

= Lord Howe Island =

Lord Howe Island (/ ˈhɑː / , local / ˈhæ?? / ; formerly Lord Howe 's Island) is an irregularly crescent @-@ shaped volcanic remnant in the Tasman Sea between Australia and New Zealand , 600 kilometres (370 mi) directly east of mainland Port Macquarie , and about 900 kilometres (560 mi) south @-@ west of Norfolk Island . It is about 10 km long and between 2 @. @ 0 km and 0 @. @ 3 km wide with an area of 14 @. @ 55 km² , though just 3 @. @ 98 km² of that comprises the low @-@ lying developed part of the island . Along the west coast there is a sandy semi @-@ enclosed sheltered coral reef lagoon . Most of the population lives in the north , while the south is dominated by forested hills rising to the highest point on the island , Mount Gower (875 m or 2 @, @ 871 ft) . The Lord Howe Island Group comprises 28 islands , islets and rocks . Apart from Lord Howe Island itself the most notable of these is the volcanic and uninhabited Ball 's Pyramid about 23 kilometres (14 mi) to the south @-@ east of Howe . To the north lies the Admiralty Group , a cluster of seven small uninhabited islands .

The first reported sighting of Lord Howe Island took place on 17 February 1788 , when Lieutenant Henry Lidgbird Ball , commander of the Armed Tender HMS Supply was en route from Botany Bay to found a penal settlement on Norfolk Island . On the return journey Ball sent a party ashore on Lord Howe Island to claim it as a British possession . It subsequently became a provisioning port for the whaling industry , and was permanently settled in June 1834 . When whaling declined , the 1880s saw the beginning of the worldwide export of the endemic kentia palms , which remains a key component of the Island 's economy . The other continuing industry , tourism , began after World War II ended in 1945 .

The Lord Howe Island Group is part of the state of New South Wales and for legal purposes is regarded as an unincorporated area administered by the Lord Howe Island Board which reports to the New South Wales Minister for Environment and Heritage . The island 's standard time zone is UTC + 10 : 30 , or UTC + 11 when daylight saving time applies . The currency is the Australian dollar . Commuter airlines provide flights to Sydney , Brisbane , and Port Macquarie .

UNESCO records the Lord Howe Island Group as a World Heritage Site of global natural significance . Most of the island is virtually untouched forest , with many of the plants and animals found nowhere else in the world . Other natural attractions include the diversity of the landscapes , the variety of upper mantle and oceanic basalts , the world 's southernmost barrier coral reef , nesting seabirds , and the rich historical and cultural heritage . The Lord Howe Island Act of 1981 established a " Permanent Park Preserve " (covering about 70 per cent of the island) . The surrounding waters are a protected region designated the Lord Howe Island Marine Park .

= = History = =

= = = 1788 ? 1834 : First European visits = = =

It appears that , prior to European discovery and settlement , Lord Howe Island was uninhabited , and unknown to Polynesian peoples of the South Pacific . The first reported European sighting of Lord Howe Island was on 17 February 1788 by Lieutenant Henry Lidgbird Ball , commander of the Armed Tender HMS Supply (the oldest and smallest of the First Fleet ships) , which was on its way from Botany Bay with a cargo of nine male and six female convicts to found a penal settlement on Norfolk Island . On the return journey of 13 March 1788 Ball observed Ball 's Pyramid and sent a party ashore on Lord Howe Island to claim it as a British possession . Numerous turtles and tame birds were captured and returned to Sydney . Ball named Mount Lidgbird and Balls Pyramid after himself and the main island after Richard Howe , First Earl Howe , who was First Lord of the Admiralty at the time .

Many names on the island date from this time , and also from May of the same year when the island was visited by four ships of the First Fleet , HMS Supply , Charlotte , Lady Penrhyn and Scarborough when much of the plant and animal life was first recorded in the journals and diaries of

visitors like David Blackburn , Master of the Supply , and Arthur Bowes Smyth , surgeon of the Lady Penrhyn . Watercolour sketches of native birds including the Lord Howe woodhen (*Gallirallus sylvestris*) , white gallinule (*Porphyrio albus*) , and Lord Howe pigeon (*Columba vitiensis godmanae*) , were made by artists including George Raper and John Hunter . As the latter two birds were soon hunted to extinction these paintings are their only remaining pictorial record . Over the next three years the Supply returned to the island several times in search of turtles and the island was also visited by ships of the Second and Third Fleets . Between 1789 and 1791 the Pacific whale industry was born with British and American whaling ships chasing sperm whales (*Physeter macrocephalus*) along the equator to the Gilbert and Ellice archipelago , then south into Australian and New Zealand waters . The American fleet numbered 675 ships and Lord Howe was located in a region known as the Middle Ground noted for sperm whales (*Physeter macrocephalus*) and southern right whales (*Eubalaena australis*) .

The island was subsequently visited by many government and whaling ships sailing between New South Wales and Norfolk Island and across the Pacific , including many from the American whaling fleet , so its reputation as a provisioning port preceded settlement , some ships leaving goats and pigs on the island as food for future visitors . Between July and October 1791 the Third Fleet ships arrived at Sydney and within days the deckwork was being reconstructed for a future in the lucrative whaling industry . Whale oil was to become New Holland 's (Australia) most profitable export until the 1830s , and it was the whaling industry that shaped Lord Howe Island 's early history .

= = = 1834 ? 1841 : Settlement = = =

Permanent settlement on Lord Howe was established in June 1834 when the British whaling barque Caroline , sailing from New Zealand and commanded by Captain John Blinkenthorpe , landed at what is now known as Blinky Beach . They left three men , George Ashdown , James Bishop and (unknown) Chapman , who were employed by a Sydney whaling firm to establish a supply station . The men were initially to provide meat by fishing and by raising pigs and goats from feral stock . They landed with (or acquired from a visiting ship) their Maori wives and two Maori boys . Huts were built in an area now known as Old Settlement which had a supply of fresh water , and a garden was established west of Blinky Beach .

This was a cashless society ; the settlers bartered their stores of water , wood , vegetables , meat , fish and bird feathers for clothes , tea , sugar , tools , tobacco and other commodities not available on the island ? but it was the whalers ? valuation that had to be accepted . These first settlers eventually left the island when they were bought out for £ 350 in September 1841 by businessmen Owen Poole and Richard Dawson (later joined by John Foulis) whose employees and others then settled on the island .

= = = 1842 ? 1860 : Trading provisions = = =

The new business was advertised and ships trading between Sydney and the New Hebrides (Vanuatu) would also put into the island . Rover 's Bride , a small cutter , became the first regular trading vessel . Between 1839 and 1859 between five and twelve ships made landfall each year , occasionally closer to 20 with seven or eight at a time laying off the reef . In 1842 and 1844 the first children were born on the island . Then in 1847 Poole , Dawson and Foulis , bitter at failing to obtain a land lease from the New South Wales Government , abandoned the settlement although three of their employees remained . One family , the Andrews , after finding some onions on the beach in 1848 , cultivated them as the " Lord Howe red onion " which was popular in the Southern Hemisphere for about 30 years until the crop was attacked by smut disease .

In 1849 there were just 11 people living on the island but it was not long before the island farms expanded . In the 1850s gold was discovered on mainland Australia where crews would abandon their ships , preferring to dig for gold than to risk a life at sea . As a consequence many vessels avoided the mainland and Lord Howe Island experienced an increasing trade which peaked between 1855 and 1857 . In 1851 about 16 people were living on the island . Vegetable crops now

included potatoes , carrots , maize , pumpkin , taro , watermelon ? even grapes , passionfruit and coffee . Between 1851 and 1853 there were several aborted proposals by the NSW Government to establish a penal settlement on the island .

From 1851 to 1854 Henry Denham captain of HMS Herald , which was on a scientific expedition to the southwest Pacific (1852 ? 1856) , completed the island 's first hydrographic survey . On board were three Scottish biologists , William Milne (a gardener @-@ botanist from the Edinburgh Botanic Garden) , John Macgillivray (naturalist) who collected fish and plant specimens , and Assistant Surgeon and zoologist Denis Macdonald . Together these men established much basic information on the geology , flora and fauna of the island .

In about 1853 a further three settlers arrived on the American whaling barque Belle , captained by Ichabod Handy . As well as George Campbell (who died in 1856) and Jack Brian (who left the island in 1854) , the third , Nathan Thompson , brought three women (called Botanga , Bogoroo , and a girl named Bogue) from the Gilbert Islands . When his first wife Botanga died he then married Bogue . Thompson was the first resident to build a substantial house in the 1860s from mainland cedar washed up on the beach . Most of the residents with island ancestors have blood relations or are connected by marriage to Thompson and his second wife Bogue .

In 1855 the island was officially designated as part of New South Wales by the Constitution Act .

= = = 1861 ? 1890 : Scientific expeditions = = =

From the early 1860s whaling declined rapidly with the increasing use of petroleum , the onset of the Californian goldrush , and the American Civil War ? with unfortunate consequences for the island . To explore alternative means of income Thompson , in 1867 , purchased the Sylph which was the first local vessel to trade with Sydney (mainly pigs and onions) . It anchored in deep water at what is now Sylph 's Hole off Old Settlement Beach , but was eventually tragically lost at sea in 1873 which added to the woes of the island at this time .

In 1869 the island was visited by a magistrate P. Cloete aboard the Thetis investigating a possible murder . He was accompanied by Charles Moore , Director of the Botanic Gardens , Sydney and his assistant , William Carron who forwarded plant specimens to Ferdinand Mueller at the botanic gardens in Melbourne who , by 1875 , had catalogued and published 195 species . Also on the ship was William Fitzgerald a surveyor and Mr Masters from the Australian Museum . Together they surveyed the island with the findings published in 1870 when the population was listed as 35 people , their 13 houses built of split palm battens thatched on the roof and sides with palm leaves . At about this time there began a downturn of trade with the demise of the whaling industry and sometimes six or twelve months passed without a vessel calling . With the provisions rotting in the storehouses the older families lost interest in market gardening .

From 1860 to 1872 forty @-@ three ships had collected provisions , but from 1873 to 1887 there were fewer than a dozen . This prompted some activity from the mainland . In 1876 a government report on the island was submitted by surveyor William Fitzgerald based on a visit in the same year . He suggested that coffee be grown but the kentia palm was already catching world attention . In 1878 the island was declared a Forest Reserve and Captain Richard Armstrong became the first resident government administrator . He encouraged schools , tree @-@ planting and the palm trade , dynamited the north passage to the lagoon , and built roads . He also managed to upset the residents , and parliamentarian John Wilson was sent from the mainland in April 1882 to investigate the situation . With Wilson was a team of scientists that included H. Wilkinson from the Mines Department , W. Condor from the Survey Department , J. Duff from the Sydney Botanical Gardens and A. Morton from the Australian Museum . J. Sharkey from the Government Printing Office took the earliest known photographs of the Island and its residents . A full account of the island appeared in the report from this visit , published as " Lord Howe Island 1882 " , which recommended that Armstrong be replaced . Meanwhile , the population had increased considerably and included 29 children ; the report recommended that a schoolmaster be appointed . This study sealed a lasting relationship with three scientific organisations , the Australian Museum , Sydney Royal Botanic Gardens and Kew Royal Botanic Gardens .

== 1890 ? 1999 ==

In 1883 the company Burns Philp started a regular shipping service and the number of tourists gradually increased . By 1932 , with the regular tourist run of SS Morinda , tourism became the second biggest source of external income after palm sales to Europe . Morinda was replaced by Makambo in 1932 , and she in turn by other vessels . The service continues into the present day with the fortnightly Island Trader service from Port Macquarie .

The palm trade began in the 1880s when the lowland kentia palm (*Howea forsteriana*) was first exported to Britain , Europe and America but the trade was only placed on a firm financial footing when the Lord Howe Island Kentia Palm Nursery was formed in 1906 (see below) .

The first plane to appear on the island was in 1931 when Francis Chichester alighted on the lagoon in a Gipsy Moth converted into a floatplane . It was damaged there in an overnight storm but repaired with the assistance of islanders and then took off successfully nine weeks later for a flight to Sydney . After World War II , in 1947 , tourists arrived on Catalina and then four @-@ engined Sandringham flying boats of Ansett Flying Boat Services operating out of Rose Bay , Sydney , and landing on the lagoon , the journey taking about 3 @.@ 5 hours . When the Lord Howe Island Airport was completed in 1974 , the seaplanes were eventually replaced with Qantaslink twin @-@ engined turbo @-@ prop Dash 8 @-@ 200 aircraft .

== 21st century ==

In 2002 , the Royal Navy destroyer HMS Nottingham struck Wolf Rock , a reef at Lord Howe Island , and almost sank . In recent times tourism has increased and the government of New South Wales has been increasingly involved with issues of conservation .

On 17 October 2011 , a supply ship , M / V Island Trader with twenty tons of fuel ran aground in the lagoon . The ship refloated at high tide with no loss of crew or cargo .

== Demographics ==

As at the 2011 census , the resident population was 360 people and the number of tourists was not allowed to exceed 400 . Early settlers were European and American whalers and many of their offspring have remained on the island for more than six generations . Residents are now involved with the kentia palm industry , tourism , retail , some fishing and farming . In 1876 it was observed that on Sundays although there was a suspension of games and labour , there were no religious services . Nowadays , in an area known locally as ' Church Paddock ' , there are Anglican , Catholic and Adventist churches , the religious affiliations on the island being 30 % Anglican , 22 % no religion , 18 % Catholic and 12 % Seventh Day Adventist . There is about an equal division of the sexes with 47 % of the population in the age group 25 ? 54 and 92 % holding Australian citizenship .

== Governance and land tenure ==

Official control of Lord Howe Island lay initially with the British Crown until it passed to New South Wales in 1855 , although until at least 1876 the islanders lived in " a relatively harmonious and self @-@ regulating community " . In 1878 Richard Armstrong was appointed administrator when the NSW Parliament declared the island a Forest Reserve . But as a result of ill feeling , and an enquiry , he was eventually removed from office on 31 May 1882 (he returned later that year though to view the transit of Venus from present @-@ day Transit Hill) . After his removal the island was administered by four successive magistrates until 1913 when a Sydney @-@ based Board was formed until 1948 when a resident superintendent was appointed . In 1913 the three @-@ man Lord Howe Island Board of Control was established , mostly to regulate the palm seed industry , but also administering the affairs of the island from Sydney until the present Lord Howe Island Board was set

up in 1954 .

The Lord Howe Island Board is a NSW Statutory Authority established under the Lord Howe Island Act , 1953 , to administer the island as part of the state of New South Wales . It reports directly to the state 's Minister for Environment and Heritage , and is responsible for the care , control and management of the island . Its duties include : the protection of World Heritage values ; the control of development ; the administration of Crown Land , including the island 's protected area ; provision of community services and infrastructure ; and regulating sustainable tourism . In 1981 the Lord Howe Island Amendment Act gave islanders the administrative power of three members on a five member Board . The Board also manages the Lord Howe Island Kentia Palm Nursery which , together with tourism , provides the island 's only sources of external income . Under an amendment bill in 2004 the Board now comprises seven members , four of whom are elected from the islander community , thus giving about 350 permanent residents a high level of autonomy . The remaining three members are appointed by the Minister to represent the interests of business , tourism and conservation . The full Board meets on the island every three months while the day to day affairs of the island are managed by the Board 's administration , with a permanent staff that had increased to 22 people by 1988 .

Land tenure has been an issue since first settlement as island residents repeatedly requested freehold title or an absolute gift of cultivated land . Original settlers were squatters . The granting of a 100 acre (40 ha) lease to Richard Armstrong in 1878 drew complaints and a few short term leases (Permissive Occupancies) were granted . In 1913 , with the appointment of a Board of Control , permissive occupancies were revoked and the Board itself given permissive occupancy of the island . Then the Lord Howe Island Act of 1953 made all land the property of the Crown . Direct descendants of islanders with permissive occupancies in 1913 were granted perpetual leases on blocks of up to 5 acres (2 ha) for residential purposes . Short term special leases were granted for larger areas used for agriculture , so in 1955 , 55 perpetual leases and 43 special leases were granted . The 1981 amendment to the act extended political and land rights to all residents of 10 years or more . There remains an active debate concerning the proportion of residents with tenure and the degree of influence on the Board of resident islanders in relation to long term planning for visitors , and issues relating to the environment , amenity and global heritage .

= = Economy = =

Trading vegetables , meat , fish and other perishables with visiting ships ceased in the 1870s when the whaling industry collapsed . With such a small population , Lord Howe Island 's economy is now extremely simple with external income derived from only two significant sources : tourism and the overseas sale of kentia palm seeds and seedlings .

= = = Kentia palm industry = = =

The first exporter of palm seeds was Ned King , a mountain guide for the Fitzgerald surveys of 1869 and 1876 , who sent seed to the Sydney Botanic Gardens . Overseas trade began in the 1880s when it was found that one of the four palms endemic to the island , kentia palm (*Howea forsteriana*) , which grows naturally in the lowlands , was ideally suited to the fashionable conservatories of the well to do in Britain , Europe and the United States , but the assistance of mainland magistrate Frank Farnell was needed to put the business on a sound commercial footing when in 1906 he became Director of a company , the Lord Howe Island Kentia Palm Nursery , whose shareholders included 21 islanders and a Sydney based seed company . However , the formation of the Lord Howe Island Board of Control was needed in 1913 to resolve outstanding issues .

The native kentia palm (known locally as the thatch palm as it was used to thatch the houses of the early settlers) is now the most popular decorative palm in the world . The mild climate of the island has evolved a palm which can tolerate low light , a dry atmosphere and lowish temperatures ? ideal

for indoor conditions . Up to the 1980s the palms were only sold as seed but from then onwards only as high quality seedlings . The nursery received certification in 1997 for its high quality management complying with the requirements of Australian Standard AS / NZS ISO 9002 .

Seed is gathered from natural forest and plantations , most collectors being descendants of the original settlers . Seed is then germinated in soil @-@ less media and sealed from the atmosphere to prevent contamination . After testing they are picked , washed (bare @-@ rooted) , sanitised and certified then packed and sealed into insulated containers for export . They grow both indoors and out and are popular for hotels and motels world @-@ wide . Nursery profits are returned to enhance the island ecosystem . The nursery plans to expand the business to include the curly palm and other native plants of special interest .

= = = Tourism = = =

Lord Howe Island is known for its geology , birds , plants , and marine life . Popular tourist activities include scuba diving , birdwatching , snorkelling , surfing , kayaking , and fishing . To relieve pressure on the small island environment only 400 tourists are permitted at any one time . The island is reached by plane from Sydney or Brisbane in less than two hours . The Permanent Park Preserve declared in 1981 has similar management guidelines to a National Park .

= = = Facilities = = =

With fewer than 800 people on the island at any time , facilities are limited ; they include a bakery , butcher , general store , liquor store , restaurants , post office , museum and information centre , a police officer , a ranger , and an ATM at the bowling club . Stores are shipped to the island fortnightly by the Island Trader from Port Macquarie . There is a small four @-@ bed hospital and dispensary . A small botanic garden displays labelled local plants in its grounds . Diesel @-@ generated power is 240 V AC , as on the mainland . There is no public transport or mobile phone coverage , but there are public telephones , fax facilities and internet access as well as a local radio station and newsletter , The Signal .

Tourist accommodation ranges from luxury lodges to apartments and villa units . The currency is the Australian dollar and there are two banks . There are no camping facilities on the island and remote @-@ area camping is not permitted . To protect the fragile environment of Balls Pyramid (which carries the last remaining wild population of the endangered Howe Island stick insect) , recreational climbing there is prohibited . No pets are allowed without permission from the Board . Islanders use tanked rainwater , supplemented by bore water for showers and washing clothes .

= = = Activities = = =

As distances to sites of interest are short , cycling is the main means of transport on the island . Tourist activities include golf (9 @-@ hole) , lawn bowls , tennis , fishing (including deep @-@ sea game fishing) , yachting , windsurfing , kite surfing , kayaking , and boat trips (including glass @-@ bottom tours of the lagoon) . Swimming , snorkelling and scuba diving are also popular in the lagoon , as well as off Tenth of June Island , a small rocky outcrop in the Admiralty group where an underwater plateau drops 36 metres to reveal extensive gorgonia and black corals growing on the vertical walls . Other diving sites are found off Ball 's Pyramid , 26 km away , where there are trenches , caves and volcanic drop @-@ offs .

Bushwalking , natural history tours , talks , and guided walks take place along the many tracks , the most challenging being the eight @-@ hour guided hike to the top of Mount Gower . There are 11 beaches and hand @-@ feeding the metre @-@ long kingfish (*Seriola lalandi*) and large wrasse at Ned 's Beach is very popular . Walking tracks cover the island with difficulty graded from 1 ? 5 , they include ? in the north : Transit Hill 2 hours return , 2 km ; Clear Place , 1 ? 2 hours return ; Stevens Reserve ; North Bay , 4 hours return , 4 km ; Mount Eliza ; Old Gulch , 20 minutes return , 300 m ; Malabar Hill and Kims Lookout , 3 hours , or 5 hours return , 7 km and ? in the south : Goat House

Cave , 5 hours return , 6 km ; Mount Gower , 8 hours return , 14 km ; Rocky Run and Boat Harbour ; Intermediate Hill , 45 minutes return , 1 km ; Little Island , 40 minutes return , 3 km . Recreational climbers must obtain permission from the Lord Howe Island Board .

= = Geography = =

Lord Howe Island is an irregularly crescent @-@ shaped volcanic remnant in the southwest Pacific Ocean . Lying in the Tasman Sea between Australia and New Zealand the island is 600 kilometres (370 mi) east of mainland Port Macquarie , 702 kilometres (436 mi) northeast of Sydney , and about 772 kilometres (480 mi) from Norfolk Island to its northeast . The island is about 10 km long and between 2 @. @ 0 km and 0 @. @ 3 km wide with an area of 14 @. @ 55 km² . Along the west coast there is a semi @-@ enclosed sheltered coral reef lagoon with white sand , the most accessible of the island 's eleven beaches . Both the north and south sections of the island are high ground of relatively untouched forest , in the south comprising two volcanic mountains , Mount Lidgbird (777 m or 2 @, @ 549 ft) and Mount Gower which , rising to 875 m (2 @, @ 871 ft) , is the highest point on the island . The two mountains are separated by the saddle at the head of Erskine Valley . In the north , where most of the population live , high points are Malabar (209 m or 686 ft) and Mount Eliza (147 m or 482 ft) . Between these two uplands is an area of cleared lowland with some farming , the airstrip , and housing . The Lord Howe Island Group of islands comprises 28 islands , islets and rocks . Apart from Lord Howe Island itself the most notable of these is the pointed rocky islet Ball 's Pyramid , a 551 @-@ metre @-@ high (1 @, @ 808 ft) eroded volcano about 23 km to the south @-@ east , which is uninhabited but bird @-@ colonised . It contains the only known wild population of the Lord Howe Island stick insect , formerly thought to be extinct . To the north there is the Admiralty Group , a cluster of seven small uninhabited islands . Just off the east coast is 4 @. @ 5 ha Mutton Bird Island , and in the lagoon is 3 ha Blackburn (Rabbit) Island .

= = = Geological origins = = =

Lord Howe Island is the highly eroded remains of a 7 @-@ million @-@ year @-@ old shield volcano , the product of eruptions that lasted for about a half @-@ million years . It is one of a chain of islands that occur on the western rim of an undersea shelf , the Lord Howe Rise , which is 3000 km long and 300 km wide extending from New Zealand to the west of New Caledonia and consisting of continental rocks that separated from the Australian plate 60 to 80 million years ago to form a new crust in the deep Tasman Basin . The shelf is part of Zealandia , a microcontinent nearly half the size of Australia that gradually submerged after breaking away from the Gondwanan supercontinent . The Lord Howe seamount chain is defined by coral @-@ capped guyots stretching to the north of the island for 1000 km (600 mi) and including the Middleton 220 kilometres (140 mi) and Elizabeth (160 kilometres (99 mi) away) reefs of the Elizabeth and Middleton Reefs Marine National Park Reserve . This chain of nine volcanic peaks was probably produced by the northward movement of the Indo @-@ Australian Plate over a stationary hotspot so the oldest guyots were the first formed and most northerly as the plate moved northward at a rate of 6 cm per year (see plate tectonics) .

= = = Basalts and calcarenite = = =

Two periods of volcanic activity produced the major features of the island . The first about 6 @. @ 9 million years ago produced the northern and central hills while the younger and highly eroded Mount Gower and Mount Lidgbird were produced about 6 @. @ 3 million years ago by successive basalt (an extrusive igneous rock) lava flows that once filled a large volcanic caldera (crater) and can now be seen as horizontal basalt strata on mountain cliffs (at Malabar and Mount Gower) occasionally interspersed with dikes (vertical lava intrusions) . Geological pyroclastic remnants of volcanic eruption can be seen on 15 ha Roach Island (where the oldest rocks occur) and Boat Harbour as tuff (ash) , breccia (with angular blocks) , and agglomerate (rounded ' bombs ') . Offshore on the

Lord Howe Rise water depths reach 2000 m falling to 4000 m to the west of the rise . From the dimensions of the rock on which the island stands it has been calculated that the island has eroded to one fortieth of its original size .

Rocks and land at the foot of these mountains is calcarenite , a coral sand , blown inland during the Pleistocene between 130 000 and 20 000 years ago and cemented into stratified layers by water percolation . In this rock are fossils of bird bones and eggs , land and marine snails and the extinct endemic horned turtle (*Meiolania platycephala*) now thought to be an ancient relictual non-swimming tortoise with relatives in South America . The crescent of the island protects a coral reef and lagoon , the barrier reef , at 31 ° S , is the most southerly in the world . Beach sands , rather than consisting of quartz grains derived from granite , as on the mainland , are made of fragments of shell , coral and coralline algae , together with basalt grains , and basaltic minerals like black diopside , and green olivine . The lowland consists of alluvial soils .

The island continues to erode rapidly and is expected to be fully submerged within 200 000 years taking an appearance akin to the Middleton and Elizabeth Reefs .

== Climate ==

Lord Howe Island has a subtropical climate . Under the Köppen climate classification , Lord Howe Island has a Humid subtropical climate (Cfa) .

In general the summers are mild or warm with rainfall erratic but occasionally heavy while in winter it is cool with rainfall more or less uniform . There is a gradual transition from summer to winter conditions and vice versa . Winds are frequent and salt-laden being moderate easterlies in the summer and fresh to strong westerlies in the winter . July is the windiest month , and the winter months are subject to frequent gales and strong winds . The island has 67.8 clear days , annually .

Storms and occasional cyclones also affect the island . Rainfall records are maintained in the north where rainfall is less than in the frequently cloud-shrouded mountains of the south . There can be wide variation in rainfall from year to year . July and August are the coldest months with average minimum temperatures of about 13 ° C and no frost . Average maximum temperatures range from between 17 ° C and 20 ° C in the winter to between 24 ° C and 27 ° C in the summer . The humidity averages in the 60 % to 70 % range year round becoming more noticeable on warmer summer days than in the cooler winter months .

== Flora and fauna ==

== Plants ==

Lord Howe Island is a distinct terrestrial ecoregion known as the Lord Howe Island subtropical forests . It is part of the Australasia ecozone and shares many biotic affinities with Australia , New Guinea , and New Caledonia . Almost half of the island's native plants are endemic and many of the island's unique plants grow on or around the mountain summits where the height has allowed the development of a true cloud forest and many different microhabitats from sealevel to the summits . One of the best known is *Howea* , an endemic genus of palms (*Arecaceae*) that are commonly known as kentia palms and make handsome houseplants . Annual exports provide a revenue of over A \$ 2 million , providing the only major industry on the island apart from tourism .

=== Origin ===

In geological terms at 7 million years old Lord Howe Island is relatively young and was never part of any continent , its flora and fauna colonising the island from across the sea , carried by wind , water or birds , possibly assisted at a geological time when other islands were exposed , enabling island hopping . Nevertheless , it is far enough away and has had sufficient time to evolve endemic

species . The high degree of endemism is emphasised by the presence of five endemic genera : *Negria* , *Lordhowea* , *Howea* , *Lepidorrhachis* , and *Hedyscepe* . Island plants are similar to those of Norfolk Island , the two islands sharing some endemic species , for example , the critically endangered species of creeping vine *Calystegia affinis* . The combined flora of these two islands is more closely related to that of New Zealand and New Caledonia than to that of Australia . There is also a small but clear link with the plants of Vanuatu . The closest mainland affinities are with the vegetation of subtropical south @-@ eastern Queensland . A link with Gondwanaland is indicated by the presence of endemic species like the wedding lily (*Dietes robinsoniana*) whose only living relatives occur in South Africa .

The flora of the island is relatively untouched with a large number of rare plants , 44 % being endemic to the island . With a diversity of conditions ranging from valleys , to ridges , plains and misty mountain tops there is habitat for a wide range of plant communities which have been comprehensively analysed and mapped . There are 57 species of fern of which 25 are endemic : they are most abundant in the moist environments of the southern island , especially the higher parts of Mount Gower , perhaps the most apparent being the four endemic tree ferns in the genus *Cyathea* that occur on the southern mountains .

= = = = Communities and special plants = = = =

Plant communities have been classified into nine categories : lowland subtropical rainforest , submontane rainforest , cloud @-@ forest and scrub , lowland swamp forest , mangrove scrub and seagrass , coastal scrub and cliff vegetation , inland scrub and herbland , offshore island vegetation , shoreline and beach vegetation , and disturbed vegetation .

Several plants are immediately evident to the visitor . Banyan (*Ficus macrophylla* subsp. *columnaris*) is a remarkable tree with a buttressed trunk and pendulous aerial roots : it can be seen on the track to Clear Place and near Ned 's Beach . Pandanus tree (*Pandanus forsteri*) has spectacular teepee @-@ like prop roots and pineapple @-@ like fruits that are orange @-@ red when mature , the tough leaves being used for basketry . It occurs in damp areas like creek beds and fine specimens can be seen along the Boat Harbour track . There are ten species of orchid on the island , the most noticeable being the bush orchid (*Dendrobium macropus* subsp. *howeanum*) on lowland trees and rocks , bearing cream flowers from August to September . Other prominent flowering plants in the summer include , on the mountain slopes , the whiskery red flowers of mountain rose (*Metrosideros nervulosa* and *Metrosideros sclerocarpa*) , the massed small yellow flowers of corokia (*Corokia carpodetoides*) , orange plump flowers of pumpkin tree (*Negria rhabdothermum*) , and white spikes of Fitzgerald tree (*Dracophyllum fitzgeraldii*) . The kava bush has large , aromatic , heart @-@ shaped leaves . After heavy rain the endemic glowing mushrooms *Mycena chlorophanos* and *Omphalotus nidiformis* can be found in the palm forests .

It is the palms that are the signature plants of the island as the kentia and curly palms especially dominate the landscape in many places , the kentia being of special economic importance . All four species are endemic to the island , often occurring in dense pure stands , the one that has proved such a world @-@ wide success as an indoor plant being the kentia or thatch palm (*Howea forsteriana*) . This is a lowland palm with drooping leaflets and seed branches in ' hands ' of 3 ? 5 while the curly palm (*Howea belmoreana*) , which occurs on slightly higher ground , has upwardly directed leaflets and solitary ' hands ' . Natural hybrids between these species occur on the island and there is a mature specimen of one growing in the island nursery . On the mountain sides higher than about 350 m there is the big mountain palm (*Hedyscepe canterburyana*) ; it has large golf @-@ ball @-@ sized fruits while the little mountain palm (*Lepidorrhachis mooreana*) has marble @-@ sized fruits and is only found on the mountain summits .

= = = = Images of native flora = = = =

= = = Animals = = =

There are no snakes , no venomous or stinging insects , animals or plants , and no dangerous daytime sharks off the beaches .

= = = = Birds = = = =

A total of 202 different birds have been recorded on the island . Eighteen species of land birds breed on the island and there are many more migratory species that occur on the island and its adjacent islets , many tame enough that it is possible for humans to get quite close . The island has been identified by BirdLife International as an Endemic Bird Area , and the Permanent Park Preserve as an Important Bird Area , because it supports the entire population of Lord Howe woodhens , most of the breeding population of providence petrels , over 1 % of the world population of another five seabird species , and the whole populations of three endemic subspecies .

Fourteen species of seabirds breed on the island . Red @-@ tailed tropicbirds can be seen in large numbers circling the Malabar cliffs where they perform acrobatic courting rituals . Between August and May thousands of flesh @-@ footed and wedge @-@ tailed shearwaters return to the island at dusk each day . From the Little Island Track between March and November one of the world 's rarest birds , the providence petrel also performs courtship displays during winter breeding and it is extremely tame . The island was its only breeding location for many years after the breeding colony on Norfolk Island was exterminated in the late 19th century ; though a small population persists on the adjacent Phillip Island . The Kermadec petrel was discovered breeding on Mount Gower in 1914 by ornithologist Roy Bell while collecting specimens for Gregory Mathews and the black @-@ winged petrel was only confirmed as a breeder in 1971 ; its numbers have increased following the elimination of feral cats from the island .

The flesh @-@ footed shearwater , which breeds in large numbers on the main island in spring @-@ autumn , used to have its chicks harvested for food by the islanders . The wedge @-@ tailed and little shearwaters breed on the main island and surrounding islets ; though only a small number of the latter species can be found on the main island . Breeding white @-@ bellied storm petrels were another discovery by Roy Bell . Masked boobies are the largest seabirds breeding on Lord Howe and can be seen nesting and gliding along the sea cliffs at Mutton Bird Point all year round . Sooty terns can be seen on the main island at Ned 's and Middle Beaches , North Bay , and Blinky Beach ; the most numerous of the island 's breeding seabirds , their eggs were formerly harvested for food . Common and black noddies build nests in trees and bushes , while white terns lay their single eggs precariously in a slight depression on a tree branch , and grey ternlets lay their eggs in cliff hollows .

Three endemic passerine subspecies are the Lord Howe golden whistler , Lord Howe silvereye and Lord Howe currawong . The iconic endemic rail , the flightless Lord Howe woodhen , is the only surviving member of its genus : its ancestors could fly but with no predators and plenty of food on the island this ability was lost . This made it easy prey for islanders and feral animals and by the 1970s the population was less than 30 birds . From 1978 to 1984 feral animals were removed and birds raised in captivity to be successfully reintroduced to the wild . The population is now relatively safe and stable .

= = = = Mammals , reptiles and amphibians = = = =

Only one native mammal remains on the islands , the large forest bat . The endemic Lord Howe long @-@ eared bat is known only from a skull and is now presumed extinct , possibly the result of the introduction of ship rats .

Two terrestrial reptiles are native to the island group : the Lord Howe Island skink and the Lord Howe Island gecko . Both are rare on the main island but more common on smaller islands offshore . The garden skink and the bleating tree frog have been accidentally introduced from the Australian mainland .

===== Invertebrates =====

The Lord Howe Island stick insect disappeared from the main island soon after the introduction of rats in 1918 . In 2001 a tiny population was discovered in a single *Melaleuca howeana* shrub on the slopes of Ball 's Pyramid , has been successfully bred in captivity , and is nearing re @-@ introduction to the main island . The Lord Howe stag beetle is a colourful endemic beetle seen during summer months . Another endemic invertebrate , the Lord Howe flax snail (or Lord Howe *Placostylus*) , has also been affected by the introduction of rats . Once common , the species is now endangered and a captive breeding program is under way to save the snail from extinction .

===== Marine life =====

Marine environments are near @-@ pristine with a mixtures of temperate , subtropical and tropical species derived from cool @-@ temperate ocean currents in the winter and the warm East Australian Current , which flows from the Great Barrier Reef , in summer . Of the 490 fish species recorded 13 are endemic and 60 % are tropical . The main angling fish are yellowtail kingfish and New Zealand bluefish while game fish include marlin , tuna and giant kingfish called " greenbacks " . Over 80 species of coral occur in the reefs surrounding the islands . Australian underwater photographer Neville Coleman has photographed various nudibranchs at Lord Howe Island .

Various species of cetaceans inhabit or migrate through the waters in vicinity , however very little about their biology in the area is known due to lack of studies and sighting efforts caused from locational conditions . Bottlenose dolphin is the most commonly observed and is the only species confirmed to be seasonal or yearly residents while some other dolphin species have also been observed . Humpback whales are the only of large whales showing slow but steady recoveries as their numbers annually migrating the island of Lord Howe are much smaller than that of those migrating along Australian continent .

Historically , migratory whales such as blue , fin , sei were very abundant in the island waters , but were severely reduced in numbers to near @-@ extinction by commercial and illegal hunts including the mass illegal hunts by Soviet Union and Japan in 1960s to 1970s . Southern right and sperm were most severely hunted among these , hence the area was called the Middle Ground by whalers . It is likely that these two were once seasonal residents around the island where right whales prefer sheltered , very shallow bays while sperm whales mainly inhabit deep waters .

===== Conservation =====

About 10 percent of Lord Howe Island 's forests have been cleared for agriculture , and another 20 percent has been disturbed , mostly by domestic cattle and feral sheep , goats and pigs . As a result , 70 % of the island remains relatively untouched with a variety of plants and animals , many of which are endemic , some of which are rare or threatened . Two species of plants , nine terrestrial birds , one bat and at least four invertebrates have become extinct since 1778 . Endemism at the generic level includes the palms *Howea* , *Hedyscepe* and *Lepidorrhachis* , a woody daisy *Lordhowea* , the tree *Negria* , the leech *Quantenobdella howensis* , three annelid worm genera (*Paraplutellus* , *Pericryptodrilus* and *Eastoniella*) , an isopod shrimp *Stigmops* , a hemipteran bug *Howeria* and a cricket *Howeta* .

The Lord Howe Island Board instigated an extensive biological and environmental survey (published in 1974) , which has guided the island conservation program . In 1981 , the Lord Howe Island Amendment Act proclaimed a ' Permanent Park Preserve ' over the north and south ends of the island . Administration of the preserve was outlined in a management plan for the sustainable development of the island prepared by the NSW National Parks and Wildlife Service , which has a ranger stationed on the island . The Island was cited under the UNESCO World Heritage List in 1982 .

Offshore environmental assets are protected by the Lord Howe Island Marine Park . This consists of a State Marine Park managed by the Marine Parks Authority of New South Wales in the waters

out to 3 nautical miles around the island and including Ball 's Pyramid . It also includes a Commonwealth Marine Park extending from 3 to 12 nautical miles out and managed by the federal Department of the Environment and Heritage . In total the Marine Park covers about 3 @,@ 005 square kilometres (1 @,@ 160 sq mi) .

===== Feral animals and plants =====

Pigs and goats were released on the island as potential food in the early 1800s , the goats destroying shrubs and grasses used as nesting sites and the pigs eating eggs and chicks and disturbing the land by nuzzling for food . Several birds have become extinct on the island since the arrival of humans . The first round of extinctions included the Lord Howe swamphen or white gallinule , white @-@ throated pigeon , red @-@ crowned parakeet and the Tasman booby , which were eliminated by visitors and settlers during the nineteenth century either from overhunting for food or protection of crops . Black rats were released from provisioning whaling ships in the 1840s and mice from Norfolk Island in 1860 . In 1918 the black rat was accidentally introduced with the shipwreck of the SS Makambo which ran aground at Ned 's Beach . This triggered a second wave of extinctions , including the vinous @-@ tinted thrush , robust white @-@ eye , Lord Howe starling , Lord Howe fantail and the Lord Howe gerygone as well as the destruction of the native phasmid and decimation of palm fruits . Bounties were offered for rat and pig tails and ' ratting ' became a popular pursuit . Subsequent poisoning programs have kept populations low . The Lord Howe boobook may have become extinct through predation by , or competition with , the Tasmanian masked owls which were introduced in the 1920s in a failed attempt to control the rat population . Stray dogs are also a threat as they could harm the native wood hen and other birds .

Invasive plants such as Crofton weed and Formosa lily occur in inaccessible areas and probably cannot be eradicated but others are currently being managed . In 1995 the first action was taken to control the spread of introduced plants of the island , chiefly ground asparagus and bridal creeper , but also cherry guava , Madeira vine , Cotoneaster , Ochna and Cestrum . This has been followed by weeding tours and the formation of the Friends of Lord Howe Island group in 2000 . Programs have also been started to remove weeds from private properties and revegetate some formerly cultivated areas . An Environmental Unit was created by the Board and it includes a Flora Management Officer and a permanent Weed Officer . Weeds have been mapped and an eradication program is in place , supported by improved education and quarantine procedures .

Despite the large number of introduced species that harm Lord Howe 's native flora and fauna , feral pigs and cats were eradicated by the early 2000s . The goat population has been reduced to just a few animals , and there are ongoing efforts to control rodents and introduced plants . In July 2012 it was announced by the Australian federal Environment Minister Tony Burke and the New South Wales Environment Minister Robyn Parker that the Australian and NSW Governments would each contribute 50 % of the estimated A \$ 9 million cost of implementing a rodent eradication plan for the island , using aerial deployment of poison baits . The plan was put to a local vote and is considered controversial . A recovery program has restored the Lord Howe woodhen numbers from only 20 in 1970 to about 200 in 2000 , which is close to carrying capacity .

===== Climate change =====

According to an analysis by Tim Flannery , the ecosystem of Lord Howe Island is threatened by climate change and global warming , with the reefs at risk from rises in water temperature . The Great Barrier Reef is specifically identified as being at risk to the effects of global warming on Australia , and the same analysis applies to the reefs of Lord Howe Island . Cool climate flora and fauna are at risk from rises in temperature , because there is limited scope for migration to higher altitudes .. The first international conference on global artificial photosynthesis as a climate change solution occurred at Lord Howe island in 2011 , the papers being published by the Australian Journal of Chemistry .

= = In fiction = =

Improbable Rendezvous , a novel by Tom Ferry , 2013 ISBN 978 @-@ 192221954 @-@ 1
Virus , a 1999 sci @-@ fi horror film : the titular computer virus sets a course for Lord Howe Island
to seize a British intelligence facility from which it can control the world 's military .