# DARWIN HARBOUR

## 2024 Integrated Report Card

DHIRC.ORG.AU

# WELCOME TO COUNTRY

"The Larrakia People are the Traditional Owners of the Darwin region. Our country runs from Cox Peninsula in the west to Gunn Point in the north, Adelaide River in the east and down to the Manton Dam area southwards.

We welcome you to our beautiful land and sea country. We have a deep, spiritual connection with our country and are responsible for making sure it is respected by all those that use it."
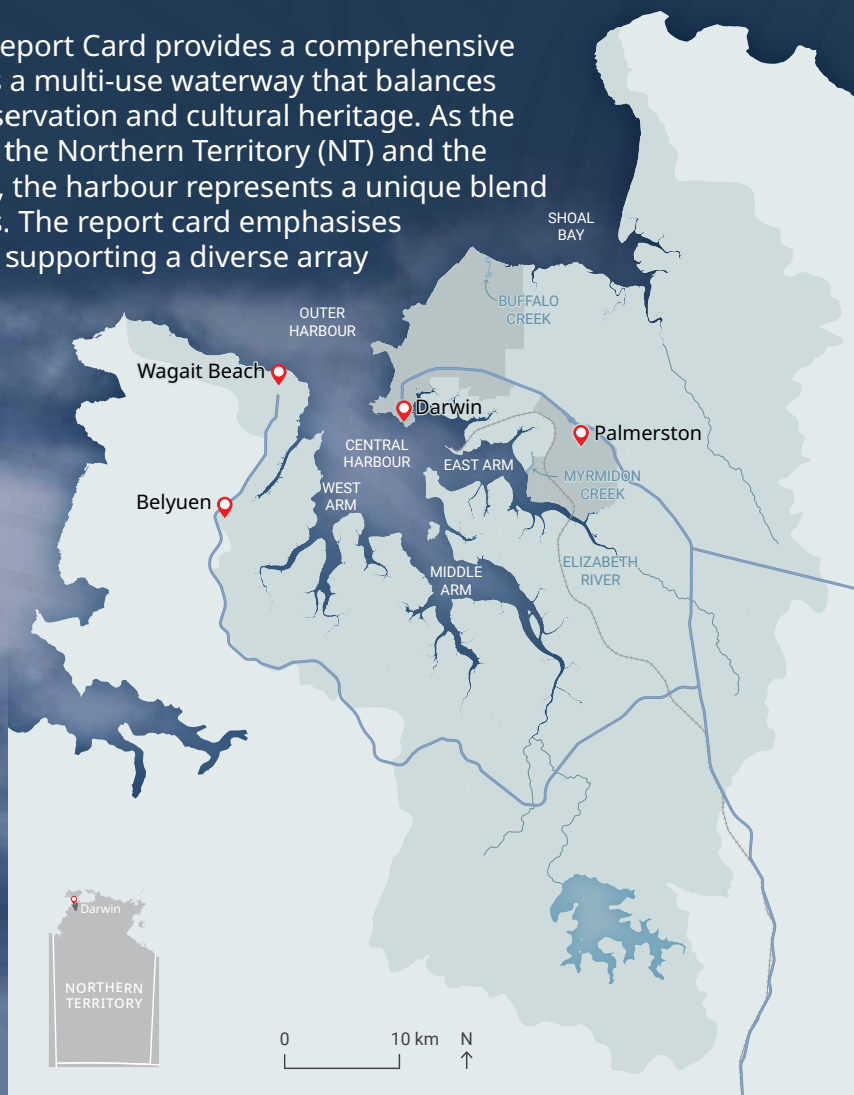
# INTEGRATED REPORTING FOR A MULTI-USE HARBOUR

The 2024 Darwin Harbour Integrated Report Card provides a comprehensive overview of Darwin Harbour's status as a multi-use waterway that balances economic activities with ecological preservation and cultural heritage. As the epicentre of commerce and industry in the Northern Territory (NT) and the traditional lands of the Larrakia People, the harbour represents a unique blend of modern utility and ancient traditions. The report card emphasises the harbour and its catchment's role in supporting a diverse array of environmental, economic, social and Indigenous cultural values.

The report card highlights Darwin Harbour's ecological diversity, home to mangroves, coral reefs and seagrass beds essential for species such as turtles, dolphins and migratory birds. These habitats support the harbour's biodiversity and recreational uses, including fishing.

The 2024 report card details efforts to ensure development within the harbour and its catchment doesn't compromise its environmental health, enjoyment for residents and visitors, or the Larrakia People's cultural values. It promotes a sustainable vision for the harbour, underscored by the Darwin Harbour Strategy that outlines principles, goals, objectives and outcomes to help guide sustainable management and planning in the region.

This year, the Darwin Harbour Advisory Committee is proud to present our Integrated Report Card, a key milestone in our commitment to a sustainable future for Darwin Harbour. It supports the Darwin Harbour Strategy and our vision to protect and enhance the harbour's environmental, economic, cultural and social values. This report card aims to guide informed decisions and community efforts, ensuring the harbour remains a valuable asset for Larrakia People, residents, visitors and all future generations. The report card is the result of a truly collaborative effort involving many local stakeholders.

# VALUES OF A HEALTHY DARWIN HARBOUR

This Darwin Harbour Integrated Report Card was developed through extensive consultation with stakeholders from the Darwin Harbour region, drawing heavily on their knowledge and expertise. It assesses various features within the harbour and its catchments.

In March 2020, a series of workshops marked the first step in the development of this report card. Stakeholders from government, Indigenous communities, industry, academia and non-government organisations convened in and around Darwin Harbour. They identified the region's key environmental, social, Indigenous cultural, and economic values and discussed potential indicators and thresholds for assessing these values. This collaborative effort culminated in the release of the inaugural report card in 2021.
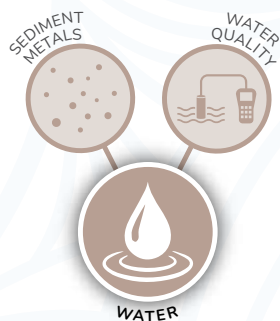
Additional workshops in subsequent years have further refined the process of generating the report card, for example, implementing a scientific expert panel for this year's report card.

The value and indicator rosette below presents an overview of the eight key values identified as important to those who live, work and play in and around Darwin Harbour, and the 19 indicators developed to assess the 'health' of these values. These indicators can guide Darwin Harbour's management and conservation strategies, maintaining its intrinsic values for present and future generations.

A companion website (dhirc.org.au) provides further details on these indicators and the methods used to derive the report card grades.



DARWIN HARBOUR VALUES

- WATER — SEDIMENT METALS, WATER QUALITY
- LIFESTYLES & WELLBEING — FISHER SATISFACTION, PARK VISITATION, AIR QUALITY
- ENVIRONMENTAL MANAGEMENT — MANAGEMENT DELIVERABLES, LITTER
- INDIGENOUS VALUES — FOOD SECURITY, FUTURE GENERATIONS, SPIRITUAL & SACRED SITES
- BIODIVERSITY — COASTAL BIRDS, BARRAMUNDI
- ECONOMIC VITALITY — SHIPPING ACTIVITY, TOURISM
- ECOSYSTEMS & LANDSCAPES — CATCHMENT HEALTH, MANGROVE HEALTH
- CLIMATE CHANGE RESILIENCE — SOLAR UPTAKE, URBAN TREE COVER, PLANNING PREPAREDNESS

# 2024 INDICATORS

## WATER

SEDIMENT METALS

WATER QUALITY

WATER

The evaluation of water incorporates indicators for water quality and sediment metals. These indicators rely on data gathered by the NT Department of Environment, Parks and Water Security (DEPWS) and they quantify pollution levels.

## LIFESTYLES AND WELLBEING

FISHER SATISFACTION

PARK VISITATION

AIR QUALITY

WET DRY

LIFESTYLES & WELLBEING

The assessment of lifestyles and wellbeing is based on three criteria – visitation to Casuarina Coastal Reserve, air quality in the wet and dry seasons and fisher satisfaction. Data for park visitation and air quality are supplied by NT DEPWS and fisher satisfaction data are from Fisheries NT.
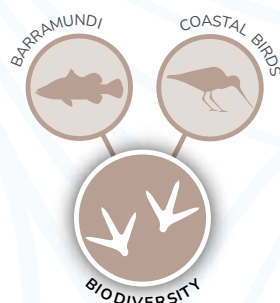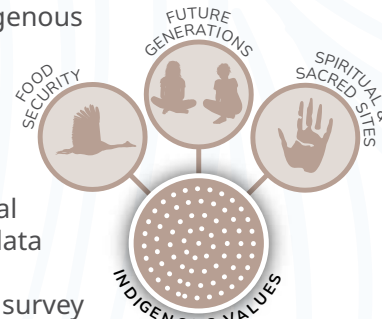
## ENVIRONMENTAL MANAGEMENT

MANAGEMENT DELIVERABLES

LITTER

ENVIRONMENTAL MANAGEMENT

Environmental management of Darwin Harbour and its catchment is assessed using information on management deliverables published by NT DEPWS and litter data collected annually via the Darwin Harbour Clean-Up led by the Larrakia Rangers.

## INDIGENOUS VALUES

FOOD SECURITY

FUTURE GENERATIONS

SPIRITUAL & SACRED SITES

INDIGENOUS VALUES

The evaluation of Indigenous values considers three specific indicators – food security, the well-being of future generations, and the preservation of spiritual and sacred sites. The data for each indicator are obtained via an online survey distributed by the Larrakia Rangers.
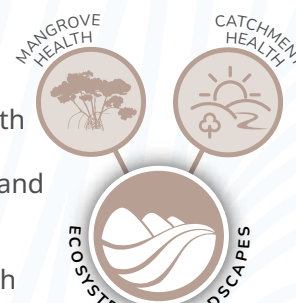
## BIODIVERSITY

BARRAMUNDI

COASTAL BIRDS

BIODIVERSITY

The assessment of biodiversity uses data on coastal bird diversity and abundance from the Larrakia Rangers, along with barramundi length data from the annual Top End Barra Series fishing competition.

## ECOSYSTEMS AND LANDSCAPES

MANGROVE HEALTH

CATCHMENT HEALTH

ECOSYSTEMS & LANDSCAPES

The evaluation of ecosystems and landscapes focuses on two indicators – the health of the catchment (via catchment disturbance) and the extent of mangroves over time. NT DEPWS supplies the data for both these indicators.

## ECONOMIC VITALITY

TOURISM

SHIPPING ACTIVITY

ECONOMIC VITALITY

Darwin Harbour's economic vitality is evaluated using tourism metrics (visitor counts, expenditures, fishing tourism) and shipping activity, measured by annual ship gross tonnage. Data are sourced from Tourism NT and Darwin Port.

## CLIMATE CHANGE RESILIENCE

PLANNING PREPAREDNESS

URBAN TREE COVER

SOLAR UPTAKE

CLIMATE CHANGE RESILIENCE

Climate change resilience is evaluated using three indicators – planning preparedness, urban tree cover and domestic solar panel installation. The data for these indicators come from policy and strategy documents, the City of Darwin and CSIRO, and the Australian Photovoltaic Institute, respectively.

# DARWIN HARBOUR AND CATCHMENT 2024 REPORT CARD

The grading system for the Darwin Harbour Integrated Report Card uses a colour-coded scale and the letters 'A' through 'E' to denote performance against objectives for each indicator. Scores are based on a universal scale from 0% to 100% and are categorised into five levels ranging from 'Very good' to 'Very poor', as detailed in the legend. Grades include a '+' or '-' if the score is within 5% of a category boundary. An additional category, 'Insufficient data', is used when current information is lacking or unavailable to assign a grade. For more detailed methods, visit dhirc.org.au.

## What do the grades mean?

**A** — **VERY GOOD**
80–100% of results meet objectives

**B** — **GOOD**
60–80% of results meet objectives

**C** — **FAIR**
40–60% of results meet objectives

**D** — **POOR**
20–40% of results meet objectives

**E** — **VERY POOR**
0–20% of results meet objectives

**INSUFFICIENT DATA**

SEDIMENT METALS

SOLAR UPTAKE

URBAN TREE COVER

PLANNING PREPAREDNESS

CLIMATE CHANGE RESILIENCE

WAT

CATCHMENT HEALTH

ECOSYSTEMS & LANDSCAPES

B

MANGROVE HEALTH

ECONOMIC VITALITY

BIODIV

SHIPPING ACTIVITY

TOURISM

COASTAL BIRDS

WATER
QUALITY

FISHER
SATISFACTION

PARK
VISITATION

AIR
QUALITY

WET
DRY

LIFESTYLES &
WELLBEING

ENVIRONMENTAL
MANAGEMENT

MANAGEMENT
DELIVERABLES

LITTER

INDIGENOUS
VALUES

FOOD
SECURITY

FUTURE
GENERATIONS

SPIRITUAL &
SACRED SITES

BARRAMUNDI

B

The 2024 Darwin Harbour Integrated Report Card provides an insightful overview of the harbour's condition through a multi-faceted analysis of eight key environmental, social, economic and Indigenous cultural values (inner ring of the rosette) measured by 19 indicators (outer ring).

At the heart of the assessment, an overall B grade indicates that the harbour is in good condition, with many of the indicator objectives being met. This favourable score primarily indicates the inherent and natural robustness of the harbour ecosystem, although there are signs that the system is experiencing stress and is in need of improved management.

This year's assessment highlights the very good performance of the **Lifestyles and wellbeing** and **Ecosystems and landscapes** values, compared to fair results for **Environmental management**, **Indigenous values** and **Climate change resilience**. Poor results are reported for **Air quality** in the dry season and for **Indigenous food security**.

Two key indicators – **Fisher satisfaction** and **Management deliverables** – are identified as important for assessing the harbour's status, yet insufficient or aging data prevents confident grading of these indicators for this year's report card.

Additional information on these values and other indicators can be found on the following pages and at dhirc.org.au.

# FINDINGS

**Water quality** in Darwin Harbour received an A- grade in 2024. Notable improvements were seen in Central Harbour and West Arm, while Elizabeth River maintains a very good condition despite a slight decline in water quality. Middle Arm and Shoal Bay saw decreases in water quality from very good to good. However, Buffalo Creek and Myrmidon Creek conditions are graded as fair to poor, respectively. **Sediment quality** is in good condition overall, receiving a B grade, similar to that received in 2021. However, several sites adjacent to developed harbour regions are more impacted, especially in the vicinity of Darwin City and northern suburbs. Buffalo Creek and Myrmidon Creek have insufficient sites for inclusion in this year's assessment.



During the reporting period, **Park visitation** at Casuarina Coastal Reserve surpassed the previous five-year average, earning an A+ grade. The 2021 report card also collected data from other regional parks, but the focus shifted to Casuarina Coastal Reserve due to its proximity to the harbour and high local usage. **Air quality** is evaluated separately for the wet and dry seasons using the AirRater system. The dry season receives a D+ due to increased particulate matter from smoke, while the wet season scores an A, leading to an overall B grade for air quality. The **Fisher satisfaction** indicator was introduced this year, but outdated data prevents reliable reporting. Future report cards will regularly report on this indicator if updated data becomes available.



**Litter** is a new indicator this year to assess environmental management, receiving a C- grade. This grade is based on the average 2.8 kg/km/person of litter collected across the harbour in recent years. The grading system is designed so that a lower amount of litter collected results in a higher grade, with the assumption that enhanced management practices will reduce the volume of litter available for collection each year. Additionally, the methodology for assessing management deliverables, introduced in the 2021 report card, was re-evaluated and discontinued this year due to difficulties isolating data specific to Darwin Harbour. Despite this, the indicator is retained in the 2024 report card to encourage the development of a more effective assessment method for future reports.



Indigenous **Food security** is rated a poor D, reflecting survey responses that highlight a decline in the availability of traditional foods and reduced reliance on the harbour as a primary food source. The indicator for **Future generations** earns a B- based on survey results showing a robust desire to preserve and transmit cultural knowledge and to use this knowledge to enhance the harbour and influence government decisions. **Spiritual and sacred sites** receives a C grade, with survey results indicating insufficient protection efforts for these sites in the region and varying levels of respect perceived by the community.
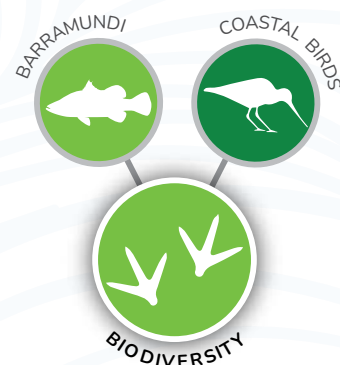
# FINDINGS

Both biodiversity indicators are newly introduced in the 2024 report card, having successfully sourced suitable, robust datasets. **Barramundi** receives a B grade based on fish length collected over the past decade through the Top End Barra Series, an annual Darwin Harbour fishing competition that includes strict rules regarding fishing methods, effort and measurement. The dataset includes 575 barramundi caught since 2014 with sizes up to 92 cm in length. Resident **Coastal birds** receives an A- grade, reflecting the healthy levels of coastal bird diversity throughout the harbour. Migratory birds are excluded from the analysis because their presence in the harbour did not consistently align with the timing of surveys. Discussions with Larrakia Rangers and BirdLife Australia are ongoing to determine how this issue can be addressed in future editions of the report card.

**Tourism** receives an A grade, marking a substantial improvement from the D+ grade in 2021. This rise is attributed to a rebound in domestic and international travel following the COVID-19 pandemic and indicates that tourist numbers and expenditure align with the 2030 goals of Tourism NT. Additionally, this year's tourism indicator is expanded to include fishing tourism, providing a broader measure of the tourism sector's health in the Darwin Harbour region. **Shipping activity**, measured by annual gross tonnage (AGT), is also introduced as a new indicator this year. Compared to AGT data from the past decade, shipping activity earns a B- grade for 2024, with an average of approximately 36.5 million gross tonnes moving annually in and out of the port.

In 2024, **Mangrove health** receives an A+ grade, benefiting from a revised measurement methodology that enhances the accuracy of mangrove extent assessments. The region saw a net increase of nearly 400 hectares in mangrove coverage since the 2016 baseline, with the biggest gains in Shoal Bay and Buffalo Creek. In contrast, Central Harbour experienced a slight decrease of 0.02%, equivalent to 0.32 hectares. **Catchment health** reveals varied disturbance levels throughout the Darwin Harbour catchment. The Howard River and Palmerston areas experienced increased disturbances compared to 2021, while Darwin City, Pioneer Creek and Elizabeth River saw lower levels of disturbance. Despite these variations, the overall assessment for this indicator maintains a B grade, consistent with the 2021 grade.

This year, the newly introduced **Planning preparedness** indicator receives a C grade, indicating initial progress but also underscoring the need for enhanced monitoring of sustainability policy implementation and impacts, and improved contingency and scenario planning. Another new indicator, **Urban tree cover**, is graded C+. Within Darwin City, areas under NT Government ownership exhibit the highest tree coverage at 29%, while Australian Government-owned land has the lowest at 20%. The domestic **Solar uptake** in the Darwin Harbour catchment area also receives a C grade. Although solar installations have increased since 2021, the grade remains unchanged in 2024.
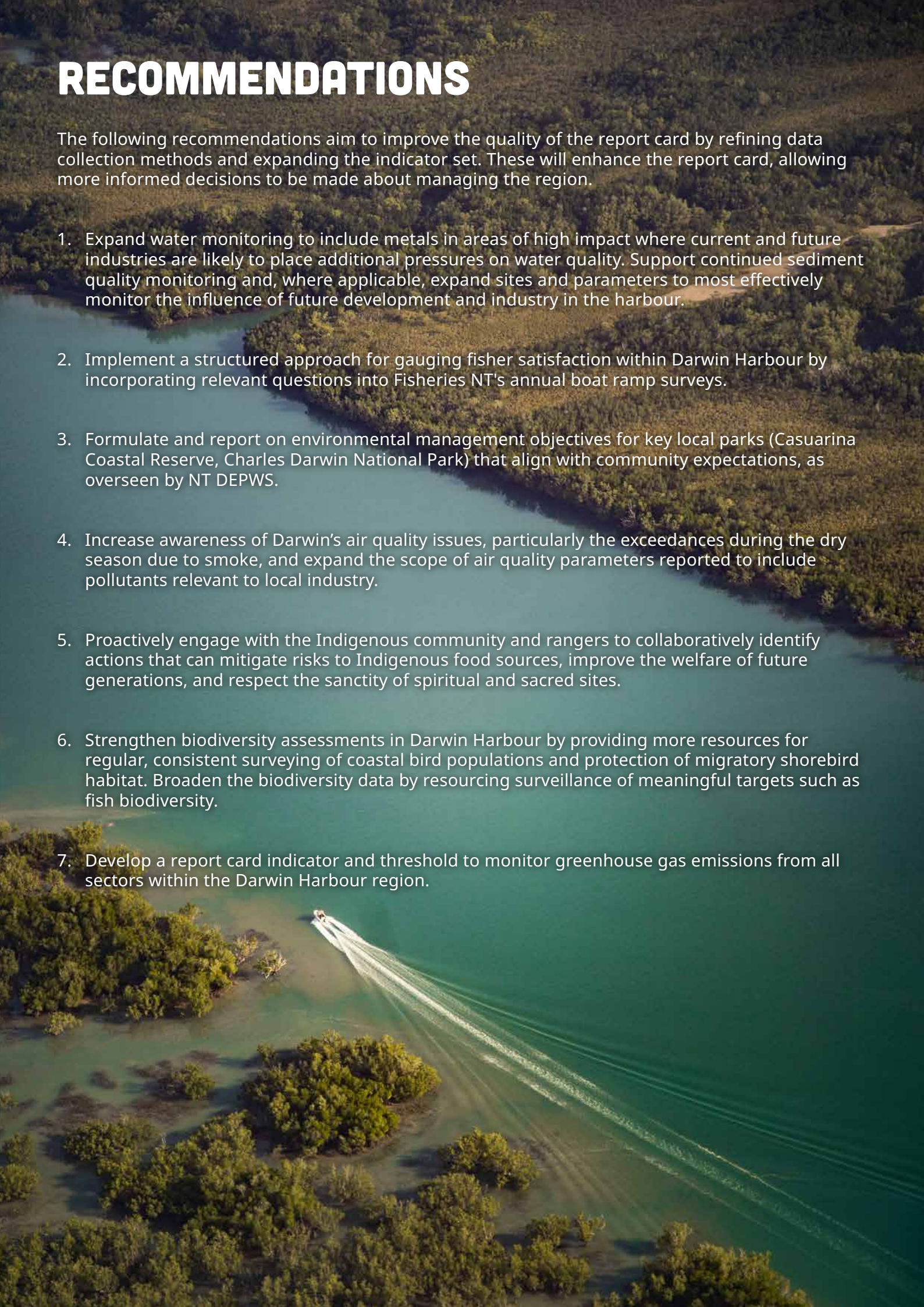
# RECOMMENDATIONS

The following recommendations aim to improve the quality of the report card by refining data collection methods and expanding the indicator set. These will enhance the report card, allowing more informed decisions to be made about managing the region.

1. Expand water monitoring to include metals in areas of high impact where current and future industries are likely to place additional pressures on water quality. Support continued sediment quality monitoring and, where applicable, expand sites and parameters to most effectively monitor the influence of future development and industry in the harbour.

2. Implement a structured approach for gauging fisher satisfaction within Darwin Harbour by incorporating relevant questions into Fisheries NT's annual boat ramp surveys.

3. Formulate and report on environmental management objectives for key local parks (Casuarina Coastal Reserve, Charles Darwin National Park) that align with community expectations, as overseen by NT DEPWS.

4. Increase awareness of Darwin's air quality issues, particularly the exceedances during the dry season due to smoke, and expand the scope of air quality parameters reported to include pollutants relevant to local industry.

5. Proactively engage with the Indigenous community and rangers to collaboratively identify actions that can mitigate risks to Indigenous food sources, improve the welfare of future generations, and respect the sanctity of spiritual and sacred sites.

6. Strengthen biodiversity assessments in Darwin Harbour by providing more resources for regular, consistent surveying of coastal bird populations and protection of migratory shorebird habitat. Broaden the biodiversity data by resourcing surveillance of meaningful targets such as fish biodiversity.

7. Develop a report card indicator and threshold to monitor greenhouse gas emissions from all sectors within the Darwin Harbour region.

# ACKNOWLEDGEMENTS AND CREDITS

DARWIN HARBOUR ADVISORY COMMITTEE

TO PROTECT AND ENHANCE THE ENVIRONMENTAL, ECONOMIC, CULTURAL AND SOCIAL VALUES OF DARWIN HARBOUR