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Marine Conservation Leadership: Does Australia Walk the Talk?

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ABSTRACT

The conservation of Australia's extraordinary marine biodiversity has been prominently championed over the past three decades by successive Federal and State Governments, who have consistently portrayed the nation as a global leader in marine protection. Here, we question whether this reputation is justified. We highlight substantial—and in some cases catastrophic—declines in marine species and ecosystems, linked to failures in marine protected area placement and management, fisheries policy, climate change, and water quality regulation. We argue that Australia must strategically expand its network of marine protected areas, prioritizing regions critical for biodiversity and ensuring effective management. This must be complemented by robust policies that promote the sustainable production and consumption of seafood and address the urgent challenges posed by climate change and pollution. Only through such comprehensive and coordinated action can Australia genuinely claim a leadership role in global marine conservation.

1 | Introduction

Australia's marine environment is remarkable, spanning all five of the world's climate zones, from the coral-rich tropics to the icy shores of Antarctica (Reeves et al. 2013). Six national marine areas have received UNESCO World Heritage status, the highest of any country. This includes the largest living structure—the Great Barrier Reef (GBR)—and the most intact sub-Antarctic marine ecosystem on the planet. With at least 33,000 marine species found within the nation's boundaries (A. J. Butler et al. 2010), Australia is not only the most biodiverse marine nation but also contains the most endemic marine species (Roberson et al. 2021; Beesely and Wells 2007; Derrick et al. 2020). Australia's approach to managing its marine ecosystems is clearly critical to global efforts aimed at achieving positive marine conservation outcomes.

For over three decades, successive Federal and State Governments have claimed a global leadership role in ocean conservation (Figure 1). For instance, in 1998, Australia's then prime minister made this declaration with the release of the nation's Ocean Policy: "we again demonstrate our world leadership" (Beringen et al. 2022). It was then repeated by the New South Wales Environment Minister at the World's Park Congress in 2014, again by the federal Environment Minister in 2021 with the Ocean Leadership Package, again by the federal Environment Minister at the 2024 Global Nature Positive Summit, and again by the most recent federal Environment Minister at the 2025 United Nations

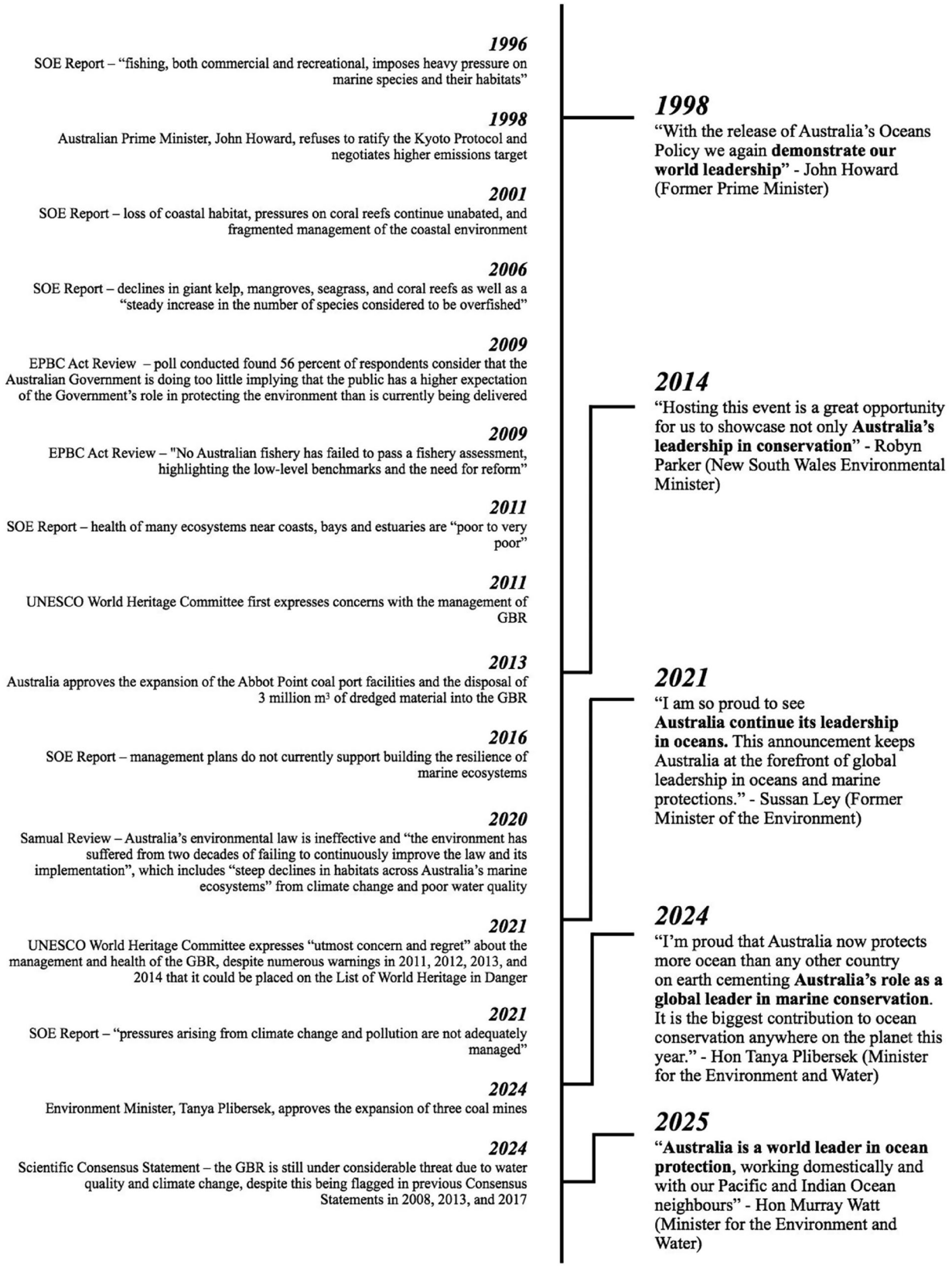

FIGURE 1 | A timeline of marine leadership claims (right) despite contrary policy decisions and evidence from comprehensive assessments of Australia's environment (left), including Australia State of Environment (SOE) Reports. A selection of policy decisions and excerpts from environmental assessments is shown (left).

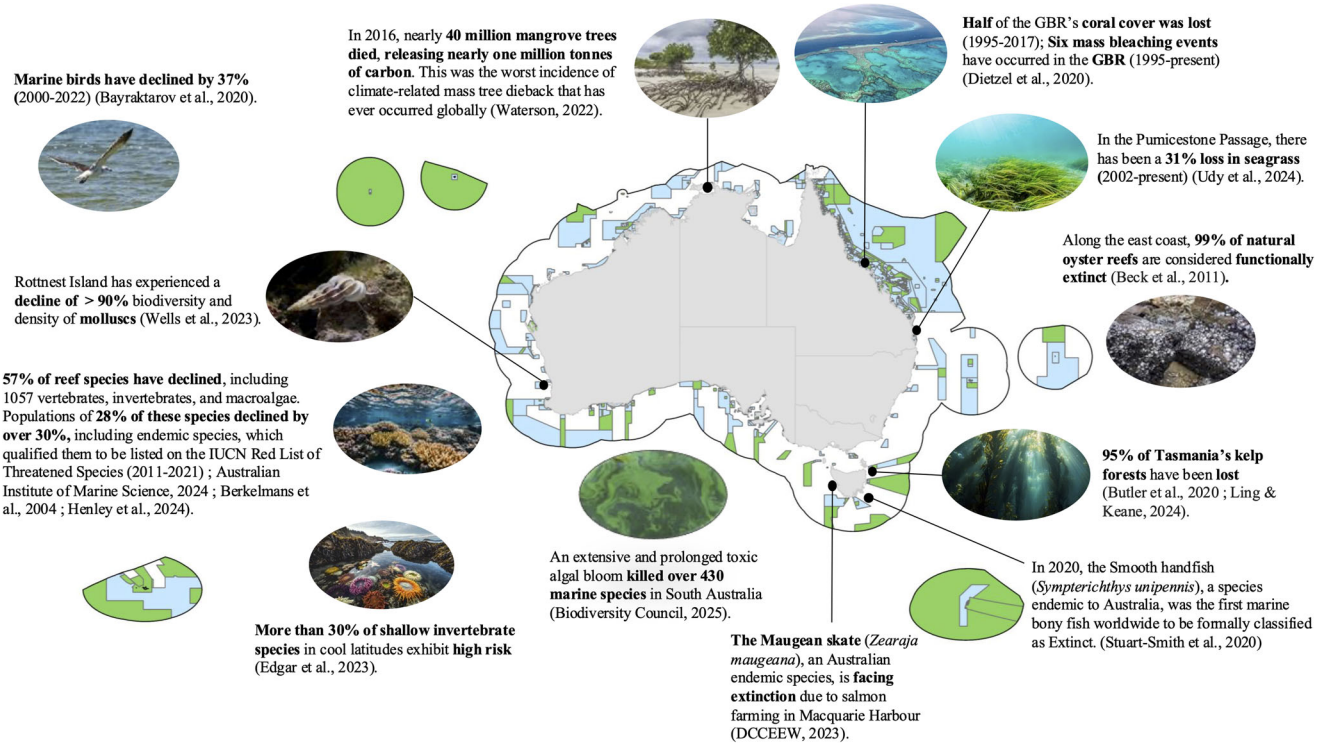

FIGURE 2 | Marine species and ecosystems are in decline across Australia (examples shown), despite an extensive network of marine protected areas (no-take reserves are green, other MPAs are blue). Images are from Adobe Stock, acquired through a Creative Cloud Educational License. *Sources:* DCCEEW (2025a), Waterson (2022), Stuart-Smith et al. (2020), IUCN Red List of Threatened Species. (n.d.), and Department of Biodiversity, Conservation and Attractions (2024).

Ocean Conference. All of these declarations reflect pride in how well Australian Government actions are doing to protect one of the most unique and biodiverse marine estates on the planet (Williams et al. 2017).

Australia's ocean conservation claims have largely gone unchallenged. In this perspective, we critically examine whether Australia's actions warrant an ocean conservation leadership position. We first summarize key contemporary changes in Australia's marine biodiversity that have occurred over the period in which these Federal and State Government claims have been made. We then examine a range of policies implemented by successive Australian Governments that, in effect, commit the nation to continued biodiversity loss. Finally, we outline a selection of critical solutions that Australia can adopt to address these challenges and legitimately reclaim its title as a global leader in marine conservation.

1.1 | The Sorry State of Australia's Marine Biodiversity

Starting in 1996, the State of the Environment Report, Australia's first comprehensive assessment of the health of Australia's environment, identified the loss of biodiversity as "our most serious environmental problem," which specifically noted losses to coastal ecosystems (Figure 1). Since then, declines in marine biodiversity have been documented at all latitudes (Figure 2; Recher 1997). In the south, for example, at least 95% of Tasmania's kelp forests have been lost since the late 90s (C. L. Butler et al. 2020; Ling and Keane 2024). Across the temperate east coast waters, 99% of natural oyster reefs are considered functionally extinct (Beck et al. 2011). In the north, half of the GBR's coral cover was lost between 1995 and 2017 (Dietzel et al. 2020), a period with only two (of six) mass bleaching events. The last three mass bleaching events caused some of the GBR's biggest declines in 39 years (Hughes et al. 2017; Emslie et al. 2024; Australia Institute of Marine Science 2024; Berkelmans et al. 2004; Henley et al. 2024).

Given broadscale ecosystem declines, it is no surprise that many marine species are in serious trouble. The most comprehensive assessment of Australia's marine species population trends found that 57% of reef species declined between 2011 and 2021, which included 1057 vertebrates, invertebrates, and macroalgae (Edgar et al. 2023). Populations of 28% of these species declined by over 30%, including endemic species, which qualifies them to be listed under the IUCN Red List of Threatened Species. Notably, more than 30% of shallow invertebrate species in cool latitudes exhibit high extinction risk (Edgar et al. 2023). Another metric—Australia's Threatened Species Index—determined that marine bird populations declined by 37% between 2000 and 2022 (Bayraktarov et al. 2020). In 2020, the first marine fish in the world was classified as extinct by the IUCN Red List: the smooth handfish (*Sympterichthys unipennis*), a fish endemic to Australia. The Maugean skate (*Zearaja maugeana*), also an Australian endemic, is facing the same unfortunate fate, primarily due to salmon farming practices in Macquarie Harbour (DCCEEW). Finally, with the Queensland Government's 2025 announcement to invest $88 million in expanding their shark control program, threatened sharks and other nontarget threatened species (e.g.,

turtles, whales, dugongs) will continue to decline. Importantly, these declines are only documented for species that we have described and monitored, which represents a small proportion of marine species estimated to live in Australia (A. J. Butler et al. 2010). Of the species that have been described, our knowledge is biased toward specific taxonomic groups and regions (e.g., coastal), and substantial knowledge gaps remain (e.g., for pelagic species) (A. J. Butler et al. 2010).

2 | Why Is This Situation so Bad?

Here, we outline some of the reasons why the degradation of marine ecosystems and species is occurring when considering the actions undertaken by different governments in four major areas: marine protected areas, fisheries management, climate change, and water quality.

2.1 | Ineffective Marine Protected Areas (MPAs)

MPAs are fundamental to any marine conservation strategy aimed at mitigating pressures from extractive activities (e.g., overfishing and seabed mining). MPAs improve the resilience of marine biodiversity to mounting threats (e.g., climate change, poor water quality), safeguarding marine biodiversity (K. E. Roberts, Cook, et al. 2020). Since 2010, Australia has been committed to the Convention on Biological Diversity (CBD), including the Kunming-Montreal Global Biodiversity Framework, which calls for an effectively managed network of MPAs that adequately represents marine biodiversity. At first glance, Australia appears to have fulfilled these commitments (Figure 2) despite the Commonwealth Government downgrading the protection of 26 MPAs (1 million km^2) in 2018 (Albrecht et al. 2021).

Since the establishment of the National Representative System of MPAs in 2012, approximately 52% of Australia's marine and coastal areas are now designated as protected (UNEP-WCMC and IUCN 2024). However, this headline figure is misleading (Davey and Watson 2025). More than half of Australia's MPAs still permit extractive activities such as commercial fishing and oil and gas exploration, rendering many of them "paper parks"—protected in name only (Grorud-Colvert et al. 2021; Pike et al. 2024; C. Roberts et al. 2024). Highly protective MPAs—those that restrict these activities—are often located in remote areas with minimal human activity, thereby avoiding economically valuable regions (Cockerell et al. 2020; Pike et al. 2024). As a result, critical habitats that underpin Australia's exceptional marine biodiversity remain underprotected (Devillers et al. 2015; Davey and Watson 2025). A wide range of ecosystems essential for biodiversity conservation, including shallow coastal zones, submarine canyons, seamounts, and rocky reefs on the continental shelf, continue to be poorly represented in the MPA network (Cresswell et al. 2021; Barr and Possingham 2013; Cockerell et al. 2020; Davey and Watson 2025). Furthermore, the current network of MPAs lacks sufficient functional connectivity, a key requirement for conserving nonmigratory and range-restricted species, particularly in the face of accelerating climate change (K. E. Roberts, Hill, et al. 2020).

2.2 | Lackluster Fisheries Management

The Commonwealth, states, and territories share fisheries management responsibilities, and there have been numerous plans generated for sustainable and healthy fisheries (DCCEEW). While at face value this spread of responsibility should be positive, there are now stark discrepancies in management effectiveness among different fisheries (e.g., state vs. Commonwealth) (Hill et al. 2023). An increasing number of Australian fish stocks are classified as overfished or subject to overfishing, with some remaining in this state for decades despite management plans (I. Butler et al. 2024). Even when stocks are assessed to be sustainable, this is often overstated in overfished and low-value stocks, or regions with rising temperatures (Edgar et al. 2024). In several notable cases, many independent experts have challenged management decisions or assessments of stock recovery or sustainability—for example, orange roughy *(Hoplostethus atlanticus)*, West Australian dhufish (*Glaucosoma hebraicum*), and Western rock lobster (*Panulirus cygnus)*. Fisheries-independent data point to excessive fishing as a major driver of declines (Edgar et al. 2018), especially for blue warehou *(Seriolella brama*), redfish (*Centroberyx affinis*), and school shark *(Galeorhinus galeus*), demonstrating that management interventions have repeatedly failed to meet rebuilding targets (I. Butler et al. 2024). The reality is that the situation is likely worse as 15%–30% of Australia's commercial catch remains unassessed (FRDC 2024; Minderoo 2021) and considerable volumes of unassessed species are landed or discarded at sea (FRDC 2024; Minderoo 2021; I. Butler et al. 2024). Further, studies have indicated underperformance in important areas such as failure in the following: transition to ecosystem instead of single-species management, implement fishery-independent monitoring, manage bycatch and discards, provide transparency of stock assessment and decision-making processes, plan for climate change, and implement legitimately precautionary management (Edgar et al. 2018; Cope et al. 2023; Hill et al. 2023).

Australia's recreational fishing is also posing an increasing threat. One in five Australians fish recreationally at least once a year (A. Moore et al. 2023), and for some stocks, recreational harvest likely exceeds commercial catch (Lyle and Tracey 2016). Despite its scale, recreational fishing remains poorly monitored (Arlinghaus et al. 2019; Lyle and Tracey 2016). In some states (e.g., South Australia, Queensland), recreational fishing licenses are not required. Recreational fishing has a strong political backing in Australia due to the influence of hunting, shooting, and recreational fishing-oriented political parties. The tension and competition between recreational and commercial fishing sectors is a major obstacle to improving their management, which, combined with the broader lack of political will to pursue innovative reforms in commercial fisheries, stalls efforts to address persistent and systemic problems (Edgar et al. 2018; Emery et al. 2017; McShane et al. 2021).

2.3 | Inadequate Climate Change Commitments

Climate change policy in Australia has been highly politicized for over two decades. There have been frequent changes in government, and different parties have taken very different approaches to climate action (Smith and McMaugh 2023). This

has led to inconsistent policy. For example, while there have been some efforts to address climate change under the current Labor government, previous conservative governments were criticized for their limited action and lack of strong commitments (Crowley 2021).

The current Australian Government has a goal of achieving net-zero emissions by 2050. As part of this, they have set an emissions reduction target of 43% below 2005 levels by 2030 (DCCEEW) and made renewable energy commitments, including the Future Made in Australia Bill of 2024. However, the current emission reduction target is consistent with a 2°C warming pathway, which equates to the loss of 99% of the world's coral reefs, including the GBR (Dixon et al. 2022). This lack of action to reduce climate change has contributed to UNESCO proposing that the GBR World Heritage Area, the world's exemplar marine park, be classified as "in danger"—not once but twice (Guest 2021; Henley et al. 2024).

Australia also has a history of making land management decisions that are inconsistent with its climate commitments. For example, Australia has one of the highest rates of land clearing in the world, accounting for up to 12% of the country's total emissions in some years (Pacheco et al. 2021; Greenhouse Office 2000). Also, Australia is one of the world's biggest producers of coal (which, when burnt, is a primary driver of emissions) and continues to approve coal mines (International Energy Agency 2024; DCCEEW 2025b). In 2024, the Environment Minister recommended a "greenfield" coal mine be approved in Queensland and approved the extension of three others (DCCEEW 2025c; Slezak 2024).

2.4 | Water Quality Management

Australia's first SOE Report (1996) stated as follows: "The most serious issue affecting Australia's marine and coastal environments is the decline in water quality caused by rising levels of nutrients and sediments." The recognition of this issue prompted numerous national (e.g., National Environment Protection Council, National Water Quality Management Strategy) and catchment-level management initiatives directed at coastal water quality improvement in Australia (Graham et al. 2011). However, the lack of long-term monitoring and inconsistent monitoring approaches for Australia's coastal waterways makes it difficult to determine if there is any improvement in coastal water quality across most regions of Australia (Cresswell et al. 2021).

Water quality has been identified as one of the most significant threats to the GBR (MacNeil et al. 2019; Waterhouse et al. 2024). Despite significant investments in GBR water quality management, land management practices and catchment modifications continue to impair reef water quality. For instance, gully erosion accounts for about 50% of the total sediment export, yet only 5% of all funding for water quality management has been allocated to gully remediation. As noted in the 2024 Scientific Consensus Statement, "While several land management practices and remediation actions are proven to be cost-effective in improving water quality, translating these into more substantial pollutant reductions will require significant scaling up of the adoption of these actions [and] prioritisation of pollutant hotspots" (Waterhouse et al. 2024).

Water quality issues are not limited to the GBR. Australia has experienced several high-profile pollution events (Grinham et al. 2024), including coral disease linked to dredging in Western Australia (Pollock et al. 2014), beach closures in Sydney due to suspected sewage contamination, and insufficient penalties for industrial oil spills. Heavy metal pollution is also a pressing issue in Australian coastal ecosystems. Median lead concentrations in Australia are up to five times higher than those in Europe and North America, while median copper levels are twice as high as those in North America (Huber et al. 2016). Regions such as New South Wales coastal waters and Moreton Bay (Queensland) have been subjected to elevated loads of lead, zinc, cadmium, and nickel. These pollutants stem from wastewater discharge, urban expansion, land development, and industrial activities (Jahan and Strezov 2018; Morelli et al. 2012; Maxwell et al. 2020; Abal and Dennison 1996; Saeck et al. 2019).

A key challenge in managing water quality in Australia is the nonbinding nature of national guidelines. The Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG 2019) do not have legal status, leaving pollution regulation to individual states. This has resulted in inconsistent approaches across the country—South Australia, for example, has well-defined regulations and compliance mechanisms, whereas other states have limited legislation governing coastal and marine water quality.

3 | How Can Australia Earn a Leadership Position in Marine Conservation?

We believe Australia's current policies and commitments to mitigating the primary threats to its marine biodiversity—climate change, overfishing, and water quality—do not currently demonstrate marine conservation leadership. Given the Samuel Review—an independent review that assessed Australia's primary environmental legislation (Samuel 2020) as outdated and ineffective at protecting Australia's biodiversity—this should not come as a surprise to those in government leadership positions. The marine leadership claims might be an exercise in smoke and mirrors, made to mask other decisions that are not consistent with marine conservation leadership (Figure 1). For example, in 2024, the minister's marine leadership claim was made less than 2 weeks after she approved the expansion of three coal mines. Here, we outline actions Australia must take to be a global leader in marine conservation, focusing on four key areas: MPAs, seafood production and consumption, climate change, and marine water quality.

3.1 | Achieve an Ecologically Representative Network of Marine Reserves in Places That Are Good for Biodiversity and Abate Threatening Processes That Cause Biodiversity Endangerment

To be a leader in marine conservation, Australia must implement an MPA estate that is ecologically representative, protects areas of significant biodiversity, and mitigates the threatening processes

driving species endangerment and ecosystem decline—planning concepts that have been foundational for decades (ANZECC 1999; Cocks and Baird 1989; Margules and Pressey 2000; Watson et al. 2023). We argue that at least 30% of each of Australia's 41 provincial bioregions, depth ranges (especially coastal and shelf areas), biological features (e.g., seagrass), and all 21 types of seafloor features must be protected within a no-take marine reserve by 2030 (Australian Marine Parks 2007). Ideally, Australia would undergo a scientific process to determine the exact amount needed for effective protection of each biological feature (Watson et al. 2023), but until then, broad, ambitious representation targets are the only way to address the current MPA network biases (Barr and Possingham 2013; Davey and Watson 2025; Kuempel et al. 2016). Furthermore, zones vital for the functional connectivity of species and the persistence and recovery of threatened marine species need to be included in the design (Goetze et al. 2021). Only through targeted and adequately funded protection of ecologically significant areas will Australia realize meaningful biodiversity outcomes and fully deliver on the components of Target 3 under the Global Biodiversity Framework (Watson et al. 2023).

3.2 | Produce and Consume Sustainable Seafood

To be a leader in marine conservation, Australia needs to have policies and practices that support both the sustainable production and consumption of seafood, goals core to Australia's Fisheries Policy, the United Nations 2030 Sustainable Development Goal, to which Australia subscribes, and GBF Target 16.

Australia's fisheries and environmental policies require coordination and consistency to ensure that seafood produced in Australia does not harm threatened marine species assessed by Australia's Threatened Species Scientific Committee (Dominguez-Martinez, Roberson, et al. 2024). For example, the Committee assessed salmon farming in Macquarie Harbour (Tasmania) as "catastrophic" to the endangered and endemic Maugean skate—a finding that should trigger action. In another example, Australia allows commercial fishing of threatened species listed under the EPBC Act, including blue warehou, which was assessed as critically endangered. Stricter regulations on fisheries that target or incidentally catch threatened species should be required, in addition to investment in new, innovative fisheries management approaches (Roberson and Wilcox 2022).

Australia must raise all its commercial and recreational fisheries—regardless of their size, value, and jurisdiction—to a level consistent with the best international management standards (Arlinghaus et al. 2019; Hilborn et al. 2020). Achieving these goals will require smart investment in streamlining, modernizing, and enforcing Australia's fisheries management measures. There are clear actions well within Australia's reach, such as building technical capacity to address the current shortage of analysts with the advanced skills necessary to support effective management (Cope et al. 2023; Edgar et al. 2018).

Even if all of the seafood produced in Australia were sustainable, the seafood consumed in Australia is not necessarily sustainable due to international trade. Roughly 70% of the seafood consumed in Australia is produced outside of Australia, mostly in countries that face substantial sustainability challenges, including high risk of illicit fishing practices that harm marine ecosystems and catch of endangered species (Dominguez-Martinez, Klein, et al. 2024; Roberson et al. 2020). Existing regulations for the international trade of seafood—including minimizing the prevalence of products from illegal, unreported, and unregulated fishing—require reform (Roberson et al. 2025), which should include certification schemes, stricter labelling laws, improved traceability systems, and increased support for exporting countries to strengthen their fisheries management.

3.3 | Generate Robust Climate Policy That Is Consistent With Global Ambitions

Long-term leadership in marine biodiversity conservation is only possible if Australia also adopts a more robust climate policy. It is essential that the nation takes a leading role in delivering on the Paris Agreement—aiming to limit global warming to well below 2°C and pursuing efforts to cap it at 1.5°C. Achieving this will require a comprehensive, multipronged approach, including raising Australia's emissions reduction targets, accelerating its net-zero commitment, reversing deforestation, decarbonizing the economy (e.g., by scaling up renewable energy), and incentivizing landowners to restore and protect carbon-absorbing ecosystems. Notably, as one of the world's largest coal producers, Australia cannot credibly claim climate or marine conservation leadership without a clear pathway to phasing out coal mining.

3.4 | Improve Coastal Water Quality

Despite significant investments in water quality improvement programs across Australia, including the GBR, these efforts remain insufficient to meet the scale of the challenge (Kroon et al. 2016; Brodie et al. 2019). Where water quality outcomes have improved in other regions globally, strong national regulatory frameworks have played a pivotal role. These frameworks typically mandate enforceable water quality standards, support multilevel governance structures, and ensure coordination among all relevant stakeholders (Thompson-Saud and Wenger 2022). In contrast, Australia relies on nonbinding national guidelines and delegates responsibility for managing pollution to individual states, resulting in inconsistent protections across jurisdictions. Australia should draw from international models, such as the US Clean Water Act and the European Union's Water Framework Directive, to design a national-level program that sets minimum standards and supports state implementation.

The GBR's Scientific Consensus Statement provides a robust foundation for improving coastal water quality management more broadly across Australia. Among its key recommendations are the need to significantly scale up the adoption of proven land management practices, prioritize interventions in pollution hotspots, and improve understanding of the costs and co-benefits of different mitigation strategies (Waterhouse et al. 2024). Moreover, locally effective and collaborative approaches, particularly those that engage landholders, Indigenous communities, the

broader public, scientists, and policymakers, are critical for accelerating uptake and securing long-term improvements.

A critical enabler of more effective water quality management is the availability of consistent, long-term monitoring data that are publicly accessible and comparable across regions. Currently, monitoring efforts in Australia are fragmented and inconsistent, making it difficult to assess trends, evaluate program effectiveness, or coordinate responses at the national scale. A national monitoring framework should be developed to harmonize methodologies, improve data interoperability, and ensure that results are transparently shared. This would support evidence-based decision-making, enable timely adaptive management, and foster accountability across all levels of government and sectors.

Although the GBR has seen the most sustained effort in water quality management, other coastal ecosystems across Australia face similar threats and deserve equal attention. The GBR's Scientific Consensus Statement and associated monitoring programs can serve as a template for evaluating water quality efforts nationwide. Applying this level of scrutiny and coordination to other regions would provide a sound basis for improving policy coherence and developing robust, enforceable national standards to protect all of Australia's coastal and marine environments.

4 | Conclusions

The sheer number of plans and policies relevant to managing Australia's unique marine environment demonstrates that the government has had good intentions. These intentions have led to some outstanding outcomes for marine biodiversity including the following: representative MPA networks in places like the GBR (Ceccarelli and Fernandes 2017), recovery of marine mammals by 67% (Bayraktarov et al. 2020), delisting of southern bluefin tuna as a threatened species in 2024 due to effective management, high sustainability standards for high-value export-oriented fisheries (Nilsson et al. 2019), bold fisheries management to phase out destructive high-bycatch fisheries in the GBR (Department of Primary Industries 2025), and moderate progress on improving water quality in the GBR (Waterhouse et al. 2024). Without question, these outcomes reflect leadership by the Australian Government in marine conservation. At times, such as after the implementation of the GBR Marine Park zoning plan in 2024, Australia was a global leader in marine conservation (Agardy 2010; Devillers et al. 2015; Fernandes et al. 2005; Ruckelshaus et al. 2008). However, given the mounting threats and declining state of marine biodiversity, Australia must do more. Australia has the capacity to lead the world in marine conservation and rightly earn a leadership position.

Consistent with our ineffective environmental legislation—the EPBC Act—Australia is overwhelmed with biodiversity, water quality, fisheries, and climate plans and strategies that are ineffective at managing threats to our unique biodiversity (e.g., National Biodiversity Strategy and Action Plan, Sustainable Ocean Plan) (Samuel 2020). Although our management recommendations are not comprehensive, we believe that they are achievable and, if adopted, would put Australia at the forefront of marine conservation. They are tangible and achieve plans that any government can adopt. If Australia continues with its "business as usual" approach to marine conservation, we are setting a dangerous precedent and risk other nations following our example (Pike et al. 2024).

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Data Availability Statement

The authors have nothing to report.

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