



# Establishing Marine Reserves on the High Seas

Benefits beyond borders

Covering almost three-quarters of the planet, the ocean plays an essential role in supporting life on Earth. This is particularly true of the high seas—the massive area beyond the boundaries of any country. These waters, which account for nearly two-thirds of the world’s ocean, provide ecosystem benefits that extend to every corner of the globe. The high seas are responsible for nearly half of the ocean’s biological productivity,<sup>1</sup> and their health is closely linked to the health and resilience of coastal regions.<sup>2</sup>

At the same time, the human impact on these waters is increasing in range and intensity. This escalation means that the international community needs an array of tools to counter threats to ocean life beyond national boundaries.

Currents carry tons of plastics and other debris thousands of kilometers from shore into the open ocean, where the waste can harm marine organisms and fundamentally change the way healthy ecosystems function. Industrial-scale fishing is also taking a toll. Worldwide, some 4 million vessels catch more than 90 million metric

tons of fish every year. This activity has led to a global decline of fisheries; 90 percent are either depleted or fully exploited.<sup>3</sup> To make matters worse, new technologies, such as those used for deep-sea bottom trawling or more efficient fish aggregating devices, are degrading important ocean habitats and increasing bycatch. Climate change and emerging uses of the ocean, including oil and gas exploration and extraction in the deep sea and seabed mining, also pose major risks.

Because of the interconnected nature of ocean ecosystems, declines on the high seas will bring corresponding declines in coastal ecosystems. For example, over 40 percent of commercially important fish species are caught both in coastal waters and on the high seas. As a result, overexploitation of marine life on the high seas will ultimately reduce catches along the coasts and degrade coastal food webs and ecosystems.<sup>4</sup> And any harm to coastal fisheries can have significant implications for food security. More than 4 billion people worldwide depend on fish as a key source of animal protein.<sup>5</sup>

## High seas reserves bring strong protections

Fully protected marine reserves are among the management tools available to help address some of the critical challenges to ocean health. Like national parks on land, these reserves protect ocean areas from extractive and destructive human activities to conserve species, habitats, and ecosystem processes. To date, though, only 1 percent of the world's ocean has been fully protected. Even less of the high seas is highly protected, in large part because no overarching laws exist to allow countries to establish reserves that will be universally recognized and respected in waters beyond national jurisdictions.

Scientists see marine reserves as critical tools for safeguarding biodiversity, habitats, and crucial ecosystem processes. Research shows that reserves boost ecological resilience against environmental stressors occurring across the globe, such as overexploitation of resources, climate change, and ocean acidification.

Marine reserves have proved to:

- **Safeguard biodiversity.** Peer-reviewed studies have found significantly higher species biomass and abundance within reserves than in similar areas that are unprotected.<sup>6</sup> Highly protected areas that greatly restrict or completely prohibit human activities experience the greatest ecological benefits, with demonstrated increases of 20 to 30 percent in the number of species and size of organisms as well as approximately 450 percent more biomass as compared with unprotected areas.<sup>7</sup>
- **Provide ecological benefits to neighboring ecosystems.** Benefits to ocean life extend beyond the borders of reserves. Because of the “spillover effect,” species migrate from closed reserve areas into waters nearby. In addition, “seeding” disperses larvae from species within a reserve to outside areas.
- **Protect top predators and maintain ecosystem balance.** Marine reserves hold even greater benefits for top predators, such as sharks and tunas. Studies have shown biomass continuing to increase exponentially in predatory fish populations for up to 18 years after reserves have been established.<sup>8</sup> Recent science highlights the critical role that healthy populations of large predators play in maintaining ecosystem balance<sup>9</sup> and how rebuilding their numbers leads to healthy and more complex food webs.<sup>10</sup> These ecosystems are then far better able to cope with, and recover from, unexpected environmental changes.
- **Enhance monitoring and enforcement.** Enforcement experts say the ability to conduct monitoring and surveillance activities is enhanced by prohibiting all extractive and destructive activities within a defined area. Any vessels detected there that are moving at fishing speed or that appear to be fishing can be readily identified using satellite and other tracking technologies. If such activities are forbidden, perpetrators can be spotted and enforcement actions taken.

**Recent science also shows that the cumulative impact of human activities matters to ocean ecosystems and that reserves yield the greatest conservation benefits when they are large, highly protected, isolated, well-enforced, and long-standing. The benefits increase exponentially when all five features are in place. For example, marine protected areas with all of these characteristics have 14 times as much shark biomass, twice as many large fish, and five times as much fish biomass than fished areas. In comparison, marine protected areas with only one or two of these characteristics were largely indistinguishable from fished areas.<sup>11</sup>**

Negative human influences touch every part of the ocean, but the harm can be reversed.

Fully protected marine reserves can help conserve biodiversity and valuable habitats that maintain ecosystem function and counter environmental change. A system of marine reserves on the high seas would protect the unique marine life in these waters, as well as the interconnected coastal and ocean ecosystems beyond.

## Endnotes

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