

The “30 by 30” Initiative: Implementing Area-Based Management Strategies to Confront Marine
Biodiversity Loss in the Mid-Atlantic Region

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Abstract

The "30 by 30" or "America the Beautiful" initiative seeks to conserve and protect 30% of United States land and ocean areas by the year 2030. Due to the increasing threats from climate change that accelerate biodiversity loss, the "30 by 30" initiative is necessary to protect the oceans now more than ever. This paper focuses on ocean protection strategies and challenges in the Mid-Atlantic region. It first reviews the applicable legal framework associated with reaching this goal, along with other federal laws that promote biodiversity. It then discusses a wide range of challenges associated with the implementation of marine protected areas (MPAs), including fishing industry concerns and the role of science and education. Lastly, it offers proposals for reform that draw on existing area-based management strategies to address regional challenges. It also considers potential synergies between offshore wind development and other area-based management strategies apart from MPAs that also promote marine biodiversity.

Experts Interviewed for this Project

- Dr. Jason Adolf, Endowed Associated Professor of Marine Science, Monmouth University
- Dr. Merry Camhi, Director, New York Seascape Program, Wildlife Conservation Society
- Noah Chesnin, Associate Director, New York Seascape Program, Wildlife Conservation Society
- Tim Dillingham, Executive Director, American Littoral Society; Highlands, New Jersey
- Kevin Hassell, Environmental Specialist and Chair of MACO, New Jersey Dept. of Environmental Protection
- Masha Kalinina, Esq., Senior Officer for International Conservation, Pew Charitable Trusts, Washington, D.C.¹
- John Tiedemann, Assistant Dean, School of Science, Monmouth University

¹ Ms. Kalinina's comments in this paper are made in her individual capacity and not on behalf of The Pew Charitable Trusts.

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Introduction

The ocean is vast, complex, and considerably more difficult to govern and regulate than terrestrial spaces. Just like the atmosphere, marine waters are constantly in motion, which leads to ocean governance challenges. Ocean ecosystems also traverse geopolitical boundaries, which compounds governance challenges. Due to the fragmented system of ocean governance and the extensive unprotected regions in the ocean, "marine species loss is becoming a threat to the entire global fishing industry" (Shah, 2014).

These marine governance challenges contribute to the current global climate crisis. The loss of biodiversity is a pressing environmental governance issue that is often overlooked due to other climate issues that directly impact the economy or human health. According to the National Oceanic and Atmospheric Administration (NOAA), “there are approximately 2,270 marine species listed as endangered or threatened under the U.S. Endangered Species Act.” If there are no changes made to current ocean governance instruments, experts predict the collapse of the seafood industry and depletion of most marine life by the year 2050 (Worm, 2006).

Core threats to ocean biodiversity stem from anthropogenic activities that put marine species in danger of extinction. Overfishing, habitat destruction, and ocean pollution largely contribute to the loss of marine biodiversity (The MarineBio Conservation Society, 2021). The significance of biodiversity is well understood in the scientific community: “biodiversity represents mass amounts of systematic ecological data that informs human understanding of the natural world around us” (Morton & Hill, 2014).

Additionally, biodiversity contributes to a flourishing economy by providing raw materials that promote consumption and production, on which many occupations depend. A thriving ecosystem also ensures clean water, carbon sequestration, prevention of soil erosion, pest control, and many other necessary ecological services (Power, 2010). Lastly, recreational pursuits rely on biodiversity, along with aesthetic and cultural values (Morton & Hill, 2014). Without robust protection of marine biodiversity, adverse economic, social, and cultural repercussions will occur in the near future.

On January 27, 2021, President Biden committed his administration to mitigate the climate crisis by establishing an ambitious conservation goal, while also undoing previous Trump administration orders. This initiative is the product of an alliance of political leaders,

scientific researchers, and professional organizations seeking to conserve and protect 30 percent of U.S. land and coastal seas by the year 2030. Known as the “30 by 30” or “America the Beautiful” initiative, it seeks to foster a cleaner, healthier planet for not only ourselves but for future generations as well (O'Shea, Smith & Poole, 2021).

The U.S. Departments of Interior, Agriculture, and Commerce, and The Council on Environmental Quality released a preliminary report in 2021 titled, “Conserving and Restoring America the Beautiful” to the National Climate Task Force. This report established a ten-year plan to conserve both U.S. land and ocean, uniting Americans to reach this shared goal. The report consists of a plan to use science as a guide in formulating efforts that build on existing legal tools and strategies with adaptive approaches, while honoring private property rights and supporting the voluntary efforts of fishery managers. The Biden Administration and agencies involved with the 30 by 30 initiative intend to work closely with affiliated and relevant stakeholders to carefully coordinate individual concerns and interests to reach this goal (U.S. Dep. of Interior, 2021).

Part I of this paper reviews the existing legal framework and mechanisms associated with reaching the 30 by 30 goal. It focuses on the use of area-based management and ecosystem-based management (EBM) strategies such as marine protected areas (MPAs), monuments, and sanctuaries to confront the loss of marine biodiversity. Along with the analysis of MPAs, part I also discusses other federal laws that help promote marine biodiversity, including The Magnuson-Stevens Fishery Conservation and Management Act (MSA) and The Endangered Species Act (ESA). It also addresses the Obama administration’s executive order to initiate a National Ocean Council, and how it has evolved into what is now referred to as the Ocean Policy Committee. The council was created to promote collaboration among stakeholders,

environmentalists, and policymakers to generate more sustainable laws that protect biodiversity while preserving fishing communities' rights to the sea.

Part II examines the challenges associated with the implementation of MPAs in the Mid-Atlantic. It first discusses fishing industry concerns regarding MPAs that disrupt the fishing community's lifestyle, as well as other political and economic concerns. It then addresses the significant role of science, including challenges stemming from a lack of science and research in MPA implementation. It also considers the need for improved methods of enforcement management and better establishment of MPAs.

Part III offers solutions to the challenges posed in part II. First, it proposes that offshore wind farms could be considered "de facto MPAs" in that they will occupy significant space in the marine environment and may help address biodiversity loss in a more efficient way than establishing "official " MPAs. Second, other effective area-based conservation methods (OECMs) can be used in addition to traditional MPAs to promote biodiversity in an "under-the-radar" and potentially effective manner. Part III also will discuss ways to harmonize the 30 by 30 initiative with the existing legal framework under the Endangered Species Act (ESA) and the Magnuson-Stevens Fishery Conservation and Management Act (MSA) by promoting fuller consideration of climate change threats in the marine environment. Part III concludes with suggestions to promote marine biodiversity through improved education, science and outreach.

I. Existing Legal Framework

Ocean management requires a multi-faceted and innovative regulatory response to mitigate the environmental protection challenges in the marine environment. Continued depletion of natural resources in the ocean -- including the extraction of fish, oil, and minerals -- results in catastrophic consequences for marine wildlife and the global environment. The ocean

continues to be viewed as an infinite resource, as well as a repository for waste and other toxic materials. International and domestic governance regimes have a one-dimensional view of managing the oceans. When addressing species conservation and marine pollution, “governance tends to apply a species-by-species and source-by-source approach” (“Comparative Ocean Governance,” Craig, 2012). This fragmented system of management attempts to maintain and regulate the ocean’s values without considering the interconnectedness and complexity of how these elements interact with one another. A more holistic and flexible approach is necessary to restore marine biodiversity and the ocean’s resources (“Comparative Ocean Governance,” Craig, 2012).

A new generation of ocean governance has led to the use of place-based management strategies, which apply a holistic approach that previous ocean management regimes failed to incorporate. With place-based management, regulators have the ability to map out certain areas in the ocean -- which may be large or small depending on the region -- and create protected areas under specific governance and management (“Ocean Governance for the 21st Century,” Craig, 2012). This regulatory approach allows for significant habitats, ecological values, and key species in the delineated area to be regulated or protected from harmful human activities.

Place-based management strategies provide safeguards against the over-exploitation, overfishing, and overuse of an area. In turn, this creates a plethora of benefits for both humans and the environment. The expansion of place-based management has led to coordinated efforts and delegated responsibilities, resulting in an overall net improvement of organized and purposeful ocean governance (“Ocean Governance for the 21st Century,” Craig, 2012). A more controlled and protected marine ecosystem leads to flourishing biodiversity and increased quality

of natural resources. This prevents humans from freely extracting mass amounts of critical marine resources (“Comparative Ocean Governance,” Craig, 2012).

There are various types of place-based management methods, with ecosystem-based management (EBM) being the most relevant for this paper. EBM is highly protective of biodiversity because it seeks to manage the oceans based on the realities of each unique marine environment rather than through artificial legal regimes that fail to recognize the interconnectedness of marine ecosystems (NOAA Fisheries “Endangered Species Conservation,” 2021). EBM uses a science-based, integrative approach to ocean management that addresses the interactions between marine species and ecosystems, anthropogenic activities, and human societies as a whole (NOAA-EBM Headquarters, 2021).

EBM recognizes the unpredictability of marine ecosystems and seeks to regulate human actions, which allows designated areas to maintain ecological integrity while regulating and protecting against harmful human-related impacts to the area. The legal tools that facilitate these place-based approaches, such as classifications of marine protected areas and marine spatial planning, are also critical components to conserving biodiversity.

A. Marine Protected Areas

Marine protected areas (MPAs) encompass a variety of EBM tools to fulfill various protection and conservation objectives. Because MPAs are a form of EBM, they incorporate the same flexible and integrative approach to protect marine biodiversity and ecosystems (Abate, 2009). To ensure ecosystem connectivity, MPAs are designed to balance the health of the ecosystem as well as human well-being through trade-offs in order to balance the multiple and often competing goals in maintaining ecosystem health (Halpern et al., 2010).

Many existing MPAs were established without consideration of climate change. However, recently developed MPAs seek to facilitate restored biodiversity and climate change adaptation now and into the future (“Ocean Governance for the 21st Century,” Craig, 2012). The official federal definition of an MPA derived from Executive Order 13158 is: “Any area of the marine environment that has been reserved by Federal, State, tribal, territorial, or local laws or regulations to provide lasting protection for part or all of the natural and cultural resources therein” (NOAA: National Marine Sanctuaries- MPA, 2021).

Therefore, MPAs are roughly comparable to state and National Parks, as both dedicate areas for special protection and supervision. Because MPAs are an umbrella term for varying place-based ocean management that fulfill different objectives, they are relatively difficult to define, and existing definitions continue to be disputed by ocean governance commentators (Wenzel & D’Iorio, 2011).

In this section, MPA classifications will be explored in further detail, reviewing no-take, no-access, and multiple use zones. It will also explain the role of MPA sanctuaries and national monuments that preserve biodiversity and marine habitats.

1. Marine Protected Area Classifications (no take, no access, multiple use)

No-take MPAs can promote marine biodiversity while also providing tourism and recreational opportunities to local communities. As its name suggests, no-take MPAs prohibit extractive activities such as fishing, mining, and drilling. Therefore, fish in no-take zones can age and grow to large, healthy sizes (National Geographic, 2021).

No-take MPAs incorporate protected habitats for marine species, sustainable fish populations for these species to consume, and tourist attractions, which promote the economy (Bohnsack, Ault, & Causey, 2004). They benefit marine species because this type of MPA

generates revenue that can be invested back into its area, creating optimal conditions for increased biomass expansion and quality of natural resources. As tourist activities develop more attractions in no-take MPAs, more economic benefits will emerge. Increased opportunities for job growth in these areas enhance the economy by employing more workers for different recreational activities (e.g., tour guides, hotel staff workers, and scuba and snorkeling instructors) (National Geographic, 2021).

Many ocean management experts support efforts to implement more “no-take” MPAs because they support economic growth while providing multiple marine ecosystem benefits (Abate, 2009). No-take MPAs are often said to be one of the most effective area-based management strategies as marine life has the opportunity to recover while their habitats regrow to better protect these valuable species (Dahlgren, 2014).

“No access” MPAs, which are rare, offer even better protection for an ecosystem as it restricts all human access to the area. No access MPAs prevent all human-related disturbances to an ecosystem. Very limited human access is permitted in these areas for certain research or monitoring purposes (Wenzel & D’Iorio, 2011). Comparatively, a no-take MPA permits human access, but must comply with extraction or impairment regulations. This allows for natural and cultural resources to generally remain undisturbed while preserving biodiversity.

Multiple-use MPAs allow for a wider range of certain extractive activities, such as large-scale commercial fishing. Other permitted activities in a multiple-use MPAs involve swimming, boating, diving, and recreational fishing (Wenzel & D’Iorio, 2011). Multiple-use MPAs seek to maintain ecological value while also permitting various stakeholders to use the area for a wider range of carefully controlled and managed economic, social, and conservation activities. What remains unavoidable is that multiple-use MPAs are prone to greater ecological destruction

compared to a no-take MPA, even if the multiple-use areas are closely managed. Even though no-take MPAs are better options to promote biodiversity protection and economic growth, “less than 1% of the world’s oceans and less than .01% of U.S. waters” are currently designated as no-take MPAs (Monterey Bay National Marine Sanctuary, 2019).

MPAs can offer year-round (*i.e.*, provide sustained protection and regulatory measures), seasonal (*i.e.*, provide protection to habitats and resources for only a fixed season or period of time), and rotating (*i.e.*, provide only cycled protection to an area, which often meets short-term conservation goals) to fulfill these different objectives (Wenzel & D’Iorio, 2011). In the U.S., there are several existing legal mechanisms at the federal and state level to create, manage, and oversee MPAs. The 30 by 30 initiative plans to build upon existing MPAs, in addition to creating new ones (Lieberman, 2021).

2. Sanctuaries

A network of 1,000 MPAs already exists in the U.S. NOAA manages 13 sanctuaries and co-manages 2 monuments. Sanctuaries and monuments are types of MPAs. They apply similar means of protection to a selected area, yet differ in the ways they are designated, and under which laws. They may incorporate “no-take” or “multiple-use” MPA zones, or a combination of the two. Sanctuaries and monuments allow for diverse activities such as fishing, research, education, recreation, and tourism opportunities that help to support local, coastal, and ocean-dependent economies (NOAA, “National Marine Sanctuaries,” 2021).

The history of Marine National Sanctuaries began in 1972 with the National Marine Sanctuaries Act (NMSA) (NOAA, “National Marine Sanctuaries,” 2021). The NMSA is the only U.S. law that is designed to preserve ocean areas and marine ecosystems. It also authorizes the federal government to manage each sanctuary and its designation process as a whole.

Congress has the ability to designate national marine sanctuaries, specifically if the area gains a substantial amount of public or congressional interest, while NOAA implements and manages these sanctuaries (NOAA “National Marine Sanctuaries,” 2021).

Regulatory prohibitions that are typical for many sanctuaries include:

(1) discharging material or other matter into the sanctuary, (2) disturbance of, construction on, or alteration of the seabed, (3) disturbance of cultural resources; and (4) exploring for, developing or producing oil, gas or minerals (with a grandfather clause for pre-existing operations).

Although monitored fishing and recreational activities are allowed, the more ecologically harmful activities listed above are typically prohibited in a National Marine Sanctuary (NOAA “National Marine Sanctuaries,” 2021).

The Florida Keys National Sanctuary is an instructive example. It protects 2,900 square nautical miles of waters surrounding the Florida Keys, including the world’s third largest and only living coral barrier reef in North America, as well as mangrove forests, and over 6,000 diverse species (Florida Department of Environmental Protection, 2021). It protects significant key species such as the bottlenose dolphin, loggerhead sponge, spiny lobster, and tropical reef fish. The Florida Keys National Sanctuary also protects special ecological values, including hard-bottom, mangrove-fringed shorelines and islands, sand flats, and seagrass meadows. (Office of Marine National Sanctuaries, 2021). Although fishing is permitted, there are specific rules to prevent overfishing.

The administrative designation of a National Sanctuary is a lengthy process. It begins with publication of several documents in the Federal Register and a notice of the proposal. Next, the Secretary of Commerce, acting through NOAA, is authorized to designate "any discrete area

of the marine environment as a national marine sanctuary and promulgate regulations implementing the designation” (Sanctuary Designation Standards, 16 U.S.C. § 1433).

The law requires a public hearing to be held in the coastal area or areas most affected by the designation (Sanctuary Designation Standards, 16 U.S.C. § 1433). Sanctuaries tend to have more multiple-use zones than no-take zones, but this may vary from site to site. “The NMSA does not prescribe specific protections for sites designated under its authority and, in fact, encourages multiple uses” (Findings, purposes, and policies; establishment of system, 16 U.S.C. § 1431).

3. Monuments

The Antiquities Act, established in 1906, was enacted to protect areas with historic interest or scientific relevance in order to create a monument (National Trust for Historic Preservation, 2017). The Act authorizes the president to implement national monuments anywhere within national jurisdiction. It also precludes the degradation, appropriation, and injury of “any historic or prehistoric ruin or monument, or any object of antiquity, situated on lands owned or controlled by the Government of the United States without the permission of the Secretary of the Department of the Government having jurisdiction over the lands on which said antiquities are situated” (Antiquities Act, 16 U.S.C. 433).

The President has direct authority to designate monuments under the Antiquities Act via presidential proclamation, which allows for immediate creation of monuments without any delay. However, designating a National Marine Sanctuary under the National Marine Sanctuaries Act (NMSA) typically takes much longer to implement because of the high level of public input NOAA receives through this process. NOAA involves the public, agency partners, tribes and

other stakeholders in the scoping and review process of creating a National Marine Sanctuary, and considers all input before determining appropriate changes (NOAA “Designations,” 2021).

Along with NOAA's existing authority, the Antiquities Act further authorizes marine regions of interest, including significant species, habitats, and unique ecological values and features to be highly protected. The only way marine national monuments can be established is through presidential proclamation via the Antiquities Act (Vincent, 2018). Marine national monuments are typically managed through multiple authorities, including NOAA, the Department of Interior, or other federal and state agencies.

For example, the Papahānaumokuākea Marine National Monument (PMNM) is managed by several government agencies: NOAA, the U.S. Fish and Wildlife Service (FWS), the Hawaii Department of Land and Natural Resources, and the Office of Hawaiian Affairs (OHA) (Papahānaumokuākea Marine National Monument, “Management,” 2020). Although Hawaii’s ocean management is different from the Mid-Atlantic’s, understanding how the PMNM works is instructive because it can be used as a guide and translated to apply to the Mid-Atlantic region.

The PMNM is a valuable example of a marine protected monument. This monument was established in June 2006 to protect the Hawaiian Islands’ coral reef ecosystem and coexisting intertidal ecosystem. It is one of the largest marine protected areas in the world, encompassing 582,578 square miles of the Pacific Ocean (Papahānaumokuākea Marine National Monument, “Physical Feature” 2020). The PMNM continues to be a successful marine national monument, endowing healthy biodiversity, clean water, and an overall robust marine environment. To protect this monument, the inner zone has a strict no-take policy, and an outer-zone allows only certain activities such as cultural Hawaiian practices and scientific research (Marine Conservation Institute, 2020).

The PMNM is much more effective in protecting biodiversity compared to National Marine Sanctuaries. PMNM's proclamation and zoning eliminate fishing, restrict access, and establish ocean zones that are not just "no take" but also "no discharge," virtually eliminating the locally controllable sources of marine pollution. In addition, restoration of the islands for wildlife protection purposes is also underway ("Ocean Governance for the 21st Century," Craig, 2012). PMNM managers also continue to work towards reducing stressors and building resilience of species and habitats by continuing and expanding the plastic removal programs that have been active since 1982. NOAA and fourteen partners removed 582 tons of plastic, fishing lines and nets, and other debris from the islands between 1996 and 2007 ("Ocean Governance for the 21st Century," Craig, 2012).

B. Other Federal Environmental Laws to Help Promote Biodiversity

The application of other federal environmental laws is necessary to promote biodiversity under the 30 by 30 initiative. One of the most significant and powerful environmental laws in the nation is the Endangered Species Act (ESA). The ESA provides strong federal protection against biodiversity loss, as its purpose is "to halt and reverse the trend toward species extinction, whatever the cost" (Salzman, p. 300, 2014).

The two federal agencies that are responsible for administering the ESA are the U.S. Fish and Wildlife Service (FWS) and the National Marine Fisheries Service under NOAA (NMFS). All federal agencies are required to consult with FWS or NMFS prior to taking any action which may affect a listed species. This ensures that the intended action will not "jeopardize the continued existence" of the endangered species or "result in the destruction or adverse modification of [the critical] habitat of such species" (Salzman, p. 303, 2014).

The North Atlantic right whale is an endangered species in the Mid-Atlantic region, which has been listed under the ESA since 1970 (NOAA Fisheries, “North Atlantic Right Whale”). In the early 1890s, the North Atlantic right whale had been hunted to the brink of extinction. Although whaling is no longer a threat to this marine mammal, other threats such as climate change, entanglement in fishing gear, and habitat degradation continue to harm whales throughout the Atlantic. Researchers calculated there are “fewer than 400 North Atlantic right whales, with fewer than 100 breeding females left” (NOAA Fisheries, “North Atlantic Right Whale”).

NOAA fisheries is responsible for the protection, conservation, and recovery of endangered and threatened marine and anadromous species under the Endangered Species Act (NOAA Fisheries “Endangered Species Conservation”, 2021). The ESA is often widely criticized by industry and conservative politicians, arguing that it goes too far to protect species, and does not effectively weigh costs and benefits. They also argue the ESA is too strict -- to the point where federal agencies are prohibited from taking action that may jeopardize the continued existence of endangered species or their habitat, no matter how valuable the action would be for society (Salzman, p. 295, 2014).

The Trump administration attempted to undermine the ESA. Trump criticized the ESA for thwarting economic growth and development (Frank, 2019). The Trump administration implemented three changes that did in fact weaken this statute in 2019. One change included the option to consider the best economic interests when listing a species, rather than solely basing decisions on scientific information. The second change required regulators to consider the protection of listed species inhabited habitat areas before designating uninhabited areas. The last change sought to limit federal agencies’ authority to take climate change into consideration when

listing species and habitats (Lambert, 2019). Fortunately, the Biden administration has already taken measures to reinstitute the ESA protection that the Trump administration sought to undermine (Grandoni & Fears, 2021).

Although some may argue the ESA is too strict, others argue it is not strict enough. This argument comes from many organizations in the environmental community. Because the ESA does not list species for protection until that species is found to be in serious endangerment, environmentalists assert the ESA employs more of an “emergency room approach” to confront and protect biodiversity (Salzman, p. 294, 2014). This is one of the greatest flaws in the ESA because it does not seek to protect healthy species; therefore, many flourishing species are at risk of being destroyed at any moment.

Another important statute in protecting marine biodiversity, the Magnuson-Stevens Fishery Conservation and Management Act (MSA), faces criticisms from environmentalists similar to those leveled at the ESA. Enacted in 1976, the MSA establishes a “national program for the conservation and management of the fishery resources of the United States ... to prevent overfishing, to rebuild overfished stocks, to insure conservation, and to realize the full potential of the Nation's fishery resources” (Findings, purposes, and policies, 16 U.S.C. § 1801).

The MSA was first passed with the objective to promote fishing, but after steady declines in fish stocks it was later amended in 1996 and again in 2006 (NOAA Fisheries “Laws and Policies”, 2021). The amendments revised the approach to federal fisheries management to take a more conservation-oriented approach, which led to additional safeguards to prevent overfishing and ensure more sustainable fish stocks for the future (Oceana, 2021). Still, fisheries management and other related agencies have attempted to weaken this law, while other environmental and climate scientists push to enhance the conservation measures in the MSA.

From a conservation-minded perspective, the MSA has been a major success. In 2017, the number of overfished stocks dropped to its lowest on record (Agosta, 2018). But this Act is still the target of valid criticism. Some of the major arguments against the MSA have been the failure of the Secretary of Commerce, acting through NOAA, to require regulations that minimize bycatch and to ban the disposal of unwanted catch of target species into the ocean. Another argument against the MSA is that it does not hold regional councils accountable for not enforcing or implementing fisheries management plans (Hennessey & Healey, 2000).

In the 30 by 30 report, “Conserving and Restoring America the Beautiful,” the MSA is mentioned as “one of the most dynamic and innovative wild-capture fishery management systems in the world.” NOAA is being called to “work closely with regional fishery management councils to identify areas or networks of areas where their fisheries management efforts would support long-term conservation goals” in the hopes to enhance the existing legal mechanisms already in place (U.S. Department of the Interior, 2021).

C. Obama’s Executive Order for a National Ocean Council

Following the Deepwater Horizon oil spill in the Gulf of Mexico, former U.S. President Obama implemented the first National Ocean Policy in 2010. This policy provided a comprehensive plan to protect and improve the ecological health and economic value of the ocean, coastal areas, and the Great Lakes (EELP Staff, 2018). Executive Order 13547 also called for the development of regional ocean management plans to facilitate a more integrated, cross-jurisdictional approach to decision-making and to facilitate data collection and sharing (Executive Order 13547, 2010).

In an effort to bridge the gap of communication between stakeholders, environmentalists, and everyone in between, this plan emphasized the importance of “extensive input from national,

regional, and local stakeholders from all marine sectors; tribal, State and local governments; and the private sector, scientists and the public” on marine governance collaboration (The White House: President Barack Obama, 2010). The objective of this plan was to bring stakeholder interests together to create a plan that will satisfy each group’s individual concerns about the ocean, whether they be environmental, cultural, economic, or tribal concerns.

This National Ocean Council was implemented only for a short period of time until the Trump administration abandoned the National Ocean Council altogether. In 2018, President Trump signed Executive Order 13840, “Ocean Policy to Advance the Economic, Security, and Environmental Interests of the United States,” which ultimately revoked Obama’s previous executive order for the National Ocean Policy (Executive Order 13840, 2018). The top priorities of Trump’s executive order focused on promoting economic growth, job security, and national security. His order also revoked the Obama order’s references to “social justice,” “biological diversity,” and “conservation.” (Malakoff, 2018). As a replacement for Obama’s National Ocean Council, Trump established a new committee of marine leaders referred to as the Ocean Policy Committee (OPC) in his 2018 executive order (Trice, 2021).

Trump's executive order also stated that the oceans are the foundation of the economy, security, global competitiveness, and well-being of the United States. Ocean industries employ millions of Americans and support a strong national economy. Domestic energy production from Federal waters strengthens the Nation's security and reduces reliance on imported energy (Executive Order 13840, 2018). The Trump administration sought to promote economic growth over biodiversity conservation and long-term sustainability of marine waters.

By contrast, the Biden administration has recently undertaken efforts to promote marine conservation, backed by science, with the 30 by 30 initiative as a significant focal point. After

his inauguration in 2021, Biden rolled out new climate mitigation actions immediately. Biden stated that the nation "desperately" needs a unified response to the climate crisis and stressed the U.S. must be the leader in the global response, which is one of the main reasons for the 30 by 30 initiative. Biden also signed a presidential memorandum protecting government scientists from political interference, in addition to having the U.S rejoin the Paris Agreement (Quinn, 2021).

As the Biden administration recognizes the connection between the oceans and climate change, efforts have been made to improve ocean management under the new administration. The National Oceanographic Partnership Program (NOPP) will also now operate under the OPC. Led by the Secretary of the Navy in coordination with NOAA, NOPP seeks to prioritize partnerships between federal agencies, scientists, industries, and non-governmental organizations to advance ocean research. The Biden administration also reestablished the Ocean Research Advisory Panel, "recommending members be composed of academia, industry, state, Tribes and the National Academies with expertise in marine science, technology and policy to provide expertise to the Ocean Policy Committee (OPC) (Quinn, 2021). With the advancement and leverage of the OPC, the Biden administration actively works to facilitate communication among marine leaders, stakeholders, and agencies to work towards similar goals of Obama's National Ocean Council, but with a more scientific foundation and greater emphasis of collaboration (Trice, 2021).

II. Challenges in Implementing MPAs in the Mid-Atlantic

In order to achieve the 30 by 30 goal, the challenges in implementing MPAs in the Mid-Atlantic must be addressed. One of the most significant challenges will be the commercial and recreational fishing communities, as the implementation of more MPAs inevitably affects their livelihood and lifestyle. The lack of sufficient scientific data and research also remains a problem

in seeking to establish MPAs. When there is insufficient science to support an area for MPA designation, the fishing industry will most likely be more opposed, often because the purpose of the MPAs is not communicated to fishers, leaving them out of the discussion altogether.

Part II addresses lifestyle, political, and economic concerns from the fishing community. It will discuss the gap of science that causes even more issues when looking to establish and implement MPAs. It also addresses other challenges in establishing and overseeing an "official" MPA, including the need for public education and outreach. Part II includes input from experts in marine management and coordination and from the fishing industry's perspective.

A. Fishing Industry Concerns

Using MPAs to restrict areas from fishing and other extractive activities to increase the long-term recovery and longevity of fish stocks may seem uncomplicated and straightforward, but many fishers are not entirely convinced. The fishing community generally views MPAs as an impediment to their line of work. Although MPAs are implemented to promote the long-term sustainability of marine life, most fishers believe that MPAs ultimately impair their livelihood (Westlund, 2017).

John Tiedemann, Assistant Dean of the School of Science at Monmouth University, has worked for four decades addressing a wide range of marine and environmental science and natural resource management issues in the Mid-Atlantic. He has witnessed firsthand the tension between environmentalists and fishing communities. Tiedemann says that many fishers have approached the topic of MPAs with opinions such as "those environmentalists want to make every fish a pet." Intrinsicly, MPAs spark controversy between marine conservationists and fishery stakeholders. This is one of the main challenges associated with the implementation of MPAs in the Mid-Atlantic region.

Tiedemann explains that because of these heavy restrictions, “fishermen feel that environmentalists are over-regulating significant fishing activities... and in certain instances, that their “right to fish” is being confiscated from them.” Consequently, the benefits that MPAs have to offer to fishing communities are often overlooked because of the “knee-jerk” reaction they get from numerous regulations that impede their line of work. Nevertheless, Tiedemann believes there are types of no-take MPAs that may help increase fish populations and help fishing communities. Tiedemann noted, “there are some rational and biological reasons for MPAs, only if we have the data to identify no-take zones that can benefit fisheries.”

When MPAs are designated and identified as critical spawning habitats for fish, fishing communities will see long-term benefits in terms of increased fish populations and more mature fish. There are no walls or boundaries in the ocean so fish will migrate to other areas that fishers can access. Therefore, Tiedemann believes that no-take zones can protect the juvenile population and spawning population when correct spawning grounds and critical nursery areas are identified and used properly.

When federal agencies propose regulations that would restrict fishing practices, fishing communities seek to have input on those regulations through comment opportunities prior to the regulations entering into effect. In many instances, however, fishing communities do not believe that their input is taken into consideration when they participate through these channels. This leads to many conflicts between the fishing community and policymakers. Tim Dillingham, Executive Director of the American Littoral Society in Highlands, New Jersey, observed that “fishermen do not like to be told what to do. They are very insightful about the ways of the ocean and the animals in the ocean. Fishermen have an understanding about the ocean’s biological

processes that is different from the scientists and, in most cases and ways, the fisherman's perspective is equally valid.”

Dillingham believes that if policymakers, environmentalists, and the fishing community collaborated more on the designation and implementation of MPAs, there would be a better outcome for all parties involved. Because of the continued lack of collaboration and a stark division of interests between these groups, fishermen have become resentful of the restrictions imposed on them by the collective group of state and federal agencies and environmental organizations.

Even with the creation of a National Ocean Council and the OPC mentioned in part I, Tim Dillingham commented, “there was still much difficulty trying to get fishermen on board with certain policies and regulations that limited their access to fishing.” Therefore, even when reasonable solutions are created, the intricate complexities of ocean governance still present a difficult challenge.

Masha Kalinina, Esq., Senior Officer, International Conservation, at The Pew Charitable Trusts, explains that traditional fisheries management often focuses on a single-species approach, rather than focusing on more collaborative and integrative management strategies. A single-species approach fails to account for the complex dimensions and interactions that occur among marine species. In addition, a single-species approach is not the best way to expand the biomass of marine species, and could even lead to depletion of fish stocks. Ecosystem-based management that considers the ecosystem as a whole when implementing management strategies has the potential to be a stepping stone to mending the tensions between fisheries stakeholders and environmentalists.

Fortunately, some fisheries management councils in the Mid-Atlantic have already adopted certain ecosystem-based management strategies. The New Jersey Department of Environmental Protection states that “The Mid-Atlantic Fishery Management Council (MAFMC) incorporates ecosystem components into the Atlantic Mackerel, Squid, and Butterfish FMP (an example of an ecosystem-based approach to fisheries management). In addition, the Atlantic States Marine Fisheries Commission (ASMFC) considers both horseshoe crab and shorebird abundance when setting annual harvest levels for horseshoe crab (Madsen, 2020).

The NJDEP plans to move towards this type of management as well, but states that “it can be difficult enough to get commercial, recreational, and environmental groups to agree on management objectives for a single species; now we are asking them to agree on objectives for multiple species at once!” (Madsen, 2020). Therefore, the challenge continues to be a lack of coordination among stakeholders, environmental organizations, and policymakers, and their conflicting objectives for marine management.

The multi-dimensional obstacles and conflicts among fisheries stakeholders, environmentalists, tribal communities, and state and federal agencies involve an even deeper layer, namely, the economic challenges. Increasing the number of no-take and no-access MPAs inevitably provokes backlash to some degree, no matter how careful and deliberate the restrictions may be. Job security is one of the main causes of the economic turmoil that MPAs trigger. Because MPAs reduce or prohibit commercial and recreational fishing activity, fishing community will lose jobs because of the increased restrictions and limited access they have to the ocean.

When limiting open area access to fishing, vessels could also experience higher levels of congestion on the remaining grounds. This comes with issues in the fishing industry such as

increased fuel usage, higher capital costs (*e.g.*, fishing gear), and fewer fish in the area to catch, leading to economic losses. (Sanchirico, 2002).

In order to convince fishers that MPAs can be beneficial for both the environment and the fishing industry, Tim Dillingham suggests that fishermen need to be informed on the rationale upon which a restriction is based. For example, when clearly articulated reasons support why certain MPAs are off limits to fishing communities – such as protecting a spawning ground for striped bass to increase biomass and sustainability for future fishing endeavors – fishermen may be more compliant because they know this restriction will benefit them in the future.

Dillingham explains, “If you don’t give them (fishers) the opportunity to learn the reasoning and the science behind certain restrictions, there is room for conspiracy theories directed at the government and environmental organizations.” In order to prevent such conspiracy theories from developing, fishermen must be involved in the scientific reasoning for MPA designation.

B. Role of Science

The absence of scientific data is another challenge associated with the implementation of MPAs in the Mid-Atlantic. In order to designate an MPA, extensive scientific research and evaluations must occur, which can be an expensive and lengthy process. MPAs typically are intended to protect large areas in the ocean. To protect and conserve 30% of the ocean, as the 30 by 30 initiative seeks to achieve, many scientists must evaluate areas and make decisions based on reliable data, which is time consuming due to the vastness of the ocean.

Kevin Hassell, Environmental Specialist and Chair of MACO for the NJDEP, explains that it is important to fully understand the ecosystem through science prior to implementing MPAs. But with this comes many challenges, which Hassell describes as “making sure the

science is being done effectively and is properly funded when we are strapped for time and strapped for funding.”

When approaching decisions about ocean management, using the best available scientific data is crucial, but the data often is not updated or available at all. Hassell noted that much of the data involving fisheries management and MPAs are “severely lacking” and that “you have to understand the system you are operating in before making any decisions.” Hassell explains that understanding the basics such as fish populations, temperature statistics, and species interactions takes time to properly decipher by both marine scientists and government legislators. Moreover, addressing concerns from fishers, tribes, coastal communities, and environmental organizations adds a layer of complexity to this process.

Tiedemann also commented on this challenge, explaining that when an area is identified as “ripe for designation as an MPA,” it is expected to be a science-based decision, but in some instances it lacks scientific data and understanding. Tiedemann noted that MPA no-take zones should be utilized for “critical spawning and nursery habitats for commercially and recreationally valuable species” because it will generate long-term benefits for fishing communities. Using this type of reasoning when implementing MPAs encourages fishers to agree with such designations when scientific knowledge is shared and understood.

Tiedemann also raised “shifting baselines” as another issue. This term was popularized by Daniel Pauly, a marine biologist known for his work in studying the anthropogenic impacts on global fisheries. Shifting baselines is the reality that every generation of fisheries managers has a different perspective on baselines, and significant changes to an ecosystem are being measured against previous baseline states, which themselves are significantly different from the original state of the system (Hobday, 2012).

For example, a species that was abundant hundreds of years ago may have experienced declines over time, but the population status in past decades is incorrectly considered as the appropriate reference point for current population management. “In this way, large declines in species over long periods of time can be masked, with each human generation ignorant of previous conditions” (Hobday, 2012). An emphasis on historical scientific perspectives regarding prime fishing areas in the ocean may help mitigate this knowledge gap.

The problem regarding a lack of science emerges when MPAs are designated without reliable scientific data to support it. Tiedemann explains that “we leave it to the regulators to protect the fish and to allow fishermen to reach certain quotas and limits, which are usually scientifically based, but many times lobbying and politics take over.” The challenges involving lobbying and politics emerge frequently on environmental issues, and this case is no different. Even when scientific data is available and the opportunities to apply science to MPA implementation are accessible, government involvement may outweigh science through the influence of lobbying and politics. Tiedemann stressed the importance of asking key questions before establishing MPAs, such as, “what criteria are we basing the MPAs on, and are we using policy and science-based criteria, economically based criteria, or basing MPA implementation on whoever has the most lobbying influence?”

An example of other ulterior motivations for MPA designation can be seen from the U.K., where large-scale MPAs around the British Indian Ocean Territory and Pitcairn have been designated. And while there may be laudable conservation-based reasons behind these actions, there are also major political dimensions. Large MPAs tend to be placed in areas where fishers do not spend much time – areas that rely heavily on the economy and are politically weak. This

is because it is much easier to designate these areas because there is less opposition to the designation (Farran, 2018).

A 2010 Wikileaks cable suggested that “one motivation behind the MPA around the Chagos Islands was to prevent resettlement of locals to their homeland.” After the locals sued the U.K. government for this effort, and after the U.K.’s Supreme Court rejected this motivation, “resettlement clearly remained an issue and was referred to by the International Court of Justice in the request for an opinion by the United Nations General Assembly” (Farran, 2018). Although the Mid-Atlantic region is much different from the U.K., there are still many local and tribal communities that reside in the region, which could raise similar concerns that MPAs may not be designated on the foundation of science, but for reasons that may fail to fully consider the interests of coastal or tribal communities.

C. Challenges in Establishing and Overseeing an "Official" MPA

Although the motivation behind MPAs seems like a win-win for environmentalists and fishers in promoting long-term environmental sustainability, there are still many concerns regarding the monitoring and enforcement of MPAs that must be addressed. Larger-scale MPAs are difficult to patrol, despite promises of using satellite and drone technology. Some experts have noted that MPAs appear to be little more than “paper parks,” protected in name only with overfishing and other adverse impacts still happening (Farran, 2018).

In the U.K., the Westminster government originally agreed to protect 127 sites in English waters, but within these sites, only the “vulnerable features” will actually be protected. “If the government's record so far is anything to go by, the vulnerable features will amount to a few handkerchiefs of seabed. The remainder of these ‘conservation zones’ can continue to be pulverized by beam trawlers and scallop dredgers” (Monbiot, 2012).

Other challenges manifest when establishing and overseeing an “official” MPA because of the language used for MPAs, and what actually counts as a no take or no access protected area versus an area that allows for multiple-uses such as fishing and recreation. Tiedemann highlighted an issue regarding the percentage of protected areas currently in the U.S oceans. Concerns rise as the NOAA official website claims, “MPAs cover about 26 percent of U.S. waters” (NOAA “Where are marine protected areas located?” 2021). But this figure includes multiple-use zones, which do not offer the same degree of protection that no-take or no access MPAs offer. Tiedemann stated that “NOAA makes this calculation of protected areas to make it look like a larger inventory than what we really have as an academic definition of an MPA. NOAA pulls coastal parks, sanctuaries, and multiple-use MPAs into the 26% calculation.”

By these measures, there would only be 4% of the oceans left to be protected pursuant to the 30 by 30 initiative. In reality, many of these types of MPAs do not protect biodiversity to its greatest extent, and it is unclear whether they count as MPAs that will actually protect marine environments and species. Tiedemann questioned NOAA’s statistics by seeking clarification on what the parameters of permitted uses are to achieve the 30 by 30.

Kalinina also recognized the challenges of monitoring an “official” MPA. When asked how MPA implementation can improve, she explained, “monitoring and enforcement are key. If you create an MPA but no one is there to make sure there is no illegal fishing, massive industrial fleets don't come through, or other violations, that’s a problem. It also requires cooperation with the Navy, as well.” She also noted the difficulty in funding MPA manager positions and hiring enough staff to secure very large marine areas.

Another challenge involves the extensive process of data gathering and scientific research before the establishment of MPAs. It is important to determine the size of an MPA in advance of

its designation, which can be difficult as one size does not fit all. A “one-size fits all” approach is not an optimal regulatory strategy. The proper size for an MPA “depends upon the goal of the MPA and the ecology of the relevant species” (Abate, 2009).

III. Proposals for Reform

The current “single-species” approach to ocean management in the Mid-Atlantic fails to consider the interactions among fish and other marine life and their surrounding environment. Area-based management strategies have been shown to facilitate the sustainability of fish stocks, which further contributes to the recovery of biodiversity. However, expanding the implementation of MPAs throughout the region comes with many political and economic challenges involving fishing communities’ concerns. It also requires a deeper understanding of science, as well as improved education and outreach to the public.

Part III of this paper proposes reforms to address these ocean governance challenges and assist in the recovery of marine species. Subpart A addresses “*de facto*” MPAs, including offshore wind farms (OWFs), and other effective area-based measures (OECMs). OWFs may have the potential to help conserve marine biodiversity, but subpart A will address the controversial attributes of offshore wind farms, describing the potential positive and negative consequences accompanying the installation of these facilities. It also explores the possibility of implementing other effective area-based measures (OECMs) alongside MPA implementation as a strategy to promote more effective marine biodiversity conservation.

Subpart B considers ways to operationalize the 30 by 30 initiative into the existing regulatory framework of the ESA and MSA, as climate change continues to be a threat multiplier to fish sustainability. Lastly, subpart C explores other possible solutions such as improved education, science, and outreach.

A. “*De facto*” MPAs and OECMs

Offshore wind farms (OWFs) are one of the leading candidates for renewable energy production in the Mid-Atlantic region and nationally. As of March 2021, 12 OWF projects are expected to be completed throughout the Mid-Atlantic as early as the year 2023 (Kessler, 2021). Additionally, Gov. Phil Murphy, one of the nation's strongest supporters of offshore wind as “a core strategy” to wean the country off fossil fuels, set an aggressive goal of 7,500 megawatts in offshore wind by 2035 (EO-92, 2019). Other examples in the region working towards more OWF designation include New York, as the state is targeting “9,000 megawatts for development by 2035, and the state of Massachusetts intending to purchase 3,200 megawatts by 2035” (AWEA, 2020). The American economy is increasing investment in offshore wind, and “recent data reveal the upward economic trajectory, with predictions for nearly \$78 billion in capital spending to occur this decade” (Cohen, 2020).

Offshore wind farms’ primary objective is to mitigate climate change by aiding in the transition from fossil fuels to renewable energy (McCrone, 2021). However, the designation of OWF may also offer leverage to promote marine biodiversity, functioning in a manner similar to MPAs. This idea has been heavily debated in the environmental community among scientists, environmentalists, and fishers. The controversy surrounding OWFs as MPAs involves factors such as noise pollution and the obstruction of marine mammal habitats (Bailey, 2014).

One of the most important benefits that OWFs can offer for the 30 by 30 initiative is in their ability to act as artificial reefs for marine species, which attract fish species while providing a surface to which marine life can attach. In a study that assessed the environmental impacts of offshore wind farms, researchers found numerous fish species and other marine species were

attracted to the wind turbines, and chose to inhabit the surrounding area (Bailey, 2014). This helped protect marine species since fishermen were unable to access the area surrounding OWFs.

Although a different region from the Mid-Atlantic, studies from the North Sea and Baltic Sea regarding OFW and marine conservation may offer guidance for how they are implemented in the Mid-Atlantic, and provide pathways for how to do better in the future. For example, the “Lillgrund” wind farm in Öresund found that numerous fish species such as Atlantic cod, shorthorn sculpin, goldsinny wrasse, black goby, eelpout, and European eel were heavily attracted to the area surrounding the designation of OWFs (Bergstrom, 2014).

In another study investigating *Lophelia pertusa* (a type of coral), offshore structures left from oil and gas platforms were found to be “instrumental in creating new settlement habitats for the vulnerable deep water coral *Lophelia pertusa*” (Bergmark, 2014). Wind turbines provide a hard substrate similar to the offshore structures, thereby promoting a safeguarded habitat for numerous marine species.

Because wind turbines also offer a sheltering effect due to their blockage of extractive and harmful activities, the local species are insulated from the dangers of fishing, trawling, and dredging. This is extremely valuable to promote increased biomass of fish stocks, as this area will allow for juvenile fish to have a higher chance of survival, and older, bigger fish will have improved survival rates as well (Langhamer, 2012). Consequently, the fishing industry will benefit from the long-term sustainability and longevity of fish stocks. As more fish spawn and grow larger alongside the protection of wind turbines, fish will have the opportunity to migrate into other areas that allow for fishers to catch them. Comparable to MPAs, OWFs have the potential to facilitate the protection and conservation of biodiversity, yet OWFs have the added

benefit of providing platforms that enable habitat construction for marine species (Bergmark, 2014).

Despite the benefits that accompany OWFs as “*de facto*” MPAs, there are still risks involving the absence of sufficient scientific data and research on this topic. Very few studies have been conducted to address this issue, and plenty of questions remain concerning the environmental impacts of OWFs (Deutsche Welle, 2021). Additional data collection in the coming years will help to determine proper OWF designation. Some other risks include food web interactions and invasive species (Bailey, 2014).

Tim Dillingham observed that the designation of OWFs as leverage for biodiversity conservation is still an “unanswered question.” Having previously served on a wind panel in 2008, he explained, “I made myself very unpopular there by demanding that we have a dedicated scientific survey with better characterization of the life that is out there in the ocean.” He stressed the importance of gathering significant amounts of scientific data and research prior to making any decisions about constructing OWFs in a designated area. Dillingham emphasized that exercising caution is prudent when approaching OWFs, due to the lack of scientific evidence on marine environment impacts from these facilities.

If designed and constructed properly, OWFs offer a protected area for marine life to flourish, while also remaining relatively undisturbed. First, government subsidies to the fishing industry would have to be reduced and redistributed towards substantial amounts of scientific research and data around possible OWF locations. Fortunately, better technology is on the rise that can collect scientific information and data faster and more efficiently than ever before.

Alongside efforts to invest in scientific research, utilize advanced technology, and promote collaboration among stakeholders, OWFs have the potential to be a driving force behind

the recovery of fish stocks and marine biodiversity in the near future. Kalinina commented, “any kind of construction in a marine environment is going to be disruptive to marine life.” She further observed that despite the drawbacks of OWFs, they are still the “lesser evil” when compared to oil and gas drilling and bottom trawling. OWFs are especially more beneficial when proper environmental impact assessments are conducted.

Other effective area-based conservation measures (OECMs) are a new marine conservation mechanism in the environmental community’s toolbox. OECMs are considered as effective, and can be more effective than MPAs if they meet strict criteria, which can be very helpful in reaching the 30 by 30 goal. This is because attributing areas other than classic protected areas can be more inclusive, and allows for areas managed by local communities or indigenous people, privately owned lands, certain military zones to be attributed toward the 30 by 30 goal, leading to a more accurate representation of global conservation efforts. (Kalinina, Briggs, & Villagomez, 2021).

The Convention on Biological Diversity (CBD) official definition of OECMs is “A geographically defined area other than a Protected Area, which is governed and managed in ways that achieve positive and sustained long-term outcomes for the *in situ* conservation of biodiversity, with associated ecosystem functions and services and where applicable, cultural, spiritual, socio–economic, and other locally relevant values” (CBD, 2018).

OECMs are implemented in marine areas that achieve similar conservation measures to MPAs, but do not have the primary objective to conserve marine biodiversity (Kalinina, Briggs, & Villagomez, 2021). Starting in 2015, the International Union for Conservation of Nature (IUCN) provided suggestions to the CBD through a Task Force on OECMs (IUCN, “OECM

Guidelines,” 2017). In 2018, the Parties to the CBD agreed upon the principles, characteristics, and criteria for the identification of OECMs (CBD Decision 14/8).

With the establishment of more qualified OECMs, which meet international criteria, throughout the Mid-Atlantic waters alongside expansion of MPAs, OECMs can be a promising new approach to promote biodiversity conservation. This concept looks far beyond conventional ocean governance legal tools and explores possibilities for further biodiversity conservation opportunities (Kalinina, Briggs, & Villagomez, 2021).

Kalinina explains that although OECMs have only recently been coined as a marine biodiversity strategy in the last few years, “examples of them have existed for a long time.” Kalinina lists other examples of possible OECMs that do not have conservation as their primary goal, but have goals related to “military defense, or an operation of a privately owned hotel.” Kalinina further explained that another element of OECMs is that “they must achieve effective outcomes of biodiversity that count towards the targets that have been set by the CBD in order to be defined as an OECM.”

OECMs have the option to list biodiversity conservation as one of their primary objectives, but may not choose to officially classify as MPAs for governance reasons. Another example of this could be indigenous or local communities that have decided to conserve an area for traditional practices without the formal recognition of regional or national government. Therefore, this type of OECM may be governed by any one of a diverse range of authorities and arrangements, from national and tribal governments to local communities (Kalinina, Briggs, & Villagomez, 2021). This allows for organized and well-managed protected areas throughout the Mid-Atlantic. One example of an OECM without the objective to promote biodiversity may be a watershed, primarily managed with the goal to ensure clean drinking and irrigation water. Yet,

this area may still protect critical wetland habitat for migratory birds, therefore, it can be classified as an OECM (Kalinina, Briggs, & Villagomez, 2021).

Another benefit of OECMs is their ability to maintain the integrity of both indigenous peoples' and local communities' sacred sites, significant cultural and natural spaces, and biodiversity elements without necessarily involving the formal regional or national government processes required for protected areas (Kalinina, Briggs, & Villagomez, 2021). With the recognition of local, tribal, and indigenous communities, there is an opportunity to create connections and engage a diversity of actors in local-to-international conservation processes (Diz et al., 2018; Kremen and Merenlender, 2018). Greater connections and engagement among a variety of parties involved with OECMs can lead to an increased government and public awareness as well, spreading knowledge for better education and outreach.

In an article published in June of 2021, experts conducted a semi-structured interview with a diverse set of actors and relevant stakeholders involved in the oceans to gather their input on the opportunities and challenges of OECMs (Alves-Pinto, Geldmann, 2021). They concluded that diverse cultural and spiritual beliefs, complex forms of governance, and management types in different OECMs might yield diverse conservation outcomes (Jonas et al., 2017), in addition to strengthening linkages between equitable conservation and effective conservation outcomes.

OECMs are also an effective solution for local or tribal communities that do not want to go through the lengthy process of designating an area as an "official" MPA. OECMs allow for recognition or tenure security of an area for these communities, while also giving them the independence to control the designated area (Alves-Pinto, Geldmann, 2021). OECMs are considered a favorable option to certain communities in terms of governance, the spread of

knowledge, and building new and existing relationships among many different marine actors domestically and internationally.

In a report published by the World Wide Fund for Nature (WWF) that discusses scenarios to recover biodiversity and rebuild fish stocks in the Mediterranean, WWF is calling for a strong and ambitious post-2020 global biodiversity framework. To do so, a mix of MPAs and OECMs can be implemented to reach improved objectives and outcomes. Some of these goals include “increased fish stocks, improved governance, building upon ocean understanding, enabling sustainable tourisms, reducing risks of natural disasters, and protecting cultural heritage” (WWF MMI, 2021).

B. Climate Change as a Threat Multiplier

Several climate change impacts threaten the marine environment,, such as ocean acidification, ocean warming, and deoxygenation, and these impacts have been increasing (EPA, 2021). One of the biggest threats to fish sustainability is climate change. The existing legal framework that protects biodiversity from anthropogenic activities that contribute to climate change includes the Endangered Species Act (ESA) and the Magnuson-Stevens Fishery Conservation and Management Act (MSA).

Because climate change is most often the common denominator of many environmental problems, it is crucial to align the existing legal framework that pertains to ocean governance with climate change mitigation objectives. The best way to do so is to reform laws such as the ESA and MSA in a way that promotes increased MPA designation. Reforming existing laws that protect biodiversity to incorporate ecosystem-based management strategies such as MPAs may help synergize the 30 by 30 initiative.

1. Proposed Reforms for the ESA

The ESA's purpose is "to halt and reverse the trend toward species extinction, whatever the cost" (Salzman, p. 300, 2014). As strict as this ambitious purpose may seem to some, it also faces criticism from environmentalists as merely being an "emergency room approach" to sustain biodiversity (Salzman, p. 294, 2014). This is because ESA does not list species under protection until that species is found to be in serious endangerment. As a result, some species listed under the ESA have since gone extinct, which underscores the need to reform the ESA (Greenwald, et al., 2019).

As climate change continues to threaten biodiversity, one of the best ways to reform the ESA would be to merge characteristics of MPA objectives and goals into its existing legal framework. The ESA also requires the designation of "critical habitat" for listed species when "prudent and determinable." This includes the geographic areas that contain the physical or biological features essential for the conservation of species and that may need special management or protection (U.S. Fish and Wildlife Service, 2017).

Similar to conserving biodiversity through MPA designation, the protection of "critical habitats" in the ESA can be taken a step further. Designating an MPA "bubble" around marine species listed under the ESA ensures not only the protection of that species, but also the ecosystem in which they reside. Using ecosystem-based management tools can help create a *de facto* MPA along with the ESA. Through this approach, the importance of a species is taken into account as a whole because its food sources, environment, and resources are also being protected under the ESA.

As an illustration, this approach would be valuable in seeking to enhance protections for the North Atlantic right whale, as this species is on the brink of extinction with only about 400 left in the Atlantic sea (NOAA Fisheries, "North Atlantic Right Whale"). By creating an "under-

the-radar” MPA for the North Atlantic right whales’ habitat that accounts for climate change-related impacts could help reduce fishing line entanglement, habitat degradation, and other harmful disruptions like ship strikes to this vulnerable species.

2. Proposed Reforms for the MSA

The MSA has an ultimate goal to end overfishing while also rebuilding sustainable fish stocks (NOAA Fisheries “Laws and Policies,” 2021). However, growing concerns around climate change dangerously threaten the sustainability of fish stocks, and reforming the MSA may be necessary to mitigate the effects of climate change in the marine environment. Adding provisions to the MSA related to climate change adaptation and ecosystem management is one way to work towards the ultimate 30 by 30 goal (Pacific Fishery Management Council, 2021).

Rep. Jared Huffman of California has proposed plans for “climate ready fisheries” to deal with shifting stocks, under a bill introduced in July of 2021. If approved, this bill would mark the first time that climate change received a mention in the landmark Magnuson-Stevens Fishery Conservation and Management Act, which Congress first passed in 1976 (Hotakainen, 2021). These new changes would require NOAA to generate “fishery management plans to incorporate climate change by promoting stock resilience, identifying data needs, examining the vulnerability of a fishery and its participants to climate change, and assessing the anticipated impacts of climate change” (Hotakainen, 2021).

Along with this proposal, the MSA can be improved further by designating more *de facto* and “under the radar” MPAs around vulnerable fish species, similar to the abovementioned ESA proposal for reform. As a result, fish species would have additional protection against overfishing and other obstructive activities. Moreover, these measures would conserve and protect fish habitats and the entire ecosystem in which they reside.

C. Improved Public Education, Science, and Outreach

The need for better education and outreach is another proposal for more effective MPA implementation. The science behind MPA administration must be available to the public to confirm its truth as well. The Mid-Atlantic Regional Council on the Ocean (MARCO) does an effective job of this through its Mid-Atlantic Ocean Data Portal (MARCO, 2021). “The Data Portal serves as a platform to engage all stakeholders in the five coastal Mid-Atlantic states, putting all of the essential data and state-of-the-art mapping and visualization technology into the hands of the agencies, industry, community leaders, and stakeholders engaged in ocean planning.” (Georgetown Climate Center, 2011).

Through the MARCO data portal, there are opportunities for stakeholders, fishermen, and related organizations to review and understand ocean intricacies, allowing for better and more coordinated ocean management planning. But even with the MARCO data portal available, providing large amounts of information to the public and government agencies, if there is no political will, education, and outreach on the subject, nothing will get accomplished.

When asked what steps can be made to implement more MPAs in the Mid-Atlantic, Director of the Wildlife Conservation Society’s New York Seascape Program, Dr. Merry Camhi, suggests more educational outreach to various stakeholders and communities. She explains that “we need to get people to recognize what is worth saving, and clarify why and how we need their help to protect the Mid-Atlantic.” The public plays an important role and has the potential to help through community outreach.

Non-governmental environmental organizations also play a role in education and outreach. Camhi suggests that “working together with other like-minded organizations” is key to

rolling out more MPAs in the region. This step is crucial because it allows for groups to collaborate and recognize different perspectives regarding ocean management as a whole. Reaching public constituencies involves other challenges as well. Most of the public in the Mid-Atlantic may not relate to the ocean in the same way coastal communities do. Activating public engagement means people must resonate with the ocean in order to possess the will to fight for it. This is especially a challenge when communicating with most urban communities because they are not as connected to the ocean; therefore, they are not as concerned about what happens within it.

Noah Chesnin, Associate Director for the Wildlife Conservation Society's New York Seascape Program, suggests increasing baseline funding for these issues. “Increasing investment for ocean conservation related issues must be raised to the level of the kinds of long-term goals and challenges regarding the 30 by 30 campaign.” It is also important to spread the word and get these tools, such as the MARCO data portal, into classrooms to support funding efforts and contributing data to MARCO.

Dr. Jason Adolf, Endowed Associate Professor of Marine Science at Monmouth University, explains that new technology that can aid in improved scientific understanding of areas before designating them as OWFs. Dr. Adolf currently works alongside Ørsted on the fishers monitoring team. He explains that state-of-the-art marine science technology can count and record the number of fish in designated marine areas through the gathering of DNA samples in the ocean. This method of counting fish is a more efficient and much less invasive approach than the previous trawling and counting fish.

In March of 2021, Ørsted and NOAA signed a data sharing agreement, which enables improved scientific data collection (Ørsted, 2021). In addition to direct share, “Ørsted will

identify further opportunities with NOAA's Technology Partnership Office to foster preeminent science and technological innovation that can support NOAA and the Department of Commerce's goals to stimulate sustainable growth in the U.S. blue economy. The MOA will run through September 30, 2025" (Ørsted, 2021).

Ørsted also encourages the collaboration and inclusion of fishers in scientific data gathering and sharing. They have already implemented several initiatives derived from fishing communities' input, including on-board fisheries representatives, changes to cable routes and landings, and commercial fishing vessels as safety and research vessels, among many other collaborative and innovative efforts (Ørsted, 2021). As discussed in Part II of this paper, building sustainable and collaborative relationships between fishers and other marine users is extremely important when working towards ocean management solutions, and has a spillover effect to better outreach and education in both urban and coastal areas.

Conclusion

The ocean's valuable resources are quickly depleting, which leads to concerns and predictions of a collapse of the seafood industry and a major depletion of most marine life by the year 2050 (Worm, 2006). It is crucial to confront biodiversity loss to not only prevent this outcome, but also to mitigate climate change. The current system of ocean management lacks area-based management strategies such as ecosystem-based management tools, as the single species approach remains the most common way to govern the seas ("Comparative Ocean Governance," Craig, 2012). Implementing more MPAs is one of the most significant ways to combat this global fishing industry and climate change issue.

Considering the challenges of fishing industry concerns, lack of science-based evidence and research, and the improper management and difficulty overseeing MPAs, the Mid-Atlantic

region is moving forward to better solutions that are geared towards the 30 by 30 initiative. As experts Tim Dillingham and John Tiedemann suggested, the best way to conserve biodiversity is through the collaboration of all stakeholders and other actors in the sea, and communicate to fishers the importance of MPAs, especially no-take MPAs.

Utilizing “*de facto*” MPAs, such as OWFs, and OECMs will help to establish more protected areas that protect biodiversity. Both of these tools have separate benefits that official MPAs do not possess. OWFs may be used as leverage to promote the protection of fish and other species, while also acting as an artificial reef (Bergmark, 2014). OECMs can also honor indigenous cultures and local communities (Kalinina, Briggs, & Villagomez, 2021).

With efforts made to better educate the public about the growing loss of biodiversity, improve funding to science that properly investigates designated areas, and a better system to properly enforce and oversee MPAs, the 30 by 30 initiative goals can be achieved.

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