



Berry Land Carer Kit

An environmental
management resource for
landowners and carers in the
Berry district

December 2022



An initiative of the Berry Corridor Bush Links Project,
Berry Landcare Inc., funded by the NSW Environment Trust.





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1 Introduction

1.1 About this document

This document is intended to act as a resource for landowners and carers in the Berry corridor and district who wish to manage their landholdings with a view to promoting biodiversity and conserving the natural ecology. It was developed by Berry Landcare as part of the Berry BushLinks project.

Originally drafted as a hard-copy resource, this document has been revised to be accessible as an e-document and to take advantage of the many relevant and continually updated internet resources.

This document is intended as a dip-in and out resource, it is not expected to be a one-off cover-to-cover read. It has been variously written and compiled by volunteers and consequently includes some individuality not normally experienced in the funded varieties of this species. Please enjoy and tolerate these peculiarities as and where required.

2 Setting the scene

This section provides an historical and environmental context to the Berry District, which helps to explain how why the current environment is in its present state and condition.

2.1 Berry BushLinks and the Berry Corridor

2.1.1 Introduction

Berry Landcare Inc. was awarded a Bush Connect Grant of \$500,000.00 from the NSW Environment Trust in 2016, to be implemented in partnership with the NSW National Parks Association. The project brought together a consortium including over fifty private landowners, community and government organisation. It aimed to support and augment the Berry Wildlife corridor by connecting existing 'steppingstone' patches of native vegetation across private and public tenures. David Rush was engaged as the Project Officer. Funding was provided for six years of a 10-year project timeline. Due to drought, Covid19 and changes in workforce, the period of funding was extended to seven years: 2016 – 2022.

To date [2021] over 200 volunteers have been involved in the project, planting 9,600 native tube stock across 33 private, and 10 government owned properties. The project has also included feral animal control, community workshops and scientific fauna research with the University of Wollongong. Over 23,000 volunteer hours have been invested.

2.1.2 Aim

By strategic tree planting, supporting existing native vegetation, and controlling weeds and pest animals, this project is restoring existing and creating new habitats within the Berry Corridor to support a range of native wildlife including threatened species and endangered ecological communities. The aim, through these activities is to support and increase the connectivity of native habitats, and thus the ecological sustainability of the Corridor.



2.1.3 Location

The area over which this project is focused is called the Berry Corridor. The Corridor extends between the Barren Grounds Nature Reserve and Seven Mile Beach National Park. The western boundary of the corridor approximates Woodhill Mountain and Coolangatta Roads. The eastern boundary approximates the Shoalhaven City Council Boundary (**Figure 1**).

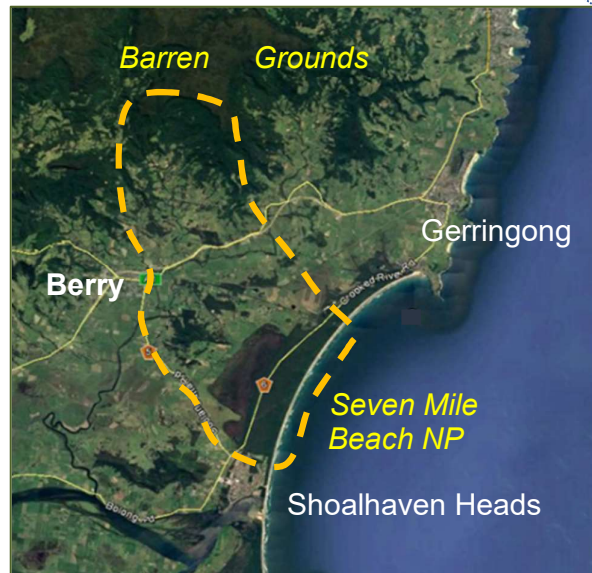
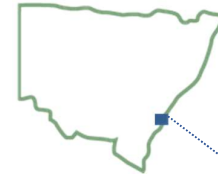


Figure 1 Location of the Berry Corridor (Yellow dashed line)



2.3 Aboriginal cultural and historical context

2.3.1 Age of occupation

The earliest archaeological evidence of Aboriginal occupation of the South Coast of NSW dates from 20,000 years ago, from sites at Bass Point and Burrill Lake. At this time the sea level was lower and evidence of camp sites, now near the coast, would have been located some 14 km inland. It is probable that earlier occupation occurred, however the survival and detection of early sites is rare. Most surviving Aboriginal sites post-date the rise of the sea to its current level around 6000 years ago.

Many Aboriginal sites have been located in the course of archaeological surveys on the NSW South Coast and its immediate hinterlands. Site types recorded in the Berry region include rock shelters with art and/or cultural deposit, grinding grooves, artefact scatters, scarred trees, ceremonial sites, coastal and estuarine middens, and burials.

2.3.2 Tribal Boundaries

Due to the nature of early historical records and observations it is difficult to be certain about the location and nature of linguistic and tribal boundaries.

Based on a review of Aboriginal tribal boundaries across Australia by Tindale in 1974, the Berry district falls within the area of the Wodi Wodi people. Tindale found the Wodi Wodi occupied an area which extended from approximately Stanwell Park in the north, to the northern bank of the Shoalhaven River in the south, and west as far as Picton, Moss Vale and Marulan.

The term Wodi Wodi was first recorded by Ridley in 1875, who based it on the testimony of Lizzy Malone, the daughter of a woman of the Shoalhaven tribe. She stated that Wodi Wodi was the name of the language spoken by the Aboriginal people of the Illawarra. Tindale considered the Shoalhaven River to form the boundary between the Wodi Wodi and the Wandandian people to the south.

The tribal groups on either side of this boundary are distinguished by different languages, those to the north spoke Dharawal (Thuruwal) and to the south spoke Dhurga. Both the Dharawal and Dhurga languages form part of the Yuin linguistic group which extends southward from Sydney to almost the Victorian border. For some contemporary Aboriginal groups the term 'Yuin' is problematic and its use as a tribal term is contested.

Contrary to Tindale's Shoalhaven river boundary, other ethnographers describe the Aborigines and linguistics of the lower Shoalhaven in terms of a single cultural character, one district, and one dialect. It seems more probable that the tribal boundary on the coastal plain was further south, and consistent with linguistic evidence, adjacent to Jervis Bay. A boundary in this region would roughly be equivalent with the Shoalhaven-Jervis Bay watershed.

Many modern researches use the term Dharawal or Tharawal to refer to the tribal group within the Illawarra and Southern Illawarra. Amongst contemporary Shoalhaven Aboriginal people the terms Jerrinja, Eloura, Wodi Wodi or Wandiwandian may be preferred. The choice of name often relates to family ties and identification with differing Aboriginal communities along the South Coast.

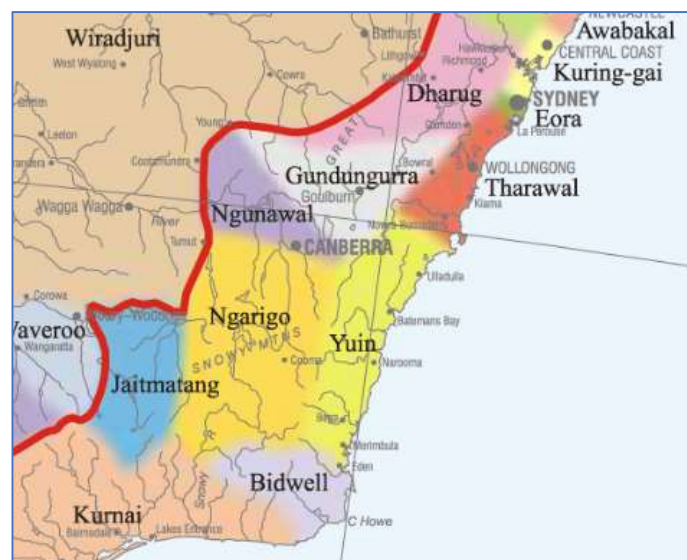


Figure 2 Extract from Aboriginal Languages map (Museums & Galleries of NSW), showing distribution of the Tharawal language. <https://mgns.w.org.au/sector/aboriginal/aboriginal-language-map/>



2.3.3 Social Structures

Within these broad language and tribal groupings were smaller social divisions, perhaps consisting of different family groupings, which were associated with local areas or home territories. European observers thought of these groupings as 'tribes' and associated them with localities which may have related to home territories. Examples include the Shoal Haven (Nowra and the adjacent area south of the Shoalhaven River), Murro (Meroo Meadow region), Broughton Creek (lower Broughton Creek and coastal plain north of the Shoalhaven River) and Gerongong (Seven Mile Beach hinterland to Gerringong).

Generally speaking, the term 'tribe' is employed to describe a large group of people who, for the most part, speak a common language and occupy a broad tract of land within which 'clans' consisting of loosely-related families own the land, and smaller groups referred to as bands perform the daily tasks of group maintenance. Matthews and Everitt described the clan organization of the Shoalhaven as consisting of related males with married women joining the band of their husband but maintaining an affiliation with their clan of birth. Children belong to the father's clan with both sons and daughters receiving the totem of their father's clan.

The Aboriginal people of the Shoalhaven banded together for specific activities, were together for a time, and then split apart; later they formed new groups which most likely had at their core a number of closely-related families. Leadership was assigned to experienced elders with the males being predominant.

Boundaries between local bands and clans were flexible and permeable, allowing groups to move about. Where resources, food or materials, were particularly rich, it is likely that use of those goods was controlled and permission had to be obtained from the custodians of that place. Where resources were widely distributed across the landscape, movement of people was less controlled.

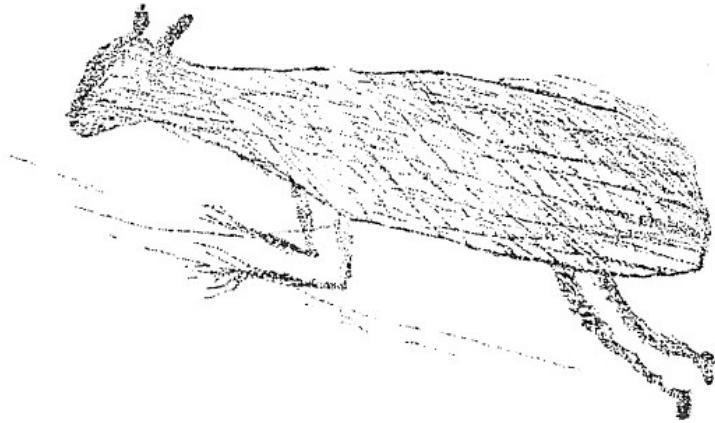


Figure 3 This Aboriginal drawing from a rock shelter in the Cambewarra Range may depict a Koala. Koalas are now locally extinct in the Berry area.

It is likely that Aboriginal groups were able to maintain their structure throughout the early period of European settlement. Later responses may have included seeking refuge and establishing camps either at a distance or close to European properties, being partially integrated into European maritime or pastoral activities, or dwelling on the fringes of European communities. As the land-use patterns of the new colonists intensified, there would have been increased demand on natural resources, and the food sources of the indigenous people would have diminished radically. In the 1840s and 1850s, the introduction of dairy farming (Bell 1960) further reduced the availability of game in the Shoalhaven District. The issuing of rations by the government encouraged a clustering of people into camps, which would have caused some breaking down of the previous marriage patterns where polygamy (male having more than one wife) was preferred. It is thought that rations were issued to discourage multiple partners.

New camps frequently were situated close to towns, and most likely contained members of a number of different clans and bands. The camps became more or less permanent, much more fixed on the landscape than the hunting and gathering camps which had provided the primary locus in previous times.

By the 1880s, many traditional social and territorial arrangements were weakening and Aboriginal people were being pressed into reserves or missions. Although the missions provided places for ration distribution they also may have been inappropriately sited or offered constraints and other forms of control such as the infamous removal of children with mixed descent.



2.3.4 Historical Overview

The first European sightings of the Shoalhaven region were made by Captain Cook in April of 1770. He noted a protected bay which would later be named Port Jervis, and on April 26 'several smokes along shore before dark'. This observation may relate to Aboriginal campfires in the vicinity of Bass Point.

First reference to interaction between the Shoalhaven tribes and Europeans comes from the recollections of survivors of the wreck of the 'Sydney Cove' who walked up the south coast from Gippsland to north of the Illawarra before being picked up. As the exhausted party came towards the Shoalhaven they met with 'unfriendly natives, at whose hands it is thought some of the exhausted ones lost their lives'.

In 1805 James Meehan reached the Shoalhaven River on an exploratory trip and noted the existence of considerable stands of red cedar along the lower reaches. The cedar getters, both legal and illegal, quickly followed and were almost certainly the first Europeans to venture into the coastal escarpment of the Illawarra Range. The first official shipment of cedar from the Shoalhaven, cut from its lower reaches, was in 1811. A year later seven ships were engaged in the trade.

An undocumented and probably violent story of culture contact and exploitation followed the cedar cutters. The conduct of the cutters was mostly beyond the control of Colonial Officials. There is evidence to suggest that the Shoalhaven Aborigines were not friendly toward the newcomers. The timber getters were obliged to fell their timber near the river banks, not only due to transport limitations, but partly for fear of the natives who were described as never having been 'otherwise than inimical to us'.

During 1819, John Oxley and Meehan were returning from Jervis Bay to the Shoalhaven with the aid of a local guide, Broughton:

The surveyor Throsby returned to the Shoalhaven from Kangaroo Valley in 1821 and went to a place he called 'Nou-woo-ro', now known as Nowra.

Early in 1822, on returning from verifying the existence and source of the Clyde River, Alexander Berry spent several days exploring the Shoalhaven River, up as far as Burrier. Six months later Berry returned with the aim of establishing a permanent settlement. He was in receipt of a government grant of 10,000 acres on the Shoalhaven River, and a labour force of nineteen convicts. This marked the start of permanent European settlement in the Shoalhaven River valley.

Berry chose for the site of his settlement an area of elevated ground at the foot of a hill variously referred to as Coolungatta, Cullengatta, Coloomgatty, and Cooloomgatta. The name was recorded by Surveyor James McBrien in 1824 as Aboriginal, meaning 'high hill'. It is now known as Coolangatta. Howitt records the name of the Yuin 'clan' inhabiting the Lower Shoalhaven District as Gurungatta-manji. 'Coolangatta' may therefore be a derivation of the name used by the original Aboriginal social groups who lived in the Nowra region.

Berry's selection of this location was apparently treated with apprehension by the local Wodi Wodi. Berry notes that in June of that year, during construction of a hut and a canal near the Shoalhaven Heads a native called Wagin (a local chief), confronted the workers and claimed the ground where they had been working. This action falls into context when it is acknowledged that the Coolangatta Mountain was a place of ancestral significance to local Aboriginal people.

Berry's settlement grew steadily with the immediate introduction of herds of cattle and the establishment of plant crops at Numbaa. Berry initially considered the local Aborigines to be ferocious and his timber workers tried to drive them away. For several years potatoes and maize was 'stolen' from the fields. Several weeks after Berry's arrival a party of twenty Aborigines camped near his settlement. Berry notes that there were two chiefs, Wagin, chief of Numba (Lower Shoalhaven), and Yagen chief of Jervis Bay. He also describes Brogher (or Broger), the brother of Broughton (an Aboriginal guide employed by Berry), as a native chief (probably of area north of Coolangatta). These probable band groupings suggest that most of the Aboriginal population was centred on the more fertile coastal plains.



Other land grants followed in the early to mid 1820s. From this period, settlers furnished brief descriptions of Aborigines in the Shoalhaven particularly those which settled on pastoral properties and gained employment. Aboriginal people also gained employment in fledgling local industries such as the whaling station at Jervis Bay.

In 1836, James Backhouse toured the Australian Colony and passed through the Shoalhaven, travelling from the Five Islands (Wollongong), through Colongatta (Berry's estate on the Shoalhaven), and Kangaroo Ground (Kangaroo Valley) to Bong Bong. Backhouse encountered many parties of Aborigines, often describing them as partly clothed in European clothes and subsisting according to both traditional and European sources of food and materials.

At the foot of the Cambewarra Mountains, he met a group of six aborigines dressed in blankets and old European clothes. 'These people were accoutred with hunting and fishing spears, and weapons of war' including a death spear barbed with 'pieces of glass' and a shield painted in white with red lines.

By the late 1830's the majority of the lower coastal plain between Gerringong and the mouth of the Shoalhaven River had been taken up as land grants. By 1840 the Coolangatta Estate had a population of 270 people.

Through the 1840s and 1850s Aboriginal communities were increasingly impacted by the spread and consolidation of European settlement. In response, Aboriginal people either settled on the pastoral stations, in 'fringe camps' adjacent to European settlements, or were forced into adjacent rough and mountainous country. By the 1840s the Shoalhaven Aborigines had been reduced to remnant groups either wandering large tracts of the coast, or subsisting at the edge of the now permanent European settlements.

Permanent Aboriginal camps became established on Broughton Creek (Berry), Crooked River (also referred to as Black Head or Gerongong), around Jervis Bay (notably Bilong on Currambene Creek), and in a gully on the northern side of the Coolungatta Mountain on the Berry Estate. The Coolangatta camp had grown with the Berry Estate, and a number of the residents there were employed as labourers and to grow vegetables.

Other encampments known from the later half of the nineteenth century include the banks of Broughton Creek at Broughton Village, and the banks of Broughton Mill Creek adjacent to Berry.

Reclamation of the Shoalhaven wetlands began on a major scale from 1873. By 1909 a total of 600 km of drains had been constructed. The draining of the wetlands effectively alienated the last terrestrial wild food areas open to the remaining local Aborigines.

Following cholera and typhoid epidemics in the Coolangatta camp in the late 1890's, The Board for the Protection of Aborigines moved residents to a newly proclaimed Reserve at Roseby Park (Orient Point) in 1900.

The last remembered traditional initiation ceremony staged in the region was conducted in the late 1880's by 'the Shoalhaven River tribes' on the southwestern side of Moeyan Hill, a low hill to the north of Coolangatta Mountain.

In 1881 a Protector of Aborigines was appointed. The Protector was replaced in 1883 by the Aborigines Protection Board and by the turn of the century had established 133 reserves across the State. Aboriginal reserves were sited to allow for the exploitation of natural resources (marine and estuarine) at a distance from white rural centres.

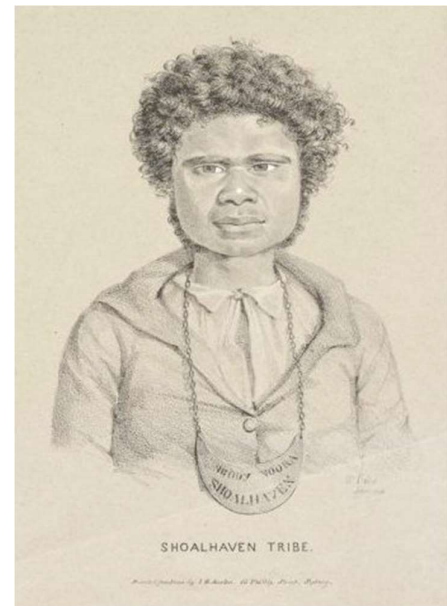


Figure 4 Portrait of Neddy Noora
Aboriginal Chief of the Shoalhaven Tribe
by Charles Rodius 1834.

The breastplate given to Neddy Noora was found in Broughton Creek at Berry in 1925. Neddy and another Aboriginal man, Toodwit (also known as Broughton), guided John Oxley's expedition to mark an overland route between Sydney and Jervis Bay in 1819.



The Aborigines Protection Board was also responsible for the infamous policy which resulted in the removal of thousands of Aboriginal children to the Cootamundra Girls Home, the Kinchela Boys Home, and in the lower Shoalhaven, the Bomaderry Aboriginal Children's Home which was established in 1908.

Missionaries were allowed to live on many of the reserves and in popular parlance Aboriginal people came to refer to the reserves as 'missions'. Reserves to which managers were assigned were referred to as 'stations'. Like the many small reserves created in the nineteenth century these places were regarded by the government as temporary arrangements to be altered or closed on the advice of the Board.

Toward the latter part of the nineteenth century, government authorities placed pressure on Aborigines to re-settle within government reserves. This effectively removed local Aboriginal groups from freehold and crown lands, and concentrated the remaining populations onto reserves. Reserves were often situated on marginal land, away from people's traditional lands and forced peoples of differing tribal affiliation into close contact. Despite this, the occupation of coastal and fringe camps continued, especially as part of the required movement of people looking for seasonal work.

In 1899 a government Aboriginal reserve of 43 acres was established near the northern end of Seven Mile Beach (Figure 5). The reserve was revoked in January 1953 (AR 29911, McGuigan no date:39). Although the exact nature of Aboriginal occupation on this reserve is not well documented, its location and duration supports the documentary evidence for a historical focus of Aboriginal occupation in the Crooked River (Black Head/Gerringong) area.

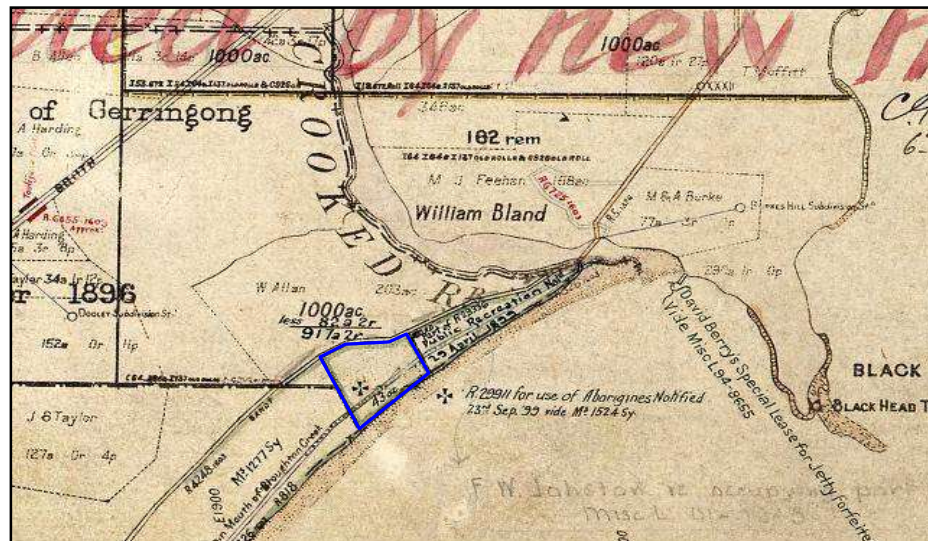


Figure 5 The location of the Seven Mile Beach Aboriginal Reserve which was gazetted in 1899 and revoked in 1953. Extract from Parish of Broughton Map 4th Ed 1893-1898, (Lands Dept ID 10353801)

From 1940 to 1969 the Aborigines Protection Board vigorously pursued a policy of assimilation. Reserves were reduced in size or were revoked (Long 1970). Houses and facilities were allowed to deteriorate in an attempt to force Aboriginal people to move off the reserves.

A Directorate was established in 1969 to control reserves and an advisory council with Aboriginal members was appointed. In 1979 the New South Wales Aborigines Welfare Board, the successor to the Aborigines Protection Board, was abolished and the reserves transferred to the Aboriginal Lands Trust. To meet the new policy of self-determination, steps were then taken to consolidate, revitalise and upgrade reserves. Reserve ownership has for the most part been transferred to Local Aboriginal Land Councils.

Today, Aboriginal people live throughout the Illawarra and South Coast as residents of the larger towns and cities - Bega, Nowra, and Wollongong, as well as maintaining communities on former reserves, and are found throughout the region in family groups. Communities of Aboriginal people are located at La Perouse, Orient Point (Jerrinja), Wreck Bay, and Wallaga Lake, as well as on 'informal reserves' such as Browns Lane near Nowra and Murray's Flats outside of Bega.



2.3.5 Some features of the Aboriginal cultural Landscape in the Berry district:

Coolangatta Estate – former location of nineteenth and early twentieth century Aboriginal encampment

Crooked River estuary – former location of nineteenth century Aboriginal encampment and a former Aboriginal Reserve

Berry – site of early original Aboriginal encampment 'Boongarree' (near the confluence of Broughton and Broughton Mill Creeks), and a later nineteenth and twentieth century transient seasonal worker camp (on Broughton Mill Creek, adjacent to and upstream of the Bowling Club)

Broughton Village – nineteenth century Aboriginal encampments were located at 'Brookside' and near water holes on Broughton Creek

Valley floor adjacent to Broughton Village – a traditional Aboriginal battle ground known as 'Dickie Woods Meadow'

Southern Illawarra Range – traditional routes and passes were used across the range and that certain places had cosmological significance and are places of high cultural significance, including the 'Nut Gatherers' at 'Bendthualaly'

Coolangatta Mountain ('Cullunghutti') – a place of high spiritual and cosmological importance known as a place of transit for the spirits of the dead.

Moeyan Hill – an important spiritual place and home of a dreamtime creature, also the location of a male initiation ceremonial ('Bunan') held by 'Shoalhaven tribes' in the 1880s, near Far Meadow.

Harley Hill Cemetery – includes the graves of many local Aboriginal people, some thought to be the victims of cholera and typhoid epidemics.

Toolijooa Ridge – a traditional travel route between the coast and the uplands, also the location of a reported ceremonial ground

2.3.6 Aboriginal fire management in South-Eastern Australia

Indigenous people used fire for a wide variety of reasons across much of Australia for thousands of years. Fire was used as an important tool for managing the land and its resources and for ceremonial and spiritual purposes. Accounts by some of the first Europeans witnessing the use of fire by Aboriginal people during early contact years, indicate that Indigenous fire regimes were mostly well controlled and patchy. The effect of this burning regime helped to shape the native plants, animals and vegetation communities and their structure.

The landscape observed by those first Europeans in south-eastern Australia had already been influenced by several thousands of years of the application of fire

by Aboriginal people and was not always recognised as a highly managed practice by some of those European settlers. More recently, studies have recognised the long association that Aboriginal people have had with the use of fire and one review by Bowman (1998) described its impacts as 'one of the most complex and contentious issues in Australian ecology', and that:



Figure 6 'Aborigines using fire to hunt Kangaroos' by Joseph Lycett c.1820 (National Library of Australia).



'fire was a powerful tool that Aboriginal people used systematically and powerfully over the landscape' ... and there is... 'little doubt that Aboriginal burning was skilful and was central to the maintenance of the landscapes colonised by Europeans in the 19th Century...This issue is not only important for the development of a comprehensive understanding of the dynamics and evolution of the Australian biota, but is central to the formulation of appropriate strategies for the conservation of the nation's biota'.

While there is no doubt that Indigenous fire practices have shaped Australia's biota, these fire practices have also been modified and or reduced across the landscape over the last 200 plus years. This has resulted in further changes to the Australian biota where once there may have been more extensive forest and woodland with grassy understory to increased forest or closed forest with a range of stratum within those forests. Of course, changing fire practices are not the only impact that has changed the biota in south-eastern Australia as there have also been impacts of land clearing, habitat loss and fragmentation for rural, residential development, roads, rail, agriculture, forestry and mining.

The focus on fire management in recent decades has been more of wildfire suppression and hazard reduction burning for protection of life and property rather than for hunting, natural resource use, ceremony, and cultural practices. It is also important to note that in today's society, Aboriginal fire management practices while they may be a component part of the suite of tools available for management of wildfire, Aboriginal burning practices were not designed solely for the purpose of wildfire suppression.

Fire ecology and management is a complex issue and the impacts of climate change only add to this complexity. No one single tool can be used to protect life and property and provide the necessary needs of a range of different vegetation communities, threatened species and threatened ecological communities. Developing a fire plan for your property should consider a range of tools and management practices that also take into account how your patch of bush contributes (or can potentially contribute) to the wider landscape needs of threatened species and threatened ecological communities. Your patch of bush may already be providing critical habitat for native animals and provide a corridor for their movement across the landscape for their long-term survival.

2.3.7 Information sources

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2.4 European historical context

2.4.1 Early exploration

In April 1770, Captain James Cook was the first European to sight the eastern shores of the region while sailing north towards Botany Bay. Cook named Pigeon House Mountain, Cape St George and noted the entrance of what seemed to be a bay (Jervis Bay), the inner north head of which he named Longnose Point, before passing Kiama's shore and on to further exploration.

Nothing more of the area was recorded by Europeans until after the settlement of Sydney in 1788. On 27 July 1791, Captain Weatherhead of the *Matilda* discovered Jervis Bay, which he named Matilda Bay after his ship, but the name was not retained. Following his visit to the bay on 18 August 1791, Naval Lieutenant Bowen provided the name 'Port Jervis' in honour of Sir John Jervis. Whaling ships immediately began calling there for shelter and water.

In December 1797, George Bass, during his voyage of coastal exploration in a whaleboat with a crew of six seamen, landed in a sheltered bay, later named Kiama Harbour, and followed around the bight of Seven Mile Beach to discover the mouth of a river, which he named Shoals Haven. He spent three days examining the river, noting the fertile banks that he thought would not be subject to flooding.

European knowledge of the area was advanced when on 10 March 1805 Lieutenant Kent of *HMS Buffalo* returned to Sydney after examining the district overland 18 miles north from Jervis Bay with James Meehan, the assistant Surveyor-General. Information from that expedition confirmed that the area was originally covered with rainforest, brush cedar, soft and hardwoods and a variety of bushes, palms, vines and ferns.

Independent cedar getters were in the Shoalhaven from at least 1811. After grounding on the shoals, the *Speedwell* managed to bring the first recorded cargo of cedar from the Shoalhaven River to Sydney in December 1812. The timber industry then grew in scale, exploiting the patches of cedar on the rivers and creeks, but the main concentration was in the Long Brush, which stretched from Kiama to Jamberoo.

Exploration from landward began in February 1818 when Dr Charles Throsby and James Meehan set out from Sydney to find an overland route to Jervis Bay. The party reached Kangaroo Valley, crossed the Shoalhaven and reached Jervis Bay but found the route to be impractical.



Figure 7 'Cabbage Trees near the Shoalhaven River' painting by Eugene von Guerard 1860 (State Library of NSW). Although the beauty of the tall rainforests on the lowlands (known as 'Brush') was acknowledged by many Europeans, their removal to create pastures and ploughlands was an overriding economic and cultural priority for the European colonists.

The need for a better route from the Southern Highlands was met, to an extent, in 1821 by a new route pioneered by Hamilton Hume and Charles Throsby through Tallaganda Shire, which Hume reported could be made along a line of where he marked the trees. However, the route was not developed until the 1840s when The Wool Road from Braidwood via Nerriga, Sassafras and Wandandian was created.

No sooner had Hume returned from that expedition when, in January 1822, he left Sydney in the *Snapper* with Lieutenant Johnston and Alexander Berry to explore the coastal rivers, sailing up the Clyde and trudging inland to the Pigeon House. Although it was a government sponsored voyage it appears that Berry's purpose was to seek out land on which he could make a settlement after an adventurous life of roving in his early days.



2.4.2 The Berry Estate

After a brief stay in Sydney in 1808 during his early career as an international merchant, Alexander Berry returned to London in 1812 by way of Cadiz. In Cadiz Berry met Edward Wollstonecraft, who subsequently became Berry's London agent, and later his partner when they decided to start a business in Sydney. Berry returned to Sydney in July 1819, and Wollstonecraft arrived in September. In 1827, Berry married Wollstonecraft's sister Elizabeth.

Like other merchants, Berry and Wollstonecraft often had to accept stock in payment of debts, and Berry sought a grant of land on which to accommodate the stock. Governor Macquarie refused, as Berry was about to leave for England, but promised him a grant when he took up permanent residence. While he was away, Wollstonecraft obtained a grant and located part of it on the North Shore where he built a cottage, 'Crow's Nest'.

On Berry's return he sought a site for the grants made to him and Wollstonecraft, travelling widely even in unsettled districts because 'Everybody was flocking to the Hunter River, Bathurst, and other places ... and all were elbowing one another. But we neither wished to elbow any one nor to be elbowed'. Berry first visited the Shoalhaven in January 1822, taking the cutter *Snapper* into Crook Haven (formerly Shoals Haven) from which he proceeded overland to examine the country on either side of the river. The rich alluvial soils and natural grassy 'meadows' led him to choose the Shoalhaven as the site for an estate and he returned in June 1822 to occupy it.

In February 1822, Berry and Wollstonecraft had jointly applied for a grant of 10,000 acres, "Coolloomagatta", which was approved by Governor Brisbane, though the deed was not issued until 1830. To this was added a 2,000 acre grant on the south side at "Numbaa".

Berry decided that his station would be built at the south-eastern foot of Mount Coolangatta. He called it "Cullengatty Farm". A store and huts were erected on the lower slope of Mount Coolangatta and the flat at Numbaa was prepared for cultivation, becoming the first farm on the Shoalhaven. His residence was begun in 1823 and completed in 1824, by which time he had 120 acres under wheat, 40 under maize, three acres under barley and three as a garden with an orchard planted at Numbaa, where 250 acres were already cleared. He had 600 cattle, 14 horses and 235 pigs on his estate. A barn was completed in 1830 at Upper Numbaa or Jindiandy where it still stands.

Berry secured additional grants of two lots each of 4,000 acres north of the first grant and one lot of 4,000 acres west of Broughton Creek. West of the latter, John Berry (one of Alexander's younger brothers) later secured 3,225 acres at Bunberra north of Pig Island and several grants surrounding it. On his death in 1848, John Berry's grants passed to Alexander.



Figure 8 Sketch of 'Mt Coolangatta' in 1874 by Conrad Martins, looking north (National Gallery of Australia). The Coolangatta homestead can be seen in the lower right distance. Although now predominantly regrowth, the mount remains forested to this day



Figure 9 The Coolangatta homestead on the Berry Estate in 1896 from the Cocks Shoalhaven Album, (State Library of NSW a6292019h), looking south.



Other grants in the area were:

- 1920 acres at Tooliia (Toolijooa) called “Richardson’s Farm” promised to J. G. Richardson 23 March 1830 (granted to A. Berry 11 February 1837).
- 1000 acres called “Hyndeston” near Gerringong to promised to Thomas Hyndes 24 July 1824 (granted to A. Berry 18 Oct 1839).
- 4000 acres called “Broughton Head Farm” promised to Aspinall and Brown 27 May 1829 (granted to A. Berry 29 May 1838).
- 1280 acres called “Cumbewarra Farm”, promised to Charles Staples 27 January 1830 (granted to A. Berry 20 May 1837):
- 1280 acres called “Meroo Farm” promised to Richard Mutton 22 June 1829 (granted to A. Berry 28 November 1837).

By 1840, all of these grants had passed to or been purchased by Alexander Berry in whose name the grants were issued. In 1842, Berry also secured 2560 acres called “Burke’s Farm” promised to John Burke (granted to A. Berry 15 February 1842) along Seven Mile Beach.

By the early 1840s, purchases of land from the crown and private individuals increased the size of the estate to about 32,000 acres, and to more than 40,000 acres by 1863 (**Figure 10**).

The total holdings of the Berry Estate, from grants and purchases, north and south of the Shoalhaven River, amounted to 57,000 acres. The northern extent of the Berry holdings is marked by the line of Boundary Road in Broughton Vale.

The motivation to enlarge the Berry estate at every opportunity was probably to secure the cedar growing in the district. Demand for cedar was strong given that by the 1820s the supply from the Illawarra and the Hunter River valley was nearing exhaustion. The Estate’s ‘meadows’, originally observed approvingly by Berry,

proved to be wetland basins unsuitable for agriculture or sustained grazing, unlike the fertile pastures of their namesakes in the United Kingdom. During his observations of the area in the 1820s, Barron Field noted his fear that ‘these grants will hardly ever repay Messrs. Berry and Wollstonecraft for their outlay upon them’. Given the small area of agricultural and cleared land on the Estate at this time, the recovery and sale of red cedar became an economic mainstay in the first decades of the Estate.

Early agriculture on the Estate include the production of maize, tobacco, wheat, barley and potatoes, all marketed in Sydney; pigs were also reared and cattle were brought to Shoalhaven from the Illawarra over a road made for the purpose. Besides buying a ship to provide transport between Sydney and Shoalhaven Berry and Wollstonecraft built a sloop and began to drain the extensive swamps included in their grants.

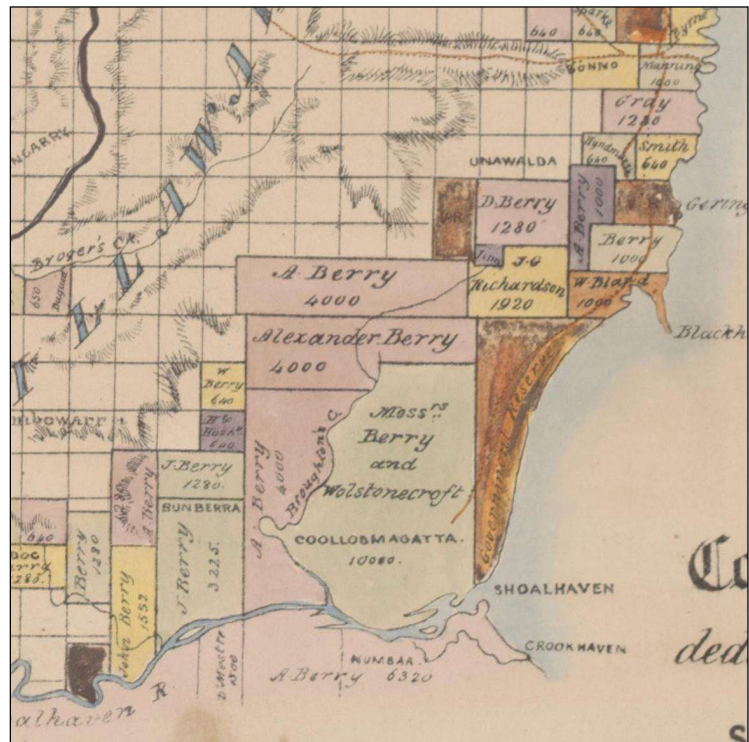


Figure 10 Extract from Baker's Australian County Atlas (County of Camden) 1843 - 1846 showing early land grants across the northern Shoalhaven district (National Library of Australia)



The development of the estate was not without its controversies. Berry was publicly accused of negligence in his care of convict servants and of ill-treating them; it was said that a government tax on cedar cut on crown land was engineered to give Berry and Wollstonecraft a virtual monopoly, and that a tax on imported tobacco was introduced for their benefit. By 1846, Berry wrote that he had lost interest in the estate and 'would gladly part with it upon any terms'; this feeling grew as labour became scarcer after the abolition of transportation and the discovery of gold.

After his wife's death in 1845, Alexander Berry (**Figure 11**) became a recluse in his Crow's Nest House. After his brother David took charge of the Shoalhaven estate in 1836 he appears to have rarely visited it. He died at 'Crow's Nest' on 17 September 1873.

Berry had no children and his property passed to his brother David.

David Berry, with his brothers John and William and his sisters Janet and Agnes, put into effect a long-held idea to join their eldest brother Alexander in NSW. They arrived at Sydney in July 1836 went at once to Coolangatta, the Shoalhaven property which, at Wollstonecraft's death in 1832, had passed entirely to Alexander.

Until John Berry died in 1848 he and David jointly managed the property. The greater part of the land was undeveloped and most of the work force was convict. The number of their assigned servants appears to have increased from an original 100 to some 300 in the 1840s. The main source of agricultural income was the breeding of cattle and horses, which were scientifically improved by imported bloodlines.

After John's death David began leasing some of the land. By 1850, he had 36 tenants, who paid 20 shillings an acre for cleared ground and were allowed five years without rent in order to clear timbered land. The widespread agricultural development and clearing of the Estate's forest lands began and progressed in parallel with the leasehold system. By 1863 the Estate had almost 300 tenants, who occupied some 8650 acres (3500 ha) or about a sixth of Coolangatta and paid an aggregate rent of about £6,000.

When convict labour ceased, trial was made of Chinese labourers and of German families hired in Hamburg. The Chinese were considered to do well as dairymen and house servants but in general their usefulness was judged to be limited.

When David Berry inherited the estate from Alexander, it was valued at £400,000 and consisted of 60,000 acres at Shoalhaven and 500 acres at North Sydney. William Berry died in October 1875, also leaving a will in David's favour. He continued to lease the Shoalhaven land on terms considered more than lenient. Berry also introduced the practice of share farming with land, implements and materials provided by the estate and labour by the farmer, the profits to be shared on an agreed basis.

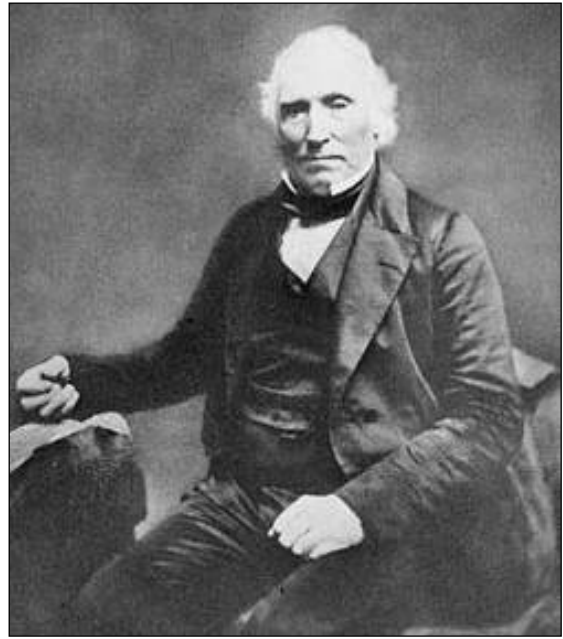


Figure 11 Alexander Berry (1781–1873) (State Library of NSW)



Figure 12 The cottage of a selector or tenant farmer at 'Mt Pleasant near Kiama' by Eugene von Guerard 1859

(<https://www.australianarthistory.com/colonial-art-in-the-illawarra>). The clearance of the tall forests across the Shoalhaven lowlands gained momentum with closer settlement by tenant farmers.



After 1883, the management of the Shoalhaven estate passed increasingly to Berry's cousin, (Sir) John Hay. When David Berry died unmarried at Coolangatta in 1889 he left an estate valued at £1,250,000. Hay was the principal beneficiary of his will. Hay died without issue at Rose Bay in 1892. Most of his estate of almost £59,000 was left to the children of his brother James.

The bequests by David Berry to the University of St. Andrews (Scotland) and to the Endowment of a hospital at Berry, amounting to a quarter of a million pounds, made it necessary for the Trustees to sell the Estate. They immediately set about a comprehensive plan of improvements before selling. A substantial component of this plan was the draining of the wetland basins to allow agriculture.

The area of the estate at that time amounted to around 100 square miles (around 26 thousand hectares). Of that area 40 square miles (just over 10 thousand hectares), consisted of alluvial flat consisting of freshwater marshes with surfaces in their lowest, some three or four feet below the flood level of the district in which they lay. To allow agricultural production, these areas had to be protected from the influx of tidal flooding by a system of drains and sluices. Another feature of the reclamation scheme was the construction of levees to restore a consistent crest-level along the natural banks of the Shoalhaven River and Broughton Creek to restrict natural flooding events. The wholesale agricultural transformation, clearance of natural habitats, and control of estuarine inundation across the Shoalhaven lowlands dates from this period.

On 29 March 1892 the sale of the Berry (Shoalhaven) Estates began and continued for three days. The Estate was divided into three for the purpose of the sale; first, the Gerringong farms of which there were four and totalled 175 acres; next came the sale of the whole township of Bomaderry followed on 30 March by the Numbaa estates, which consisted of between 5,000 and 6,000 acres. This was included in the Municipality of Numbaa, which had been incorporated in 1868.

The sale terms were all standardised at 25 per cent deposit, 15 per cent within two years and the balance over five years with an interest rate of five per cent per annum. In all cases preference was given to tenant farmers to secure the land they had formerly farmed and from that date many of the present family holdings date their freehold. The disposal by sale of the estates in Shoalhaven and North Sydney began in 1892 and was not completed until 20 years later in 1912.

2.4.3 The settlement and growth of the Berry township

Until 1899, the town of Berry was known as Broughton's Creek, Broughton Creek, or simply 'The Crick'. Originally a station of the Berry Estate, the subsequent town was a privately owned settlement developed by the Berry Estate to service the Estate's industry and surrounding tenant farmers. The town was subsequently renamed Berry in honour of its patron family after the death of David Berry in 1889.

The place was probably named after Broughton (c.1798-c.1850) who was a local Aboriginal man who was born at 'Boon-ga-ree,' an Aboriginal encampment on Broughton Mill Creek, close to the current town location. Boongaree may have been a semi-permanent occupation site and was the first human settlement at Berry.

Broughton's Aboriginal name was recorded variously as Toodwick, Toodood or Toodwit, and he is an important historical figure because his life illustrates how many local Aboriginal people strove to adapt to the new society introduced by the colonists. Broughton was accepted by the European community as a guide and tracker and appears for a time, to have acted as an intermediary between the white and black communities (**Figure 13**).

By 1818 he was working for Dr Charles Throsby of Liverpool, who probably gave him his European name after his friend William Broughton. He served as a guide and translator on several of Throsby's explorations to the south and at least once for John Oxley.

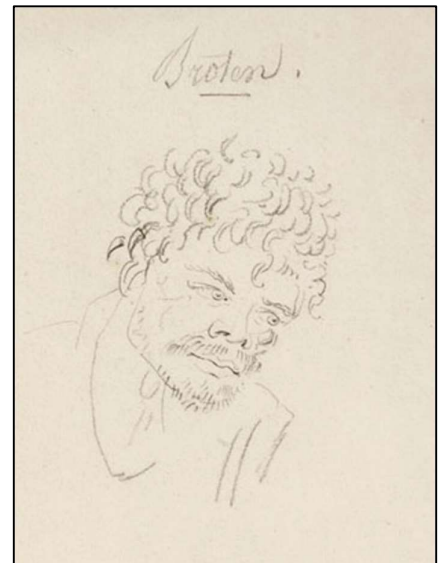


Figure 13 Charcoal sketch portrait of 'Brotten', by Jaques Arago, 1819, "Nlle Hollande J.A." (State Library of NSW PXB 283)



In 1822, Broughton started work for Alexander Berry, setting up Berry's farm, Coolangatta, recruiting Aboriginal labour, 'keeping the peace', capturing bushrangers, droving cattle and providing his own labour. He became a favourite of Berry, who called him 'my Landsman' and later 'my oldest surviving Black friend' and who presented him with a rectangular breastplate inscribed 'Broughton Native Constable of Shoalhaven 1822'. The names of Broughton and his brother Broger (Brogher) survive in several physical features and localities in the Shoalhaven. Brogers Creek is named after the latter. After the former there is Broughton Creek, Broughton's Head, Broughton Vale, Broughton Village, and Broughton Mill Creek. Contrary to this conventional allocation, a 1935 newspaper article notes some alternative possibilities: William Broughton, of the 1821 Hume expedition; and Minne Broughton a little girl who figured in a shipwreck (Sydney Morning Herald 25 June 1935 p12).

Broughton Creek was strategically sited on the northern part of Alexander Berry's Coolangatta Estate. With a double wharf on the junction of Broughton Creek and Broughton Mill Creek, a water powered sawmill and a tannery by 1860, the embryonic town proved a focal point for the farming hinterland.

The milling of timber on the estate appears to have begun as an open saw pit site in 1827. In late 1826, a number of 'free' sawyers signed an agreement to

saw at Broughton Creek, and the following year, James Smith, described as the Overseer of the timber establishment at Broughton Creek, was measuring the timber on hand. In the early 1830s, a sawmill was erected on the site to replace the previous saw pits (Antill 1982:350). It was in operation from at least 1836. The Berry Estate timber mill and tannery was one of the first industrial complexes to be established on the NSW South Coast.

On 3 October 1836, when leaving 'Coolangatta' Backhouse noted, "A circuit of about six miles over grassy forest hills between two marshes brought us to Alexander Berry's sawing establishment at Broughton Creek, which is under the superintendence of Alexander Pattison [or Patterson], a respectable Scotchman, with a wife and numerous family". In January 1840, the Reverend W. B. Clarke also recorded visiting the sawmill noting, "We came about 5 o'clock to a river, which we crossed, then to the saw-mill established by Mr Berry, which we visited. The machinery is simple and washed by water in the American plan,".

The sawmill was leased to a tenant to cut cedar and hardwood for use on the Estate between 1842 and 1850.



Figure 14 Photograph of the Tannery, Broughton Creek, c.1875 (In Mabbutt nd:6)



Figure 15 Photograph of James Wilson's store, Pulman Street, Berry, c.1875 (Photographer: Henry Toose, in Mabbutt n.d.9)



The village had a schoolhouse provided by Alexander Berry in 1861 and a postmaster from the same date. By 1866, there were 300 people in the immediate vicinity. Although the sawmill had closed, the tannery flourished. There were two stores, a smithy, a saddlery and a hotel.

Figure 16 presents a sketch of Broughton Creek Village in the 1870s, looking southwest towards modern day Pullman Street. At this time, the town was restricted to the ridgeline to the east of Broughton Mill Creek. In the 1880s, the current town grid was surveyed on the west side of Broughton Mill Creek in response to the need for further space and higher ground for town expansion. As part of the move to the west side, tenants were given longer leases, up to 25 years, and later it was made possible to buy the land.

As the land surrounding Berry was taken up by Europeans, firstly on the Estate by tenant farmers, and from the 1860s by settlers selecting adjacent lands under the Robertson Land Act, Broughton Creek became an important port providing access to the Sydney markets where agricultural goods and butter could be traded. This was critical for the growing dairying industry. **Error! Reference source not found.** shows a photograph of the (second) wharf at Berry in 1896 – the first wharf was at the ‘Crooked S’, the junction of Broughton and Broughton Mill Creeks. Farmers from Broughton Vale, Broughton Village, Jaspers Brush, Brothers Creek, Woodhill and even Kangaroo Valley, took their butter and other produce to the Broughton Creek wharf. From the wharf it was taken to the ocean steamer at Greenwell Point or drogher, until 1871, when Alexander Berry provided a flat bottomed steamer, the *Coolangatta*.

The Illawarra rail line (now the South Coast line) was opened as an isolated line as far as Bombo in 1887. The Bombo to Bomaderry section was opened in 1893.

The town of Berry continued to flourish as a service centre for a predominantly saw milling and dairying district. The population was 1,300 in 1884, with additional town blocks enlarging the town site from that laid out in 1883. Today, Berry continues to provide basic service needs of the community, but the 1980s saw it transformed into a tourist town, with tea rooms, antique and gift shops.

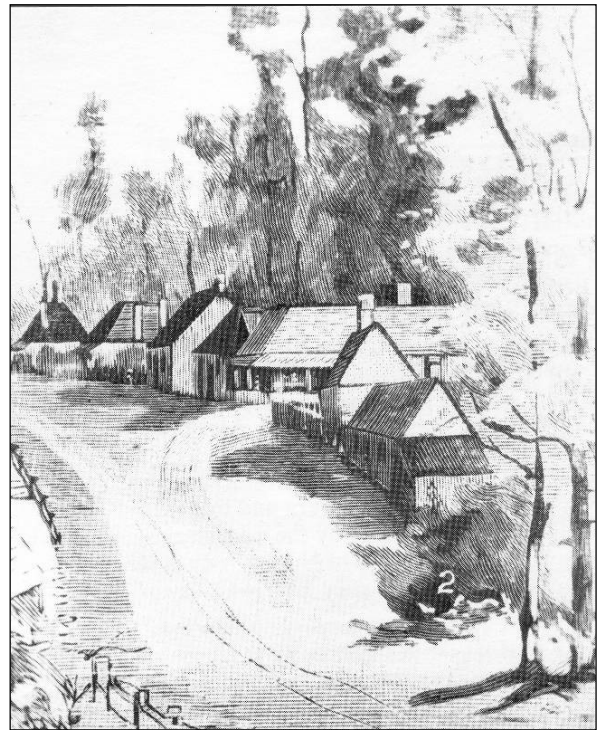


Figure 16 Broughton Creek Village along the ridge at Pullman Street in the 1870s (In Bayley 1975: 74)

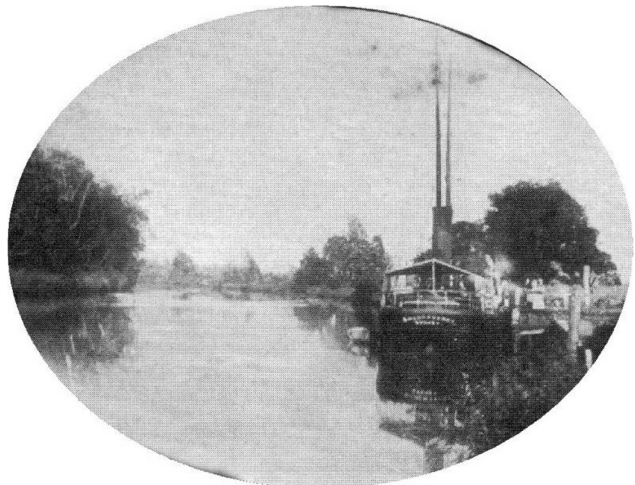


Figure 17 Photograph of the SS Coomonderry at the (second) Berry wharf, 1896 (In Mabbutt n.d.: 58)

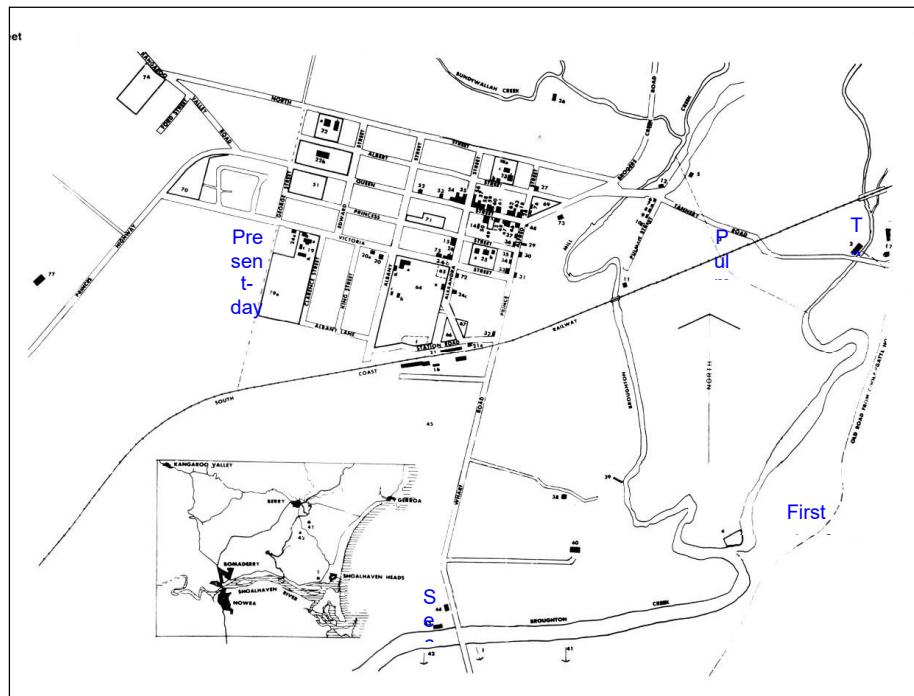


Figure 18 Map of present day Berry showing locations of historic sites, including Pulman Street, the tannery and the two wharf sites (In Lidbetter 1993:75)

2.4.4 The dairy industry

Alexander Berry, being the first in the area to create the concept of a farming village community, also became the first to set up a dairy on the South Coast. Within two years of his arrival, he recorded that, “a shipment of farm produce to Sydney ... included in this shipment 78 lbs of butter and 20 cheeses”. So, by the end of 1824 his first dairying trade with Sydney Town has begun.

Within another 10 years or so the dairying herd at ‘Coolangatta’ had increased in quantity and quality. While the first dairy structures were hurriedly installed and crudely made from packed mud, as the brickfield production improved, later buildings were more substantial. A large dairy was developed on his grants south of the river at Jindiandy, close to Upper Numbaa and strategically placed three miles from the river bank so as to reduce the risk from flooding.

After his arrival in 1836, John Berry, who managed the Shoalhaven Estate, changed its emphasis from agriculture to stock breeding and the production of beef. He was said to have lived on horseback and was eventually thrown from his horse on April 15, 1848, dying from injuries four days later. With John Berry’s death and in 1849 the introduction of tenant farmers, the early days of the Shoalhaven being a breeding ground for young stock drew to a close.

Twenty acre plots were leased rent free on the condition that they were cleared and fenced by the end of two to five years. By 1850, the leasing of the Estate started and the tenant farmers began to establish dairying as the chief industry of the Shoalhaven district. By the 1870s most of the cedar had been cut out and the clearing leases had given way to farms - originally for wheat production. Eventually wheat growing was replaced by dairying.

Bayley contends that Kiama was the birthplace of dairying in Australia; it was the centre that first tried to export butter to England and it pioneered the system of factory production. A Butter Export Co-operative Co. was formed in 1870 and efforts were made to export butter to London and India, with an initial measure of success. The Kiama Pioneer Co-operative Dairy Factory was officially opened on 18 June 1884 and was the first of its kind in Australia. It was situated near Spring Creek on the Jamberoo Road. A monument commemorating the Butter Factory now stands at that location.



Further south, other dairy factories were established between 1884 and 1894. These were the Kangaroo Dairy Co. (1888) on Sawyers Creek one kilometre south of the Berry Road along Factory Road; the Barrengarry Butter Factory (1888 to 1925); the Kangaroo River Dairy Co. (1890); and the Upper River Butter Factory on the eastern bank 16 km south of the Gerringong Creek junction (1894-1901).

When it was opened in September 1895, the Berry Central Creamery was described as the 'largest and most complete butter factory in the colony'. At that time it was noted that 1,075 tons of butter were produced annually in the Berry district from 12,800 cattle, the product of which could be treated by the Berry Central Creamery. The registered trade mark was a bunch of Lillipilli berries, from a local forest species, still present in the region today. In 1911, a group of dairymen purchased the Creamery from the Berry Estate and formed a co-operative, which subsequently became the Berry Rural Co-operative Society Ltd. The milk market continued to grow and in 1958 butter manufacture ceased. A peak annual milk intake was reached in 1976-77 but a downward trend developed in the 1980s. From 1991, milk was collected from farms in the Co-operative's tankers and delivered direct to the Australian Co-operative Foods Limited Factory at Bomaderry.

The sub-division of the Berry estate over the 40 years following the death of David Berry initiated the establishment of many small dairy farms on both sides of the Shoalhaven.

During the last decade of the nineteenth century, when Alexander Hay was the Manager of the Berry Estate, a more scientific approach was adopted towards dairying in the Shoalhaven. Following an investigative trip to Europe by Alexander, the Trustees of the Estate erected the above mentioned Butter Factory at Berry and established a select herd of imported pure bred dairy cattle on a stud farm at Coolangatta.

At that time, two public institutions of importance to the dairy farmers of the district were established at Berry. At the urging of Alexander Hay, a Bill was passed through the NSW Parliament to vary the will of David Berry to the extent that a Stud Farm and an Experimental Farm should share in the endowment bequeathed by him for a Cottage Hospital established at Berry. That was agreed upon and a transfer of Port Jackson foreshores belonging to the Estate and judged to be equal in value to the endowment was satisfactorily arranged. The Crown then assumed the Trusteeship of all three institutions (the Hospital, Stud Farm and Experimental Farm) and established them at Berry.

The Berry Experiment Farm opened near the river beside the road to Coolangatta in October 1899, being the first of its kind on the coast. It continued under the Department of Agriculture until in April 1934 it was taken over by the Child Welfare Department. It was remodelled to house 40 boys to take farm training. In 1939,



Figure 19 "A Sketch of the Broughton Creek Road" (Illustrated Sydney News 21 November 1885:p14 & 16), "not far distant from Broughton Creek [Berry]" Note the continued presence of tall forest vegetation on the lowlands at this time.

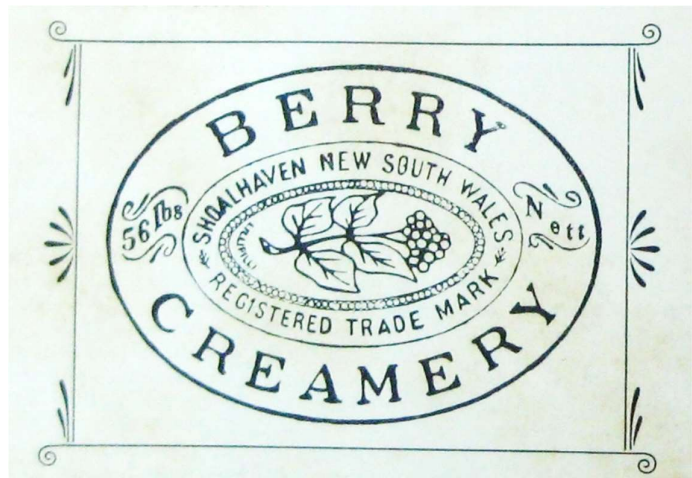


Figure 20 The logo of the Berry Creamery (from back page of 'Descriptive Account of The Berry Estate Coolangatta Shoalhaven' 1895. W.C. Penfold & Co, Sydney)



additional buildings were added, together with more modern farming facilities. In the 1970s the Child Welfare Training Farm closed and re-opened as a holiday home for the underprivileged and was later transferred to the Department of Sport and Recreation.

In the 1920s, a Pasture Research Unit was established off Wharf Road, Berry, by the Department of Agriculture. In the 1950s, the first Artificial Insemination Breeding Station (AIBS) in New South Wales was established at that location, and in 1958, it was moved to Graham Park, southwest of Berry on the Princes Highway. In the 1990s, the Centre closed and the buildings were used by Wollongong University, until new premises were built for them in 2000 in Nowra.

Following the decline of dairying, and in particular small-farm dairying, in the latter decades of the twentieth century, the economic viability of maintaining pasture land, especially on steeper slopes in the Berry district has dramatically declined. This has led, together with landuse trends towards hobby-farming and tourism, to substantial revegetation across steeper gradients in the district's foothills and basal slopes. Much of this vegetation is driven by natural re-seeding of indigenous species from neighbouring forest remnants. This has benefitted soil stabilization and increased connectivity between natural habitats, providing unexpected opportunities for biodiversity and habitat conservation management.

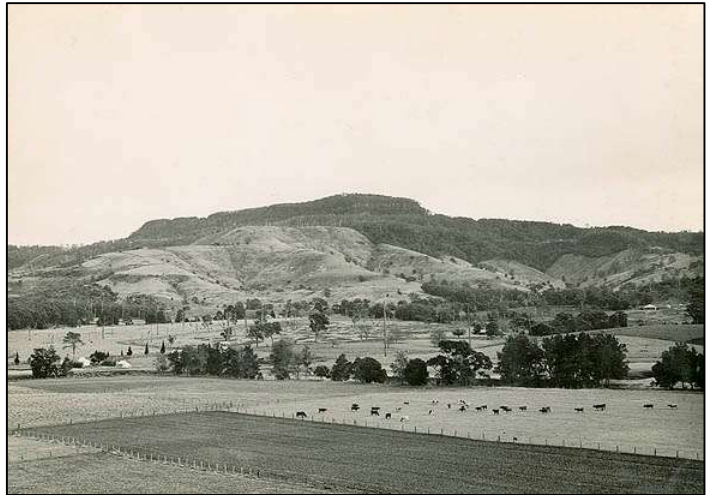


Figure 20 'View of Berry Training Farm', approx. mid-twentieth century. Note the extent of clearing on the background foothills (State Records of NSW, State Library of NSW digital ID: 12932_a012_a012X2446000077)



Figure 22 Compare the top image with this contemporary view showing the extent of native revegetation (Looking northwest from Homestead Lane, Berry, towards Broughton Head (photo: K. Officer 2019))



2.4.5 Information sources

This section is based on selective summaries of content presented in NOHC 2012.

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2.5 Landforms and geological context

2.5.1 Geology and landforms

The Berry district and the Berry Corridor consist of three main landform zones: the escarpment, spurs and steeper slopes of the Cambewarra Range; the adjacent ridgelines rolling hills and foothills; and the valley floor. The Shoalhaven coastal plain comprises the valley floor and adjacent rolling hills and ridgelines. The boundary between the foothills and the coastal plain is not distinct and an approximate cut-off would be the 100 metre to 140 metre contour (above height datum, AHD).

The Cambewarra Range is a southern extension of the Illawarra Escarpment and its seaward side can be characterised as a eroded cross section through the accumulated sedimentary layers of the Sydney Basin. From the Triassic Hawkesbury Sandstone at the top of the escarpment, to the lowland foothills formed on Permian siltstones and shales of the Berry Formation, this 640 m sequence represents 65 million years of geological time. The sandstones in this sequence are the most resistant to weathering and have formed the escarpments and elevated plateaus of the district, including Barren Grounds Nature Reserve at the top of the Range (652 m AHD) on Hawkesbury Sandstone), and Coolangatta Mountain and Moeyan Hill on the coastal plain (on Budgong Sandstone).

Interspersed with the sedimentary rocks of this sequence are volcanic rocks, such as latite, belonging to the Permian aged Gerringong Volcanics, and later basalts from the Tertiary era. These volcanic rocks are also resistant to weathering and have formed many of the benches in the upper ranges.

The low ridges and basal slopes bordering and crossing the coastal plain have formed from the Berry Formation (siltstone, shale and sandstones), the Broughton Tuff (tuff and tuffaceous sandstone), and the Bombo Latite. The former two are metamorphic sedimentary formations, the latter a series of igneous lava flows. The Bombo Latite has formed the watershed ridges and higher ground that subdivide the various catchments and valley floors in the Kiama and Gerringong region. It dominates the higher relief to the east of the plain, notably the crest and upper slopes of Toolijooa ridge and the mid-range of the western slopes of the Broughton Creek valley adjacent to Broughton Village. The lower slopes of Toolijooa ridge are comprised of the Kiama Tuff (trachytic tuff). Elsewhere towards the west of the plain, basal slopes and watershed ridges have formed from the Berry formation.

The valley floor of the coastal plain presents a low relief topography of Quaternary (the last 2.5 million years) aged fluvial sedimentary deposits which typically includes a suite of depositional landforms such as colluvial fans, flood plain, terrace sequences, current and former streambeds, wetland basins and old delta deposits. Quaternary fluvial deposits are encountered on the floor of the Broughton and Broughton Mill Creek valleys.

The majority of the fluvial valley deposits were laid down some 20,000 to 30,000 years ago and the high terrace levels probably date to around 29,000 years ago (Walker 1962). There has been a marked increase in water runoff and the rate of sediment discharged from major Illawarra streamlines in the last 100 years (Wollongong City Council 1976). The increase in sedimentation is attributable to the great disruption of

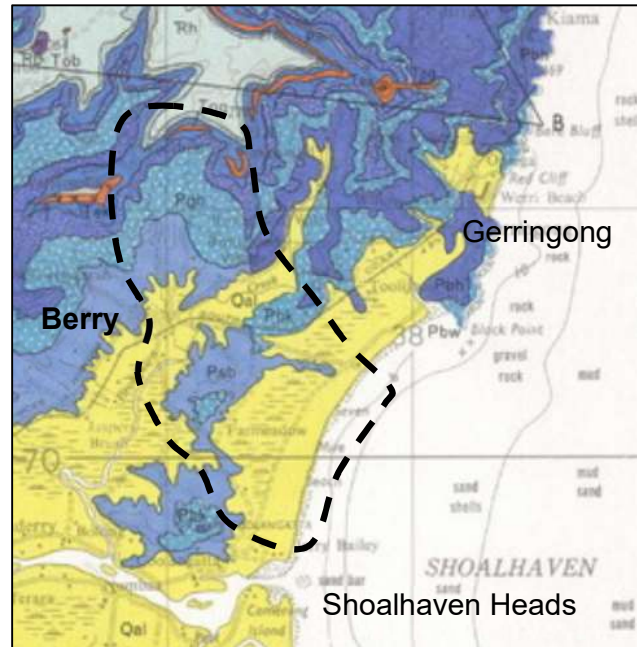


Figure 23 The geology of the Berry District, the Berry Corridor is delineated by a black dashed line (extract from Wollongong 1:250k Geological Sheet S15609 2nd Ed 1966, Geological Survey of NSW).

Blue – Permian sandstones, shales and siltstones and volcanic latite (darker blue)

Light green (top of map) Triassic sandstone

Orange – Tertiary volcanic basalt

Yellow – Quaternary sediments



vegetative cover, and the consequent erosion caused by European clearing and agriculture. A consequence has been the deposition of sediment layers across the surface of the plain's basins and fans. Another impact is increased rates of erosion and bank failure.

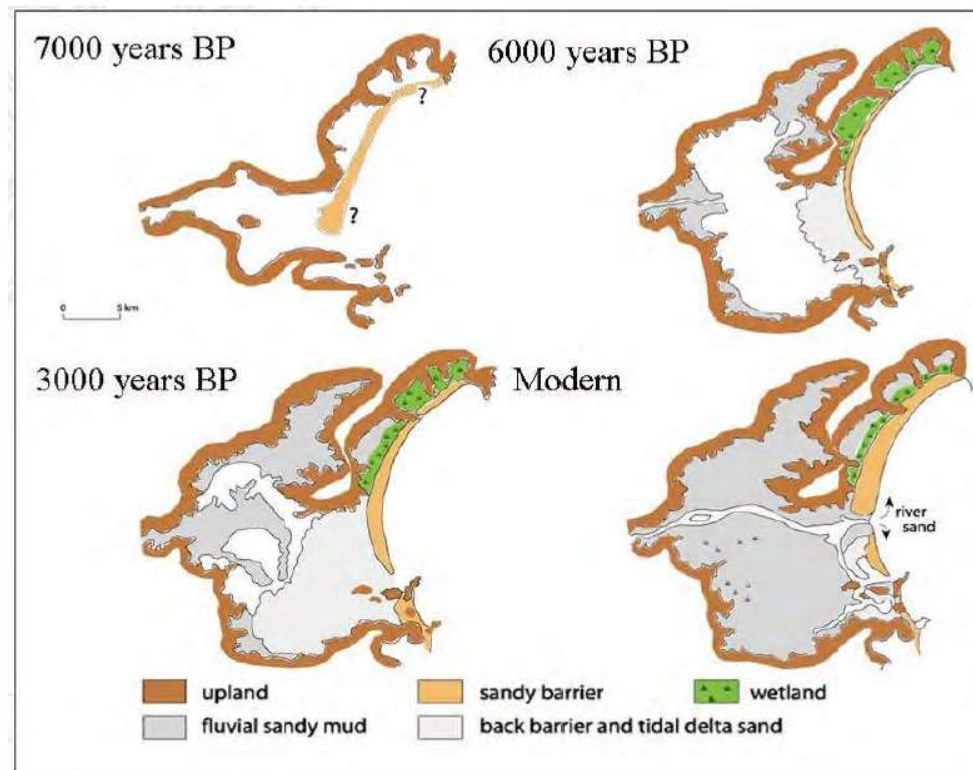


Figure 24 Stages in the evolution of the Shoalhaven River lower valley and estuarine basin during the Holocene (the last 10,000 years).

With the rise in sea level, the former marine embayments were replaced with a large estuary behind a sand barrier. This was rapidly infilled with riverine sediments to form a complex of freshwater wetland basins. River sand now reaches the sea and contributes to the widening ('progradation') of the Seven Mile Beach barrier.

Note the past contexts of the Moeyan Hill-Coolangatta Mt ridgeline as a former coastline along its eastern margin, followed by a peninsula between a former estuary (western margin) and wetland embayments (to the east). After Rogers and Woodroffe 2015, based on Woodroffe et al. 2000 and Umitsu et al 2001.

The sediments of the coastal margin are dominated by marine and aeolian (wind-blown) sediments deposited as a result of prograding (encroaching seaward) coastlines after high sea levels. These consist of estuarine deposits, as well as former sand barriers, dune and beach ridges. Around 8000 years ago, the sea was more than 10 metres below the present level, and reached its present level between 6000 to 6500 years ago. This is known as the post glacial marine transgression (Roy 1994, Thom and Roy 1985, Woodroffe et al. 2000).

Following stabilisation of former, and the current sea level, sand barriers formed across drowned valley embayments, creating a series of estuarine environments along the eastern seaboard, which subsequently and variously filled with sediment (Roy 1994). The plains of the lower Shoalhaven River are a large scale example of this process. They demonstrate an evolution from a brackish water estuarine environment to freshwater alluvial plains (**Figure 24**). When the sea reached its present level, most of the plains were flooded to form a large coastal embayment. Following the incipient formation of a sand barrier (of which Comerong Island is an evolved remnant), a coastal lagoon and estuary, similar in extent to Lake Illawarra must have been formed. This lagoon received fluvial input from Broughton Creek to the north and the Shoalhaven River to the west. The gradual infilling of the estuary then proceeded, with a pattern characterised by sedimentation around the periphery and gradual infill in the centre of the flood basin. Most of the plains adjacent to Broughton Creek were infilled between 5000 and 4000 years ago. Infill of the estuary basin was largely complete by 3000 years ago (Woodroffe et al. 2000).



The town of Berry is situated at a point where the fluvial deposits of the Broughton Mill Creek valley (including Bundewallah Creek) interface with the former estuary embayment of the lower Shoalhaven. Upon entering the estuary, these streams would have dumped their sediments, and formed a small delta which extended progressively from north south into the embayment, prior to its infilling by about 4000 years ago (Wearne 1984:Fig 6.1, Woodroffe et al. 2000).

The range that includes Coolangatta Mountain (304 m AHD), Moeyan Hill (163 m AHD), and their associated slopes, forms a bedrock peninsula situated between the now drained wetland basins of the lower Broughton Creek, and the mostly drained basins to the east, formed by the Seven Mile Beach sand barrier. At the time of the sea level rise, following the cessation of the last glacial maximum, around 6000 to 6500 years ago, the Coolangatta – Moeyan rangelands would have formed a promontory, surrounded by coastal, and subsequently estuarine, embayments (Wearne 1984, Woodroffe et al. 2000).

During the last 2000 to 3000 years, the Shoalhaven River appears to have been channelized within levee deposits for most of its course across the plain. Isolated flood basins have persisted to the north and south. (Woodroffe et al. 2000)

2.5.2 Soils

Soil is vital to life in the berry bush corridor by supporting the ground beneath and supplying a medium for organisms to grow. Soils also are integral in the regulation of water flow and filtration therefore affecting stream outputs and water quality. Low quality soils reduced the potential of crops, pastures, live stock and the natural environments also would be damaged

The soils in the foothills are comprised of Podzolic profiles, these are sandy soils cut into the siltstone features of the berry formation and do not provide a very efficient substrate for productive land use. On volcanic bedrock landforms, there are Kraznemic soils which are much richer in nutrients when compared to the Podzolic. These soils formed from weathered volcanic rocks and are high in clay content. Clay in the soil helps retain nutrients and water content and saves money when irrigating and fertilizing (Young R.W, 1982).

Large flooding events in the past deposited large amounts of acid sulphate rich soils across the coastal plain. These are hard to neutralise and sometimes kill all vegetation. Caring, monitoring and maintaining these soils needs to be a key goal for all land holders in the bush corridor to achieve the highest quality soils

2.5.3 Information Sources

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2.6 Climate of the Berry Region

2.6.1 Temperature

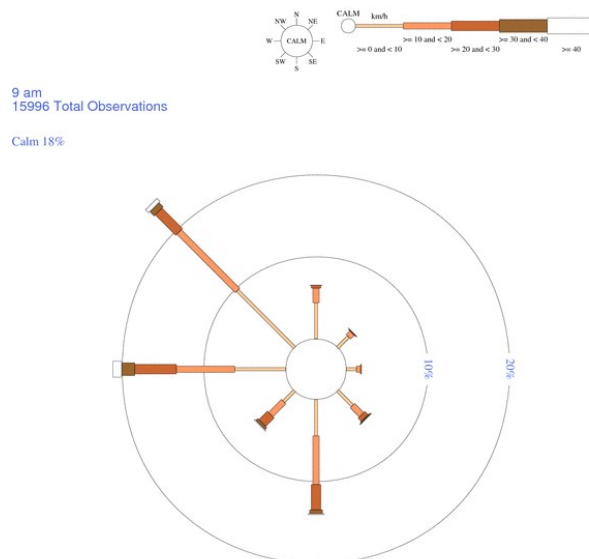
Berry and the surrounding areas have a consistently temperate, warm and mild climate throughout the year with coastal weather systems providing a stable climate. It experiences a relatively warm Summer/Autumn period where temperatures average from 22-17 °C with average maximums getting to 27°C in the warmest parts of the year. During Winter/Spring periods, temperatures average from 17-11°C and average minimums get down to 7°C.

2.6.2 Rainfall

Rainfall is generally higher in the summer when its warmest, although there is no dramatic difference through the entire year. Annual rain fall for berry is around 1000mm with most rain associated with moisture bearing southerly air streams on the coast.

2.6.3 Wind

The prevailing wind in the region is a calm NW that has an average speed of 12km/hr. Weather conditions often change intra-daily due to fronts from the NE and SE. These fronts form due to oceanic pressure systems often bringing a change in temperature, humidity and wind.





2.7 The Shoalhaven Catchment

2.7.1 Overview

Berry is a part of the greater Shoalhaven catchment, that drains into the nearby Shoalhaven River. This catchment is one of the largest in NSW and helps provide water for over 4 million people in the Shoalhaven, Illawarra and Sydney. The berry area contributes higher than average amounts of water to this catchment and is vital to maintaining its health.

Rain events are considered erratic and often form as heavy isolated storms, these storms occur all through the year but are more common in late autumn/ winter. Large anti cyclonic events off the coast to the south often bring large storms with considerable amounts of rain. These storms can quickly inundate low lying areas and usually occur for short periods of time.

Rain variability is highest inland with more consistent rainfall occurring on the coast. The high elevation of the escarpment causes rain to form as moist air is forced up from the coast, this causes wetter than average annual conditions.

In the previous decades the El Nino weather system has caused lower than average rainfall for the area but in recent times the status of the weather system has changed to inactive.

Areas on escarpment may experience more varied temperatures and more extreme minimums compared to the coastal areas as some elevated locations are up to 700m above sea level. The area is subject to four distinct seasons with the summer months being wetter than the cooler months although rainstorms frequently occur in winter and autumn. Daily variability in weather is common with cool cloudy days occurring after warm sunny days.

2.7.2 The Catchment

The Shoalhaven catchment covers 7,300 square kilometres, and includes more than one-third of Sydney's drinking water catchment. The Shoalhaven River has four main tributaries, the Mongarlowe, Corang, Endrick and Kangaroo Rivers, and is highly valued for its wild and scenic attributes. Other tributaries include the Ettrema, Boro, Reedy, Danjerra, Yalwal, Broughton, Broughton Mill and Yarrunga Creeks.

The Shoalhaven River flows through a large coastal floodplain before entering the Pacific Ocean at Shoalhaven Heads. The Berry Corridor extends from the northern edge of the Cambewarra Range, and across the coastal plain at the northeastern end of the river catchment.

Approximately half of the Shoalhaven River Catchment has had minimal disturbance to its native vegetation. About 35% of the Catchment is used for agriculture and a further 11% for forestry. Only about 4% of the Catchment is urbanised – Nowra being by far its largest urban centre with a population of 31,000 (2006 Census).

The Shoalhaven River floodplain covers approximately 5% of the Catchment. The floodplain is experiencing considerable urban and industrial growth, particularly in and around Nowra and Bomaderry. The Nowra/Bomaderry district is identified as a growth area with the population expected to increase by up to 50% by 2030 (<https://www.oceanwatch.org.au/wp-content/uploads/2016/05/CS1-Shoalhaven-Catchement.pdf>).

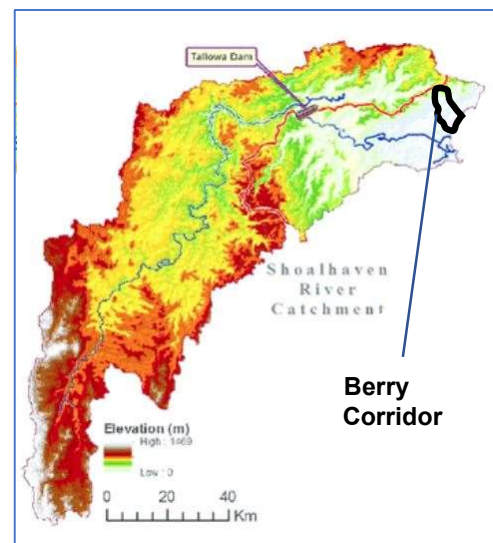


Figure 25 The location of the Berry Corridor relative to the Shoalhaven River catchment (base image ALUM 2010)



The Shoalhaven River catchment, extends from the fine wool country around Braidwood in the south-west to the lush forests and cleared agricultural lowlands of the coastal ranges and plain in the north-east. Cattle and sheep grazing are the largest single land use.

The catchment also supports horse studs, piggeries, dairies, and poultry production as well as vineyards, olive groves, canola and cereal crops. Cleared grazing land covers 36 percent of the catchment, along with large areas of national parks (31 percent) and forests (27 percent).

2.7.3 Historical Shoalhaven River flood levels

Here is a list of the recorded flood levels from the mid-1800s to 1999.

Flood water depth recorded at Nowra 1860 – 1999.

February 1860	5.7m
June 1864	5.2m
April 1867	5m
June 1867	5.1m
March 18705m
April 1870	6.5m
May 1871.....	4.5m
February 1873	6.2m
June 1891 –.....	5.3m
February 1898	5m
July 1900	4.4m
July 1904	3.7m
January 1911	3.6m
October 1916	5.3m
December 1920	4.2m
July 1922	4.2m
May 11, 1925	5.4m
May 27, 1925	4.4m
June 1949	4m
February 1956	4.6m
October 1959	4.7m
March 1961	4.2m
November 1961.....	4.2m
June 1964	3.5m
August 1974.....	4.9m
June 1975	4.9m
October 1976	4.1m
March 1978	5.3m
April 1988	4.8m
August 1990	4.3m
June 1991	4m
October 1999	3.5m

Source

<https://www.facebook.com/shoalhavenhistory/> posted: 9 Aug 2020

2.7.4 Flooding and evacuation emergency contact

The NSW state emergency service (SES) is the main organisation that deals with flooding and evacuation, if assistance is required call **132 500**. The Bureau of Meteorology broad casts weather warnings and updates on the radio and real time information can be found on their website <http://www.bom.gov.au/>.



2.8 Remnant Vegetation of the Shoalhaven Region

2.8.1 The significance of native vegetation

Native vegetation plays a significant role in the diverse natural and social systems that abound in Australia. Native vegetation provides food, shelter and breeding habitat for native animals. When native vegetation is lost, there is a flow on effect to other native plants and animals. A range of degrading influences also affects the long-term conservation of remnant bushland. They include complete and partial clearing for development, fragmented and small remnant areas, encroachment, altered water flow regimes in riparian areas, altered fire regimes, recreational use, feral animal impacts and the consequent weed invasion that is encouraged by all these processes.

2.8.2 Remnant native vegetation in the Shoalhaven

When compared with much of NSW, the Shoalhaven has extensive areas of native vegetation in a relatively undisturbed state, with over 80% of the Shoalhaven area under native vegetation cover. Compared with most of Australia this percentage is high, but reflects the large areas of National Parks, State forests and the generally poor and fragile soils covering most of the Shoalhaven.

Whilst a considerable percentage of this vegetation comprises large continuous tracts in public ownership, away from these areas and closer to human settlement, vegetation exists as remnants of the original plant community. This remnant vegetation is under pressure from human activities, with many of the remnants containing biological communities and species not well represented in the current reserve system. This makes remnant vegetation in the Shoalhaven particularly significant for the protection of the region's biodiversity.

The values of our remnant bushland are many and substantial.



Conservation & protection of biodiversity



Habitat & shelter for plants and animals



Soil stability & water quality



Our natural heritage



2.8.3 Plant communities in the Shoalhaven

Due to the great diversity of geology, soils, topography and climate, the Shoalhaven contains a variety of plant species and communities. Plant communities vary in structure from subtropical rainforest to heathland and include a range of eucalypt-dominated forests and woodlands and extensive wetland communities.

Certain plant communities which once covered the higher nutrient soils suitable for agriculture or were located on coastal areas now cleared for settlement are now represented only in small remnants. For example, the forest red gum *Eucalyptus tereticornis* woodland open forest community, the paperbark *Melaleuca* spp open forest of the coastal foothills and plains, and the littoral rainforests of sheltered coastal sites. Many of these remnants are under continuing pressure from agriculture and/or recreational activities, are weed infested and require protection and management measures to ensure their longer-term survival.

2.8.4 Threatened species in the Shoalhaven

A species is considered threatened if there is a reduction in its population size, it has a restricted geographical distribution, or there are few mature individuals.

In NSW an assessment is undertaken by the NSW Threatened Species Scientific Committee. A species may then be listed under the NSW [Biodiversity Conservation Act 2016](#) (BCA) under the categories *vulnerable*, *endangered*, *critically endangered*, or *presumed extinct*.

Other things which can be listed under the BCA are [Populations of a species](#) and [ecological communities](#) which can also be listed as threatened. Processes that threaten species may be listed as [key threatening processes](#). Habitat essential to the survival of endangered or critically endangered species, populations of a species or ecological communities, can be declared as [critical habitat](#).

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is the Commonwealth legislation which lists species nationally



2.8.5 Threatened Ecological Communities (TEC's) in the Berry Corridor

Robertson Rainforest	Thin strip straddling the escarpment of the southern edge of Barren Grounds Nature Reserve east from Drawing Room Rocks and eastwards to Shoalhaven/Kiama LGA boundary
Riverflat Eucalypt Forest	Tiny patch on Broughton Head on eastern end of Rodway Nature Reserve
Illawarra Sub-tropical Rainforest	Numerous patches south of Barren Grounds NR escarpment, Moeyan Hill, David Berry Hospital, 3 patches Northern Wire Lane & 1 patch around 160 Beach Road and 2 patches Harley Hill
Swamp Sclerophyll Forest	A patch in land adjacent to (east of) Harley Hill Reserve Beach Rd, north of Toolijooa Rd, Gerroa Sand Quarry & around edges of Coomonderry Swamp
Bangalay Sand Forest	Thin strip on corner of Gerroa Sand Quarry, south east of Coomonderry Ridge & behind dunes of 7 Mile Beach NP
Swamp Oak Forest	Near turn-off to Shoalhaven Heads on Gerroa Road
Sydney Freshwater Wetland	Coomonderry Swamp
Illawarra Lowlands Grassy Woodlands	Adjacent (west) of Connolly's Creek west of Bong Bong Rd & small patch south of Coomonderry Ridge & Jim's Forest. Patches on properties east and south of Moeyan Hill and small patch on property north of Moeyan Hill
Swamp Oak Floodplain Forest	Straddling Broughton Mill Ck east of Woodhill Mtn Rd and 6 patches within & west of Cleary Bros land. Patch on corner of Broughton Ck immediately Nth of rail line and near NE corner of Berry Sport & Rec Centre land

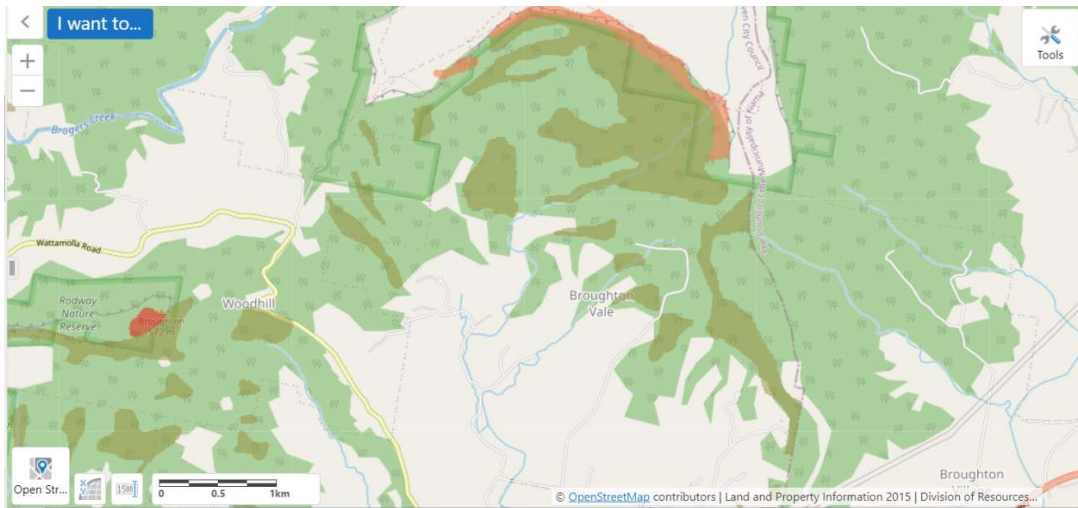


Figure 26: Northern Section of Berry Corridor (Barren Grounds to Boundary Road) (Open Street Map Contributors)



Figure 27: Central Section of Berry Corridor (Boundary Road to Beach Road) (Open Street Map Contributors)

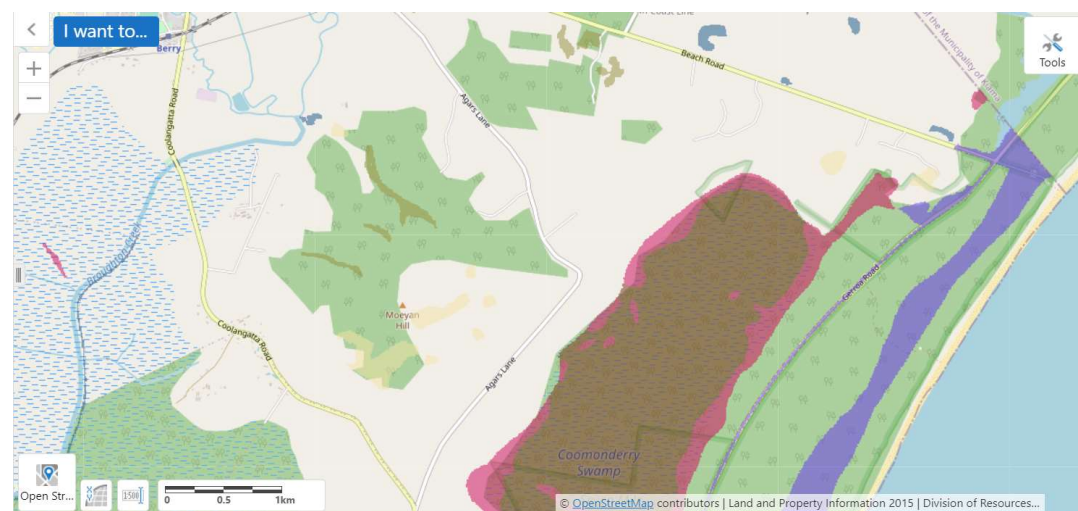


Figure 28: Southern Section of Berry Corridor (Beach Road to 7 Mile Beach NP) (Open Street Map Contributors)



2.8.6 Native fauna of the Shoalhaven

Matching the diversity of plant communities in the Shoalhaven is a rich assemblage of native fauna. At least 60 of the fauna species occurring in the area are listed as endangered or vulnerable on the Threatened Species Conservation Act. The endangered species Green and Golden Bell-frog, Little Tern, Eastern Bristlebird and Broad-headed Snake are considered to have relatively significant populations in the Shoalhaven. Important populations of vulnerable species such as the Giant Burrowing Frog, Glossy Black-Cockatoo, Ground Parrot, Powerful Owl, Masked Owl, Sooty Owl, Tiger Quoll, Brush-tailed Rock Wallaby, Yellow-bellied Glider, Long-nosed Potoroo Large-footed Mouse-eared Bat and Heath Monitor are also found in the Shoalhaven.

2.8.7 Threatened Fauna and Migratory Species in the Berry Corridor

Note: this is not a complete list of Threatened fauna in the Berry Corridor

Common Name	Scientific Name	EPBC Act	TSC Act	Occurrence Likelihood
BIRDS				
Gang-gang Cockatoo	<i>Callocephalon fimbriatum</i>	-	Vulnerable	Recorded
Powerful Owl	<i>Ninox strenua</i>	-	Vulnerable	High
MAMMALS				
Yellow-bellied Sheath-tail Bat	<i>Saccolaimus flaviventris</i>	-	Vulnerable	High
Eastern Freetail Bat	<i>Mormopterus norfolkensis</i>	-	Vulnerable	High
Grey-headed Flying Fox	<i>Pteropus poliocephalis</i>	Vulnerable	Vulnerable	High
Eastern Bentwing-bat	<i>Miniopterus schreibresii oceanensis</i>	-	Vulnerable	High
Eastern False Pipistrelle	<i>Falsistrellus tasmaniensis</i>	-	Vulnerable	High
Southern Myotis or Fishing Bat	<i>Myotis macropus</i>	-	Vulnerable	Recorded
Greater Broad-nosed Bat	<i>Scoteanax rueppellii</i>	-	Vulnerable	High
Greater Glider	<i>Litorea aurea</i>		Endangered Population	Recorded
AMPHIBIANS				
Green and Golden Bell Frog	<i>Petauroides Volans</i>		Vulnerable	Recorded



MIGRATORY SPECIES				
BIRDS				
White-bellied Sea Eagle	<i>Haliaeetus leucogaster</i>	M		Recorded
Fork-tailed Swift	<i>Apus pacificus</i>	M		High
Cattle Egret	<i>Ardea ibis</i>	M		Recorded
Black-faced Monarch	<i>Monarcha melanopsis</i>	M		Recorded
Rufous faintail	<i>Rhipidura rufifrons</i>	M		Recorded
Australian Reed Warbler	<i>Acrocephalus stentoreus</i>	M		High



2.8.8 Threatened Species that live in the Shoalhaven

2.8.9 Fauna

Known threatened species that live in Shoalhaven

Threatened fauna that live in Shoalhaven

Below is a list of threatened fauna known to occur in the Shoalhaven LGA. This list may not be exhaustive, and it is recommended that you contact Council's Environmental Assessment Unit on (02) 4429 3209 for further information.

Threatened fauna in Shoalhaven

Common Name	Scientific Name	NSW Status	National Status EPBC
Australasian Bittern	<i>Botaurus poiciloptilus</i>	Vulnerable	
Australian Grayling	<i>Prototroctes maraena</i>		Vulnerable
Australo-African Fur-seal	<i>Arctocephalus pusillus</i>	Vulnerable	
Barking Owl	<i>Ninox connivens</i>	Vulnerable	
Beach Stone Curlew	<i>Esacus neglectus</i>	Endangered	
Black Bittern	<i>Ixobrychus flavicollis</i>	Vulnerable	
Black-browed Albatross	<i>Diomedea melanophrys</i>	Vulnerable	
Black Rock Cod	<i>Epinephelus daemeli</i>	Vulnerable	
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>	Endangered	
Black-tailed Godwit	<i>Limosa limosa</i>	Vulnerable	
Blue-billed Duck	<i>Oxyura australis</i>	Vulnerable	
Broad Headed Snake	<i>Hoplocephalus bungaroides</i>	Endangered	Vulnerable
Broad-billed Sandpiper	<i>Limicola falcinellus</i>	Vulnerable	Migratory
Brown Treecreeper	<i>Climacteris picumnus</i>	Vulnerable	
Brush-tailed Phascogale	<i>Phascogale tapoatafa</i>	Vulnerable	
Brush-tailed Rock Wallaby	<i>Petrogale penicillata</i>	Endangered	Vulnerable
Bush Stone Curlew	<i>Burhinus grallarius</i>	Endangered	
Common Bent-wing Bat/Large Bent wing Bat	<i>Miniopterus schreibersii</i>	Vulnerable	Conservation Dependent
Dugong	<i>Dugong dugon</i>	Endangered	Migratory
Diamond Firetail	<i>Stagonopleura guttata</i>	Vulnerable	
Eastern Bentwing-bat	<i>Miniopterus schreibersii oceanensis</i>	Vulnerable	
East Coast Freetail Bat	<i>Mormopterus norfolkensis</i>	Vulnerable	
Eastern Bristlebird	<i>Dasyornis brachypterus</i>	Endangered	Endangered
Eastern Cave Bat	<i>Vespadelus troughtoni</i>	Vulnerable	
Eastern Chestnut Mouse	<i>Pseudomys gracilicaudatus</i>	Vulnerable	
Eastern False Pipistrelle	<i>Falsistrellus tasmaniensis</i>	Vulnerable	
Eastern Pygmy Possum	<i>Cercartetus nanus</i>	Vulnerable	
Eastern Quoll	<i>Dasyurus viverrinus</i>	Endangered	
Flatback Turtle	<i>Natator depressus</i>		Vulnerable
Freckled Duck	<i>Stictonetta naevosa</i>	Vulnerable	



Common Name	Scientific Name	NSW Status	National Status EPBC
Gang Gang Cockatoo	<i>Callocephalon fimbriatum</i>	Vulnerable	
Giant Burrowing Frog	<i>Heleioporus australicus</i>	Vulnerable	Vulnerable
Glossy Black Cockatoo	<i>Calyptorhynchus lathami</i>	Vulnerable	
Golden-tipped Bat	<i>Kerivoula papuensis</i>	Vulnerable	
Great Knot	<i>Calidris tenuirostris</i>	Vulnerable	Migratory
Great White Shark	<i>Carcharodon carcharias</i>	Vulnerable	Vulnerable
Greater Broad-nosed Bat	<i>Scoteanax rueppellii</i>	Vulnerable	
Greater Sand Plover	<i>Charadrius leschenaulti</i>	Vulnerable	Migratory
Green and Golden Bell Frog	<i>Litoria aurea</i>	Vulnerable	Vulnerable
Green Sawfish	<i>Pristis zijsron</i>	Endangered	
Green Turtle	<i>Chelonia mydas</i>	Vulnerable	Vulnerable
Grey Headed Flying Fox	<i>Pteropus poliocephalus</i>	Vulnerable	Vulnerable
Grey Nurse Shark	<i>Carcharias taurus</i>	Endangered	Critically Endangered
Ground Parrot	<i>Pezoporus wallicus</i>	Vulnerable	Endangered
Heath Monitor	<i>Varanus rosenbergi</i>	Vulnerable	
Hooded Plover	<i>Thinornis rubricollis</i>	Endangered	
Humpback Whale	<i>Megaptera novaeangliae</i>	Vulnerable	Vulnerable
Koala	<i>Phascolarctos cinereus</i>	Vulnerable	
Large-eared Pied Bat	<i>Chalinolobus dwyeri</i>	Vulnerable	Vulnerable
Large-footed Myotis/Large Footed Mouse-eared Bat/ Fishing Bat	<i>Myotis adversus</i>	Vulnerable	
Leathery Turtle	<i>Dermochelys coriacea</i>	Vulnerable	Vulnerable
Lesser Sand Plover	<i>Charadrius monogolus</i>	Vulnerable	
Little Shearwater	<i>Puffinus assimilis</i>	Vulnerable	
Little Tern	<i>Sterna albifrons</i>	Endangered	
Littlejohns' Tree Frog	<i>Litoria littlejohnii</i>	Vulnerable	Vulnerable
Long-nosed Potoroo	<i>Potorus tridactylus</i>	Vulnerable	Vulnerable
Macquarie Perch	<i>Macquaria australasica</i>	Vulnerable	Endangered
Masked Owl	<i>Tyto novaehollandiae</i>	Vulnerable	Vulnerable
Northern Giant Petrel	<i>Macronectes halli</i>	Vulnerable	Vulnerable
Olive Whistler	<i>Pachycephala olivacea</i>	Vulnerable	
Orange Bellied Parrot	<i>Neophema chrysogaster</i>	Endangered	Critically Endangered
Osprey	<i>Pandion haliaetus</i>	Vulnerable	
Parma Wallaby	<i>Macropus parma</i>	Vulnerable	Extinct
Pied Oystercatcher	<i>Haematopus longirostris</i>	Vulnerable	
Pink Robin	<i>Petroica rodinogaster</i>	Vulnerable	
Powerful Owl	<i>Ninox strenua</i>	Vulnerable	



Common Name	Scientific Name	NSW Status	National Status EPBC
Providence Petrel	<i>Pterodroma solandri</i>	Vulnerable	
Red-crowned Toadlet	<i>Pseudophryne australis</i>	Vulnerable	
Regent Honeyeater	<i>Xanthomyza phrygia</i>	Endangered	Endangered
Rosenberg's Goanna	<i>Varanus rosenbergi</i>	Vulnerable	
Sanderling	<i>Calidris alba</i>	Vulnerable	
Shy Albatross	<i>Diomedea cauta</i>	Vulnerable	Vulnerable
Sooty Owl	<i>Tyto tenebricosa</i>	Vulnerable	
Sooty Oystercatcher	<i>Haematopus fuliginosus</i>	Vulnerable	
Southern Brown Bandicoot	<i>Isoodon obselus</i>	Endangered	
Southern Giant Petrel	<i>Macronectes giganteus</i>	Endangered	Endangered
Southern Right Whale	<i>Eubalaena australis</i>	Vulnerable	Endangered
Sperm Whale	<i>Physeter catadon</i>	Vulnerable	
Spotted-tailed Quoll	<i>Dasyurus maculatus</i>	Vulnerable	Endangered
Square-tailed Kite	<i>Lophoictinia isura</i>	Vulnerable	
Squirrel Glider	<i>Petaurus norfolcensis</i>	Vulnerable	
Striated Fieldwren	<i>Calamanthus fuliginosus</i>	Vulnerable	
Stuttering Barred Frog	<i>Mixophyes balbus</i>	Endangered	Vulnerable
Superb Fruit-Dove	<i>Ptilinopus superbus</i>	Vulnerable	
Swift Parrot	<i>Lathamus discolor</i>	Endangered	Endangered
Terek Sandpiper	<i>Xenus cinereus</i>	Vulnerable	Migratory
Turquoise Parrot	<i>Neophema pulchella</i>	Vulnerable	
Wandering Albatross	<i>Diomedea exulans</i>	Endangered	Vulnerable
White-footed Dunnart	<i>Sminthopsis leucopus</i>	Vulnerable	
Yellow-bellied Glider	<i>Petaurus australis</i>	Vulnerable	Vulnerable
Yellow-bellied Sheath-tail Bat	<i>Saccolaimus flaviventris</i>	Vulnerable	



2.8.10 Flora

Threatened flora that live in Shoalhaven

Below is a list of threatened flora known to occur in the Shoalhaven LGA. This list may not be exhaustive, and it is recommended that you contact Council's Environmental Assessment Unit on (02) 4429 3209 for further information.

Threatened flora in Shoalhaven

Common Name	Scientific Name	Family	NSW Status	National Status EPBC
Bynoe's Wattle	<i>Acacia bynoeana</i>	Fabaceae	Endangered	Vulnerable
Deane's Boronia	<i>Boronia deanei</i>	Rutaceae	Vulnerable	Vulnerable
Budawang's Cliff Heath	<i>Budawangia gnidioides</i>	Epacridaceae	Vulnerable	Vulnerable
Spider Orchid	<i>Caladenia tessellata</i>	Orchidaceae	Endangered	Vulnerable
(Moss)	<i>Calomnion complanatum</i>	Calomniaceae	Endangered	
Sand Spurge	<i>Chamaesyce psammogeton</i>	Euphorbiaceae	Endangered	
Chef's Cap Correa	<i>Correa baeuerlenii</i>	Rutaceae	Vulnerable	Vulnerable
Leafless Tongue Orchid	<i>Cryptostylis hunteriana</i>	Orchidaceae	Vulnerable	Vulnerable
Illawarra Socketwood	<i>Daphnandra sp "Illawarra"</i>	Monimiaceae	Endangered	Endangered
Australian Salt-grass	<i>Distichlis distichophylla</i>	Poaceae	Endangered	
Albatross Mallee	<i>Eucalyptus langelyi</i>	Myrtaceae	Vulnerable	Vulnerable
Ettrema Mallee	<i>Eucalyptus sturgissiana</i>	Myrtaceae	Vulnerable	
Tangled Bedstraw	<i>Galium australe</i>		Endangered	
East Lynne Midge Orchid	<i>Genoplesium vernale</i>	Orchidaceae	Vulnerable	Vulnerable
Brittle Midge Orchid	<i>Genoplesium baueri</i>	Orchidaceae	Vulnerable	
Genoplesium superbum	<i>Genoplesium superbum</i>	Orchidaceae	Endangered	
	<i>Grevillea renwickiana</i>	Proteaceae	Endangered	
Square Raspwort	<i>Haloragis exalta subsp. Exalta</i>	Haloragaceae	Vulnerable	Vulnerable
	<i>Hibbertia sp. Nov. "Menai"</i>	Dilleniaceae	Endangered	
Pretty Beard Orchid	<i>Calochilus pulchellus</i>	Orchidaceae	Endangered	
Delicate Cress	<i>Irenepharsus tryperus</i>	Brassicaceae	Endangered	Endangered
Leafy Peppercress	<i>Lepidium foliosum</i>	Brassicaceae	Extinct	
Biconvex paperbark	<i>Melaleuca</i>	Myrtaceae	Vulnerable	Vulnerable



Common Name	Scientific Name	Family	NSW Status	National Status EPBC
	<i>biconvexa</i>			
	<i>Melaleuca deanei</i>	Myrtaceae	Vulnerable	Vulnerable
Budawangs Wallaby-Grass	<i>Plinthanthesis rodwayi</i>	Poaceae	Endangered	Vulnerable
Cotoneaster Pomaderris	<i>Pomaderris cotoneaster</i>	Rhamnaceae	Endangered	Endangered
Jervis Bay Leek Orchid	<i>Prasophyllum affine</i>	Orchidaceae	Endangered	Endangered
Villous Mint-bush	<i>Prostanthera densa</i>	Lamiaceae	Vulnerable	Vulnerable
Illawarra Greenhood	<i>Pterostylis gibbosa</i>	Orchidaceae	Endangered	Endangered
	<i>Pterostylis pulchella</i>	Orchidaceae	Vulnerable	Vulnerable
Budawang's Bush- Pea	<i>Pultenaea baeuerlenii</i>	Fabaceae	Vulnerable	Vulnerable
Eastern Australian Underground Orchid	<i>Rhizanthella slateri</i>	Orchidaceae	Vulnerable	
Coast Groundsel	<i>Senecio sphulatus</i>		Endangered	
	<i>Solanum celantum</i>	Solanaceae	Endangered	
Magenta Lilly Pilly	<i>Syngium paniculatum</i>	Myrtaceae	Vulnerable	Vulnerable
Austral Toad-Flax	<i>Thesium australe</i>	Santalaceae	Vulnerable	Vulnerable
Nowra Heath Myrtle	<i>Triplarina nowraensis</i>	Myrtaceae	Endangered	Endangered
Narrow-leafed Wilsonia	<i>Wilsonia backhousei</i>	Convulvaceae	Vulnerable	
Round-leafed Wilsonia	<i>Wilsonia rotundifolia</i>	Convulvaceae	Endangered	
Bomaderry Zieria	<i>Zieria baeuerlenii</i>	Rutaceae	Endangered	Endangered
	<i>Zieria murphyi</i>	Rutaceae	Vulnerable	Vulnerable
Warty Zieria	<i>Zieria tuberculata</i>	Rutaceae	Vulnerable	Vulnerable



2.9 Threats to Remnant Vegetation in the Shoalhaven

2.9.1 Species loss in Australia

Australia has a tragic record of species extinction. More mammals have become extinct in this country over the last 200 years than in any other country in the world. Many other species that live in our forests and woodlands are now in severe decline.

With so much of Australia's land cleared for either agricultural or urban land use whole ecosystems are permanently transformed. This permanent transformation has resulted in broad scale environmental losses, degradation and a major reduction in biodiversity.

2.9.2 Depletion of vegetative communities

Whilst no vegetation communities have been lost to the Shoalhaven, all have been depleted to some extent since the arrival of Europeans. There are extensive areas of National Park in the western section of the region, however these areas are based primarily on sandstone formations which support types of ecosystems with distinct floristics and fauna habitat. Consequently, many communities based on the richer soils such as spotted gum, blackbutt and red mahogany are poorly represented in the reserve system. Some of these communities are depleted to such an extent that the Federal and State targets of 15% reservation of pre-European vegetation are unable to be achieved.

2.9.3 Impacts of rural development

Broad scale clearing of native vegetation does not occur to the same degree in the Shoalhaven as in other parts of the State. Current clearing activities are associated with rural residential development and urban expansion which has become a significant rural land use in the past twenty years and is undoubtedly the most prominent single issue in the ongoing debate over rural land use in the Shoalhaven.

The greatest impact of rural residential development is the fragmentation of vegetation due to clearing for buildings, access tracks, fences, dams and bushfire management. This leads to pressures on vegetation due to the introduction of exotic plants, domestic pets, stock and increased demands upon natural water sources.