BOAGS BIOREGION
HIGH PRIORITY MARINE PARKS

Rocky Cape National Park, M.Jacques

MARINE LIFE NETWORK

Facebook: At the “Tasmanians for Marine Parks” site,

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Boags Bioregion Plan

What is the Boags Bioregion

The Boags Bioregion encompasses the entire mainland north coast of Tasmania.

Banded Stilt, The Boags Bioregion is well-known for world class bird sites. Photo: Dr Eric Woehler

Special natural features of the Boags Bioregion

Tasmania's oceans are all special, but why is Bass Strait (Boags Bioregion) different from other parts of Tasmania? Some of its key features are:

- Large seagrass beds
- long sandy beaches
- unique rocky headlands
- high tidal range
- strong currents
- diverse communities of sessile filter feeding invertebrates
- high fish diversity of characteristic Bass Strait rocky reef species.
- sheltered open coastline
- highly varied geology
- wide range of reef structures and substrates
- offshore islands,
- inlets and estuaries
- Large 'mesotidal' river estuaries
- internationally important areas for resident and migratory shorebirds
- breeding habitat for large numbers of seabirds
- invertebrate strandline faunas

What Scientists have said about the natural values of the bioregion

Dr Karen Parsons – Nowhere else on earth report

"Magnificent features characteristic of his region include: the southernmost beds of a conspicuous and long-lived seagrass, the Southern Strapweed (*Posidonia australis*), as well as the majority of habitat for another seagrass, Sea Nymph (*Amphibolis antarctica*); long sandy beaches broken by prominent and geomorphologically unique rocky headlands that extend underwater to depths of ~ 20 m; a high tidal range of 3-4.4 m which creates strong currents and associated diverse communities of sessile filter feeding invertebrates; a high fish diversity; and characteristic Bass Strait rocky reef species that are rare or absent further south, including fishes (e.g. Ornate Cowfish, Snook, Yellowstriped Leatherjacket, Scalyfin), macroinvertebrates (e.g. Mosaic Seastar, Greenlip Abalone), and brown macroalgae (e.g. *Cystophora monilifera* and *Xiphophora chondrophylla*).

This bioregion has a sheltered open coastline, protected from high ocean waves, but is still partly exposed to westerly winds. Major bands of rock type in Tasmania generally run in a north-south direction, changing as you move from west to east. The Boags Bioregion therefore provides a 'cross section' of all the major types and has a highly varied geology, ranging from ancient Precambrian (> 600 million years) rocks to more 'recent' Jurassic (~150-200 million years) dolerite, and provides outstanding examples of relic dune systems and beach ridges formed during geological uplift events. The varied rock types in turn provide a wide range of reef structures and substrates that influence the type and diversity of marine species present. Tidal currents around mainland Tasmania are strongest in this region because of the higher tide range on the wide Bass Strait shelf and more constricted flow around the many offshore

islands, inlets and estuaries. Large 'mesotidal' river estuaries are a major although geographically restricted category of estuary in Tasmania, consisting of 15 estuaries that all occur in this region. Large headlands that 'jut out' into Bass Strait also modify currents and create areas of variable wave exposure and high biodiversity. The Boags Bioregion contains internationally important areas for resident and migratory shorebirds, including the top four Tasmanian sites in terms of shorebird diversity, and sites that are the stronghold for many migratory species. Islands within this region provide breeding habitat for large numbers of seabirds, and have invertebrate strandline faunas that are amongst the most diverse in Tasmania."

Social and economic value of the bioregion

North West Coast

The Boags bioregion includes much of the Bass Strait coastline of mainland Tasmania. The costal land along the NW coast is renowned for rich farming land, mainly focusing on dairying and vegetable cropping. Along most of the coastal river mouths there are urbanised service centres varying in size from major cities like Devonport and Burnie, to medium and small rural towns like Smithton, Stanley, Wynyard, Ulverstone and Penguin. There are also numerous seaside settlements with holiday shacks and retirement homes. Much of the coastal hinterland is cleared.

Most people in Tasmania are employed in service industries, with the health and care sector the largest employer in the State. In North West Tasmania Health Care and Social Assistance generated 6,643 FTE jobs in 2021/22.

In North West Tasmania, manufacturing is the largest exporter, generating $1,363 million in 2021/22. Of that, $872.6M was manufactured food items.

Agriculture is worth $862M in total value terms, dominated by dairying at almost $300M, livestock at $213M and vegetable cropping at $142M.

Commercial fishing was $37.5M in total output, only $2.2M of this is local sales and 62.8M was exported. The port of Stanley is an active processing centre for the wild fishery.

Observations of increased destructive grazing of the Long-spined Sea Urchin *Centrostephanus rodgersii* are of concern.

The North East

The North East side of the Bioregion is dominated by the large Tamar estuary where most of the population of the bioregion lives. Despite being heavily urbanised and industrialised, much of this estuary retains its vegetative cover.

The rest of the NE coastline is sparsely populated with a mix of farmland, production forest and coastal reserves. There are relatively low levels of economic development along the NE coastline. There is a legacy of inland tin mining in this area, but mining activity has virtually ceased in modern times.

The Northern Tasmania Region (NE and Tamar) has an estimated resident population in 2022 of 155,694. The Northern Tasmania Region's (NE and Tamar) Gross Regional Product is estimated at $10.06 billion, which represents 27.26% of the state's GSP (Gross State Product).

There were approximately $1.2 billion in exports from the region, dominated by manufacturing and agriculture. This trade is dominated by the metal processing plants on the east Tamar. There were $135.3 million in fishing exports. There is wild fishery base and processing activity at Bridport.

In 2020/21, the total value of agricultural output in the Northern Tasmania Region was $913m, more than the NW. The largest commodity produced was livestock slaughtering, which accounted for 25.6% of the Northern Tasmania Region's total agricultural output in value terms.

In 2021/22, the total tourism sales in the Northern Tasmania Region were $766.9m.

In the Northern Tasmania Region, Health Care and Social Assistance is the largest employer, generating 9,549 FTE jobs in 2021/22. The Construction industry had the largest number of total registered businesses in Northern Tasmania Region, comprising 17.3% of all total registered businesses, compared to 17.4% in Tasmania.[1]

Recreational Fishing

The north coast accounted for 20% of the overall Tasmanian recreational fishing effort, evenly distributed between the North West and combined Tamar-North East Coast regions (Lyle 2019).

Species of significance off northern Tasmania included Australian Salmon, Flathead, Mullet, Flounder, Gould's Squid, Southern Calamari, Rock Lobster and Abalone,

Recreational rock lobster fishing effort is low. The north coast (Areas 4-5) accounted for 12% of the harvest (9,876 lobster) and 7% of effort (Lyle 2021) , but these zones include the heavily fished eastern and western ends of Bass Strait, that are mainly not part of the Boags bioregion.

Commercial Fishing

The Boags Bioregion covers part of commercial catch zones 4 and 5. Excluding the productive areas outside the bioregion it is fair to conclude that very little rock lobster fishing occurs in the bioregion, which has suffered very heavy fishing pressure in the past and is not historically known to be particularly productive.

[1] Full time equivalent employment | Northern Tasmania | economy.id

The statistics indicate that the abalone catch is relatively small in this area. The recommended Bass Strait Zone TACC for 2023 was 84 t from a total allowable commercial catch (TACC) of 794.5 t2.

Marine farming

Marine Farming Development Plans establish zones for marine farming. There are currently 14 approved Plans, seven of which currently contain existing salmon farming operations.

There has been significant controversy in Tasmania over the areas likely to be subject to future development. Protests have begun against marine farming in the NW, not usually an area renowned for high levels of environmental activism in the past. Aquaculture exports were worth $106.8M in the NW, likely dominated by existing fish farms, but this may grow if industry expansion plans are implemented.

The Tamar is home to a few existing salmon farms in the Inspection Head/Longreach area but fish farms could potentially be installed over a wide area inside the estuary.

Threats

The general threats of significance to low lying or soft coastlines like estuaries and beaches are: [3]

- increased siltation resulting from land clearance and urban and rural runoff,
- increased nutrient loads resulting from marine farms, sewerage and agricultural use of fertilisers,
- foreshore development, dredging, habitats clearing and reclamation
- modification to water flow through dams and weirs,
- acidification of rivers and heavy metal pollution from mines,
- the spread of introduced pest species, and
- sea level rise and coastal erosion.
- Wildlife displacement, disruption of social and feeding behaviour e.g. Beach crowding, Pet impacts[4].
- Microplastics and litter (particularly damaging to seabirds).

On Harder coastlines like reef, or in the open sea,[5]

- climate change effects, ocean acidification, changes food supply, damage/changes to food availability e.g. plankton communities change, changing diseases, range extension, weather changes, extreme events,
- overfishing ,

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[2] Tasmanian-Abalone-Assessment-2022-compressed-1.pdf (utas.edu.au)

[3] Based upon, A Classification of Tasmanian Estuaries and Assessment of their Conservation Significance using Ecological and Physical Attributes, Population and Land Use G.J. Edgar1, N.S. Barrett2 and D.J. Graddon3, Ocean Rescue 2000

[4] Dr Eric Woehler, pers comms

[5] Based on media monitoring by Marine Life Magazine 2010 - 2020

- invasive (feral) species.
- Microplastics and litter (particularly damaging to seabirds).
- Wildlife interactions – eg. Boat strike on sea mammals.
- Disruption of behaviour e.g. seismic testing.
- pollutants., Excessive nutrients e.g. salmon farms, sewerage, stormwater.
- Silt from erosion,
- Habitat damage- dredging and bottom trawling.

The Boags Bioregion coast lies adjacent to land often urbanized or heavily modified for agriculture, many of the above general threats are active issues in the bioregion. It is also of generally low fishery productivity, except for the eastern and western entrances of Bass Strait and is vulnerable to overfishing, especially recreational fishing near major urban centres and accessible boat ramps. It has a legacy of past heavy industrial pollution and there are ongoing debates about marine farms and wind farms.

Why have marine parks

Marine Parks protect depleted, threatened, rare, endangered or endemic species and ecological communities and in particular to preserve habitats considered critical for the survival of such species. Some species are sensitive, with complex habitat requirements, or are vulnerable to disturbance.

They can slow down the decline of degraded ecosystems and be a focus for efforts to restore habitats. A healthier more resilient habitat is more likely to survive new threats like invasive species and climate change.

They can protect economically significant habitats like fish nursery sites, as well as habitats, species and seascapes of importance to recreation and tourism.

They can protect geological, archaeological, historical sites, seascapes, cultural sites and cultural practices and manage these significant sites for future generations.

They can aid in the interpretation of marine and estuarine systems for the purposes of conservation, recreation and public education.

They provide places for research and provide reference sites for scientific studies, including sites for baseline fisheries monitoring and long-term environmental monitoring.

Current Protections for habitat in the Boags Bioregion

There are no marine parks or marine conservation areas in the Boags Bioregion. In fact, there are none in the north of the State, other than the Kent Group in the middle of Bass Strait.

Some protection is given to foreshore areas in land based reserves. Where they are created to extend to low water mark they provide some protection for the inter-tidal zone.

There are some limited fisheries restrictions imposed on particular areas like no netting zones and shark refuge areas in bays and estuaries. There are size, catch, possession limits and seasonal closures for some target species. The calamari and squid fisheries are closed in Bass Strait during peak calamari spawning periods.

There is a permitting regime for certain larger development activities under specific legislation. Local government planning regimes do not generally extend out to sea and have not been given jurisdiction over activities like fish farming.

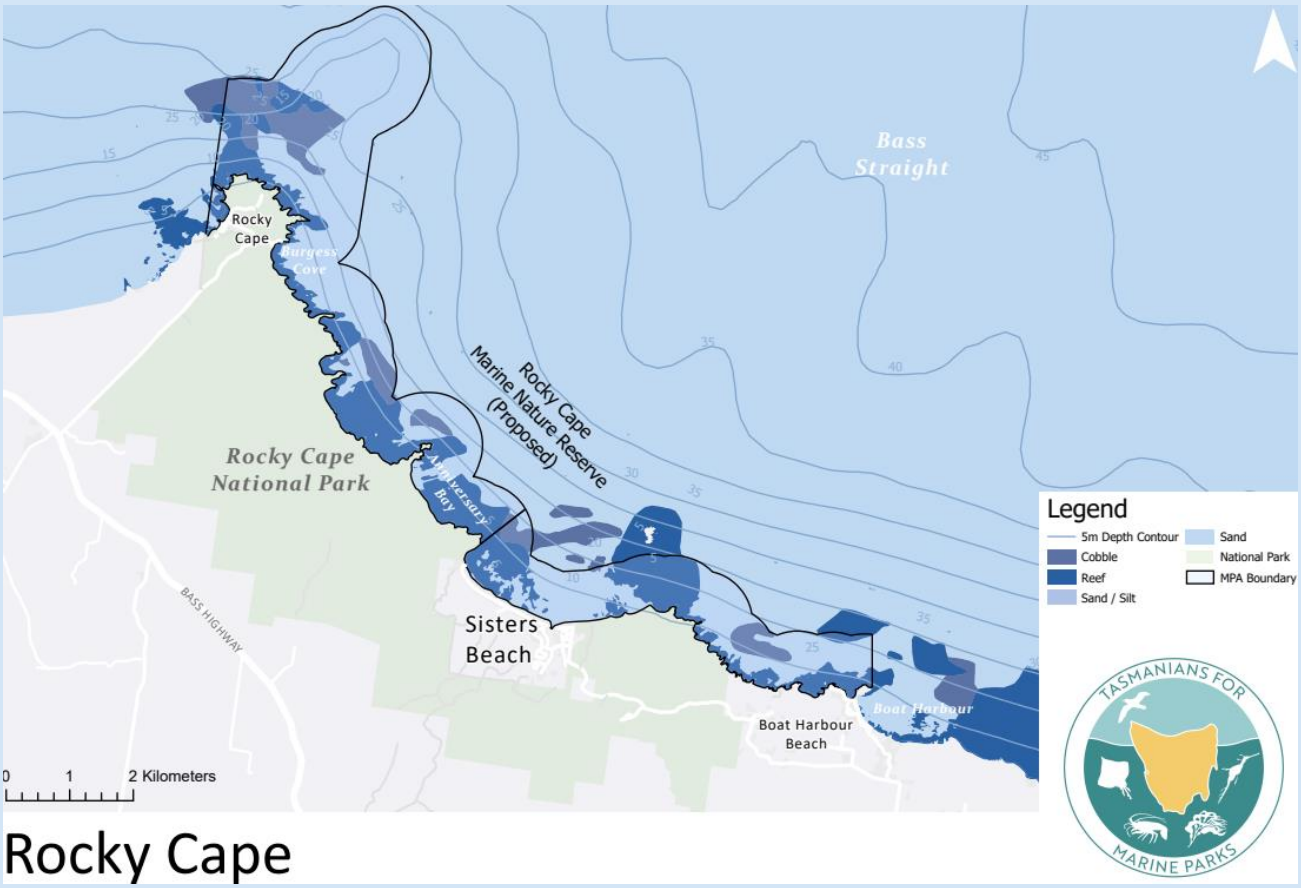
Sea Fan and Sea Pen: Photos: Greg Close

So where would we put any new marine parks?

Scientists have been talking about more marine parks for Tasmania for a long time. The areas previously talked about were, Rocky Cape/Boat Harbour, Black River estuary, Waterhouse Island, Ringarooma Coastal Reserve, Low Head-She Oak Pt - Tamar River, Badger Head, Stanley, Three Sisters-Goat Island, Lillico Beach, Tenth Island, Boullanger Bay/Robbins Passage. Not all of these areas are high priority sites for protection in a marine park.

Here are the details about those proposals:

Rocky Cape–Boat Harbour



Special Features of the Site

- One of the most unique and important sites in the country
- Site of high naturalness
- A vulnerable area in need of better recognition and protection
- unusual physical characteristics
- large cape and rocky points offering a variety of sheltered sites
- strong current
- extremely diverse range of marine habitats in a compact area
- high geomorphological diversity, including very old highly folded metamorphic quartzite
- extremely high algal, invertebrate and fish diversities.
- Seagrass communities are also diverse
- a large component of species not recorded in other Tasmanian estuaries
- spectacular gardens of sessile invertebrates.
- eastern boundary of the 'Western Bass Strait Transition' which extends to South Australia.
- Links to adjacent national park, scenic lookouts and other locations popular with tourists
- Sheltered sites for recreation, education, research and tourism, close to a major urban centre.

- Popular recreational diving sites.
- Rocky Cape is a listed geoheritage site as is the Breakneck Point area to the east of Sister's Beach.

Special features of the Boags Bioregion contained in the site

Large seagrass beds	✓
long sandy beaches	✓
unique rocky headlands	✓
high tidal range	✓
strong currents	✓
diverse communities of sessile filter feeding invertebrates	✓
high fish diversity of characteristic Bass Strait rocky reef species	✓
sheltered open coastline	✓
highly varied or unique geology	✓
wide range of reef structures and substrates	✓
offshore islands, inlets and estuaries	
Large 'mesotidal' river estuaries	
internationally important areas for resident and migratory shorebirds	
breeding habitat for large numbers of seabirds	
invertebrate strandline faunas	✓

Notes on natural values

First recommended for protection by Prof. Graham Edgar 1981.

Ocean Rescue - Rocky Cape was identified as the "most biologically suitable location on Tasmania's north coast due to its diverse range of habitats and species abundance. The entire section of coast from Rocky Cape to Jacobs Boat Harbour contains areas suitable for a marine reserve, and no one section was identified as having a higher conservation value than any other."

High Value Site – Dr Karen Parsons - “The rocky reefs of this location are exceptional due to a diversity of habitats and species, similarly high geomorphological diversity, relatively low level of anthropogenic disturbance, and high recreational value to divers. The unique assemblages of Rocky Cape are in part a reflection of its unusual physical characteristics, with this site the only area on the north coast where ancient Precambrian rock outcrops into coastal and marine habitats. This rock consists of highly folded metamorphic quartzite that extends offshore as moderately-structured reef, with caves and crevices providing a complex range of habitats for marine life. Unique conditions are also formed by reefs dropping off quickly into deeper water (>25 m), and by the large cape protruding into Bass Strait, causing acceleration of currents and variable exposure to prevailing westerly conditions. The reefs of Rocky Cape are therefore more ‘current driven’ than typical for the north coast, with the combination of depth and high current resulting in extensive sponge gardens which supplement the high diversity of algal-dominated reef, sparse seagrass and soft sediment habitats found in shallower waters. The combination of reef complexity, and variable currents over a broad depth range has no doubt contributed to the outstanding species richness of the area. Rocky Cape also lies at the very eastern boundary of a marine biological province known as the ‘Western Bass Strait Transition’ which extends westwards to South Australia. The highly diverse communities of macroalgae, invertebrate and fish at Rocky Cape therefore contain representatives of this province that are absent or uncommon in more eastern parts of the Boags Bioregion or elsewhere to the south in Tasmania.”

Rocky Cape, Photo M.Jacques

Where should the boundaries go?

Ocean Rescue - no one section was identified as having a higher conservation value than any other."

Dr Barrett - The two best options for a reserve would be to either protect all waters 500 m offshore from the seaward reef edge from Rocky Cape Beach to the western end of Sisters Beach (including Outer Reef) or alternatively protect a similar distance offshore from the eastern end of Sisters Beach to the western end of Boat Harbour Beach (including Sisters Island) [with allowances for the operation of boat ramps]. An alternative - the reef system from the northern tip of Rocky Cape seaward to include Outer Reef with a suitable buffer zone around the reef margin, and eastwards to the eastern side of Anniversary Point, in addition to the waters extending 500m offshore [800m takes in the reef edge] from the seaward extension of reef extending from the eastern end of Sisters Beach [national park boundary] to the western shore of Western Bay.

Known Threats

The site is adjacent to a terrestrial national park has a high level of naturalness apart from the small seaside villages at Rocky Cape, Sister's Beach and Boat Harbour.

The area is subject to many common threats like climate change, as well as threats specific to areas close to coastal development, such as pollution, aquaculture and heavy localised fishing pressure.

There are no current marine farms in the area but a suitable grow area has been identified on the western boundary of the proposed area.

Current protection

The area is abutting the important Rocky Cape National Park.

There is a small conservation area on Sisters Island.

The calamari and squid fisheries are closed in Bass Strait during peak calamari spawning periods.

Current human uses

The area is popular with recreational fishermen, some fishermen may angle over the seagrass beds, or from local jetties. There are public boat ramps at Sisters Beach and Rocky Cape. Cray and abalone fishing is carried out in the region but it is not an especially naturally productive fishery for these species based on past fisheries assessments. The proximity of larger settlements like Wynyard and Burnie mean that the area is at risk from localised overfishing. Anecdotally, much of the angling effort has shifted offshore in recent years for game fish.

There is public infrastructure at the seaside villages in the area, such as stormwater outfalls and sewerage treatment plants, that need not be affected. These uses can be accommodated and be excluded from permitting requirements.

There are tourism enterprises in the area based mostly on beach going, bushwalking and other national park activities, which are likely to be enhanced by a marine park declaration.

Economic Interests	-Existing or potential contribution to economic value by virtue of its protection, eg. for recreation or tourism, or as a refuge or nursery area, or source of supply for economically important species. - Current or potential use for the extraction of, or exploration for resources - Current or potential use for the extraction of, or exploration for resources - Importance for shipping and/or trade. - Value due to its contribution to local or regional employment and economic development.	An area of low impact on current users even if highly protected.
Indigenous Interests	-Traditional usage and/or current economic value. Contains indigenous cultural values. Native title considerations	No significant adverse impact, subject to further consultation.
Social Interests	Existing or potential value to the local, national or international communities because of its heritage, cultural, traditional, aesthetic, educational, recreational, or economic values	Villages in the area are beach and ocean focussed as part of the local lifestyle. .
Scientific Interests	Existing or potential value for research and monitoring.	High
Practicality/Feasibility	Degree of insulation from external destructive influences Social and political acceptability, and a degree of community support Access for recreation, tourism, and education Lends itself to practical management (cost effectiveness, compliance etc.).	Lends itself to practical management as part of the national park. Good access for recreation, tourism, and education. Medium proximity of threats.

Vulnerability Assessment	Extent to which the site is vulnerable and susceptible to human induced changes and threatening processes.	Vulnerable
Replication	Provides a replication of ecosystems within a Marine Protected Area within the bioregion.	There are no MPAs in the bioregion.

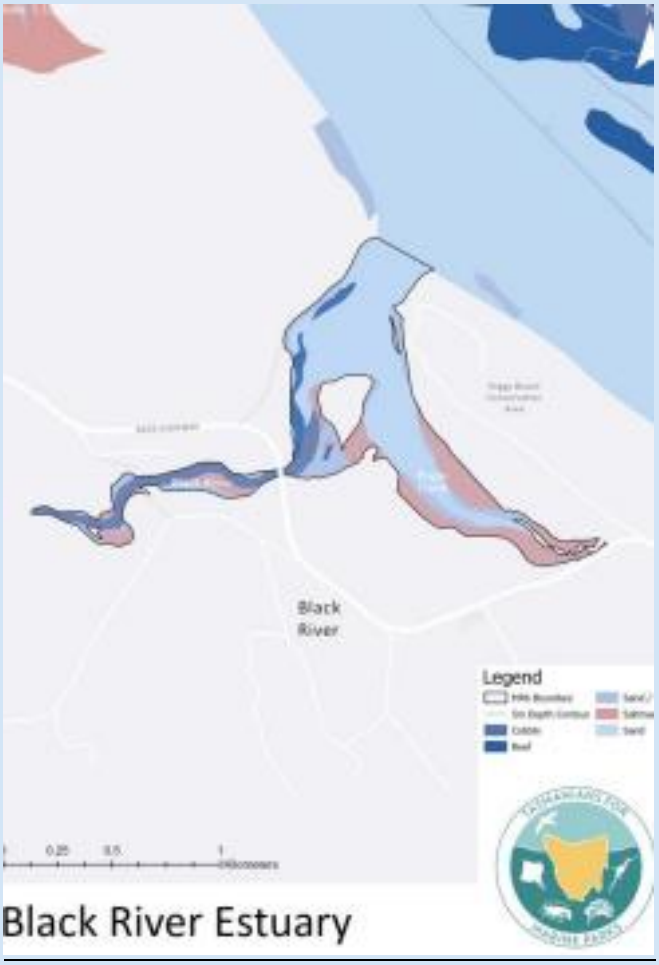
Design Comments

The proposed park captures a still pristine area adjacent to the national park. The design captures a large variety of habitats from deep cliffs along the shipping channel to inshore seaweed gardens and intertidal terrace. As the area is highly productive and is surrounded by less inviting and more exposed areas, it is likely to clash with recreational users and some alternative options need to be discussed with users.

Recommended Protection

IUCN II National park, with measures to accommodate the public boat ramps. The marine park may be either to the east or west of Sister's Beach.

Black River estuary



Special features of the site

- Rated Class A Group V estuary, pristine with high environmental values.
- Relatively good catchment condition with little coastal development
- Known geoheritage site
- Good biodiversity.
- Accessible for recreation and education

Special features of the Boags Bioregion contained in the site

Large seagrass beds	
long sandy beaches	✓
unique rocky headlands	
high tidal range	✓

strong currents	✓
diverse communities of sessile filter feeding invertebrates	✓
high fish diversity of characteristic Bass Strait rocky reef species	
sheltered open coastline	✓
highly varied or unique geology	✓
wide range of reef structures and substrates	
offshore islands, inlets and estuaries	✓
Large 'mesotidal' river estuaries	✓
internationally important areas for resident and migratory shorebirds	
breeding habitat for large numbers of seabirds	
invertebrate strandline faunas	✓

Notes on natural values and design of sites

Rated Class A estuary, pristine with high environmental values.

Sea Pen: Photos: Greg Close

"The Black estuary was preferred over the Boobyalla estuary as representative of Group V estuaries because the population densities in catchments of these two estuaries were similar, the proportion of agricultural land in Black River catchment was lower, and the Black estuary was not affected by mine drainage. Also, nearly half of the Tasmanian coastline, extending from the Tamar to Port Davey, would lack a Class A estuary if the Black was assigned a lower

conservation class. The other possible Class A estuary in Group V, the Crayfish estuary, possessed a less degraded catchment than the Black or Boobyalla, but was affected by a number of dwellings near the mouth and included only a small estuarine area".

"In order for the proposed system of estuarine protected areas to comprehensively protect all major elements of the Tasmanian biota, the taking of flora and fauna should be prohibited in all Class A reserves, except where such restrictions would substantially disadvantage members of the public. …Because other areas are available for fishing nearby, prohibitions on the taking of estuarine life in the Black River … should not substantially disenfranchise the public, with the possible exception of the users of dwellings (approximately five in total) adjacent to the Black River estuary. The number of local residents affected by a Black River MEPA, the only recommended MEPA that covers a complete estuary on the northern Tasmanian coast, would be less than for any other possible estuarine protected area in that region other than Boobyalla Inlet or Welcome Inlet."

The beach and river mouth are part of the Perkins Bay Coastal Depositional Landform, a known geoheritage site.

Known Threats

The area is subject to many common threats like climate change, as well as threats specific to areas moderately close to urbanisation, such as pollution and heavy localised fishing pressure.

Nine major threats to Tasmanian estuaries are recognised and they would apply to this area:

(i) increased siltation resulting from land clearance and urban and rural runoff, (ii) increased nutrient loads resulting from sewage and agricultural use of fertilisers, (iii) urban effluent, (iv) foreshore development and dredging, (v) marine farms, (vi) modification to water flow through dams and weirs, (vii) acidification of rivers and heavy metal pollution from mines, (viii) the spread of introduced pest species, and (ix) long-term climate change. While all of these factors can potentially disrupt ecosystem processes, their level of threat varies greatly". [6]

Current protection

The calamari and squid fisheries are closed in Bass Strait during peak calamari spawning periods.

No Nets, set lines or traps can be set upstream of the mouth and including those waters within 100m to seaward of the mouth to the bridge carrying the A2 road across the river.

The southern shoreline is part of Peggs Beach Conservation Area. The upstream catchment is poorly protected. The Northern shore is private farmland and private uncleared land, with the

[6] A Classification of Tasmanian Estuaries and Assessment of their Conservation Significance using Ecological and Physical Attributes, Population and Land Use G.J. Edgar1, N.S. Barrett2 and D.J. Graddon3, Ocean Rescue 2000

upper catchment earmarked for future production forest. There is a narrow conservation reserve along the riverbank of the upper catchment.

Current human uses

The area is popular with recreational fishermen, who sometimes may angle from the shore or beach. There is no public boat access. The absence of oceanic rocky reef means that no cray and abalone fishing is carried out in the region but it is not an especially naturally productive fishery for these species based on past fisheries assessments.

There is basic camping facility in the area.

Economic Interests	-Existing or potential contribution to economic value by virtue of its protection, eg. for recreation or tourism, or as a refuge or nursery area, or source of supply for economically important species. - Current or potential use for the extraction of, or exploration for resources - Current or potential use for the extraction of, or exploration for resources - Importance for shipping and/or trade. - Value due to its contribution to local or regional employment and economic development.	An area of low impact on current users even if highly protected. Some impact on shore fishing, there are surf fishing alternative options nearby
Indigenous Interests	-Traditional usage and/or current economic value. Contains indigenous cultural values. Native title considerations	No significant adverse impact, subject to further consultation.
Social Interests	Existing or potential value to the local, national or international communities because of its heritage, cultural, traditional, aesthetic, educational, recreational, or economic values	Popular camping site .
Scientific Interests	Existing or potential value for research and monitoring.	High
Practicality/Feasibility	Degree of insulation from external destructive influences Social and political acceptability, and a degree of community support	Lends itself to practical management as good access for recreation, tourism, and education.

	Access for recreation, tourism, and education Lends itself to practical management (cost effectiveness, compliance etc.).	Medium proximity of threats.
Vulnerability Assessment	Extent to which the site is vulnerable and susceptible to human induced changes and threatening processes.	Vulnerable
Replication	Provides a replication of ecosystems within a Marine Protected Area within the bioregion.	There are no MPAs in the bioregion.

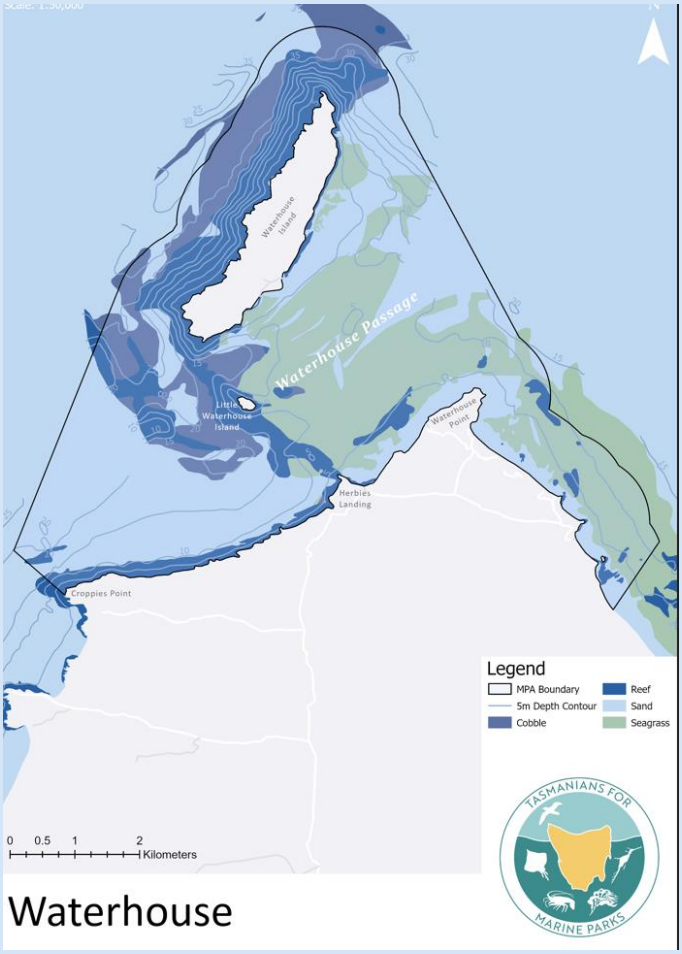
Design Comments

Includes the area of marine influence with the greatest biodiversity.

Recommended Protection

IUCN II National park.

Waterhouse Island



Special Features of the Site

- Site of high naturalness
- shelter provided from the prevailing westerly winds by the islands, reef ridge and Waterhouse Point
- strong current through a restricted channel
- extremely diverse range of marine habitats in a compact area
- Contrasting geology to Rocky Cape. Rock types are more recent than at Rocky Cape, including highly structured dolerite boulder fields and lower relief granites.
- Seagrass communities are dense, extensive and diverse
- Dense algal beds
- Links to adjacent terrestrial reserve
- sandy beaches and rocky intertidal habitat, and is also of geological interest due to relict terrestrial dune systems
- Sheltered sites for recreation, education and research.
- diverse fish assemblages highly representative of the central 'Bass Strait Province'

Special features of the Boags Bioregion contained in the site

Large seagrass beds	✓
long sandy beaches	✓
unique rocky headlands	✓
high tidal range	✓
strong currents	✓
diverse communities of sessile filter feeding invertebrates	✓
high fish diversity of characteristic Bass Strait rocky reef species	✓
sheltered open coastline	✓
highly varied or unique geology	✓
wide range of reef structures and substrates	✓
offshore islands, inlets and estuaries	✓
Large 'mesotidal' river estuaries	
internationally important areas for resident and migratory shorebirds	
breeding habitat for large numbers of seabirds	
invertebrate strandline faunas	✓

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Notes on natural values and design of sites

Prof. Graham Edgar recommendation.

Ocean Rescue - After Rocky Cape, the next most desirable location in the Bass Strait region for marine reserves.

Waterhouse Island offers a wide range of habitats from deep reef to shallow reef, and from the sheltered seagrass beds on the eastern side to the exposed coastline of the western side. It also offers the longest section of unbroken reef habitat in the region, as the remainder of the coastline consists of small isolated rocky headlands separated by long sections of sandy beaches.

High Value Site – Dr Parsons Nowhere else on earth report

"The rocky reefs of this location are exceptional due to a diversity of habitats and species, similarly high geomorphological diversity, relatively low level of anthropogenic disturbance, and high recreational value to divers. The unique assemblages of Rocky Cape are in part a reflection of its unusual physical characteristics, with this site the only area on the north coast where ancient Precambrian rock outcrops into coastal and marine habitats. This rock consists of highly folded metamorphic quartzite that extends offshore as moderately-structured reef, with caves and crevices providing a complex range of habitats for marine life. Unique conditions are also formed by reefs dropping off quickly into deeper water (>25 m), and by the large cape protruding into Bass Strait, causing acceleration of currents and variable exposure to prevailing westerly conditions. The reefs of Rocky Cape are therefore more 'current driven' than typical for the north coast, with the combination of depth and high current resulting in extensive sponge gardens which supplement the high diversity of algal-dominated reef, sparse seagrass and soft sediment habitats found in shallower waters. The combination of reef complexity, and variable currents over a broad depth range has no doubt contributed to the outstanding species richness of the area. Rocky Cape also lies at the very eastern boundary of a marine biological province known as the 'Western Bass Strait Transition' which extends westwards to South Australia. The highly diverse communities of macroalgae, invertebrate and fish at Rocky Cape therefore contain representatives of this province that are absent or uncommon in more eastern parts of the Boags Bioregion or elsewhere to the south in Tasmania."

Dr Barratt on the Design - Waterhouse Island to at least one kilometre offshore, including the exposed western shore reefs, sheltered eastern shore reefs and the high current and deep reefs at the northern tip. Seagrass beds in Waterhouse Passage from one kilometre east of Waterhouse Point to the northern tip of Waterhouse Island and westwards to Little Waterhouse Island. Additionally the reef extending from the beach to the south of North Croppies Point through to Little Waterhouse Island and Barrett Rocks.

Known Threats

The site has a high level of naturalness.

The area is subject to many common threats like climate change and heavy localised fishing pressure.

There are no current marine farms in the area.

Current protection

None. Adjacent to land-based conservation area

The calamari and squid fisheries are closed in Bass Strait during peak calamari spawning periods.

Current human uses

The area is popular with recreational fishermen, some fishermen may angle over the seagrass beds, or from the shore. There is a basic public boat access area at Waterhouse Point. Cray and abalone fishing is carried out in the region but it is not an especially naturally productive fishery for these species based on past fisheries assessments. Commercial shark fishing occurs in the channel.

There is little public infrastructure in the area.

Economic Interests	-Existing or potential contribution to economic value by virtue of its protection, eg. for recreation or tourism, or as a refuge or nursery area, or source of supply for economically important species. - Current or potential use for the extraction of, or exploration for resources - Current or potential use for the extraction of, or exploration for resources - Importance for shipping and/or trade. - Value due to its contribution to local or regional employment and economic development.	An area of low impact on current users even if highly protected.
Indigenous Interests	-Traditional usage and/or current economic value. Contains indigenous cultural values. Native title considerations	No significant adverse impact, subject to further consultation.
Social Interests	Existing or potential value to the local, national or international communities because of its heritage, cultural, traditional, aesthetic, educational, recreational, or economic values	Villages in the area are beach and ocean focussed as part of the local lifestyle. .
Scientific Interests	Existing or potential value for research and monitoring.	High
Practicality/Feasibility	Degree of insulation from external destructive influences Social and political acceptability, and a degree of community support Access for recreation, tourism, and education	Lends itself to practical management as part of the national park. Good access for recreation, tourism, and education.

	Lends itself to practical management (cost effectiveness, compliance etc.).	Medium proximity of threats.
Vulnerability Assessment	Extent to which the site is vulnerable and susceptible to human induced changes and threatening processes.	Vulnerable
Replication	Provides a replication of ecosystems within a Marine Protected Area within the bioregion.	There are no MPAs in the bioregion.

Recommended Protection

IUCN II National park.

Tamar River fish and invertebrates, M.Jacques

Low Head–She Oak Pt , Tamar

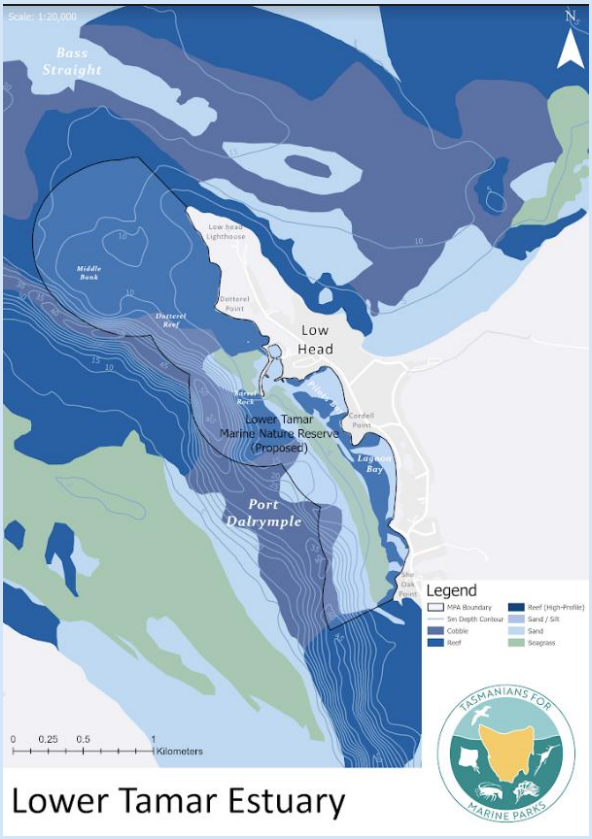
Special Features of the Site

- Site of high naturalness in a heavily developed area
- A vulnerable area in need of better recognition and protection
- the only drowned river valley with a large tidal range
- strong current
- very deep habitats rarely encountered so close to shore (55 m)
- variable light conditions
- extremely diverse range of marine habitats in a compact area
- extremely high algal, invertebrate and fish diversities.
- Seagrass communities are also diverse
- a large component of species not recorded in other Tasmanian estuaries
- extensive, spectacular gardens of sessile invertebrates.
- Little penguin colony supporting a tourist enterprise
- Links to adjacent historic sites, nearby scenic lookouts and other location popular with tourists
- Sheltered sites for recreation, education, research and tourism, close to a major urban centre.
- Popular recreational diving sites.

Special features of the Boags Bioregion contained in the site

Large seagrass beds	✓
long sandy beaches	✓
unique rocky headlands	✓

high tidal range	✓
strong currents	✓
diverse communities of sessile filter feeding invertebrates	✓
high fish diversity of characteristic Bass Strait rocky reef species	✓
sheltered open coastline	✓
highly varied or unique geology	✓
wide range of reef structures and substrates	✓
offshore islands, inlets and estuaries	✓
Large 'mesotidal' river estuaries	✓
internationally important areas for resident and migratory shorebirds	✓
breeding habitat for large numbers of seabirds	✓
invertebrate strandline faunas	✓



Notes on natural values and design of sites

Rated Class A estuary, pristine with high environmental values.

Prof Edgar and Dr Barratt recommendation – exceptional estuarine biodiversity. The Lower Tamar is rated a Class A estuary, pristine with high environmental values.

Dr Parsons - "The Tamar Estuary is totally unique within Tasmania, being the only drowned river valley with a large tidal range, whilst the lower estuary is characterised by strong tidal currents and very deep habitats rarely encountered so close to shore (55 m). An extremely diverse range of marine habitats is represented, including sandy beaches, rocky shores, algal and sponge dominated reefs, seagrass beds, soft sandy bottoms and coastal vegetation utilised by seabirds. The Tamar Estuary is unusual in possessing extremely high algal, invertebrate and fish diversities, and a large component of species not recorded in other Tasmanian estuaries. A survey of 111 estuaries recorded the Tamar as having the highest or second highest number of invertebrates and fish in the state, whilst this estuary is the only known location to support as many as 300 species of algae. Seagrass communities are also diverse, supporting five out of the seven Tasmanian species within an area less than 4 km2, with the different seagrass species supporting distinct fish communities and containing shark nursery habitats within a protected Shark Refuge Area. The strong currents and deep consolidated reef and cobble habitats of the estuary channel provide ideal conditions for development of extensive, spectacular 'sponge gardens' that are dominated by sponges, soft corals and gorgonians, and cover an estimated 5.4 km2 in depths ranging from 15 to 55 m. The only other estuary containing such highly developed sessile invertebrate communities is Bathurst Channel in the south-west, but the two systems are totally distinct due to contrasting water clarity, nutrient levels and biogeographic (i.e. warm versus cool temperate) influences."

Known Threats

The site is located in an estuary that has a high level of naturalness despite intensive development activity.

The area is subject to many common threats like climate change, as well as threats specific to areas close to intense human settlement and industrialisation, such as pollution, dredging and heavy localised fishing pressure.

Nine major threats to Tasmanian estuaries are recognised and they would apply to this area:

(i) increased siltation resulting from land clearance and urban and rural runoff, (ii) increased nutrient loads resulting from sewage and agricultural use of fertilisers, (iii) urban effluent, (iv) foreshore development and dredging, (v) marine farms, (vi) modification to water flow through dams and weirs, (vii) acidification of rivers and heavy metal pollution from mines, (viii) the spread of introduced pest species, and (ix) long-term climate change. While all of these factors can potentially disrupt ecosystem processes, their level of threat varies greatly". [7]

Current protection

The area is an important bird area (IBA), but this listing is meant to recognise values and offers no direct protection without other legislative intervention.

There are small reserves on some of the adjacent land. The area is subject to limited netting bans and is a shark refuge area.

The calamari and squid fisheries are closed in Bass Strait during peak calamari spawning periods.

There are limited mullet net bans in much of the proposed area, and a netting ban adjacent to the little penguin colony at Low Head. Oddly, beach seine netting is still permitted. The Tamar is a shark refuge area.

Current human uses

The area is popular with recreational fishermen mainly trolling in the shipping channel for pelagic fish, which is not prevented by the proposal, some fishermen may angle over the

[7] A Classification of Tasmanian Estuaries and Assessment of their Conservation Significance using Ecological and Physical Attributes, Population and Land Use G.J. Edgar1, N.S. Barrett2 and D.J. Graddon3, Ocean Rescue 2000

seagrass beds, but most angling activity is from the breakwater at the pilot station. There is no known commercial fishing in the estuary.

The adjacent area is dominated by historic sites, foreshore reserve and residential housing. There is likely to be public infrastructure in the area such as stormwater outfalls and cables, that need not be affected. The area of the Low Head Pilot station and its adjacent waters are subject to a Crown lease. This also includes the nearest public boat ramp. There are several harbour navigational aids in the area. These uses can be accommodated and be excluded from permitting requirements.

There are tourism enterprises in the area such as the pilot station, museum and little penguin colony, which are likely to be enhanced by a marine park declaration.

Marine farming is carried out in the area but further up the estuary from the proposed area.

Economic Interests	-Existing or potential contribution to economic value by virtue of its protection, eg. for recreation or tourism, or as a refuge or nursery area, or source of supply for economically important species. - Current or potential use for the extraction of, or exploration for resources - Current or potential use for the extraction of, or exploration for resources - Importance for shipping and/or trade. - Value due to its contribution to local or regional employment and economic development.	An area of low impact on current users even if highly protected.
Indigenous Interests	-Traditional usage and/or current economic value. Contains indigenous cultural values. Native title considerations	No significant adverse impact, subject to further consultation.
Social Interests	Existing or potential value to the local, national or international communities because of its heritage, cultural, traditional, aesthetic, educational, recreational, or economic values	Adjacent area is populated with several adjacent cultural and historic sites. .
Scientific Interests	Existing or potential value for research and monitoring.	High
Practicality/Feasibility	Degree of insulation from external destructive influences	Close to sources of threat. Lends itself to practical management. Good access for

	Social and political acceptability, and a degree of community support Access for recreation, tourism, and education Lends itself to practical management (cost effectiveness, compliance etc.).	recreation, tourism, and education.
Vulnerability Assessment	Extent to which the site is vulnerable and susceptible to human induced changes and threatening processes.	Vulnerable
Replication	Provides a replication of ecosystems within a Marine Protected Area within the bioregion.	There are no MPAs in the bioregion

Design Comments

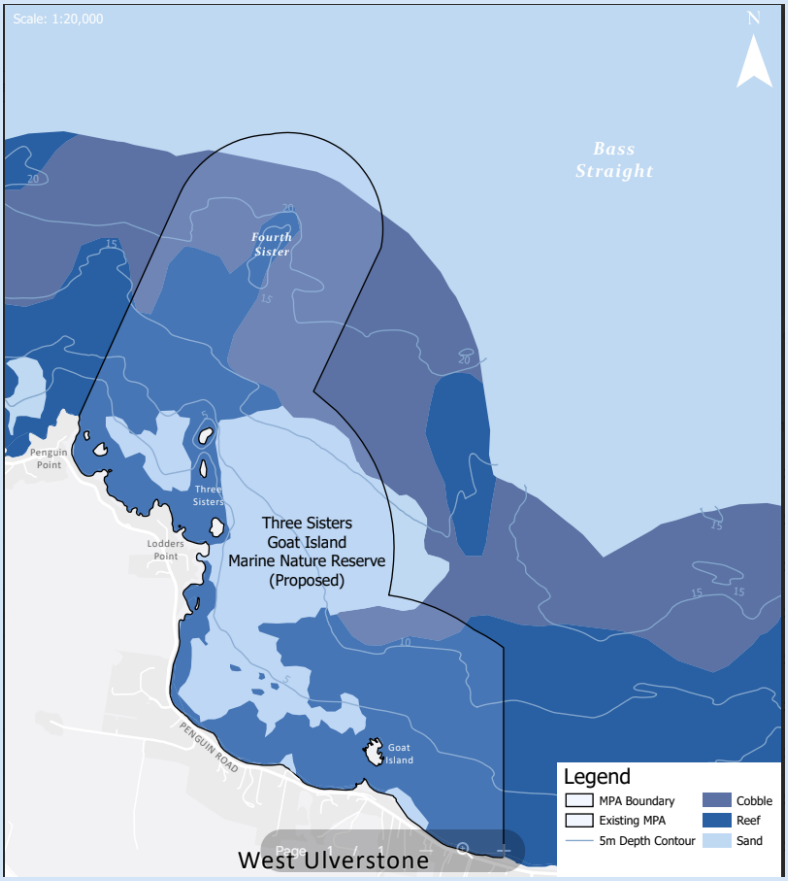
The proposed park captures a still pristine area adjacent to the eastern shore of the lower estuary. The design captures a large variety of habitats from deep cliffs along the shipping channel to inshore seaweed gardens and intertidal flats.

The boundaries attempt to avoid current human uses in the eastern side of the Channel and the Crown lease covering the modern pilot station would need to be excluded from restrictive measures. Major reshaping of channel obstructions ceased some time ago, and was only required further up the estuary. Harbour operations are unlikely to require dredging in this location.

Recommended Protection

IUCN II National park, excluding the Low Head pilot station (and public boat ramp) lease.

Three Sisters–Goat Island



Special features of the site

- Nearby penguin rookery
- Aboriginal fish traps
- Geoheritage site
- Spectacular coastal views
- The Third Sister is a known recreational dive site with interesting algal diversity.
- Substantial offshore spire on the Fourth Sister
- Geologically unique
- Moderate representation of Bass Strait fish and invertebrates
- Cobble habitat

Special features of the Boags Bioregion contained in the site

Large seagrass beds	✓
long sandy beaches	✓
unique rocky headlands	✓

high tidal range	✓
strong currents	✓
diverse communities of sessile filter feeding invertebrates	✓
high fish diversity of characteristic Bass Strait rocky reef species	
sheltered open coastline	✓
highly varied or unique geology	✓
wide range of reef structures and substrates	✓
offshore islands, inlets and estuaries	✓
Large 'mesotidal' river estuaries	
internationally important areas for resident and migratory shorebirds	
breeding habitat for large numbers of seabirds	
invertebrate strandline faunas	✓

Notes on natural values and design of sites

Dr Barratt - "would make a valuable contribution to conservation in this region by protecting habitats under-represented in regional reserve proposals, and further protecting the penguin population that come ashore to nest in the associated coastal reserves".

The Three Sisters- Goat Island Nature Reserve was originally proposed for MPA protection by commercial fishermen (TFIC/TASFA, see Barratt 2001)

Goat Island has long been recognised as a unique geological feature.

The Three Sisters-Goat Island are of sufficient size to show some recovery following protection, and are likely to proceed given their degree of public support.

Mapping within the proposed Three Sisters-Goat Island protected area revealed three major habitat types. These were reef, sand, and cobble/gravel (Fig. 15). The reef was in many respects similar to Lillico Beach, with a broad intertidal platform, extending subtidally with a gradual slope. It does differ however, in that some areas were more eroded than others due to differing rock types, with the less eroded areas providing the islands and a moderate amount of physical structure on the reef. The islands and reef appear to be generally of conglomerate origin, and this differs from the basalt found at Lillico Beach. This reef, although well-developed structurally, lacked crevices (in the 5 and 10m survey sites), and therefore the number of refuges available for invertebrates and fishes was limited.

At some distance offshore the reef graded to cobble and gravel, but like Lillico beach, a broad transition zone was present and the reef/cobble boundary shown on the map is only indicative. Patches of more solid reef are found scattered throughout the cobble area, and likewise cobble in the reef area. A substantial amount of the area nominated for the propagation area is sand, a substrate that essentially fringes the intertidal zone from Goat Island to Penguin Point, greatly limiting the amount of solid reef that would be protected under the current proposal.

The macroalgal community differed slightly throughout the area examined as the outer Sisters are subject to more wave exposure and have steeper gradients than the remaining coastline.

At the outer Sister between 0-2 m depth there was a mixed flora of *Acrocarpia paniculata*, *Cystophora xiphocarpa*, *Macrocystis angustifolia, Melanthaliaobtusata, Halopteris paniculata* and geniculate coralline algae. Between 4-6 m, the flora was similar but with *Acrocarpia* dominant and *Ecklonia* present. Below 6 m there was virtually no brown algae and the reef was dominated by *Caulerpa flexilis* and *Thamnoclonium dichotomum* (a red algae with associated commensal sponge) to approximately 10 m where *Thamnoclonium* and sponges were the dominant cover.

On the remaining coastline where the reef is more gradual and more subject to sediment re-suspension, the flora is similar to the Outer Sister to depths of 4 m, but below this there is very little cover of macroalgae. The most common group below 4 m were geniculate coralline algae. The abundance of geniculate corallines on this coastline is a unique feature and appears to be due to a higher tolerance than other algae to the high sediment loads found in this area. Like Lillico Beach, a combination of low aspect reef, high sediment inputs and frequent onshore winds appears to have heavily influenced the algal species composition and depth distributions.

The distribution of fish and invertebrates was particularly patchy in this area with patterns of abundance related more to patches of structure with available shelter than to depth. The urchin *Heliocidaris ertyhrogramma* and abalone *Haliotis rubra* were moderately common in these areas, and occasional large aggregations of spider crabs (*Leptomithrax gaimardii*) were also observed. These aggregations each contained many thousands of crabs and were concentrated on the outer reef areas.

Common fishes included *Notolabrus tetricus* (blue-throated wrasse), *Notolabrus fucicola* (purple wrasse), *Pictilabrus laticlavius* (senator wrasse), *Trachinops caudimaculatus* (hulafish), *Cheilodactylus nigripes* (magpie perch) and *Caesioperca rasor* (barber perch).

The proposed protected area at the Three Sisters-Goat Island Nature Reserve has a number of positive features, including proximity to a terrestrial nature reserve, the inclusion of several notable geomorphological features (the islands), and a substantial offshore extension in the eastern sector, providing protection for a relatively large area of cobble and gravel seabed, a habitat common along the central north coast. The large area of sand inshore however, means that very little solid reef at intermediate depths would be included in the current proposal, reducing its value for fish stock enhancement and for conservation. As more substantial reef exists to both the west and east of the current proposal, it is recommended that the suggested boundaries be extended at least one kilometre west to Tea Tree Point to include the more extensive reef habitat found between here and Penguin Pt, and also extended at least one kilometre east to buffer the reef at Goat Island from the impacts of fishing along the protected area boundary. The reef in this area has substantially more physical structure than that found at Lillico Beach and is consequently likely to be of more use in enhancing resident fish stocks, particularly if a sufficient amount of reef is eventually included in the proposal.

The Nature Reserve contains the only known exposed contact between metamorphosed and unmetamorphosed Precambrian rocks in Tasmania, and is therefore highly significant in the evolution of the Tasmanian landscape. Part of this feature is a Precambrian stretched pebble conglomerate, an unusual rock type. The place is of outstanding value as a teaching and research site. The Nature Reserve is a rocky off-shore island and foreshore composed of Precambrian rocks including a stretched pebble conglomerate. The vegetation of the area includes a mixture of salt tolerant coastal species, reeds and grasses. It is possible that cultural values, both indigenous and non- indigenous, of national estate significance may exist in this place. As yet, the AHC has not identified, documented or assessed these values[8]

Dr Barratt - "would make a valuable contribution to conservation in this region by protecting habitats under-represented in regional reserve proposals, and further protecting the penguin population that come ashore to nest in the associated coastal reserves".

The Third Sister is a known recreational dive site with interesting algal diversity.

The islands are steep-sided. Their vegetation of sparse coastal scrub is largely limited to their summits. Because landings are difficult owing to the lack of beaches and safe anchoring points they are little affected by human visitation and disturbance, although Australian fur seals haul-out on the lowest of them.

The island group has been identified as an Important Bird Area (IBA) by BirdLife International because, with up to 400 breeding pairs, it supports over 1% of the world population of black-faced cormorants. Pacific gulls and sooty oystercatchers breed there every year in small numbers, and Caspian terns have nested there. White-bellied sea-eagles forage around the islands."

[8] Australian Heritage Database (environment.gov.au)

Known Threats

The site is adjacent to a nature reserve and has a high level of naturalness despite being close to coastal settlements. It suffered for many years from sediment plumes from the Tioxide paint factory to the West but that industry closed some time ago. The area could be considered to be in recovery.

It is close to the coastal settlements at Penguin and Ulverstone but is not a popular fishing site.

The area is subject to many common threats like climate change, as well as threats specific to areas close to coastal development, such as pollution.

There are no current marine farms in the area but a suitable grow area has been identified on the western boundary of the proposed area.

Current protection

The islands and sea terrace are part of the Three Sisters-Goat Island Nature Reserve. Much of the foreshore is licensed by the Crown, assumedly to the Crown but perhaps also to private owners as large areas of the reserve have been cleared by adjacent private householders.

The area is on the register of the national estate and is also listed as an Important Bird Area, but that offers no statutory protection.

The calamari and squid fisheries are closed in Bass Strait during peak calamari spawning periods.

According to website discussions and local anecdotal sources, fishing in Ulverstone is not considered as good as further east at Turners Beach with the main activity being spinning for Australian salmon from the Ulverstone breakwaters. Although shore fishermen have been seen in the area, the foreshore access to the proposed MPA is already mostly blocked by the railway and road and the steep slopes in much of the area.

Current human uses

The area is not popular with recreational fishermen, some fishermen may spin over the seagrass beds, or fish from the shore. Cray and abalone fishing is carried out in the region but it is not an especially naturally productive fishery for these species based on past fisheries assessments.

There is little public infrastructure in the area.

Economic Interests	-Existing or potential contribution to economic value by virtue of its protection, eg. for recreation or tourism, or as a refuge or nursery area, or source of supply for economically important species. - Current or potential use for the extraction of, or exploration for resources - Current or potential use for the extraction of, or exploration for resources - Importance for shipping and/or trade. - Value due to its contribution to local or regional employment and economic development.	An area of low impact on current users even if highly protected. Known to be an rarely visited spot for fishing.
Indigenous Interests	-Traditional usage and/or current economic value. Contains indigenous cultural values. Native title considerations	Reservation would help to protect known in-water Aboriginal sites. No significant adverse impact, subject to further consultation.
Social Interests	Existing or potential value to the local, national or international communities because of its heritage, cultural, traditional, aesthetic, educational, recreational, or economic values	The site is an iconic coastal landmark of geoheritage significance. Although long bypassed by a highway diversion, it is still renowned as a local beauty spot.
Scientific Interests	Existing or potential value for research and monitoring.	High
Practicality/Feasibility	Degree of insulation from external destructive influences Social and political acceptability, and a degree of community support Access for recreation, tourism, and education Lends itself to practical management (cost effectiveness, compliance etc.).	Lends itself to practical management as part of the national park. Moderate access for recreation, tourism, and education.

		Medium proximity of threats.
Vulnerability Assessment	Extent to which the site is vulnerable and susceptible to human induced changes and threatening processes.	Vulnerable
Replication	Provides a replication of ecosystems within a Marine Protected Area within the bioregion.	There are no MPAs in the bioregion.

Design Comments

There is a difficulty in capturing all the site values in a form that would create an easily recognised set of external boundaries by reference to natural features. The unusual shape of the Fourth Sister (an underwater reef to seaward, creates an odd shaped MPA.

Recommended Protection

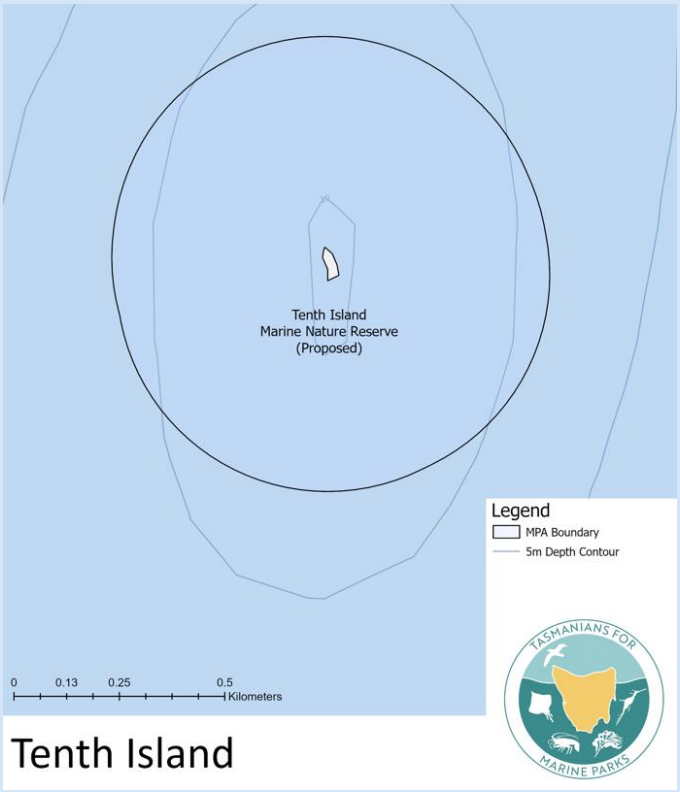
IUCN II National park.

Tenth Island

- important Australian fur seal breeding colony
- breeding ground for approximately 20 pairs of black-faced cormorants
- geologically interesting
- tourism and educational potential

Special features of the Boags Bioregion contained in the site

Large seagrass beds	
long sandy beaches	
unique rocky headlands	
high tidal range	✓
strong currents	✓
diverse communities of sessile filter feeding invertebrates	
high fish diversity of characteristic Bass Strait rocky reef species	
sheltered open coastline	✓
highly varied or unique geology	✓
wide range of reef structures and substrates	✓
offshore islands, inlets and estuaries	✓
Large 'mesotidal' river estuaries	
internationally important areas for resident and migratory shorebirds	
breeding habitat for large numbers of seabirds	
invertebrate strandline faunas	



Notes on natural values and design of sites

Small Bass Strait Island Reserves Draft Management Plan October 2000 - Tenth Island, also known as Barrenjoey, is 6 kilometres from mainland Tasmania and is accessible from the northern coastal towns of Low Head, George Town, Lulworth and Weymouth. It forms part of the George Town municipality, which is also seeking to create wealth through increased tourism.

Tenth Island is reserved as an important Australian fur seal breeding colony with 408 pups being counted in the 1998 census. The mean annual pup production over the last decade is 371, with a range of between 194 and 541 (Humes and Gales, 1999). It is also the breeding ground for approximately 20 pairs of black-faced cormorants.

Appropriate education-focused ecotourism ventures have been licensed to operate seal watching tours to Tenth Island, Reid Rocks and possibly Judgement Rocks

Moriarty Rocks, Tenth Island, Judgement Rocks, West Moncoeur and Reid Rocks Nature Reserves are significant as Tasmania's only Australian fur seal breeding colonies, which provide approximately half the global habitat for the species. Population trend data are variable indicating a small overall increase over the past decade, but numbers fluctuate considerably from site to site due to the influence of storms on breeding success.

Moriarty Rocks, Tenth Island, Judgement Rocks, West Moncoeur Island and Reid Rocks Nature Reserves are important as they provide approximately 50% of the global Australian fur seal (*Arctocephalus pusillus*) breeding habitat, the other 50% being provided by Victorian administered colonies in Bass Strait and Port Philip Bay. It is difficult to assess the population trends of the Australian fur seal as their breeding success or failure tends to correlate with the

frequency of storms in Bass Strait during their breeding season. Regular long-term monitoring of the population is essential in order to fully understand the trends.

Tenth Island is composed predominantly of lower Palaeozoic Mathinna Group siltstone and sandstone (Dixon, 1996).

Tenth Island is easily accessed from Low Head, Georgetown, Weymouth and Lulworth.

Threats

"The area is subject to many common threats like climate changes, as well as threats specific to areas close to coastal development, such as pollution, aquaculture and heavy localised fishing pressure.

There are no current marine farms in the area.

The area around the island is subject to fishing pressure, some of this activity may be disruptive to normal wildlife behaviour, particularly netting.

Its accessibility from George Town and Low Head and the nearby holiday villages of Lulworth and Weymouth makes Tenth Island a target for day trippers and sightseers, who want to see a seal colony. It may require a broad education campaign or licensing regime to teach day trippers and potential ecotourist operators the necessary protocols to protect seals.

Current protection

The calamari and squid fisheries are closed in Bass Strait during peak calamari spawning periods.

Tenth Island Nature Reserve, also known as Barrenjoey, is situated in Bass Strait at 40057'S, 146059'E approximately 6 kilometres off Stony Head to the east of Low Head. It is 1.26 hectares in area and approximately 150 metres long, 75 metres wide and 10 metres high. Tenth Island became a Nature Reserve on 5 April 1978.

Pursuant to Section 25 of the National Parks and Wildlife Act 1970, the island is declared a restricted area to which the public does not have a general right of access.

A 500 metre netting ban was recommended in the management plan for this area but never enacted.

The seal colony was recommended for MPA protection by PWS Seal biologists, Prof. Graham Edgar, also at the Marine Reserves 1996 Bronte Workshop, by Tasmanian Fisheries Industry Council and Tasmanian Amateur Sea Fishermens' Association (1997).

No protection exists for marine areas.

Current human uses

There is a rough public boat access as close as Lulworth. Cray and abalone fishing is carried out in the region but it is not an especially naturally productive fishery for these species based on past fisheries assessments.

There is no public infrastructure on the island.

Economic Interests	-Existing or potential contribution to economic value by virtue of its protection, eg. for recreation or tourism, or as a refuge or nursery area, or source of supply for economically important species. - Current or potential use for the extraction of, or exploration for resources - Current or potential use for the extraction of, or exploration for resources - Importance for shipping and/or trade. - Value due to its contribution to local or regional employment and economic development.	An area of low impact on current users even if highly protected.
-Indigenous Interests	-Traditional usage and/or current economic value. Contains indigenous cultural values. Native title considerations	No significant adverse impact, subject to further consultation.
Social Interests	Existing or potential value to the local, national or international communities because of its heritage, cultural, traditional, aesthetic, educational, recreational, or economic values	Villages in the area are beach and ocean focussed as part of the local lifestyle. Has tourism potential.
Scientific Interests	Existing or potential value for research and monitoring.	High
Practicality/Feasibility	Degree of insulation from external destructive influences Social and political acceptability, and a degree of community support	Lends itself to practical management as part of an existing reserve within visual range of

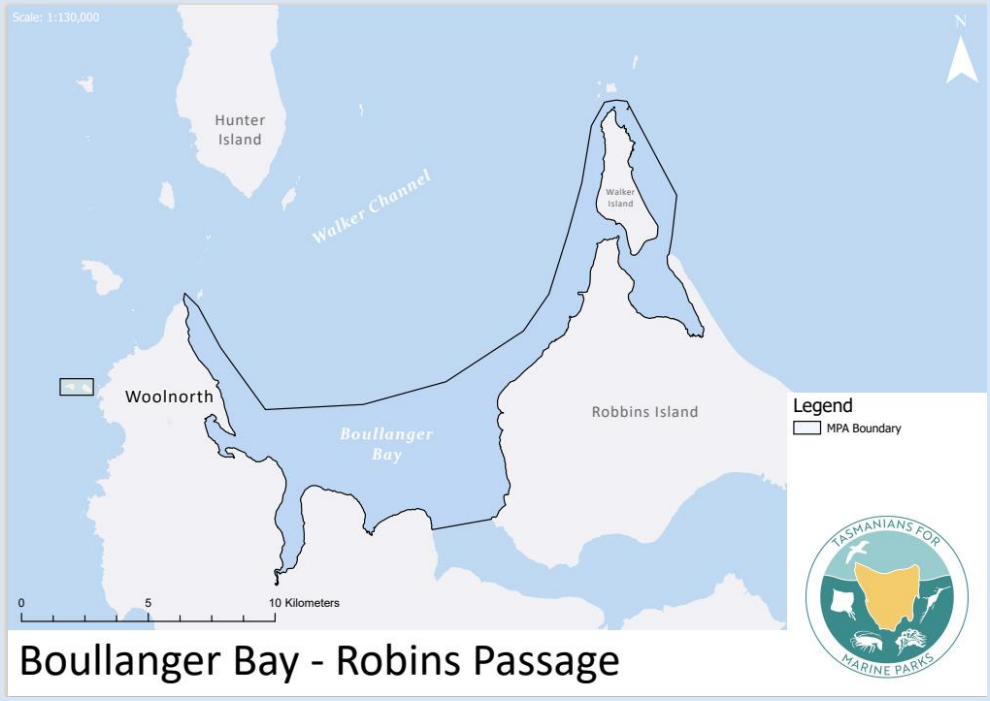
	Access for recreation, tourism, and education Lends itself to practical management (cost effectiveness, compliance etc.).	the shore. Available access for recreation, tourism, and education. Medium proximity of threats.
Vulnerability Assessment	Extent to which the site is vulnerable and susceptible to human induced changes and threatening processes.	Vulnerable
Replication	Provides a replication of ecosystems within a Marine Protected Area within the bioregion.	There are no MPAs in the bioregion.

Recommended Protection

IUCN II National park. The extent of the island which is closed to fishing is open to further negotiation. There needs to be control of the setting of nets and other fishing gear near the island.

Photo Eric Woehler

Boullanger Bay/ Robbins Passage



Special Features of the Site

- the most important site for migratory shorebirds in Tasmania
- large bird populations that are a large percentage of national populations, huge flocks of birds particularly over summer.
- A habitat for diverse bird species
- Habitat for endangered or vulnerable species including the Eastern Curlew
- Part of a larger area nominated for Ramsar listing
- may contain more than 10% of our seagrass beds including locally rare or unusual species
- a fascinating maze of intertidal sandbars, saltpans and saltmarsh.
- The birds are feeding on diverse beds of mollucs (shells) and other intertidal fauna.
- Wild, remote and rarely visited
- Unlikely to clash materially with most existing uses
- A vulnerable area in need of better recognition and protection
- The littoral system of Robbins Passage is considered to have outstanding geoheritage reference value due to its size and complexity.

Special features of the Boags Bioregion contained in the site

Large seagrass beds	✓
long sandy beaches	✓
unique rocky headlands	

high tidal range	✓
strong currents	✓
diverse communities of sessile filter feeding invertebrates	✓
high fish diversity of characteristic Bass Strait rocky reef species	
sheltered open coastline	✓
highly varied or unique geology	✓
wide range of reef structures and substrates	
offshore islands, inlets and estuaries	✓
Large 'mesotidal' river estuaries	
internationally important areas for resident and migratory shorebirds	✓
breeding habitat for large numbers of seabirds	✓
invertebrate strandline faunas	✓

Notes on natural values and design of sites

High Value Site – Dr Parsons Nowhere else on earth report

"In the very north west of our state lies a bird watchers paradise, a biological 'gem' rich in bird life which contains extensive intertidal feeding areas and additional highly productive marine habitats. This area contains the highest diversity of species (12 species) and being of greatest international significance. Bird numbers exceed 1% of national population estimates for seven species, and exceed 5% of estimates for three of these (Double-banded Plover, Red-necked Stint and Ruddy Turnstone). It is the only site in Tasmania that supports significant numbers of the Grey Plover and Red Knot, and is also the Tasmanian stronghold for the Great Knot, Sharp-tailed Sandpiper, Grey-tailed Tattler, Bar-tailed Godwit, Lesser Sand Plover, and Pacific Golden Plover. It is internationally significant for the Endangered migratory Eastern Curlew, and for the resident Pied Oystercatcher, Sooty Oystercatcher and Near Threatened Hooded Plover, while the coastal saltmarsh supports the Critically Endangered Orange-bellied Parrot during its migration season. This area also contains exceptional and extensive seagrass beds, including the most prolific beds of the Southern Strapweed in the region, and one of only two known Tasmanian sites for a warm temperate seagrass species, the Fibrous Strapweed (Posidonia angustifolia). Whilst updated seabed mapping is required in this area, 1990s data

suggest that this small section of Tasmania's coast may contain more than 10% of our seagrass beds."

Dr Woehler comments - BirdLife Tasmania is presently in discussions with State and Fed Govts about a nomination of the Robbins Passage – Boullanger Bay wetlands for Ramsar listing. [wider high value area] Extends from Woolnorth/Cape Grim to East Inlet SE of Stanley. c100km2 of area, includes all intertidal sandbars, saltpans, saltmarsh etc. Covers Walker Channel, Robbins Passage, Boullanger Bay , East and West Inlet, Duck Bay, Mosquito Inlet, etc.

Known Threats

The site is adjacent to a very large windfarm proposal that includes a large number of turbines, a transmission line, an access bridge.

The wind farm proponent has stated that. "There are diverse shorebird species that frequent the Boullanger Bay to Robbins Passage area. A significant number of the shorebirds feed and roost on the west coast of Robbins Island, which has been the subject of 20 years of bi-annual surveys by BirdLife Tasmania. The tidal flats in this area are an important summer feeding site for the migratory shorebirds, where they build up sufficient energy to fly back to the Northern Hemisphere. Surveys along the coastline and over the island show that shorebirds fly the coastline and between the foraging areas of low tide and key roost sites at high tide". "Turbines will not be located within 500 metres of the entire coastline of the island. Turbines will not be located on the Northern-most end of the island where some shorebirds have been detected flying." A bridge at the end of Robbins Island Road would connect to the southwest coast of Robbins Island. There is also a wharf on the NE side. These are not in the proposed MPA area.

The area is subject to many common threats like climate changes, as well as threats specific to sandy inlets of this kind like reclamation, inappropriate recreational use, dredging.

Nine major threats to Tasmanian estuaries are recognised and they would apply to this area along with vegetation damage from inappropriate recreational uses and overfishing in the deeper areas.

(i) increased siltation resulting from land clearance and urban and rural runoff, (ii) increased nutrient loads resulting from sewage and agricultural use of fertilisers, (iii) urban effluent, (iv) foreshore development and dredging, (v) marine farms, (vi) modification to water flow through dams and weirs, (vii) acidification of rivers and heavy metal pollution from mines, (viii) the spread of introduced pest species, and (ix) long-term climate change. While all of these factors can potentially disrupt ecosystem processes, their level of threat varies greatly". [9]

[9] A Classification of Tasmanian Estuaries and Assessment of their Conservation Significance using Ecological and Physical Attributes, Population and Land UseG.J. Edgar1, N.S. Barrett2 and D.J. Graddon3, Ocean Rescue 2000

Current protection

The area is an important bird area (IBA), but this listing is to recognise values and offers no direct protection without other legislative intervention.

There are small conservation area on Kangaroo Island (126Ha), Wallaby Is (45Ha.),Harcus Is (13Ha.), Brick Is. (0.25Ha). There are game reserves on Petrel Is and Big Stony Is on the northern tip of Robbins Is. Where islands are used for indigenous muttonbirding it is not intended to interfere with this activity.

The calamari and squid fisheries are closed in Bass Strait during peak calamari spawning periods. There is a no netting zone in Mosquito Inlet, and a gill net ban in much of the proposed area.

Current human uses

The Montagu area is popular with recreational fishermen but this area is outside the proposed area. The proposed MPA is remote, shallow, difficult to access and rarely visited. The area is of little or no value to commercial fishing as its mainly intertidal flat.

Adjacent dry land is often used for cattle farming and dairying but there is no direct impact from the proposed MPA on these activities. The adjacent area is used once a year to muster cattle over to Robbins Island, but this is unlikely to have significant environmental impact.

Has possible use as a wind resource, with some infrastructure on the intertidal flats, but there are alternative sites outside the proposed MPA for this infrastructure.

The area is listed as part of the Far North West Marine Farming Development Plan Area, potentially for shellfish farming despite a lack of apparent suitability. Petuna also has an exploratory permit over part of the area.

There are marine farms outside the proposed area to the east, mainly shellfish leases. Only small areas of the deeper channels might be useful for this industry, but the area is difficult to access and use for shellfish farming. There is no active shellfish farming in the area currently proposed. The nearest fish pen leases for Atlantic salmon are those proposed off Stanley.

There is no significant public infrastructure in the area.

Economic Interests	-Existing or potential contribution to economic value by virtue of its protection, eg. for recreation or tourism, or as a refuge or nursery area, or source of supply for economically important species.	An area of low impact on current users even if highly protected.

	- Current or potential use for the extraction of, or exploration for resources - Current or potential use for the extraction of, or exploration for resources - Importance for shipping and/or trade. - Value due to its contribution to local or regional employment and economic development.	
Indigenous Interests	-Traditional usage and/or current economic value. Contains indigenous cultural values. Native title considerations	No significant adverse impact, subject to further consultation.
Social Interests	Existing or potential value to the local, national or international communities because of its heritage, cultural, traditional, aesthetic, educational, recreational, or economic values	Subject to ongoing proposals, but presently little used or recognised.
Scientific Interests	Existing or potential value for research and monitoring.	High
Practicality/Feasibility	Degree of insulation from external destructive influences Social and political acceptability, and a degree of community support Access for recreation, tourism, and education Lends itself to practical management (cost effectiveness, compliance etc.).	Remote
Vulnerability Assessment	Extent to which the site is vulnerable and susceptible to human induced changes and threatening processes.	Vulnerable
Replication	Provides a replication of ecosystems within a Marine Protected Area within the bioregion.	Bird values are unique

Design Comments

The proposed park has tried to capture the most remote, wild and important part of a much larger area of importance to birdlife. The adjacent shallow mudflats and saltmarsh will also protect fragile and threatened vegetation communities and fish nursery areas. The boundaries attempt to avoid current human uses in the eastern side of the Channel.

Recommended Protection

IUCN II National park or IUCN IV marine conservation area with management measures to protect bird habitat and seagrass beds in particular. The area is also recommended for Ramsar listing.

Identification Criteria (from Tasmania's MPA Strategy)

All of the above sites meet the identification Criteria:

Criteria	Description of criteria
Comprehensiveness	-Adds to the coverage of the full range of ecosystems recognised at an appropriate scale within and across each bioregion. -Enhances the comprehensive nature of the Representative System of Marine Protected Areas in Tasmania.
Adequacy	The size of the area, its boundaries and location are adequate to ensure that its biological and ecological values can be protected and managed and the impact of activities can be minimised.
Representativeness	-Represents one or more ecosystems within an Interim Marine and Coastal Regionalisation of Australia bioregion. -Enhances the representative nature of the Representative System of Marine Protected Areas in Tasmania.
Ecological Importance	-Contributes to maintenance of essential ecological processes or life-support systems. -Contains habitat for rare or endangered species. - Preserves genetic diversity, ie. is diverse or abundant in species. -Contains areas on which other species or other systems are dependent, eg. contain nursery or juvenile areas or feeding, breeding or rest areas for migratory species. -Contains one or more areas which are a biologically functional, self-sustaining ecological unit. International or National Significance. -Is listed, or has the potential to be listed, on the World or National Heritage List or declared as Biosphere Reserve or subject to an international or national conservation agreement
Uniqueness	-Contains unique species, populations, communities or ecosystems. - Contains unique or unusual geographic features

Productivity	Do the species, populations, or communities of the area have a high natural productivity
Vulnerability Assessment	Contains ecosystems and/or communities vulnerable to natural processes.
Biogeographic Importance	Captures important biogeographical qualities.
Naturalness	Extent to which the area has been protected from, or not been subject to, human-induced change

Sites recommended but not classified as high priority sites at this time

Ringarooma Coastal Reserve	Supporting data on the area's marine environmental natural values is missing
Badger Head	Supporting data on the area's marine environmental natural values is missing
Stanley	Supporting data on the area's marine environmental natural values is incomplete. The area off North Head is known to have an interesting habitat for smaller species, the area has a significant seal haulout site important to a local tourism business. There is a popular recreational diving site near the Stanley Breakwater. Important bird inlets at East and West Inlet.
Lillico Beach	Little penguin colony, No gill netting is allowed within a 1 km radius of the Lillico Beach penguin viewing platform. Dr Barrett was of the view that no netting restrictions may be an adequate protection measure.

Who are We?

Marine Life Network (MLN) are ordinary people who volunteer their time to help protect and promote the wonders of Tasmania's ocean environment. The aims of Marine Life Network are to educate and advocate.

We do anything useful for the marine environment, but our main campaign at present is a campaign called "Tasmanians for Marine Parks". This campaign is trying to create a system of comprehensive, adequate and representative marine parks for Tasmania.

An effort has been made to recruit a broad a cross-section of the community from along the political spectrum. MLN is non-partisan, welcoming to everyone, and is not an affiliate of existing political parties.