

Browse Island

A journey to Western Australia's most remote nature reserve

A trip to Browse Island highlights the challenges of travelling to, and managing, our remote nature reserves, and the importance of biosecurity vigilance on our offshore islands.

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Located about 450 kilometres north-northeast of Broome, and accessed by a 24-hour boat trip, Browse Island is the most remote island nature reserve in Western Australia. It lies in a vast ocean that straddles the Timor Sea and Indian Ocean. And, at 175 kilometres from the nearest Kimberley coastline, the nature reserve feels more like an Indonesian territory than an Australian one. Browse Island is a small (some 17 hectares) low-lying and densely vegetated coral cay that sits at the middle of a near-circular and spectacular white sandy beach, and is surrounded by a fringing reef exposed to strong winds and swell.

The island had not been visited by department staff since 2005. So, in early

August 2018 DBCA scientists and West Kimberley District staff, together with renowned seabird expert George Swann, boarded a 20-metre charter vessel in Broome to make the journey to this remote outpost to record the current status of the island's flora and fauna, particularly seabirds, and report on the presence of introduced weeds and house mice.

THE EARLY YEARS

In 1872, a merchant ship sailing from Darwin to Fremantle was becalmed in waters off the north-west Kimberley coast. To pass the time, its owner George Howlett followed large flocks of seabirds that were converging towards a nearby landmass, which is now known as Browse



Island. However, it is thought that the famed English explorer William Dampier was the first European to record the island in September 1699, when he sighted a “small low sandy Island, ... inhabited only by boobies and man-of-war birds



Above Browse Island is located in a vast ocean between the Timor Sea and Indian Ocean.
 Photo – Dorian Moro/DBCA

Top right The island was declared a nature reserve in 1991.
 Photo – Bruce Greatwich/DBCA

Above right Traps were used to survey for house mice on the island.
 Photo – Dorian Moro/DBCA

[frigate birds]”. Enterprising companies soon learnt of the substantial deposits of guano (bird droppings) on the island and recognised its value as an agricultural fertiliser for the phosphorus and nutrient-poor farming lands of south-western WA.

The Browse Island Guano Company Limited was established on 26 February 1876 in Adelaide, South Australia to mine the guano accumulation and export it to markets overseas. The company mined the guano deposits extensively for 10 years before operations ceased. Guano extraction on the island continued periodically under separate leases until 1921 when high-quality guano deposits on the island were exhausted.

There is still abundant evidence of the industry on the island today – remnants of the stacked rock phosphate stone walls and supporting structures, rail tracks used to guide loaded carts from the interior to the coast, and even gravesites of deceased miners. Unfortunately, the industry also left behind far more sinister

legacies, including introduced species such as cats and house mice. An early painting from 1878, held by the Yarmouth County Museum, Nova Scotia, depicts evidence of significantly altered vegetation, which, while unrecorded, has no doubt impacted the colonies of seabirds that nest there and the nesting turtles that visit the island.

Early shipping reports in newspapers accessed via the National Library of Australia’s online newspaper archive, Trove, provide some clues to the impacts of guano mining to the island. The captain of the brig *Silver Stream* called at Browse Island on the way to Darwin in 1885, reporting “two vessels were loading with guano. The flat, scrubby island was covered with one mass of birds, and on

it were also seen a number of wild cats and some fowls and pigs”. Surprisingly, feral cats persisted on Browse Island well after guano mining ceased with the naval commanding officer of the HMAS *Canberra* reporting the presence of “a small famished looking cat” in 1929 and the renowned ornithologist Dominic Serventy was “surprised to see the tracks of a domestic cat” during his visit in 1949.

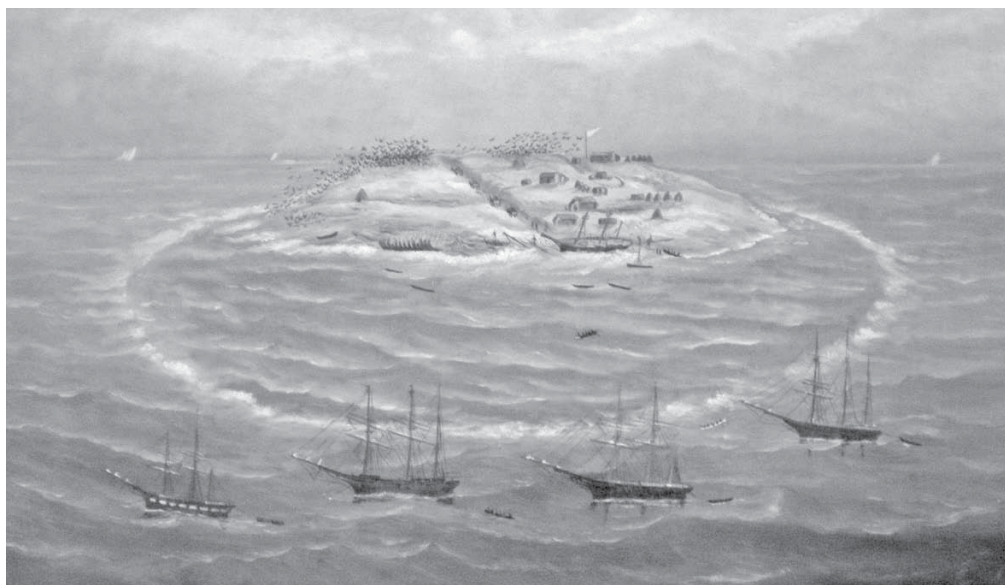
MODERN TIMES

Traditional Indonesian fishing vessels (known as perahus) have frequented Browse Island, which is a class ‘A’ Nature Reserve, for some time. Since 1974, the Australian Government has allowed these traditional fishers access to the marine area surrounding Browse Island under a Memorandum of Understanding (MoU). The primary market interests of those aboard these vessels are species such as trepang, clam, fish (including sharks) and trochus shells. The MoU does not allow for landings on the island itself, but there is observational and recent historical evidence of human access and wildlife poaching to suggest it occurs anyway.

There are at least six substantial shipwrecks reported around the island, mostly due to periodic cyclones during the guano mining era. All these wrecks are protected under the *State Government Maritime Archaeology Act 1973* and disturbance or removal of any material is illegal.

THE CHALLENGES OF GETTING THERE

Working on island nature reserves off the Western Australian coast presents various logistical challenges. Browse Island’s isolation makes it difficult and costly to get to, and probably explains why the last departmental survey of the island was 13 years ago. Coupled with the remoteness of this nature reserve is the uncertainty of the sea conditions, including swell, which made getting to and from the island an adventure in itself. During our August 2018 trip we experienced strong southerly winds, up to 35 knots. Choppy sea conditions made



Top An 1885 painting of Browse Island shows the impact of guano mining on Browse Island. *Image – Yarmouth County Museum and Archives, Yarmouth, Nova Scotia, Canada*

Above Traditional Indonesian fishing vessels are permitted in the waters around Browse Island under an MoU. *Photo – Bruce Greatwich/DBCA*

for a rough trip and provided some of us on board with a new definition of what it meant to be seasick.

Sighting the island was a relief, and we observed 13 traditional Indonesian fishing vessels anchored offshore, indicating the continued use of this area. But landing on the island was another challenge, as the dinghy we used to ferry gear and people ashore had to negotiate the outer reef and associated surf breaks. Timing the landing ashore required patience and the right ocean calm to unload the gear, as the tides

in the area are large (up to 10 metres) and the resulting currents strong.

THE MOUSE ON BROWSE

A key objective of this survey was to record the status of introduced house mice on the island, and to assess their threat to the island’s ecosystem, particularly nesting birds. House mice were initially collected on the island during a visit in June 1972 by departmental staff undertaking the first biological survey of the Kimberley islands from 1971 to 1973. Oil company personnel stationed on the island at the time kindly trapped eight mice for the visiting survey crew.

There are numerous sub-species of house mice worldwide; the western European house mouse (*Mus musculus domesticus*) is currently the only subspecies known from Australia. It is thought to have come from England with the first fleet. In fact, it was not until 2012 that the identity of the ‘mouse from Browse’ was revealed. A tissue sample from a



Above A survey of house mice aimed to estimate how abundant they were on the island.

Photo – Bruce Greatwich/DBCA

Above right Getting to and from Browse Island involved a 24-hour boat journey.

Photo – Dorian Moro/DBCA

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single mouse trapped on Browse Island by a seabird survey team lead by Dr Rohan Clarke from Monash University was forwarded to the house mouse genetics lab of Dr Hitoshi Suzuki at Hokkaido University, Japan. He confirmed that the house mice on Browse and Ashmore Reef islands belonged to a tropical species of house mouse: the south-east Asian house mouse (*Mus musculus castaneus*). Genetically, these mice align with those of the Indonesian islands of Rote and Timor and therefore pose a biosecurity risk to Australia should they stowaway in vessels or cargo that land on the island. Their impact to seabirds on the island also remains unknown.

Our team set up to 600 snap traps across the island as we had no understanding of how many mice we may catch, nor how long our landing may be, due to the uncertainty of the weather. Traps were established on a 15-metre grid across the entire vegetated part of the island.

It became clear the next day that mouse densities were very high; 550 animals were captured overnight. The dry nature of the vegetation together with high mouse densities suggested food was likely in short supply – most mice had cannibalised other dead mice in the traps. We collected liver samples for future genetic analyses, and kept some mice as museum specimens. We also found that this Asian house mouse averaged about 19 grams, making it about 35 per cent heavier than their counterparts from other islands and the mainland.

FLORA AND WEEDS

The island is densely vegetated with the tall spindly shrub Indian lantern flower (*Abutilon indicum* var. *australiense*) cloaked with the tangling creeper *Ipomoea macrantha*, which made walking in straight lines to set mouse traps challenging. While the vegetation complex is relatively uniform, a potential new species of plant was recorded not just for the island, but as a first record for the Western Australian census. This species, the fish plate shrub (*Guettarda speciosa*), is known from nearby islands at Ashmore Reef, so it is likely to have been self-introduced to the island. A representative sample of all flora species observed was taken and subsequently lodged with the WA Herbarium and is awaiting identification.

The only obvious weed observed on the island was buffel grass (*Cenchrus ciliaris*), which has been previously reported there.

MARINE RUBBISH

Another objective of the survey was to conduct a beach clean-up. Marine debris that had washed up on the sand was collected, sorted, bagged and removed from the island. We spent considerable time recording the items onto a datasheet and categorising each item into one of 55 possible categories with records contributing to the Australian Marine Debris Initiative coordinated by the Tangaroa Blue Foundation – a not-for-profit organisation focused on protecting our oceans. The rubbish we collected was diverse. Of particular note was the large number of plastic drink bottles, fish netting, aluminium cans, shoes (including thongs), and many other plastics and consumables including an old Asian whiskey bottle with a bracelet inside. Overall, some seven kilograms of rubbish was removed over the one-and-a-half days we were on the island.

SEABIRDS

Browse Island was the most famous of the northern Australian islands for guano mining, suggesting it was once the ‘jewel in the crown’ of seabird islands off the Kimberley coast, and leading to it being described in 1876 as having “... been appropriated by millions of the feathered



Left Seven kilograms of rubbish was collected at the island.

Photo – Bruce Greatwich/DBCA

Below left Crested terns occur on Browse Island.

Photo – Rob Drummond/Lochman
Transparencies

Below right Buff-banded rail were observed during the survey.

Photo – Bruce Greatwich/DBCA



of modern-day threats such as weeds and house mice, and encouragement of breeding through bird decoys and other methods, we hope the skies of Browse Island may once again be filled with the raucous chatter and breathtaking spectacle of thousands of seabirds.

MARINE TURTLES

The green turtles (*Chelonia mydas*) that nest at Browse Island, together with those that nest 170 kilometres away at Scott Reef, form a discrete genetic stock within the world's green marine turtle populations. This highlights the importance of these islands to this nesting region and demonstrates a lack of movement between neighbouring rookeries on other islands or mainland Australia. The remoteness of Browse Island, and the challenges of visiting there, means that managing the nature reserve and policing activities there are difficult. For example, there are reports over the past 20 years of poaching of adult green turtles that have been found to have been killed on the beach before laying, and their eggs removed.

Our survey of the beach area above the high-water mark confirmed that green turtles still nest on Browse Island, although their numbers remain unknown. Our early morning walks revealed evidence of hatchling tracks in the sand, which suggests some level of successful hatching occurs. One adult female was sighted returning to the sea following nesting. Thankfully, no evidence of illegal harvests were found at this time, however, peak nesting season occurs over

tribe, whose eggs lie scattered thickly over every available part of the islet”.

Unfortunately, it appears a combination of historical impacts including guano mining and the introduction of feral cats and house mice, is likely to have resulted in the abandonment of Browse Island as a seabird breeding colony. Dominic Serventy's visit to the island in 1949 proved a great disappointment as “there were no seabirds of any kind present, nor any indication that the island had been used as a nesting or roosting place for years”.

Consistent with more recent visits to the island by ornithologists, our survey reported comparatively little bird life. The most conspicuous birds were pacific reef herons (*Egretta sacra*), and greater crested terns (*Thalasseus bergii*). The island-hopping buff-banded rail (*Gallirallus philippensis*) was also flushed on numerous occasions as we went about setting mouse traps.

However, it's not all doom and gloom. We recorded the first modern record of significant numbers of brown boobies (*Sula leucogaster*) using the island, with up to 200 individuals observed flying in just before dusk to roost on the beach, suggesting birds in the area are again utilising the island. Furthermore, we encountered a small number (six pairs) of bridled terns (*Onychoprion anaethetus*) exhibiting breeding behaviour. Investigating one location where these birds were frequently seen revealed the presence of a single chick – the first documented breeding of this species on the island in modern times.

Off the Kimberley's north-west coast, significant seabird breeding colonies exist at Lacepede Islands Nature Reserve, Adele Island Nature Reserve and Ashmore Reef. Browse Island is positioned between Ashmore Reef and Adele Island and therefore forms a link between these islands. Perhaps with the elimination



the summer period, so we did not expect numbers to be high during our survey.

SIGN INSTALLATION

One final job of our trip was to install a new dual-language (English and Indonesian) sign on the northern part of the island. We hope that by providing information about the importance of this island for the conservation of seabird and nesting turtle populations we can inform those aboard fishing and tourism vessels about the biosecurity risks associated with landing on the island, and we can establish what is hopefully a new chapter in the history of this remote reserve.

LOOKING FORWARD

The (potentially thousands) of south-east Asian house mice on this island present a biosecurity risk to Australia, and most likely threaten the viability of seabird eggs and possibly turtle eggs. Rodents are known to prey on seabird eggs on islands elsewhere around Australia, and globally. The high density of house mice we observed from a single night's trapping on Browse Island, coupled with the lack of nesting seabirds, is concerning. While it has been recognised that Browse Island was historically a significant seabird site, contemporary evidence indicates this is no longer the case.

Given what we know about the high abundance of nesting seabird colonies on nearby Ashmore Reef, Adele Island and Lacepede Islands, it is plausible that high densities of house mice may be

one of the key reasons for the lack of seabirds using the island today. Moreover, we know that seabirds recolonise and promptly nest on islands where rodents have been eradicated. So future island management may need to factor in the importance of this island to seabirds – and nesting turtles – and to consider the eradication of house mice to promote seabird recolonisation of this remote, but important land mass.

Above left A dual-language sign was installed at the island to communicate with Indonesian fishermen.

Photo – Bruce Greatwich/DBCA

Above The survey will help inform management actions to protect and conserve Browse Island.

Below All equipment had to be transferred on and off Browse Island using a small vessel.

Photos – Dorian Moro/DBCA



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