

CLEVELAND BAY – ENVIRONMENTAL AND SOCIAL VALUES

EXECUTIVE SUMMARY

Cleveland Bay supports a diverse range of interconnected coastal and marine ecosystems. These include seagrass meadows, coral reefs, mangroves, wetlands, fisheries and wildlife habitats.

Stakeholders use and value these ecosystems for their environmental, cultural, economic and community aspects. Understanding these values is an important part of assessing and managing maintenance dredging and sea placement activities.

This summary provides an overview of the key environmental and social values that occur within and around Cleveland Bay.

A BAY SHAPED BY NATURE

Cleveland Bay is an ecologically important coastal environment in North Queensland. Framed by Cape Pallarenda, Cape Cleveland and Magnetic Island (Yunbenun), the bay is a broad, shallow tropical embayment supporting a rich network of marine, coastal and wetland habitats.

These interconnected environments provide habitat for wildlife, support fisheries and recreation, sustain cultural connections and contribute to the lifestyle and economy of the Townsville region.

WHAT MAKES CLEVELAND BAY SPECIAL?

Cleveland Bay contains an exceptional diversity of habitats within a relatively small area, including:

- Seagrass meadows.
- Coral reefs.
- Mangroves.
- Saltmarshes.
- Estuaries.
- Intertidal mudflats.
- Coastal wetlands.
- Island and headland environments.

SEAGRASS MEADOWS – THE FOUNDATION OF THE BAY

Seagrass meadows are among Cleveland Bay's most important environmental assets. The bay supports some of the most extensive and diverse seagrass habitats in North Queensland, with eight recorded seagrass species occurring throughout shallow coastal waters. Extensive meadows occur in eastern Cleveland Bay and around Cape Cleveland, Pallarenda, the Strand and Magnetic Island.

These meadows provide critical habitat and food resources for a wide range of marine species. They are a regionally important feeding ground for dugongs and marine turtles and support many fish, prawn and invertebrate species that rely on seagrass habitats during different stages of their life cycle.



Seagrass meadows play an important ecological role by:

- Providing feeding habitat for dugongs and turtles.
- Supporting fish and prawn nursery areas.
- Stabilising marine sediments.
- Trapping and recycling nutrients.
- Improving ecosystem productivity.
- Supporting biodiversity across the bay.

The health of Cleveland Bay's seagrass meadows is closely linked to the health of adjacent coral reef, mangrove and wetland habitats. Together these interconnected environments support fisheries, wildlife and the ecological productivity of the bay.

Healthy seagrass meadows also provide benefits to the community by supporting commercial and recreational fisheries, contributing to water quality and helping sustain the wildlife that makes Cleveland Bay special

MONITORING AND RESEARCH

Seagrass meadows in Cleveland Bay have been monitored for almost two decades. This monitoring helps understand changes in meadow extent, condition and recovery over time.

WHY SEAGRASS MATTERS

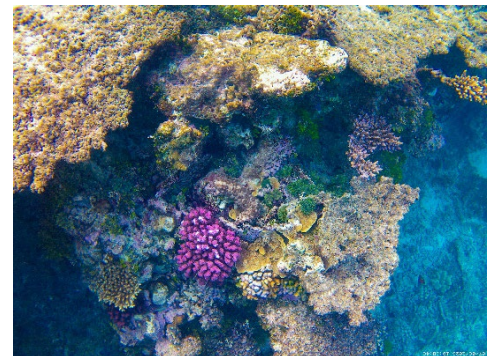
- Supports dugongs and turtles
- Provides fish nursery habitat
- Stabilises sediments
- Supports fisheries productivity
- Contributes to ecosystem health

CORAL REEFS – A DIVERSE INSHORE REEF SYSTEM

Coral reef communities occupy a much smaller proportion of Cleveland Bay than seagrass habitats but remain an important component of the bay's biodiversity.

Fringing reefs occur around Magnetic Island, Middle Reef and Virago Shoal, supporting diverse coral communities adapted to naturally turbid inshore conditions.

Coral reefs are another defining feature of Cleveland Bay. Approximately 987 hectares of reef habitat occur within the bay, including the fringing reefs of Magnetic Island, Middle Reef and Virago Shoal.



Unlike many offshore reef systems, Cleveland Bay's reefs have adapted to naturally turbid coastal waters and variable environmental conditions. These inshore reefs support a diverse range of marine plants and animals and are among the most distinctive reef communities found in the central Great Barrier Reef region.

Coral reefs play an important ecological role by:

- Providing habitat and shelter for marine life.
- Supporting reef fish and invertebrate communities.
- Contributing to biodiversity.

- Supporting fish populations and fisheries productivity.
- Contributing to ecological connectivity through annual coral spawning events.
- Linking with seagrass and mangrove habitats as part of a larger coastal ecosystem.

The reefs surrounding Magnetic Island are particularly important because they occur alongside seagrass meadows, mangroves and coastal wetlands, creating a highly connected marine environment that supports wildlife throughout different stages of their life cycles.

For the community, coral reefs contribute to the natural beauty of Cleveland Bay and support recreation, boating, snorkelling, diving, tourism, research and education.

MONITORING AND RESEARCH

Coral condition around Magnetic Island and surrounding reefs is regularly monitored to better understand long-term environmental trends and ecosystem health.

WHY CORAL REEFS MATTER

- Support biodiversity
- Provide habitat for marine life
- Contribute to ecosystem connectivity
- Support tourism and recreation

MANGROVES, WETLANDS AND SALTMARSHES – NATURE'S COASTAL NURSERIES

Mangroves, wetlands and saltmarshes are a defining feature of Cleveland Bay's coastline. Extensive mangrove forests occur throughout the bay, particularly along the southern shoreline, estuaries and creek systems, while saltmarshes and coastal wetlands form a vital transition between land and sea. Together, these habitats form an interconnected coastal ecosystem that supports a wide variety of fish, crustaceans, birds, marine wildlife and ecological processes throughout Cleveland Bay.

These habitats support a remarkable diversity of wildlife. Mangrove forests provide habitat for fish, prawns, mud crabs, birds, bats, reptiles and estuarine animals, while wetlands and saltmarshes support migratory shorebirds, waterbirds and a wide range of marine and terrestrial species. Many fish and crustacean species spend part of their life cycle within these sheltered environments before moving into the broader waters of Cleveland Bay.

Mangroves, wetlands and saltmarshes play an important ecological role by:

- Providing nursery habitat for fish, prawns and mud crabs.
- Supporting commercial, recreational and Traditional Owner fisheries.
- Stabilising shorelines and reducing coastal erosion.
- Trapping sediments and nutrients.
- Improving water quality.
- Supporting migratory birds and other wildlife.
- Cycling nutrients between terrestrial and marine environments.
- Providing natural resilience to storms, flooding and cyclones.



These habitats are closely connected to Cleveland Bay's seagrass meadows and coral reefs. Nutrients and organic matter produced within mangrove and wetland systems help support food webs throughout the bay, while the

proximity of mangroves, seagrass and reef habitats creates important ecological linkages that support wildlife through different stages of their life cycles.

For the community, mangroves, wetlands and saltmarshes help sustain fisheries, protect coastal areas from erosion and extreme weather, improve water quality and provide important habitat for the wildlife that makes Cleveland Bay unique. The internationally recognised Bowling Green Bay wetlands on the southern boundary of the bay further highlight the significance of these coastal ecosystems, supporting migratory birds, threatened species and important fish breeding areas.

DUGONGS

Cleveland Bay supports a regionally significant dugong population and provides important feeding habitat for this marine mammal. The bay's extensive seagrass meadows, particularly along the southern and eastern shores and around Cape Cleveland and Magnetic Island, support dugongs by providing the food resources they rely upon. Cleveland Bay and the surrounding waters of Magnetic Island are recognised as important dugong habitat and are protected through the declaration of a Dugong Protection Area.

Dugongs are herbivorous marine mammals that feed primarily on seagrass and are listed as Vulnerable under Queensland and Australian conservation legislation. As they graze, they contribute to natural ecological processes within seagrass ecosystems and are closely linked to the health and distribution of seagrass meadows throughout the bay. Healthy seagrass habitats are therefore important for supporting dugong populations and the broader marine ecosystem.

Dugongs contribute to Cleveland Bay's ecosystem by:

- Utilising and maintaining productive seagrass habitats.
- Contributing to ecological processes within seagrass ecosystems.
- Supporting biodiversity within the bay's marine environment.
- Linking seagrass habitats across the broader coastal landscape through their movements.
- Acting as an indicator of the condition and availability of seagrass habitat.
- Contributing to the environmental significance of Cleveland Bay and the Great Barrier Reef region.

The presence of dugongs highlights the importance of protecting interconnected seagrass, mangrove, wetland and reef habitats throughout Cleveland Bay. These habitats support dugongs as well as a wide range of other marine species that depend on healthy coastal ecosystems.

For the community and traditional owners, dugongs are an important local species and are valued from a social and cultural perspective.

MARINE TURTLES

Marine turtles have occupied Cleveland Bay's coastal and marine environments for thousands of years and remain an important component of the bay's biodiversity. The bay supports several turtle species, including green turtles, flatback turtles, hawksbill turtles, loggerhead turtles, olive ridley turtles and occasionally leatherback turtles. Several of these species are listed as threatened under Australian conservation legislation.

Green turtles and flatback turtles are particularly important within Cleveland Bay, where seagrass meadows provide important feeding habitat and nearby beaches, islands and coastal areas support nesting and breeding activity. The



Photo credit: D Yates. 2002



Photo credit: JCU Tropwater

interconnected habitats of seagrass, coral reef, mangroves and wetlands provide food, shelter and movement corridors for turtles throughout different stages of their life cycle.

Marine turtles contribute to Cleveland Bay's ecosystem by:

- Utilising seagrass, reef and coastal habitats throughout their life cycle.
- Contributing to ecological processes within marine ecosystems.
- Supporting biodiversity within the bay and surrounding Great Barrier Reef region.
- Linking habitats through movements between feeding, nesting and resting areas.
- Acting as indicators of the condition of marine and coastal habitats.
- Contributing to the environmental significance of Cleveland Bay.

The presence of marine turtles highlights the importance of maintaining healthy seagrass meadows, coral reefs, wetlands and coastal habitats throughout Cleveland Bay. These interconnected ecosystems support turtle populations as well as many other marine species that depend on the bay's diverse habitats.

For the community and traditional owners, sea turtles are an important local species and are valued from a social and cultural perspective.

DOLPHINS AND WHALES

The waters of Cleveland Bay support a variety of marine mammals, including Australian snubfin dolphins, Australian humpback dolphins and visiting whale species. Dolphins are regularly observed throughout the bay, particularly in the sheltered coastal waters, estuaries and nearshore areas where fish and other prey are abundant.

Australian snubfin dolphins and Australian humpback dolphins are species of particular significance in Cleveland Bay and are both species of conservation significance in northern Australian coastal waters. These dolphins are adapted to the bay's shallow coastal environment and move between estuaries, mangroves, nearshore waters and open bay habitats in search of food.



Whales are less frequently observed within Cleveland Bay itself but may be seen in surrounding waters during seasonal migrations along the Queensland coast. Humpback whales travel through the Great Barrier Reef region during annual migrations between Antarctic feeding grounds and tropical breeding waters.

Dolphins and whales play an important ecological role by:

- Utilising estuarine, coastal and nearshore marine habitats throughout the bay.
- Occupying higher trophic levels within marine food webs.
- Contributing to the biodiversity of Cleveland Bay and the Great Barrier Reef region.
- Linking coastal, estuarine and offshore habitats through movement and habitat use.
- Reflecting the ecological connectivity between different marine environments.
- Forming part of the diverse marine fauna supported by Cleveland Bay's interconnected habitats.

The presence of dolphins and whales highlights the importance of maintaining healthy estuarine, coastal and marine habitats throughout Cleveland Bay. Seagrass meadows, mangroves, coastal waters and adjacent offshore environments collectively support the ecological processes and food resources that sustain a range of marine mammal species.

MIGRATORY BIRDS

Cleveland Bay's mudflats, wetlands, saltmarshes, mangroves and coastal shorelines provide important habitat for migratory birds that travel thousands of kilometres along the East Asian–Australasian Flyway. Each year, many species migrate from breeding grounds in northern Asia and the Arctic to spend the summer months in Australia.

The extensive intertidal mudflats and wetlands surrounding Cleveland Bay, particularly the internationally significant Bowling Green Bay wetlands, provide feeding and roosting habitat for a diverse range of shorebirds and waterbirds. Species recorded within the region include eastern curlew, little tern, sharp-tailed sandpiper, curlew sandpiper and many other migratory bird species protected under international agreements.



Migratory birds rely on Cleveland Bay because its productive coastal habitats provide abundant food resources including shellfish, crustaceans, worms and other invertebrates that support long-distance migration.

- Utilising wetlands, mudflats, saltmarshes and coastal habitats throughout the bay.
- Contributing to the biodiversity of Cleveland Bay's coastal and wetland ecosystems.
- Supporting ecological connectivity between local, regional and international habitats through migratory movements.
- Contributing to food web dynamics within intertidal and wetland environments.
- Demonstrating the ecological importance of Cleveland Bay's wetlands and shorebird habitats.
- Forming part of the diverse wildlife supported by interconnected coastal ecosystems.

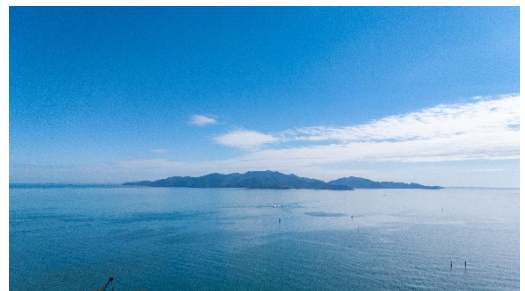
The presence of migratory birds highlights the importance of maintaining healthy wetlands, mudflats, saltmarshes and coastal habitats throughout Cleveland Bay. These interconnected environments provide feeding, roosting and refuge habitat for migratory species and support ecological processes operating at local, regional and international scales.

MAGNETIC ISLAND (YUNBENUN)

Magnetic Island is one of Cleveland Bay's defining features. Monitoring has provided valuable information about how reefs respond to natural environmental variability, including floods, cyclones, marine heatwaves and changes in water quality.

The island supports:

- Fringing coral reefs.
- Seagrass meadows.
- Mangrove communities.
- Native woodlands.
- Important wildlife habitat.
- Significant cultural heritage values.



Its landscapes and ecosystems help define the character of the bay and contribute to its biodiversity and scenic beauty.

TRADITIONAL OWNER CONNECTIONS

Cleveland Bay lies within the Sea Country of the Gurambilbarra Wulgurukaba and Bindal peoples.

For thousands of years, Traditional Owners have maintained cultural, spiritual and economic connections to the bay, its islands, estuaries and marine resources. These connections remain an important part of caring for Country today.

SUPPORTING FISHERIES

The habitats of Cleveland Bay support important commercial, recreational and Traditional Owner fisheries.

Seagrass meadows, mangroves, estuaries and wetlands provide breeding, nursery and feeding habitat for species including:

- Barramundi.
- Threadfin salmon.
- Grunter.
- Flathead.
- Mud crabs.
- Prawns.
- Mackerel.



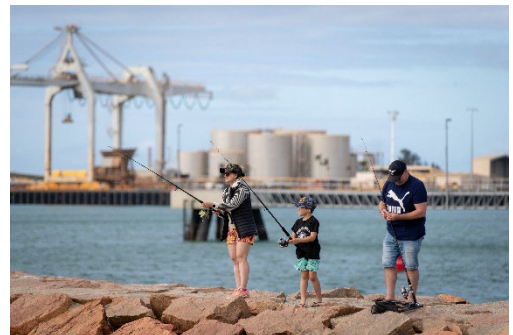
Healthy habitats help sustain healthy fish populations.

SUPPORTING COMMUNITY LIFE

Cleveland Bay is more than an environmental asset—it is part of everyday life in North Queensland.

The bay supports:

- Traditional Owner use of Sea Country.
- Ferries to Magnetic Island and Palm Island.
- Recreational fishing.
- Boating and sailing.
- Tourism and recreation.
- Research and education.
- Port and shipping activities.



These activities rely on the health and resilience of the bay's natural systems.

A HIGHLY PROTECTED ENVIRONMENT

Cleveland Bay is protected through a range of environmental management frameworks including:

- Great Barrier Reef World Heritage Area.
- Great Barrier Reef Marine Park.
- Cleveland Bay Dugong Protection Area.
- Cleveland Bay Fish Habitat Area.
- Bowling Green Bay Ramsar Wetland.
- Magnetic Island National Park.
- State and Commonwealth environmental legislation.

These protections help guide environmental management and assessment activities across the region.

WHY CLEVELAND BAY MATTERS

Cleveland Bay is a place where nature, wildlife and community come together.

Its seagrass meadows, coral reefs, mangroves, wetlands, wildlife and cultural heritage form one of North Queensland's most valuable coastal environments.

Beyond its environmental values, Cleveland Bay supports recreation, boating, tourism, transport, education, research and port activities that contribute to the region's economy and lifestyle.

KEY TAKEAWAYS

- Cleveland Bay supports diverse and interconnected ecosystems.
- Seagrass meadows, coral reefs, mangroves and wetlands are fundamental to ecosystem health.
- Cleveland Bay provides habitat for dugongs, turtles, dolphins and migratory birds.
- The bay supports important Traditional Owner, recreational and commercial values.
- Cleveland Bay is recognised through a range of State, Commonwealth and international environmental protections.
- Long-term monitoring and scientific research help inform environmental management and decision-making.

Protecting Cleveland Bay helps protect the wildlife, habitats and community values that make this part of North Queensland special.