U= Unknown, NR= Not recorded

Betty Cay, Lihou Atoll 09/06/2025		Breeding effort and life stages				
common name	scientific name	Nests	Chicks	Young	Breeding pairs	Adolescents and adults
red-tailed tropicbird	<i>Phaethon rubricauda roseotinctus</i>	0	0	0	0	0
lesser frigatebird	<i>Fregata ariel</i>	0	0	0	0	0
great frigatebird	<i>Fregata minor</i>	0	0	0	0	0
masked booby	<i>Sula dactylatra dactylatra</i>	0	0	0	0	0
brown booby	<i>Sula leucogaster</i>	0	0	0	0	0
red-footed booby	<i>Sula sula</i>	0	0	0	0	0
black noddy	<i>Anous minutus</i>	0	0	0	0	0
brown noddy	<i>Anous stolidus</i>	0	0	0	0	P
bridled tern	<i>Onychoprion anaethetus</i>	0	0	0	0	0
sooty tern	<i>Onychoprion fuscatus</i>	0	0	0	0	0
roseate tern	<i>Sterna dougallii</i>	0	0	0	0	0
black-naped tern	<i>Sterna sumatrana</i>	0	0	0	0	P
New Caledonian fairy tern	<i>Sternula nereis exsul</i>	2	0	0	2	5
crested tern	<i>Thalasseus bergii</i>	0	0	0	0	0
Herald petrel	<i>Pterodroma heraldica</i>	0	0	0	0	0
Australian pelican	<i>Pelecanus conspicillatus</i>	0	0	0	0	0
ruddy turnstone	<i>Arenaria interpres</i>	0	0	0	0	0
red-necked stint	<i>Calidris ruficollis</i>	0	0	0	0	0
lesser sand plover	<i>Charadrius mongolus</i>	0	0	0	0	0
Pacific golden plover	<i>Pluvialis fulva</i>	0	0	0	0	0
wandering tattler	<i>Tringa incana</i>	0	0	0	0	0
buff-banded rail	<i>Gallirallus philippensis tounelieri</i>	0	0	0	0	0
eastern reef egret	<i>Egretta sacra</i>	0	0	0	0	0
nankeen night-heron	<i>Nycticorax caledonicus</i>	0	0	0	0	0
purple swamphen	<i>Porphyrio melanotus</i>	0	0	0	0	0
sacred kingfisher	<i>Todiramphus sanctus</i>	0	0	0	0	0
welcome swallow	<i>Hirundo neoxena</i>	0	0	0	0	0

2.13 South Diamond Islet – Tregrosse Reef

Island visited on the 11th of June 2025 (3 hours on island).

2.13.1 Vegetation



Figure 85. Map of BioCondition monitoring sits and Health Check sites on South Diamond Islet.

Table 53. Vegetation species found on South Diamond Islet on the June 2025 voyage.

Scientific name/community	Common name
<i>Abutilon albescens</i>	lantern bush
<i>Achyranthes aspera</i>	chaff flower
<i>Argusia argentea</i>	octopus bush
<i>Boerhavia albiflora</i> var. <i>albiflora</i>	tar vine
<i>Ipomoea violacea</i>	moon flower
<i>Lepturus repens</i>	stalky grass
<i>Plumbago zeylanica</i>	native plumbago
<i>Portulaca oleracea</i>	pig weed
<i>Stenotaphrum micranthum</i>	beach buffalo grass
<i>Tribulus cistoides</i>	bull's head burr

The vegetation was generally in good condition at the time of assessment. A healthy community of *Ipomoea violacea* was present, not previously recorded on South Diamond though recorded on the other three Diamond Islets within the Tregrosse Reef (Figure 86). Growing in a mixed herbland community amongst *Achyranthes aspera*, *Tribulus cistoides*, *Portulaca oleracea* and *Boerhavia albiflora* var. *albiflora*, it featured a number of buds and flowers.

There were three patches of scale found on *Achyranthes aspera* communities during the assessment of Health Check sites. Two of these scale areas, Health Check Site 6 (previously site

33 and site 18 (previously site 45), were contained to a small area and had not spread to further surrounding vegetation. Site 3 (previously site 29), however, featured a larger area of dead *Achyranthes aspera*, with scale present across the area. The scale did not extend onto surrounding healthy vegetation beyond the patch. Scale was not observed on South Diamond Islet during the 2021 visit so may have been introduced since 2021.

In the north-east interior there has been some shift in vegetation community composition since 2021. The 2025 visit revealed a reduction of *Achyranthes aspera* at Health Checks sites 34 and 42, replaced by *Boerhavia albiflora* var. *albiflora*, which has in turn had some dieback (Figure 87 and 88). The area of reduced vegetation was being utilised as nesting habitat for noddies and sooty terns.

No weeds were detected.



Figure 86. Two aspects of *Ipomoea violacea* found on South Diamond, a species not previously recorded on this island. Fiona Hagger ©



Figure 87. Left: Health Check site 7 (previously site 34) on South Diamond Islet East in 2021. Right: the same site in 2025. Note the shift in vegetation species, with the 2025 visit revealing dieback of *Boerhavia albiflora* var. *albiflora*, which has in turn created nesting habitat for noddies and sooty terns. Fiona Hagger ©



Figure 88. Left: Health Check site 15 (previously site 42) on South Diamond Islet facing North in 2021. Right: Same site in 2025. Note the shift in vegetation species, with the 2025 visit revealing dieback of *Boerhavia albiflora* var. *albiflora*, which has in turn created bird nesting habitat.

Fiona Hagger ©



Figure 89. Left: Health Check site 17 (previously site 44) on South Diamond Islet south in 2021. Right: Same site in 2025. Note the species composition shift in the foreground, with abundant flowering *Tribulus cistoides* present in 2025.

Fiona Hagger ©

BioCondition monitoring site M09



Figure 90. Left: is BioCondition monitoring site M09 on South Diamond Islet facing ESE in 2021. Right: Same site in 2025.
Fiona Hagger ©



Figure 91. Left: BioCondition monitoring site M09 on South Diamond Islet facing WNW in 2021. Right: Same site in 2025.
Fiona Hagger ©

2.13.2 Island Watch/Health Checks

A Parks Australia Island Watch summary proforma for South Diamond Islet (Tregrosse Reef) was completed by Fiona Hagger (Table 54).

Table 54. June 2025 Island Watch summary for South Diamond Islet, Tregrosse Reef.

Island Watch category	
South Diamond Islet (Tregrosse Reef)	
Key Natural Value Assessments	
Birds	
Formal bird survey by A. McDougall?	Yes
Any new or unusual sightings, or any changes to condition of nesting/roosting habitat?	No
Island Geomorphology	
Significant island changes?	No
Severe storm/cyclone damage?	No
Turtles	
Turtles seen on island?	No
Number of nests/body pits:	Not counted
Any new or unusual sightings, or any changes to the condition of nesting habitat?	No
Native vegetation	
Condition of key veg value: herb/grassland/abutilon	Mostly good – some scale present on <i>Achyranthes aspera</i>
Anything else of interest, and changes or concerns? Eg dieback, drought – all veg communities	Some dieback of <i>Tribulus cistoides</i> on the north-east of the islet. Some grow back present.
Threats	
Weeds	
Does the island appear weed free?	No weeds detected.
Species observed and brief description:	N/A
Any future actions needed?	No - other than continued biosecurity procedures for all visitors to island.
Pest/Invasive animals	
Any signs of pest animals? Includes invertebrates like ants, grasshopper, scale insect etc.	Scale present <i>Abutilon albescens</i> and <i>Achyranthes aspera</i> shrubland. Ant surveys collected <i>Cardiocondyla atalanta</i> at two sites, and <i>Nylanderia</i> sp. <i>obscura</i> gp. at three sites. The latter was picked up at the last survey done on South Diamond in 2021.
Species observed and brief description:	N/A
Any future actions needed? (eg pest monitoring or control work)	Monitoring of scale should be undertaken at each visit, with consideration given to comparing to previous visits, and containing any additional spreading. Continued ant surveys. Continued biosecurity procedures for all visitors to island.
Human impacts/ threats	
Any evidence of fires?	No
Trampling, digging by humans:	None detected
Marine debris notes?	1 bag of marine debris collected, total equating to 4kg.
Other	
Infrastructure	

Condition of infrastructure, any work required?	Sign maintenance carried out – sign scrubbed to remove bird faeces, and a waterproof coat was also applied. This will need to be checked and potentially carried out each visit by Parks Australia staff.
Cultural values	
Anything observed, anything new or of concern?	No
Monitoring and collections	
Any other monitoring or surveys undertaken?	Debris removal, testing for signs of Highly Pathogenic Avian Influenza (HPAI) – Guy Weerasinghe (DAFF), Health Checks, vegetation assessments and Island Watch carried out by Fiona Hagger (PA), ant surveys – carried out by Maële Brisset (New Caledonia).
By whom and where is information to be stored?	Parks Australia to retain and be keeper of island data.
Areas of island visited	
Sites (locations) or whole island:	19 health check sites were assessed, and 1 BioCondition monitoring sites visited. Most of the island was traversed.

Note: In 2021, 19 Health Checks sites were assessed, which is considerably more than other islands in the CSMP have. On the 2025 visit, all 19 sites were visited. Future visits could probably reduce the number of Health Check sites.

Table 55. Health Check results – Mixed Herb/shrubland, South Diamond Islet, Tregrosse Reef

Site 1 species present (previously site 28): *Tribulus cistoides*, *Boerhavia albiflora*, *Portulaca oleracea*, *Lepturus repens*, *Achyranthes aspera*, *Argusia argentea*

Site 2 species present (previously site 29): *Achyranthes aspera*, *Tribulus cistoides*, *Portulaca oleracea*

Site 3 species present (previously site 30): *Lepturus repens*, *Argusia argentea*, *Boerhavia albiflora*, *Tribulus cistoides*

Site 4 species present (previously site 31): *Achyranthes aspera*, *Tribulus cistoides*, *Lepturus repens*, *Argusia argentea*, *Portulaca oleracea*

Site 5 species present (previously site 32): *Plumbago zeylanica*, *Abutilon albescens*, *Achyranthes aspera*, *Argusia argentea*, *Tribulus cistoides*

Site 6 species present (previously site 33): *Achyranthes aspera*, *Plumbago zeylanica*, *Abutilon albescens*

Key: **G = good**; **GC = good with some concerns**; **SC = significant concern**; **C = critical**; **NA = not applicable**.

Health Check Indicator	General impression						General impression
	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	
1. Infestations of ecosystem-changing pest plants	G	G	G	G	G	G	G
2. Infestations of pest plants other than ecosystem-changers	G	G	G	G	G	G	G
3. Risk of future invasion by significant pest plants not already present	G	G	G	G	G	G	G
4. Rainforest invasion	G	G	G	G	G	G	G
5. Woody thickening (other than by rainforest species)	G	G	G	G	G	G	G
6. Overgrazing/browsing by feral animals, stray stock or natives	G	G	G	G	G	G	G
7. Trampling, digging or rooting by animals or trampling by visitors	G	G	G	G	G	G	G
8. Impacts on wetlands	NA	NA	NA	NA	NA	NA	NA
9. Vehicle impacts	G	G	G	G	G	G	G
10. Dumping	G	G	G	G	G	G	G
11. Ground cover	G	G	G	G	G	G	G
12. Fire damage to fire-sensitive and non fire-dependent ecosystems	NA	NA	NA	NA	NA	NA	NA

13. Fire damage to fire-adapted peat-based ecosystems	NA	NA	NA	NA	NA	NA	NA
14. Age class distribution in fire-adapted ecosystems in conservation	NA	NA	NA	NA	NA	NA	NA
15. Severe bushfire in fire-adapted wooded ecosystems	NA	NA	NA	NA	NA	NA	NA
16. Severe storm, cyclone or tornado in wooded ecosystems	NA	NA	NA	NA	NA	NA	NA
17. Overtopping, erosion and associated impacts resulting... from...	G	G	G	G	G	G	G
18. Ecosystem health and dieback	G ¹	SC ²	G	G	G	GC ³	G
19. Key features for faunal biodiversity in terrestrial ecosystems	G	G	G	G	G	G	G
20. Recruitment of canopy species	NA	NA	NA	NA	NA	NA	NA
Overall Condition Class G							

¹ Fairly extensive patch of dead *Tribulus cistoides* at Health Check site 1 (previously site 28). This bare patch is being used as nesting habitat for Sooty Terns. Some growth of *Boerhavia albiflora*, *Portulaca oleracea* and new *Tribulus cistoides* shoots were beginning to populate the area at the time of visiting.

² Scale present on *Achyranthes aspera* at this site. No tending ants present. For further information see notes in the vegetation section above. Figure 92 and 93 demonstrates the size of affected area and extent of spread of scale on *Achyranthes aspera* within this site.

³ Scale present amongst *Abutilon albescens* and *Achyranthes aspera* shrubland. No tending ants present (Figure 94).



Figure 92. Presence of scale on *Achyranthes aspera* at Health Check Site 2 (previously Site 29). Tending ants not present.
Fiona Hagger ©



Figure 93. Scale on *Achyranthes aspera* at Health Check Site 2 (previously site 29). Tending ants not present.
Fiona Hagger ©



Figure 94. Scale present at Health Check site 6 (previously site 33), *Abutilon albescens* and *Achyranthes aspera* shrubland, South Diamond Islet. No tending ants present. Contained to a small patch and not affecting surrounding vegetation.
Fiona Hagger ©

Table 56. Health check results – Mixed Herb/shrubland, South Diamond Islet, Tregosse Reef

Site 7 species present (previously site 34): *Portulaca oleracea*, *Boerhavia albiflora*, *Tribulus cistoides*, *Plumbago zeylanica*

Site 8 species present (previously site 35): *Plumbago zeylanica*, *Abutilon albescens*, *Achyranthes aspera*

Site 9 species present (previously site 36): *Tribulus cistoides*, *Boerhavia albiflora*, *Lepturus repens*

Site 10 species present (previously site 37): *Portulaca oleracea*, *Lepturus repens*, *Argusia argentea*

Site 11 species present (previously site 38): *Lepturus repens*

Site 12 species present (previously site 39): *Lepturus repens*, *Argusia argentea*, *Portulaca oleracea*

Key: **G** = good; **GC** = good with some concerns; **SC** = significant concern; **C** = critical; **NA** = not applicable.

Health Check Indicator	General impression						General impression
	Site 7	Site 8	Site 9	Site 10	Site 11	Site 12	
1. Infestations of ecosystem-changing pest plants	G	G	G	G	G	G	G
2. Infestations of pest plants other than ecosystem-changers	G	G	G	G	G	G	G
3. Risk of future invasion by significant pest plants not already present	G	G	G	G	G	G	G
4. Rainforest invasion	G	G	G	G	G	G	G
5. Woody thickening (other than by rainforest species)	G	G	G	G	G	G	G
6. Overgrazing/browsing by feral animals, stray stock or natives	G	G	G	G	G	G	G
7. Trampling, digging or rooting by animals or trampling by visitors	G	G	G	G	G	G	G
8. Impacts on wetlands	NA	NA	NA	NA	NA	NA	NA
9. Vehicle impacts	G	G	G	G	G	G	G
10. Dumping	G	G	G	G	G	G	G
11. Ground cover	G	G	G	G	G	G	G
12. Fire damage to fire-sensitive and non fire-dependent ecosystems	NA	NA	NA	NA	NA	NA	NA
13. Fire damage to fire-adapted peat-based ecosystems	NA	NA	NA	NA	NA	NA	NA
14. Age class distribution in fire-adapted ecosystems in conservation	NA	NA	NA	NA	NA	NA	NA
15. Severe bushfire in fire-adapted wooded ecosystems	NA	NA	NA	NA	NA	NA	NA
16. Severe storm, cyclone or tornado in wooded ecosystems	NA	NA	NA	NA	NA	NA	NA
17. Overtopping, erosion and associated impacts resulting... from...	G	G	G	G	G	G	G
18. Ecosystem health and dieback	G	G	G ⁴	G	G	G	G
19. Key features for faunal biodiversity in terrestrial ecosystems	G	G	G	G	G	G	G
20. Recruitment of canopy species	NA	NA	NA	NA	NA	NA	NA
Overall Condition Class G							

⁴ Patch of dead *Tribulus cistoides* at Health Check site 9 (previously site 36). This Health Check site is in close proximity to Health Check site 1 (just slightly north of site 1, beyond the crest and heading down the dune), and the extensive patch of dead *T. cistoides* in Site 1 extends into Site 9. Site 9 has more growth of *Boerhavia albiflora*, *Portulaca oleracea* and *Tribulus cistoides* shoots beginning to populate the area at the time of visiting.

Table 57. Health check results – Mixed Herb/shrubland, South Diamond Islet, Tregrosse Reef

Site 13 species present (previously site 40): *Tribulus cistoides*, *Lepturus repens*, *Boerhavia albiflora*

Site 14 species present (previously site 41): *Plumbago zeylanica*, *Abutilon albescens*, *Achyranthes aspera*

Site 15 species present (previously site 42): *Achyranthes aspera*, *Plumbago zeylanica*, *Tribulus cistoides*, *Boerhavia albiflora*

Site 16 species present (previously site 43): *Abutilon albescens*, *Plumbago zeylanica*, *Tribulus cistoides*

Site 17 species present (previously site 44): *Tribulus cistoides*, *Achyranthes aspera*, *Lepturus repens*, *Boerhavia albiflora*

Site 18 species present (previously site 45): *Achyranthes aspera*, *Tribulus cistoides*, *Boerhavia albiflora*, *Lepturus repens*

Site 19 species present (previously site 46): *Achyranthes aspera*, *Boerhavia albiflora*, *Tribulus cistoides*, *Lepturus repens*

Key: **G** = good; **GC** = good with some concerns; **SC** = significant concern; **C** = critical; **NA** = not applicable.

Health Check Indicator	Condition Class	General impression
------------------------	-----------------	--------------------

	Site 13	Site 14	Site 15	Site 16	Site 17	Site 18	Site 19	
1. Infestations of ecosystem-changing pest plants	G	G	G	G	G	G	G	G
2. Infestations of pest plants other than ecosystem-changers	G	G	G	G	G	G	G	G
3. Risk of future invasion by significant pest plants not already present	G	G	G	G	G	G	G	G
4. Rainforest invasion	G	G	G	G	G	G	G	G
5. Woody thickening (other than by rainforest species)	G	G	G	G	G	G	G	G
6. Overgrazing/browsing by feral animals, stray stock or natives	G	G	G	G	G	G	G	G
7. Trampling, digging or rooting by animals or trampling by visitors	G	G	G	G	G	G	G	G
8. Impacts on wetlands	NA	NA	NA	NA	NA	NA	NA	NA
9. Vehicle impacts	G	G	G	G	G	G	G	G
10. Dumping	G	G	G	G	G	G	G	G
11. Ground cover	G	G	G	G	G	G	G	G
12. Fire damage to fire-sensitive and non fire-dependent ecosystems	NA	NA	NA	NA	NA	NA	NA	NA
13. Fire damage to fire-adapted peat-based ecosystems	NA	NA	NA	NA	NA	NA	NA	NA
14. Age class distribution in fire-adapted ecosystems in conservation	NA	NA	NA	NA	NA	NA	NA	NA
15. Severe bushfire in fire-adapted wooded ecosystems	NA	NA	NA	NA	NA	NA	NA	NA
16. Severe storm, cyclone or tornado in wooded ecosystems	NA	NA	NA	NA	NA	NA	NA	NA
17. Overtopping, erosion and associated impacts resulting... from...	G	G	G	G	G	G	G	G
18. Ecosystem health and dieback	G ¹	G ¹	G	G	G	GC ¹	G	G
19. Key features for faunal biodiversity in terrestrial ecosystems	G	G	G	G	G	G	G	G
20. Recruitment of canopy species	NA	NA	NA	NA	NA	NA	NA	NA
Overall Condition Class G								

¹ Scale present at Site 18 (previously site 45). No tending ant present. Contained to a small area and not affecting surrounding vegetation (Figure 95).



Figure 95. Scale on *Achyrantes aspera*, site 18 (previously site 45), South Diamond Islet.

Fiona Hagger ©

2.13.3 Birds

Sooty tern nests occupied most bare ground patches within the vegetated parts of the island. Of the two species of frigatebirds in the Coral Sea, only lesser frigatebirds were observed nesting on South Diamond Islet. Ground nesting and tree/shrub nesting was seen.

A creche of 18 young, crested terns was observed along the beach rock on the northern side of the island.

Table 58. Bird species and breeding effort on South Diamond Islet, Tregrosse Reefs.

Key: P= Present, U= Unknown, NR= Not recorded

South Diamond Islet, Tregrosse Reefs 11/06/2025		Breeding effort and life stages				
common name	scientific name	Nests	Chicks	Young	Breeding pairs	Adolescents and adults
red-tailed tropicbird	<i>Phaethon rubricauda roseotinctus</i>	0	0	0	0	0
lesser frigatebird	<i>Fregata ariel</i>	255	1	0	256	370
great frigatebird	<i>Fregata minor</i>	0	0	0	0	0
masked booby	<i>Sula dactylatra dactylatra</i>	20	13	0	33	34
brown booby	<i>Sula leucogaster</i>	38	2	0	40	37
red-footed booby	<i>Sula sula</i>	P	P	0	P	P
black noddy	<i>Anous minutus</i>	0	0	0	0	P
brown noddy	<i>Anous stolidus</i>	P			P	P
bridled tern	<i>Onychoprion anaethetus</i>	0	0	0	0	0
sooty tern	<i>Onychoprion fuscatus</i>	5850	0	0	5850	6000+
roseate tern	<i>Sterna dougallii</i>	0	0	0	0	0
black-naped tern	<i>Sterna sumatrana</i>	0	0	0	0	4
New Caledonian fairy tern	<i>Sternula nereis exsul</i>	0	0	0	0	0
crested tern	<i>Thalasseus bergii</i>	0	0	18	18	12
Herald petrel	<i>Pterodroma heraldica</i>	0	0	0	0	0
Australian pelican	<i>Pelecanus conspicillatus</i>	0	0	0	0	0
ruddy turnstone	<i>Arenaria interpres</i>	0	0	0	0	1
red-necked stint	<i>Calidris ruficollis</i>	0	0	0	0	0
lesser sand plover	<i>Charadrius mongolus</i>	0	0	0	0	0
Pacific golden plover	<i>Pluvialis fulva</i>	0	0	0	0	4
wandering tattler	<i>Tringa incana</i>	0	0	0	0	0
buff-banded rail	<i>Gallirallus philippensis tounelierii</i>	0	0	0	0	0
eastern reef egret	<i>Egretta sacra</i>	0	0	0	0	0
nankeen night-heron	<i>Nycticorax caledonicus</i>	0	0	0	0	0
purple swampphen	<i>Porphyrio melanotus</i>	0	0	0	0	0
sacred kingfisher	<i>Todiramphus sanctus</i>	0	0	0	0	0
welcome swallow	<i>Hirundo neoxena</i>	0	0	0	0	0

2.13.4 Ant Surveys

Two ant species collected, *Cardiocondyla atalanta* at two sites, and *Nylanderia* sp. *obscura* gp. at three sites. Scale bugs present on *Abutilon albescens* and *Achyranthes aspera* shrubland.

A butterfly (Figure 96), the meadow argus *Junonia villida*, was observed this voyage. This is the second species of butterfly recorded at South Diamond Islet since the Island health assessment

voyages began in 2019 (The spotted grass-blue butterfly, *Zizeeria kasandra*, was found in Jul 2021).



Figure 96. A meadow argus (*Junonia villida*), observed on *Acaranthus aspera* plants.
Australian Museum, Sydney ©

2.14 East Diamond Islet – Tregrosse Reef

Island was visited on the 11th of June 2025 (4 hours on island).

2.14.1 Vegetation

Table 59. Vegetation species found on East Diamond Islet on the June 2025 voyage.

Scientific name/community	Common name
<i>Abutilon albescens</i>	lantern bush
<i>Achyranthes aspera</i>	chaff flower
<i>Argusia argentea</i>	octopus bush
<i>Boerhavia albiflora</i> var. <i>albiflora</i>	tar vine
<i>Canavalia rosea</i>	coastal jack bean
<i>Cordia subcordata</i>	Sea trumpet
<i>Ipomoea pes-caprae</i> subsp. <i>brasiliensis</i>	goats foot morning glory
<i>Lepturus repens</i>	stalky grass
<i>Plumbago zeylanica</i>	native plumbago
<i>Portulaca oleracea</i>	pig weed
<i>Stenotaphrum micranthum</i>	beach buffalo grass
<i>Tribulus cistoides</i>	bulls head burr

Other species observed on previous visits that were not found include:

- *Lepidium englerianum* – last found on the previous Parks Australia visit in 2024. It may have been present on this trip, however due to adverse weather conditions not all of the island was traversed.
- A juvenile single plant of *Scaevola taccada* (Cardwell cabbage) was found on East Diamond Islet in 2021. Prior to 2021 it had not been recorded in the CSMP despite being common on Great Barrier Reef islands. This is a transient species, dispersed by ocean currents. It was noted in the 2021 CSMP voyage report that this species was unlikely to persist on East Diamond Island. In 2022 the *S. taccada* was no longer present at the site or anywhere else on the island. It has not been seen since.

At the time of visiting, the vegetation on East Diamond Islet was extremely abundant and lush and made traversing through the centre of the islet difficult. As with the other cays visited on this trip, it was evident that East Diamond Islet had received good rainfall in the lead-up to our visit.

A small but healthy community of *Ipomoea pes-caprae* subsp. *brasiliensis* was found on the southeastern shoreline, where it was last mapped in 2021 (Figure 97).

Due to persistent, very heavy rainfall at the time of visit, Health Checks and comprehensive vegetation checks were not able to be undertaken. The island was traversed as much as possible with priority placed on undertaking a weed check around AMSA's AtoN and path, and visiting *C. subcordata* sites. No weeds were detected on the way to or around the AtoN. Future visits should continue to carefully inspect this area for weeds.

The *C. subcordata* was in better condition than the previous visit in 2024, likely due to the favourable weather conditions. New growth was observed on some of the communities. Wind damage to the exposed upper canopy was still present, as has been the case on previous visits. In 2023 egg scale insect tended by ants was observed on some of the *C. subcordata* plants at BioCondition monitoring site M23. This was not observed in 2025. Future visits should carefully check for evidence of *Pulvinaria urbicola*.



Figure 97. *Ipomoea pes-caprae* subsp *brasiliensis* on East Diamond Islet.

Fiona Haqger ©



Figure 98. Healthy, lush *C. subcordata* supporting nesting birds.

Fiona Hagger ©



Figure 99. *Cordia subcordata* with *Canavalia rosea* vine growing over it.

Fiona Hagger ©



Figure 100. *Cordia subcordata* stand with wind damage.

Fiona Hagger ©

2.14.2 Island Watch/Health Checks

A Parks Australia Island Watch summary proforma for East Diamond Islet (Tregrosse Reef) was completed by Fiona Hagger (Table 60).

Table 60. June 2025 Island Watch summary for East Diamond Islet, Tregrosse Reef.

Island Watch category	
East Diamond Islet (Tregrosse Reef)	
Key Natural Value Assessments	
Birds	
Formal bird survey by A. McDougall	Yes
Any new or unusual sightings, or any changes to condition of nesting/roosting habitat?	No
Island Geomorphology	
Significant island changes	No
Severe storm/cyclone damage?	No
Turtles	
Turtles seen on island	No
Number of nests/body pits:	Not counted.
Any new or unusual sightings, or any changes to the condition of nesting habitat?	No
Native vegetation	
Condition of key veg value: herb/grassland/abutilon	Good – lush and abundant
Anything else of interest, and changes or concerns? Eg dieback, drought – all veg communities	The <i>Cordia subcordata</i> was more looking more health and lush than previous recent visits, likely due to the favourable weather conditions. Some wind damage to the exposed upper canopy.
Threats	
Weeds	
Does the island appear weed free?	No weeds detected. A weed check was undertaken around AMSA's AtoN, including the track taken from the beach by the repair crew last year.
Species observed and brief description.	N/A
Any future actions needed?	Continue weed checks. Continued biosecurity procedures for all visitors to island.
Pest/Invasive animals	
Any signs of pest animals? Includes invertebrates like ants, grasshopper, scale insect etc.	Ant surveys found <i>Tetramorium wroughtonii</i> at three survey sites. No other species were observed, although it is worth noting that there was a lot of rain at the time of surveys. Previous surveys have found <i>Nylanderia bourbonica</i> (2016), <i>Tetramorium simillimum</i> (2021); <i>Tetramorium simillimum</i> , <i>Cardiocondyla nuda/atalanta</i> , <i>Nylanderia obscura</i> (2022); and <i>Nylanderia obscura</i> , <i>Tetramorium simillimum</i> (?) (2023).
Species observed and brief description.	
Any future actions needed? (eg pest monitoring or control work)	Continued ant surveys, continued biosecurity procedures for all visitors to island.
Human impacts/ threats	
Any evidence of fires?	No
Trampling, digging by humans	None detected
Marine debris notes	1 bag of marine debris collected, total equating to 4kg.

Other	
Infrastructure	
Condition of infrastructure, any work required?	Sign maintenance carried out – sign scrubbed to remove bird faeces, and a waterproof coat was also applied. This will need to be checked and potentially carried out each visit by Parks Australia staff.
Cultural values	
Anything observed, anything new or of concern?	No
Monitoring and collections	
Any other monitoring or surveys undertaken	Debris removal, testing for signs of Highly Pathogenic Avian Influenza (HPAI) – Guy Weerasinghe (DAFF), simple vegetation assessments and Island Watch carried out by Fiona Hagger (PA), ant surveys – carried out by Maële Brisset (New Caledonia). Work was restricted due to unfavourable weather conditions. Reef surveys led by Andrew Hoey (JCU)
By whom and where is information to be stored?	Parks Australia to retain and be keeper of island data.
Areas of island visited	
Sites (locations) or whole island	The island was lightly traversed but adverse weather conditions prohibited detailed assessments.

2.14.3 Birds

Bad weather hindered a more thorough survey of the island. Red-tailed tropicbird breeding pair counts have remained similar for East Diamond Islet over several surveys. Lesser frigatebirds appeared (anecdotally) to be fewer in number, compared to previous surveys. Counts were not possible due to the time available and weather conditions present.

Table 61. Bird species and breeding effort on East Diamond Islet, Tregrosse Reefs.

Key: P= Present, U= Unknown, NR= Not recorded

East Diamond Islet, Tregrosse Reefs 11/06/2025		Breeding effort and life stages				
common name	scientific name	Nests	Chicks	Young	Breeding pairs	Adolescents and adults
red-tailed tropicbird	<i>Phaethon rubricauda roseotinctus</i>	19	1	1	21	21
lesser frigatebird	<i>Fregata ariel</i>	P	0	P	P	P
great frigatebird	<i>Fregata minor</i>	P	P	0	P	P
masked booby	<i>Sula dactylatra dactylatra</i>	27	1	0	28	37
brown booby	<i>Sula leucogaster</i>	4	0	0	4	5
red-footed booby	<i>Sula sula</i>	P	P	0	P	P
black noddy	<i>Anous minutus</i>	P	0	0	P	P
brown noddy	<i>Anous stolidus</i>	0	0	0	0	0
bridled tern	<i>Onychoprion anaethetus</i>	0	0	0	0	0
sooty tern	<i>Onychoprion fuscatus</i>	P	0	0	P	P
roseate tern	<i>Sterna dougallii</i>	0	0	0	0	0
black-naped tern	<i>Sterna sumatrana</i>	0	0	0	0	0
New Caledonian fairy tern	<i>Sternula nereis exsul</i>	0	0	0	0	0
crested tern	<i>Thalasseus bergii</i>	0	0	0	0	6
Herald petrel	<i>Pterodroma heraldica</i>	0	0	0	0	0
Australian pelican	<i>Pelecanus conspicillatus</i>	0	0	0	0	0
ruddy turnstone	<i>Arenaria interpres</i>	0	0	0	0	0
red-necked stint	<i>Calidris ruficollis</i>	0	0	0	0	0
lesser sand plover	<i>Charadrius mongolus</i>	0	0	0	0	0
Pacific golden plover	<i>Pluvialis fulva</i>	0	0	0	0	6
wandering tattler	<i>Tringa incana</i>	0	0	0	0	0
buff-banded rail	<i>Gallirallus philippensis tounelieri</i>	0	0	0	0	0
eastern reef egret	<i>Egretta sacra</i>	0	0	0	0	0
nankeen night-heron	<i>Nycticorax caledonicus</i>	0	0	0	0	0
purple swamphen	<i>Porphyrio melanotus</i>	0	0	0	0	0
sacred kingfisher	<i>Todiramphus sanctus</i>	0	0	0	0	0
welcome swallow	<i>Hirundo neoxena</i>	0	0	0	0	1

2.14.4 Ant Surveys

One species recorded, *Tetramorium wroughtonii* at 3 survey sites. No other species were observed, although it is worth noting that there was a lot of rain at the time of surveys. Previous surveys have found *Nylanderia bourbonica* (2016), *Tetramorium simillimum* (2021, 2022, 2023), *Cardiocondyla nuda/atalanta*, *Nylanderia obscura* (2022, 2023).

2.15 Un-named cay – Holmes Reef

Observed from boat during a stop on the 12th June 2025. Unvegetated and un-named cay at Holmes Reef West, which is submerged at high tide. Observations were made of birds.



Figure 101. un-named cay on Holmes Reef.

Andrew McDougall © Queensland Government

2.15.1 Birds

An incidental survey was conducted from the vessel during a stop near an un-named cay at Holmes Reef. The counts are of roosting birds as the site does not support breeding birds, due to the site being submerged at high tide. The count represents the visible part of the cay from our stationary position.

Table 62. Bird species and breeding effort on un-named cay, Holmes Reef.

Key: P= Present, U= Unknown, NR= Not recorded

Unnamed cay, Holmes Reef 12/06/2025		Breeding effort and life stages				
common name	scientific name	Nests	Chicks	Young	Breeding pairs	Adolescents and adults
red-tailed tropicbird	<i>Phaethon rubricauda roseotinctus</i>	0	0	0	0	0
lesser frigatebird	<i>Fregata ariel</i>	0	0	0	0	0
great frigatebird	<i>Fregata minor</i>	0	0	0	0	0
masked booby	<i>Sula dactylatra dactylatra</i>	0	0	0	0	4
brown booby	<i>Sula leucogaster</i>	0	0	0	0	38
red-footed booby	<i>Sula sula</i>	0	0	0	0	2
black noddy	<i>Anous minutus</i>	0	0	0	0	0
brown noddy	<i>Anous stolidus</i>	0	0	0	0	1
bridled tern	<i>Onychoprion anaethetus</i>	0	0	0	0	0
sooty tern	<i>Onychoprion fuscatus</i>	0	0	0	0	4
roseate tern	<i>Sterna dougallii</i>	0	0	0	0	0
black-naped tern	<i>Sterna sumatrana</i>	0	0	0	0	0
New Caledonian fairy tern	<i>Sternula nereis exsul</i>	0	0	0	0	0
crested tern	<i>Thalasseus bergii</i>	0	0	0	0	13
Herald petrel	<i>Pterodroma heraldica</i>	0	0	0	0	0
Australian pelican	<i>Pelecanus conspicillatus</i>	0	0	0	0	0
ruddy turnstone	<i>Arenaria interpres</i>	0	0	0	0	0
red-necked stint	<i>Calidris ruficollis</i>	0	0	0	0	0
lesser sand plover	<i>Charadrius mongolus</i>	0	0	0	0	0
Pacific golden plover	<i>Pluvialis fulva</i>	0	0	0	0	0
wandering tattler	<i>Tringa incana</i>	0	0	0	0	0
buff-banded rail	<i>Gallirallus philippensis tounelieri</i>	0	0	0	0	0
eastern reef egret	<i>Egretta sacra</i>	0	0	0	0	0
nankeen night-heron	<i>Nycticorax caledonicus</i>	0	0	0	0	0
purple swamphen	<i>Porphyrio melanotus</i>	0	0	0	0	0
sacred kingfisher	<i>Todiramphus sanctus</i>	0	0	0	0	0
welcome swallow	<i>Hirundo neoxena</i>	0	0	0	0	0

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Appendix

Appendix 1. Plot Orientation and Data Recorded at Permanent BioCondition Monitoring Sites

Plots are located in representative areas within a vegetation community.

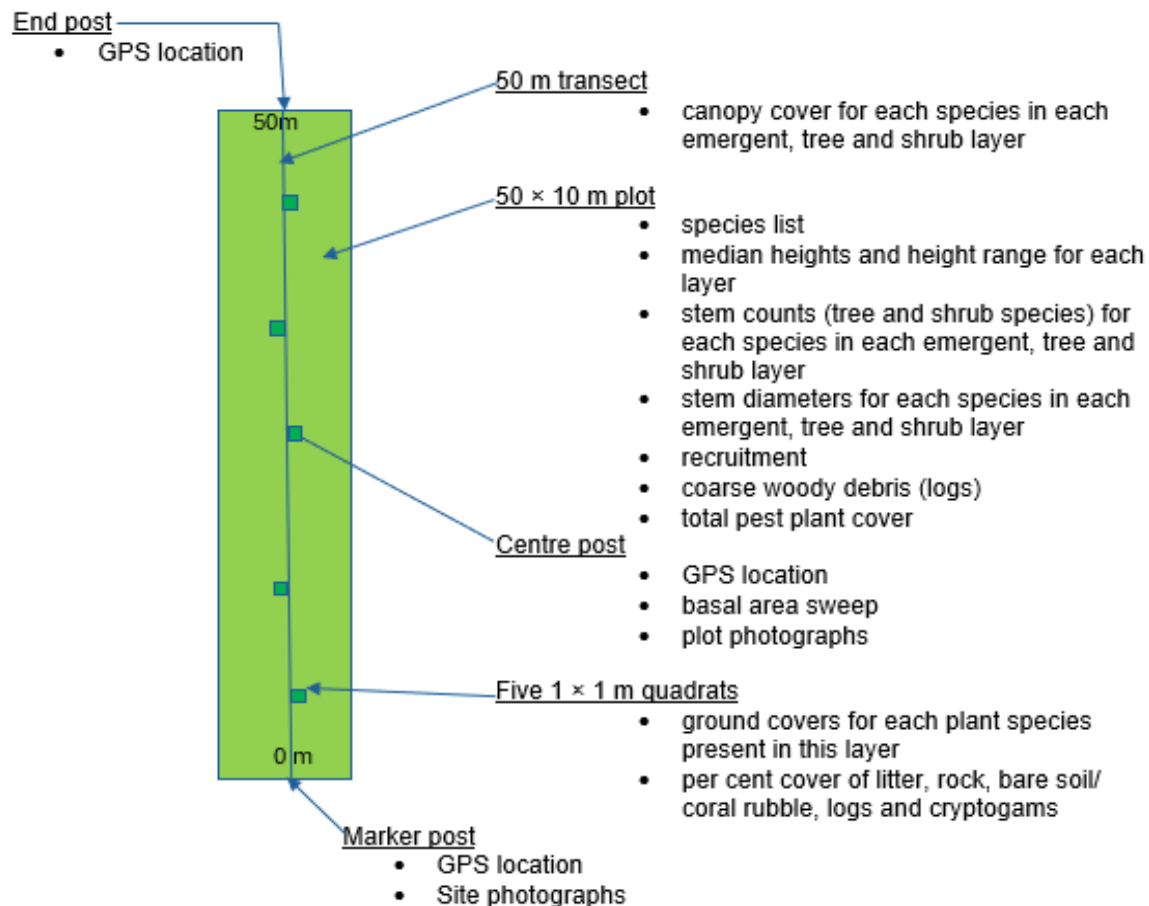


Figure A.1. Plot orientation and data recorded at each permanent vegetation monitoring site.

Site descriptions

Site descriptions for each site are documented. These descriptions include all site attributes that do not change including GPS coordinates and location description, area/width of the vegetation represented by the plot, a position in landscape diagram, landform element, landform pattern, slope, altitude, substrate, plot size and plot orientation.

Other data recorded:

- site number, recorder names, date, start and finish time
- GPS location of plot centre and end points (WGS84 datum), location description, transect bearing
- vegetation structural layers present, median height and height range of each layer
- comprehensive species list for each layer
- ground layer per cent foliage projected cover for each vascular plant species, litter, bare ground, rock outcrop, logs and cryptogams
- per cent crown cover by species for each layer for the emergent, tree and shrub layers (if present)

- from the species list and cover measurements, the following can be derived:
 - vegetation cover in each layer – total and differentiated by growth form
 - native cover in each layer
 - introduced plant (weed) cover in each layer
 - species richness – total and differentiated by growth form
 - native species richness – total and differentiated by growth form
 - introduced plant (weed) species richness – total and differentiated by growth form
 - species richness in each layer present – total and differentiated by growth form
 - native species richness in each layer present – total and differentiated by growth form
 - introduced plant (weed) species richness in each layer present – total and differentiated by growth form
 - estimate of overall introduced plant (weed) cover (including herbaceous and woody weeds)
- stem counts of woody species (if present) per species per layer in the tree and shrub layers; including standing dead plants (count per hectare can be calculated for each species, growth form and layer)
- basal area sweep measurements of woody species (if present) per species per layer
- girth measurements for woody species if present to obtain average diameter of large trees or shrubs (basal area per hectare can be calculated for each species, growth form and layer)
- evidence of recruitment of woody species
- topsoil depth, colour and texture
- soil samples are collected for analysis
- total length of logs (coarse woody debris)
- presence of shearwater burrows or other evidence of bird nesting
- evidence of turtle nesting
- other disturbance type (e.g., evidence of wind damage to vegetation, wind erosion, saltwater inundation, fire, mowing/slashing, other human disturbance) and severity
- patch size
- community extent
- community area
- community context (extent of connectivity to other native vegetation communities)
- evidence of disease, death, dieback, presence of scale insect, insect attack and leaf drop
- recent mean monthly climatic data
- ten site photographs - a landscape and portrait from 0m in the direction of the transect bearing and eight from the plot centre – a landscape and portrait photo facing the direction of the bearing and at 90, 180 and 270 degrees from the direction of the bearing.

Structure of vegetation communities was determined using **Table A.1**

Table A.1. Vegetation structure classifications based on growth form, height and cover.

Proj. foliage cover	>70%	>30–70%	10–30%	<10%
Crown class	Dense/closed	Mid-dense	Sparse	Very sparse
Crown cover % ¹	>80%	>50–80%	20–50%	<20%
GROWTH FORM²	Structural formation classes (qualified by height)			
Trees >30 m	tall closed forest TCF	tall open forest TOF	tall woodland TW	tall open woodland TOW
Trees 10–30 m	closed forest CF	open forest OF	woodland W	open woodland OW
Trees 2–10 m	low closed forest LCF	low open forest LOF	low woodland LW	low open woodland LOW
Shrubs 2–8 m	closed scrub CSC	open scrub OSC	tall shrubland TS	tall open shrubland TOS
Shrubs 1–2 m	closed heath CHT or closed shrubland CS	open heath OHT or shrubland S	shrubland S	open shrubland OS
Shrubs <1 m	dwarf closed shrubland DCS	dwarf open heath DOHT	dwarf shrubland DS	dwarf open shrubland DOS
Succulent shrub	NA	succulent shrubland	succulent shrubland SS	open succulent shrubland OSS
Hummock grasses	NA	NA	hummock grassland HG	open hummock grassland
Tussock grasses	closed tussock grassland CTG	tussock grassland TG	open tussock grassland OTG	sparse tussock grassland STG
Herbs ³	closed herbland CH	herbland H	open herbland OH	sparse herbland SH
Forbs	closed forbland CFB	forbland FB	open forbland OFB	sparse forbland SFB
Rush	closed rushland CR	rushland R	open rushland OR	sparse rushland SR
Vines	closed vineland CVI	vineland VI	open vineland OVI	sparse vineland SVI
Ferns	closed fernland CFN	fernland FN	open fernland OFN	sparse fernland SFN
Sedges	closed sedgeland CV	sedgeland V	open sedgeland OV	sparse sedgeland SV

Appendix 2. Health Check sites

Table A.2. GPS location and site name for each Health Check site assessed on the expedition. All Coordinates are in WGS 84 datum.

Island	Site ID	Lat	Long	Date
North East Cay (Herald)	NE_Herald_Pis_02	-16.94397	149.19945	5/6/2025
	NE_Herald_Arg_01	-16.93959	149.20052	5/6/2025
	NE_Herald_Arg_02	-16.94018	149.19976	5/6/2025
	NE_Herald_Arg_03	-16.94064	149.20228	5/6/2025
	NE_Herald_Cord_01	-16.93979	149.20069	5/6/2025
	NE_Herald_Cord_02	-16.94363	149.20125	5/6/2025
	NE_Herald_Cord_03	-16.94054	149.19948	5/6/2025
South West Islet (Coringa)	SWCoringa_Arg_01	-16.96651	149.90795	6/6/2025
	SWCoringa_Cord_01	-16.96765	149.90713	6/6/2025
	SWCoringa_Cord_02	-16.96651	149.90795	6/6/2025
	SWCoringa_Herb_01	-16.96813	149.90736	6/6/2025
	SWCoringa_Herb_02	-16.96808	149.90951	6/6/2025
North Islet (Willis)	NWillis_Herb_01	-16.11244	149.99243	7/6/2025
	NWillis_Herb_02	-16.11254	150.00403	7/6/2025
	NWillis_Herb_03	-16.11269	150.00323	7/6/2025
	NWillis_Herb_04	-16.11291	150.00188	7/6/2025
	NWillis_Herb_05	-16.11319	150.00104	7/6/2025
South West Cay (Lihou)	SWC_Lihou_Herb_1 (tussock grassland) (prev HC_47)	-17.64368	151.41220	8/6/2025
	SWC_Lihou_Herb_2 (prev HC_48)	-17.64369	151.41268	8/6/2025
	SWC_Lihou_Herb_3 (prev HC_49)	-17.64401	151.41302	8/6/2025
	SWC_Lihou_Herb_4 (prev HC_50)	-17.64410	151.41341	8/6/2025
	SWC_Lihou_Herb_5 (Abutilon) (prev HC_51)	-17.64438	151.41338	8/6/2025
	SWC_Lihou_Herb_6 (Abutilon) (prev HC_52)	-17.64457	151.41366	8/6/2025
	SWC_Lihou_Herb_7 (tussock grassland) (prev HC_53)	-17.64352	151.41557	8/6/2025
	SWC_Lihou_Herb_8 (prev HC_54)	-17.64372	151.41494	8/6/2025
	SWC_Lihou_Herb_9 (closed Abutilon shrubland) (prev HC_55)	-17.64373	151.41474	8/6/2025
	SWC_Lihou_Herb_10 (closed Abutilon shrubland) (prev HC_56)	-17.64396	151.41451	8/6/2025
	SWC_Lihou_Herb_11 (prev HC_57)	-17.64374	151.41436	8/6/2025
	SWC_Lihou_Herb_12 (tussock grassland) (prev HC_58)	-17.64329	151.41362	8/6/2025
Georgina Cay	Georgina_closed herbland_01 (prev HC_59)	-17.59471	151.50317	8/6/2025
	Georgina_open tussock grassland_02 (prev HC_60)	-17.59462	151.50290	8/6/2025
	Georgina_open tussock grassland_03 (prev HC_61)	-17.59603	151.50060	8/6/2025

	Georgina_closed tussock grassland_04 (prev HC_62)	-17.59560	151.50147	8/6/2025
	Georgina_closed herbland_05 (prev HC_63)	-17.59536	151.50150	8/6/2025
	Georgin_closed herbland_06 (prev HC_64)	-17.59452	151.50373	8/6/2025
	Georgina_open tussock grassland_07 (prev HC_65)	-17.59430	151.50423	8/6/2025
Dianna Cay	Dianna_turtle_nesting_area_01 (prev HC_52)	-17.47457	151.75416	9/6/2025
Hermit Crab Islet	Hermit Crab_open tussock grassland_01 (prev HC_77)	-17.41446	151.87015	9/6/2025
	Hermit crab_closed herbland_02 (prev HC_78)	-17.41553	151.87151	9/6/2025
	Hermit Crab_closed herbland_03 (prev HC_79)	-17.41581	151.87443	9/6/2025
	Hermit Crab_open tussock grassland_04 (prev HC_80)	-17.41573	151.87533	9/6/2025
	Hermit Crab_closed tussock grassland_05 (prev HC_81)	-17.41506	151.87280	9/6/2025
	Hermit Crab_open tussock grassland_06 (prev HC_82)	-17.41439	151.87055	9/6/2025
Turtle Islet	Turtle_Isl_HC_01 (prev HC_95)	-17.11996	152.05494	10/6/2025
	Turtle_Isl_closed herbland_HC_02 (prev HC_96)	-17.11639	152.00367	10/6/2025
	Turtle_Isl_open tussock grassland_HC_03 (prev HC_97)	-17.11715	152.00405	10/6/2025
	Turtle Isl_closed herbland_HC_04 (prev HC_98)	-17.11649	152.00372	10/6/2025
	Turtle Isl_open herbland_HC_05 (prev HC_99)	-17.11662	152.00378	10/6/2025
	Turtle Isl_open tussock grassland_HC_06 (prev HC_100)	-17.11650	152.00323	10/6/2025
	Turtle Isl_open tussock grassland_HC_07 (prev HC_101)	-17.11593	152.00358	10/6/2025
Lorna Cay	Lorna Cay_Open herbland_HC_01 (prev HC_103)	-17.12119	151.83594	10/6/2025
	Lorna Cay_Open herbland_HC_02 (prev HC_104)	-17.12057	151.83729	10/6/2025
	Lorna Cay_Closed herbland_HC_03 (prev HC_105)	-17.12165	151.83658	10/6/2025
	Lorna Cay_Open herbland_HC_04 (prev HC_106)	-17.12297	151.83552	10/6/2025
	Lorna Cay_Open herbland_HC_05 (prev HC_107)	-17.12282	151.83509	10/6/2025
	Lorna Cay_Open herbland_HC_06 (prev HC_108)	-17.12418	151.83441	10/6/2025
South Diamond Islet	South Diamond_Strand_HC_01	-17.65809	150.82714	11/6/2025
	South Diamond_Strand_HC_02	-17.65774	150.82649	11/6/2025
	South Diamond_Strand_HC_03	-17.65861	150.82594	11/6/2025
	South Diamond_Strand_HC_04	-17.65899	150.82637	11/6/2025
	South Diamond_Grassland_HC_05	-17.65882	150.82659	11/6/2025
	South Diamond_Grassland_HC_06	-17.65856	150.82694	11/6/2025
	South Diamond_Grassland_HC_07	-17.65845	150.82697	11/6/2025
	South Diamond_Grassland_HC_08	-17.65816	150.82679	11/6/2025
	South Diamond_Strand_HC_09	-17.65797	150.82715	11/6/2025
	South Diamond_Strand_HC_10	-17.65830	150.82758	11/6/2025
	South Diamond_Strand_HC_11	-17.65915	150.82678	11/6/2025
	South Diamond_Grassland with emergent argusia_HC_12	-17.65934	150.82676	11/6/2025
	South Diamond Grassland_HC_13	-17.65789	150.82560	11/6/2025

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	South Diamond Abutilon shrubland_HC_14	-17.65823	150.82688	11/6/2025
	South Diamond Herbland_HC_15	-17.65815	150.82701	11/6/2025
	South Diamond Abutilon shrubland_HC_16	-17.65845	150.82683	11/6/2025
	South Diamond Open herbland_HC_17	-17.65847	150.82659	11/6/2025
	South Diamond Open herbland_HC_18	-17.65870	150.82671	11/6/2025
	South Diamond Open herbland_HC_19	-17.65859	150.82711	11/6/2025
South Islet (Willis Islets)	SWillis_HC_Argusia_01	-16.28679200	149.96320300	11/6/2025
	SWillis_HC_Argusia_02	-16.28854900	149.96614200	11/6/2025
	SWillis_HC_Argusia_03	-16.28847400	149.96569800	11/6/2025
	SWillis_HC_Ipomoea_01	-16.28722800	149.96494400	11/6/2025
	SWillis_HC_Lepturus_grassland_01	-16.28593000	149.96339000	11/6/2025
	SWillis_HC_Sporobolus_grassland_01	-16.28644000	149.96366000	11/6/2025
	SWillis_HC_Sporobolus_grassland_02	-16.28789600	149.96569100	11/6/2025
	SWillis_HC_Sporobolus_grassland_03	-16.28664000	149.96390500	11/6/2025