A visit to Middle Island

Islands are places of romantic appeal—and Western Australia has hundreds of them, from the south coast to the Kimberley. Every island is different and each one has a story to tell. Department of Environment and Conservation officers Andrew Williams and Robert Powell have visited a number of islands to study butterflies, including fascinating Middle Island in the Recherche Archipelago.

by Andrew A E Williams and Robert Powell

Not so long ago, Western Australia's islands were actually part of the Australian mainland. During the last glacial maximum, some 18,000 years ago, the expanding polar ice-packs sucked up vast quantities of oceanic water. As a result, sea levels fell, and our islands became high points on an expanding coastal plain. Since then sea levels have risen, re-forming today's islands.

WA's islands vary in age. Some of those furthest from the mainland may have existed for 15,000 years, others for much less time. Rottnest Island, 18 kilometres off Perth, has apparently been separated from the mainland for 7000 years. Remarkably, Aboriginal oral history records Aboriginal ancestors as being able to walk from what is now Fremantle across Gage Roads to Rottnest.

Many islands have a distinctive appearance. Fires are usually less frequent on islands than on the adjacent mainland, but the pressure on plants from grazing animals is often higher. Such factors often result in island vegetation that is dramatically different from that of the nearby mainland.

From a conservation standpoint, islands may be immensely valuable as refuges for animals marooned as sea levels rose. Lancelin Island, for example, which lies less than a kilometre from the mainland, is the only place where the Lancelin Island skink (*Ctenotus lancelini*) is now known to occur. Interestingly, the original population of this species now appears to have disappeared from the mainland. Some of our mammals that have become extinct on the mainland through the introduction of the fox and the cat still exist on some islands. Islands also provide places where many seabirds can nest, free from many mainland predators.

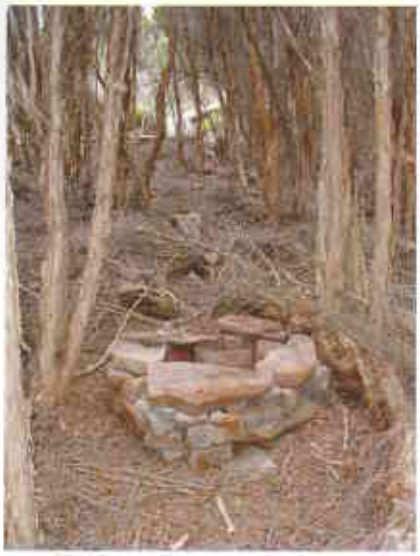
Biologically, WA's islands are fascinating places to study. Even though they have been isolated for a relatively short time, some already have animal forms that are distinct from their counterparts on the mainland. Two islands in the Recherche Archipelago have an endemic subspecies of dugite (*Pseudonaja affinis tanneri*) and the Houtman Abrolhos Islands have a distinct subspecies of spiny-tailed skink (*Egernia stokesii stokesii*).

Previous page
Main Aerial view of the northern shore of Lake Hillier on Middle Island.
Photo – David Bettini
Inset bottom Native hibiscus (*Alogyne hakeifolia*) after a fire in 1977.
Photo – Angas Hopkins/DEC
Inset right Fringed heath-blue (*Neolucia agricola*), a common resident butterfly.

Below Flinders Peak, Middle Island, viewed from nearby Goose Island.
Photos – Robert Powell/DEC

The Recherche Archipelago

The 100 or so islands of the Recherche Archipelago lie off the southern coast of Western Australia east of Esperance. Their earliest recorded history dates back to 1627, when Pieter Nuyts and Francois Thijssen visited the south coast of Australia in the Dutch ship *Gulden Zeepaard*. The next recorded visit, more than 150 years later, was in 1791, when Captain Vancouver arrived aboard the *Discovery*. The following year, Rear Admiral Bruny D'Entrecasteaux, in command of two ships, *La Recherche* and *L'Esperance*, visited the south coast, and named the islands 'L'Archipel de la Recherche'. D'Entrecasteaux did not, however, proceed through the archipelago, but chose rather to skirt



around it, following a safer, more southerly route.

In January 1802, Matthew Flinders arrived on board the *Investigator*. His party, which included noted botanist Robert Brown, was the first to set foot on Middle Island, the largest island in the archipelago. In 1803, having completed a circumnavigation of the continent, Flinders again visited Middle Island, where he buried two of his crew members, Charles Douglas and William Hillier. In 1818, Captain Phillip Parker King, on board the *Mermaid*, briefly visited Middle Island.

By 1825, reports of abundant seals had lured sealers to the south coast. By all accounts they were a rough lot, many being time-expired convicts, sent out by merchants from Sydney. Newspapers of the day (*Perth Gazette* and *Western Australian Journal*) reported on the activities of these lawless gangs, which had established themselves on the archipelago's largest islands. For a time the archipelago was virtually ruled by the notorious 'Black Anderson', a giant African–American from Long Island. About this time, Middle Island became a centre for whaling. Evidence of the stone houses and stone-lined wells built in those days is still visible today. When the whaling industry declined, Middle Island was abandoned and was not reoccupied until the end of the century, when salt was mined for a short time on Lake Hillier. Some years later, in June 1920, the SS *Penguin* was deliberately run aground in shallow water off Belinda Beach. The remains of its rusting hull can still be seen protruding from the water.

Top left Restored stone-lined well, originally built in whaling days.
Photo – Robert Powell/DEC

Top Lake Hillier.
Photo – David Bettini

Above The SS *Penguin* was wrecked on Middle Island in 1920 while trying to shelter from a gale. It was engaged in survey work at the time.
Photo – Andrew Williams/DEC

In 1950 the Australian Geographical Society conducted a comprehensive biological survey of 20 of the archipelago's islands, including Middle Island. Today, the islands of the Recherche Archipelago are encompassed within the Recherche Archipelago Nature Reserve, and managed by the Department of Environment and Conservation (DEC).

Middle Island

Middle Island (1080 hectares) lies about 120 kilometres east of Esperance and 8.5 kilometres south of the mainland at Cape Arid. Its dominant feature, Flinders Peak, rises to 174 metres. Its coastline is very irregular, with numerous promontories and coves. The only safe landing is Belinda Beach, on the northern side of the island, sheltered from the southerly swells. The island is composed largely of granite, though part of the central

area is overlain with limestone, and sand has accumulated in some valleys. The different soils give rise to a varied flora. Middle Island is the only island in the archipelago to have a lake. Lake Hillier, pink and hypersaline, is located behind a narrow, steep dune inland from Belinda Beach.

In November 2003, reserve management personnel from DEC's (then CALM's) Esperance office visited Middle Island to repair a boardwalk and erect new reserve signs. We joined the party to document the island's butterfly fauna. November was chosen as the best month for this purpose. We also took the opportunity to observe the island's vertebrate fauna and to study its vegetation.

Left Tall eucalypts in long-unburnt vegetation photographed on Middle Island in the 1970s.
Photo – Angas Hopkins/DEC

Below View across Lake Hillier. Eucalypts and moonahs (*Melaleuca lanceolata*) growing densely in the background are still far from their mature size, more than 26 years after the 1977 fire.
Photo – Robert Powell/DEC

Because Middle Island is part of the Recherche Archipelago Nature Reserve, strict conditions apply to visits to the island.

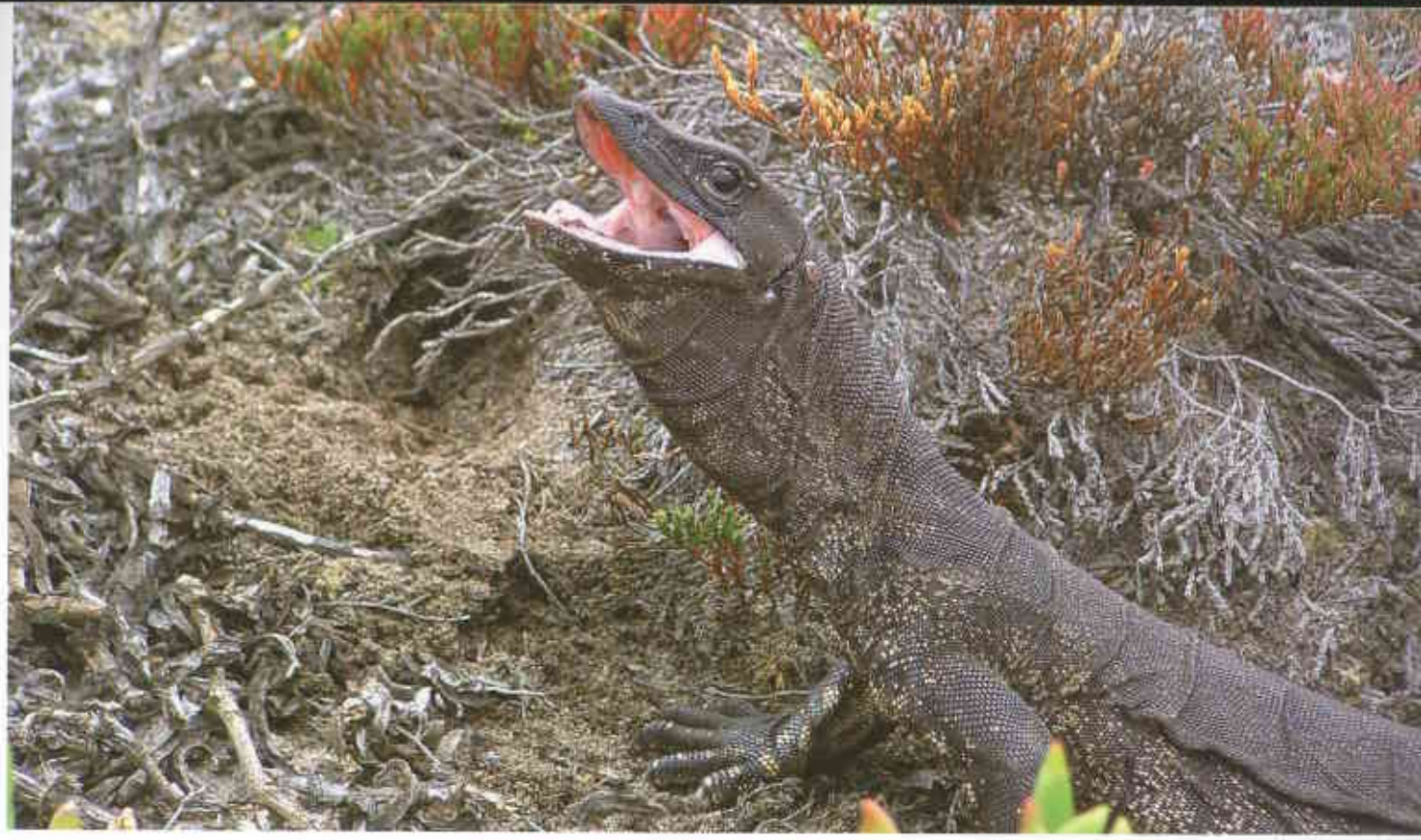
Vegetation

In 1972 a major wildfire burnt half of Middle Island and, the following year, staff from the WA Herbarium, the WA Wildlife Research Centre and other institutions collaborated to begin a study of its effects (an account of which is published in *SWANS*, Volume 11, No. 2, 1981). These studies established that, before the fire, Middle Island had not been burnt for 170 years. Unfortunately, a second wildfire, in 1977, burnt much of the remaining area, precluding further study of vegetation that had remained unburnt for such a long time.

On the mainland many tree and shrub species survive being burnt, and recover by resprouting from epicormic shoots along their branches, or from underground rootstocks. The fires on Middle Island, however, killed virtually all the trees and shrubs outright, and the subsequent regrowth was almost entirely from seedlings. Most of the area we explored was burnt in the fire of 1977. It was apparent that, 26 years later, the vegetation was far from fully developed. The eucalypts and moonahs (*Melaleuca lanceolata*) were still quite small and juvenile. We contemplated how very different it would have been had the fires not occurred: the old vegetation would have had a special beauty and given us a sense of timelessness. Moreover, we would have been able to get about much more easily. The old, tall vegetation, much more open at ground level than the dense tangle we encountered, would have allowed us access to Flinders Peak to look for hilltopping butterflies.

Vertebrate fauna

One mammal, 15 reptile species and a frog have been recorded from Middle Island. Our opportunistic observations showed that many species continue to flourish. Tammar wallabies (*Macropus eugenii*) were very common, particularly in the dense cover south of Lake Hillier. Southern heath monitors (*Varanus rosenbergi*), the island's main predators, were often foraging for invertebrates in leaf litter



Above Southern heath monitor.
Photo – Robert Powell/DEC

Right The spotted-thighed frog occurs in southern WA, including two islands in the Recherche Archipelago. Here it takes advantage of summer rains to breed.
Photo – David Pearson/DEC

around our campsite, and at times were bold enough to enter our tents! Ornate dragons (*Ctenophorus ornatus*) were active on exposed granite surfaces during the day. Several skink species, including Napoleon's skink (*Egernia napoleonis*) and *Bassiana trilineata*, were seen in shrubland and woodland habitats. At night, marbled geckos (*Phyllodactylus marmoratus*) and barking geckos (*Underwoodisaurus milii*) were spotted with the lights of our head-torches. A crowned snake (*Elapognathus coronata*) was found coiled under a sheet of exfoliating granite, and tadpoles, probably of the spotted-thighed frog (*Litoria cyclorhynchus*), inhabited a rock pool on a granite dome near our campsite. Several species of birds were seen, including the sooty oystercatcher, Pacific gull, white-bellied sea-eagle, silvereye and singing honeyeater.

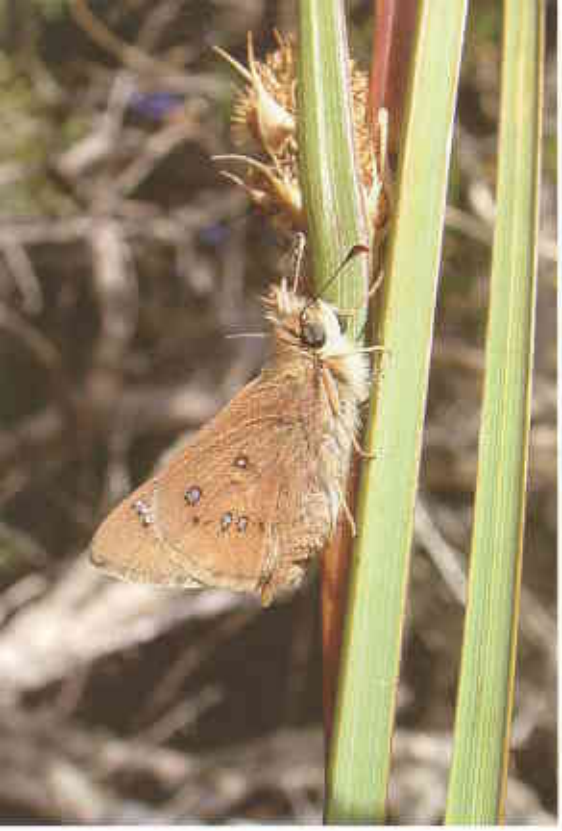
Butterflies

Island butterflies can conveniently be divided into 'visitors' and 'permanent residents'. The visitors are species that travel between the island and the mainland. They may breed on the island if the right plants grow there, but readily leave the island, and there are times when neither the butterflies nor their eggs, larvae or pupae are present. The permanent residents breed and also remain on the island. At any time of year either the adult butterflies or their eggs, larvae or pupae will be present. Most butterfly species fall neatly into one of those categories. Most visitors breed continuously and have several generations a year, whereas most permanent residents have just one generation a year.

Studying island butterflies tells us which species are mobile enough to travel to islands, and which species are able to maintain a sedentary population on an island. Islands that lie different distances from the mainland can show us what distances the more mobile butterfly species will travel, and islands of different sizes show what size of habitat is necessary for the more sedentary species.

We recorded six butterfly species on Middle Island. Four of them—the Australian painted lady (*Vanessa kershawi*), yellow admiral (*Vanessa itea*), meadow argus (*Junonia villida*) and common grass-blue (*Zizina labradus*)—fall into the 'visitor' category.

The first three are powerful, fast-flying insects, known to be highly



Far left A golden-haired sedge-skipper (*Hesperilla chrysotricha*) on coast saw-sedge (*Gahnia trifida*) on which the larvae feed.

Left Fringed heath-blue butterfly.

Below left Australian painted lady (*Vanessa kershawi*), a highly mobile butterfly and a typical visitor from the mainland.

Bottom Andrew Williams setting butterfly specimens.
Photos – Robert Powell/DEC

mobile and migratory. They typically turn up on islands, even distant ones, where they breed on suitable plants. We recorded all three on islands of the Houtman Abrolhos group, 60-70 kilometres off the coast west of Geraldton. The last, the common grass-blue, does not fly so strongly, and probably relies more on favourable winds to travel to islands. During our survey on Mondrain Island, also in the Recherche Archipelago, 11 kilometres from the coast, we did not encounter this butterfly during the first three days, but found it in abundance on the fourth day, after the wind began to blow from the north-east, more the direction of the mainland.

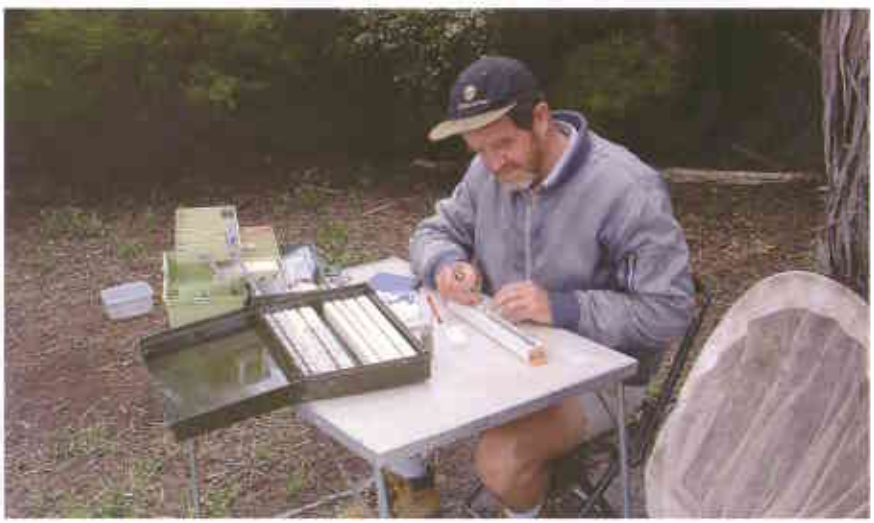
The remaining two species—the fringed heath-blue (*Neolucia agricola*) and the golden-haired sedge-skipper (*Hesperilla chrysotricha*)—are likely to be permanent residents.

The fringed heath-blue was common and widespread on Middle Island. It breeds on plants in the pea family (*Fabaceae*), in such genera as *Pultenaea* and *Eutaxia*. Specimens were found near flowering shrubs of *Pultenaea obcordata* and *Eutaxia obovata*, on which the larvae would undoubtedly feed.

Skipping danger

The golden-haired sedge-skipper was locally abundant along the eastern shoreline of Lake Hillier, where the plant on which the larvae feed, coast saw-sedge (*Gahnia trifida*), grows in a narrow belt. In the early mornings, males were seen flying among the foliage, searching for newly-emerged unmated females. The larvae live in tubular shelters, which they make by producing silk and sewing three or four of the sedge's leaves together. One end of this tube is left open and the larva comes out occasionally to feed. Once it is mature it seals the entrance with a wad of silk and then pupates. The butterflies emerge in November, and are on the wing for only a week or two. Having mated, the females then lay their eggs on the sedge and the life-cycle begins again.

Wildfires on islands can threaten resident butterfly populations by destroying the foliage on which their larvae feed. The 1977 fire may well have burnt much or all of the coast saw-sedge at Lake Hillier. The sedge-skipper survived, however, probably because clumps of the sedge also occur on parts of the island not affected by this fire.



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