



# Securing our Top End coasts and seas

Safeguarding their economic, social,  
cultural and environmental values



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Keep Top End Coasts Healthy is an alliance of environment groups including the Australian Marine Conservation Society, the Pew Charitable Trusts and the Environment Centre of the Northern Territory.

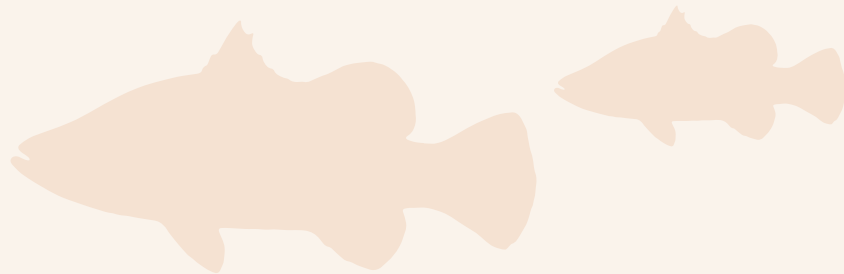
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The Top End's coasts and seas are unique in their mix of natural, cultural, social and economic values, but also in their lack of conservation and management. The Northern Territory should drive positive and effective changes in the planning of coastal and marine environments to enhance their health and strengthen their connections with culture and community.

# EXECUTIVE SUMMARY

## 1. Introduction

The Top End is a unique and rich mix of nature, culture, lifestyle, livelihoods and economy under threat. The Northern Territory can set a new course for the future of the region's coasts and seas by driving positive and effective change in the planning of coastal and marine environments, enhancing their health and strengthening their connections with culture and community. This new course should provide an integrated management planning framework that contains existing and new tools backed up by good governance and policy, enforcement and resourcing to avoid repeating the mistakes of the past.

## 2. Charting a new course

A clear vision, measurable objectives, deployment of proven, Territory-tailored tools, with achievable targets, realistic timelines and adequate resources are essential for the successful implementation of an integrated management planning framework. Recognition of the rights, aspirations and enterprise of Indigenous communities should be the foundation for regional coastal and marine planning that effectively responds and adapts to climate change and provides certainty for coastal and marine industries.

## 3. Building knowledge and understanding

Connecting marine science and traditional ecological knowledge is becoming more commonplace in the quest to better understand Top End coasts and seas and to improve their planning and management. This collaboration should underpin regional coastal and marine planning. To ensure its success, it will be important to fill significant gaps in marine science and provide adequate support to sustain traditional ecological knowledge, culture and livelihoods. Critical too will be making available wherever possible government, academic and corporate data, through the establishment of a centralised data hub, and the implementation of a monitoring, evaluation, reporting and improvement framework.

## 4. Identifying values and threats

The Top End's coastal waters are some of the world's last, near-pristine tropical marine environments, largely due to limited development and low population pressure, and the management of saltwater country by Indigenous communities for thousands of years.

A recent economic analysis estimated that Territory marine and coastal ecosystems contributed about \$1billion per year to the Territory economy, around 4% of the Gross State Product, and supported up to 6,300 jobs. The same analysis estimated that non-market ecosystem services were worth between \$875m and \$1.9b per annum.

But the Top End is not immune from the impact of inappropriate development and damaging extractive uses. Fresh and groundwater extraction, port developments and transshipping, seabed mining, invasive species, localised overfishing, pollution from legacy and operational mines, and climate change, can each impact on the future health of the region's coasts and seas. To avoid the fate of more heavily populated and overused areas in the Asia-Pacific, the Territory will need to deploy a suite of proven measures that ensure good management of the Top End's most valued resource. The lack of scientific knowledge about these coastal and marine environments is often cited as a reason to hold off on key measures — this is both unnecessary and unwise.



## 5. Caring for coasts and seas

Indigenous communities have been caring for saltwater country for millennia, passing it forward across the generations in near-pristine condition. Territory land rights legislation in the 1970s has given Traditional Owners inalienable freehold title to 85% of the Top End's coastline and intertidal zone. Saltwater country management has been enhanced by the establishment of Indigenous Protected Areas, Indigenous ranger groups and detailed management plans. Along with providing some protection for marine and coastal habitats, Indigenous Protected Areas on coasts and seas strengthen culture, livelihoods, knowledge and regional economic development and can provide greater certainty for other users. They also rightly place Traditional Owners at the forefront of regional coastal and marine spatial planning and recognise rights, meet aspirations and encourage Indigenous enterprises.

The Top End's coasts and seas are unique in their mix of natural, cultural, social and economic values, but also in their lack of planning, protection and management. Areas managed for conservation should be a key element of regional coastal and marine planning and can benefit fisheries, tourism and regional economies. Management zones to support recreational fishing can enhance and secure the Top End's prime lifestyle activity, deal with conflicts and improve certainty for other users. Recreational fishing is central to the Territory lifestyle and dependent on the good health of marine and coastal environments.

## 6. Conclusions

This report (the third in the Keep Top End Coasts Healthy series) makes recommendations that chart a new course for Territory coastal and marine planning. This includes the need for knowledge building, dealing with impacts and caring for the coast through integrated spatial planning including the creation of Indigenous Protected Areas and areas managed for conservation and recreation.

The Northern Territory is a region with a unique mix of nature, culture, livelihoods, lifestyle and economy, but also of one where these values are threatened unless new policies, strategies and plans are implemented. We can achieve healthy and productive coasts and seas that sustain culture and support the Territory lifestyle now and into the future.



The Keep Top End Coasts and Seas program is working to improve coastal and marine planning, protection and management. Photo: Nick Parry



# 1. INTRODUCTION

## A remarkable opportunity for a unique part of the world

unique/ju:'ni:k/*adjective* 1. being the only one of its kind; unlike anything else.

A small word, with a significant meaning, but it is too often misused to exaggerate worth. Not so in the Top End, a place like no other, a remarkable mix of nature, culture and lifestyle, a powerful driver of the Territory economy and, according to the latest research, one of the few areas in the world's oceans relatively untouched by human impacts<sup>1</sup>.

Territory Labor correctly used the word when introducing its *Protecting our marine environment* policy during the 2016 Territory election:

'The Territory's coasts are unique, natural and culturally significant. They are an important part of our identity, and way of life'<sup>2</sup>.

But the policy's preamble also struck a note of caution:

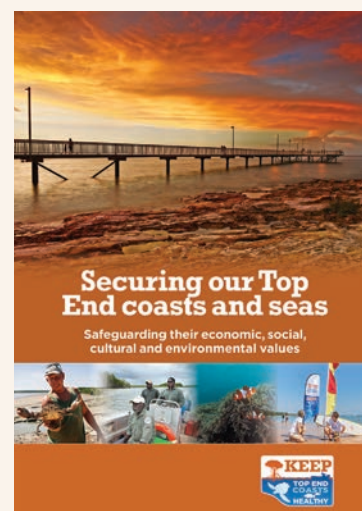
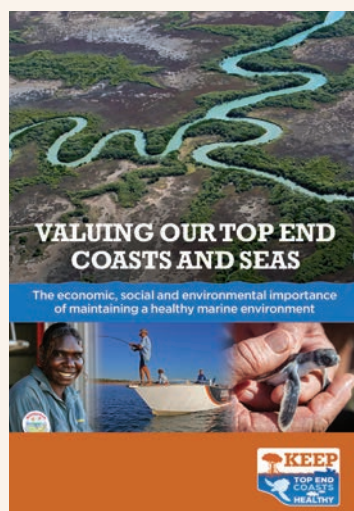
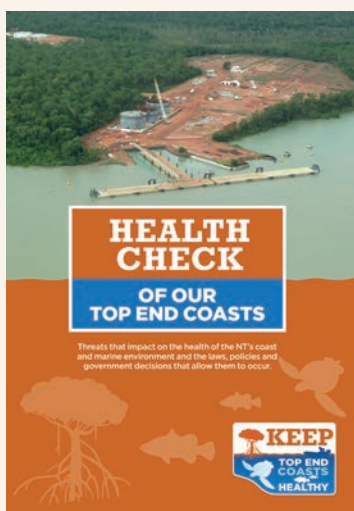
'With this opportunity comes great responsibility—growing industrial development and coastal construction and increasing use of the Territory's natural resources requires good governance, sustainable management and protective measures tailored to the Territory'<sup>3</sup>.

By any measure, being responsible for looking after the natural, cultural, social and economic values of the Top End's coasts and seas is challenging. To meet that challenge, governments, Traditional Owners, industry, scientists and the community must work as one.

The Keep Top End Coasts Healthy series of three reports is one community response to the challenge, providing information on how best to plan for and secure a healthy future for the region's coasts and seas now and into the future.

The first report, *Health check of our Top End coasts*, identified the key threats to the region's natural resources and the changes required to ensure their good governance and sustainable management. The second report, *Valuing our Top End coasts and seas*, described the environmental, cultural, social and economic values that would be lost if threat responses were inadequate.

This third and final report, *Securing our Top End coasts and seas*, discusses "good governance, sustainable management and protective measures" for the Top End's coasts and seas. It also considers how to deal with impacts and threats, build knowledge and understanding, care for saltwater country, support the fishing lifestyle and improve coastal and marine planning that is currently beset by a piecemeal, ad-hoc and silo-based approach.





## **We are all in this together**

Integrated, inclusive and effective coastal and marine planning requires a transparent and accountable approach involving all interests. As part of its preparation of the Coastal and Marine Management Strategy and Implementation Plan, the Gunner Government has established a Partnership Group that includes representatives of Traditional Owners, marine-based industries and agencies, science, conservation, natural resource management, tourism and recreational fishing, each with a strong connection to the Top End's coasts and seas. It is intended that this collaborative approach will continue throughout the Strategy's completion and implementation.

Collaboration between governments will also be crucial to secure a positive future for the Top End's coasts and seas. Territory waters connect with those of the Commonwealth, stretch across the Arafura Sea and Gulf of Carpentaria towards Indonesia, Timor Leste, Papua New Guinea, Queensland's Cape York and the Torres Strait. The Australian Government is currently finalising management arrangements for marine parks in Commonwealth waters; six offshore parks are found along the boundary of Territory waters. An opportunity presents itself for the Territory and Australian governments to build a solid foundation for future ocean health and prosperity by working together on their marine planning.

## **Turning strategy into actions**

For future coastal and marine policy to drive positive and effective change, it should:

1. facilitate the development of an integrated framework for regional marine planning;
2. recognise and support the rights, aspirations and enterprise of Indigenous communities;
3. support the critical role of marine science and traditional ecological knowledge in coastal and marine planning and management;
4. be guided by a robust set of scientific principles—ecologically sustainable development, ecosystem-based management and marine spatial planning—and rigorous and transparent processes;
5. aim to maintain and improve marine and coastal environments and ensuring their ecologically sustainable use;
6. include areas that provide long-term secure protection for conservation values and recreational pursuits alongside Indigenous Protected Areas
7. provide certainty for coastal and marine industries;
8. respond and adapt effectively to climate change;
9. ensure the Territory's commercial, tourism and recreational fishing story can continue to be told; and
10. be well resourced with measurable objectives, achievable targets and realistic timelines.

## **In the pages to come**

This third report in the Keep Top End Coasts Healthy series now considers how the Territory can move forward to ensure the ecologically sustainable planning and use of one of its greatest assets, coastal and marine environments. It charts a new course for coastal and marine planning and then outlines the steps in that journey: building knowledge and understanding, identifying values and threats, and caring for coasts and seas with Indigenous Protected Areas, and areas that provide long-term secure protection for conservation values and recreational pursuits. Such an approach can secure saltwater country, safeguard marine life, support the Top End fishing lifestyle and build the Territory's coast as a unique tourism icon.

## 2. CHARTING A NEW COURSE

### A blank canvas

There is a 411-page document on the Northern Territory Government website that shows how Top End land-use planning works. The Northern Territory Planning Scheme contains information on planning principles, planning zones and provisions for land use in the Darwin region and large and small towns. Colourful maps accompany the plan and vividly illustrate where more than 30 land-use zones are applied across the Territory.

But the striking colours—and planning more generally—abruptly end where land meets sea. The mouth of the Liverpool River and the Arafura Sea are each labelled on the Maningrida zoning map, but the words are surrounded by white space, an indication that no planning applies. The same is true for Darwin Harbour on the Darwin zoning map. In terms of land-use planning, the Top End's marine waters, all 72,000 km<sup>2</sup>, do not exist.

Yes, there are fishery management areas, two marine parks, five reef protection areas, three tiny aquatic reserves and a number of coastal national parks and conservation reserves, but the protection, management and use of the Top End's coasts and seas are not planned, managed and protected in any comprehensive and integrated way.

Without healthy and productive coasts and seas, the Top End's culture, livelihoods and lifestyle will suffer. These are too important to fall victim to the vagaries of the existing approach to their planning and management.

If it were not for Traditional Owners, who have been implementing saltwater country and Indigenous Protected Area strategies and management plans, the Territory would be bereft of any vision, aspiration and objectives for looking after its coasts and seas.

Coastal and marine planning has evolved in an ad-hoc and piecemeal fashion. But this could change if the Territory's Coastal and Marine Management Strategy and Implementation Plan bear fruit and:

‘...provide guidance to all managers and users to ensure a holistic approach to understanding and using these environments, whilst safeguarding them for the benefit of all Territorians’<sup>4</sup>.

The Strategy will also be:

‘...a science based and consultative approach to management and conservation, involving all stakeholders. Commencing in 2018, the plan will safeguard our coasts—boosting recreational fishing opportunities, preventing damaging pollution, fostering sustainable industries and safeguarding the Territory's lifestyle’<sup>5</sup>.

The lack of comprehensive policies and strategies for the Top End's coasts and seas is challenging. But such a blank canvas provides a remarkable opportunity for the Coastal and Marine Management Strategy and its Implementation Plan. They can size the canvas, provide the brushes and fill the colour palette for painting a vision for the future.

What is now required is a clear and agreed whole-of-government strategic vision and policy. This should seek to maintain, restore and improve the health of coasts and seas and contain a sound set of principles, robust objectives, effective actions and timelines, adequate resources and an integrated regional coastal and marine planning framework.

### Regional and spatial coastal and marine planning

Regional marine and coastal planning should aim to ensure that the multiple users of coastal and marine environments are supported while minimising or avoiding resource-use conflicts. The inclusion of regional coastal and marine planning provisions in planning legislation would give the plans legal support. The planning and management processes adopted by Traditional Owners in the development of IPA management plans provide a firm basis for the development of regional coastal and marine plans.

Regional and spatial coastal and marine planning should:

- ensure decisions on regional marine resource allocation are environmentally, socially, culturally and economically balanced, and that threats are minimised;
- identify and conserve important places, significant species and ecological communities in coastal waters;
- establish management based on marine and coastal ecosystems and informed by traditional ecological knowledge;
- ensure ecosystem-based management is integrated across relevant industry and government bodies and the marine-coastal-catchment continuum;
- build the capacity of Traditional Owners to ensure their effective engagement in decision making and implementation, including co-management;
- foster community stewardship, engagement and understanding of the Top End's coasts and seas, their ecological integrity, biological diversity, ecological processes and resources;
- support collaborative partnerships in research, planning, monitoring and management;
- respond to climate change and its impacts on coastal communities with long-term strategic adaptation approaches;
- outline amendments to planning legislation to include provision for regional coastal and marine planning principles, processes and enforcement; and
- include mechanisms e.g. parks, that can give a strong legal basis to Indigenous Protected Areas.

The following chapters cover some of the keys steps that need to be followed in the development of a regional coastal and marine plan:

- building knowledge by gathering the necessary baseline data within research, information and monitoring systems and supporting two-way science;
- identifying values and threats and the actions to protect the values and minimise the threats; and
- caring for coasts and seas through the establishment of IPAs and areas managed for protection of conservation values and recreational pursuits.



The work of Indigenous ranger groups is central to future regional coastal and marine planning, protection and management in the Top End. Photo: David Hancock



### 3. BUILDING KNOWLEDGE AND UNDERSTANDING

‘Yolngu ecological knowledge is all encompassing, combining spiritual, moral and communal components. The nature of the sea, its flora and fauna and the interaction between its various elements can be described in great detail by our elders. This knowledge is based on accumulated information gathered and refined by generations of observers and students of the sea. The holders of the knowledge and those who are responsible for our management processes are also the users, or have a prescribed social relationship with the users. This system sets levels of use of resources that are within boundaries controlled by the community derived values’<sup>6</sup>.

From The Ginytjirrang Mala (1994) *An Indigenous Marine Protection Strategy for Manbuynaga Rulyapa*

#### Constraints on knowledge

The pursuit of knowledge and its application are critical to the future planning and management of the Top End’s coasts and seas. With knowledge and understanding, those who make decisions can act with greater confidence. Science, allied with traditional ecological knowledge, is critical to ensure effective and appropriate decision making, especially in the planning and management of coasts and seas:

‘Marine science is essential to our understanding of the marine environment and unlocking the opportunity it offers. It is a fundamental tool for the industries that develop marine resources; the managers that oversee them; and the policy makers that decide their future. Effectively communicated, it can guide, educate, and even entertain us. It can help all Australians to participate in preserving, respecting and continuing to value the benefits that our marine endowment provides’<sup>7</sup>.

But there are significant knowledge constraints on how Top End coasts and seas work, largely due to the region’s remoteness, limited research capacity and inadequate resourcing:

‘Coastal and marine systems are complex and expensive and difficult to study. There are still many knowledge gaps, such as the drivers of, and threats to, marine biodiversity; the distribution of many threatened species (e.g. sawfish and river sharks), and where climate change impacts will be greatest... Monitoring is also required to determine whether management efforts are being effective’<sup>8</sup>.

Limited knowledge has significant implications for how we protect, manage and use the Top End’s coasts and seas, requiring that we act with caution and ensure protection measures are in place. Key knowledge gaps include:

- historical ecological baselines for ecosystems, species and habitats, their current condition and the pressures upon them;
- threatened species including sharks, rays, cetaceans and seahorses;
- coastal and oceanographic processes;
- adequacy of the marine conservation estate;
- ecological sustainability of resource use and resource allocation priorities (what are the various ecological baselines and tipping points of coastal and marine ecosystems to effectively manage them?);
- biosecurity threats; and
- individual and cumulative impacts, including of climate change and large-scale infrastructure projects such as water extraction and dams

## Two-way science: a collaboration

To help overcome these knowledge constraints, scientists are increasingly working with Indigenous communities in a collaborative, two-way science process:

‘...the rapid, grassroots-driven growth of an Indigenous community ranger workforce in recent decades, especially in Central and Northern Australia, is one of the strongest areas of Indigenous engagement in science...In the rapid movement toward a knowledge-based economy in Australia and globally, it is imperative that Indigenous knowledge systems are appropriately acknowledged for the contributions that they currently make, and appreciated for their capacity to contribute even more’<sup>9</sup>.

But traditional ecological knowledge:

‘...and its ongoing practice and transfer to younger generations of Indigenous people face a range of threats, including loss of Indigenous languages, passing away of knowledge holders, limitations on access to land, environmental change, competing demands on young people, and the lack or mismanagement of recorded information’<sup>10</sup>.

In one example of responses to these concerns, Territory NRM has been working with Indigenous communities to help maintain, accumulate, transfer and apply traditional ecological knowledge ‘held inside the Yan-nhangu language of the islands’, focusing on the ‘linguistic and cultural knowledge of fish, shellfish and the coastal ecology in the Crocodile Islands’<sup>11</sup>. This work helped establish an Indigenous Ranger program, management of biodiversity loss and the development of protocols for access to Yan-nhangu marine sites by Yan-nhangu and non-Yan-nhangu people.

Collaboration between scientists and Indigenous communities can enhance knowledge and understanding, be applied to planning issues and contribute to ecologically sustainable management. One such issue is saltwater intrusion in Arafura Swamp, the Territory’s largest coastal wetland:

‘Since about 1995 the Yolngu people of the Arafura swamp started to notice ecological changes. Northern parts of the swamp that had previously supported magpie geese and long-necked turtles—important resources for Yolngu people—have become severely affected by saltwater entering the swamp. This change has corresponded with an increase in feral animal numbers on the swamp’<sup>12</sup>.

The Wanga Djakamirr and Gurruwiling ranger groups and the Northern Land Council, Charles Darwin University and Territory NRM are together developing options to manage the threat, including a model of swamp water movement along with data collection and monitoring by the rangers.

In another two-way project, Yugul Mangi Rangers are working with ecologists from Macquarie University to record species distributed throughout the South East Arnhem Land Indigenous Protected Area, which contains some coastal habitats:

‘SE Arnhem Land is one of Australia’s least known locations to Western science—many areas have never been surveyed before by biologists and is likely to contain new species. By gaining a better understanding of species presence/absence in the proposed IPA, including threatened and endangered species, the Rangers and Traditional Owners can make informed decisions about fire management and feral animals. Ultimately, we are contributing to Australia’s bigger goal of *Caring for Country*, but we need to find out what is there first!’<sup>13</sup>

In what could be called a two-way health program, Yolngu women on Elcho Island are working with medical experts and using traditional ecological knowledge and traditional health practices to tackle chronic health problems in a remote health retreat. Traditional foods such as wild yams, fish, mangrove worms, shellfish and crabs are being used in the Hope for Health Project, which is renewing the community’s connection to the shoreline and sea. Since its 2015 launch: ‘85 percent of participants showed a reduction in waist circumference, almost two-thirds had improved kidney function, and four in five people had reduced their blood pressure’<sup>14</sup>.

New and collaborative two-way science can help overcome current knowledge constraints and increase understanding of the Top End coasts and seas. So too can existing data already gathered but not made public by governments, corporations, resource users and academics. The growing body of data gathered by Indigenous ranger groups, citizens science projects and academic research will also become a linchpin in efforts to fill knowledge gaps. A critical need is to bring this and the existing data together in a useful and useable way.

‘Evidence based science and knowledge must be at the centre of all decision making. By harnessing this knowledge greater understanding and certainty can be gained and innovative and creative solutions may evolve to better protect our environment and foster steady progress. Traditional knowledge has been developed from experience gained over the centuries and adapted to the local culture and environment’<sup>15</sup>.

Collection and collation of this knowledge is an ongoing endeavour. Importantly - it's pursuit must not delay the management response. The trick is to make the management response adaptive to new information ongoing. It is management measures that should be prioritised now are those that preserve resilience against in the face of a range of threats and deliver clear and low-cost environmental and social benefits. The most effective are spatial measures with clear objectives - Indigenous Protected Areas, and areas that provide long-term secure protection for conservation values and recreational pursuits. Along with the identification of values and threats, these are discussed in the following chapters.



Clown fish at Nhulunbuy, Northern Territory. Photo: Xanthe Rivett



## 4. IDENTIFYING VALUES AND THREATS

'We've space and capacity to grow—we've one per cent of Australia's population living on one sixth of its land mass with significant distances between our population centres. There are considerable land, water, and mineral resources providing green-field development opportunities...[natural] resources are integral to the Territory's economic growth and underpin priority industries, in particular agriculture, energy, mining and tourism'<sup>16</sup>.

Department of Trade, Business and Innovation in *Our economic future: Northern Territory Economic Development Framework*.

### Valuing the Top End

The Top End is a unique part of Australia, a remarkable mix of natural and cultural values with powerful social and lifestyle connections cherished by Territorians and visitors alike. It is also one of the last intact tropical marine and coastal regions.

Containing more than 50 mangrove species, the Top End's mangrove forests are more diverse than any other part of Australia, representing 40% of the nation's mangrove cover. Six of the world's seven marine turtle species feed and breed in the Top End, an important refuge for they are under serious threat elsewhere. The region's coasts and seas can also offer sanctuary for dugong, dolphins, whales and many threatened seabirds and shorebirds.

Seagrass meadows are critical for the survival of dugongs, and are also rated globally as the third-most valuable ecosystem for ecosystem services e.g. water quality regulation, shoreline protection, habitat for prawns and other marine life, and a refuge from predation.

Wetlands of the Top End's coastal floodplains support significant wildlife and also provide important ecosystem services, such as filtering water and absorbing the impacts of storm and flood. Saltwater crocodiles roam these wetlands and are a magnet for Top End tourists and underpin a \$25million crocodile farm industry. In the 1970s hunting brought crocodiles close to extinction but they are now protected because of their environmental, cultural and economic importance.

Indigenous communities in the Top End have an extraordinarily rich and continuing culture going back 65,000 years. This connection and commitment to caring for saltwater country continues through the modern economy, with Indigenous people working in government, Indigenous bodies, park management, mining and tourism, and becoming increasingly involved in tourism-based hospitality, accommodation and ecotourism that focus on the relationships between culture and ecology.

The unique Top End lifestyle shared by the wider community is adapted to the region's tropical climate, and is the major selling point used to attract residents and visitors alike. Research conducted for the Keep Top End Coasts Healthy program has revealed that people love living in Darwin and the Top End because it is different from the south, with great weather, fascinating wildlife, the chance to explore the great outdoors and, to fish. Catching the iconic barramundi is at the heart of the Top End's fishing story.

Recreational and commercial fishing, aquaculture and fishing tourism are all reliant on the continuing good health of coasts and seas and are important economic drivers in the Top End. The economic impact of recreational fishing is felt very strongly in the regional parts of the Top End, where 70% of effort occurs.

An analysis by Neville Crossman and others<sup>17</sup> in 2018 concluded that:

- recreational fishing has a direct economic value of \$21.3m annually, with a total contribution of about \$76m annually;
- marine and coastal tourism has a direct economic value of \$156m annually, and a total contribution to the Territory economy of about \$691m each year;
- mangroves, seagrasses and tidal saltmarshes are worth \$65m/year;
- blue carbon sequestration is worth \$39m to \$468m annually, and the total stock of carbon between \$23.9 billion and \$198.5 billion, most in mangroves; and
- Indigenous cultural values were worth about \$52.5m to \$412m annually.

The final conclusion of Neville Crossman and his colleagues was that:

"Overall, we estimate that the Northern Territory marine and coastal ecosystems contribute about

\$1billion per year to the Territory economy. The Gross State Product (i.e. Territory-level GDP) in 2015-16 is \$23.6 billion, meaning the marine and coastal ecosystems contribute around 4% to the Territory economy. These ecosystems also support about 6,300 jobs. But only some of the ecosystem services provided by the Northern Territory's marine and coastal ecosystems are bought and sold in the market. The value of ecosystem services can thus be thought more broadly in terms of the contribution that they make to economic welfare (wellbeing) – we estimate these values at between \$875m and \$1.9b per annum. The large range is explained by the different assumptions used to estimate the values"<sup>18</sup>.

These are the values at risk if we fail to effectively plan, manage and protect Top End coasts and seas.

## Impacts of development and use

The Top End is a unique part of Australia, a rich and vibrant mix of tropical marine and coastal habitats, animals and plants underpinning the Territory's economic future and the maintenance of its culture, livelihoods and lifestyle. The Top End's coastline stretches for 11,000 kilometres, its coastal waters span 72,000 km<sup>2</sup>. These are some of the world's last, near-pristine tropical waters, largely due to limited development and low population pressure, and the management of saltwater country by Indigenous communities for thousands of years.

But the Top End's coasts and seas are now threatened by inappropriate development and land and sea-based resource uses. Territorians are witnessing the impacts from climate change, the clearing and extensive die-off of mangroves, the potential collapse of reef fish populations, altered surface and groundwater flows, localised depletion of fish stocks, port developments and transshipping, pollution from legacy and operational mines, invasive species and inadequate fire management and the emerging threat from seabed mining. Each can impact the future health of the region's coasts and seas. But Territorians now have a unique opportunity to learn from the mistakes made in other parts of Australia and the world, and to be active custodians of the Top End's healthy coasts and seas.

The first report in the Keep Top End Coasts Healthy series found that these impacts have emerged due to a combination of weak laws, poor decision-making, the lack of transparency, inadequate oversight and regulation, and limited knowledge. For example:

- the new Port of Melville was built without the necessary government approvals and, since it began operating, there have been two spills into the Apsley Strait between Bathurst and Melville islands;
- legacy mine sites, such as the Redbank copper mine near the Territory Queensland border, continue to contaminate river and coastal waters, while the operational mine at McArthur River remains an ongoing source of pollution in local waterways;
- the construction of the Inpex gas processing plant at Bladin Point in the Darwin Harbour, and associated channel dredging, have caused a significant decline in water quality. With poor water quality and recreational fishing pressure, jewfish once plentiful are rarely seen<sup>19</sup>;
- the August 2016 oil spill across 30 kilometres of the Darwin Harbour revealed a significant weakness in government process and capacity. No one took responsibility: the EPA has no capacity to respond promptly and Port management has changed with the new managers not responsible.

Too often, coastal and marine environments have suffered because a lack of knowledge has failed to initiate a cautious approach and efforts to protect them. In many cases, the impacts on these environments have rarely been predicted or acted upon before becoming environmentally and socially unacceptable e.g. introduced marine pests, plastics pollution, industrial contaminants, dam construction, intensive catchment agriculture, marine aquaculture and overfishing.

Without sufficient knowledge, it is very difficult to predict what impacts a particular use or development may cause, how those impacts may combine with others and how they may change over time. The acknowledgment of uncertainty must be at the heart of the science that underpins coastal and marine planning and a precautionary approach. Such an approach is not a brake on action or anti-development, rather it provides the framework for quality decision-making on complex issues to avoid or minimise significant impacts.

Consider seabed mining, which is currently subject to a temporary moratorium in the Top End. The moratorium was announced after Territorians became concerned about the potential impacts on seafloor habitats, marine life, threatened species and fishing. The moratorium was renewed this year but there remains great uncertainty about this industry—the mining method is untried—and its long-term impacts. What is known is that mining will damage seabed habitats where it occurs and where tailings are dumped, and cloud the water column. Scientific monitoring elsewhere has shown that the size of tailings dumps from seabed mining was underestimated and the recovery of marine life far slower than predicted<sup>20</sup>.

Proposals to construct dams to store water extracted from the Top End's tropical rivers for use in irrigated agriculture also present significant threats to marine life and fisheries. Dams the world over have created unintended (and intended) environmental, cultural and social consequences. In the Top End they 'would change the way rivers flow, stop movements of aquatic animals, block flows of sediments and nutrients to estuaries and change the habitats and food supply of aquatic plants and animals'<sup>21</sup>. The dams would also 'stop fish from moving up and down rivers, and prevent nutrients and sediments from reaching the estuaries, which are important feeding grounds for juvenile fish. Commercially important species such as barramundi and grunter need freshwater flows from rivers to breed and grow'<sup>22</sup>.

Seabed mining and dam construction are examples of why a precautionary approach is required, where a lack of scientific certainty should not be an excuse to hold back the implementation of proactive government policy and measures to ensure such activities do not compromise the Territory's natural, cultural and social capital.

The absence or the lack of awareness of a threat is no reason for failing to act. By conserving fully functioning environments before threats emerge, managers will be better placed to manage future threats. Action now is far better than looking for a future cure.

## Sustaining fisheries

Top End seafood is local and caught in near-pristine waters, and most has been assessed as sustainable.

In the most recent Northern Territory Government's fish stock report<sup>23</sup>, two species, black jewfish and golden snapper, were assessed as overfished, sandfish could not be defined, and seven were considered sustainable. For two others, the mud crab and Australian blacktip shark, their Gulf of Carpentaria stocks were either overfished (shark) or trending towards depletion (crab).

The fisheries report acknowledges that the term 'stock status' does not consider the 'broader ecological or economic considerations' and 'does not have the broader meaning of such terms as "ecologically sustainable" or "ecologically viable", which consider the sustainability of the entire ecosystem and the role of specific stocks in the function of the ecosystem'<sup>24</sup>. To provide a measure of ecological sustainability will require the development of assessment criteria, such as for bycatch and interactions with threatened species, and their application to each fishery.

In recent times, the Territory's fishing industry has made significant improvements to its practices to reduce its impacts on coastal and marine environments and targeted and non-targeted species. Restrictions on catch have also been used to avoid overfishing, and harvest strategies are being developed. Changes have included modifications to gear types and avoidance of certain areas to minimise bycatch of threatened species and damage to seabed habitats. Bycatch of sawfish, turtles, dolphins, dugongs and other marine life in commercial fisheries can be very expensive to manage and undermine threatened species management. Minimising bycatch helps the affected species but can save fishers money by reducing the time, resources and effort spent dealing with it.

Recreational fishing also faces challenges. The *Northern Territory Government's Recreational Fishing Development Plan 2012-2022* found that:

'With the increasing number of recreational fishers in the Northern Territory and advancement in fishing technology, it is likely that some fish stocks in more populated areas are being fished at or near their sustainable limits. Continuing increases in fishing pressure may lead to low quality fisheries based on small-sized recruits, and fish stocks declining or even collapsing if proactive management is not adopted. This may impact on fishing quality and lifestyle values and also regional tourism centres and local economies. There is limited data available on the status of many recreationally significant fish stocks in Territory waters. Inadequate information heightens the need for precautionary fishery management measures...'<sup>25</sup>.



The lack of data creates uncertainty, so the *Recreational Fishing Development Plan* recommended increased 'fisheries research and data collection on key recreational species' and 'comprehensive five-yearly surveys, ongoing monitoring of key areas and targeted surveys'. The plan also recommended the following strategies and actions:

- 'ensure that recreational fishing controls protect stock sustainability, by taking into account species' abundance, biological characteristics and levels of fishing pressure;
- 'ensure fisheries management measures are proactive and anticipative of increasing recreational fishing activity and impacts;
- 'ensure fish are protected at vulnerable stages of their life cycle, such as juvenile fish and spawning aggregations;
- 'improve fish handling and release techniques to minimise mortality of released fish;
- 'targeted management of fishing hot spots;
- 'identify important fish habitats, nursery areas and spawning aggregation sites that may require additional specific management measures'<sup>26</sup>.

## Adapting to climate change

Sea levels are rising along the Top End coast and will have significant impacts: erosion of beaches and cultural sites, the drowning of wetlands and the flooding of houses, commercial buildings and roads. Temperatures are also on the rise and, although cyclones will be fewer in number, those that do arrive will be more intense.

Nature-based tourism is one of the Top End's key economic drivers but Kakadu's iconic wetlands are at risk from saltwater intrusion and the loss of melaleuca forests that provide important waterbird roosting sites.

Other biodiversity impacts could include:

- reduction or loss of coral reefs through coral bleaching, increased cyclone intensity and increased turbidity from coastal erosion;
- smothering of seagrass meadows by silt-laden river discharges (due to increased rainfall) and eroded coastal sediments;
- loss of seagrass from reduced light and photosynthesis in deeper and warmer water;
- narrowing or loss of sandy beaches where threatened marine turtles nest and migratory shorebirds feed;
- reductions in or loss of islands, their seabird colonies and other conservation values;
- reduction in the area of mangrove forests;
- increased sea temperatures and acidification; and
- shifts in the intertidal zone.

Top End fisheries are also at risk:

'Climate change will alter fish habitats and food supplies and the species and numbers of fish in the northern Australian rivers and wetlands. These changes will affect the viability of fisheries and aquaculture ventures. Investment in aquaculture is already risky due to seasonal changes in rainfall and variation in prices. It would become riskier with sea level rises and expected increases in storm frequency. The industry needs to learn more about these effects to prepare for the future'<sup>27</sup>.

A comprehensive review<sup>28</sup> of climate change policy and actions in Australia found that the Northern Territory Government needed to adopt:

- sea-level rise benchmarks and a sea-level rise planning policy and incorporate them into all coastal zone development planning;
- a specific coastal adaptation policy; and
- further research into the impacts of climate change on Territory coastal areas.

## 5. CARING FOR COASTS AND SEAS

'In 1996, a group of Aboriginal people discovered an illegal fishing camp hidden in mangroves on their sacred land in Blue Mud Bay, in north-east Arnhem Land. They also found the severed head of a crocodile, which they considered a desecration of Baru, their ancestor. Clan leader Djambawa Marawili and 46 of his fellow Yolngu artists then created a stunning series of 50 paintings on bark to demonstrate the rules, philosophies and stories that link their people to the coast, the rivers and the oceans. The Yirrkala bark paintings became known as the Saltwater Collection which were presented to the Federal High Court in 2008 in lieu of written documents'<sup>29</sup>. *Creative Spirits website*

### Claiming rights to land—and sea

Cape Shield and Cape Barron mark the entrance to Blue Mud Bay, tranquil waters with small islands, fringing mangrove forests and tidal mudflats. Located on the east coast of Arnhem Land, Blue Mud Bay is recognised internationally as an important bird area: during the wet season, up to 500,000 magpie geese gather on its fringing freshwater floodplains, while the islands support breeding colonies of little, black-naped and bridled terns.

With a tidal range between two and four metres, extensive mudflats exposed at low tide are where thousands of migratory shorebirds arrive in summer to rest and feast. The intertidal zone is also habitat for the Territory's big iconic fish, the barramundi, as well as mud crabs and sea cucumbers (trepang), all targets of commercial and recreational fishers.

Blue Mud Bay is within the saltwater country of the Yolngu people, who have protected and managed the area for thousands of years. In 2008 they were in the High Court in what has become known as the Blue Mud Bay Case. It tested the scope of the Northern Territory's *Aboriginal Land Rights Act 1976* and its granting of property rights over the intertidal zone to Traditional Owners. Did the law apply to the waters of the intertidal zone or just the mud and sand beneath?

The High Court determined that the Traditional Owners of Blue Mud Bay have exclusive access rights over intertidal waters, making it 'one of the most important Aboriginal land rights decisions in Australian history'<sup>30</sup> and one that 'affirms the strength of the property rights that have been granted'<sup>31</sup>. It also highlights the aspirations that Traditional Owners have to manage and protect saltwater country by securing the central role in its planning and management. This has been underpinned by the *Aboriginal Land Rights Act 1976*, the *Aboriginal Land Act 1978* and the *Aboriginal Sacred Sites Act 1989*, which have provided Indigenous communities with inalienable freehold title over two-thirds of Territory lands, including 85% of the coast.

But 10 years after the High Court decision, negotiations continue under an interim arrangement between the government and Traditional Owners that allows free access for recreational and commercial fishers and tourists. In several areas intensively used by recreational and/or commercial fishers, government and Traditional Owner agreements have allowed fishing access and provided some benefits to local Indigenous communities. For the rest of the intertidal zone, negotiations are scheduled for conclusion by the end of 2018.

Resolving issues of access and governance such as these is very important in the development and implementation of regional coastal and marine planning.

'Jointly managed by the Aboriginal landowners and Parks and Wildlife, the Cobourg Peninsula is one of Australia's true wilderness areas. With more than 250 species of fish and over 2000 square km of Marine Park to explore, Cobourg is the ideal fishing destination for those looking to catch good fish without the crowds!'<sup>32</sup>

*Venture North Safaris*

## Planning saltwater country management

‘The importance of the IPA lies in the coming together of natural values and the fact that we continue to live on our lands and keep strong our culture, our traditional knowledge and our use and management of our country. Our country continues to nurture us as it did our ancestors and this we also wish for our children. This is our home’<sup>33</sup>. *Laynhapuy Homelands Association*

When the Dhimurru Indigenous Protected Area (IPA) was extended into marine waters in 2013, it was the first to do so in Australia. The Yolngu people had already been managing the area under their 2006 *Dhimurru sea country plan*<sup>34</sup>, which had as its guiding principles:

Yolngu control and empowerment–Respect for Yolngu values–Conservation and enhancement of natural and cultural values of the IPA–Both-ways management–Collaborative relationships–Napaki [non-Indigenous] recreation values–Caring for Dhuwa and Yirritja clan estates–Sacred sites protection–Ecosystem maintenance–Sustainability–Recognition of Yolngurights, interests and responsibilities–Maintenance of Yolngu knowledge–Application of Yolngu knowledge and practices–Best practice management–Development of Yolngu Enterprises.

The Dhimurru plan has been followed by others in the Top End and, along with the establishment of IPAs and Indigenous ranger groups, has greatly improved saltwater country management by protecting habitats, strengthening cultural connections to coasts and seas, sacred sites and totemic animals, supporting livelihoods, building knowledge, enhancing the sustainable use of traditional resources, growing Indigenous enterprise and providing greater certainty for other coastal and marine resource users.

IPAs and saltwater country plans have placed coastal Indigenous communities at the forefront of marine and coastal planning and management processes and Traditional Owners should now be given a pre-eminent and central role. Collaborating with Traditional Owners on IPA management plans would help kick-start regional coastal and marine planning. But their lack of legal status needs resolution.

Where IPAs are established on Aboriginal-owned terrestrial land, enforcing compliance with saltwater country and IPA management plans has a solid legal basis. That is not the case in marine waters, where IPAs have no legal status under Northern Territory or federal legislation. The Blue Mud Bay negotiations can only resolve this in part as Aboriginal ownership extends just to the mean low-water mark, not the three-nautical-mile boundary of Territory coastal waters nor the Commonwealth waters beyond it.

Amendments to Territory planning legislation to include regional coastal and marine planning principles, processes and objectives would confer legal status to regional plans, while mechanisms such as parks can provide legal support to marine IPAs.

Pivotal to the establishment and success of IPAs has been the work of Indigenous ranger groups. There are more than 20 across the Top End, providing the most cost-effective and management-effective outcomes for the implementation of saltwater country plans and management. Their work plans can include research on fish species, dugongs and turtles, the retrieval of ghost nets, fishery compliance training, protection of sacred sites and threatened species, fisheries management, the removal of weeds and feral animals, and education of the community about their work, fishing regulations and culture.

A 2008 review<sup>35</sup> of Aboriginal land and sea management in the Top End found it to be ‘the fastest growing movement in Natural Resource Management in Australia’, and ‘the number of sea ranger and women ranger groups increasing’. Their research revealed many positive outcomes for Indigenous communities, including improved health and self-esteem, new jobs and the transfer of traditional ecological knowledge.

Working with coastal Indigenous ranger groups to fully develop the potential of their IPAs through monitoring, evaluation, reporting and improvement plans (MERI) should be a priority. Many ranger groups that have IPAs do not have these plans, which are instrumental in focussing actions of importance to them and in line with IPA objectives.

‘Why do I have these logos on my shirt? One logo is on my heart, because Rangers care about their Country. I have two logos on my shoulders, because we carry our Country on our shoulders. The logos are also on our arms because we look after our Country like it’s our baby’<sup>36</sup>



Dolphins at Nhulunbuy. Photo: Xanthe Rivett



### Areas for protection of conservation values and recreation

Although the Top End's coasts and seas are unique, they also stand alone in their lack of planning, management and conservation compared with other parts of Australia. Even so, some initial important steps have been taken towards safeguarding them.

There are two marine parks: Garig Gunak Barlu National Park (Cobourg Marine Park) and Limmen Bight Marine Park. Fisheries legislation has been used to establish three small aquatic life reserves in the Darwin Harbour and five reef fish protection areas scattered along the west coast between the Tiwi Islands and Wadeye.

Under the *Aboriginal Land Act 1978*, two sea closures were created in the Crocodile Islands, while sacred sites protected under the *Sacred Sites Act 1989* are spread along the coast and in marine waters, and the Dhimurru IPA was extended into marine waters in 2013. There is also a number of coastal and conservation reserves and national parks that have coastal boundaries, and two fish management areas along the Daly and Mary rivers that include small coastal strips.

Established under different pieces of legislation (or no legislation as is the case with Dhimurru) with different objectives, together these initiatives represent the beginning of the Territory's efforts to spatially plan, manage and safeguard the Top End's coasts and seas.

At a time when impacts and threats are growing, introducing marine conservation measures has become critical for the future of the Top End's coasts and seas. Such measures have proven successful within Australia and around the world where they are science based in their location and zoning, have public consultations in their development and adequately resourced and monitored.

Based on a growing body of evidence, the marine science community has regularly affirmed the need to establish areas managed for conservation to ensure ecosystems continue to function well and lifestyle values, including recreation, are maintained. This has been achieved with land-based national parks for more than a century. Areas managed for conservation also protect breeding and feeding sites, increase fish biomass, build food and livelihood security for coastal communities, generate social and economic benefits, including growth in tourism, secure carbon storage in seagrasses and mangroves, and support recreational fishing.

Healthy coasts and seas are at the heart of the Top End's unique personality and the flavour of its 'lifestyle', the word most used by Territorians in a survey conducted for this series of Keep Top End Coasts Healthy reports:

'I love the relaxed lifestyle, the heat here and it doesn't take long to get out bush and see the waterfalls'.

One of the Territory Government's priorities is to grow the Territory's population by investing in infrastructure to attract people:

'We need more people—it's as simple as that. We need more people living here, working here, playing here and spending here. We need their families and their friends to come here. We are investing in the liveability of our capital and regional towns'<sup>37</sup>.

Ensuring the 'liveability of our capital and regional towns' is critical. People come here, and stay here, for the lifestyle which relies on the good health of the Top End's coast and seas.

Going fishing is a big part of the Top End lifestyle, with around one-third of Territorians and many tourists dropping a line. Recreational fishing provides significant benefits to regional economies and economic opportunities for Indigenous communities. The Territory Government hopes to encourage these by investing \$50million in upgraded access roads, boat ramps, toilets, CCTV surveillance, fish aggregation devices and artificial reefs:

'This investment in infrastructure development will also create indirect jobs for fishing tour operators, fishing tackle shops, boat sales and servicing and the tourism, hospitality and retail sectors that cater to tourists and locals alike'<sup>38</sup>.

Recreational fishing values are about more than just catching fish though—surveys show many recreational fishers go fishing for the outdoors experience and interaction with the natural environment. What they regard as valuable includes:

- *fish catchability*: increasing catch per effort for the larger, more desirable fish such as barramundi;
- *environment*: maintaining natural habitats, wildlife, remoteness and adventure that make recreational fishing great in the Top End;
- *participation*: maintaining or increasing recreational fishing participation, which can be important to social wellbeing and health;
- *access*: providing safe all-weather roads and boat ramps that allow reasonable access, as well as good camping sites, telecommunications, guides and rangers; and
- *economic opportunity*: supporting tourism, tackle and boating related industries, services in local communities, and importantly local management/ranger opportunities.

But as we have seen in chapter 4, recreational fishing in the Top End is facing similar challenges to those impacting southern waters and their management, including the impacts of localised depletion, commercial fishing, aquaculture, water extraction, seabed mining, mangrove die-offs and coral bleaching. The use of areas managed for conservation and recreation in regional coastal and marine planning can support the Top End lifestyle and recreational fishing. These areas should be safeguarded against the impacts of resource uses such as industrialisation, urban development, altered ground and surface water flows, port and aquaculture projects and seabed mining.

'fishing, national parks and laid-back lifestyle. It is home to an eclectic mix of cultures whose outdoor lifestyle is complemented by brilliant sunsets, fantastic fishing and a colourful calendar of outdoor events'<sup>39</sup> *Tourism Top End*

## 6. CONCLUSIONS AND RECOMMENDATIONS

The three reports in the Healthy Top End Coasts series have drawn a picture of a region with a unique mix of nature, culture, lifestyle and economy, but also of one where these values are threatened unless new policies and plans are implemented.

The first report, *Health check of our Top End coasts*, reviewed the threats to the Northern Territory's coastal and marine environments, finding that the neglect by successive administrations now requires considerable work to adequately safeguard them from current and future threats. The second report, *Valuing our Top End coasts and seas*, focused on the special natural, cultural, social and economic values of the Top End, values that could be lost if threat responses were inadequate.

This third and final report, *Securing our Top End coasts and seas*, recommends an integrated coastal and marine policy and planning framework that embraces the principles of ecologically sustainable development, ecosystem-based management and marine spatial planning, and the fundamental role of Indigenous communities in managing saltwater country. It charts a new course, one that will hopefully lead to healthy and productive coasts and seas that maintain culture and support the Territory lifestyle now and into the future.

### RECOMMENDATIONS

#### Charting a new course for planning

Charting a new course for regional coastal and marine planning in the Territory requires:

- an integrated regional coastal and marine planning framework; and
- amendments to planning legislation to include provisions for regional coastal and marine planning principles, processes and objectives.

#### Building knowledge and understanding

Building knowledge and understanding of Top End coasts and seas requires:

- identification of knowledge constraints and the prioritisation of research to overcome them;
- development and implementation of a two-way science and traditional ecological knowledge policy;
- development of a centralised information hub to gather data and encourage consistency in monitoring and data gathering methodologies and techniques;
- mapping of coastal and marine ecosystems, habitats and key species over the next decade and use of the new knowledge in adaptive management;
- sharing of government, academic and industry data currently outside the public domain;
- a comprehensive and integrated monitoring, evaluation, reporting and improvement program, including the development of a set of environmental, cultural, social and economic indicators and historical ecological baselines, integrated databases and monitoring field guides; and
- a ten-yearly state of the coastal and marine environment report.

#### Identifying values and threats

Helping to manage and avoid the impacts of development and use in Top End coasts and seas requires:

- acknowledgment that the best-available science should underpin regional coastal and marine planning;
- a coastal and marine climate adaptation policy that ensures the Top End's coasts and seas are climate ready and includes actions that maximise climate resilience in marine and coastal environments; sea-level-rise planning benchmarks; vulnerability assessments; blue carbon initiatives;
- the identification of the environmental cultural, social and economic impacts of surface and underground water extraction in environmental assessments of proposed development projects;
- the acknowledgement that new and major coastal and marine infrastructure should undergo rigorous, transparent and inclusive environmental assessment and approvals processes.

## Caring for coasts and seas

Helping to care for the Top End coasts and seas requires:

- the rights and interests of Traditional Owners being at the forefront of decisions about the allocation of resources, allowable uses and management strategies in saltwater country;
- a pre-eminent role and capacity-building mechanisms for Traditional Owners, in partnership with government, to effectively engage in the preparation and implementation of the Strategy and the planning, protection and management of saltwater country;
- a commitment to the engagement and involvement of Indigenous ranger groups as saltwater country managers by providing them with adequate resourcing, training and enforcement powers;
- amendments to planning legislation to include provision for regional coastal and marine planning principles, processes and enforcement;
- mechanisms e.g. parks, that can give a strong legal basis to Indigenous Protected Areas;
- areas managed for conservation and recreation in regional coastal and marine plans, with efforts to minimise or avoid the impacts from uses beyond their boundaries; and
- management measures that protect fish nurseries e.g. seagrasses and mangroves, and target land-based impacts from agriculture, mining, coastal development and water extraction.



Indigenous ranger groups provide the most cost-effective and management-effective outcomes for the implementation of saltwater country planning and management. Photo: David Hancock



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Dr. Mick Guinea holds a flatback hatchling he will soon release on Bare Sand Island.  
Photo: Danielle Ryan, Bluebottle Films.





The Keep Top End Coasts Healthy program will continue to keep the community well informed and engaged on the need to better plan, protect and manage the Territory's coasts and seas.



Photos (LtoR):  
1, 2 & 3 Nick Parry, 4. Opal Sternbaum

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