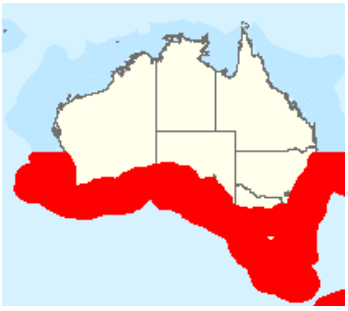
Appendix 8:

Threatened Species
(Commonwealth Assessment of Significance)

Birds

Common Name

Amsterdam albatross



Latin Name

Diomedea (exulans) Amsterdamensis

EPBC Status	FM / TSC Listing
Endangered, Migratory, Listed Marine	N/A

Distribution across Australia

The Amsterdam albatross is not resident in Australia but visits Australian waters to the south and south-west.

Critical Habitat Resources in Australia

There are no critical habitat resources for the Amsterdam albatross within the wider study area. No critical habitat for albatross or petrel species (other than Gould's petrel) listed in this report is found in the wider study area. Both albatross and petrel species have specific breeding localities and a broad range of foraging habitats that are considered to be critical habitat however critical foraging habitat is considered to be waters south of 25 degrees. Further, six breeding areas within Australian waters have been listed as critical habitat for albatrosses; Macquarie Island, Albatross Island, Pedra Branca, the Mewstone, Heard and McDonald Islands and the Australian Antarctic Territory (DSEWPC, 2011).

Important Habitat Values for the Species

The Amsterdam albatross only breeds and cares for chicks on the upland plateau of Amsterdam Island in the southern Indian Ocean; otherwise they remain at sea for several years, soaring aloft on air currents and float on the water surface when wind subsides. The species feeding distribution has been related to sea surface temperatures and tuna distributions (Rivalan *et al*., 2010).

Recognised Threats and Potential Impact(s) of the Proposal

Global threats to the Amsterdam albatross include longline fishing, disease, habitat destruction, predation by introduced fauna, reduced food availability, ingestion/entanglement in marine debris and pollution (Web Reference 1). Potential impacts associated with the proposal include entanglement in longline infrastructure, ingestion of marine debris, altering food resources, physical distance (e.g. noise), habitat modification and habitat exclusion.

Proposed Impact Management and Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not near significant breeding, roosting or feeding grounds.

Monitoring and Management

Marine fauna interactions will be monitored and reviewed on a regular basis.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impacts on the Amsterdam albatross.

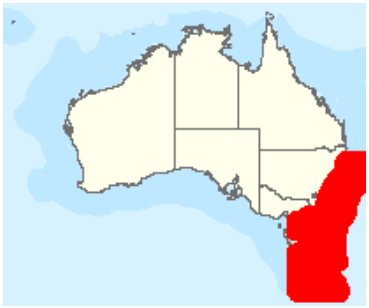
Birds

Common Name

Antipodean albatross

Latin Name

Diomedea antipodensis



EPBC Status	FM / TSC Listing
Vulnerable, Migratory, Listed Marine	Vulnerable

Distribution across Australia

The Antipodean albatross uses Australian waters to feed where it occurs in NSW waters during winter to feed on cuttlefish. The Australian distribution represents a small proportion of their entire range.

Critical Habitat Resources in Australia

There are no critical habitat resources for the Antipodean albatross within the wider study area. No critical habitat for albatross or petrel species (other than Gould's petrel) listed in this report is found in the wider study area. Both albatross and petrel species have specific breeding localities and a broad range of foraging habitats that are considered to be critical habitat however critical foraging habitat is considered to be waters south of 25 degrees. Further, six breeding areas within Australian waters have been listed as critical habitat for albatrosses; Macquarie Island, Albatross Island, Pedra Branca, the Mewstone, Heard and McDonald Islands and the Australian Antarctic Territory (DSEWPC, 2011).

Important Habitat Values for the Species

Th Antipodean albatross breeds in New Zealand on the Antipodes Islands and Campbell Island and feeds across the south-west Pacific Ocean, Southern Ocean and the Tasman Sea, mainly from New Zealand to Chile.

Recognised Threats and Potential Impact(s) of the Proposal

Feral animal predation in breeding areas, long line fisheries as well as demersal and trawl fisheries all constitute threats to the Antipodean albatross. Litter discards can lead to ingestion which also threatens the Antipodean albatross. Potential impacts associated with the proposal include entanglement in longline infrastructure, ingestion of marine debris, altering food resources, physical distance (e.g. noise), habitat modification and habitat exclusion.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not near significant breeding, roosting or feeding grounds.

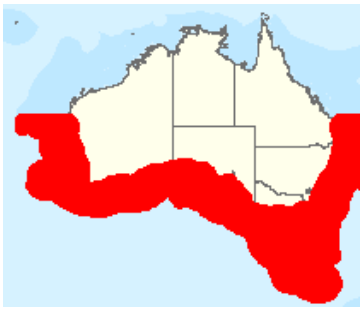
Monitoring and Management

Marine fauna interactions will be monitored and reviewed on a regular basis.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impacts on the Antipodean albatross

Birds



Common Name

Tristan albatross

Latin Name

Diomedea dabbenena, Diomedea exulans exulans

EPBC Status	FM / TSC Listing
Endangered, Migratory, Listed Marine	N/A

Distribution across Australia

Only one definitive record of the tristan albatross has been collected from Australian waters - a bird was tagged on Gough Island and recaptured off Wollongong, NSW.

Critical Habitat Resources in Australia

There are no critical habitat resources for the tristan albatross within the wider study area. No critical habitat for albatross or petrel species (other than Gould's petrel) listed in this report is found in the wider study area. Both albatross and petrel species have specific breeding localities and a broad range of foraging habitats that are considered to be critical habitat however critical foraging habitat is considered to be waters south of 25 degrees. Further, six breeding areas within Australian waters have been listed as critical habitat for albatrosses; Macquarie Island, Albatross Island, Pedra Branca, the Mewstone, Heard and McDonald Islands and the Australian Antarctic Territory (DSEWPC, 2011).

Important Habitat Values for the Species

The tristan albatross breeds nesting in grass tussocks, on subantarctic Inaccessible and Gough Islands in the Atlantic Ocean. The species forage in the Atlantic Ocean around South Africa and north almost as far as the equator. The birds sleep and rest on ocean waters when not breeding.

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats include predation on their breeding islands, drowning in longline fishing gear, ingestion of marine debris, pollution and collisions with gear from fishing trawlers. Potential impacts associated with the proposal include entanglement in longline infrastructure, ingestion of marine debris, altering food resources, physical distance (e.g. noise), habitat modification and habitat exclusion.

Proposed Impact Mitigation Measures

<u>Mitigation</u>

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.

3. Site selection - leases are not near significant breeding, roosting or feeding grounds.

<u>Monitoring and Management</u>

Marine fauna interactions will be monitored and reviewed on a regular basis.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impacts on the tristan albatross.

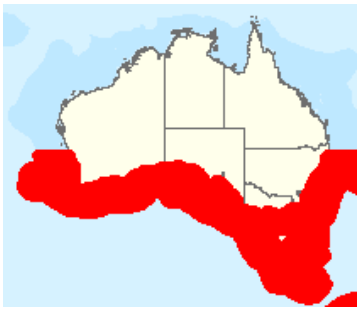
Birds

Common Name

Wandering albatross

Latin Name

Diomedea exulans (sensu lato)



EPBC Status	FM / TSC Listing
Vulnerable, Migratory, Listed Marine	Endangered

Distribution across Australia

Wandering albatrosses breed on the Australian Macquarie Island in the southwest corner of the Pacific Ocean, about half-way between New Zealand and Antarctica. It occurs inshore, off shore and in pelagic waters around Australia, particularly around eastern NSW between July and November for short periods.

Critical Habitat Resources in Australia

There are no critical habitat resources for the wandering albatross within the wider study area. No critical habitat for albatross or petrel species (other than Gould's Petrel) listed in this report is found in the wider study area. Both albatross and petrel species have specific breeding localities and a broad range of foraging habitats that are considered to be critical habitat however critical foraging habitat is considered to be waters south of 25 degrees. Further, six breeding areas within Australian waters have been listed as critical habitat for albatrosses; Macquarie Island, Albatross Island, Pedra Branca, the Mewstone, Heard and McDonald Islands and the Australian Antarctic Territory (DSEWPC, 2011).

Important Habitat Values for the Species

The wandering albatross feeds on squid, fish and crustaceans from the surface, by shallow diving (2-5 m) and on the surface aggressively on carrion. The species occurs inshore, offshore and in pelagic waters of high productivity to feed. .

Recognised Threats and Potential Impact(s) of the Proposal

The wandering albatross is susceptible to drowning or injury from encounters with longline fisheries, entanglement, ingestion of marine debris and acculturation of chemical contaminants. Trolling and trawling fisheries also pose a potential threat to the species. On Macquarie Island, an increase in Subantarctic skuas and human disturbance is likely to have negatively affected the breeding success of the wandering albatross. Potential impacts associated with the proposal include entanglement in longline infrastructure, ingestion of marine debris, altering food resources, physical distance (e.g. noise), habitat modification and habitat exclusion.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not near significant breeding, roosting or feeding grounds.

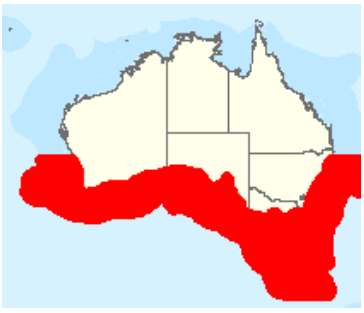
Monitoring and Management

Marine fauna interactions will be monitored and reviewed on a regular basis.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impacts on the wandering albatross.

Birds



Common Name

Gibson's albatross

Latin Name

Diomedea exulans gibsoni

EPBC Status	FM / TSC Listing
Vulnerable, Migratory, Listed Marine	Vulnerable

Distribution across Australia

Gibsons albatross use Australian waters, mostly the Tasman Sea, to forage while they breed in New Zealand.

Critical Habitat Resources in Australia

There are no critical habitat resources for the gibson's albatross within the wider study area. No critical habitat for albatross or petrel species (other than Gould's petrel) listed in this report is found in the wider study area. Both albatross and petrel species have specific breeding localities and a broad range of foraging habitats that are considered to be critical habitat however critical foraging habitat is considered to be waters south of 25 degrees. Further, six breeding areas within Australian waters have been listed as critical habitat for albatrosses; Macquarie Island, Albatross Island, Pedra Branca, the Mewstone, Heard and McDonald Islands and the Australian Antarctic Territory (DSEWPC, 2011).

Important Habitat Values for the Species

Gibson's albatross are pelagic feeders that use the wind to travel great distances, generally between 30° and 50°S. This species breeds on Adams and Auckland Islands in New Zealand on moss terraces in grass tussocks.

Recognised Threats and Potential Impact(s) of the Proposal

Key threats to gibson's albatross include incidental catch in longline fishing, trawling, trolling and intentional shooting. Potential impacts associated with the proposal include entanglement in longline infrastructure, ingestion of marine debris, altering food resources, physical distance (e.g. noise), habitat modification and habitat exclusion.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not near significant breeding, roosting or feeding grounds.

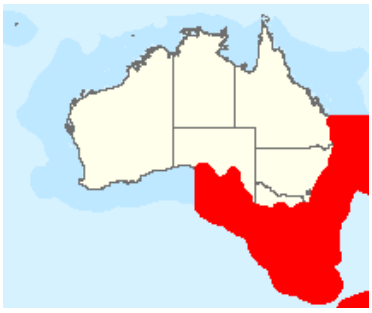
Monitoring and Management

Marine fauna interactions will be monitored and reviewed on a regular basis.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impacts on the gibson's albatross.

Birds



Common Name

Campbell albatross

Latin Name

Thalassarche (melanophris) impavida

EPBC Status	FM / TSC Listing
Vulnerable, Migratory	N/A

Distribution across Australia

Campbell albatrosses forage within Australian waters: Tasman Sea and south western Pacific Ocean.

Critical Habitat Resources in Australia

There are no critical habitat resources for the campbell albatross within the wider study area. No critical habitat for albatross or petrel species (other than Gould's petrel) listed in this report is found in the wider study area. Both albatross and petrel species have specific breeding localities and a broad range of foraging habitats that are considered to be critical habitat however critical foraging habitat is considered to be waters south of 25 degrees. Further, six breeding areas within Australian waters have been listed as critical habitat for albatrosses; Macquarie Island, Albatross Island, Pedra Branca, the Mewstone, Heard and McDonald Islands and the Australian Antarctic Territory (DSEWPC, 2011).

Important Habitat Values for the Species

The campbell albatross only breeds on the northern and western coastline of Campbell Island, off New Zealand, on steep slopes and ledges covered with tussocks and mud. Non-breeding adults and juveniles feed on squid, fish, crustaceans, carrion and gelatinous organisms from the surface or by making shallow dives within neretic and oceanic waters around south Australian waters, the Tasman Sea and the south western Pacific Ocean.

Recognised Threats and Potential Impact(s) of the Proposal

Key threats to the campbell albatross include incidental catch in longline fishing and trawling (Web Reference 2). Potential impacts associated with the proposal include entanglement in longline infrastructure, ingestion of marine debris, altering food resources, physical distance (e.g. noise), habitat modification and habitat exclusion.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not near significant breeding, roosting or feeding grounds.

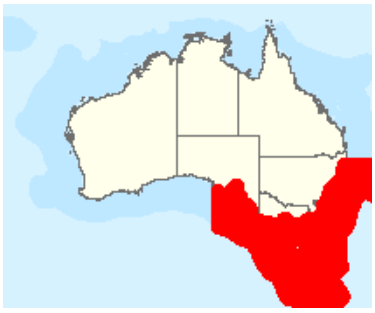
Monitoring and Management

Marine fauna interactions will be monitored and reviewed on a regular basis.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impacts on the campbell albatross.

Birds



Common Name

Buller's albatross

Latin Name

Thalassarche bulleri

EPBC Status	FM / TSC Listing
Vulnerable, Migratory. Listed Marine	N/A

Distribution across Australia

The buller's albatross regularly forages in the Tasman Sea and South Pacific Ocean. This species does not breed in Australia but is commonly sighted off the coast from Coffs Harbour to Tasmania and west to Eyre Peninsula (Web Reference 1).

Critical Habitat Resources in Australia

There are no critical habitat resources for the buller's albatross within the wider study area. No critical habitat for albatross or petrel species (other than Gould's petrel) listed in this report is found in the wider study area. Both albatross and petrel species have specific breeding localities and a broad range of foraging habitats that are considered to be critical habitat however critical foraging habitat is considered to be waters south of 25 degrees. Further, six breeding areas within Australian waters have been listed as critical habitat for albatrosses; Macquarie Island, Albatross Island, Pedra Branca, the Mewstone, Heard and McDonald Islands and the Australian Antarctic Territory (DSEWPC, 2011).

Important Habitat Values for the Species

The buller's albatross inhabits marine and pelagic waters in the subantarctic and subtropical waters of the southern Pacific Ocean and breeds on a number of Islands around New Zealand in a range of habitats including tussocks, meadows and forest cover. Specific habitat requirements are poorly known.

Recognised Threats and Potential Impact(s) of the Proposal

Buller's albatross is the most common bycatch from New Zealand's longline fisheries, and are considered to be threatened by longline fishing operations, competition with fisheries for marine resources and marine pollution in Australia (Web Reference 1). Potential impacts associated with the proposal include entanglement in longline infrastructure, ingestion of marine debris, altering food resources, physical distance (e.g. noise), habitat modification and habitat exclusion.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not near significant breeding, roosting or feeding grounds.

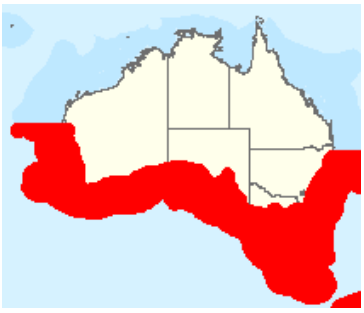
Monitoring and Management

Marine fauna interactions will be monitored and reviewed on a regular basis.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impacts on the buller's albatross.

Birds



Common Name

Shy albatross, tasmanian shy albatross

Latin Name

Thalassarche cauta (sensu stricto)

EPBC Status	FM / TSC Listing
Vulnerable, Migratory, Listed Marine	Vulnerable

Distribution across Australia

Shy albatrosses are distributed below 25°S in shelf waters around Tasmania and south eastern Australia.

Critical Habitat Resources in Australia

There are no critical habitat resources for the shy albatross within the wider study area. No critical habitat for albatross or petrel species (other than Gould's petrel) listed in this report is found in the wider study area. Both albatross and petrel species have specific breeding localities and a broad range of foraging habitats that are considered to be critical habitat however critical foraging habitat is considered to be waters south of 25 degrees. Further, six breeding areas within Australian waters have been listed as critical habitat for albatrosses; Macquarie Island, Albatross Island, Pedra Branca, the Mewstone, Heard and McDonald Islands and the Australian Antarctic Territory (DSEWPC, 2011).

Important Habitat Values for the Species

Breeding occurs on Albatross Island, Bass Strait, and Mewstone and Pedra Branca, off southern Tasmania, on level sparsely vegetated ground. Dispersal after fledging is considered to be colony specific (Web Reference 1) but extends to waters off South Africa, South America and Australia. Waters over the continental shelf are considered key areas for foraging.

Recognised Threats and Potential Impact(s) of the Proposal

The shy albatross is the species of albatross most frequently killed by longlines in the Australian Fishing Zone. Trawl fisheries, shooting, disease and competition for food are also recognised threats for the species. Potential impacts associated with the proposal include entanglement in longline infrastructure, ingestion of marine debris, altering food resources, physical distance (e.g. noise), habitat modification and habitat exclusion.

Proposed Impact Mitigation Measures

<u>Mitigation</u>

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not near significant breeding, roosting or feeding grounds.

<u>Monitoring and Management</u>

Marine fauna interactions will be monitored and reviewed on a regular basis.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impacts on the shy albatross.

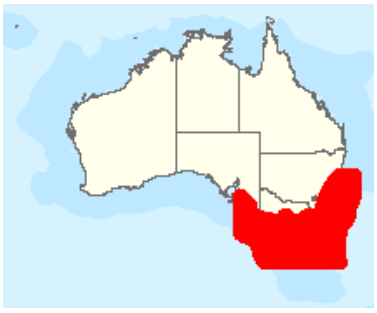
Birds

Common Name

Salvin's albatross

Latin Name

Thalassarche salvini



EPBC Status	FM / TSC Listing
Vulnerable, Migratory, Listed Marine	N/A

Distribution across Australia

Salvin's albatross is an infrequent visitor which forages in Australian waters south east of Tasmania.

Critical Habitat Resources in Australia

There are no critical habitat resources for the salvin's albatross within the wider study area. No critical habitat for albatross or petrel species (other than Gould's petrel) listed in this report is found in the wider study area. Both albatross and petrel species have specific breeding localities and a broad range of foraging habitats that are considered to be critical habitat however critical foraging habitat is considered to be waters south of 25 degrees. Further, six breeding areas within Australian waters have been listed as critical habitat for albatrosses; Macquarie Island, Albatross Island, Pedra Branca, the Mewstone, Heard and McDonald Islands and the Australian Antarctic Territory (DSEWPC, 2011).

Important Habitat Values for the Species

Salvin's albatross breed on disparate island groups: the French Crozet Islands in the Indian Ocean, and the New Zealand Snares, Chatham and Bounty Islands in the South Pacific Ocean. This species is otherwise found on continental shelves and seamounts across the Southern, South Pacific and Indian Oceans.

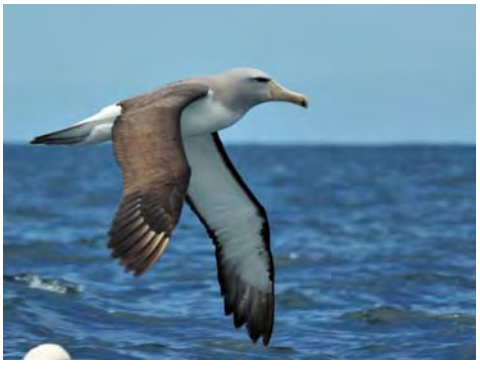
Recognised Threats and Potential Impact(s) of the Proposal

Key threats to the salvin's albatross include incidental catch in longline fishing and trawling (Web Reference 1). Potential impacts associated with the proposal include entanglement in longline infrastructure, ingestion of marine debris, altering food resources, physical distance (e.g. noise), habitat modification and habitat exclusion.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not near significant breeding, roosting or feeding grounds.



Monitoring and Management

Marine fauna interactions will be monitored and reviewed on a regular basis.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impacts on the salvin's albatross.

.

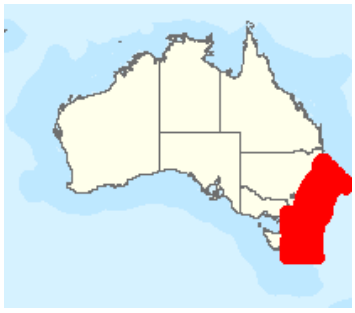
Birds

Common Name

White-capped albatross

Latin Name

Thalassarche steadi



EPBC Status	FM / TSC Listing
Vulnerable, Migratory, Listed Marine	N/A

Distribution across Australia

The white-capped albatross is common off the south-east coast of Australia, particularly Bass Strait.

Critical Habitat Resources in Australia

There are no critical habitat resources for the white-capped albatross within the wider study area. No critical habitat for albatross or petrel species (other than Gould's petrel) listed in this report is found in the wider study area. Both albatross and petrel species have specific breeding localities and a broad range of foraging habitats that are considered to be critical habitat however critical foraging habitat is considered to be waters south of 25 degrees. Further, six breeding areas within Australian waters have been listed as critical habitat for albatrosses; Macquarie Island, Albatross Island, Pedra Branca, the Mewstone, Heard and McDonald Islands and the Australian Antarctic Territory (DSEWPC, 2011).

Important Habitat Values for the Species

The white-capped albatross breeds in the New Zealand subantarctic on a number of separate islands: Disappointment, Auckland, Adams, Bollon's and Forty-four Islands. The birds are common off south-east Australia and South Africa and are also abundant in most New Zealand shelf waters.

Recognised Threats and Potential Impact(s) of the Proposal

Predation on Auckland Island by pigs, drowning in longline fishing gear, collision with trawl warps are recognised threats for the species. Most longline drownings are associated with South African, Namibian and New Zealand than Australian fisheries. Ingestion or capture in marine debris, oil spills, pollution and competition with commercial fisheries are also threats (Web Reference 1). Potential impacts associated with the proposal include entanglement in longline infrastructure, ingestion of marine debris, altering food resources, physical distance (e.g. noise), habitat modification and habitat exclusion.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not near significant breeding, roosting or feeding grounds.

Monitoring and Management

Marine fauna interactions will be monitored and reviewed on a regular basis.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impacts on the white-capped albatross.

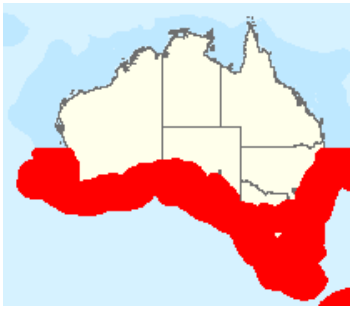
Birds

Common Name

Black-browed albatross

Latin Name

Thalassarche melanophris



EPBC Status	FM / TSC Listing
Vulnerable, Migratory, Listed Marine	Vulnerable

Distribution across Australia

The black-browed albatross breeds on Australian subantarctic islands: Heard, McDonald, Macquarie, Bishop and Clerk. The species remains around this region during the breeding season then in winter it migrates north to the continental shelf and shelf-break of South Australia, Tasmania, Victoria and NSW. Some animals are observed at the continental shelf break of Western Australia and Queensland (Web Reference 1).

Critical Habitat Resources in Australia

There are no critical habitat resources for the black-browed albatross within the wider study area. No critical habitat for albatross or petrel species (other than Gould's petrel) listed in this report is found in the wider study area. Both albatross and petrel species have specific breeding localities and a broad range of foraging habitats that are considered to be critical habitat however critical foraging habitat is considered to be waters south of 25 degrees. Further, six breeding areas within Australian waters have been listed as critical habitat for albatrosses; Macquarie Island, Albatross Island, Pedra Branca, the Mewstone, Heard and McDonald Islands and the Australian Antarctic Territory (DSEWPC, 2011).

Important Habitat Values for the Species

The black-browed albatross breeds on a number of sub and peri-Antarctic Islands and Islets: within Chilean, British, French, Australian and New Zealand territories. The species migrates north in non breeding periods and reaches 35°S within open waters of the Pacific, Atlantic and Indian Oceans. More northerly sightings occur closer to continents. The species tolerates a large range of sea surface temperatures (0-24°C) (Web Reference 1).

Recognised Threats and Potential Impact(s) of the Proposal

The main threat to the species is drowning within longline fisheries, with secondary threats including interactions with trawling fisheries, marine debris and pollutants and competition with fisheries for food (Web Reference 1). Potential impacts associated with the proposal include entanglement in longline infrastructure, ingestion of marine debris, altering food resources, physical distance (e.g. noise), habitat modification and habitat exclusion.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not near significant breeding, roosting or feeding grounds.

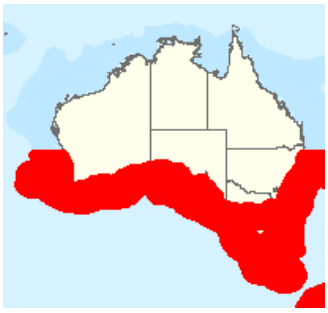
Monitoring and Management

Marine fauna interactions will be monitored and reviewed on a regular basis.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impacts on the black-browed albatross.

Birds



Common Name

Streaked shearwater

Latin Name

Calonectris leucomelas, Puffinus leucomelas

EPBC Status	FM / TSC Listing
Migratory, Listed Marine	N/A

Distribution across Australia

The streaked shearwater is common a pelagic seabird occurring in both pelagic and inshore waters in southern Australia during the summer, after breeding in the northern hemisphere.

Critical Habitat Resources in Australia

There are no critical habitat resources for the streaked shearwater within the direct or wider study area.

Important Habitat Values for the Species

The streaked shearwater breeds on offshore islands of Japan, Russia, China, North and South Korea, and along the coasts of Japan and Russia and migrates south when not breeding. It forages by surface seizing and shallow dives in pelagic and inshore waters feeding on fish and squid (Web Reference 2).

Recognised Threats and Potential Impact(s) of the Proposal

Streaked shearwaters are susceptible to capture in fishing nets and longlines. Potential impacts associated with the proposal include entanglement in longline infrastructure, ingestion of marine debris, altering food resources, physical distance (e.g. noise), habitat modification and habitat exclusion.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not near significant breeding, roosting or feeding grounds.

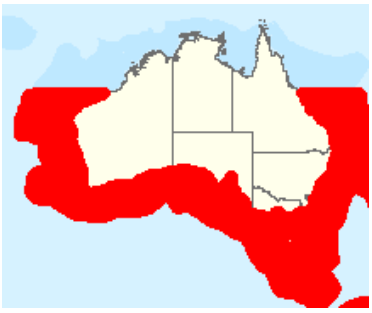
Monitoring and Management

Marine fauna interactions will be monitored and reviewed on a regular basis.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impacts on the streaked shearwater.

Birds



Common Name

Southern giant petrel

Latin Name

Macronectes giganteus

EPBC Status	FM / TSC Listing
Endangered, Migratory, Listed Marine	Endangered

Distribution across Australia

The southern giant petrel breeds on six islands within Australian territory in the Southern Ocean and Australian Antarctic Territory. The birds remain within the same ocean sector as their breeding island in non breeding seasons. Most records in southeastern Australia occur between June and December.

Critical Habitat Resources in Australia

There are no critical habitat resources for the southern giant petrel within the wider study area. No critical habitat for albatross or petrel species (other than Gould's petrel) listed in this report is found in the wider study area. Both albatross and petrel species have specific breeding localities and a broad range of foraging habitats that are considered to be critical habitat however critical foraging habitat is considered to be waters south of 25 degrees. Further, six breeding areas within Australian waters have been listed as critical habitat for giant petrels; Macquarie Island, Albatross Island, Pedra Branca, the Mewstone, Heard and McDonald Islands and the Australian Antarctic Territory (DSEWPC, 2011).

Important Habitat Values for the Species

The southern giant petrel nests in mounds of moss, grass and stone on bare or grassy ground. This species eats krill, squid, offal and carrion, and is wide ranging from Antarctica to the Chilean, African and Australian subtropics. It breeds throughout the southern oceans and is widespread throughout the Southern Ocean. Birds have been found to remain in the same ocean sector as their breeding island, in non-breeding season.

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats include longline fishing, predation by black rats and feral cats breeding on islands, oil spills, declines in cuttlefish populations, climate change and habitat degradation (Web Reference 3). Potential impacts associated with the proposal include entanglement in longline infrastructure, ingestion of marine debris, altering food resources, physical distance (e.g. noise), habitat modification and habitat exclusion.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not near significant breeding, roosting or feeding grounds.

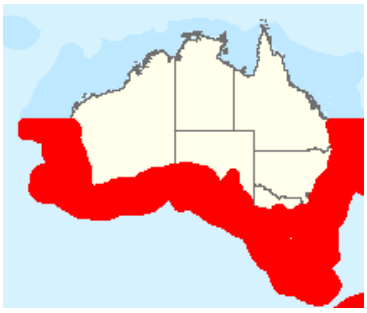
Monitoring and Management

Marine fauna interactions will be monitored and reviewed on a regular basis.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impacts on the southern giant petrel.

Birds



Common Name

Northern giant petrel

Latin Name

Macronectes halli

EPBC Status	FM / TSC Listing
Vulnerable, Migratory, Listed Marine	Vulnerable

Distribution across Australia

The northern giant petrel visits waters off the southern Australian mainland during winter and breed on Australian Macquarie Island.

Critical Habitat Resources in Australia

There are no critical habitat resources for the northern giant petrel within the wider study area. No critical habitat for albatross or petrel species (other than Gould's petrel) listed in this report is found in the wider study area. Both albatross and petrel species have specific breeding localities and a broad range of foraging habitats that are considered to be critical habitat however critical foraging habitat is considered to be waters south of 25 degrees. Further, six breeding areas within Australian waters have been listed as critical habitat for giant petrels; Macquarie Island, Albatross Island, Pedra Branca, the Mewstone, Heard and McDonald Islands and the Australian Antarctic Territory (DSEWPC, 2011).

Important Habitat Values for the Species

The northern giant petrel is found in the Antarctic Polar Front. Its distribution varies seasonally from sub-Antarctic Ocean waters to subtropical waters in winter. The species has many islands upon which it breeds.

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats include longline fishing, trawling, human disturbance, ingestion of hooks, entanglement and ingestion of marine debris, oil spills and other forms of marine pollution (Web Reference 1). Potential impacts associated with the proposal include entanglement in longline infrastructure, ingestion of marine debris, altering food resources, physical distance (e.g. noise), habitat modification and habitat exclusion.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not near significant breeding, roosting or feeding grounds.

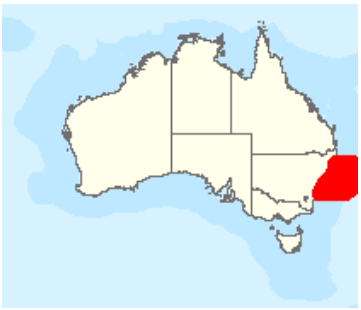
Monitoring and Management

Marine fauna interactions will be monitored and reviewed on a regular basis.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impacts on the northern giant petrel.

Birds



Common Name

Gould's petrel

Latin Name

Pterodroma leucoptera leucoptera

EPBC Status	FM / TSC Listing
Endangered, Migratory	Vulnerable

Distribution across Australia

The Gould's petrel feeds within the Tasman Sea and breeds on two small islands off Port Stephens in NSW during winter. Most records at sea are in waters off south-eastern Australia, especially near Tasmania (predominately between December and April). Records also exist for the waters off south-western Western Australia (Web Reference 1).

Critical Habitat Resources in Australia

Cabbage Tree Island is a significant breeding locality for the species and Boondelbah Island also has a few nesting birds. These islands are located on the Mid North Coast of NSW in Port Stephens. Non-breeding and feeding ranges are unknown but assumed to be the Tasman Sea.

Important Habitat Values for the Species

The species is only breeds on the islands offshore of Port Stephens (NSW) so the critical habitat resources listed for Australia are universal.

Recognised Threats and Potential Impact(s) of the Proposal

Threats to the species while on land include entanglement in sticky Bird-Lime Tree fruits, predation by other birds and introduced rabbits which degrade Gould's petrel breeding habitat. With their feeding distribution largely unknown further threats can be assumed to be entanglement and ingestion of marine debris, pollution and potentially by-catch in fisheries. Potential impacts associated with the proposal include entanglement in longline infrastructure, ingestion of marine debris, altering food resources, physical distance (e.g. noise), habitat modification and habitat exclusion.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not near significant breeding, roosting or feeding grounds.

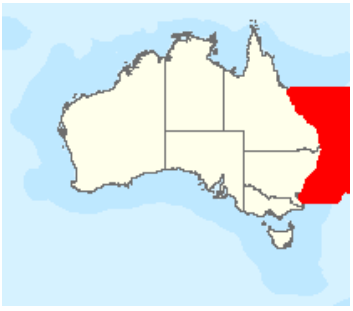
Monitoring and Management

Marine fauna interactions will be monitored and reviewed on a regular basis.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impacts on the Gould's petrel.

Birds



Common Name

Kermadec petrel (Western)

Latin Name

Pterodroma neglecta neglecta

EPBC Status	FM / TSC Listing
Vulnerable	Vulnerable

Distribution across Australia

The kermadec petrel is a marine, pelagic seabird which disperses over the southern Pacific Ocean and breeds on many islands including the Australian islands of Lord Howe, Phillip and Norfolk.

Critical Habitat Resources in Australia

There are no critical habitat resources for the kermadec petrel within the wider study area. However, Balls Pyramid near Lord Howe Island and Phillip Island near Norfolk Island, are the only known breeding sites in Australian waters (Web Reference 3).

Important Habitat Values for the Species

The species breeds across islands in the southern Pacific Ocean including Australian, New Zealand and Chilean territories. The species forages via surface seizing and dipping in tropical and subtropical areas of the Pacific Ocean but its diet is largely unknown.

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to kermadec petrel breeding colonies have been attributed to predation by black rats on Lord Howe Island and Kestrels on Phillip Island. The effect of fisheries, including as longline, on the species is unknown. Potential impacts associated with the proposal include entanglement in longline infrastructure, ingestion of marine debris, altering food resources, physical distance (e.g. noise), habitat modification and habitat exclusion.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not near significant breeding, roosting or feeding grounds.

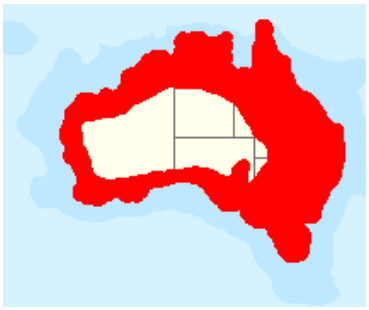
Monitoring and Management

Marine fauna interactions will be monitored and reviewed on a regular basis.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impacts on the kermadec petrel.

Birds



Common Name

White-bellied sea eagle

Latin Name

Haliaeetus leucogaster

EPBC Status	FM / TSC Listing
Migratory, Listed Marine	Vulnerable

Distribution across Australia

The white-bellied sea eagle is distrusted along the coastline of Australia and extends inlands along waterways of eastern Australia dependent on climatic conditions. Breeding sites are patchy along this distribution.

Critical Habitat Resources in Australia

There are no critical habitat resources for the white-bellied sea eagle within the wider study area.

Important Habitat Values for the Species

The white-bellied sea eagle is found in Australia, the Malay Archipelago, South East Asia, India and China. It is a terrestrial species found along the coast but it can range inland depending on climatic conditions. The coastal and inland habitats are varied while breeding habitats are generally close to water in tall open forest or woodland. The carnivorous birds forage opportunistically in inshore waters over large expanses eating aquatic and terrestrial animals.

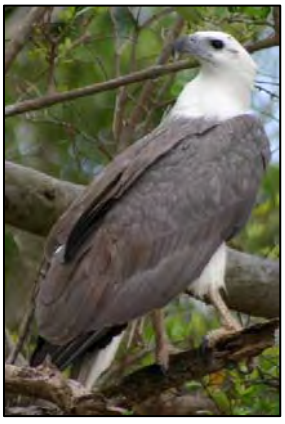
Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to the white-bellied sea eagle include habitat destruction through human disturbance and urbanisation of coastal areas, poisoning, shooting, inland water resource deterioration and competition with wedge-tailed eagles (Web Reference 1). Potential impacts associated with the proposal include entanglement in longline infrastructure, ingestion of marine debris, altering food resources, physical distance (e.g. noise), habitat modification and habitat exclusion.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not near significant breeding, roosting or feeding grounds.



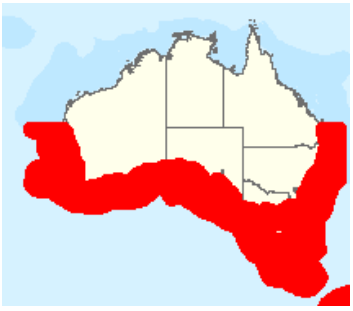
Monitoring and Management

Marine fauna interactions will be monitored and reviewed on a regular basis.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impacts on the white-bellied sea eagle.

Birds



Common Name

Great skua

Latin Name

Catharacta skua

EPBC Status	FM / TSC Listing
Listed Marine	N/A

Distribution across Australia

The Australian distribution is not known. This species was listed under the EPBC Act as a Marine Species for the co-ordinates chosen, yet no information is held in the DSEWPaC website on the bird. It is assumed to visit our oceans to feed, while similar species with a southern hemisphere distribution include subantarctic skua (southern) (*Catharacta lonnbergi lonnbergi),* south polar skua *(Catharacta maccormicki),* and pomarine skua (*Stercorarius pomarinus)*. These birds also have no distribution in mainland Australia and are limited to the polar regions.

Critical Habitat Resources in Australia

There are no critical habitat resources in Australia for the great skua.

Important Habitat Values for the Species

The Great Skua breeds in Norway, Iceland, the Scottish islands/mainland and the Faroe Islands, and nests on coastal moorland and rocky islands. This species is a migrant, wintering at sea in the Atlantic Ocean and regularly reaching North American waters. Its diet consists of predominately fish but it also eats small mammals, eggs, berries and carrion.

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to the great skua include predation of fledgings by rats, cats or the Arctic Fox (Web Reference 1). Potential impacts associated with the proposal include entanglement in longline infrastructure, ingestion of marine debris, altering food resources, physical distance (e.g. noise), habitat modification and habitat exclusion.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not near significant breeding, roosting or feeding grounds.

Monitoring and Management

Marine fauna interactions will be monitored and reviewed on a regular basis.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impacts on the great skua.

Birds

Common Name

Providence petrel

Latin Name

Pterodroma solandri

EPBC Status	FM / TSC Listing
Listed Marine, Migratory	Vulnerable

Distribution across Australia

The providence petrel is a pelagic seabird which disperses over the southern western Pacific Ocean and throughout the breeding season is highly concentrated off the east coast of Australia on the offshore islands of Lord Howe, Phillip and historically Norfolk. This species can be found in eastern Australian waters in the non-breeding season however in December to February they are mostly absent (Web Reference 1).

Critical Habitat Resources in Australia

There are no critical habitat resources for the providence petrel within the wider study area. However, with the exception of the small breeding colony on Philip Island, the Australian offshore island, Lord Howe, is the last remaining stronghold breeding location for providence petrel. On Lord Howe Island, there are two primary sites which are used for breeding including Mount Lidgbird and Mount Gower (Web Reference 1).

Important Habitat Values for the Species

Providence petrel is a marine pelagic seabird that inhabits both subtropical and tropical waters of the South west Pacific Ocean migrating in the non-breeding season to the North Pacific and Bering Sea. During the breeding season, they nest on the tops of two summits on Lord Howe Island in grass lined chambers at the end of burrows or rock crevices on the slope of the mountains (Web Reference 1). The providence petrel typically forages in warmer waters off Australia in large mixed flocks capturing a range of prey from fish, squid, crustaceans and offal.

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to the providence petrel include interactions with longline fisheries and other fishing gear, introduced predators (e.g. feral pigs, cats, goats, black rats and predatory masked owls), introduced diseases, cyclones and severe storms (Web Reference 1). Potential impacts associated with the proposal include entanglement, ingestion of marine debris, altering food resources, physical distance (e.g. noise), habitat modification and habitat exclusion.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not near significant breeding, roosting or feeding grounds.

Monitoring and Management

Marine fauna interactions will be monitored and reviewed on a regular basis.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impacts on the providence petrel.

Birds

Common Name

Flesh-footed shearwater

Latin Name

Puffinus carneipes

EPBC Status	FM / TSC Listing
Listed Marine, Migratory	Vulnerable

Distribution across Australia

The flesh-footed shearwater is a marine trans-equatorial migrant species, ranging throughout the south-west Pacific and southern Indian Oceans. Two of the low numbers of breeding areas left in the world are located in Western Australia and Lord Howe Island (LHI). The flesh-footed shearwater is a locally common visitor to waters of the continental shelf and continental slope from south-western Western Australia to south-eastern Queensland and around LHI (Web Reference 1).

Critical Habitat Resources in Australia

There are no critical habitat resources for the flesh-footed shearwater within the wider study area. The flesh-footed shearwater has limited breeding localities (France, New Zealand and Australia) with the main breeding areas being one in the southwest Pacific including LHI and New Zealand; the other being islands off Western Australia (Web Reference 1).

Important Habitat Values for the Species

The flesh-footed shearwater predominately occurs in the subtropics over continental shelves and slopes and occasionally inshore waters. On the offshore islands in which it breeds, pairs nest in burrows on sloping ground in coastal forest, scrubland, shrubland or grassland with these same burrows being used for roosting during the breeding season. Burrows are situated in areas that provide a clear flight-path for birds to enter and exit their colonies (Web Reference 1).

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to the flesh-footed shearwater include interactions with commercial fisheries (e.g. longline, trawl and gillnet), pollution, habitat degradation including nests (by humans, animals and introduced plants), predation by domestic dogs or rodents, herbicides, collisions with vehicles, dependence on fishery discards, over-extraction of prey species, parasites and disease (Web Reference 1). Potential impacts associated with the proposal include entanglement, ingestion of marine debris, altering food resources, physical distance (e.g. noise), habitat modification and habitat exclusion.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not near significant breeding, roosting or feeding grounds.

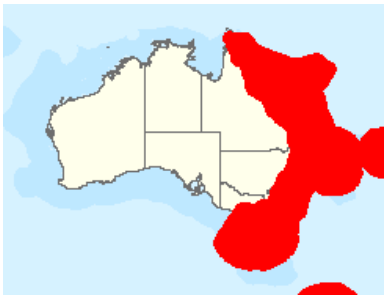
Monitoring and Management

Marine fauna interactions will be monitored and reviewed on a regular basis.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impacts on the flesh-footed shearwater.

Birds



Common Name

White-bellied storm petrel

Latin Name

Fregetta grallaria grallaria

EPBC Status	FM / TSC Listing
Vulnerable	Vulnerable

Distribution across Australia

The white-bellied storm petrel has a wide-spread oceanic distribution in the south Pacific, Indian and Atlantic Oceans. In the non-breeding season, majority of individuals migrate to warmer water and are frequently found near the continental edge (10-25 km offshore) of Australia. Vagrant birds also often visit NSW coastal waters, especially during/after a storm. During the breeding season, December to February, they are found at various rocky or vegetated islands including islands in the Lord Howe Island group (NSW) (NSW NWPS, 1999b).

Critical Habitat Resources in Australia

There are no critical habitat resources for the white-bellied storm petrel within the wider study area.

Important Habitat Values for the Species

The white-bellied storm petrel occurs in highly saline sub-tropical and tropical waters. However, this species has been recorded in sub Antarctic waters (NSW NWPS, 1999b). Foraging in nearshore waters along the continental shelf of Australia and breeding only on small offshore islets in the Lord Howe Island Group (Web Reference 1). Nests are built in the crevices between large volcanic rocks and burrows excavated banks with breeding colonies frequently being located near dykes (Web Reference 1).

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to the white-bellied storm petrel include introduced predators (e.g. rats and cats) (Web Reference 1). Potential impacts associated with the proposal include entanglement in longline infrastructure, ingestion of marine debris, altering food resources, physical distance (e.g. noise), habitat modification and habitat exclusion.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not near significant breeding, roosting or feeding grounds.

Monitoring and Management

Marine fauna interactions will be monitored and reviewed on a regular basis.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impacts on the white-bellied storm petrel.

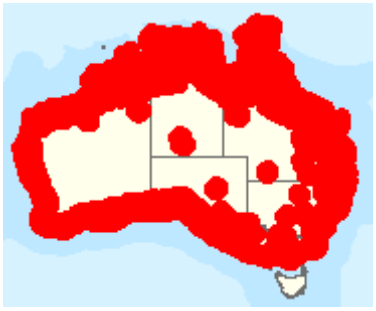
Birds

Common Name

Eastern osprey

Latin Name

Pandion cristatus



EPBC Status	FM / TSC Listing
Listed Marine, Migratory	Vulnerable

Distribution across Australia

In Australia, the eastern osprey is found continuously around the coastline being reasonably common on the north coast, patchy on eastern coast but rare or absent in Victoria and Tasmania. The breeding range in Australia extends around the northern coast of Australia (including many offshore islands) from Albany in Western Australia to Lake Macquarie in NSW; with a second isolated breeding population on the coast of South Australia (Web Reference 1).

Critical Habitat Resources in Australia

No habitat resources critical to the survival of the eastern osprey are declared within the wider area of the proposal.

Important Habitat Values for the Species

The eastern osprey inhabits littoral and coastal areas, as well as terrestrial wetlands in tropical and temperate zones in Australia and offshore islands. This species requires extensive areas of open fresh, brackish or saline water to foraging. Typically their habitat includes inshore waters, sandy/muddy/rocky shores, reefs, bays, coastal cliffs, beaches, estuaries, mangrove swamps, broad rivers, reservoirs and large lakes and waterholes. The eastern osprey appears to have a preference for coastal cliffs and elevated islands. It constructs large nests out of sticks in high dead or partly dead trees or artificial platforms including jetties and telegraph poles. This species predominately consumes fish (Web Reference 1).

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to the eastern osprey include habitat loss, degradation and alteration (due to urban and tourism development), pollution (e.g. pesticides, heavy metals and fishing tackle), competition for food with recreational and commercial fisheries, reduced water quality in foraging areas (due to effluent discharge or runoff), human disturbance and collisions with powerlines (Web Reference 1). Potential impacts associated with the proposal include entanglement in longline infrastructure, ingestion of marine debris, altering food resources, physical distance (e.g. noise), habitat modification and habitat exclusion.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.

3. Site selection - leases are not near significant breeding, roosting or feeding grounds.

Monitoring and Management

Marine fauna interactions will be monitored and reviewed on a regular basis.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impacts on the eastern osprey.

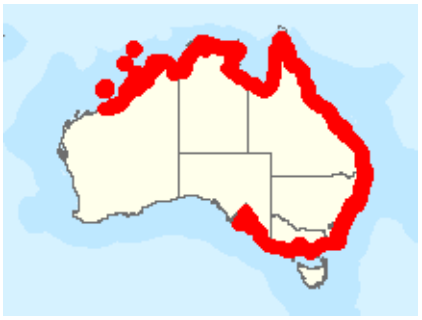
Birds

Common Name

Little tern

Latin Name

Sterna albifrons



EPBC Status	FM / TSC Listing
Migratory, Listed Marine	Endangered

Distribution across Australia

In Australia, the little tern has a widespread and almost continuous distribution from north-western Australia, around the northern and eastern coasts to south-eastern Australia, including Tasmania (Web Reference 1).

Critical Habitat Resources in Australia

There are no known critical habitat resources for the little tern in Australia. However, this species is recorded as nesting within the wider study region (i.e. Lake Wollumboola).

Important Habitat Values for the Species

The little tern is predominantly inhabits sheltered coastal environments including lagoons, estuaries, lagoons, river mouths, beaches, lakes, bays, inlets, harbours and occasionally ventures offshore. Nests are typically in small depressions in sand, driftwood and other debris. The little tern usually forages singly or in small loose flocks. It feeds by plunging in shallow water to capture small fish, crustaceans, insects and even molluscs (Web Reference 1).

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to the little tern include native and introduced predators, human disturbance (e.g. coastal development, egg collecting, tourism), habitat degradation and changes to food supplies (e.g. oil spills, overfishing, pesticide residues) and interbreeding (Web Reference 1). Potential impacts associated with the proposal include entanglement in longline infrastructure, ingestion of marine debris, altering food resources, physical distance (e.g. noise), habitat modification and habitat exclusion.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.

3. Site selection - leases are not near significant breeding, roosting or feeding grounds.

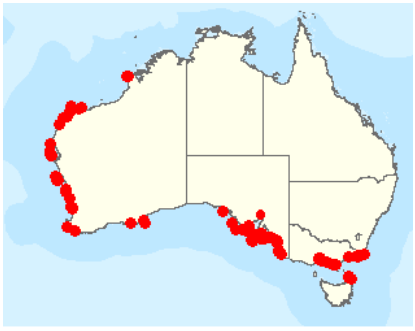
Monitoring and Management

Marine fauna interactions will be monitored and reviewed on a regular basis.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impacts on the little tern.

Birds



Common Name

Sooty tern

Latin Name

Sterna fuscata (Onychoprion fuscata)

EPBC Status	FM / TSC Listing
Listed Marine	Vulnerable

Distribution across Australia

In Australia, the sooty tern is mostly found in the tropics on the north coast and associated islands with occasional sightings on the west and east coasts. This species is found in NSW usually after storms.

Critical Habitat Resources in Australia

No habitat resources critical to the survival of the sooty tern have been declared within the wider proposal area.

Important Habitat Values for the Species

Compared with most other terns, the sooty tern inhabits more pelagic habitats, foraging offshore and only occupying inshore areas for breeding or during stormy weather (NSW NWPS, 1999a). This species can be found nesting on coral cays, atolls, sandbanks, rock stacks and cliffs on offshore islands including Lord Howe Island and Norfolk Island (NSW NWPS, 1999a). The sooty tern diet consists predominately of fish and squid, crustaceans, insects and offal.

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to the sooty tern include climate change, habitat loss, modification and degradation and introduced predators (Web Reference 1). Potential impacts associated with the proposal include entanglement in longline infrastructure, ingestion of marine debris, altering food resources, physical distance (e.g. noise), habitat modification and habitat exclusion.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not near significant breeding, roosting or feeding grounds.

Monitoring and Management

Marine fauna interactions will be monitored and reviewed on a regular basis.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impacts on the sooty tern.

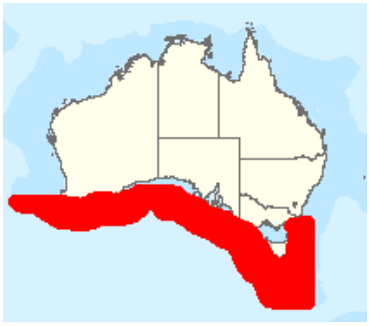
Birds

Common Name

Sooty albatross

Latin Name

Phoebetria fusca



EPBC Status	FM / TSC Listing
Listed Marine	Endangered

Distribution across Australia

In Australia, the sooty albatross is a rare but most likely a regular migrant predominately during the autumn and winter months. The sooty albatross occurs north to south-east Queensland, NSW, Victoria, Tasmania and South Australia.

Critical Habitat Resources in Australia

There are no critical habitat resources for the sooty albatross within the wider study area. No critical habitat for albatross or petrel species listed in this report is found in the wider study area. Both albatross and petrel species have specific breeding localities and a broad range of foraging habitats that are considered to be critical habitat however critical foraging habitat is considered to be waters south of 25 degrees. Further, six breeding areas within Australian waters have been listed as critical habitat for giant petrels; Macquarie Island, Albatross Island, Pedra Branca, the Mewstone, Heard and McDonald Islands and the Australian Antarctic Territory (DSEWPC, 2011).

Important Habitat Values for the Species

The sooty albatross is a marine and pelagic species that tolerates a wide range of sea surface temperatures and salinities. During summer, this species inhabits subtropical and subantarctic waters (south of 35° S) but is most prolific near the Subtropical Convergence. During autumn and winter, this species mainly occurs in the Subtropical Zone which is where immature albatrosses reside throughout the year. Breeding occurs on vegetated cliffs and steep slopes that are sheltered from prevailing winds on subtropical and subantarctic islands in the Indian and Atlantic Oceans. This species forages at the sea surface preying upon cephalopods, fish, crustaceans, siphonophores and penguin carrion on the high seas.

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to the sooty albatross include drowning in longline fishing gear ingestion/entanglement in marine debris, fisheries bycatch, disease and introduced pests (Web Reference 1). Potential impacts associated with the proposal include entanglement in longline infrastructure, ingestion of marine debris, altering food resources, physical distance (e.g. noise), habitat modification and habitat exclusion.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not near significant breeding, roosting or feeding grounds.

Monitoring and Management

Marine fauna interactions will be monitored and reviewed on a regular basis.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impacts on the sooty albatross.

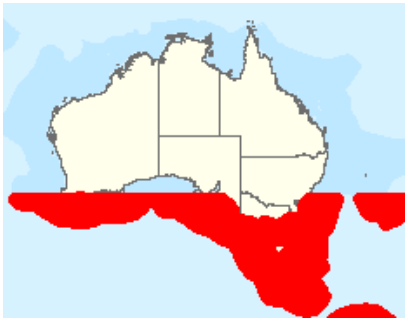
Birds

Common Name

Grey-headed albatross

Latin Name

Thalassarche chrysostoma



EPBC Status	FM / TSC Listing
Endangered, Migratory, Listed Marine	Endangered

Distribution across Australia

In Australia, this species has been recorded south and west of Tasmania, occasionally off Victoria, rarely in South Australia and Western Australia, only as a vagrant in NSW and once in southern Queensland. Non-breeding and breeding birds disperse widely across the Southern Ocean. During summer, this species resides at more southerly latitudes where they frequent the waters off southern Australia and New Zealand (Web Reference 1).

Critical Habitat Resources in Australia

There are no critical habitat resources for the grey-headed albatross within the wider study area. No critical habitat for albatross or petrel species listed in this report is found in the wider study area. Both albatross and petrel species have specific breeding localities and a broad range of foraging habitats that are considered to be critical habitat however critical foraging habitat is considered to be waters south of 25 degrees. Further, six breeding areas within Australian waters have been listed as critical habitat for giant petrels; Macquarie Island, Albatross Island, Pedra Branca, the Mewstone, Heard and McDonald Islands and the Australian Antarctic Territory (DSEWPC, 2011).

Important Habitat Values for the Species

The grey-headed albatross is marine, pelagic and migratory. Outside the breeding season this species remains at sea and generally only comes onto land to breed. Nests are found on steep slopes, hillsides and tussock-covered cliffs overlooking the sea or run inland from the coast. This species consumes crustaceans, fish, squid, lampreys and penguin carrion which are captured by surface-seizing/diving. This species usually feeds far from shelf waters around continental land masses and breeding islands but occasionally visits inshore and offshore waters in the Australasian region (Web Reference 1).

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to the grey-headed albatross include commercial fishing (esp. longline), ingestion/entanglement in marine debris, introduced pests, loss of food stock, oil spills, pollution, shooting and other forms of human distance (Web Reference 1). Potential impacts associated with the proposal include entanglement in longline infrastructure, ingestion of marine debris, altering food resources, physical distance (e.g. noise), habitat modification and habitat exclusion.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages.
3. Site selection - leases are not near significant breeding, roosting or feeding grounds.

Monitoring and Management

Marine fauna interactions will be monitored and reviewed on a regular basis.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impacts on the grey-headed albatross.

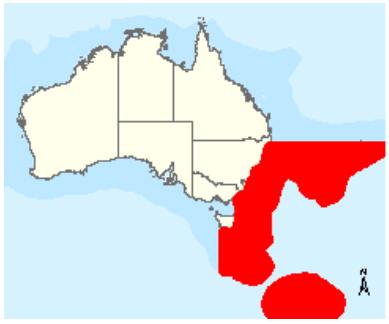
Birds

Common Name

Chatham albatross

Latin Name

Thalassarche cauta eremita



EPBC Status	FM / TSC Listing
Endangered, Migratory, Listed Marine	Endangered

Distribution across Australia

The chatham albatross forages in the coastal waters off Tasmania, eastern and southern New Zealand, the central South Pacific and South America. Breeding for this species is restricted to Pyramid Rock, Chatham Islands off the coast of New Zealand. This species is a rare vagrant to southeast Australian waters (Web Reference 1).

Critical Habitat Resources in Australia

There are no critical habitat resources for the chatham albatross within the wider study area. No critical habitat for albatross or petrel species listed in this report is found in the wider study area. Both albatross and petrel species have specific breeding localities and a broad range of foraging habitats that are considered to be critical habitat however critical foraging habitat is considered to be waters south of 25 degrees. Further, six breeding areas within Australian waters have been listed as critical habitat for giant petrels; Macquarie Island, Albatross Island, Pedra Branca, the Mewstone, Heard and McDonald Islands and the Australian Antarctic Territory (DSEWPC, 2011).

Important Habitat Values for the Species

The chatham albatross is a marine species and has been recorded in harbours and bays, inshore and offshore waters, shelf waters around breeding islands and over continental shelves during the non-breeding season, but is rarely sighted in pelagic waters. Nesting occurs on level or gently sloping ledges, summits, slopes and caves of rocky islets and stacks. Its diet consists of fish and cephalopods which it captures via surface seizing or diving.

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to the chatham albatross include longline fishing, predation by introduced predators and degradation of breeding habitat from human or other disturbance (Web Reference 1). Potential impacts associated with the proposal include entanglement in longline infrastructure, ingestion of marine debris, altering food resources, physical distance (e.g. noise), habitat modification and habitat exclusion.

Proposed Impact Mitigation Measures

<u>Mitigation</u>

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not near significant breeding, roosting or feeding grounds.

<u>Monitoring and Management</u>

Marine fauna interactions will be monitored and reviewed on a regular basis.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impacts on the chatham albatross.

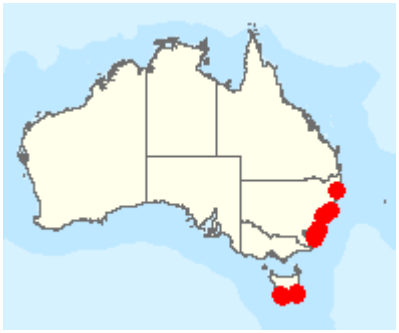
Birds

Common Name

Sooty shearwater

Latin Name

Puffinus griseus, Ardenna griseus



EPBC Status	FM / TSC Listing
Migratory, Listed Marine	Endangered

Distribution across Australia

Sooty shearwaters breed on small islands in the south Pacific and south Atlantic Oceans, mainly around Australia, New Zealand, the Falkland Islands and Tierra del Fuego. There are breeding records in NSW, Victoria and Tasmania.

Critical Habitat Resources in Australia

In Australia, the sooty shearwater breeds on 17 islands including Phillip Island (off Nolfolk Island) (Web Reference 7). There are also breeding records for Bowen Island, Broughton Island, Lion Island, Little Broughton Island, Montague Island, Cabbage Tree Island, Mutton Bird Island, Boondelbah Island, Tollgate Islands, South Solitary Island and a number of islands off Tasmania and Victoria. There are historical records of sooty shearwaters breeding on Bowen Island but this is not declared as critical habitat and is not expected to be directly or indirectly impacted by the proposed leases which are 9.5 to 11.9 km away.

Important Habitat Values for the Species

The sooty shearwater concentrates around upwellings and over the continental shelf in cooler waters. This species is migratory and nests in large colonies on islands and headlands. Burrows for breeding are usually under tussock grass, low scrub or rock crevices. Its diet consists of fish, cephalopods and crustacea which it captures at the surface and by diving (up to 68 m). This species is often observed following whales and fishing boats consuming disturbed fish and scraps thrown overboard, respectively. Provisioning trips ranging from 1-15 days are made by parents including trips to the Antarctic Polar Front which reduces competition in breeding ground areas (Web Reference 7).

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to the sooty shearwater include human harvesting, longline fisheries, climate change and introduced predators. Potential impacts associated with the proposal include entanglement in longline infrastructure, ingestion of marine debris, altering food resources, physical distance (e.g. noise), habitat modification and habitat exclusion.

Proposed Impact Mitigation Measures

<u>Mitigation</u>

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not near significant breeding, roosting or feeding grounds.

<u>Monitoring and Management</u>

Marine fauna interactions will be monitored and reviewed on a regular basis.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impacts on the sooty shearwater.

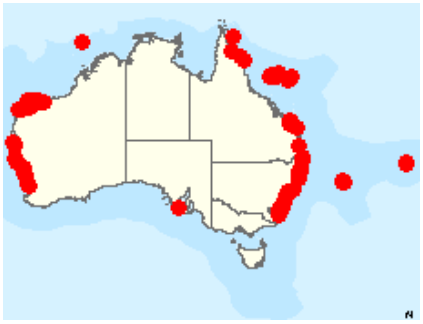
Birds

Common Name

Wedge-tailed shearwater

Latin Name

Puffinus pacificus



EPBC Status	FM / TSC Listing
Migratory, Listed Marine	Endangered

Distribution across Australia

The wedge-tailed shearwater inhabits tropical and subtropical waters where it is prevalent in the Indian Ocean, the Coral Sea and the Tasman Sea. In Australia, this species breeds on offshore islands and on the east and west coasts.

Critical Habitat Resources in Australia

The wedge-tailed shearwater breeds on the islands off Western Australia, the islands and cays of the Great Barrier Reef (Queensland), Cocos-Keeling Islands, Lord Howe Island (NSW), Norfolk Island (NSW) and the islands along the east coast of Australia (e.g. Montague Island, NSW) (Web Reference 1). Notably, the wedge-tailed shearwater breeds on Bowen Island at the entrance to Jervis Bay. However, Bowen Island is 9.8-12 km from the proposed leases, which is considered a sufficient distance to mitigate potential impacts on this species and its nesting habitat.

Important Habitat Values for the Species

The wedge-tailed shearwater is a pelagic seabird with a wide tolerance of surface temperatures and salinities (optimal = > 21°C and > 34.6%). This species usually inhabits waters over the continental slope but has been found to feed over cool nutrient-rich waters in tropical zones. In Australia, wedge-tailed shearwaters have also been observed feeding along the junction between inshore and offshore water masses. This species consumes fish, cephaolopods and shrimp using a range of methods including contact-dipping, surface seizing, dipping and deep plunging (Web Reference 1).

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to wedge-tailed shearwaters include harvesting by humans, guano mining, trampling, construction, weeds, oil pollution, longline fishing, predation, parasites and climate change. Potential impacts associated with the proposal include entanglement in longline infrastructure, ingestion of marine debris, altering food resources, physical distance (e.g. noise), habitat modification and habitat exclusion.

Proposed Impact Mitigation Measures

<u>Mitigation</u>

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not near significant breeding, roosting or feeding grounds.

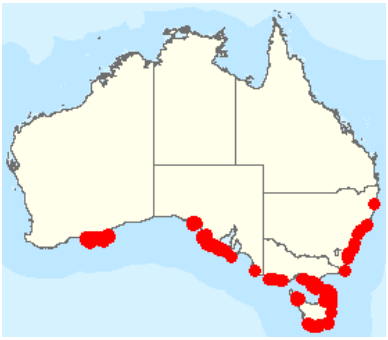
<u>Monitoring and Management</u>

Marine fauna interactions will be monitored and reviewed on a regular basis.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impacts on the wedge-tailed shearwater.

Birds



Common Name

Short-tailed shearwater

Latin Name

Puffinus tenuirostris, Ardenna tenuirostris

EPBC Status	FM / TSC Listing
Migratory, Listed Marine	Endangered

Distribution across Australia

Short-tailed shearwaters breed in southeast Australia, around Tasmania and on islands in the Bass Strait. Antarctic waters are a key feeding ground for this species.

Critical Habitat Resources in Australia

Short-tailed shearwaters breed in colonies in southeast Australia, around Tasmania and on islands in the Bass Strait, and feed in Antarctic waters. Short-tailed shearwaters migrate to the North Pacific Ocean and the Arctic Ocean (north of Alaska) and then return to their colonies around September. There are no declared critical habitat resources in Australia for the short-tailed shearwater. However, the short-tailed shearwater breeds on Bowen Island at the entrance to Jervis Bay. Bowen Island is 9.8-12 km from the proposed leases, which is considered a sufficient distance to mitigate potential impacts on this species and its nesting habitat.

Important Habitat Values for the Species

Short-tailed shearwaters dig nesting burrows in soft sandy soils which can be up to 2 m long. Adults feed at sea during the day and return at dark which is thought to minimise the threat of terrestrial predators. Their diet consists of fish, krill, crustaceans and squid which is captured using methods such as plunging into the water, surface seizing, scavenging, hydroplaning, bottom feeding (up 50 m) and pursuing underwater. Adults generally feed in close proximity to the colony in breeding season while during migration they feed whenever food is available (Web Reference 8).

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to short-tailed shearwaters include over harvesting by humans, habitat destruction, drowning associated with gillnet fisheries, marine debris ingestion, introduced predators and trampling of burrow by humans. Potential impacts associated with the proposal include entanglement in longline infrastructure, ingestion of marine debris, altering food resources, physical distance (e.g. noise), habitat modification and habitat exclusion.

Proposed Impact Mitigation Measures

<u>Mitigation</u>

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of infrastructure will be undertaken.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not near significant breeding, roosting or feeding grounds.

<u>Monitoring and Management</u>

Marine fauna interactions will be monitored and reviewed on a regular basis.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impacts on the short-tailed shearwater.

Birds

Common Name

Fork-tailed swift

Latin Name

Apus pacificus

EPBC Status	FM / TSC Listing
Migratory, Listed Marine	

Distribution across Australia

Fork-tailed swifts are non-breeding visitors to all states and territories of Australia. The fork-tailed swift is recorded in all regions of NSW. Most sightings in NSW are east of the Great Divide.

Critical Habitat Resources in Australia

There are no declared critical habitat resources in Australia for the fork-tailed swift.

Important Habitat Values for the Species

Fork-tailed swifts are predominately aerial and fly from less than 1 m to at least 300 m above ground. In Australia, this species mostly occur over inland plains but sometimes in coastal areas or above foothills. Fork-tailed swifts often occur over cliffs, beaches, islands and occasionally, well out at sea. This species mostly inhabits dry or open habitats, including riparian woodland, tea-tree swamps, low scrub, heathland or saltmarsh. In addition, this species occurs over towns, urban areas, cities, at treeless grassland and sandplains covered with spinifex, open farmland and inland and coastal sand-dunes.

The diet of the fork-tailed swift consists of insects but studies have found that this species also consumes small bees, wasps, termites and moths. The Fork-tailed Swift is an aerial eater which flies between 1-300 m above the ground to forage. In particular, the edge of low pressure systems is a popular feeding ground.

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to fork-tailed swifts include habitat destruction and predation by feral animals. Potential impacts associated with the proposal include entanglement in longline infrastructure, ingestion of marine debris, altering food resources, physical distance (e.g. noise), habitat modification and habitat exclusion.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not near significant breeding, roosting or feeding grounds.

Monitoring and Management

Marine fauna interactions will be monitored and reviewed on a regular basis.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impacts on the fork-tailed swift.

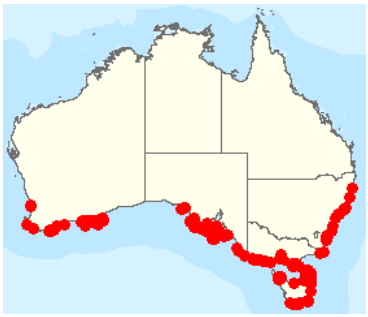
Birds

Common Name

Little penguin

Latin Name

Eudyptula minor



EPBC Status	FM / TSC Listing
Listed Marine	Endangered

Distribution across Australia

The little penguin is the only penguin species that breeds on the Australian mainland. It inhabits the southern coasts of Australia including Perth (Western Australia) around to Coffs Harbour (northern NSW) (Web Reference 6).

Critical Habitat Resources in Australia

Little penguin colonies tend to be restricted to offshore islands but were originally quite common on the Australian mainland. Montague Island, Tollgate Island and Brush Island are among the largest colonies in NSW. A secluded cove in the Manly (Sydney) is the only known mainland breeding colony in NSW. Small colonies also exist on Broughton Island, Two Fold Bay and Lion Island (Web Reference 6). In regards to the study region, there is a colony of about 5000 penguins on Bowen Island which is at the entrance to Jervis Bay. However, this island is not declared as critical habitat for the little penguin and is not expected to be directly or indirectly impacted by the proposed leases which are 9.5 to 11.9 km away.

Important Habitat Values for the Species

The little penguin is a marine species but nests in burrows often set up on sand-dune vegetation, among rocks, in sea caves or on headlands. This species generally is at sea during the day and returns to their colonies after dark. The diet of the little penguin consists of small fish (e.g. garfish, anchovies, pilchards), squid and krill where they usually feed in shallow waters within 15-20 km of the coast. This species feeds at the surface and makes dives to the seafloor (Web Reference 6).

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to the little penguin include introduced predators (e.g. dogs, cats and foxes), destruction or distance of nesting habitat by human activity, reckless human behaviour (e.g. jet skiiers), pollution, run off from human development and changes to food sources (e.g. overfishing and introduction of exotic pathogens) (Web Reference 6). Potential impacts associated with the proposal include entanglement in longline infrastructure, ingestion of marine debris, altering food resources, physical distance (e.g. noise), habitat modification and habitat exclusion.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not near significant breeding, roosting or feeding grounds.

Monitoring and Management

Marine fauna interactions will be monitored and reviewed on a regular basis.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impacts on the little penguin.

Birds

Shorebirds

Common Name	Latin Name	EPBC Status	FM / TSC Listing
Sanderling	*Calidris alba*	Migratory, Listed Marine	Vulnerable
Great Knot	*Calidris tenuirostris*	Migratory, Listed Marine	Vulnerable
Greater Sand Plover	*Charadrius leschenaultii*	Migratory, Listed Marine	Vulnerable
Lesser Sand Plover	*Charadrius mongolus*	Migratory, Listed Marine	Vulnerable
Broad-billed Sandpiper	*Limicola falcinellus*	Migratory, Listed Marine	Vulnerable
Black-tailed Godwit	*Limosa limosa*	Migratory, Listed Marine	Vulnerable
Great Egret, White Egret	*Ardea alba*	Migratory, Listed Marine	
Cattle Egret	*Ardea ibis*	Migratory, Listed Marine	
Curlew Sandpiper	*Calidris ferruginea*	Migratory, Listed Marine	Endangered
Ruddy Turnstone	*Arenaria interpres*	Migratory, Listed Marine	
Sharp-tailed Sandpiper	*Calidris acuminata*	Migratory, Listed Marine	
Red Knot, Knot	*Calidris canutus*	Migratory, Listed Marine	
Pectoral Sandpiper	*Calidris melanotos*	Listed Marine	
Red-necked Stint	*Calidris ruficollis*	Migratory, Listed Marine	
Double-banded Plover	*Charadrius bicinctus*	Migratory, Listed Marine	
Oriental Plover, Oriental Dotterel	*Charadrius veredus*	Migratory, Listed Marine	
Latham's Snipe, Japanese Snipe	*Gallinago hardwickii*	Migratory, Listed Marine	
Grey-tailed Tattler	*Heteroscelus brevipes*	Migratory, Listed Marine	
Bar-tailed Godwit	*Limosa lapponica*	Migratory, Listed Marine	
Eastern Curlew	*Numenius madagascariensis*	Migratory, Listed Marine	
Little Curlew, Little Whimbrel	*Numenius minutus*	Migratory, Listed Marine	
Whimbrel	*Numenius phaeopus*	Migratory, Listed Marine	
Pacific Golden Plover	*Pluvialis fulva*	Migratory, Listed Marine	
Painted Snipe	*Rostratula benghalensis (sensu lato)*	Migratory, Listed Marine	
Australian Painted Snipe	*Rostratula australis*	Vulnerable	
Wood Sandpiper	*Tringa glareola*	Migratory, Listed Marine	
Marsh Sandpiper, Little Greenshank	*Tringa stagnatilis*	Migratory, Listed Marine	
Red-capped Plover	*Charadrius ruficapillus*	Listed Marine	
Swinhoe's Snipe	*Gallinago megala*	Migratory, Listed Marine	

Pin-tailed Snipe	*Gallinago stenura*	Migratory, Listed Marine	
Black-winged Stilt	*Himantopus himantopus*	Listed Marine	
Hooded Plover and Hooded Plover (Eastern)	*Thinornis rubricollis Thinornis rubricollis rubricollis*	Listed Marine	Critically Endangered
Beach Stone-curlew	*Esacus neglectus*	Listed Marine	Critically Endangered
Terek Sandpiper	*Xenus cinereus*	Migratory, Listed Marine	Vulnerable
Grey Ternlet	*Procelsterna cerulean*	Listed Marine	Vulnerable

Distribution across Australia

Sanderling, Great Knot, Greater Sand Plover and Lesser Sand Plover, Pectoral Sandpiper, Red-capped Plover, Black-winged Stilt

In Australia, the sanderling has a widespread distribution occurring in all states and territories from north-western Australia, around the northern and eastern coasts to the south coast of Australia, including Tasmania (Web Reference 1).

Broad-billed Sandpiper

In Australia, the broad-billed sandpiper is most abundant on the north and north-west coasts but it also regularly occurs at scattered localities in southern Australia including Shoalhaven Heads (north of Jervis Bay) but it is not known to occur in Tasmania (Web Reference 1).

Black-tailed Godwit

In Australia, the black-tailed godwit is found in all states and territories but is most abundant on the north coast between Darwin and Weipa (Web Reference 1).

Great Egret

In Australia, the great egret is widespread where it is found in all states and territories including Lord Howe, Norfolk and Macquarie Islands. The largest and greatest concentrations of breeding colonies are located near the coastal regions of the Northern Territory (Web Reference 1).

Cattle Egret

In Australia, the cattle egret is widespread where it is found in all states and territories including Norfolk Island and sub-antarctic islands. Two major locations for this species include the area from north-east Western Australia to the Top End of the Northern Territory, as well as south-east Australia. The main breeding site in Australia is the central east coast from Newcastle north to Bundaberg (Web Reference 1).

Curlew Sanpiper

In Australia, the curlew sandpiper is widespread in coastal and inland areas where it is found in all states and territories (Web Reference 1).

Ruddy Turnstone

In Australia, the ruddy turnstone has a widespread distribution during non-breeding season. This species is found in all states and territories mostly in coastal regions and occasionally inland.

Sharp-tailed Sandpiper

In Australia, the sharp-tailed sandpiper has a widespread distribution during the non-breeding season where it is found in all states and territories. This species is most abundant in the south-east both in coastal areas and inland.

Red Knot

In Australia, the red knot occurs in all states and territories but is less numerous in south-west Australia.

Red-necked Stint

The red-necked stint occurs along most of the Australian coastline with large densities off the coast off Victoria and Tasmania. This species has been recorded in all coastal regions and inland in all states. The red-necked stint also has been recorded on Lord Howe Island, Nolfolk Island, Macquarie Island and Auckland Island (Web Reference 1).

Double-banded Plover

The double-banded plover is common in eastern and southern Australia, mainly between the Tropic of Capricorn and western Eyre Peninsula during the non-breeding season. It is thought to occasionally frequent northern Queensland and Western Australia. This species is most abundant however, in Victoria and Tasmania (Web Reference 1).

Oriental Plover

In Australia, the oriental plover mostly occurs in northern Australia, notably along the north-western coast between Exmouth Gulf and Derby in Western Australia. There are also other scattered sites along the northern coast, including the Top End, the Gulf of Carpentaria and on Cape York Peninsula. It also occurs inland on the 'blacksoil' plains of northern Western Australia, the Northern Territory and north-western Queensland. The oriental plover has also been sighted on Lord Howe Island and Christmas Island (Web Reference 1).

Latham's Snipe

The latham's snipe occurs in south-eastern Australia and is a passage migrant through northern Australia. It has been recorded from Cape York Peninsula through to south-eastern South Australia. Its range extends inland over the eastern tablelands in south-eastern Queensland and to the west of the Great Dividing Range in NSW. The latham's snipe is widespread in Tasmania, Victoria and is considered common south of the Richmond River in NSW. This species has also been recorded on Lord Howe Island, Norfolk Island and Macquarie Island (Web Reference 1).

Grey-tailed Tattler

The grey-tailed tattler is predominately distributed in the northern coastal regions but occurs in all states and territories (Web Reference 1).

Bar-tailed Godwit

The bar-tailed godwit is known to occur in the coastal areas of all Australian states. This species is widespread along the east and south-east coasts of Queensland, NSW and Victoria, in the Torres Strait and on offshore islands (e.g. migrant to Christmas Island, Norfolk Island, Lord Howe Island, Kermadec Island and Chatham Island).

Eastern Curlew

The eastern curlew is found in all states particularly the north east and south-east regions of Australia. This species has a continuous distribution from Barrow Island and Dampier Archipelago (WA) through to the Kimberley Division and along the Northern Territory, the islands of the Torres Strait, Queensland and NSW coasts including Lord Howe Island and Norfolk Island (Web Reference 1).

Little Curlew

The little curlew occurs in northern Australia from Port Headland (WA) to the Queensland coast during the non-breeding season. This species has also been recorded from inland Australia and the east coast, Lord Howe Island, Cocos-Keeling Island and Christmas Island (Web Reference 1). In NSW this species has scattered records east of the Great Dividing Range from Casino south to Greenwell Point with a few scattered records west of the Great Diving Range (Web Reference 1).

Whimbrel

The whimbrel is found in all Australian states and territories but is more common in the north. This species is also a regular visitor to Norfolk Island, Lord Howe Island, Cocos-Keeling Island, Christmas Island, Kermadec Islands, Chatham Islands, Prince Edward Islands, Iles Crozet and Ile de la Possession (Web Reference 1).

Pacific Golden Plover

The pacific golden plover has a widespread distribution but is particularly abundant along the coastlines of Queensland and NSW (Web Reference 1).

Painted Snipe (Australian)

The painted snipe occurs in all Australian states and territories but is most abundant on the east coast. This species has been recorded at scattered locations throughout Queensland, NSW, southeastern South Australia and Victoria. It has also been recorded less frequently at a smaller number of more scattered locations in Western Australia, the Northern Territory, far west South Australia, south-east Tasmania and Lord Howe Island (Web Reference 1).

Wood Sandpiper

The wood sandpiper is most abundant in north-west Australia but occurs in all states and territories. In NSW this species has been recorded east of the Great Divide, from Stratheden and Casino, south to Nowra, mostly from the Riverina, but also from the Upper and Lower Western Regions (Web Reference 1).

Marsh Sandpiper

The marsh sandpiper is distributed throughout Australia in all states and territories. This species is widespread in all regions of NSW (particularly central and south coasts, western plains and western slopes of Great Divide). There are also records for Lord Howe Island, Norfolk Island, Chatham Island and Christmas Island (Web Reference 1).

Swinhoe's Snipe

The swinhoe's snipe has been recorded in the north between the Kimberley Divide and Cape York Peninsula. In the Northern Territory the species is common and widespread in the Top End. The swinhoe's snipe has been recorded in

Darwin, Melville Island, Cannon Hill, Red Lily Lagoon and Mount Brockman. In Western Australia the species has been recorded in Pilbara, the Kimberley region, Mount Goldsworthy, Mount Blaize and in the north-west regions around the Mitchell Plateau. In Queensland specimens have been taken at Normanton and it has been sighted at Mount Isa (Web Reference 1).

Pin-tailed Snipe

The pin-tailed snipe has been recorded in the Top End, Pilbara, south-west Western Australia and NSW. This species has also been reported on the Cocos-Keeling Islands and Christmas Islands (Web Reference 1).

Hooded Plover (Eastern)

The hooded plover occurs in south-eastern Australia from Jervis Bay, NSW to the western reaches of Eyre Peninsula in South Australia. Its range includes Tasmania and a number of offshore islands including King Island, Kangaroo Island and Flinders Island (Web Reference 1).

Beach Stone-curlew

The beach stone-curlew occurs around the north coast of Australia including the islands near Onslow in Western Australia to the Manning River in NSW. However, this species is rarely recorded on ocean beaches in NSW which is thought to be due to urban and industrial development and recreational activities on the coast (NSW NPWS, 1999c).

Terek Sandpiper

The terek sandpiper occurs in all Australian states and territories. This species is widespread in coastal Queensland from south-east of the Gulf of Carpentaria north to Torres Strait. Terek sandpipers are also found along eastern and south-east Australia. There are scattered records of this species along the NSW coast from the Northern Rivers region south to Lake Wollumboola. It has also been recorded on Lord Howe Island, Norfolk Island, Prince Edward Island and Christmas Island (Web Reference 1).

Grey Ternlet

The grey ternlet is widely distributed in the southern Pacific Ocean. This species breeds on oceanic islands including Lord Howe Island. Grey ternlets occasionally occur in coastal NSW waters particularly after storm events (Web Reference 9).

Critical Habitat Resources in Australia

There are no declared critical habitat resources within Australia for the listed shorebird species. However, there are a number of nationally and internationally important sites within Australia for the shorebirds.

Sanderling

Important sites for the sanderling in Australia include: Eighty Mile Beach, Roebuck Bay, Ashmore Reef, Rivoli Bay, Brown Bay (Green Pt), The Coorong and Coorong National Park, Shallow Inlet/Sandy Point, Coffin Bay National Park, Discovery Bay Conservation Park, Port Fairy to Warrnambool Coast, Yokinup Bay, Cape Arid National Park, Garden Island, Ocean Beach, Strahan, Esperence Bay, Canunda National Park, Beachport National Park, Blanche Point, Green Point (SA) and Rivoli Bay (SA) (Web Reference 1).

Great Sand Plover

Internationally important sites in Australia for great sand plovers include: Eighty Mile Beach (WA), Roebuck Bay (WA), south-eastern corner of Gulf of Carpentaria (Qld), Ashmore Reef (WA), Darwin area (NT) (Web Reference 1).

Lesser Sand Plover

The Shoalhaven River estuary is a nationally important site for the lesser sand plover (Web Reference 1).

Broad-tailed Godwit

Internationally important sites in Australia for black-tailed godwits include: SE Gulf of Carpentaria (Qld), Roebuck Bay (WA), Nungbalgarri Creek (NT), Buckingham Bay (NT), Port McArthur (NT), Boucat Bay (NT), Hunter Estuary (NSW), Blue Mud Bay (NT), Roper River area (NT), Cape Bowling Green (Qld), Adelaide River Floodplain (NT), Chambers Bay (WA), Fog Bay and adjacent islands (NT) and Anson Bay, south (NT) (Web Reference 1).

Red-necked Stint

Sites of international importance and maximum or average counts for the red-necked stint include: The Coorong (SA), Eighty Mile Beach (WA), South East Gulf of Carpentaria (Qld), Penrice Saltfields (SA), Port Hedland Saltworks (WA), Corner and Shallow Inlets (Vic), Roebuck Bay (WA), Wilson Inlet (WA), Werribee-Avalon (Vic), Alfred Cove Nature Reserve (WA), Altona (Vic), Lake Macleod (WA), Peel Inlet (WA), Spencer Gulf (SA), Swan Bay - Mud Islands (Vic), Lake George (SA), Westernport Bay (Vic), Kangaroo Island (SA), Gippsland Lakes (Vic), Anderson Inlet (Vic) and Price Saltfields (SA) (Web Reference 1).

Double-banded Plover

Sites of international and national significance to the double-banded plover include: Lough Calvert (Beeac) (Vic), Boullanger Bay/Robbins Passage, Werribee-Avalon (Vic), Kangaroo Island (Tas), Corner Inlet (Vic), Altona (Vic), Shipwreck Point, Perkins Island (Tas), Shallow Inlet/Sandy Point, Anderson's Inlet (Vic), Westernport Bay (Vic), Lake Bathurst (NSW), King Island (Tas), Derwent River, estuary and Pittwater (Tas), Swan Bay-Mud Islands (Vic), Cape Portland-Musselroe Bay (Tas). There are also two important feeding and roosting sites for this species in the Botany Bay area - Penrhyn Inlet and Sydney Airport (Web Reference 1).

Oriental Plover

Internationally important sites for the oriental plover include: Eighty Mile Beach (WA), Port Hedland Saltworks (WA), Roebuck Bay (WA), Dampier Saltworks (WA) and Lake Sylvester (NT) (Web Reference 1).

Grey-tailed Tattler

Internationally important sites for the oriental plover include: Eighty Mile Beach (WA), Great Sandy Strait (Qld), Moreton Bay (Qld), Roebuck Bay (WA), Shoalwater Bay and Broad Sound (Qld), Barrow Island (WA), Ashmore Reef (WA), Port McArthur (NT), Islands off False Orford Ness (Qld), Milingimbi coast (NT), SE Gulf of Carpentaria (Qld), Low Island,Arnhem Bay (NT), Fog Bay and adjacent islands (NT), Limmen River mouth (NT), Lacepede Islands (WA) and Bynoe Harbour (NT) (Web Reference 1).

Bar-tailed Godwit

Important sites in Australia of international significance to the bar-tailed godwit include: Eighty Mile Beach (WA), Roebuck Bay (WA), Corner Inlet (Vic), Great Sandy Strait (Qld), Moreton Bay (Qld), Milingimbi coast (NT), Shoalwater Bay and Broad Sound (Qld), Elcho Island (NT) and Hunter Estuary (NSW) (Web Reference 1).

Little Curlew

Sites of international significance to the little curlew include: Kakadu National Park (NT), Roebuck Plains (WA), south-east Gulf of Carpentaria (NT), Anna Plains (WA), Lake Finniss (NT), Roebuck Bay (Queensland), Derby Sewage Ponds (WA) and Parry floodplain, Wyndham (WA) (Web Reference 1).

Whimbrel

Australian sites of international significance to the whimbrel include: Shoalwater Bay and Broad Sound (Qld), south-east Gulf of Carpentaria (Qld), Great Sandy Strait (Qld), Chambers Bay (NT), Moreton Bay (Qld), Cairns Foreshore (Qld) and Roebuck Bay (WA) (Web Reference 1).

Pacific Golden Plover

International significant sites in Australia for the pacific golden plover include: Moreton Bay (Qld). Nationally important sites for this species include: south-eastern Gulf of Carpentaria (Qld), Great Sandy Strait (Qld), Hunter River estuary (NSW), Eighty Mile Breach (WA), Clarence and Richmond Rivers (NSW), Derwent River estuary-Pittwater (Tas), The Coorong (SA), Shoalhaven River estuary (NSW), Corner and Shallow Inlets (Victoria), north-western (Tas), Swan Bay-Mud Islands, southern Port Phillip Bay (Vic) and Anderson Inlet (Vic) (Web Reference 1).

Wood Sandpiper

Sites of national importance to the wood sandpiper include: Parry Floodplain (Wyndham) (WA), Camballin (WA), Lake Argyle (WA), Shark Bay area (WA), Vasse-Wonnerup estuary (WA), Lake McLarty (WA) and Kogolup Lakes (WA) (Web Reference 1).

Marsh Sandpiper

Sites of international importance to the marsh sandpiper include the south-east Gulf of Carpentaria. Sites of national importance include: Buffalo Lake area, Normanton (Qld), Hunter River estuary (NSW), Lake Namulla, Cunnamulla (Qld), Port Hedland Saltworks (WA), Tullakool Evaporation Ponds (NSW), Kakadu National Park (NT), Parry River floodplain (WA), Peel Inlet (WA), Camballin (WA), Third Marsh, Kerang (Vic), Eighty Mile Beach (WA), Parkes wetlands (NSW), Reedy Lake, Moolap (Vic), Macquarie Marshes (NSW), Hospital Lake, Moolap (Vic), Swan Hill Sewage Farm (Vic), Alva Beach (Ayr) (Qld), Moolap Saltworks (Vic), Penrice Saltworks (SA), Kooragang Island (NSW) and Charters Towers (Qld) (Web Reference 1).

Terek Sandpiper

Sites of international significance in Australia to the terek sandpiper include: Eighty Mile Beach (WA), south-east Gulf of Carpentaria (Qld), Shoalwater Bay and Broad Sound (Qld), Great Sandy Strait (Qld), Roebuck Bay (WA), Chambers Bay (NT), Joseph Bonaparte Bay (Turtle Point) (WA), Fog Bay and adjacent islands (NT), Milingambi coast (NT), Hunter River estuary (NSW), Moreton Bay (Qld) and Hunter Estuary (NSW) (Web Reference 1).

Important Habitat Values for the Species

Sandering

The sanderling is a coastal species that inhabits open sandy beaches exposed to open sea-swell, exposed sandbars, spits, shingle banks and rocky outcrops. It forages in the wave-wash zone and amongst seaweed. Breeding habitat is open ground, raised hummocks and ridges. The sanderling's omnivorous diet consists of seeds, plants, spiders, insects, crustaceans, worms and occasionally jellyfish, fish and larger molluscs (Web Reference 1).

Great Knot

The great knot inhabits sheltered coastal habitats including intertidal mudflats and sandflats, sandy beaches, sandy spits, and islets, as well as exposed rock platforms and reefs. This species consumes invertebrates such as gastropods, polychate worms, molluscs, crustaceans and bivalves which it captures by methodically thrusting its bill deep into the mud (Web Reference 1).

Greater Sand Plover

The greater sand plover inhabits coastal environments including estuaries, sheltered sandy, shelly and muddy beaches, as well as sandy estuarine lagoons, rock platforms, inshore reefs, sand cays on coral reefs and small rocky islands. This species breeds in semi-arid areas or open deserts. The greater sand plover consumes molluscs, insects, worms and crustaceans during the non-breeding season. During the breeding season their diet consists of ants, beetles, and insects (Web Reference 1).

Lesser Sand Plover

Non-breeding lesser sand plovers inhabit coastal littoral and estuarine environments including large intertidal sandflats and mudflats in sheltered harours, estuaries and bays, as well as coral reefs, wave-cut rock platforms, rocky outcrops and sandy ocean beaches. Breeding habitat consists of high elevations, in tundra on steppes and in flat, barren valleys and basins, boggy areas, above the tree-line or channelised areas of the upper reaches of rivers. The lesser sand plover does not breed in Australia. The lesser sand plover consumes molluscs, insects, worms and crustaceans during the non-breeding season. During the breeding season their diet consists of beetles and fly larvae (Web Reference 1).

Broad-billed Sandpiper

The broad-billed sandpiper occurs in sheltered coastal environments including estuarine mudflats, shallow freshwater lagoons, saltworks, sewage farms, saltmarshes, soft intertidal mudflats, reefs and rocky platforms, creeks, swamps and lakes. This species is omnivorous consuming molluscs, worms, crustaceans, polychaetes, insects, seeds and occasionally rootlets and other vegetation (Web Reference 1).

Great Egret

The great egret inhabits a wide range of wetland habitats including swamps, marshes, margins of rivers and lakes, reservoirs, sewage treatment ponds; drainage channels; salt pans and salt lakes; salt marshes; estuarine mudflats, tidal streams; mangrove swamps; coastal lagoons; and offshore reefs damp or flooded grasslands, pastures and agricultural lands. This species consumes molluscs, crustaceans, fish, insects, small birds, frogs, lizards, snakes and mammals (Web Reference 1).

Cattle Egret

The cattle egret inhabits tropical and temperate grasslands, terrestrial wetlands and wooded lands. Its diet consists of mostly grasshoppers during the breeding season but also consumes cicadas, centipedes, spiders, cattle ticks, frogs, lizards and small mammals (Web Reference 1).

Curlew Sandpipers

The curlew sandpipers predominately inhabit sheltered coastal areas including estuaries, bays, inlets, lagoons, non-tidal swamps, lakes, lagoons near the coast, ponds in saltworks and sewage farms. Roosting occurs on bare dry shingle, shell or sand beaches, sandspits and islets in or around coastal or near coastal lagoons and other wetlands. The diet of this species consists of mainly invertebrates including worms, insects, molluscs, crustaceans and seeds (Web Reference 1).

Ruddy Turnstone

The ruddy turnstone inhabits exposed rock coast lines, coral reefs, platforms, rocky/shingle/gravel beaches, shoals, cays and dry ridges of sand and coral. This species usually forages between the strand-line and wave-zone of foreshores, often amongst banks of seaweed and other tide-wrack. The ruddy turnstone is nocturnal and diurnal and their diet consists of worms, insects, spiders, molluscs and crustaceans (Web Reference 1).

Sharp-tailed Sandpiper

The sharp-tailed sandpiper prefers muddy edges of shallow wetlands including swamps, lagoons, waterholes, lakes and pools near the coast, and dams, soaks, bore drains and bore swamps, saltpans and hypersaline saltlakes inland. This species forages at the edge of the water of intertidal mudflats or wetlands, in inundated vegetation of grass, sedges or

saltmarsh, in sewage ponds and on coastal mudflats at low tide. The sharp-tailed sandpiper's diet consists of crustaceans, insects, seeds, worms and molluscs (Web Reference 1).

Red Knot

The red knot inhabits intertidal mudflats and sandflats, sandy beaches, estuaries, inlets, lagoons, bays and harbours and occasionally terrestrial saline wetlands near the coast. Foraging usually occurs on soft substrate near the edge of water on intertidal mudflats or sandflats exposed at low tide. Roosting occurs on mudflats, sandy beaches, spits and islets. The red knot is omnivorous consuming worms, crustaceans, echinoderms, bivalves and gastropods. This species is diurnal and nocturnal where feeding activity in non-breeding areas is regulated by the tide (Web Reference 1).

Pectoral Sandpiper

The pectoral sandpiper prefers shallow fresh to saline wetlands. This species is found at coastal lagoons, inundated grasslands, saltmarshes, river pools, creeks, floodplains, artificial wetlands, estuaries, bays, swamps and lakes. Its diet consists of algae, seeds, arachnids, insects and crustaceans (Web Reference 1).

Red-necked Stint

The red-necked stint is mostly a coastal species that inhabits sheltered inlets, bays, lagoons and estuaries with intertidal mudflats. This species is often sighted near spits, islets and banks but are also occasionally found near protected sandy or coralline shores, exposed beaches, stony/rocky shores, reefs, shoals, lagoons, lakes, swamps, riverbanks, waterholes, bore drains, dams, soaks and pools in saltflats. The red-necked stint is omnivorous consuming small invertebrates (e.g. marine worms, molluscs, snails and slugs, shrimps, spiders, beetles, flies and ants), as well as plant seeds (Web Reference 1).

Oriental Plover

The oriental plover inhabits coastal habitats including estuarine mudflats and sandbanks, sandy or rocky ocean beaches, reefs and coastal grasslands before travelling inland (non-breeding season). Inland habitats consist of flat, open, semi-arid or arid grasslands. This species does not breed in Australia. Its diet consists of insects, including termites, beetles, grasshoppers, crickets and bugs (Web Reference 1).

Latham's Snipe

The latham's snipe inhabits permanent and ephemeral wetlands up to 2000 m above sea level. This species is usually recorded in open, freshwater wetalnds with low, dense vegetation but it has also been sighted in saline and brackish areas. The latham's snipe is omnivorous consuming seeds, other plant material and invertebrates (e.g. insects, earthworms, spiders, molluscs, isopods and centipedes).

Grey-tailed Tattler

The grey-tailed tattler inhabits sheltered coasts with reefs and rock platforms or with intertidal mudflats, intertidal rocky, coral or stony reefs, platforms, islets, embayments, estuaries and coastal lagoons. The diet of this species consists of polychaetes, molluscs, crustaceans, insects and occasionally fish. The grey-tailed tattler is diurnal where it roosts at night

Bar-tailed Godwit

The bar-tailed godwit predominately occurs in coastal habitats such as large intertidal sandflats, mudflats, banks, estuaries, inlets, harbours, bays, coastal lagoons, around seagrass beds, saltmarsh, coastal sewage farms and saltworks, saltlakes, brackish wetlands near coasts, sandy ocean beaches, rock platforms, and coral reef-flats. This species is carnivorous predominately consuming crustaceans, insects worms, molluscs and some plant material but is has also been recorded eating fruits, fish and tadpoles (Web Reference 1).

Eastern Curlew

The eastern curlew mainly inhabits sheltered coasts, including estuaries, bays, harbours, inlets and coastal lagoons, intertidal mudflats and sandflats and seagrass beds. Occasionally this species is recorded on ocean beaches, coral reefs, rock platforms and rocky islets, saltmarsh, mudflats fringed by mangroves, saltworks and sewage farms. The eastern curlew is carnivorous mainly eating small molluscs, crustaceans and some insects. It is a diurnal and nocturnal species that is extremely wary and is known to take flight at the first sign of danger (Web Reference 1).

Little Curlew

The little curlew inhabits short, dry grassland and sedgeland, open woodlands with a grassy or burnt understorey, dry saltmarshes, coastal swamps, mudflats or sandflats of estuaries or beaches on sheltered coasts. This species is omnivorous, where it mainly eats insects, berries and seeds (Web Reference 1).

Whimbrel

The whimbrel inhabits intertidal mudflats of sheltered coasts, harbours, estuaries and river deltas, unvegetated mudflats, sandy or rocky beaches, on coral or rocky islets or on intertidal reefs and platforms. This species is mainly carnivorous in non-breeding areas, consuming annelids, crustaceans and rarely vertebrates (e.g. small fish and Little Tern). The whimbrel is a diurnal and nocturnal feeder (Web Reference 1).

Pacific Golden Plover and Red-Capped Plover

The pacific golden plover inhabits coastal areas and occasionally occurs around inland wetlands. This species has been recorded on beaches, sandflats, mudflats and sheltered areas (e.g. harbours, estuaries and lagoons). Pacific golden plovers are occasionally sighted on islands, sand, coral cays, exposed reefs, rocks and terrestrial habitats (usually wetlands) (Web Reference 1).

Painted Snipe (Australian)

The painted snipe inhabits shallow terrestrial freshwater to brackish wetlands (e.g. swamps, claypans, temporary and permanent lakes). The diet of the painted snipe consists of vegetation, seeds, crustaceans, insects, worms, molluscs and other invertebrates (Web Reference 1).

Wood Sandpiper

The wood sandpiper inhabits well-vegetated, shallow, freshwater wetlands, such as swamps, billabongs, lakes, pools and waterholes. This species is carnivorous and its diet consists of mainly insects and molluscs in Australia but it also eats seeds, algae, worms, crustaceans, arachnids, fish and frogs elsewhere (Web Reference 1).

Marsh Sandpiper

The marsh sandpiper inhabits permanent or ephemeral wetlands including swamps, lagoons, intertidal mudflats, billabongs, saltpans, saltmarshes, estuaries, pools on inundated floodplains, sewage farms and saltworks. This species is carnivorous and consumes insects, molluscs and (internationally) crustaceans.

Swinhoe's Snipe

The swinhoe's snipe inhabits the edges of wetlands (e.g. wet paddy fields, swamps and freshwater streams), grasslands, drier cultivated areas (including crops of rapeseed and wheat), market gardens, dense clumps of grass and rushes round the edges of fresh and brackish wetlands (e.g. swamps, billabongs, river pools, small streams and sewage ponds) (Web Reference 1).

Pin-tailed Snipe

The pin-tailed snipe inhabits the edges of shallow freshwater swamps, ponds and lakes with emergent, sparse to dense cover of grass/sedge or other vegetation (Web Reference 1).

Hooded Plover (Eastern)

The hooded plover inhabits coastal areas, high energy sandy beaches, adjacent beaches, rock platforms, reefs, around near coastal lakes and lagoons. This species consumes marine invertebrates (e.g. polychaete worms, molluscs and crustaceans), insects (e.g. beetles, flies, dragonflies) and vegetable material (mostly seeds) (Web Reference 1).

Beach Stone-curlew

The beach stone-curlew inhabits open, undisturbed beaches, islands, reefs and estuarine intertidal mud and sandflats. This species is also found near river mouths, offshore sandbars associated with coral atolls, reefs and rock platforms and coastal lagoons. The beach stone-curlew prefers beaches with mangroves or estuaries nearby on which it feeds on usually during low tide. This species diet consists of crabs and other marine invertebrates (NSW NPWS, 1999c).

Terek Sandpiper

The terek sandpiper inhabits intertidal mudflats, sheltered estuaries, harbours, lagoons, embayments, islets, mudbanks, near mangroves, sandbanks and spits. This species is also occasionally found on sandy beaches, among seaweed and rocky areas. The diet of terek sandpipers consists of crustaceans, insects, arachnids, seeds and molluscs (Web Reference 1).

Grey Ternlet

The grey ternlet breeds on seacliffs of the northern hills, southern mountains and offshore islands of Lord Howe Island. This species makes a rough nest of grass and seaweed in pockets and hollows along cliff faces. Its diet consists of small fish, crustaceans and squid taken from the water's surface (Web Reference 9).

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to shorebirds include habitat loss (direct and indirect), habitat degradation (e.g. invasion of intertidal mudflats by weeds, changes to the hydrological regime, exposure of acid sulphate soils, loss of vegetation and nest destruction), climate change, human disturbance (e.g. recreation activities on beaches), pollution, disease, introduced species and direct mortality from human activities (e.g. building wind farms within migratory routes and bird strikes from aircraft). Potential impacts associated with the proposal include entanglement in longline infrastructure, ingestion of marine debris, altering food resources, physical distance (e.g. noise), habitat modification and habitat exclusion.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not near significant breeding, roosting or feeding grounds.

Monitoring and Management

Marine fauna interactions will be monitored and reviewed on a regular basis.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impacts on shorebird species.

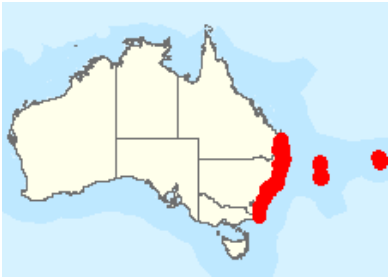
Fishes

Common Name

Black Rockcod

Latin Name

Epinephelus daemelii



EPBC Status	FM / TSC Listing
Vulnerable	Vulnerable

Distribution across Australia

Black Rockcod are known to occur in subtropical and warm temperate waters of the south-western Pacific Ocean. In Australia, Black Rockcod have been recorded from southern Queensland to Kangaroo Island off South Australia, as well as at Lord Howe Island, Norfolk Island and northern New Zealand (Web Reference 4).

Critical Habitat Resources in Australia

No area within the Jervis Bay region is declared as 'critical habitat' for the Black Rockcod.

Important Habitat Values for the Species

Typical habitat of the Black Rockcod includes caves and gutters around near shore rocky reefs down to depths of at least 50 m (Heemstra & Randall, 1993). Recently settled small juveniles are frequently found in intertidal rock pools along the coastline of NSW while larger juveniles are often captured by anglers on rocky reefs in estuary systems (Web Reference 1). This species is also highly territorial and individuals are frequently encountered in the same location or cave for extended periods of time. Adults can occupy a particular cave for most of their life (Heemstra & Randall, 1993).

Black Rockcod are protogynous hermaphrodites, where individuals initially become a sexually mature female and then change into a male after spawning for one or more years. Their life cycle revolves around rocky reefs and possibly rock pools with pelagic dispersal of eggs and larvae. Males establish a harem within their territory at the time of spawning. There is limited information on their diet of Black Rockcod in NSW but it is likely that it is an epibenthic predator, feeding on macroinvertebrates and fishes on or near the bottom predominately at dusk and during the night (Heemstra & Randall, 1993).

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to the Black Rockcod include over harvesting via line, spear and net fishing, as well as loss and degradation of estuarine nursery habitat. Black Cod are now protected from all forms of fishing however accidental capture continues. Potential impacts associated with the proposal include entanglement in longline infrastructure, altering food resources, physical distance (e.g. noise), habitat modification and habitat exclusion.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not near significant breeding, resting or feeding grounds.

Monitoring and Management

Marine fauna interactions will be monitored and reviewed regularly.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impacts on the Black Rockcod.

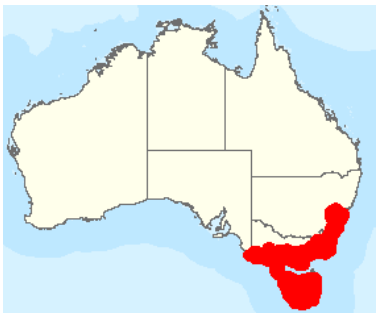
Fishes

Common Name

Australian Grayling

Latin Name

Prototroctes maraena



EPBC Status	FM / TSC Listing
Vulnerable	Protected

Distribution across Australia

The Australian Grayling has been recorded in rivers flowing east and south of the main dividing ranges. Historically, the Australian Grayling has been recorded in coastal streams from the Grose River (west of Sydney), southwards through NSW, Victoria and Tasmania (including King Island). This species was also known to occasionally occur high upstream of the Snowy River and has been collected from Lake Macquarie and Shoalhaven River (Web Reference 1).

Critical Habitat Resources in Australia

No area within the Jervis Bay region is declared as 'critical habitat' for the Australian Grayling.

Important Habitat Values for the Species

The Australian Grayling migrates between freshwater and the ocean (i.e. it is a diadromous). When inhabiting freshwater environments it inhabits clear, gravel-bottomed streams with alternating pools and riffles, and granite outcrops. This species consumes aquatic insect larvae, small crustaceans, algae and small insects (Web Reference 1). Spawning occurs in freshwater where larvae is likely to be swept out to sea and return as whitebait after 4-6 months.

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to the Australian Grayling include habitat fragmentation, degradation, modification and loss, recreational fishing, overfishing of prey species, climate change and invasive species (e.g. Goldfish, Mosquito Fish and Rainbow Trout) (Web Reference 4). Potential impacts associated with the proposal include entanglement, altering food resources, physical distance (e.g. noise), habitat modification and habitat exclusion.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not near significant breeding, resting or feeding grounds.

Monitoring and Management

Marine fauna interactions will be monitored and reviewed regularly.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impacts on the Australian Grayling.

Fishes

Syngnathiformes

Common Name	Latin Name	EPBC Status	FM / TSC Listing
Seahorses			
Bigbelly, Eastern or New Zealand Potbelly Seahorse	*Hippocampus abdominalis*	Listed Marine	Protected
White's, Crowned or Sydney Seahorse	*Hippocampus whitei*	Listed Marine	Protected
Short-head Seahorse	*Hippocampus breviceps*	Listed Marine	Protected
Pipefishes			
Upside-down Pipefish	*Heraldia nocturna*	Listed Marine	Protected
Crested Pipefish, Briggs' Crested Pipefish	*Histiogamphelus briggsii*	Listed Marine	Protected
Javelin Pipefish	*Lissocampus runa*	Listed Marine	Protected
Sawtooth Pipefish	*Maroubra perserrata*	Listed Marine	Protected
Red Pipefish	*Notiocampus ruber*	Listed Marine	Protected
Spotted Pipefish, Gulf Pipefish	*Stigmatopora argus*	Listed Marine	Protected
Widebody, Wide-bodied or Black Pipefish	*Stigmatopora nigra*	Listed Marine	Protected
Double-end(ed) or Alligator Pipefish	*Syngnathoides biaculeatus*	Listed Marine	Protected
Hairy Pipefish	*Urocampus carinirostris*	Listed Marine	Protected
Mother-of-pearl Pipefish	*Vanacampus margaritifer*	Listed Marine	Protected
Lord Howe Pipefish	*Cosmocampus howensis*	Listed Marine	Protected
Trawl Pipefish, Bass Strait Pipefish	*Kimblaeus bassensis*	Listed Marine	Protected
Port Phillip Pipefish	*Vanacampus phillipi*	Listed Marine	Protected
Girdled Pipefish	*Festucalex cinctus*	Listed Marine	Protected
Tiger Pipefish	*Filicampus tigris*	Listed Marine	Protected
Beady Pipefish, Steep-nosed Pipefish	*Hippichthys penicillus*	Listed Marine	Protected
Bentstick, Bend Stick or, Short-tailed Pipefish	*Trachyrhamphus bicoarctatus*	Listed Marine	Protected
Ghost Pipefish			
Robust or Blue-finned Ghost Pipefish	*Solenostomus cyanopterus*	Listed Marine	Protected
Rough-snout Ghost Pipefish	*Solenostomus paegnius*	Listed Marine	Protected
Ornate, Harlequin or Ornate Ghost Pipefish	*Solenostomus paradoxus*	Listed Marine	Protected
Pipehorses			
Shortpouch Pygmy Pipehorse	*Acentronura tentaculata*	Listed Marine	Protected
Spiny or Australian Spiny Pipehorse	*Solegnathus spinosissimus*	Listed Marine	Protected
Seadragons			
Weedy Seadragon	*Phyllopteryx taeniolatus*	Listed Marine	Protected

Distribution across Australia

Syngnathiformes are distributed across the world in predominantly tropical, subtropical or warm temperate waters (Web Reference 4).

Critical Habitat Resources in Australia

No area in Australia waters is declared as 'critical habitat' for syngnathiformes. However, numerous areas within Jervis Bay are important habitat for syngnathiforms such as reefs, crevices, small caves, areas at particular depths and particular host organisms (e.g. gorgonians, sponges and corals).

Important Habitat Values for the Species

Off the NSW coast syngnathiformes are found in a variety of habitats ranging from deep reefs to coastal algae, weed or seagrass habitats, or around man made structures such as jetties or mesh nets. Often the ends of jetties are rich with seahorses due to water circulation patterns that sometimes present rich patches of zooplankton on which they feed. Seahorses in particular are able to wrap their tails around structures and feed on passing organisms (Web Reference 4).

Seahorses

Seahorses swim slowly upright in the water, or wrap their tails around objects such as seagrass fronds to hold them in place for feeding or for stabilisation during turbulent water conditions such as storms. Seahorses use camouflage to blend in with their surroundings before using an ambush predatory feeding behaviour on small crustaceans. There are six species of seahorses known to occur in NSW waters, including the Pot-belly Seahorse (*Hippocampus abdominalis)* and White's Seahorse (*Hippocampus whitei*).

Seadragons

The Weedy Seadragon (*Phyllopteryx taeniolatus)* is the only known seadragon in NSW waters. Weedy seadragons can be observed along reefs with kelp or along the edge of sand areas feeding on very small shrimp-like mysids and other small crustaceans.

Pipefish

Pipefish generally inhabit sheltered areas in coral reefs, seagrass beds and sandy lagoons. They use their tube-like mouth as a vacuum to draw in prey and some clean crustaceans from the scales of other fish. There are 19 pipefish species known to inhabit NSW waters such as the Tiger Pipefish (*Filicampus tigris*) that can be found in seagrass beds or sheltered reefs to depths of 15 m.

Pipehorses

A pipehorse is able to camouflage very well and make a meal out of small crustaceans that feed on the algae. Pipehorses are found on soft bottoms near reefs or rubble in shallow to very deep waters, or amongst seagrasses. There are five species of pipehorses known to inhabit NSW waters including the Spiny Pipehorse (*Solegnathus spinosissimus*) and the Double-ended Pipehorse (*Syngnathoides biaculeatus*).

Ghostpipefish

Ghostpipefish are found in NSW in habitats ranging from muddy open bottoms to reefs with rich invertebrate life, usually in sheltered coastal or estuary waters. Ghostpipefish like seahorses and pipefish have an elongated snout that they use to feed on small shrimp-like crustaceans. Examples include the Ornate Ghostpipefish (*Solenostomus paradoxus*) and the Rough Snout Ghostpipefish (*Solenostomus cyanopterus*).

Seamoths

Seamoths are found lying flat or crawling on sandy or muddy bottoms with flattened bodies, pectoral fins held out to their side, and modified ventral fins for walking. Seamoths feed primarily on tiny crustaceans and other small invertebrates, which they suck in whole with their protusible mouth. There are two species of seamoths found in NSW waters: the Little Dragonfish (*Eurypegasus draconis*) and the Longtail Seamoth (*Pegasus volitans*).

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to syngnathiformes include habitat degradation, habitat modification and collection for aquarium keeping, Chinese medicine and tourist souvenirs (Web Reference 4). Potential impacts associated with the proposal include pollution, habitat degradation and habitat modification. Conversely, the longline infrastructure may provide additional habitat for some syngnathiforme species within Jervis Bay.

Proposed Impact Mitigation Measures

Mitigation

1. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.

2. Site selection - leases are located away from areas that are likely to represent important syngnathiforme habitat i.e seagrass beds, reefs, sponges, rocky caves and crevices.
3. The proposed leases represent a relatively small proportion of potential syngnathiforme habitat available in the wider area and will not isolate any area of this habitat.

Monitoring and Management

Marine fauna interactions, water quality and the condition of the benthic environment will be monitored and reviewed on a regular basis.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have significant impacts on syngnathiforme species.

Seahorses

White's Seahorse (*Hippocampus whitei*)

Seadragons

Weedy Seadragon (*Phyllopteryx taeniolatus)*

Pipefish

Tiger Pipefish (*Filicampus tigris*)

Pipehorses

Spiny Pipehorse (*Solegnathus spinosissimus*)

Ghostpipefish

Ornate Ghostpipefish (*Solenostomus paradoxus*)

Seamoths

Little Dragonfish (*Eurypegasus draconis*)

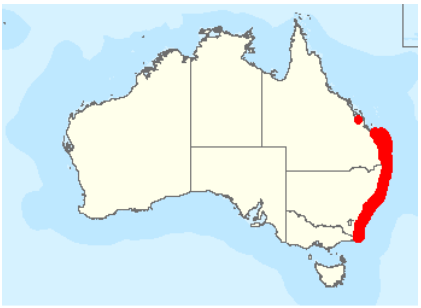
Sharks

Common Name

Greynurse Shark (east coast population)

Latin Name

Carcharias taurus



EPBC Status	FM / TSC Listing
Critically Endangered	Critically Endangered

Distribution across Australia

The Greynurse Shark (east coast population) is sighted from southern Queensland down the east coast into NSW but infrequently in northern Queensland, Victorian, South Australian and Tasmanian waters. The species is known to have specific aggregation sites yet it is suggested to migrate seasonally along the NSW coast (Pollard *et al,* 1996).

Critical Habitat Resources in Australia

Many of the known aggregation sites for Greynurse Sharks (eastern Australian population) have been declared critical habitat for the species and are protected by both state and federal legislation. Ten aggregation sites in NSW have been declared as critical habitat for the Greynurse Shark; namely Big and Little Seals Rocks, Fish Rock (South West Rocks), Green Island (South West Rocks), Julian Rocks (Byron Bay), Little Broughton Island (Port Stephens), Magic Point (Maroubra), Montague Island (Narooma), The Pinnacle (Foster) and Tollgate Islands (Batemans Bay).,

Important Habitat Values for the Species

Greynurse sharks are typically found in coastal inshore waters around rocky reefs and gravel or sand filled gutters, overhangs or caves, in 15-40m of water, (Otway & Parker 2000; Web Reference 4), called aggregation sites Many aggregation locations for this species have been protected as critical habitat; however their entire range and movement patterns (especially with respect to nocturnal activities and feeding) have not yet been quantified. It has also been suggested the movement and aggregation of the species differs by genders and age (Otway & Parker, 2000).

Recognised Threats and Potential Impact(s) of the Proposal

The Greynurse Shark has been the subject of targeted fishing in Australia with catches recorded since the 1850's. Greynurse Sharks are now protected from all forms of fishing however accidental bycatch and hooking by commercial and recreational fishers with baited hooks as well as discarded gear remains a recognised threat, potentially resulting in injury via entanglement or ingestion, sometimes without recovery.
Potential impacts associated with the proposal include entanglement in infrastructure and change of distribution due to removal of foraging habitat.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not near significant breeding, resting or feeding grounds.

Monitoring and Management

Marine fauna interactions will be monitored and reviewed regularly.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impacts on the Greynurse Shark.

Sharks

Common Name

White Shark

Latin Name

Carcharodon carcharias

EPBC Status	FM / TSC Listing
Vulnerable, Migratory	Vulnerable

Distribution across Australia

The White Shark is widely distributed across temperate and subtropical Australia from Moreton Bay in southern Queensland around the southern coastline to the North West Cape (WA) (Bruce & Bradford, 2008). This species distribution is not uniform along the coastline with more frequent observations being made near pinniped (seal) colonies. Aggregations of juveniles have also been suggested (Bruce & Bradford, 2008). The animals visit inshore areas such as bays and estuaries as well as the open ocean (Bruce, 2008).

Critical Habitat Resources in Australia

No critical habitat has been declared for the species in Australia, however three primary residency regions have been identified in eastern Australia: Corner Inlet/Lakes Entrance (Victoria), Fraser Island (Queensland) and Stockton Beach/Hawks Nest (NSW).

Important Habitat Values for the Species

The White Shark can be found in diverse habitats from open oceans, continental shelf and slope areas, inshore to rocky reefs, surf beaches and bays and estuaries (Web Reference 1). This species life cycle and thus habitat requirements are poorly understood (Bruce & Bradford, 2008). White Sharks are known to range widely: an example is a shark tagged in Neptunes (SA) which swam across the Tasman Sea to New Zealand and also to a depth of 1000m (Web Reference 1).

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to the White Shark include incidental capture by commercial and recreational fishers, historic game fishing, beach meshing and baiting for human protection, entanglement or ingestion of discarded gear, illegal trade (both within Australia and overseas) and tourism activities (Web Reference 1). Potential impacts associated with the proposal include entanglement in longline infrastructure and change of distribution through modification of potential habitat.

Proposed Impact Mitigation Measures

<u>Mitigation</u>

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not near significant breeding, resting or feeding grounds.

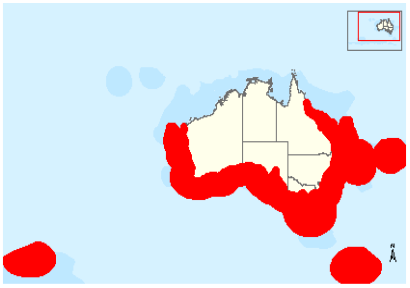
<u>Monitoring and Management</u>

Marine fauna interactions will be monitored and reviewed regularly.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impacts on the White Shark.

Sharks



Common Name

Mackerel Shark, Porbeagle

Latin Name

Lamna nasus

EPBC Status	FM / TSC Listing
Migratory	

Distribution across Australia

The Mackerel Shark is widely distributed in the cold and temperate marine waters of the Southern Hemisphere and the North Atlantic. It inhabits Australian waters ranging from southern Western Australia to southern Queensland.

Critical Habitat Resources in Australia

No critical habitat has been declared for the species in Australia.

Important Habitat Values for the Species

The Mackerel Shark can be found in diverse habitats from deep open ocean to very shallow inshore areas but is most commonly found over food-rich banks on the outer continental shelf. This species conducts long distance seasonal migrations and in the South Pacific the population shifts north past 30°S into subtropical waters during winter and spring while in summer the Mackerel Shark retreats south past 35°S. The Mackerel Shark is an opportunistic hunter that predominately preys on bony fishes and cephalopods.

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to the Mackerel Shark include capture by commercial and recreational fishers, sport fishing, bycatch, beach meshing for human protection and entanglement or ingestion of discarded gear (Web Reference 1). Potential impacts associated with the proposal include entanglement in longline infrastructure and change of distribution through modification of potential habitat.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not near significant breeding, resting or feeding grounds.

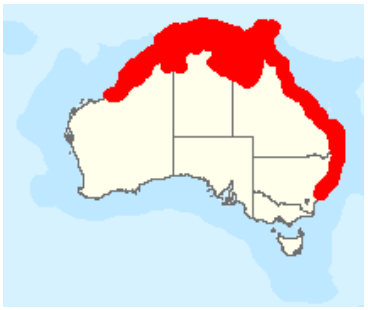
Monitoring and Management

Marine fauna interactions will be monitored and reviewed on a regular basis.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impacts on the Mackerel Shark.

Sharks



Common Name

Green Sawfish, Dindagubba, Narrowsnout Sawfish

Latin Name

Pristis zijsron

EPBC Status	FM / TSC Listing
Vulnerable	Extinct

Distribution across Australia

The Green Sawfish has been found from southern NSW waters (as far as Jervis Bay) north around to Broome in Western Australia. This species used to be regularly sighted in Tweed, Clarence and the Richmond Rivers in NSW. Records of the last 40 years have not seen the species south of northern Queensland and it is now presumed extinct in NSW (Web Reference 4). This species is most commonly known from the Gulf of Carpentaria, Queensland, where it is regularly sighted in the Mission River and at Albatross Bay (Web Reference 1).

Critical Habitat Resources in Australia

There are no critical habitat resources for the Green Sawfish within the wider proposal area.

Important Habitat Values for the Species

The Green Sawfish has been recorded in inshore, estuarine and offshore waters with sandy and muddy benthic habitats (Web Reference 4). Their diet consists of mullet, molluscs and small crustaceans which they capture using a combination of a shoaling and sweeping method (Web Reference 4).

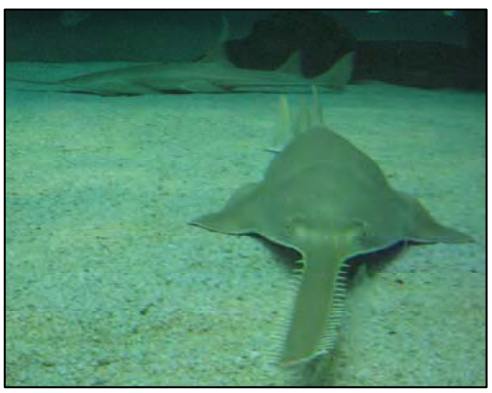
Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to the Green Sawfish include incidental catch by commercial and recreational fishers, change in their soft sediment habitats, shark fining, habitat degradation, Australian Indigenous harvesting and reproduction constraints (Web Reference 1). Potential impacts associated with the proposal include entanglement in longline infrastructure and change of distribution through modification of potential habitat.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not near significant breeding, resting or feeding grounds.



Monitoring and Management

Marine fauna interactions will be monitored and reviewed on a regular basis.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impacts on the Green Sawfish.

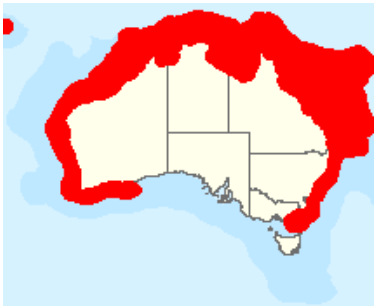
Sharks

Common Name

Whale Shark

Latin Name

Rhincodon typus



EPBC Status	FM / TSC Listing
Vulnerable, Migratory	N/A

Distribution across Australia

Whale Sharks are known to occur in New South Wales, Queensland, Northern Territory, Western Australia, Christmas Island, Indian Ocean and occasionally South Australia and Victoria. The species is thought to be primarily pelagic and highly migratory (Web Reference 1).

Critical Habitat Resources in Australia

Important habitats for the Whale Shark within the Australian jurisdiction are known seasonal aggregation areas off Ningaloo Reef in Western Australia (between March and July), Christmas Island (between December and January) and in the Coral Sea (between November and December). Seasonal aggregations off Ningaloo Reef are associated with climatic and oceanographic processes in the region (DEH, 2005).

Important Habitat Values for the Species

The Whale Shark is a slow moving filter feeding shark which is the largest species of fish, growing up to 20 m (DEH, 2005). The Whale Shark inhabits tropical to warm-temperate oceans worldwide. Seasonal aggregations are also known to occur outside Australian jurisdiction in a number of range states such as the Philippines, Belize and the Maldives.

Recognised Threats and Potential Impact(s) of the Proposal

Commercial harvest is the main threat to the species outside of Australian waters, whereas competition with fisheries, habitat damage, pollution, disease and direct disturbance from tourism are considered potential threats within Australian jurisdiction. At present none of these potential threats are thought to have an impact on the number of Whale Sharks visiting Australian waters (DEH, 2005). Potential impacts associated with the proposal include entanglement with or injury from marine debris and removal of potential foraging habitat.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not near significant breeding, resting or feeding grounds. The proposed leases represent a relatively small proportion of potential habitat in the wider area and will not isolate any habitat.

Monitoring and Management

Marine fauna interactions will be monitored and reviewed regularly.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impacts on the Whale Shark.

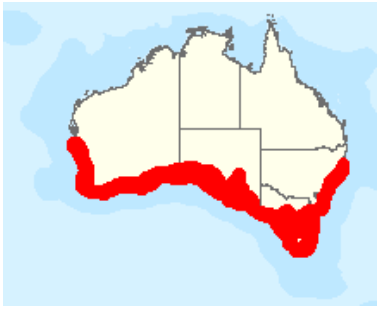
Marine Mammals

Common Name

New Zealand fur seal

Latin Name

Arctocephalus forsteri



EPBC Status	FM / TSC Listing
Listed Marine	Vulnerable

Distribution across Australia

In Australian waters, the New Zealand fur seal has been reported from Western Australia, South Australia, Victoria, Tasmania (including Macquarie Island), New South Wales and Queensland (south of Fraser Island).

Critical Habitat Resources in Australia

Important breeding habitats for the New Zealand fur seal within the Australian jurisdiction include islands off Western Australia, South Australia and Tasmania (including Macquarie Island). There are numerous locations around the coast of Australia that represent important habitat for non-breeding colonies, including Montague Island near Narooma in NSW (Shaughnesy *et al.,* 2001).

Important Habitat Values for the Species

The preferred habitat of this species for breeding and haul-out sites is rocky platforms and islands but it appears to avoid exposed rock platforms and sandy and pebbly beaches. New Zealand fur seals congregate at specific sites between October and mid-January to breed. New Zealand fur seal foraging habitat includes both shallow inshore waters and the margins of the continental shelf where it feeds on cephalopods, bony fish and seabirds.

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to this species include commercial and recreational fishing operations, particularly bycatch mortality, reduced food availability and entanglement or ingestion of plastic debris. Potential impacts associated with the proposal include boat strikes, acoustic pollution, reduced foraging habitat availability, entanglement and ingestion of marine debris.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not within significant breeding, resting or feeding grounds. The proposed leases represent a relatively small proportion of potential habitat in the wider area and will not isolate any habitat.
4. Boating traffic and noise associated with the leases will be kept to a minimum and implementation of safe boating practices in relation to marine fauna will be mandatory for all lease operators.

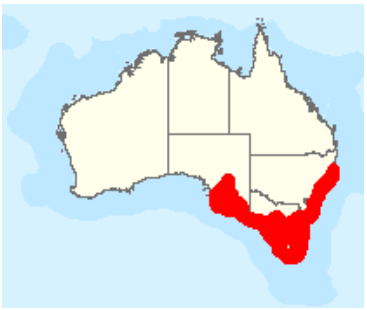
Monitoring and Management

Marine fauna interactions will be monitored and reviewed regularly.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impact on the New Zealand fur seal.

Marine Mammals



Common Name

Australian fur seal

Latin Name

Arctocephalus pusillus

EPBC Status	FM / TSC Listing
Listed Marine	Vulnerable

Distribution across Australia

The Australian fur seal is found around Bass Strait, Tasmania, southern Victoria, on islands off South Australia and along the coast of NSW up to the Mid North Coast (Shaughnessy, 1999).

Critical Habitat Resources in Australia

There are ten locations along the Victorian coast and Tasmanian islands in Bass Strait where the Australian fur seal breeds. There are also a number of non-breeding colonies between Jervis Bay in NSW and Kangaroo Island in South Australia (Web Reference 4). Montague Island near Narooma is the main haul-out site in NSW but Green Cape (far south coast) and Steamers Beach (south of Jervis Bay) are also regular haul-out sites within NSW waters.

Important Habitat Values for the Species

The preferred habitat of this species for breeding and haul-out sites is rocky islands, and includes pebble and boulder beaches and gentle sloping rock ledges (Shaughnessy, 1999). Breeding colonies form between October and January with males coming ashore first to establish territories. Foraging habitat includes inshore waters of a depth up to 200 m with its diet consisting of cephalopods, bony fish and crustaceans.

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to this species include commercial and recreational fishing operations, particularly bycatch mortality, reduced food availability and entanglement or ingestion of plastic debris. Potential impacts associated with the proposal include boat strikes, acoustic pollution, reduced foraging habitat availability, entanglements and ingestion of marine debris.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not within significant breeding, resting or feeding grounds. The proposed leases represent a relatively small proportion of potential habitat in the wider area and will not isolate any habitat.
4. Boating traffic and noise associated with the leases will be kept to a minimum and implementation of safe boating practices in relation to marine fauna will be mandatory for all lease operators.

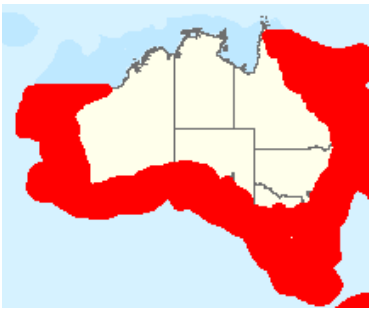
Monitoring and Management

Marine fauna interactions will be monitored and reviewed on a regular basis.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impact on the Australian fur seal.

Marine Mammals



Common Name

Minke whale

Latin Name

Balaenoptera acutorostrata

EPBC Status	FM / TSC Listing
Cetacean	N/A

Distribution across Australia

In Australia, the minke whale is recorded off the coast of Queensland, New South Wales, Victoria, Tasmania, South Australia and Western Australia (Web Reference 1).

Critical Habitat Resources in Australia

No habitat critical to the survival of the minke whale occurs in the wider study area.

Important Habitat Values for the Species

Minke whales migrate seasonally and inhabit polar, temperate and tropical areas but are considered to prefer cooler waters. This species is found within coastal and offshore areas and is a seasonal feeder with a diet consisting of krill, copepods and small schooling fish, such as sardines, herring and anchovies (Web Reference 1).

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to the minke whale include pollution, direct disturbance from seismic and defence operations, collision with large vessels, entanglement in fishing gear, overfishing of krill and climate change (Web Reference 1). Potential impacts associated with the proposal include boat strikes, acoustic pollution, reduced foraging habitat availability, entanglement in longline infrastructure and ingestion of marine debris.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not within significant breeding, resting or feeding grounds. The proposed leases represent a relatively small proportion of potential habitat in the wider area and will not isolate any habitat.
4. Boating traffic and noise associated with the leases will be kept to a minimum and implementation of safe boating practices in relation to marine fauna will be mandatory for all lease operators.

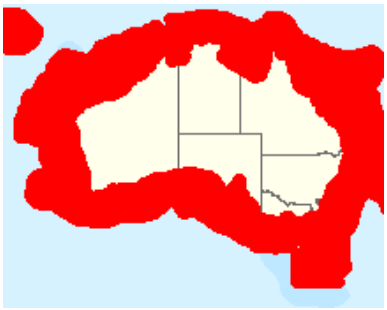
Monitoring and Management

Marine fauna interactions including entanglements, boating traffic and noise, will be monitored and reviewed regularly.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impact on the minke whale.

Marine Mammals



Common Name

Common dolphin, short-beaked common dolphin

Latin Name

Delphinus delphis

EPBC Status	FM / TSC Listing
Cetacean	N/A

Distribution across Australia

In Australia, the common dolphin is recorded in all states and territories but is predominately found in southern Australian waters (Web Reference 1).

Critical Habitat Resources in Australia

The common dolphin inhabits offshore waters and there appears to be two main locations within Australian jurisdiction which this species inhabits - the southern south-eastern Indian Ocean and the Tasman Sea (Web Reference 1). However, no habitat critical to the survival of the common dolphin occurs in the wider study area.

Important Habitat Values for the Species

The common dolphin occurs in temperate, subtropical and tropical areas inhabiting neritic, pelagic and oceanic waters. This species is an opportunistic feeder preying upon shoaling and mesopelagic fish and cephalopods (Web Reference 1).

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to the common dolphin include incidental catch, pollution, habitat degradation, environmental changes, competition with fisheries and direct catch (Web Reference 1). Potential impacts associated with the proposal include boat strikes, acoustic pollution, reduced foraging habitat availability, entanglements and ingestion of marine debris.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not within significant breeding, resting or feeding grounds. The proposed leases represent a relatively small proportion of potential habitat in the wider area and will not isolate any habitat.
4. Boating traffic and noise associated with the leases will be kept to a minimum and implementation of safe boating practices in relation to marine fauna will be mandatory for all lease operators.

Monitoring and Management

Marine fauna interactions including entanglements, boating traffic and noise, will be monitored and reviewed regularly.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impact on the common dolphin.

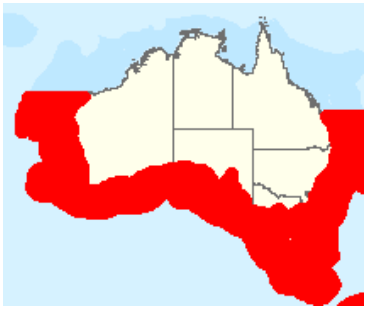
Marine Mammals

Common Name

Southern right whale

Latin Name

Eubalaena australis



EPBC Status	FM / TSC Listing
Endangered, Migratory, Cetacean	Vulnerable

Distribution across Australia

Southern right whales are seasonally recorded in the coastal waters of all Australian states ranging from Hervey Bay and Stradbroke Island in Queensland and around the southern coastline, including Tasmania, to Exmouth in Western Australia.

Critical Habitat Resources in Australia

Habitat important to the survival of the species are those areas known to seasonally support significant aggregations of whales and those ecosystem processes upon which southern right whales rely. Significant calving areas are located in Victoria, South Australia and Western Australia, generally consisting of shallow (5-10 m) gradually sloping protected bays. It is thought likely that foraging habitat is related to oceanographic parameters and ecological processes affecting concentration and distribution across Australia of prey which consists predominantly of zooplankton. Southern right whales are known to be present along the east coast of Australia between May and November. No habitat considered important for southern right whales occurs in the direct area of the proposed Commercial Shellfish Aquaculture Leases.

Important Habitat Values for the Species

There is limited information on the southern right whale's feeding and migratory habitat but it is thought to be related to bathymetric and oceanographic parameters and ecological processes affecting prey concentration (Web Reference 1). The diet of the southern right whale consists of euphausids, copepod and amphipod crustaceans.

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to the southern right whale include expansion of scientific whaling, habitat degradation, pollution, climate and oceanographic change and prey depletion (over harvesting). Potential impacts associated with the proposal include boat strikes, acoustic pollution, reduced foraging habitat availability, entanglements and ingestion of marine debris.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. vessel storage bins.
3. The proposed leases represent a relatively small proportion of potential habitat in the wider area and will not isolate any habitat.
4. Boating traffic and noise associated with the leases will be kept to a minimum and implementation of safe boating practices in relation to marine fauna will be mandatory for all lease operators.

Monitoring and Management

Marine fauna interactions will be monitored and reviewed regularly.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impact on the southern right whale.

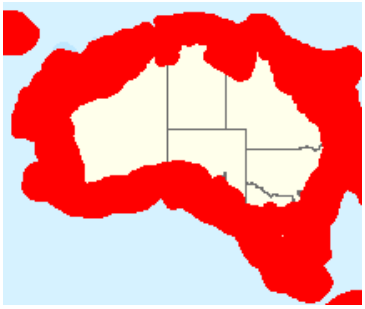
Marine Mammals

Common Name

Risso's dolphin, Grampus

Latin Name

Grampus griseus



EPBC Status	FM / TSC Listing
Cetacean	N/A

Distribution across Australia

In Australia, there are records of the risso's dolphin off the coast of all Australian states except Tasmania and the Northern Territory (Web Reference 1).

Critical Habitat Resources in Australia

The only suspected 'resident' population of risso's dolphins in Australia is located around Fraser Island in Queensland (Web Reference 1). No habitat critical to the survival of the risso's dolphin occurs in the wider study area.

Important Habitat Values for the Species

The risso's dolphin inhabits inshore and offshore waters in subantarctic, temperate, subtropical and tropical regions. However, this species is predominately oceanic and pelagic and appears to have a preference for warm temperate to tropical waters. The risso's dolphin is frequently sighted over the continental slope in waters deeper than 1000 m and has a diet consisting of squid, octopus and fish (Web Reference 1).

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to the risso's dolphin include direct and incidental catch, pollution, acoustic pollution, habitat degradation, tourism, overfishing, intentional killing, live capture and shark nets (Web Reference 1). Potential impacts associated with the proposal include boat strikes, acoustic pollution, reduced foraging habitat availability, entanglement in longline infrastructure and ingestion of marine debris.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not within significant breeding, resting or feeding grounds. The proposed leases represent a relatively small proportion of potential habitat in the wider area and will not isolate any habitat.
4. Boating traffic and noise associated with the leases will be kept to a minimum and implementation of safe boating practices in relation to marine fauna will be mandatory for all lease operators.

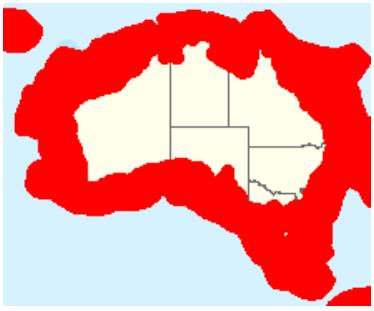
Monitoring and Management

Marine fauna interactions including entanglements, boating traffic and noise, will be monitored and reviewed regularly.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impact on the risso's dolphin.

Marine Mammals



Common Name

Humpback whale

Latin Name

Megaptera novaeangliae

EPBC Status	FM / TSC Listing
Vulnerable, Migratory, Cetacean	Vulnerable

Distribution across Australia

In Australia, humpback whales are distributed throughout the Australian Antarctic, Commonwealth offshore, State and Territory waters. Humpback whales travel northward to breeding areas between May and July and return southward to their sub-Antarctic feeding grounds between September and November. Calving grounds are found along the mid and northern parts of the east and west coasts and feeding grounds in the Southern Ocean. Northern and southern hemisphere populations are thought to be genetically distinct due to their temporal migration separation (Web Reference 1).

Critical Habitat Resources in Australia

Habitat important and potentially critical to the survival of humpback whales is defined as those areas known to seasonally support significant aggregations of whales and those ecosystem processes upon which they rely. Calving, resting and feeding areas and also certain sections of migratory pathways are considered of particular importance. Feeding usually takes place in productive Antarctic waters where Antarctic krill is concentrated, although some feeding behaviour has been reported near mainland Australia. Important calving areas within Australian waters include the Great Barrier Reef complex and southern Kimberley between Broome and the northern end of Camden Sound. Important migratory pathways include Abrolhos and Geraldton Islands, Point Cloats to North West Cape in Western Australia, Cape Byron in NSW and east of Moreton and Stradbroke Island in Queensland. Twofold Bay in NSW, the Whitsundays, Moreton Bay, Hervey Bay, Bell Cay, the Palm Island Group and the Swain Reefs in Queensland, as well as Geographe Bay, Exmouth Gulf and around Houtman Albrolhos Islands in Western Australia are some important resting areas (Web Reference 1).

Important Habitat Values for the Species

Humpback whales inhabit the ice-edge in their Antarctic feeding grounds (south of 55° S) during summer. Their diet consists of krill, predominately *Euphausia superba*, which are consumed using a variety of feeding methods such as 'lunge feeding' and 'bubble feeding'. In winter, this species migrates to warmer waters to mate and pregnant females give birth to calves near islands and atolls (Web Reference 1).

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to humpback whales include expansion of scientific whaling, pollution, direct disturbance from seismic and defence operations, collision with large vessels, entanglement in fishing gear, climate change, habitat degradation and prey depletion due to over harvesting (Web Reference 1). Potential impacts associated with the proposal include boat strikes, acoustic pollution, reduced foraging habitat availability, entanglement in longline infrastructure and ingestion of marine debris.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.

3. The proposed leases represent a relatively small proportion of potential habitat in the wider area and will not isolate any habitat.
4. Boating traffic and noise associated with the leases will be kept to a minimum and implementation of safe boating practices in relation to marine fauna will be mandatory for all lease operators.

Monitoring and Management

Marine fauna interactions including entanglements, boating traffic and noise, will be monitored and reviewed regularly.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impact on humpback whales.

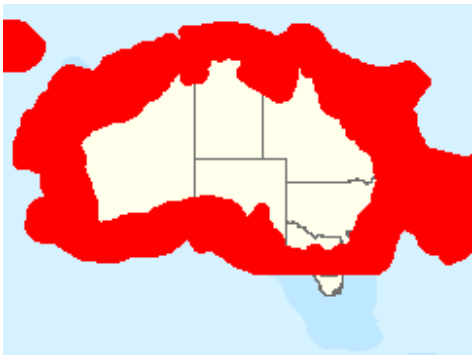
Marine Mammals

Common Name

Bryde's whale

Latin Name

Balaenoptera edeni



EPBC Status	FM / TSC Listing
Migratory, Cetacean	N/A

Distribution across Australia

Bryde's whale is present in temperate to tropical waters being restricted to latitudes of 40°N and 40°S inhabiting inshore and offshore environments. In Australia, bryde's whale has been recorded in every state except Northern Territory with a sighting in NSW and Victoria, and multiple strandings of the species in the other states (Web Reference 1).

Critical Habitat Resources in Australia

No habitat critical to the survival of bryde's whale occurs in the wider study area.

Important Habitat Values for the Species

There are two forms of bryde's whale that inhabit and utilise different habitats. The coastal form of bryde's whale occupy the 200 m depth isobar travelling up the coast for available prey, where the offshore form is found in deeper waters of 500-1000 m (Web Reference 1). Both forms of bryde's whale use the upper layers of the ocean and are therefore are recognised as pelagic species (Web Reference 1).

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to bryde's whale include pollution, scientific whaling, direct disturbance possibly from seismic and/or defence operations, collision with large vessels, entanglement in fishing gear and interactions with fisheries (Web Reference 1). Potential impacts associated with the proposal include boat strikes, acoustic pollution, reduced foraging habitat availability, entanglement in longline infrastructure and ingestion of marine debris.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not within significant breeding, resting or feeding grounds. The proposed leases represent a relatively small proportion of potential habitat in the wider area and will not isolate any habitat.
4. Boating traffic and noise associated with the leases will be kept to a minimum and implementation of safe boating practices in relation to marine fauna will be mandatory for all lease operators.

Monitoring and Management

Marine fauna interactions will be monitored and reviewed regularly.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impact on the bryde's whale.

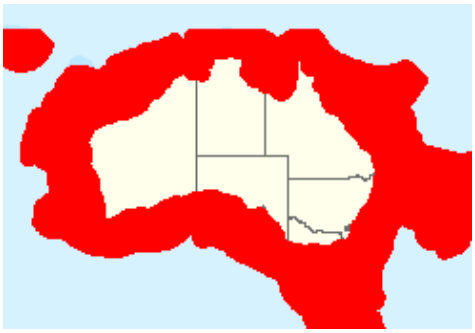
Marine Mammals

Common Name

Blue whale

Latin Name

Balaenoptera musculus



EPBC Status	FM / TSC Listing
Migratory, Endangered, Cetacean	Endangered

Distribution across Australia

The blue whale has a cosmopolitan distribution in tropical to Antarctic waters. In Australia, the blue whale is widespread occurring around the entire coastline at various times of the year. These waters are used predominantly for opportunistic feeding or as part of a migration route. However, there are three known significant feeding areas around the southern continental shelf - Perth Canyon, the Bonney Upwelling and adjacent upwelling areas of South Australia and Victoria.

Critical Habitat Resources in Australia

While there are three significant feeding areas for the blue whale on the southern coast of Australia, there is no habitat critical to the survival of this species occurring in the direct or wider study area.

Important Habitat Values for the Species

The blue whale has highly variable habitat requirements, from migrating to polar regions in summer, upwelling areas for feeding and deep water adjacent to tropical island groups for breeding (Web Reference 1). In these polar regions, blue whales feed on krill but are also known to feed on fish and squid (Web Reference 1).

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to the blue whale include scientific whaling, habitat degradation, climate change, prey depletion from over harvesting, direct disturbance possibly from seismic and/or defence operations, collision with large vessels, entanglement in fishing gear and low reproduction rates (Web Reference 1). Potential impacts associated with the proposal include increased risk of boat strikes, increased acoustic pollution due to increased boating activity, reduced foraging habitat availability, entanglement in longline infrastructure and ingestion of marine debris.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. vessel storage bins.
3. The proposed leases represent a relatively small proportion of potential habitat in the wider area and will not isolate any habitat.
4. Boating traffic and noise associated with the leases will be kept to a minimum and implementation of safe boating practices in relation to marine fauna will be mandatory for all lease operators.

Monitoring and Management

Marine fauna interactions will be monitored and reviewed regularly.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impact on the blue whale.

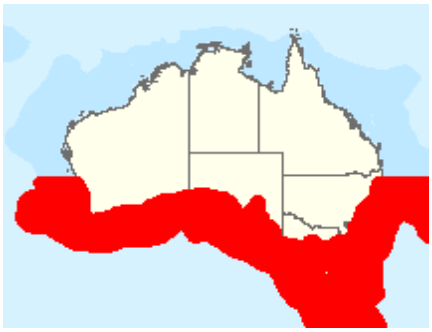
Marine Mammals

Common Name

Pygmy right whale

Latin Name

Caperea marginata



EPBC Status	FM / TSC Listing
Migratory, Cetacean	N/A

Distribution across Australia

The pygmy right whale has been recorded intermittently on the Australian coastline between 32° N and 47°S. The northern distribution of the pygmy right whale may be limited to the east and west coasts due to the south flowing East Australian Current (EAC) and the Leeuwin Current (Web Reference 1).

Critical Habitat Resources in Australia

No habitat critical to the survival of pygmy right whale occurs in the direct or wider study area.

Important Habitat Values for the Species

Pygmy right whales have been reported to inhabit significant feeding areas associated with upwellings and with high zooplankton abundance, particularly copepods and small euphausiids, which comprise their main prey (Web Reference 1). These coastal upwelling events appear to be an essential factor in regulating pygmy right whale distribution. Pygmy right whales do not appear to be deep divers implying that they principally inhabit the pelagic zone of oceanic waters.

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to the pygmy right whale include scientific whaling, habitat degradation, climate change, collision with large vessels and entanglement in fishing gear (Web Reference 1). Potential impacts associated with the proposal include increased risk of boat strikes, increased acoustic pollution due to increased boating activity, reduced foraging habitat availability, entanglement in longline infrastructure and ingestion of marine debris.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not within significant breeding, resting or feeding grounds. The proposed leases represent a relatively small proportion of potential habitat in the wider area and will not isolate any habitat.
4. Boating traffic and noise associated with the leases will be kept to a minimum and implementation of safe boating practices in relation to marine fauna will be mandatory for all lease operators.

Monitoring and Management

Marine fauna interactions will be monitored and reviewed regularly.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impact on the pygmy right whale.

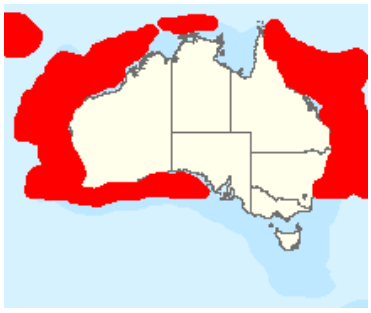
Marine Mammals

Common Name

Killer whale, orca

Latin Name

Orcinus orca



EPBC Status	FM / TSC Listing
Migratory, Cetacean	N/A

Distribution across Australia

The killer whale is found in all seas and oceans of the world usually in family groups. Concentrations have been reported around Tasmania but this species has been recorded from all States of Australia.

Critical Habitat Resources in Australia

No habitat critical to the survival of the killer whale occurs in the direct or wider study area.

Important Habitat Values for the Species

The species occurs in most habitat types from coastal areas to the deep ocean waters, from the tropics to polar regions although sightings near the coast of NSW are rare. These animals are carnivores and one of the most efficient large predators of the ocean. They often work in packs, and will take a broad range of vertebrates including other whales, seals, penguins, fish, sea otters, and turtles. Killer whales have marked territorial behaviour and home ranges. Their prey is determined by what is available in their home range but they also seek out areas of seasonal abundance such as seal pupping sites.

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to the killer whale include pollution, incidental capture, interactions with fisheries and targeted hunting (Web Reference 1). Potential impacts associated with the proposal include acoustic pollution, reduced foraging habitat availability, entanglement in longline infrastructure and ingestion of marine debris.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not within significant breeding, resting or feeding grounds. The proposed leases represent a relatively small proportion of potential habitat in the wider area and will not isolate any habitat.
4. Boating traffic and noise associated with the leases will be kept to a minimum and implementation of safe boating practices in relation to marine fauna will be mandatory for all lease operators.

Monitoring and Management

Marine fauna interactions will be monitored and reviewed regularly.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impact on the killer whale.

Marine Mammals

Common Name

Indo-Pacific, Indian ocean, spotted bottlenose dolphin

Latin Name

Tursiops aduncus

EPBC Status	FM / TSC Listing
Cetacean	N/A

Distribution across Australia

There are records of the Indo-Pacific bottlenose dolphin in northern, eastern and western Australia.

Critical Habitat Resources in Australia

There are four main regions around Australia in which Indo-Pacific bottlenose dolphins are known to inhabit - the Coral Sea, the Tasman Sea, the eastern Indian Ocean and the Arafura/Timor Seas (Web Reference 1). However, no habitat critical to the survival of this species occurs in the wider study area.

Important Habitat Values for the Species

The Indo-Pacific bottlenose dolphin occurs in inshore areas including estuaries, nearshore waters and bays, as well as shallow offshore waters and open coast environments where they feed on a variety of fish and cephalopods.

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to the Indo-Pacific bottlenose dolphin include direct and incidental catch, pollution, acoustic pollution, habitat degradation, tourism, overfishing, intentional killing, live capture and shark nets (Web Reference 1). Potential impacts associated with the proposal include increased risk of boat strikes, increased acoustic pollution from boating activity, reduced foraging habitat availability, entanglement in longline infrastructure and ingestion of marine debris.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not within main aggregation areas within Jervis Bay. The proposed leases represent a relatively small proportion of potential habitat in the wider area and will not isolate any habitat.
4. Boating traffic and noise associated with the leases will be kept to a minimum and implementation of safe boating practices in relation to marine fauna will be mandatory for all lease operators.

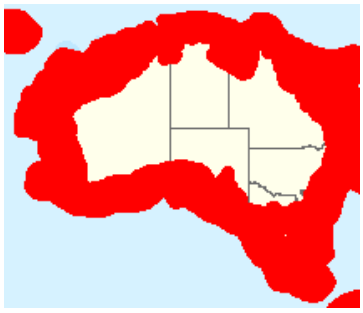
Monitoring and Management

Marine fauna interactions including entanglements, boating traffic and noise, will be monitored and reviewed regularly.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impact on the Indo-Pacific bottlenose dolphin.

Marine Mammals



Common Name

Bottlenose dolphin

Latin Name

Tursiops truncates s str.

EPBC Status	FM / TSC Listing
Cetacean	N/A

Distribution across Australia

In Australia, there are records of the bottlenose dolphin in south-western Western Australia, South Australia, Tasmania, New South Wales and Queensland.

Critical Habitat Resources in Australia

The bottlenose dolphin generally inhabits offshore waters deeper than 30 m but is also found in shallow coastal waters. There appears to be two main locations within Australian jurisdiction which this species inhabits - the South Pacific Ocean and the southern Indian Ocean.

Important Habitat Values for the Species

The bottlenose dolphin occurs in all temperate and tropical waters inhabiting inshore areas, such as lagoons, estuaries, bays and open coast, as well as offshore areas such as oceanic island coasts. Consequently, this species is associated with many types of substrate and habitats, including mud, sand, reefs, mangroves and seagrass beds. Bottlenose dolphins are opportunistic feeders preying upon mesopelagic fish and squid.

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to the bottlenose dolphin include direct and incidental catch, pollution, acoustic pollution, habitat degradation, tourism, overfishing, intentional killing, live capture and shark nets (Web Reference 1). Potential impacts associated with the proposal include increased risk of boat strikes, increased acoustic pollution from boating activity, reduced foraging habitat availability, entanglement in longline infrastructure and ingestion of marine debris.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. vessel storage bins.
3. Site selection - leases are not within main aggregation areas within Jervis Bay. The proposed leases represent a relatively small proportion of potential habitat in the wider area and will not isolate any habitat area.
4. Boating traffic and noise associated with the leases will be kept to a minimum and implementation of safe boating practices in relation to marine fauna will be mandatory for all lease operators.

Monitoring and Management

Marine fauna interactions will be monitored and reviewed regularly.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impact on the bottlenose dolphin.

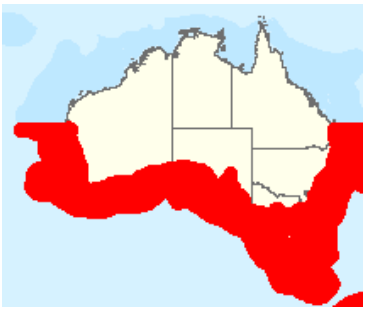
Marine Mammals

Common Name

Dusky dolphin

Latin Name

Lagenorhynchus obscurus



EPBC Status	FM / TSC Listing
Migratory, Cetacean	N/A

Distribution across Australia

Dusky dolphins are southern hemisphere dolphins usually found in temperate waters and often seen in large groups of hundreds. They can be seen inshore in the warmer months and may frequent bays. Low rates of observations or strandings suggest that the dusky dolphin is rare along the south-east Australian coast and are unlikely to be resident.

Critical Habitat Resources in Australia

No habitat critical to the survival of the dusky dolphin occurs in the wider study area.

Important Habitat Values for the Species

The dusky dolphin predominately inhabits inshore waters in sub-Antarctic and temperate areas but is also considered to be pelagic (Web Reference 1). This species is often found over the continental shelf and slope preferring waters with surface temperatures between 10 ºC and 18 ºC. The dusky dolphins diet consists of a range of schooling fish, particularly anchovies, as well as squid and lantern fishes (Web Reference 1).

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to the dusky dolphin include direct and incidental catch, pollution, acoustic pollution, habitat degradation, tourism, overfishing, intentional killing, live capture and shark nets (Web Reference 1). Potential threats associated with the proposal include boat strikes, acoustic pollution, reduced foraging habitat availability, entanglement in longline infrastructure and ingestion of marine debris.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not within significant breeding, resting or feeding grounds. The proposed leases represent a relatively small proportion of potential habitat in the wider area and will not isolate any habitat.
4. Boating traffic and noise associated with the leases will be kept to a minimum and implementation of safe boating practices in relation to marine fauna will be mandatory for all lease operators.

Monitoring and Management

Marine fauna interactions will be monitored and reviewed regularly.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impact on the dusky dolphin.

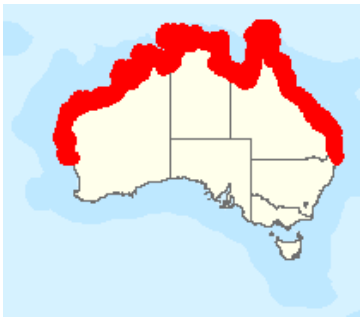
Marine Mammals

Common Name

Dugong

Latin Name

Dugong dugon



EPBC Status	FM / TSC Listing
Migratory, Listed Marine, Cetacean	Endangered

Distribution across Australia

Dugongs are recorded in north Australian waters including Moreton Bay, the Gulf of Carpentaria, the Great Barrier Reef in Queensland, as well as Shark Bay and the northern coast of Western Australia. The Dugong occasionally visits the coastal and estuarine waters of NSW (Web Reference 1) where it is suggested that warm currents, low rainfall and availability of seagrass in this locality draws some individuals south of their accepted range.

Critical Habitat Resources in Australia

No critical habitat for the dugong has been declared in NSW. However, dugongs have been sighted in coastal and estuarine waters around Brisbane Water, Lake Macquarie, Port Stephens, and Wallis Lake in 2002/03 but these individuals are thought to be non-breeding vagrants. These areas are associated with some of the largest seagrass beds in NSW and the presence of the dugong in these areas usually coincides with warm water temperatures (>18°C).

Important Habitat Values for the Species

Dugongs are herbivores that eat seagrass and frequent coastal waters, estuarine creeks and streams, wide, shallow protected bays and mangrove channels, the leeward side of inshore islands and offshore areas where the continental shelf is shallow, wide and protected. They like to live in large herds but due to declining numbers are often now found in smaller groups and although they only live where there is seagrass, they may migrate between these areas.

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to the dugong include habitat degradation and loss, boat strikes, entanglements, ingestion of marine debris, disease, parasites, tourism and harassment, acoustic disturbance, chemical pollution, incidental catch, indigenous harvest, aquaculture activities and tidal surges (Web Reference 1). Potential impacts associated with the proposal include boat strikes, acoustic pollution, reduced foraging habitat availability, entanglements and ingestion of marine debris.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. vessel storage bins.
3. Site selection - there are no significant seagrass beds in the direct lease areas. The proposed leases represent a relatively small proportion of potential habitat in the wider area and will not isolate any habitat area.
4. Boating traffic and noise associated with the leases will be kept to a minimum and implementation of safe boating practices in relation to marine fauna will be mandatory for all lease operators.

Monitoring and Management

Marine fauna interactions will be monitored and reviewed regularly.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impact on the dugong.

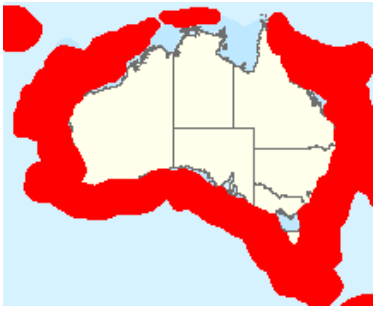
Marine Mammals

Common Name

Sperm whale

Latin Name

Physeter macrocephalus



EPBC Status	FM / TSC Listing
Migratory, Cetacean	Vulnerable

Distribution across Australia

Sperm whales have been sighted off the coast of all the Australian states (Web Reference 1). Their distribution is patchy but wide ranging extending from the tropics to the polar pack-ice including the subantarctic islands: Macquarie and Heard. Sperm whales tend to concentrate where the seabed rises steeply from a greater depth beyond the continental shelf.

Critical Habitat Resources in Australia

No habitat critical to the survival of the sperm whale occurs in the wider study area.

Important Habitat Values for the Species

The habitat of the sperm whale is difficult to categorise due to its cosmopolitan nature and its ability to inhabit all oceans. Sperm whales tend to inhabit offshore areas with a water depth of 600 m or more and are uncommon in waters with a depth of less than 300 m. However, there are occasional records of sperm whales occurring inshore in the wider study area. The sperm whales diet consists of cephalopods such as squid and octopus, as well as large demersal fishes such as rays, teleosts and sharks (Web Reference 1).

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to the sperm whale include entrapment in fishing gear (including 'ghost nets'), a resumption of legal commercial whaling, collision with large vessels on shipping lanes beyond the edge of the continental shelf, seismic operations in similar areas causing evasive responses, pollution (e.g. plastic debris), oil spills and dumping of industrial wastes leading to bio-accumulation of toxic substances in body tissues. Potential threats associated with the proposal include boat strikes, acoustic pollution, entanglement in longline infrastructure and ingestion of marine debris.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. vessel storage bins.
3. Site selection - leases are not within significant breeding, resting or feeding grounds.
4. Boating traffic and noise associated with the leases will be kept to a minimum and implementation of safe boating practices in relation to marine fauna will be mandatory for all lease operators.

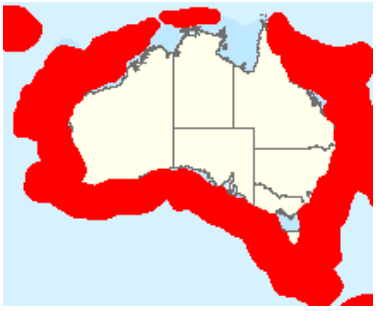
Monitoring and Management

Marine fauna interactions will be monitored and reviewed regularly.

Predicted Outcome/ Effectiveness

Given the rarity of the sperm whales in coastal waters it is unlikely this species would be impacted as a result of the proposal and is therefore not considered to represent a significant threat.

Marine Mammals



Common Name

Antarctic minke whale

Latin Name

Balaenoptera bonaerensis

EPBC Status	FM / TSC Listing
Migratory, Cetacean	

Distribution across Australia

Antarctic minke whales have been sighted off the coast of all States but not off Northern Territory. This species is known to occur north of 21 °S off the east coast but their distribution off the west coast is currently unknown. Antarctic minke whales distribution also extends down to approximately 65° S in the Australian Antarctic Territory (Web Reference 1).

Critical Habitat Resources in Australia

No habitat critical to the survival of the Antarctic minke whale occurs in the wider study area.

Important Habitat Values for the Species

Antarctic minke whales primarily inhabit cold temperate to Antarctic waters between 21° S and 65° S in offshore and pelagic areas. During winter (breeding season), this species occupies pelagic waters that are usually greater than 600 m deep. Antarctic minke whales migrate to higher latitudes in summer to feed. Adults feed predominately on Antarctic krill (*Euphausia superba*) but smaller krill species and copepods are also consumed.

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to Antarctic minke whales include commercial and scientific whaling, direct disturbance from seismic and/or defence operations, collision with large vessels, entanglement in fishing gear and pollution (e.g. plastic debris, oil spills and dumping of industrial wastes leading to bio-accumulation of toxic substances in body tissues). Potential threats associated with the proposal include boat strikes, acoustic pollution, entanglements and ingestion of marine debris.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. vessel storage bins.
3. Site selection - leases are not within significant breeding, resting or feeding grounds. The proposed leases represent a relatively small proportion of potential habitat in the wider area and will not isolate any area of habitat.
4. Boating traffic and noise associated with the leases will be kept to a minimum and implementation of safe boating practices in relation to marine fauna will be mandatory for all lease operators.

Monitoring and Management

Marine fauna interactions will be monitored and reviewed regularly.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impact on the Antarctic minke whale.

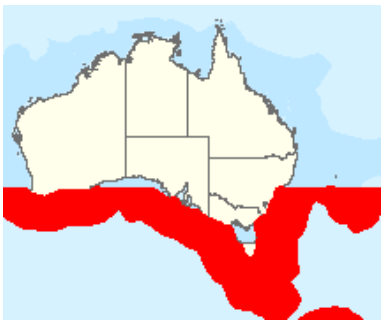
Marine Mammals

Common Name

Arnoux's beaked whale

Latin Name

Berardius arnuxii



EPBC Status	FM / TSC Listing
Cetacean	

Distribution across Australia

The distribution of arnoux's beaked whales in Australia is largely based on stranded specimens which have occurred in South Australia, south-west Western Australia, Tasmania and the sub Antarctic. Possible sightings have occurred inshore off the south coast of NSW and off South Australia. Confirmed sightings have occurred in Australian Antarctic territorial waters. The Tasman Sea and around the East Pacific Rise are where this species has been most frequently sighted (Web Reference 1).

Critical Habitat Resources in Australia

No habitat critical to the survival of the arnoux's beaked whale is known to occur in Australia.

Important Habitat Values for the Species

The arnoux's beaked whale inhabits deep oceanic waters, particularly submarine escarpments and sea mounts (which tend to carry higher prey densities). It is thought to dive to depths of greater than 1000 m to pursue prey. This species has also been sighted along the ice edge south of the Indian Ocean. There is a paucity of information on its diet but based on the diet of other beaked whales, it is assumed that it eats squid, octopus, fishes and pelagic fishes e.g. mackerel, sardines, pollack and saury (Web Reference 1).

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to the arnoux's beaked whale include entanglement in drift nets and other nets set, lost or discarded in international waters, competition from expanding commercial fisheries in higher latitudes (e.g. Orange Roughy and Patagonian Toothfish), pollution (leading to accumulation of toxins in body tissues) and anthropogenic noise. Potential threats associated with the proposal include boat strikes, acoustic pollution, entanglements and ingestion of marine debris.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. vessel storage bins.
3. Site selection - leases are not within significant breeding, resting or feeding grounds. The proposed leases represent a relatively small proportion of potential habitat in the wider area and will not isolate any habitat.
4. Boating traffic and noise associated with the leases will be kept to a minimum and implementation of safe boating practices in relation to marine fauna will be mandatory for all lease operators.

Monitoring and Management

Marine fauna interactions will be monitored and reviewed regularly.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impact on the arnoux's beaked whale.

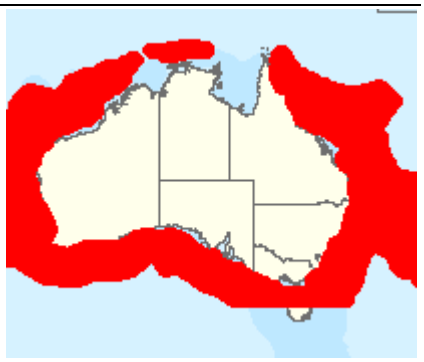
Marine Mammals

Common Name

Short-finned pilot whale

Latin Name

Globicephala macrorhynchus



EPBC Status	FM / TSC Listing
Cetacean	

Distribution across Australia

In Australia, short-finned pilot whales inhabit temperate (10–22 °C) to tropical (22–32 °C) oceanic waters. Stranding events have occurred in all states and territories.

Critical Habitat Resources in Australia

No habitat critical to the survival of the short-finned pilot whale is known to occur in Australian waters.

Important Habitat Values for the Species

Short-finned pilot whales are a deep water species that inhabits waters near the edge of the continental shelf and over deep submarine canyons but may frequent coastal seas. The diet of this species consists of squid, cuttlefish, octopus and fish. Short-finned pilot whale distribution and movements appear to be regulated by prey availability (Web Reference 1).

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to the short-finned pilot whale include localised fisheries (particularly in Caribbean, Japan, Indonesia and Sri Lanka), entanglement in drift nets and other nets set, lost or discarded in international waters, competition from expanding commercial fisheries (especially mid to high latitudes), pollution (leading to accumulation of toxins in body tissues), interactions with commercial fisheries and anthropogenic noise (i.e. oil and gas exploration), (Web Reference 1). Potential threats associated with the proposal include boat strikes, acoustic pollution, entanglements and ingestion of marine debris.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not within significant breeding, resting or feeding grounds. The proposed leases represent a relatively small proportion of potential habitat in the wider area and will not isolate any habitat.
4. Boating traffic and noise associated with the leases will be kept to a minimum and implementation of safe boating practices in relation to marine fauna will be mandatory for all lease operators.

Monitoring and Management

Marine fauna interactions will be monitored and reviewed regularly.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impact on the short-finned pilot whale.

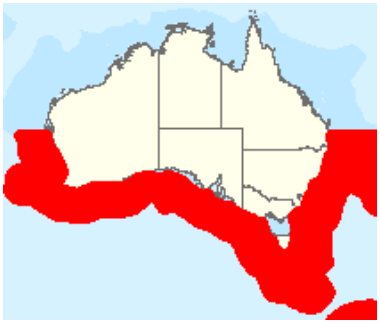
Marine Mammals

Common Name

Long-finned Pilot Whale

Latin Name

Globicephala melas



EPBC Status	FM / TSC Listing
Cetacean	

Distribution across Australia

In Australia, the long-finned pilot whale occurs in waters off southern Australia (all states) and at Macquarie and Heard Island. However, in Northern Territory there has only been one sighting of this species (Web Reference 1).

Critical Habitat Resources in Australia

No habitat critical to the survival of the long-finned pilot whale is known to occur in Australian waters.

Important Habitat Values for the Species

The long-finned pilot whale inhabits oceanic waters and waters around all major land masses. This species typically occurs in temperate (10–20°C) and subantarctic (1-8°C) deep oceanic waters and high productivity zones along the continental slope. The long-finned pilot whale also inhabits shallow shelf waters (< 200 m) in pursuit of favoured prey species. Their diet mainly consists of squid but fish are also consumed. Long-finned pilot whales mostly feed at night and tend to bunch up when travelling and spread out when feeding (Web Reference 1).

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to the long-finned pilot whale include localised fisheries (particularly in Caribbean, Japan, Indonesia and Sri Lanka), entanglement in drift nets and other nets set, lost or discarded in international waters, competition from expanding commercial fisheries (especially mid to high latitudes), pollution (leading to accumulation of toxins in body tissues), interactions with commercial fisheries, anthropogenic noise (i.e. oil and gas exploration and development), Department of Defence activities, recreational boating and marine tourism (Web Reference 1). Potential threats associated with the proposal include boat strikes, acoustic pollution, entanglements and ingestion of marine debris.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. vessel storage bins.
3. Site selection - leases are not within significant breeding, resting or feeding grounds. The proposed leases represent a relatively small proportion of potential habitat in the wider area and will not isolate any habitat.
4. Boating traffic and noise associated with the leases will be kept to a minimum and implementation of safe boating practices in relation to marine fauna will be mandatory for all lease operators.

Monitoring and Management

Marine fauna interactions will be monitored and reviewed regularly.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impact on the long-finned pilot whale.

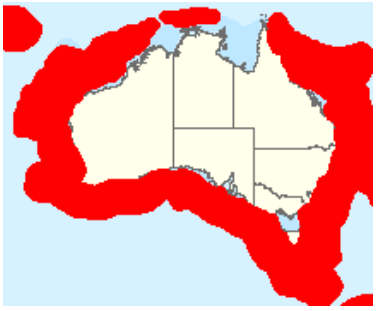
Marine Mammals

Common Name

Pygmy sperm whale

Latin Name

Kogia breviceps



EPBC Status	FM / TSC Listing
Cetacean	

Distribution across Australia

In Australia, the pygmy sperm whale has been recorded in all states (predominately strandings) but not in the Northern Territory. However, their distribution within Australian waters cannot be accurately calculated due to the paucity of records (Web Reference 1).

Critical Habitat Resources in Australia

No habitat critical to the survival of the pygmy sperm whale is known to occur in Australian waters.

Important Habitat Values for the Species

The pygmy sperm whale is a pelagic open ocean species that inhabits temperate to tropical waters. This species predominately occurs beyond the continental shelf edge (opposed to the dwarf sperm whale which tends to live over or near the shelf edge). The pygmy sperm whale is thought to feed in deep water on cephalopods but it occasionally consumes deep-sea fishes and shrimp (Web Reference 1).

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to the pygmy sperm whale include commercial whaling, entanglement in drift nets and other nets set, lost or discarded in international waters, commercial fisheries interactions (e.g. bycatch), ingestion of plastic debris, competition from expanding commercial fisheries (particularly pelagic squid) and pollution (leading to accumulation of toxins in body tissues) (Web Reference 1). Potential threats associated with the proposal include boat strikes, acoustic pollution, entanglements and ingestion of marine debris.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not within significant breeding, resting or feeding grounds. The proposed leases represent a relatively small proportion of potential habitat in the wider area and will not isolate any habitat.
4. Boating traffic and noise associated with the leases will be kept to a minimum and implementation of safe boating practices in relation to marine fauna will be mandatory for all lease operators.

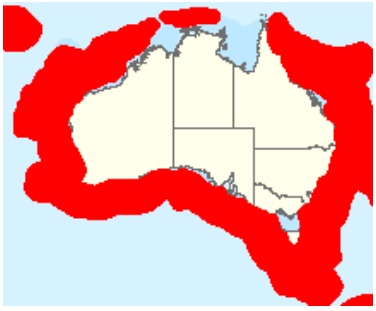
Monitoring and Management

Marine fauna interactions will be monitored and reviewed regularly.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impact on the pygmy sperm whale.

Marine Mammals



Common Name

Dwarf sperm whale

Latin Name

Kogia sima

EPBC Status	FM / TSC Listing
Cetacean	

Distribution across Australia

In Australia, the dwarf sperm whale has been recorded in Western Australia, the Northern Territory, NSW, Tasmania and South Australia, which were predominately stranded animals (Web Reference 1).

Critical Habitat Resources in Australia

No habitat critical to the survival of the dwarf sperm whale is known to occur in Australian waters.

Important Habitat Values for the Species

The dwarf sperm whale is a pelagic species that inhabits temperate to tropical waters around the world. This species is thought to live over or near the edge of the continental shelf (opposed to the pygmy sperm whale which appears to prefer oceanic waters beyond the edge of the shelf). Dwarf sperm whales hunt for prey in deep water consuming cephalopods and occasionally deep-sea fishes and crustaceans (Web Reference 1).

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to the dwarf sperm whale include commercial whaling, entanglement in drift nets and other nets set, lost or discarded in international waters, commercial fisheries interactions (e.g. bycatch), ingestion of plastic debris, competition from expanding commercial fisheries (particularly pelagic squid), vessel strikes and pollution (leading to accumulation of toxins in body tissues) (Web Reference 1). Potential threats associated with the proposal include boat strikes, acoustic pollution, entanglements and ingestion of marine debris.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not within significant breeding, resting or feeding grounds. The proposed leases represent a relatively small proportion of potential habitat in the wider area and will not isolate any habitat.
4. Boating traffic and noise associated with the leases will be kept to a minimum and implementation of safe boating practices in relation to marine fauna will be mandatory for all lease operators.

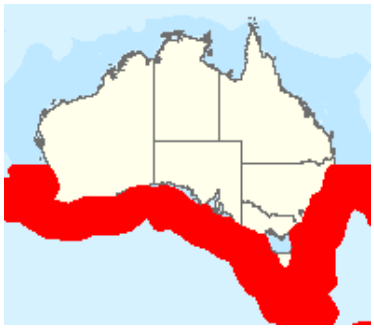
Monitoring and Management

Marine fauna interactions will be monitored and reviewed regularly.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impact on the dwarf sperm whale.

Marine Mammals



Common Name

Southern right whale dolphin

Latin Name

Lissodelphis peronii

EPBC Status	FM / TSC Listing
Cetacean	

Distribution across Australia

In Australia, the southern right whale dolphin is found in southern continental Australian waters. There are records that this species has stranded in Tasmania, the Great Australian Bight and around south-western Australia (Web Reference 1).

Critical Habitat Resources in Australia

No habitat critical to the survival of the southern right whale dolphin is known to occur in Australia waters.

Important Habitat Values for the Species

The southern right whale dolphin is a pelagic species that occurs between the Subtropical and Subantarctic Convergences. This species generally inhabits offshore waters but occasionally frequents deep inshore waters and the outer edges of the continental shelf. Its distribution has been found to be associated with cold currents and upwelling conditions, as well as the West Wind Drift. The diet of the southern right whale dolphin is thought to consist of myctophids, other mesopelagic fish, squid, crustaceans and euphausiids (Web Reference 1).

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to the southern right whale dolphin include sporadic whaling, entanglement in drift nets and other nets set (particularly gill-nets), lost or discarded in international waters, commercial fisheries interactions (especially line fishing), ingestion of plastic debris and pollution (leading to accumulation of toxins in body tissues) (Web Reference 1). Potential threats associated with the proposal include boat strikes, acoustic pollution, entanglements and ingestion of marine debris.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not within significant breeding, resting or feeding grounds. The proposed leases represent a relatively small proportion of potential habitat in the wider area and will not isolate any habitat.
4. Boating traffic and noise associated with the leases will be kept to a minimum and implementation of safe boating practices in relation to marine fauna will be mandatory for all lease operators.

Monitoring and Management

Marine fauna interactions will be monitored and reviewed regularly.

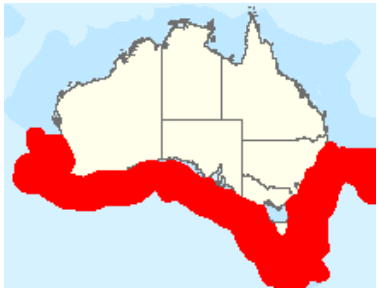
Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impact on the southern right whale dolphin.

Marine Mammals

Common Name

Andrew's beaked whale



Latin Name

Mesoplodon bowdoini

EPBC Status	FM / TSC Listing
Cetacean	

Distribution across Australia

In Australia, andrew's beaked whales have been recorded in NSW, Tasmania, Victoria and Western Australia.

Critical Habitat Resources in Australia

No habitat critical to the survival of andrew's beaked whales is known to occur in Australian waters.

Important Habitat Values for the Species

Andrew's beaked whale inhabits deep oceanic temperate waters between the continental slope and the abyssal plain. This species may also occur in areas near submarine escarpments and sea mounts. Andrew's beaked whale is thought to undertake deep dives in search of prey (up to 5.75 km) and feed on mid- and deep-water squid and fish (Web Reference 1).

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to andrew's beaked whales include anthropogenic noise, entanglement in drift nets and other nets set lost or discarded in international waters, competition from expanding commercial fisheries in higher latitudes (particularly on pelagic squids in temperate waters), ingestion of plastic debris and pollution (leading to accumulation of toxins in body tissues) (Web Reference 1). Potential threats associated with the proposal include boat strikes, acoustic pollution, entanglements and ingestion of marine debris.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not within significant breeding, resting or feeding grounds. The proposed leases represent a relatively small proportion of potential habitat in the wider area and will not isolate any habitat.
4. Boating traffic and noise associated with the leases will be kept to a minimum and implementation of safe boating practices in relation to marine fauna will be mandatory for all lease operators.

Monitoring and Management

Marine fauna interactions will be monitored and reviewed regularly.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impact on andrew's beaked whale.

Marine Mammals

Common Name

Blainville's beaked whale, dense-beaked whale

Latin Name

Mesoplodon densirostris

EPBC Status	FM / TSC Listing
Cetacean	

Distribution across Australia

In Australia, blainville's beaked whale has been recorded in Western Australia, Queensland, NSW, Lord Howe Island, Victoria and Tasmania (Web Reference 1).

Critical Habitat Resources in Australia

No habitat critical to the survival of the blainville's beaked whale is known to occur in Australian waters.

Important Habitat Values for the Species

Blainville's beaked whales inhabit temperate to tropical oceanic waters ranging in depth from 700-1000 m. This species is thought to occur in waters over the continental slope to the abyssal plain. The diet of blainville's beaked whales consists of mid- and deep-water squid and fish (Web Reference 1).

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to blainville's beaked whales include commercial harvesting, anthropogenic noise, entanglement in drift nets and other nets set lost or discarded in international waters, competition from expanding commercial fisheries in lower latitudes (particularly on pelagic squids), ingestion of plastic debris and pollution (leading to accumulation of toxins in body tissues) (Web Reference 1). Potential threats associated with the proposal include boat strikes, acoustic pollution, entanglements and ingestion of marine debris.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not within significant breeding, resting or feeding grounds. The proposed leases represent a relatively small proportion of potential habitat in the wider area and will not isolate any habitat.
4. Boating traffic and noise associated with the leases will be kept to a minimum and implementation of safe boating practices in relation to marine fauna will be mandatory for all lease operators.

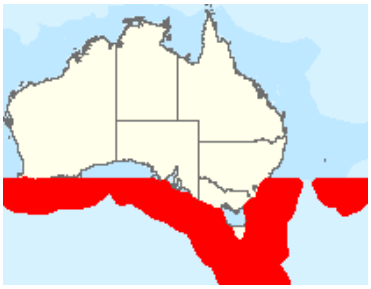
Monitoring and Management

Marine fauna interactions will be monitored and reviewed regularly.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impact on blainville's beaked whale.

Marine Mammals



Common Name

Hector's Beaked Whale

Latin Name

Mesoplodon hectori

EPBC Status	FM / TSC Listing
Cetacean	

Distribution across Australia

Hector's beaked whale is known to occur in Australian oceanic sub-Antarctic and temperate waters. This species has been recorded in the southern states including South Australia, Tasmania and Western Australia (Web Reference 1).

Critical Habitat Resources in Australia

No habitat critical to the survival of the hector's beaked whale is known to occur in Australian waters.

Important Habitat Values for the Species

Hector's beaked whale inhabits deep oceanic waters in cool temperate to sub-antarctic regions. This species is thought to frequent shelf-edge habitats, canyon habitats, continental slopes to the abyssal plain, submarine escarpments and sea mounts. Hector's beaked whales consume mid- and deep- water squid and fish (Web Reference 1).

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to hector's beaked whales include opportunistic whalers, entanglement in drift nets and other nets set lost or discarded in international waters and anthropogenic noise (Web Reference 1). Potential threats associated with the proposal include boat strikes, acoustic pollution, entanglements and ingestion of marine debris.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not within significant breeding, resting or feeding grounds. The proposed leases represent a relatively small proportion of potential habitat in the wider area and will not isolate any habitat.
4. Boating traffic and noise associated with the leases will be kept to a minimum and implementation of safe boating practices in relation to marine fauna will be mandatory for all lease operators.

Monitoring and Management

Marine fauna interactions will be monitored and reviewed regularly.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impact on hector's beaked whale.

Marine Mammals

Common Name

Strap-toothed beaked whale

Latin Name

Mesoplodon layardii

EPBC Status	FM / TSC Listing
Cetacean	

Distribution across Australia

Strap-toothed beaked whales occur in Australian oceanic sub-Antarctic and temperate waters. This species has been recorded on the southern coast of Western Australia, South Australia, Victoria, Tasmania, NSW, Queensland, Macquarie Island and Heard Island (Web Reference 1).

Critical Habitat Resources in Australia

No habitat critical to the survival of the strap-toothed beaked whale is known to occur in Australian waters.

Important Habitat Values for the Species

The strap-toothed beaked whale inhabits deep oceanic waters in cool temperate to sub-antarctic regions. This species is thought to frequent shelf-edge habitats, canyon habitats, continental slopes to the abyssal plain, submarine escarpments and sea mounts. Strap-toothed beaked whales consume mid- and deep- water squid and fish, where they are active predators and presumed to be strong swimmers capable of deep diving (Web Reference 1).

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to strap-toothed beaked whales include opportunistic whalers, entanglement in drift nets and other nets set lost or discarded in international waters and anthropogenic noise (Web Reference 1). Potential threats associated with the proposal include boat strikes, acoustic pollution, entanglements and ingestion of marine debris.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not within significant breeding, resting or feeding grounds. The proposed leases represent a relatively small proportion of potential habitat in the wider area and will not isolate any habitat.
4. Boating traffic and noise associated with the leases will be kept to a minimum and implementation of safe boating practices in relation to marine fauna will be mandatory for all lease operators.

Monitoring and Management

Marine fauna interactions will be monitored and reviewed regularly.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impact on strap-toothed beaked whales.

Marine Mammals

Common Name

True's beaked whale

Latin Name

Mesoplodon mirus

EPBC Status	FM / TSC Listing
Cetacean	

Distribution across Australia

True's beaked whales occur in Australian oceanic sub-Antarctic and temperate waters. This species has been recorded off the coast of Western Australia, Victoria and Tasmania (Web Reference 1).

Critical Habitat Resources in Australia

No habitat critical to the survival of the true's beaked whale is known to occur in Australian waters.

Important Habitat Values for the Species

True's beaked whale inhabits deep oceanic waters in cool temperate to sub-antarctic regions. This species is thought to frequent shelf-edge habitats, canyon habitats, continental slopes to the abyssal plain, submarine escarpments and sea mounts. Strap-toothed beaked whales consume mid- and deep- water squid and fish, where they are active predators and presumed to be strong swimmers capable of deep diving (Web Reference 1).

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to true's beaked whales include opportunistic whalers, entanglement in drift nets and other nets set lost or discarded in international waters and anthropogenic noise (Web Reference 1). Potential threats associated with the proposal include boat strikes, acoustic pollution, entanglements and ingestion of marine debris.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not within significant breeding, resting or feeding grounds. The proposed leases represent a relatively small proportion of potential habitat in the wider area and will not isolate any habitat.
4. Boating traffic and noise associated with the leases will be kept to a minimum and implementation of safe boating practices in relation to marine fauna will be mandatory for all lease operators.

Monitoring and Management

Marine fauna interactions will be monitored and reviewed regularly.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impact on true's beaked whales.

Marine Mammals

Common Name

False killer whale

Latin Name

Pseudorca crassidens

EPBC Status	FM / TSC Listing
Cetacean	

Distribution across Australia

In Australia, false killer whales have been recorded off the coast of all states and territories. Strandings have occurred in the Northern Territory (2), Queensland (5), NSW (11), Victoria (2), Tasmania (15), South Australia (3) and Western Australia (17) (Web Reference 1).

Critical Habitat Resources in Australia

No habitat critical to the survival of the false killer whale is known to occur in Australian waters.

Important Habitat Values for the Species

False killer whales inhabit tropical to temperate deep oceanic waters but have also been sighted in semi-enclosed seas (e.g. Red Sea) and deep coastal waters. This species also inhabits inshore waters but only where the continental shelf is narrow. The diet of the false killer whale consists of cephalopods and fish but it has been observed attacking other small cetaceans (Web Reference 1).

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to false killer whales include interactions with fisheries, deliberate culling, commercial whaling, collecting for aquariums, incidental entanglement (e.g. tuna purse seine, longline fisheries and driftnets), ingestion of plastic debris and pollution (leading to accumulation of toxins in body tissues) (Web Reference 1). Potential threats associated with the proposal include boat strikes, acoustic pollution, entanglements and ingestion of marine debris.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not within significant breeding, resting or feeding grounds. The proposed leases represent a relatively small proportion of potential habitat in the wider area and will not isolate any habitat.
4. Boating traffic and noise associated with the leases will be kept to a minimum and implementation of safe boating practices in relation to marine fauna will be mandatory for all lease operators.

Monitoring and Management

Marine fauna interactions will be monitored and reviewed regularly.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impact on false killer whales.

Marine Mammals

Common Name

Cuvier's beaked whale, goose-beaked whale

Latin Name

Ziphius cavirostris

EPBC Status	FM / TSC Listing
Cetacean	

Distribution across Australia

In Australia, the cuvier's beaked whale has been recorded in all states and territories. The majority of records are from strandings between Januray and July, which suggest that there may be some seasonality of their occurrence. Stranding records have occurred in Western Australia (5), South Australia (2), Victoria (3), Tasmania (13), NSW (2), Queensland (3), Northern Territory (1) and at Macquarie Island (2) (Web Reference 1).

Critical Habitat Resources in Australia

No habitat critical to the survival of cuvier's beaked whales is known to occur in Australian waters.

Important Habitat Values for the Species

Cuvier's beaked whales inhabit oceanic waters (usually deeper than 1000 m) and rarely found close to the mainland except where the continental shelf is narrow, coastal waters are deep and/or near submarine canyons. The diet of this species consists of oceanic cephalopods, fish and crustaceans (Web Reference 1).

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to cuvier's beaked whales include opportunistic whalers, entanglement in drift nets and other nets set lost or discarded in international waters, anthropogenic noise, pollution and ingestion of marine debris (Web Reference 1). Potential threats associated with the proposal include boat strikes, acoustic pollution, entanglements and ingestion of marine debris.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Site selection - leases are not within significant breeding, resting or feeding grounds. The proposed leases represent a relatively small proportion of potential habitat in the wider area and will not isolate any habitat.
4. Boating traffic and noise associated with the leases will be kept to a minimum and implementation of safe boating practices in relation to marine fauna will be mandatory for all lease operators.

Monitoring and Management

Marine fauna interactions will be monitored and reviewed regularly.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impact on cuvier's beaked whales.

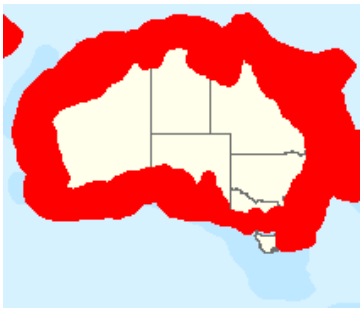
Reptiles

Common Name

Loggerhead turtle

Latin Name

Caretta caretta



EPBC Status	FM / TSC Listing
Endangered, Migratory, Listed Marine	Endangered

Distribution across Australia

In Australia, loggerhead turtles have been recorded in tropical and temperate waters off the coasts of New South Wales, Queensland, Northern Territory and Western Australia (Web Reference 1).

Critical Habitat Resources in Australia

There are a number of important nesting sites for the loggerhead turtle along the east coast of Australia, particularly around the southern Great Barrier Reef and along the west coast, notably Shark Bay, North-West Cape, the Muiron Islands region and the northern Dirk Hartog Island Turtle Bay-Cape Levillain coast (Web Reference 5). Loggerhead turtles are only occasionally sighted in the Jervis Bay region and there are no critical habitat resources in the wider study area.

Important Habitat Values for the Species

Hatchlings to sub-adult loggerhead turtles occur in the open ocean foraging on planktonic organisms. Loggerheads turtles enter benthic foraging habitat including coral reefs, estuaries and bays, at a larger size than other hard-shelled sea turtles. Adults and large juveniles feed on jellyfish, sea urchins, shellfish, sponges, crustaceans and algae (Web Reference 1).

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to the loggerhead turtle include direct harvesting, predation by native fauna, feral animals and pets, fisheries bycatch, entanglement and/or ingestion of marine debris, boat strikes, climate change, coastal development, habitat loss and water quality deterioration. Potential impacts associated with the proposal include entanglement in longline infrastructure, ingestion of marine debris, boat strikes, acoustic pollution and reduced foraging habitat availability.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as byproducts of aquaculture processing (e.g. shells, tissues), biofouling, obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins on vessels will be secured and have tightly fitted lids.
3. Boating traffic and noise associated with the leases will be kept to a minimum and implementation of safe boating practices in relation to marine fauna will be mandatory for all lease operators.
4. Site selection - leases are not within significant breeding, nesting or feeding grounds.

Monitoring and Management

Marine fauna interactions including entanglements, boating traffic and noise, will be monitored and reviewed regularly.

Predicted Outcome / Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impact on the loggerhead turtle.

Reptiles

Common Name

Green turtle

Latin Name

Chelonia mydas

EPBC Status	FM / TSC Listing
Vulnerable, Migratory, Listed Marine	Vulnerable

Distribution across Australia

Green turtles forage, migrate and nest across tropical northern Australia. This species usually occurs between the 20°C isotherms but occasionally individuals will enter temperate waters (Web Reference 1).

Critical Habitat Resources in Australia

There are a number of important nesting and inter-nesting sites for the green turtle along the Australian coastline including Elizabeth-Middleton Reefs National Marine Reserve off NSW, the Capricorn and Bunker Island Groups, Raine Island, Mon Repos and Western Cape York Peninsula in Queensland, Coburg Peninsula and Rocky Island in Northern Territory and Exmouth Gulf, Muiron Islands, Lacepede Islands and Ningaloo coast in Western Australia (Web Reference 1). However, there are no critical habitat resources for the green turtle in the wider study area.

Important Habitat Values for the Species

The first 5-10 years of the green turtles life is spent drifting in ocean currents. During this pelagic phase this species is often found in association with macroalgae rafts and driftlines. They settle in shallow benthic foraging habitats (e.g. rocky reefs or coral reefs) when they reach a carapace length of 30-40 cm. Juveniles diets consist of plankton while adults mainly feed on seagrass and algae and occasionally mangroves, sponges, jellyfish and fish-egg cases (Web Reference 1).

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to the green turtle include direct harvesting, predation by native fauna, feral animals and pets, fisheries bycatch, entanglement and/or ingestion of marine debris, boat strikes, climate change, coastal development, habitat loss and water quality deterioration. Potential impacts associated with the proposal include entanglement in longline infrastructure, ingestion of marine debris, boat strikes, acoustic pollution and reduced foraging habitat availability.

Proposed Impact Mitigation Measures

<u>Mitigation</u>

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins.
3. Boating traffic and noise associated with the leases will be kept to a minimum and implementation of safe boating practices in relation to marine fauna will be mandatory for all lease operators.
4. The proposed leases represent a relatively small proportion of potential habitat in the wider area and will not isolate any area of habitat.

<u>Monitoring and Management</u>

Marine fauna interactions will be monitored and reviewed regularly.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impact on the green turtle.

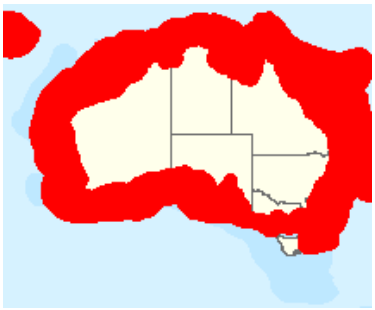
Reptiles

Common Name

Leatherback turtle, leathery turtle

Latin Name

Dermochelys coriacea



EPBC Status	FM / TSC Listing
Endangered, Migratory, Listed Marine	Vulnerable

Distribution across Australia

In Australia, the leatherback turtle has been recorded feeding in coastal waters offshore of all Australian States. This species occurs in temperate, subtropical and tropical areas but is most commonly sighted in the coastal waters of southern Australia, south-western Western Australia, south-east Australia (i.e. Tasmania, Victoria and eastern South Australia) and central eastern Australia (i.e. Sunshine Coast to central New South Wales) (Web Reference 1).

Critical Habitat Resources in Australia

There are no major nesting sites for the leatherback turtle in Australia but there is some scattered nesting along the coast in southern Queensland and Northern Territory. Nesting has been recorded in northern NSW near Ballina and south of Forster in Bootie National Park. However, there are no critical habitat resources for this species in the wider study area.

Important Habitat Values for the Species

The leatherback turtle is a highly pelagic species but ventures close to shore during the nesting season. Adults forage over Australian continental shelf waters feeding on gelatinous organisms e.g. jellyfish, salps, squid and siphonophores. Little is known about the diet of post-hatchlings and small juveniles which tend to disappear in the open ocean for several years. They require sandy beaches to nest with sand temperatures of 24-34°C for successful incubation (Web Reference 1).

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to leatherback turtles include harvesting, boat strikes, predation by native fauna, feral animals and pets, fisheries bycatch, entanglement, ingestion of marine debris, climate change and extreme weather events, coastal development, seismic surveys, habitat loss and water quality deterioration. Potential impacts associated with the proposal include entanglement, ingestion of marine debris, boat strikes, acoustic pollution and reduced foraging habitat availability.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins.
3. Boating traffic and noise associated with the leases will be kept to a minimum and implementation of safe boating practices in relation to marine fauna will be mandatory for all lease operators.
4. The proposed leases represent a relatively small proportion of potential habitat in the wider area and will not isolate any area of habitat.

Monitoring and Management

Marine fauna interactions will be monitored and reviewed regularly.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impact on the leatherback turtle.

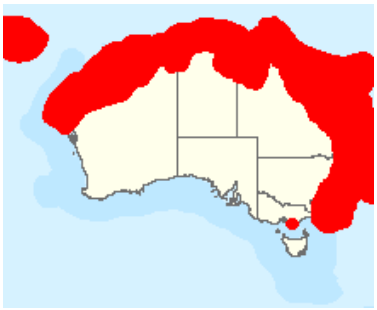
Reptiles

Common Name

Hawksbill turtle

Latin Name

Eretmochelys imbricate



EPBC Status	FM / TSC Listing
Vulnerable, Migratory, Listed Marine	N/A

Distribution across Australia

Hawksbill turtles are recorded in temperate, subtropical and tropical waters across all of the world's oceans while nesting is predominately confined to tropical areas.

Critical Habitat Resources in Australia

Australia has the largest breeding population of hawksbill turtles in the world and the largest rookeries. Some of the important nesting sites for this species include Rosemary Island and Varanus Island in Western Australia, around Torres Strait and the northern Great Barrier Reef in Queensland (Web Reference 1). Some important foraging and juvenile habitat for the hawksbill turtle includes the inner Great Barrier Reef Cays (north from Grenville) and Milman Island in Queensland, the reefs west of Cape Preston and south to Onslow in Western Australia and the Groote Eylandt in Northern Territory. However, there are no critical habitat resources for the hawksbill turtle in the wider study area of the proposal.

Important Habitat Values for the Species

The first 5-10 years of the hawksbill turtles life is spent drifting in ocean currents. During this pelagic phase this species is often found in association with macroalgae rafts and driftlines. Hawksbill turtles settle in shallow benthic foraging habitats e.g. rocky reefs or coral reefs, when they reach a carapace length of 30-40 cm. Adults are omnivores and feed on octopus, squid, gastropods, sponges, hydroids, jellyfish, seagrass and algae, while juveniles eat plankton (Web Reference 1).

Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to the hawksbill turtle include direct harvesting, predation by native fauna, feral animals and pets, fisheries bycatch, entanglement and/or ingestion of marine debris, coastal development, climate change, habitat loss and water quality deterioration. Potential impacts associated with the proposal include entanglement in longline infrastructure, ingestion of marine debris, boat strikes, acoustic pollution and reduced foraging habitat availability.

Proposed Impact Mitigation Measures

Mitigation

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins.
3. Boating traffic and noise associated with the leases will be kept to a minimum and implementation of safe boating practices in relation to marine fauna will be mandatory for all lease operators.
4. The proposed leases represent a relatively small proportion of potential habitat in the wider area.

Monitoring and Management

Marine fauna interactions will be monitored and reviewed regularly.

Predicted Outcome / Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impact on the hawksbill turtle.

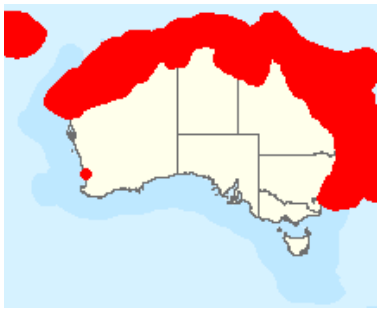
Reptiles

Common Name

Flatback turtle

Latin Name

Natator depressus



EPBC Status	FM / TSC Listing
Vulnerable, Migratory, Listed Marine	N/A

Distribution across Australia

The flatback turtle is generally restricted to the tropical waters of northern Australia (Web Reference 1).

Critical Habitat Resources in Australia

There are no critical habitat resources for this species in the direct or wider study area. There are no areas of significant habitat such as nesting sites known to occur within NSW.

Important Habitat Values for the Species

Adults, subadults and hatchlings inhabit soft bottom habitat over the continental shelf of northern Australia. Nesting habitat includes sandy beaches in the subtropics and tropics with sand temperatures between 25°C and 33°C at nest depth. Nesting of the flatback turtles is confined to Australian beaches where four genetic stocks have been recognised. These important nesting sites occur in eastern Australia (between Bundaberg and Torres Strait), the Gulf of Carpentaria, the Northern Territory (e.g. Fog Island, Tiwi Islands and Turtle Point) and Western Australia (e.g. Kimberley Region and Lacrosse Island). Little is known about the diet of this species but juveniles have been found feeding on squid, gastropod molluscs and siphonophores e.g. hydroids, jellyfish and soft corals (Web Reference 1).

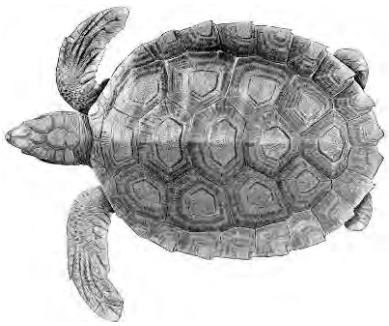
Recognised Threats and Potential Impact(s) of the Proposal

Recognised threats to the flatback turtle include direct harvesting, boat strikes, predation by native fauna, feral animals and pets, fisheries bycatch, entanglement, ingestion of marine debris, climate change and extreme weather events, coastal development, seismic surveys, habitat loss and water quality deterioration. Potential impacts associated with the proposal include entanglement, ingestion of marine debris, boat strikes, acoustic pollution and reduced foraging habitat availability.

Proposed Impact Mitigation Measures

<u>Mitigation</u>

1. A Marine Fauna Interaction Management Plan will be implemented, which will involve monitoring and recording all marine fauna interactions with longline infrastructure, vessels and/or humans during the operational stage, as well as any behavioural changes such as movement corridors and foraging/socialising patterns. A Marine Fauna Entanglement Avoidance Protocol will also be implemented which will detail a response plan for entanglement incidences including procedures to be followed, training and equipment required and reporting incidents, as well as maintenance measures to ensure entanglement hazards are minimised. Thick ropes will be used, the taut rope policy will be implemented and regular inspections and maintenance of longline infrastructure will be undertaken to ensure structural integrity e.g. no loose ropes.
2. A Waste Management Plan will be implemented which will detail disposal procedures (best practices) for wastes such as obsolete infrastructure (e.g. worn ropes) and domestic garbage, as well as daily operational and maintenance procedures to minimise escape of marine debris and accidental spillages e.g. storage bins.
3. Boating traffic and noise associated with the leases will be kept to a minimum and implementation of safe boating practices in relation to marine fauna will be mandatory for all lease operators.
4. The proposed leases represent a relatively small proportion of potential habitat in the wider area.



<u>Monitoring and Management</u>

Marine fauna interactions including entanglements, boating traffic and noise, will be monitored and reviewed regularly.

Predicted Outcome/ Effectiveness

Provided that the leases are properly managed, monitored and the mitigation measures implemented, the proposal is considered unlikely to have any detrimental impact on the flatback turtle.

Commercial Shellfish Aquaculture Leases, Jervis Bay, NSW.

References

Baker, G. B., Gales, R. Hamilton, S. and Wilkinson, V. (2002) Albatrosses and Petrels in Australia: A Review of their Conservation and Management. *Emu*, **102** (1): 71-97.

Blaber, S. J. M. (1986) The Distribution and Abundance of Seabirds South-east of Tasmania and Over the Soela Seamount During April 1985. *Emu*, **86** (4): 239-244.

Bruce, B. and Bradford, R.W. (2008) *Spatial dynamics and habitat preferences of juvenile White Sharks – identifying critical habitat and options for monitoring recruitment*. CSIRO Marine and Atmospheric Research, Hobart.

Bruce, B. (2008) *The Biology and Ecology of the White Shark, Carcharodon carcharias*. Sharks of the Open Ocean M.D. Camhi, E.K. Pikitich and E.A. Babcock, Blackwell Publishing, Oxford.

Department of Environment and Heritage (2004) *Whale Shark (Rhincodon typus) Recovery Plan Issues Paper 2005-2010*. DEH, Canberra.

Department of Sustainability, Environment, Water, Population and Communities (2011) *National Recovery Plan for Threatened Albatrosses and Giant Petrels 2011-2016*. Commonwealth of Australia, Hobart.

Heemstra, P.C. and Randall, J.E. (1993) *FAO Species Catalogue Volume 16 Groupers of the World (Family Serranidae, Subfamily Epinephelinae).* Food and Agriculture Organisation of the United Nations, Rome.

NSW National Parks and Wildlife Service (1999a) *Threatened Species Information – Sooty Tern.* NSW NPWS, Hurstville.

NSW National Parks and Wildlife Service (1999b) *Threatened Species Information – White bellied Storm-Petrel*. NSW NPWS, Hurstville.

NSW National Parks and Wildlife Service (1999c) *Threatened Species Information – Beach Stone-curlew*. NSW NPWS, Hurstville.

Otway, N. and Parker, P.C. (2000) *The biology, ecology, distribution, abundance and identification of marine protected areas for the conservation of threatened Grey Nurse Sharks in South East Australian waters.* NSW Fisheries Final Report Series, Cronulla.

Pollard, D. A., Lincoln Smith, M.P. and Smith, A.K. (1996) The biology and conservation status of the Grey Nurse Shark (*Carcharias taurus* Rafinesque 1810) in New South Wales, Australia. *Aquatic Conservation: Marine and Freshwater Ecosystems,* **6**: 1-20.

Rivalan, P., Barbraud, C., Inchausti, P. and Weimerskirch, H. (2010) Combined impacts of longline fisheries and climate on the persistence of the Amsterdam Albatross, *Diomedia Amsterdamensis Ibis,* **152** (1): 6-18.

Shaughnessy, P.D. (1999). *The Action Plan for Australian Seals*. Environment Australia, Canberra.

Internet References

Web Reference 1

Department of Sustainability, Environment, Water, Population and Communities (2011) "Species Profile and Threats Database" Retrieved 07/07/11 from http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl.

Web Reference 2

BirdLife International (2009) "Campbell Albatross *Thalassarche impavida*" Retrieved 20/09/11 from http://www.birdlife.org/datazone/speciesfactsheet.php?id=30007.

Web Reference 3

NSW Department of Environment and Conservation (2005) "NSW Threatened Species Profile Search" Retrieved 20/09/11 from http://www.threatenedspecies.environment.nsw.gov.au/index.aspx.

Web Reference 4

NSW Department of Primary Industries (2005)"Threatened Species Conservation - What is currently listed?" Retrieved 07/07/11 from http://www.dpi.nsw.gov.au/fisheries/species-protection/conservation/what-current.

Web Reference 5

WA Department of Environment and Conservation (2011) "Marine Turtles in Western Australia" Retrieved 20/09/11 from http://www.dec.wa.gov.au/index.php?option=com_content&Itemid=1401&id=2462&lang=en&task=view.

Web Reference 6

NSW Office of Environment and Heritage (2011) "Little Penguin" Retrieved 20/11/12 from http://www.environment.nsw.gov.au/animals/TheLittlePenguin.htm

Web Reference 7

Bird Life International (2012) "Sooty Shearwater *Puffinus griseus*" Retrieved 20/11/12 from http://www.birdlife.org/datazone/speciesfactsheet.php?id=3933

Web Reference 8

Parks and Wildlife Service Tasmania (2010) "Short-tailed Shearwater, *Puffinus tenuirostris*" Retrieved 20/11/12 from http://www.parks.tas.gov.au/?base=5100

Web Reference 9

NSW Office of Environment and Heritage (2012) "Grey Ternlet" Retrieved 11/12/12 from http://www.environment.nsw.gov.au/threatenedspeciesapp/profile.aspx?id=10670

Photo References

Photo 1 - Amsterdam albatross

http://www.flickr.com/photos/dominique_filippi/3615751495/

Photo 2 – Antipodean albatross

http://www.albatrossencounter.co.nz/albatross/greatalbatross

Photo 3 - Tristan albatross

Ross Wanless and Andrea Angel

Photo 4 - Wandering albatross

http://www.ozanimals.com/image/albums/australia/Bird/wandering-albatross-1.jpg

Photo 5 - Gibson's albatross

http://upload.wikimedia.org/wikipedia/commons/6/62/Gibsons_albatross.jpg

Photo 6 - Campbell albatross

http://upload.wikimedia.org/wikipedia/commons/4/4a/070226_Campbell_mollymawk_off_Kaikoura_1.

Photo 7 - Buller's albatross

http://www.sossa-international.org/Gallery/530BRASadWGONG20AUG04PJM_2438Ga.jpg

Photo 8 - Shy albatross

http://www.ecology-solutions.com.au/sb_images/tasmanian%20shy%20albatross.jpg

Photo 9 - Salvin's albatross

http://ibc.lynxeds.com/photo/shy-albatross-diomedea-cauta/flying-bird

Photo 10 - White-capped albatross

www.rosssea.info/pix/big/Mollymauk.jpg

Photo 11 - Black browed albatross

http://www.sossa-international.org/Gallery/821BBAL.Ulladulla.181008.AEOGa.jpg

Photo 12 - Streaked shearwater

http://ebirdr.com/uploads/images/Streaked_Shearwater-

Photo 13 - Southern giant petrel

http://www.rosssilcock.com/PSSOGP.jpg

Photo 14 - Northern giant petrel

http://ibc.lynxeds.com/photo/northern-giant-petrel-macronectes-halli/petrel-resting-valpara%C3%ADso-bay-chile

Photo 15 – Gould's petrel

http://www.mpa.nsw.gov.au/images/explore/psglmp-Goulds-petrel.jpg

Photo 16 - Kermadec petrel

http://hbs.bishopmuseum.org/birds/rlpmonograph/images/HRBPs/HRBP%201305%20Kermadec%20Petrel.jpg

Photo 17 - White-bellied sea eagle

http://upload.wikimedia.org/wikipedia/commons/6/6a/White_Bellied_Sea_Eagle_070531b.jpg

Photo 18 - Great skua

http://ibc.lynxeds.com/photo/great-skua-catharacta-skua/great-skua-wandering-around

Photo 19 - Providence petrel

http://chardonnayslogblog.blogspot.com.au/2011_07_01_archive.html?z

Photo 20 - Flesh-footed shearwater

http://ibc.lynxeds.com/photo/flesh-footed-shearwater-puffinus-carneipes/swimming-bird-pink-feet

Photo 21 - White-bellied storm petrel

http://www.biodiversityexplorer.org/birds/hydrobatidae/fregetta_grallaria.htm

Photo 22 - Eastern osprey

http://www.birdforum.net/opus/Osprey

Photo 23 - Little tern

http://www.here.com.au/little-tern/

Photo 24 - Sooty tern

http://www.ozanimals.com/Bird/Sooty-Tern/Sterna/fuscata.html

Photo 25 - Sooty albatross

http://www.immaginidalmondo.net/foto-uccelli/albatros-foto-uccelli-acquatici-ornitologia/

Photo 26- Grey-headed albatross

http://en.wikipedia.org/wiki/File:Thalassarche_chrysostoma_-_SE_Tasmania.jpg

Photo 27 - Chatham albatross

http://www.flickriver.com/groups/all_albatross/pool/interesting/

Photo 28 - Sooty shearwater

http://www.ozanimals.com/Bird/Sooty-Shearwater/Puffinus/griseus.html

Photo 29 - Wedge-tailed shearwater

http://www.birdinghawaii.co.uk/Annotatedlist2.htm

Photo 30 - Short tailed shearwater

http://www.ozanimals.com/Bird/Short-tailed-Shearwater/Puffinus/tenuirostris.html

Photo 31 - Fork-tailed Swift

www.ontfin.com

Photo 32 - Little penguin

http://tolweb.org/Eudyptula_minor/57252

Photo 33 - Black cod

http://www.fishbase.org/photos/PicturesSummary.php?StartRow=0&ID=7338&what=species&TotRec=3

Photo 34 - Australian Grayling

http://www.dse.vic.gov.au/about-dse/media-releases/not-such-a-gray-area-new-research-solves-a-fishy-migration-mystery

Photo 35 - White's seahorse

http://underwater.com.au/image/id/5704

Photo 36 - Weedy seadragon

http://www.oceanwideimages.com/categories.asp?cID=50&p=4

Photo 37 - Tiger's pipefish

http://fieldguide.sims.org.au/Group.html?groupId=CSbf8Jmb

Photo 38 - Spiny pipehorse

http://www.arkive.org/spiny-pipehorse/solegnathus-spinosissimus/

Photo 39 - Ornate ghostfish

http://www.diverosa.com/Lembeh%202006/IL2-086%20Ornate%20ghost%20pipefish,%20Solenostomus%20paradoxus%202.html

Photo 40 - Little Dragonfish

http://whrhsmarinebiology.wikispaces.com/E+draconis+

Photo 41 - Grey Nurse Shark

http://www.daveharasti.com/articles/speciesspotlight/images/greynurse1.jpg

Photo 42 - Great White Shark

http://www.abc.net.au/reslib/200902/r340542_1548991.jpg

Photo 43 – Mackerel Shark

http://marinebio.org/species.asp?id=378

Photo 44 - Green Sawfish

http://upload.wikimedia.org/wikipedia/commons/9/9b/Sawfish_genova.jpg

Photo 45 - Whale Shark

http://upload.wikimedia.org/wikipedia/commons/f/f1/Whale_shark_Georgia_aquarium.jpg

Photo 46 - New Zealand fur seal

http://www.scuba-equipment-usa.com/marine/JUN05/New_Zealand_Fur_Seal%28Arctocephalus_forsteri%29.html

Photo 47 - Australian fur seal

http://www.abyss.com.au/scuba/pc/Australian-Fur-Seal-p5451.htm

Photo 48 - Minke whale

http://marinebio.org/species.asp?id=230

Photo 49 - Common dolphin

http://www.jwoolfden.com/Seabird_Cruise/Common_Dolphin_01.jpg

Photo 50 - Southern right whale

http://www.sea-way.org/blog/Right_Whale_BIG_3.JPG

Photo 51 - Risso's dolphin

http://images.marinespecies.org/resized/22030_rissos-dolphin-grampus-griseus.jpg

Photo 52 - Humpback whale

http://www.noaanews.noaa.gov/stories2009/20090413_hawaiicenter.html

Photo 53 - Bryde's whale

http://bigbluelog.blogspot.com.au/2011/01/january-2011.html

Photo 54 - Blue whale

http://www.tonywublog.com/20111207/trips-to-photograph-whales-with-tony-wu.html#axzz1oO2UcM00

Photo 55 - Pygmy right whale
http://mamiferosdomundo.blogspot.com.au/2011/05/familia-neobalenidae.html
Photo 56 - Killer whale
http://www.theanimalfiles.com/images/killer_whale_wallpaper_1024.jpg
Photo 57 - Spotted dolphin
http://www.flickr.com/photos/volk/1148824068/
Photo 58 - Indo-Pacific dolphin
http://www.blueanimalbio.com/mammalia/jing/haitun.htm
Photo 59 - Bottlenose dolphin**
http://en.wikipedia.org/wiki/File:Bottlenose_Dolphin_KSC04pd0178_%28cropped%29.jpg
Photo 60 - Dusky dolphin
http://www.panoramio.com/photo/3319985
Photo 61 - Dugong
http://members.optusnet.com.au/~alreadman/dugong%20junji.jpg
Photo 62 - Sperm whale
http://images.nationalgeographic.com/wpf/media-live/photos/000/007/cache/sperm-whale_717_600x450.jpg
Photo 63 - Antarctic minke whale
http://www.whalesanctuary.co.uk/2009/08/species-spotlight-minke.html
Photo 64 - Arnoux's beaked whale
http://www.cms.int/reports/small_cetaceans/data/b_arnuxii/b_arnuxii.htm
Photo 65 - Short-finned pilot whales
http://animalworld.tumblr.com/post/2964701266/short-finned-pilot-whales-globicephala
Photo 66 - Long-finned pilot whale
http://www.cms.int/reports/small_cetaceans/data/G_melas/g_melas.htm
Photo 67 - Pygmy sperm whale
http://200.54.73.149/template/galerias/04.asp?idseccion=1198
Photo 68 - Dwarf sperm whale
http://www.mnh.si.edu/mna/image_info.cfm?species_id=115
Photo 69 - Southern right whale dolphin
http://flickrhivemind.net/Tags/lissodelphis/Interesting
Photo 70 - Andrew's beaked whale
http://www.cms.int/reports/small_cetaceans/data/m_bowdoini/m_bowdoini.htm
Photo 71 - Blainville's beaked whale
http://www.wikiocean.org/2012/07/le-gouf-lincroyable-canyon-du-golfe-de-gascogne/
Photo 72 - Hector's beaked whale
http://www.cms.int/reports/small_cetaceans/data/m_hectori/m_hectori.htm
Photo 73 - Strap-toothed beaked whale
http://www.cms.int/reports/small_cetaceans/data/m_layardii/m_layardii.htm
Photo 74 - True's beaked whale
http://www.cms.int/reports/small_cetaceans/data/m_mirus/m_mirus.htm
Photo 75 - False killer whale
http://www.latitudscuba.com/?p=2539
Photo 76 - Cuvier's beaked whale
http://www.crru.org.uk/cuviers_beakedwhale.asp
Photo 77 - Loggerhead turtle
http://en.wikipedia.org/wiki/File:Loggerhead_turtle.jpg
Photo 78 - Green turtle
http://www.uimages.org/green-turtle/

Photo 79 - Leatherback turtle

http://indoneshianitsuite.blogspot.com.au/2010/10/leatherback-turtle-dermochelys-coriacea.html

Photo 80 - Hawksbill turtle

http://www.scubajedi.com/sea-turtles-in-crisis/

Photo 81 - Flatback turtle

http://upload.wikimedia.org/wikipedia/commons/6/66/Natator_depressus.jpg