



Towards a sustainable marine management regime

An update on Tasmanian progress

***Directions in interdisciplinary marine research and
resource management.***

Discussion paper

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Summary

Tasmania is a unique and special place, wild in parts and populated in others, nestled inside a spectacular coastline. This little island provides a home for diverse marine ecosystems, supports regional economies, holds cultural significance for First Nations communities and provides recreation for hundreds of thousands of residents and visitors.

The fishing industry is an important employer in some regions of Tasmania, and the state government has plans to expand it to \$1 billion by 2030.¹ Salmon farming, recreational fishing, fishing tourism, commercial wild-catch fisheries and shellfish aquaculture collectively employ 2,900 or more Tasmanians.

Tasmania's coastal waters have high biodiversity and endemism but are in a state of decline and increasing pressure from climate change, fishing and aquaculture operations, agricultural run-off, urban development, and population growth. Where problems have been identified, there is often no recovery or threat abatement plan.

Despite the environmental, economic and cultural significance of Tasmania's coastal waters, it has been over a decade since the last integrated assessment of their health by resource managers. Legislative and regulatory frameworks that manage their use operate in isolation and need to be modernised and integrated. Only 1.1% of Tasmania's marine waters are fully protected.

This report recommends:

1. An integrated, ecosystem-based approach to managing our marine estate.
2. Establishing multi-disciplinary ecosystem condition assessments and reporting.
3. Establishing comprehensive, adequate and representative marine protected areas (MPAs) to conserve the region's high global values, consistent with integrated ocean management.
4. An independent review of Tasmania's marine legislation and regulatory framework.
5. Adequate resourcing for the Tasmanian Parks and Wildlife Service to co-manage MPAs with First Nations Tasmanians, in collaboration with scientists, and stakeholders.

Introduction

Whether for pleasure, profession, or cultural pursuits, many Tasmanians spend much of their lives in, on, or next to the sea. Despite this, Tasmania still lacks an integrated approach to managing our marine environment.

This report seeks to stimulate discussion about how we manage our nearshore marine environment, including safeguarding ecosystem wellbeing. It provides a non-technical entrée to current discussion points among marine and social researchers and reminds us of previous commitments to integrate resource management.

Tasmania has some of the highest levels of marine diversity and endemism in the world.² This is globally significant. Habitats supporting the rich variety of marine life include kelp forests, rocky reefs, seagrass beds, sponge gardens and open water, each with their own communities of fish, seabirds, marine mammals and invertebrates. Tasmania also has a significant portion of healthy marine environments and an unusually high percentage of undisturbed and varied estuaries.⁹

The multiple uses of Tasmania's marine environment vary from commercial uses such as fishing, aquaculture, ports and shipping, and emerging offshore industries, to a diverse range of cultural, tourism and recreational activities.

At the same time as uses expand and compete, climate change is adding to, and in some cases exacerbating, previously existing stressors. Land-based activities including the expansion and intensification of agriculture, pollution from runoff from industry, along with changes to freshwater and sediment flows, are also impacting the health of our marine environment.³

Tasmania continues to take a sector-based approach to governance of the marine environment. Progress towards an ecosystem-based management (EBM) has been minimal, even though integrated EBM could begin to mitigate the compounding threats that confront Tasmania's marine environment.^{4,5} In particular, the EBM practices of First Nations Tasmanians practice of EBM provides relevant management strategies which have not been adequately considered or incorporated.³

Societies have many objectives for the use and conservation of marine ecosystems and services, which often compete and can lead to conflict. Comprehensive approaches recognise this and provide opportunities for resolution, allowing for biodiversity conservation and encouraging sustainable use of marine resources. Without them, unresolved conflict and sub-optimal outcomes are almost assured.

There are a variety of zoning categories and restrictions used throughout Tasmania's 21 marine reserves (also known as marine protected areas or MPAs). In Tasmania, the term 'marine

reserve' includes marine nature reserves and marine conservation areas. Marine nature reserves are national parks of the sea; fishing in these reserves is generally off-limits. Swimming, snorkelling, scuba diving, kayaking, boating and other non-extractive activities are encouraged. Marine conservation areas allow both commercial and recreational fishing.⁶

The CSIRO estimates that highly protected, no-take MPAs comprise just 1.1% of State waters surrounding the islands of Tasmania, excluding Macquarie Island (4.3% including Macquarie Island). Partially-protected or multiple-use zoned MPAs comprise 2.7% (or 5.8% including Macquarie Island).⁷ Given scientific consensus that no-take MPAs provide the greatest capacity for long-term biodiversity conservation and associated ecosystem services such as food security and carbon sequestration, protection of Tasmania's resources is inadequate by any measure.

Figure 1: Location of Tasmanian Marine Reserves and other closures



Source: Department of Primary Industries, Parks, Water and Environment (2019) *Marine reserves*, <https://dpiwpe.tas.gov.au/sea-fishing-aquaculture/recreational-fishing/area-restrictions/marine-reserves>

To date, all MPAs have been established under the *Nature Conservation Act* (or Acts repealed by it), with protection for 'fish' (defined here as marine species other than mammals, birds or freshwater fish) declared under the Fisheries Rules 2009 under the *Living Marine Resources Management Act 1995*, as required. This lack of integrated legislation perpetuates the divide between resource use and biodiversity conservation.^{19,20}

Status and threats

Australia's most recent national State of the Environment Report (2016) classifies most of Tasmania's marine bioregions' ecological conditions as slightly to moderately disturbed, with some of these classified as having high ecological value. A few isolated areas that have been affected by significant land-based activities are classified as highly disturbed. The report identifies data quality as good but notes a lack of data is available outside site-specific areas assessed for regulated activities.²³

Introduced species are preying on native invertebrates, including commercial species (e.g. the Northern Pacific starfish, *Asterias amurensis*, preys on shellfish), and altering seabed habitats and communities (e.g. the New Zealand screw shell, *Maoricolpus roseus*).²³ Other marine pests include Wakame—Japanese Kelp (*Undaria pinnatifida*) and the European Green Crab (*Carcinus maenas*).

Jellyfish blooms are an emerging phenomenon in Tasmania and elsewhere. They arise from a feedback mechanism resulting from warmer waters and increased nutrient loads arising from rapid expansion of fish farms in Tasmania. They affect everything in the ecosystem as well as aquaculture species by directly feeding on fish well as on eggs and larvae of all marine species.¹⁹

Increased inshore aquaculture can introduce higher nutrient loads into the inner shelf water column, affecting macroalgal assemblages up to 100–400 metres from farms.²³

Plastic pollution poses another threat to marine life and further challenges for managers. It transcends jurisdictional borders and all sectors of society. Scientists continue to describe the magnitude of the problem – from killing seabirds and turtles, to polluting beaches and waterways. Microplastic was recently found in Antarctic sea ice for the first time.²⁴ Efforts are required at all levels, from communities to corporations to State, national and international governance arrangements.²⁵

Figure 2: Marine debris, Pinmatik/Rocky Cape



Source: Photo by Eloise Carr.

The most recent assessment of Tasmania's Scalefish fishery (2018-19) estimates only 50% of target species are being harvested sustainably. The remainder are either depleted, depleting, recovering from depletion, or undefined. Consideration of broader ecosystem risks resulting from these harvesting levels has not been assessed since 2012–13.²⁶ This report does not suggest MPAs should be used as fisheries management tools, rather, it considers fish as biodiversity, the conservation of which can be effectively achieved through such measures. Designing closed areas that aim to rebuild commercially harvested species is a different process to designing protected areas for the purpose of conserving biodiversity.

Information on recreational fisheries in Tasmania is relatively sparse in comparison to commercial data. Detailed analyses of the Tasmanian recreational fishery are available from the national surveys and state-wide surveys, the most recent of which was conducted in 2017-18. Additional data are provided by targeted surveys of the offshore recreational fishery and other research, along with recreational net licence numbers.²⁶

Climate change

Ocean acidification has increased by 30% since preindustrial times and according to the CSIRO these changes can be amplified in coastal regions. Impacts arising from both elevated global ocean temperatures and changing marine chemistry have been recorded and are likely to impact entire marine ecosystems.²⁷

The east coast of Tasmania is a recognised hotspot for the changes occurring as a result of climate change. Scientists estimate these waters are warming almost four times faster than the global average and this is projected to continue.²⁸ The warmer, nutrient poor waters of the East Australian Current are flowing farther south and staying longer.^{27,29,28} There are substantial changes in species distributions and some species ranges are shrinking, posing serious risk of extinction.³⁰ At the 2019 meeting of the International Council for the Exploration of the Sea (ICES), Professor Greta Pecl of the Institute of Marine and Antarctic Studies at the University of Tasmania described the magnitude of what is occurring:

We are currently living through the greatest re-distribution of life on earth for at least 20,000 years. This is affecting our ecosystems, human health and even the climate itself.³¹

Key changes to the marine environment from Tasmania's warming waters include:

1. The poleward expansion of *Centrostephanus* sea urchins leading to the decimation of kelp forests.²⁹
2. 50% of intertidal species have extended their ranges south over the last 50 years.³¹
3. Dozens of fish species have major distributional changes.³¹
4. 85% of seaweeds are found further poleward on the east coast compared to 1940.³¹
5. The so-called Gloomy Octopus expanding its range from the mainland, and is now found in high enough numbers in Tasmania to be commercially fished.³²

Figure 3: Gloomy octopus



Source: Rohrlach (2016) *Gloomy Octopus-Octopus tetricus*, used under a Creative Commons Attribution-ShareAlike licence, https://commons.wikimedia.org/wiki/File:Gloomy_Octopus-Octopus_tetricus.JPG

Figure 4: Urchin barrens arise from range-expanded sea urchins devouring kelp forests



Source: John Turnbull/Flickr.

Loss of kelp forests

Over 95% of Tasmania's giant kelp forests have been lost over recent decades, to be replaced by forests of the smaller *Ecklonia radiata*, or by vast expanses of moonscape-like habitat thanks to hungry invasive sea urchins, called 'urchin barrens'.³³ Authorities have prepared no Recovery or Threat Abatement Plan for this community.³⁴

In 2012, Giant Kelp Marine Forests of South East Australia became the first marine community to be listed as endangered under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Overgrazing by urchins has exacerbated the impacts of the changes in the East Australian Current.^{33,35}

While climate change has enabled the southward migration of the *Centrostephanus* urchins, their local proliferation is also linked to overfishing of large southern rock lobster, their primary predator in Tasmania.^{27,35,36} Recreational and commercial fishing of rock lobsters reduced their populations to historical lows of less than 10% of natural levels in 2011/12.³⁷

Giant kelp forests form surface canopies and support some of the most productive and diverse ecosystems on Earth.²⁸ It is difficult to quantify the full value of Tasmania's kelp forests.³⁶ As described above, they are highly valuable for fisheries, particularly rock lobster and abalone fisheries.³⁸ Beyond this, their effect on coastal food-webs is positive for recreational fishing, ecotourism and recreation (e.g. scuba-diving), especially for coastal communities.²⁸ Kelp forests also take up carbon dioxide (CO₂) through photosynthesis, acting as carbon sinks to reduce local seawater acidity and increase dissolved oxygen.³⁹ Kelp is also important to First Nations Tasmanians for a range of purposes including ceremonial, medicinal, clothing, food, shelter, and as domestic devices.⁴⁰

Urchin barrens now cover approximately 15% of reefs on Tasmania's east coast.³³ This has had a devastating effect on native lobster populations, and therefore on Tasmania's valuable lobster fishery. Measures underway to attempt to stop healthy reefs becoming urchin barrens include:

- increasing the abundance of rock lobster on the East Coast by cutting commercial and recreational catches,
- translocating rock lobsters from elsewhere,
- rebuilding the stock of large lobsters, and/or
- development of an urchin roe fishing industry for human consumption.

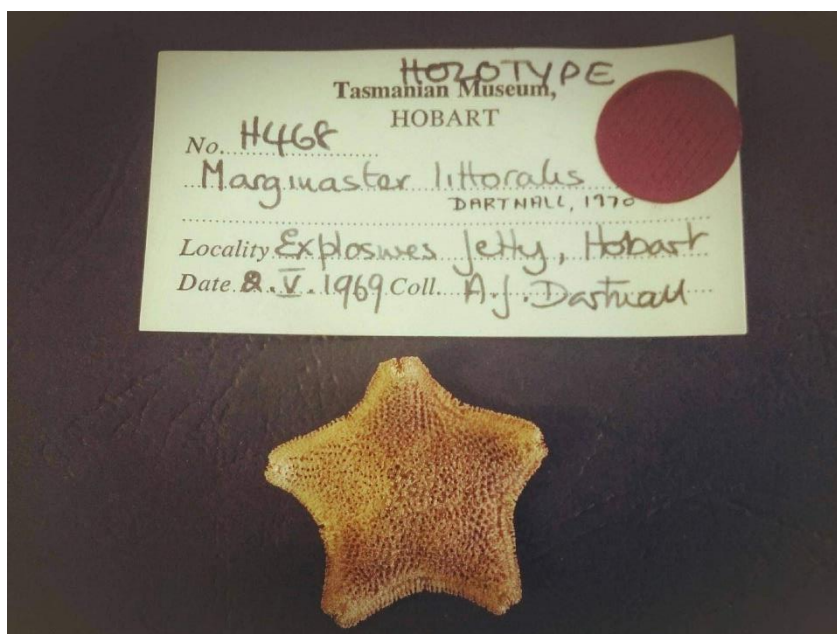
Other species at risk

In addition to the Giant Kelp community, at least 40 marine species occurring in Tasmania are considered to be threatened under state or national legislation, while more are listed as

protected migratory and marine species. As nominations are being received all the time, the number of species may have changed. Threatened species listed under the *Threatened Species Protection Act 1995* include 22 sea and shorebirds, three fish, one shark, one skate, five whales, four turtles, three seals, and one seaweed/alga. An additional range of species found here are listed as globally Threatened, including fish, seabird and shorebird species, while some areas occupied by threatened species are also listed as Critical Habitat at a national level.⁹

Tasmania has the unfortunate dual distinction of recording Australia's first documented marine animal extinction, the Derwent River Seastar (*Marginaster littoralis*),⁴¹ and the first ever marine bony fish to be listed as extinct (Smooth Handfish, *Sympterichthys unipennis*).⁴²

Figure 5: Derwent River Seastar (*Marginaster littoralis*)



Source: by Dr Narissa Bax, courtesy of the Tasmanian Museum historical collections.

Land based pressures

Land based sources of marine pollution include coastal industries, stormwater from urban landscapes, sewerage systems, fish hatcheries and agricultural runoff. Each pollution type has the potential to affect biodiversity differently. For example, urban pollution greatly affects rocky reef communities and changes their ecological structure according to the distance from the source of the pollution.⁴³

A note on precaution

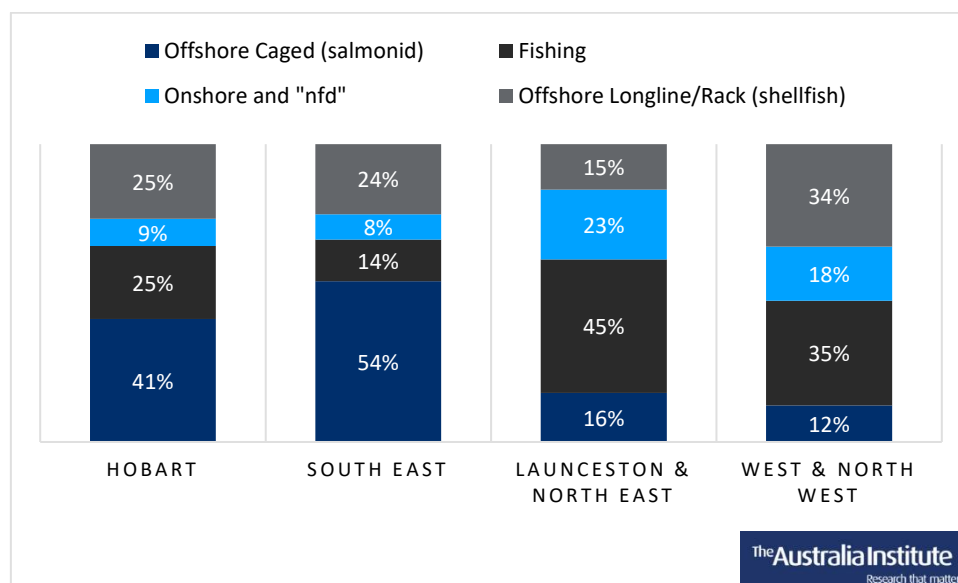
There is increasing movement towards evidence-based management for marine resources internationally. However, the requirement for evidence of impacts to enable decision making is at odds with a precautionary approach to management. The Precautionary Principle calls for preventive actions in the face of uncertain information about risks. The Hobart-based Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR), is regularly cited as a governance model that has successfully applied a precautionary approach to achieve conservation and sustainable use of marine resources. CCAMLR's approach takes into account the needs of predators and scientific uncertainties when setting catch limits for harvested species and is not premised on there being threats of serious or irreversible damage. This international treaty, signed in 1980, is a pioneering example of precautionary ecosystem-based management.

Importance of commercial and recreational fishing industries

Tasmania's aquaculture and commercial wild-catch fisheries directly employ about 2,100 people across Tasmania's four regions. A further 800–1,700 are employed as a result of recreational fishing.

Fishing and aquaculture jobs vary across Tasmania's four regions. Offshore caged aquaculture (the main method of farming salmon) provides the majority of fishing and aquaculture industry employment in the south (Hobart and South East regions), but across the north (the Launceston and North East, West and North West regions), fishing and offshore longline/rack aquaculture provide the majority of jobs.

Figure 6: Jobs by sector and region (percentage of total fishing and aquaculture jobs)



Source: ABS (2016) *2016 Census – Employment, Income and Education – SA4 (UR) by INDP - 4 Digit Level – Counting: Persons Place of Usual Residence*

Note: "nfd" means "not further defined", meaning that the respondent has not provided information for their response to be classified in more detail. Longline and rack aquaculture are methods of farming shellfish, including abalone and oysters.

Tasmania's 106,000 recreational fishers spend about \$161 million per year on bait, gear, fuel, accommodation and the other goods and services (employing 837–1,674 people, at a rough estimate), and catch about 1,039,800 fish.⁸

Benchmarking Tasmania's marine environment

Condition reporting

Australia's natural environment is in an overall state of decline and is under increasing threat. The course we are on is unsustainable.^{10,11}

The Tasmanian Government has not reported on the condition of Tasmania's marine environment for over a decade. The Tasmanian State of the Environment Report (SOE) was last produced in 2009 by the independent Tasmanian Planning Commission to assess the sustainable use of ecosystems, including their condition, pressures and trends. The SOE Report advised whether management objectives were being achieved and provided recommendations for action.

According to the 2009 report, it was not possible then to describe the status or trends in the conditions of estuarine, coastal and marine ecosystems due to insufficient information being available. Similarly, the distribution and impacts of introduced marine species went unreported in any detail other than that they were increasing.¹⁰ The report identified issues associated with a lack of whole of government direction in environmental policies and recommended improved alignment across government. The development of a comprehensive environmental policy framework was recommended, including a risk assessment-based approach and a long-term strategic environmental management plan.¹⁰

Sustainability reporting has evolved since 2009 and in 2020 best-practice assessments are now multidisciplinary endeavours, including human aspects and the linkages between marine ecosystems, economies and institutional systems.¹²

Regulatory environment

Management of Australia's environment is a shared responsibility between states or territories and the Commonwealth Government. This arrangement is failing to protect our environment, according to the review of our national environmental law, the *Environment Protection and Biodiversity Conservation Act 1999*.¹¹

In order for fishing and aquaculture to be sustainable, issues like which fish species are caught and the methods used to catch them, where fish farms and fisheries are located, which fish species are farmed and how they are farmed all need to be taken into consideration. Progress on Tasmania's marine bioregional planning process stalled with the 2014 change in government. A fractured regulatory regime means that even if restarted, the current framework is ill-equipped to deliver an outcome that is good for industry, community and the environment.

Marine Protected Areas

Globally, only approximately 5.3%¹³ of the marine environment has some level of protection. Tasmania lags well behind this already low level of marine protection with 1.1% of State waters surrounding the island of Tasmania highly protected and 2.7% partially protected.⁷

State and Territory governments committed to action on MPAs in 1998.¹⁴ The Commonwealth Government's commitment included funds for projects that would lead to the declaration of MPAs. In 2001 the *Tasmanian Marine Protected Areas Strategy* recognised the importance of the marine environment to the people of Tasmania. Its primary goal was 'to establish and manage a comprehensive adequate and representative system of MPAs, to contribute to the long-term ecological viability of marine and estuarine systems, to maintain ecological processes and systems and to protect Tasmania's biological diversity'.¹⁵ The Strategy outlined the goals, principles and outcomes of a representative system of MPAs, including guidelines for identification. However, it has been criticised as lacking key criteria for success such as timelines for implementation, methodology and approach.⁷

Tasmanian MPAs are declared and managed under three legislative instruments administered by three divisions within the Department of Primary Industries, Parks, Water and Environment (DPIPWE). The *Nature Conservation Act 2002* (NCA) provides for the conservation and protection of fauna, flora and geological diversity, the declaration of national parks and reserves and related purposes. The *National Parks and Reserves Management Act 2002* (NPRMA) provides for the management of national parks and reserves and related purposes. The *Living Marine Resources Management Act 1995* (LMRMA) regulates commercial and

recreational fisheries, including fisheries closures, aquaculture, pollution and pests. For the purpose of the LMRMA, 'fish' are defined as marine species other than mammals, birds or freshwater fish.

In 2003–04 the first comprehensive inquiry into establishing MPAs was undertaken and resulted in the Kent Group National Park marine extension and Port Davey Marine Reserve being declared.¹⁶

The Bruny Bioregion (see map at Appendix A) was the second bioregion referred for inquiry to the Resource Planning and Development Commission (RPDC). Over some two and a half years, the RPDC analysed extensive background information, public submissions and representations in public hearings. It identified areas suitable for inclusion within MPAs for their ecological significance, then selected areas that minimised negative social, cultural and economic impacts, noting that the resulting 14 areas were 'as lean a system of MPAs as the Commission could determine whilst still complying with the terms of reference and the Strategy.'¹⁷ Fourteen Marine Conservation Areas were subsequently proclaimed in 2009.⁷ However, as fishing continues across all these areas, unrestricted, the RPDC minimum standards have not been met. The recommendations should be revisited, and the level of protection increased immediately.

Indigenous Protected Areas and co-management opportunities

First Nations Tasmanians value healthy marine ecosystems as part of a range of associated values, including integrated land and sea country access rights, spiritual and cultural practices and economic values. Cultural practices include harvesting shellfish such as limpets, warreners and abalone, harvesting of yula (muttonbird), fish and crayfish.³

There are no legislative provisions for Indigenous co-management, but Tasmania's MPA Strategy provides for partnerships in managing marine areas and species and aims to incorporate First Nations Tasmanians in decision-making.¹⁵

Indigenous Protected Areas (IPAs) are voluntarily dedicated to protection by the Traditional Owners associated with the area. First Nations Tasmanians have been proactive in leading partnership-building, establishing ranger groups and capacity building. There are eight Tasmanian IPAs, comprising approximately 11,000 hectares, and three Ranger Groups that work across these (Tasmanian Aboriginal Centre, Tasmanian NPWS and truwana Rangers).¹⁸

The terrestrial components of IPAs are recognised in the National Reserve System. However, recognition of marine components requires regulatory reform because the criteria for the National Representative System of MPAs (NRSMPA) do not recognise IPAs or Native Title. The

NRSMPA criteria predate both and are yet to be revised.⁷ The existing terrestrial protected areas do include management of some marine species, such as yula (muttonbird).

Timeline for marine protection

Early 1980s	Tasmania declared 15 marine and estuarine protected areas for the purposes of habitat conservation, heritage protection, and crayfish research.
1991	Ninepin Point, Tinderbox, Maria Island and Governor Island marine reserves declared for habitat and biodiversity protection.
Late 1990s	Tasmania committed to the <i>Guidelines for Establishing the National Representative System of MPAs</i> and its associated action plan.
1999-2000	Macquarie Island Marine Reserve established, including components in Commonwealth and State waters – Tasmania’s largest MPA.
2001	Updated Tasmanian MPA Strategy adopted.
2003	RPDC Inquiry into the establishment of MPAs within the Davey and Twofold Shelf Bioregions.
2004	Kent Group National Park and Port Davey Marine Reserve declared.
2005-2008	RPDC Inquiry into the establishment of MPAs within the Bruny Bioregion.
2009	Fourteen marine conservation areas declared as part of the Bruny Bioregion process (commercial and recreational fishing is permitted across all areas).
2014	Moratorium on new MPAs commences with the change of government in Tasmania.

Regulation of aquaculture

The *Marine Farming Planning Act 1995* is the principle regulatory tool that guides the development and management of aquaculture in Tasmania. The Tasmanian Government’s vision for the finfish farming industry is outlined in its Sustainable Industry Growth Plan. The plan outlines priorities for the industry and includes areas for proposed “grow” and “no-grow” zones for finfish around the state.¹

The plan has been questioned during the ongoing 2020 Parliamentary inquiry into salmon farming in Tasmania, which received 225 written submissions. The issues raised during the inquiry were wide-ranging and included concerns about:

- ecosystem impacts associated with the scale and pace of development including
 - impacts arising from jellyfish and algal blooms,¹⁹
 - high nutrient loads,
 - seal relocations,
 - biosecurity risks,
 - impacts on rare, threatened and endangered species, and
 - marine debris.²⁰
- a lack of necessary science to guide the planned growth and,
- the inadequacy of the regulatory framework and processes including
 - allocation of leases, and
 - auctioning of leases and associated state revenue²¹
- Calls for a comprehensive state-wide integrated marine planning process.
- Calls for clear legislative criteria for decision-makers under the legislation, through which approvals are granted with transparency to avoid a perceived overlap of regulatory and industry development functions of decision-makers.²⁰

Regulation of commercial, recreational & Aboriginal fishing

DPIPWE regulates commercial, recreational and Aboriginal fishing activities under the *Living Marine Resources Management Act 1995*. This Act provides for the sustainable development of Tasmania's biodiversity, for management plans relating to fish resources and the protection of marine habitats.

The management planning process in Tasmania involves engagement with commercial and recreational sectors and representative organisations can be formally recognised.

Representative bodies for each major fishery and the recreational sector now exist. Fishery advisory committees are also formed under the Act to provide the Minister with advice in relation to the management of a fishery. These committees are the key vehicles for assessing and progressing management issues and proposals. Certified fishing bodies are automatically provided with membership of the relevant advisory committee.²²

First Nations Tasmanians have successfully established their right to fish but expect to also gain an economic benefit from the exploitation of their traditional resources. A comprehensive and modern approach to marine resource management should acknowledge and provide for this.

Focus on the North West coast

North West Tasmania is worth further investigation as a priority area for conservation and ecosystem-based management, due to the region's high ecological value. Four of Tasmania's nine geographically distinct bioregions are not represented within any MPAs (see map at

Appendix A). This is inadequate at the most fundamental level. Two of these bioregions without MPAs are shared with Victoria/SA and NSW. One runs along the west coast, north of Port Davey. The fourth, Boags, lies along most of the length of north Coast (excluding Cape Otway and Hunter Island, see Figure 8).⁴⁴

The Boags bioregion has sheltered open coasts, protected from large ocean waves but with some exposure to westerly winds. Its characteristics include southern extents of some seagrass species, unique geomorphology; high tidal ranges (3.4-4m) creating strong currents and associated filter feeding invertebrates; high fish diversity; highly diverse intertidal invertebrate communities; seabird breeding habitats; and rocky reef communities that are rare or absent further south. There are large headlands, tidal river estuaries, offshore islands and the top four most internationally important Tasmanian sites for shorebirds.⁹

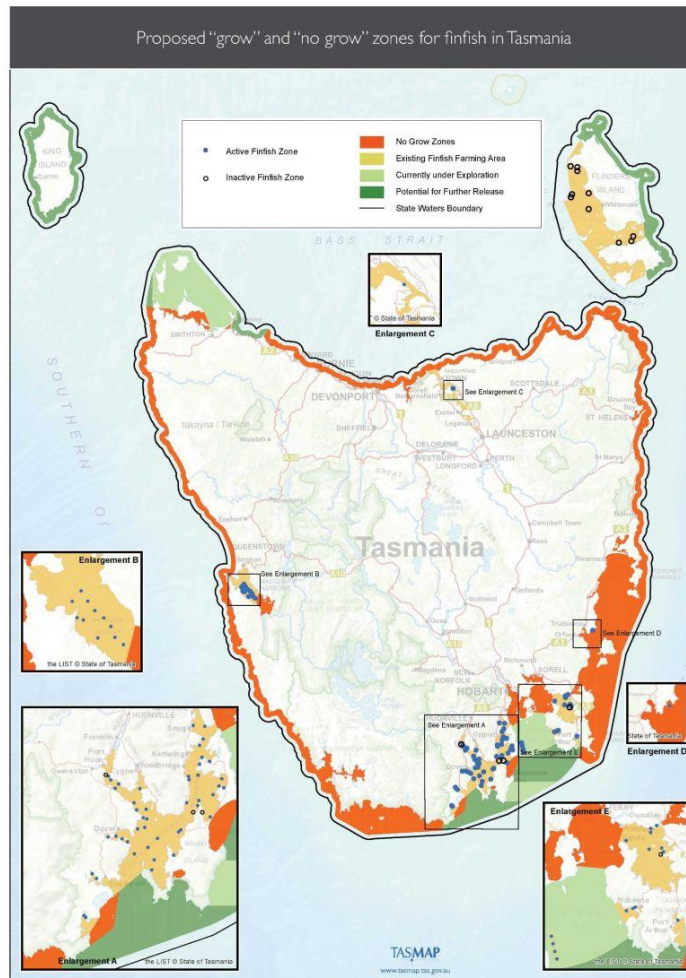
The Boags bioregion also has ecological distinctions between its eastern and western components. Pinmatik/Rocky Cape lies at this boundary, boasting exceptional geology that creates complex habitats that in turn host species absent or uncommon further east or south.⁸ Pinmatik/Rocky Cape holds significant cultural caves, including sea caves, and is a very important cultural land and seascape.⁴⁵ It is also of high recreational value to divers and is relatively undisturbed.

Another high value area is Boullanger Bay, Robbins Island and Passage. This area is the most important site for migratory shorebirds in Tasmania, containing the highest diversity of species (12 species) and greatest international significance. The area hosts an endangered, a near threatened and a critically endangered species. Bird numbers exceed 1% of national population estimates for seven species, and exceed 5% of estimates for three of these. The extensive intertidal areas provide important feeding sites and allow these species to thrive. The area has previously been estimated to contain over 10% of Tasmania's seagrass beds.⁹

Socio-economic marine values include recreational and commercial fishing, aquaculture, boating and other recreational/tourism activities. Salmon farming expansion has been flagged for the area along the coast, between Pinmatik/Rocky Cape and Perkins Island, including around Stanley and offshore (see Figure 7). Furthermore, a wind farm is in the planning stage for Robbins Island, adjacent to the most important site for migratory shorebirds in Tasmania as outlined above. Planning approval is anticipated by the proponent in early 2021.

Recreational fishing is popular in this region and is almost entirely undertaken by local residents (90%). Line fishing is the main method and flathead dominates catches, with Gurnards, Australian Salmon and a range of other finfish of secondary importance.⁸ There are also Southern Calamari spawning hotspots along this part of the coast.⁴⁶

Figure 7: Map of proposed 'grow' and 'no grow' areas for finfish aquaculture in Tasmania



Source: DPIPWE (2017) *Sustainable Industry Growth Plan for the Salmon Industry*, www.dpipwe.tas.gov.au/salmonplan

Where to from here: Opportunities and priorities

Scientific

In 2016, the first World Ocean Assessment of the United Nations stated that humankind was running out of time to start managing oceans sustainably. UN Member States, through the declaration of the Decade of Ocean Science for Sustainable Development, 2021-2030, are convinced the opportunity exists to achieve this goal if we are prepared to listen to and act upon the evidence science presents. The Intergovernmental Oceanographic Commission recently prepared an implementation plan to achieve this. It provides a framework for transformational action that will build on existing achievements and deliver action across geographies, sectors, disciplines, and generations.⁴⁷

Tasmania is a place where scientific research has the capacity to play a key role in our ability to manage our marine environment sustainably. New and established institutions are collaborating in new and innovative ways. The Institute of Marine and Antarctic Studies (IMAS) provides current advice to support decision making in the marine environment, including through its National Environmental Science Programme (NESP) Marine Biodiversity Hub. IMAS provides a wealth of knowledge on key Tasmanian issues that must be better integrated into regulatory decision making.

The Centre for Marine Socioecology (CMS), established in 2014, is a collaboration between the University of Tasmania, CSIRO and the Australian Antarctic Division. The Centre brings together inter-disciplinary research to support better marine management locally, nationally and globally. Its collaborators have produced an impressive body of work over its first 5 years.

The Blue Economy Cooperative Research Centre (CRC) presents new opportunities for sustainable resource development. It is funded for the next decade and brings together 40 national and international partner organisations with expertise in aquaculture, marine renewable energy and marine engineering. This CRC aims to support innovative, commercially viable and sustainable offshore developments in marine renewable energy output and seafood production.

Ecosystem-based management (EBM) generally means taking an integrated approach towards managing the uses of our natural environments by including human activities, impacts and the needs of the environment to remain healthy. EBM is now widely accepted as the best means of managing the complex interactions in marine systems.⁴

UNESCO defines integrated oceans management as a similar concept which “combines value creation and the safeguarding of ecosystem health.”⁴⁸ Integrated marine management requires clearly identified needs and objectives, stakeholder ownership, well-defined governance frameworks, and scientific tools to deal with conflicts and negotiation.⁴

These concepts are not new: international forums have been calling for urgent action on ocean management for decades.⁵ At the same time, experts continue to call for increased protection of marine habitats as part of such considerations. The International Union for the Conservation of Nature (IUCN), scientists, conservationists and some governments have called for at least 30% of the ocean to be highly protected in no-take MPAs, to build resilience and recovery for ecosystems, habitats and species.^{49,50}

The 2020 UNESCO report *Strengthening global coordination and science-based solutions for integrated ocean management*, commissioned by 14 serving heads of state and governments, calls for:

“a pressing need to strike the balance between production and protection [in ocean and coastal areas], and that integrated ocean management (IOM) offers the tools to do so,” by providing a holistic (rather than sectoral) understanding of ocean uses and pressures, allowing governments and stakeholders to collaborate in identifying priority uses for marine environments.⁵¹

Marine governance

Victoria recently updated its marine governance and regulatory environment. The *Marine and Coastal Act 2018* (VIC) requires the development of a statewide Marine Spatial Planning Framework (MSP Framework) that provides a process for achieving integrated and coordinated planning and management of the marine environment. The Victorian MSP Framework has three primary functions:⁵²

1. To support integration and coordination of planning and management across marine sectors, the land-sea interface and jurisdictional boundaries,
2. To support Traditional Owners, marine sectors, marine users and the community participate in marine planning and management, and
3. To provide a process for initiating, approving and undertaking marine spatial planning.

Another approach that seeks to link planning, decision making and management arrangements across sectors, to enable a comprehensive view of sustainability has been led by Tasmanian researchers from across IMAS, CMS, CSIRO and the University of Tasmania, UTAS. They argue

for linking and modifying existing sector-based plans into an overarching scheme with nine key features:

1. Recognition of need
2. Shared vision
3. Appropriate legal and institutional frameworks
4. Processes for stakeholder participation
5. Operational objectives
6. Consideration of trade-offs and cumulative impacts
7. Flexibility to adapt to changing conditions
8. Review processes and
9. Effective resourcing, capacity, leadership and tools.

They combine these features with five phases of development to create a framework for implementation and evaluation. This body of work describes key phases for developing the framework, studies cases in Australia and Canada, and discusses factors that can impede or enable progress towards integrated marine management.⁵³

The process used to identify Australia's National Representative System of MPAs was built on ecosystem-based management and spatial planning. It built in different socio-economic desires that sought to ensure areas for conservation avoided areas of highest value to commercial fishers, aquaculture, recreational fishing or with proximity to ports or marinas.⁷

New Zealand also provides a model for consideration, where Maori values are incorporated into economic systems and customary management of marine areas. New Zealand undertook its first marine spatial planning process from 2013–2016. A review of this work found that marine spatial planning can support ecosystem-based management, collaborative processes can be powerful in achieving shared outcomes for the community and Indigenous knowledge can strengthen planning processes by providing more holistic knowledge.⁵⁴

The Australian Panel of Experts on Environmental Law (APEEL) remind us of past policy commitments to address the fragmented approach to marine and coastal governance. They recommend the use of marine spatial planning to achieve this and the completion of the National Representative System to include state and territory MPAs. They recommend recognition of sea-country as an essential part of these processes, including legal and non-legal mechanisms for sea country governance.⁵⁵

Biodiversity conservation

The year 2020 marks the deadline for reaching the global targets for the Convention on Biological Diversity (CBD) and the UN Sustainable Development Goals (SDG), which both aim to

protect 10% of the world's coastal and marine waters in effectively managed, ecologically representative, and well-connected systems of protected areas. Estimates are that approximately 5.3%¹³ of the planet's oceans now have some level of protection. Tasmania lags well behind with only 1.1% highly protected and 2.7% partially protected, not including the state's subantarctic island.⁷

The most fundamental objective of a comprehensive, adequate and representative approach to conservation is to ensure examples of the full range of ecosystems are protected within and across all bioregions.⁵⁰ Scientific evidence now supports full protection of at least 30% of bioregions to reverse existing adverse impacts, increase resilience to climate change, and sustain long-term ocean health.⁷ The areas chosen must also be characteristic of the ecosystems they are designed to represent.¹⁴ MPAs are widely used and recognised as an effective tool for marine conservation which subsequently benefits people and coastal communities.

When well designed and implemented, their proven benefits include:⁵⁰

- Research – providing for baseline information to build understanding and enabling sound management practices
- Climate mitigation and resilience – enhanced ecosystem resilience and carbon storage
- Biodiversity conservation – species, genes and ecosystems
- Tourism and recreation – economic and health benefits to coastal communities
- Protection of cultural and spiritual resources and values – saving our history and sacred places
- Disaster risk reduction – protecting coastlines from extreme weather and coastal erosion
- Improved fisheries – increased biomass and stock replenishment
- Restoration – providing places to restore ecosystems such as reefs and seagrass beds
- Models of fair and open governance – MPAs can recognise rights, share benefits and reduce conflicts through transparent and inclusive decision-making processes.

The 2005-08 Bruny Bioregion Inquiry (see Appendix A) into establishing MPAs was controversial and for many years the Tasmanian Government has lacked the political will to advance the conservation of marine ecosystems.

The Bruny Bioregion Marine Conservation Areas have been criticised from a scientific perspective, and the process from a governance perspective. Fishing activities continue within the 14 Conservation Areas essentially unrestricted. This approach provides virtually no protection from one of the most important threats in the bioregion.⁵⁶

A critique of the Bruny process found a cumbersome legal framework has fragmented management roles and responsibilities and that low levels of trust existed between

stakeholders and government. Of particular concern was the tendency of political interventions to privilege narrow sectoral interests and override outcomes from statutory consultation processes that were informed by wide stakeholder input. Influence was found to be concentrated in relatively few actors, mostly members of the commercial and recreational fishing sectors, some government agencies, and the relevant Minister as the main decision-maker. Direction, political leadership and coordination across sectors and government levels were deemed unsatisfactory by research participants, and MPA management was found to be underfunded. Also of note is the finding that the polarisation of views was not as prevalent as was perceived and that there were missed opportunities for introducing collaborative approaches to MPAs.⁵⁷

Securing the social licence for MPAs

Support for MPAs comes from an understanding of interdependence – that maintaining a fishing lifestyle depends on maintaining a healthy marine environment. Sociology has an important role in establishing need and mapping out pathways for developing shared values and improving trust in institutions. The design and effective implementation of MPAs now depends on science that spans a range of disciplines – natural sciences combined with social sciences, supported by effective analytical frameworks and decision-analysis tools.⁷

Some research suggests that high levels of marine protection enjoy strong community support. Although further research is required to update and locally validate findings, attitudes towards marine conservation in Australia include:⁷

- Australian research found a majority of recreational fishers, including Tasmanians, support high levels of marine protection, including in no-take zones.
- While agreeing that fishing and resource extraction is important for socio-economic reasons, Australians (including Tasmanians), believe there is an imbalance between extraction and conservation.
- Most Australians support high levels of marine protection, regardless of political leanings (this study did not include Tasmania).
- Most Australians think MPAs are a logical, sensible and practical way to achieve marine conservation.
- Findings from existing MPAs include that many recreational fishers do not consider they have been negatively impacted by no-take MPAs, including if it has meant they have to fish in different locations.

What explains the apparent disconnect between the opposition expressed during the Bruny Bioregion Inquiry and these research findings? Governments have tended to conduct MPA planning in isolation and without reflection on existing MPAs and how they are affecting

communities.⁷ Further research is required, with a focus on current Tasmanian perceptions, how these are formed and how communities living with MPAs are affected by their presence.

Conclusion and recommendations

Despite the economic, environmental and cultural importance of the State's environment, marine governance lacks integration in Tasmania – between Federal and State governments and across sectors, government departments and the catchment-coast-marine continuum. Tasmania's sectoral approach to managing the multiple uses of the marine environment continues to be dominated by economic imperatives and is allowing the health of marine ecosystems to decline. Legislation to protect the marine environment is heavy on process but light on performance measurement, with inadequate tools to ensure statutory goals are achieved. We observe environmental and conservation concerns continue to be outweighed and overshadowed. Without a more comprehensive approach, those economic interests will also suffer in the short to medium term.

Recommendations:

1. Government commitment to establishing integrated, ecosystem-based management, which identifies current and future uses of the entire marine estate for all uses, users and values. This planning and management should be informed by comprehensive data on environmental, social and economic factors, and should be established through a science based, consultative, multi-sector marine spatial planning regulatory process.
2. Establishing multi-disciplinary ecosystem condition assessments and reporting.
3. Recommence a program to establish comprehensive, adequate and representative MPAs to conserve the region's high global values. This should be embedded in an integrated approach to marine management and value a healthy, dynamic and biodiverse environment in its own right, as well as for communities, now and in the future. North-west Tasmania is worth further investigation as a priority area, due to its ecological values and relatively low level of existing conflicting uses.
4. An independent review of Tasmania's marine legislation and regulatory framework.
5. Adequate resourcing for the Tasmanian Parks and Wildlife Service to co-manage MPAs with First Nations Tasmanians, in collaboration with scientists, and stakeholders.

Limitations

This report is limited in scope and is only able to provide a brief overview of some of the key issues relevant to how we manage our marine environment. We draw attention to those institutions undertaking deep dives into marine science and governance and encourage further consideration of their research.

For example, we have only briefly mentioned ocean acidification, marine introduced pests and plastics. These are big issues but are beyond the scope of this report. There is also a pressing need for improved management of the adjacent coastal zone – in particular, the review and updating of the Tasmanian Coastal Policy (1996), which has been largely ignored for the past two decades.

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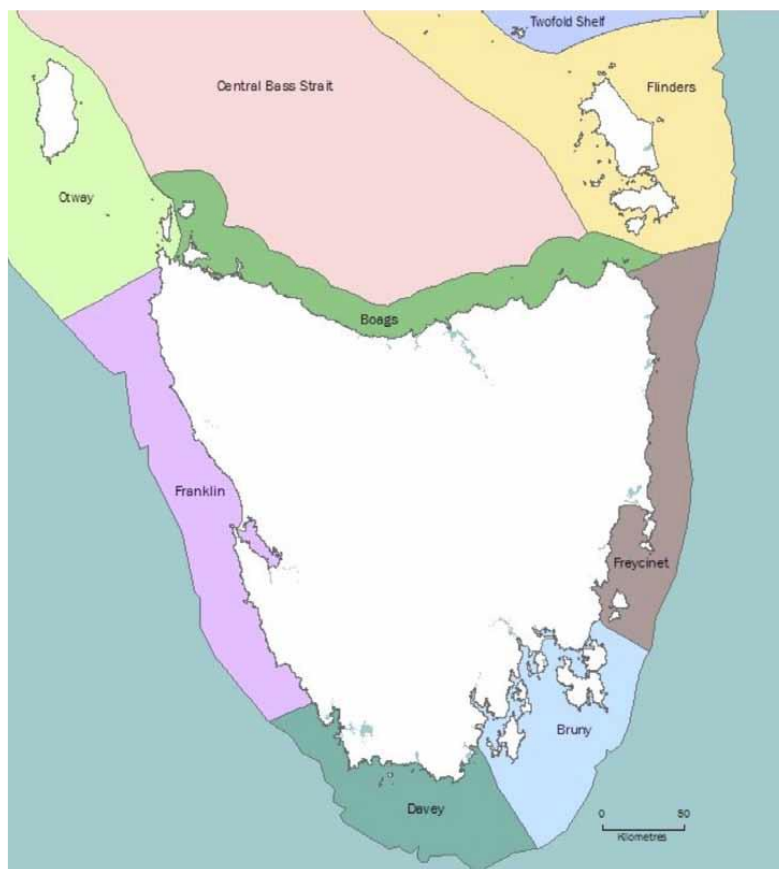
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Appendix A: Marine bioregions

There are nine Integrated Marine and Coastal Regionalisation (IMCRA v4.0) meso-scale marine bioregions in Tasmania:

- Franklin
- Davey
- Bruny
- Freycinet
- Boags
- Otway
- Central Bass Strait
- Flinders
- Twofold Shelf

Figure 8: Tasmanian marine bioregions, as classified by IMCRA v4.0



Source: Parsons (2011) *Nowhere Else on Earth: Tasmania's Marine Natural Values*