



November 15, 2024

Ms. Astrid Puentes Riaño

UN Special Rapporteur on the human right to a healthy environment

**RE: Inputs for HRC March Session Thematic Report.**

**Human Rights Impacts of Overfishing.**

Dear Ms. Puentes Riaño,

We respectfully submit the following brief in the name of the *Earthjustice* Oceans Program in response to the call for inputs on oceans and human rights in preparation of a thematic report to be presented to the 58<sup>th</sup> session of the UN Human Rights Council.

This brief summarizes how overfishing causes the loss of marine biodiversity and threatens human rights. Concretely, we summarize the importance of marine biodiversity for protecting human rights and identify four categories of impacts that overfishing poses to these rights: (1) reduced fisheries productivity; (2) the degradation of marine ecosystems; (3) the spread of illegal, unreported, and unregulated (IUU) fishing; and (4) contribution to global climate change. This information is relevant for the fourth (main challenges) and fifth (safeguards and frameworks) key questions identified in the call for inputs.

*Earthjustice* is a nonprofit, non-governmental, public interest environmental law organization based in the United States. We wield the power of law and the strength of partnership to protect people's health, to preserve magnificent places and wildlife, to advance clean energy, and to combat climate change. Earthjustice works to promote the human right to a healthy environment and to fight for climate justice in countries all over the world. We have extensive experience working on oceans and ocean justice issues—including fisheries management, bycatch, and illegal, unreported, and

unregulated (IUU) fishing—and collaborating with international bodies, including Regional Fisheries Management Organizations.

Sincerely,



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# Human Rights Impacts of Global Overfishing

## I. Marine biodiversity is inextricably linked to human rights.

For billions of people worldwide, the ocean and its biodiversity are more than an ecosystem; they represent an economically, culturally, and spiritually important space that shapes everything from the food we eat to the air we breathe. Overfishing<sup>1</sup> is considered the primary threat to global marine biodiversity,<sup>2</sup> and therefore is a major threat to the human rights of populations that value and depend on marine ecosystems.

Marine biodiversity is fundamental to ensuring global food security and nutrition, particularly for coastal communities and developing nations where seafood is a dietary staple. The ocean provides about 20% of the animal protein consumed by over 3.2 billion people, and about 70% of protein intake in island and coastal regions,<sup>3</sup> offering critical nutrients and essential vitamins,<sup>4</sup> particularly to vulnerable coastal nations.<sup>5</sup> Indeed, fish accounts for 15% of all global protein from animal sources,<sup>6</sup> and many lower-income nations rely on subsistence fishing as a key food source.<sup>7</sup>

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<sup>1</sup> The term “overfishing” is generally used to describe the practice of removing more fish or other target species than the marine environment can naturally replenish. Over time, overfishing depletes targeted fish stocks until it is no longer profitable to pursue them, a point commonly referred to as “fisheries collapse.” Marine Stewardship Council, *Overfishing* (last visited Nov. 14, 2024), <https://www.msc.org/what-we-are-doing/oceans-at-risk/overfishing>; Christian Mullon et al., *The Dynamics of Collapse in World Fisheries*, 6 *Fish and Fisheries* 111 (2005), <http://dx.doi.org/10.1111/j.1467-2979.2005.00181.x>.

<sup>2</sup> Helen F. Yan et al., *Overfishing and Habitat Loss Drives Range Contraction of Iconic Marine Fishes to Near Extinction*, 7 *Science Advances* eabb6026 (2021), <https://doi.org/10.1126/sciadv.abb6026> (“overfishing is unquestionably the primary threat to ocean biodiversity”).

<sup>3</sup> Copernicus Marine Service, *Why is the ocean important for food security?* (last visited Nov. 14, 2024), <https://marine.copernicus.eu/explainers/why-ocean-important/food-security>; The Climate Change Review, *The environmental impact of the fishing industry* (last visited Nov. 14, 2024), <https://www.theclimatechangereview.com/post/the-environmental-impact-of-the-fishing-industry>.

<sup>4</sup> Christopher D. Golden et al., *Aquatic Foods to Nourish Nations*, 598 *Nature* 315 (2021), <https://www.nature.com/articles/s41586-021-03917-1>.

<sup>5</sup> Viana et al., *Nutrient supply from marine small-scale fisheries*, 13 *Sci Rep* 11357 (2023), <https://doi.org/10.1038/s41598-023-37338-z>.

<sup>6</sup> Food and Agriculture Organization of the United Nations (FAO), *The State of World Fisheries and Aquaculture 2024 – Blue Transformation in Action* p. 78 (2024), <https://doi.org/10.4060/cd0683en>.

<sup>7</sup> Ritchie, H., & Roser, M., *Fish and Overfishing*, *Our World in Data* (last visited Nov. 14, 2024), <https://ourworldindata.org/fish-and-overfishing>.

Marine biodiversity provides critical ecosystem services. This includes producing half of the world's oxygen,<sup>8</sup> protecting coastal communities from flooding and storm surges,<sup>9</sup> and sequestering enormous amounts of carbon dioxide from the atmosphere.<sup>10</sup>

Marine biodiversity is also important for spiritual practices around the world.<sup>11</sup> In the Pacific, native Hawaiians have a kinship relationship with marine life and consider whales their ancestors as well as physical manifestations of the god of the sea.<sup>12</sup> Sharks also play a significant spiritual role as family guardians and messengers between humans and gods.<sup>13</sup> Similarly, the Chumash People in Santa Cruz Island, California, consider dolphins their brothers and sisters –siblings that did not make it to the mainland as humans.<sup>14</sup> In the Caribbean, the Mayans associate sea turtles with the creation of earth and freedom, and the town of Akumal in Mexico means “the place of the turtles” after the word áak in Mayan. The connection between spiritual well-being and marine biodiversity is not limited to Indigenous groups but extends to new eco-spiritual practices and fundamental philosophies of life. When marine biodiversity declines and marine ecosystems suffer, the populations who value these marine resources suffer, too.<sup>15</sup>

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<sup>8</sup> National Oceanic and Atmospheric Administration (NOAA), *How Much Oxygen Comes from the Ocean?*, National Ocean Service (June 16, 2024), <https://oceanservice.noaa.gov/facts/ocean-oxygen.html#:~:text=Scientists%20estimate%20that%20roughly%20half,smallest%20photosynthetic%20organism%20on%20Earth.>

<sup>9</sup> Miguel Inácio et al., *Nature-Based Solutions to Mitigate Coastal Floods and Associated Socioecological Impacts*, in *Nature-Based Solutions to Mitigate Coastal Floods and Associated Socioecological Impacts* (2020), [https://link.springer.com/chapter/10.1007/978-3-030-02318-8\\_10](https://link.springer.com/chapter/10.1007/978-3-030-02318-8_10).

<sup>10</sup> Florian Ricour et al., *Century-scale Carbon Sequestration Flux Throughout the Ocean by the Biological Pump*, 16 *Nature Geoscience* 1105 (2023), <https://www.nature.com/articles/s41561-023-01318-9>.

<sup>11</sup> Katherine N. Irvine et al., *Biodiversity and Spiritual Well-being*, in *Biodiversity and Health in the Face of Climate Change* (M. Marselle, J. Stadler, H. Korn, K. Irvine, A. Bonn eds., 2019), [https://doi.org/10.1007/978-3-030-02318-8\\_10](https://doi.org/10.1007/978-3-030-02318-8_10).

<sup>12</sup> Hawaiian Islands Humpback Whale National Marine Sanctuary, *Native Hawaiian Culture and Heritage*, NOAA (last visited Nov. 14, 2024), <https://hawaiihumpbackwhale.noaa.gov/heritage/native-culture.html>.

<sup>13</sup> Shark Stewards, *Hawaii's Spiritual Connection to the Shark* (last visited Nov. 14, 2024), <https://sharkstewards.org/hawaii-spiritual-connection-to-the-shark/#:~:text=In%20Hawaii%2C%20sharks%20have%20a,a%20human%20as%20their%20%27aumakua.>

<sup>14</sup> National Park Service, *Limuw: The Island of the Rainbow Bridge* (last visited Nov. 14, 2024), <https://www.nps.gov/chis/learn/historyculture/limuw.htm>.

<sup>15</sup> Wallace J. Nichols, *Blue Mind: the Surprising Science That Shows How Being Near, In, On, or Under Water Can Make You Happier, Healthier, More Connected and Better at What You Do* (2014).

## **II. Overfishing threatens the human right to a healthy environment.**

According to the United Nations Food and Agriculture Organization (FAO), nearly 40% of fish stocks worldwide are depleted due to overfishing, a percentage that has been continually increasing since 1974.<sup>16</sup> As detailed below, overfishing's harmful impacts on marine biodiversity results in severe consequences for human populations, including loss of food, loss of income, degradation of spiritually and culturally important species and/or practices, increased inequity, and worsened impacts from climate change.

### **a. Overfishing reduces fisheries productivity, undermining livelihoods and food security.**

Overfishing results in the depletion of harvestable fish stocks, leading to reduced food sources and employment opportunities for the billions of people worldwide who depend on marine resources. The social and economic consequences of this depletion are severe; each year, up to USD\$83 billion is lost in unrealized economic benefits due to overfishing.<sup>17</sup>

These consequences often fall disproportionately on small-scale and artisanal fishing communities, especially in low-income countries. Industrial fishing corporations heavily target the easily accessible fish resources concentrated along coastal areas, leading to the global depletion of coastal resources.<sup>18</sup> Many small-scale fishing vessels lack the capacity to fish further away, and are forced to rely on depleted coastal resources. This can lead to increased rates of poverty and malnutrition if coastal communities lack readily available alternative sources of food and employment.<sup>19</sup> The decline of small-scale fisheries can also have severe social and cultural implications, as fishing is interwoven with the traditions, cuisines, and practices of many coastal communities.

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<sup>16</sup> FAO, *supra* note 6, at p. 42.

<sup>17</sup> Tim Cashion et al., *Establishing Company Level Fishing Revenue and Profit Losses from Fisheries: A Bottom-Up Approach*, 13 PLoS ONE e0207768 (2018), <https://doi.org/10.1371/journal.pone.0207768>.

<sup>18</sup> Jeremy B.C. Jackson et al., *Historical Overfishing and the Recent Collapse of Coastal Ecosystems*, 293 Science 629 (2001), <https://doi.org/10.1126/science.1059199>.

<sup>19</sup> See Magne Knudsen, *Poverty and Beyond: Small-Scale Fishing in Overexploited Marine Environments*, 44 Human Ecology 341 (2016), <https://link.springer.com/article/10.1007/s10745-016-9824-y> (describing the dynamics of overfishing and poverty in small-scale fishing communities in the Philippines); U. Thara Srinivasan et al., *Food Security Implications of Global Marine Catch Losses due to Overfishing*, 12 Journal of Bioeconomics 183 (2010), <https://link.springer.com/article/10.1007/s10818-010-9090-9>.

The human rights consequences of overfishing are already manifesting throughout much of Africa, a continent where small-scale fisheries are a fundamental source of both food and livelihoods. Almost half of African fish stocks are estimated to be overexploited or fully exploited.<sup>20</sup> Despite the fact that fish is the source of nearly one-fifth of animal protein intake for Africans, Africa is the only continent in the world where per capita fish consumption is anticipated to decrease.<sup>21</sup> Many African nations are forced to import seafood to feed growing populations,<sup>22</sup> while foreign industrial fishing vessels continue to catch and export millions of dollars' worth of seafood from African waters.<sup>23</sup>

**b. Overfishing degrades the health of marine ecosystems, threatening the rights of the communities that depend on them.**

Overfishing degrades ecosystem health in a number of ways, including shifting food web dynamics and reducing the populations of ecologically important species.

First, fishing vessels, particularly large-scale industrial vessels, tend to target larger, high-value fish species. This has led to the phenomenon of “fishing down the food web,” in which global fishing fleets have systematically depleted the larger species higher on the food web, eventually leaving marine ecosystems devoid of predators and dominated by smaller fish species.<sup>24</sup> This change in species composition has cascading impacts for the broader marine ecosystem; affecting the feeding patterns of migratory species,<sup>25</sup> changing the composition of marine habitat species on the seafloor,<sup>26</sup> and sometimes

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<sup>20</sup> Chin Yee Chan et al., *Prospects and Challenges of Fish for Food Security in Africa*, 20 *Global Food Security* 17 (2019), <https://doi.org/10.1016/j.gfs.2018.12.002>.

<sup>21</sup> *Id.*; OECD/FAO, *Fish and Seafood*, in *OECD-FAO Agricultural Outlook 2017–2026* (2017), p. 117, available at: [https://www.oecd-ilibrary.org/agriculture-and-food/oecd-fao-agricultural-outlook-2017-2026/fish-and-seafood\\_agr\\_outlook-2017-12-en](https://www.oecd-ilibrary.org/agriculture-and-food/oecd-fao-agricultural-outlook-2017-2026/fish-and-seafood_agr_outlook-2017-12-en).

<sup>22</sup> Chan et al., *supra* note 20.

<sup>23</sup> Alfonso Daniels et al., *Western Africa's Missing Fish: The Impact of Illegal, Unreported and Unregulated Fishing and Under-reporting Catches by Foreign Fleets* (2016), available at: <https://digitalcommons.fiu.edu/srhreports/iuufishing/iuufishing/102/>.

<sup>24</sup> Daniel Pauly et al., *Fishing Down Marine Food Webs*, 279 *Science* 860 (1998), <https://doi.org/10.1126/science.279.5352.860>.

<sup>25</sup> Ben Lascelles et al., *Migratory Marine Species: Their Status, Threats and Conservation Management Needs*, 24 *Aquatic Conservation* 111 (2014), <https://doi.org/10.1002/aqc.2512>.

<sup>26</sup> *See, e.g.*, Antonio Pusceddu et al., *Chronic and Intensive Bottom Trawling Impairs Deep-sea Biodiversity and Ecosystem Functioning*, 111 *PNAS* 8861 (2014), <https://doi.org/10.1073/pnas.1405454111>.

even leading to the collapse of entire ecosystems.<sup>27</sup> These weakened marine ecosystems are also more vulnerable to other anthropogenic threats, such as habitat destruction, pollution, and climate change.<sup>28</sup>

In addition to depleting the populations of target species, overfishing also harms the populations of non-target species that are caught accidentally in the course of fishing (known as “bycatch”). Bycatch is a primary threat to many ecologically and culturally important marine species, including sea birds,<sup>29</sup> sea turtles,<sup>30</sup> sharks,<sup>31</sup> and marine mammals.<sup>32</sup> For example, a 2021 scientific study found that overfishing is the largest driver of global shark decline, threatening 99.6% of shark and ray species.<sup>33</sup> Over the last fifty years, oceanic sharks and rays have declined in abundance by more than 70%,<sup>34</sup> and over one-third of shark and ray species are threatened with extinction.<sup>35</sup> Sharks are often considered a keystone species, meaning that they play an essential role in their marine ecosystems.<sup>36</sup> Their decline due to overfishing not only reduces global

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<sup>27</sup> See, e.g., Jackson et al., *supra* note 18; John W. McManus et al., *Coral Reef Fishing and Coral-algal Phase Shifts: Implications for Global Reef Status*, 57 ICES Journal of Marine Science 572 (2000), <https://doi.org/10.1006/jmsc.2000.0720>.

<sup>28</sup> U. Rashid Sumaila & Travis C. Tai, *End Overfishing and Increase the Resilience of the Ocean to Climate Change*, 7 *Frontiers in Marine Science* 523 (2020), <https://doi.org/10.3389/fmars.2020.00523>.

<sup>29</sup> Maria P. Dias, *Threats to Seabirds: A Global Assessment*, 237 *Biological Conservation* 525 (2019), <https://doi.org/10.1016/j.biocon.2019.06.033>.

<sup>30</sup> Bryan P. Wallace, *Impacts of Fisheries Bycatch on Marine Turtle Populations Worldwide: Toward Conservation and Research Priorities*, 4 *Ecosphere* 1 (2013), <https://doi.org/10.1890/ES12-00388.1>.

<sup>31</sup> Shelby Oliver et al., *Global Patterns in the Bycatch of Sharks and Rays*, 54 *Marine Policy* 86 (2015), <https://doi.org/10.1016/j.marpol.2014.12.017>.

<sup>32</sup> Andrew J. Read, *The Looming Crisis: Interactions Between Marine Mammals and Fisheries*, 89 *Journal of Mammalogy* 541 (2008), <https://doi.org/10.1644/07-MAMM-S-315R1.1>.

<sup>33</sup> Nicholas K. Dulvy et al., *Overfishing Drives Over One-Third of All Sharks and Rays Toward a Global Extinction Crisis*, 31 *Current Biology* 4773 (2021), <https://doi.org/10.1016/j.cub.2021.08.062>.

<sup>34</sup> Nathan Pacoureau et al., *Half a Century of Global Decline in Oceanic Sharks and Rays*, 589 *Nature* 567 (2021).

<sup>35</sup> Dulvy et al., *supra* note 33.

<sup>36</sup> See Simon Dedman et al., *Ecological Roles and Importance of Sharks in the Anthropocene Ocean*, 385 *Science* (2024), <https://doi.org/10.1126/science.adl2362> (describing how sharks are often essential to ecosystem functioning).

biodiversity, but has repercussions for fisheries,<sup>37</sup> tourism,<sup>38</sup> the global carbon cycle,<sup>39</sup> and Indigenous cultural practices<sup>40</sup> that will directly harm human populations.

**c. Illegal, unreported, and unregulated (IUU) fishing contributes to overfishing and is linked to wide-scale human rights violations.**

Illegal, unreported, and unregulated (IUU) fishing encapsulates all fishing that happens outside of fisheries management legal frameworks and is a major contributor to global overfishing. In fact, IUU fishing accounts for roughly 20% of global fish catches.<sup>41</sup> IUU fishing is often conducted in a way that is even more damaging to the marine environment than legal fishing; for example, it is associated with the use of more impactful fishing gears,<sup>42</sup> high rates of bycatch,<sup>43</sup> and increased catches of endangered or threatened species.<sup>44</sup> Perpetrators of IUU fishing seek out areas with weak regulations and/or poor enforcement. For example, the vast area of international waters beyond the exclusive economic zones (EEZs) of nations (known as the high seas) is a hotbed of IUU fishing.<sup>45</sup> Similarly, IUU vessels often target the waters of countries that

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<sup>37</sup> See Francesco Feretti et al., *Patterns and Ecosystem Consequences of Shark Declines in the Ocean*, 13 *Ecology Letters* 1055 (2010), <https://doi.org/10.1111/j.1461-0248.2010.01489.x> (noting the broad, ecosystem-level consequences of shark declines).

<sup>38</sup> Andrés M. Cisneros-Montemayor et al., *Global Economic Value of Shark Ecotourism: Implications for Conservation*, 47 *Oryx* 381 (2013), <https://doi.org/10.1017/S0030605312001718>.

<sup>39</sup> Olivia F.L. Dixon & Austin J. Gallagher, *Blue Carbon Ecosystems and Shark Behaviour: An Overview of Key Relationships, Network Interactions, Climate Impacts, and Future Research Needs*, 10 *Frontiers in Marine Science* (2023), <https://doi.org/10.3389/fmars.2023.1202972>.

<sup>40</sup> See, e.g., Noelani Puniwai, Pua ka wiliwili, nanahu ka manō: *Understanding Sharks in Hawaiian Culture*, 92 *Human Biology* 11 (2020), <https://doi.org/10.13110/humanbiology.92.1.03>; Matthew T. McDavitt, *The Cultural Significance of Sharks and Rays in Aboriginal Societies Across Australia's Top End* (2015), available at: [http://www.fossilsawfish.com/uploads/3/4/8/7/34873745/mcdavitt\\_2005.pdf](http://www.fossilsawfish.com/uploads/3/4/8/7/34873745/mcdavitt_2005.pdf).

<sup>41</sup> Sjarief Widjaja et al., *Illegal, Unreported and Unregulated Fishing and Associated Drivers*, p. 3 (2020), available at: [www.oceanpanel.org/](http://www.oceanpanel.org/).

<sup>42</sup> Sumaila & Tai, *supra* note 28, at p. 3 (“where overfishing is a result of illegal, unreported, or unregulated fishing, these fishing operations are often also conducted with highly impacting fishing gears”).

<sup>43</sup> See, e.g., P.E. Michael et al., *Illegal Fishing Bycatch Overshadows Climate as a Driver of Albatross Population Decline*, 579 *MEPS* 1616 (2017), <https://doi.org/10.3354/meps12248>; S.M. Martin et al., *Catch and Bycatch Composition of Illegal Fishing in the British Indian Ocean Territory (BIOT)* (2013), available at: <https://www.fao.org/3/bh067e/bh067e.pdf>.

<sup>44</sup> Environmental Justice Foundation et al., *Illegal, Unreported and Unregulated Fishing and the European Green Deal* (2020), available at: [https://www.iuuwatch.eu/wp-content/uploads/2020/09/EU-IUU-Coalition-Biodiversity-Policy-Brief\\_FINAL.pdf](https://www.iuuwatch.eu/wp-content/uploads/2020/09/EU-IUU-Coalition-Biodiversity-Policy-Brief_FINAL.pdf).

<sup>45</sup> Kristina M. Gjerde, *High Seas Fisheries Governance: Prospects and Challenges in the 21<sup>st</sup> Century*, in *The World Ocean in Globalisation* (2011), available at: <https://brill.com/display/book/9789004204225/B9789004204225-s014.xml>.



either lack strong marine conservation and human rights laws, or lack the capacity to enforce the measures they have.<sup>46</sup>

IUU fishing is also associated with human rights violations, particularly for workers in the seafood industry. For example, IUU fishing is associated with high rates of forced labor, human trafficking, unsafe working conditions, and other violations of basic human rights.<sup>47</sup> Crew of IUU vessels, who are often migrant workers from less-developed countries, are frequently trapped on vessels for extended periods of time, denied fair wages, deprived of adequate food and water, denied the ability to contact shore, and bound by unjust contract terms.<sup>48</sup>

In addition to violating the rights of workers, IUU fishing also undermines the rights of legal fishers and fishing communities. By operating outside of sustainable fishery management frameworks, IUU vessels are able to out-compete legal fishers, leaving local communities with the consequences of marine ecosystem degradation and none of the economic benefits.

#### **d. Overfishing contributes to the consequences of global climate change.**

Not only does overfishing directly contribute to climate change, but the effects of overfishing will also aggravate the consequences of climate change for many coastal communities, potentially causing the loss of access to traditionally fished species as their ranges change.<sup>49</sup>

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<sup>46</sup> Don Liddick, *The Dimensions of a Transnational Crime Problem: The Case of IUU Fishing*, 17 Trends in Organized Crime 290 (2014), <https://link.springer.com/article/10.1007/s12117-014-9228-6>.

<sup>47</sup> See e.g., Ian Urbina, *Ship of horrors: life and death on the lawless high seas*, The Guardian (Sep. 12, 2019), <https://www.theguardian.com/world/2019/sep/12/ship-of-horrors-deep-sea-fishing-oyang-70-new-zealand>; Editorial Board, *Slave Labor on the High Seas*, The New York Times (Feb. 20, 2016), <https://nyti.ms/1oS2UYo>; *Outlaw Ocean: Exposing Human Rights Abuse on the High Seas*, The Economist Group World Ocean Initiative (Nov. 1, 2019), <https://ocean.economist.com/governance/articles/outlaw-ocean-exposing-human-rights-abuse-on-the-high-seas>.

<sup>48</sup> *Forced Labour and Human Trafficking in Fisheries*, International Labour Organization (last visited Nov. 14, 2024), <https://www.ilo.org/topics/forced-labour-modern-slavery-and-trafficking-persons/sectors-and-topics/forced-labour-and-human-trafficking-fisheries>; Azmath Jaleel & Hance D. Smith, *The Plight of the Fishers and the Management of IUU Fishing*, 150 Marine Policy 105557 (2023), <https://doi.org/10.1016/j.marpol.2023.105557>.

<sup>49</sup> Jason S. Link & Reg A. Watson, *Global Ecosystem Overfishing: Clear Delineation Within Real Limits to Production*, 5 Science Advances 1, 7 (2019), <https://doi.org/10.1126/sciadv.aav0474>.

Overfishing directly contributes to climate change. First, the global fishing sector is a major source of emissions, accounting for 1.2% of world oil consumption.<sup>50</sup> Emissions have risen as vessels increasingly fish farther offshore.<sup>51</sup> Overfishing also undermines the ocean’s ability to act as a carbon sink. By depleting fish populations, overfishing reduces the efficiency of the marine “biological pump” that removes carbon dioxide from the atmosphere through feeding, respiration, and excretion.<sup>52</sup> For example, one study found that overfishing has prevented the sequestration of roughly 21.8 million metric tons of carbon.<sup>53</sup>

Overfishing may also aggravate the effects of climate change by increasing pressure on already depleted coastal resources and potentially creating range shifts causing coastal communities to lose access to traditionally fished species, which may also have cultural and spiritual importance. This is because warming ocean temperatures due to climate change have led species to shift their distribution towards more suitable habitats and away from many coastal communities.<sup>54</sup> In fact, one study predicts that by the end of this century, 45% of fish stocks will shift globally and 81% of coastal countries will experience at least one shifting stock.<sup>55</sup> Fish stocks are also generally predicted to shift away from tropical areas towards the poles,<sup>56</sup> and away from coastal waters towards deeper ocean areas that are more difficult to access.<sup>57</sup>

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<sup>50</sup> Peter Tyedmers, *Fueling Global Fishing Fleets*, 34 *A Journal of the Human Environment* 635 (2006), [http://dx.doi.org/10.1639/0044-7447\(2005\)034\[0635:FGFF\]2.0.CO;2](http://dx.doi.org/10.1639/0044-7447(2005)034[0635:FGFF]2.0.CO;2).

<sup>51</sup> Robert W.R. Parker, *Fuel Use and Greenhouse Gas Emissions of World Fisheries*, 8 *Nature Climate Change* 333 (2018), <https://www.nature.com/articles/s41558-018-0117-x>.

<sup>52</sup> Natalie F. Andersen, *Good Fisheries Management is Good Carbon Management*, 3 *NPJ Ocean Sustainability* (2024), <https://doi.org/10.1038/s44183-024-00053-x>.

<sup>53</sup> Gaël Mariani et al., *Let More Big Fish Sink: Fisheries Prevent Blue Carbon Sequestration—Half in Unprofitable Areas*, 6 *Science Advances* (2020), <https://doi.org/10.1126/sciadv.abb4848>.

<sup>54</sup> Allison L. Perry, *Climate Change and Distribution Shifts in Marine Fishes*, 308 *Science* 1912 (2005), <https://doi.org/10.1126/science.1111322>.

<sup>55</sup> Juliano Palacios-Abrantes et al., *Timing and Magnitude of Climate-Driven Range Shifts in Transboundary Fish Stocks Challenge Their Management*, 28 *Global Change Biology* 2312 (2022), <https://doi.org/10.1111/gcb.16058>.

<sup>56</sup> *Climate Change and Fishing*, Marine Stewardship Council (last visited Nov. 14, 2024), <https://www.msc.org/what-we-are-doing/oceans-at-risk/climate-change-and-fishing#:~:text=How%20does%20climate%20change%20affect%20fishing%3F,potential%20seafood%20catch%20by%202050>.

<sup>57</sup> Palacios-Abrantes et al., *supra* note 55.

### **III. Policy solutions are needed to end overfishing, promote justice, and secure human rights.**

Global action is needed to end overfishing and its harmful effects on human rights. Below are effective policy solutions that can contribute to strengthening global fishery management practices.

#### **a. Ending harmful fisheries practices.**

Stronger action needs to be taken at the international level to address harmful fishing practices such as IUU fishing, overexploitation, and bycatch. Regional Fisheries Management Organizations (RFMOs) should improve existing policies through science-based decision-making to better protect marine ecosystems and the communities that depend on them. RFMOs must increase compliance measures and actions as well as improve transparency so that overfishing and bycatch issues can be better identified and addressed. Human rights issues, which are intertwined with fisheries issues, should be incorporated into RFMO management measures. In addition, nations should be encouraged to accept, ratify or approve instruments already in place to combat IUU fishing, such as the Agreement on Port State Measures (PSMA).

#### **b. Eliminate harmful fishing subsidies.**

Fishing subsidies exacerbate overfishing because they enable vessels to increase their capacity and fish further offshore.<sup>58</sup> In fact, many distant-water industrial fisheries would be unprofitable without these subsidies. One study found that high seas fleets are subsidized by governments up to four times their actual amount of net profit, and over half of high seas fleets would be unprofitable if the subsidies were stopped.<sup>59</sup> Fishing subsidies also overwhelmingly benefit industrial fishing vessels to the detriment of small-scale and artisanal fleets. One study found that only 19% of global fisheries

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<sup>58</sup> U. Rashid Sumaila et al., *Updated Estimates and Analysis of Global Fisheries Subsidies*, 109 *Marine Policy* 103695 (2019), <https://doi.org/10.1016/j.marpol.2019.103695>.

<sup>59</sup> Enric Sala et al., *The Economics of Fishing the High Seas*, 4 *Science Advances* 1 (2018), <https://advances.sciencemag.org/content/4/6/eaat2504>.

subsidies benefited small-scale fisheries, even though these fisheries employ 90% of fishers.<sup>60</sup>

While the WTO reached a consensus on the Agreement on Fisheries Subsidies in 2022, the provisions under this agreement fall short of what is needed to effectively limit the impact of fisheries subsidies.<sup>61</sup> To date 86 members have accepted the the Agreement, which needs 111 to enter into force. In addition, negotiations continue to address outstanding and important issues not contained in the current Protocol. Countries should accept, ratify or approve the current protocol as well as commit to ambitious additional provisions that will further eliminate harmful subsidies and reduce the incentive for overfishing.

### **c. Expand global network of marine protected areas.**

In international waters, governance has been consistently criticized as ineffective due to the patchwork nature of existing frameworks,<sup>62</sup> the relatively weak conservation and human rights measures governing some fisheries,<sup>63</sup> and poor monitoring and enforcement.<sup>64</sup> Restricting or prohibiting fishing in certain areas through the implementation of marine protected areas (MPAs) can be a powerful tool to reinforce existing regulatory frameworks. Recent studies have found that strategically expanding the existing global MPA network would decrease industrial fishing effort<sup>65</sup> and could improve future catch by up to 20%.<sup>66</sup> Marine protected areas can also help to remediate

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<sup>60</sup> Anna Schuhbauer et al., *The Global Fisheries Subsidies Divide Between Small- and Large-Scale Fisheries*, 7 *Frontiers in Marine Science* (2020), <https://doi.org/10.3389/fmars.2020.539214>.

<sup>61</sup> Daniel J. Skerritt, *Mapping the Unjust Global Distribution of Harmful Fisheries Subsidies*, 152 *Marine Policy* 105611, 105612 (2023), <https://doi.org/10.1016/j.marpol.2023.105611>.

<sup>62</sup> See Laura Karoliina Nieminen et al., *Protecting the High Seas from Illegal, Unregulated, and Unreported Fishing with Overarching Management* (2024), <http://dx.doi.org/10.20944/preprints202404.0373.v1> (“Patchwork fisheries governance is one of the key underlying reasons why IUU fishing has spread from coastal areas to the high seas”).

<sup>63</sup> Isabella Montecalvo et al., *Ocean Predators: Squids, Chinese Fleets and the Geopolitics of High Seas Fishing*, 152 *Marine Policy* 105584 (2023), <https://doi.org/10.1016/j.marpol.2023.105584>.

<sup>64</sup> Christopher Ewell et al., *An Evaluation of Regional Fisheries Management Organization At-Sea Compliance Monitoring and Observer Programs*, 115 *Marine Policy* 103842 (2020), <https://doi.org/10.1016/j.marpol.2020.103842>.

<sup>65</sup> Gavin McDonald, *Global Expansion of Marine Protected Areas and the Redistribution of Fishing Effort*, 121 *Environmental Sciences* e2400592121 (2024), <https://doi.org/10.1073/pnas.2400592121>.

<sup>66</sup> Daniel F. Viana et al., *Sustainable-Use Marine Protected Areas to Improve Human Nutrition*, 15 *Nature Communications* 7716 (2024), <https://www.nature.com/articles/s41467-024-49830-9#:~:text=We%20estimate%20that%2C%20depending%20on,intake%20in%20coral%20reef%20nations.>

the harmful effects of historical overfishing, including protecting important habitats<sup>67</sup> and providing refuges for migratory species.<sup>68</sup>

Despite their utility in combatting overfishing, only 8.2% of ocean waters are covered by MPAs, and just 2.9% are considered to be “highly protected.”<sup>69</sup> Spatial protections on the high seas are especially lacking, with only 0.8% currently protected.<sup>70</sup> Significant expansion is needed in order to achieve the goal of 30% MPA coverage by 2030 adopted in the Kunming-Montreal Global Biodiversity Framework.<sup>71</sup> The opportunity for this expansion has recently increased with the adoption of the UN Agreement on Marine Biodiversity of Areas beyond National Jurisdiction (BBNJ Agreement), which includes a framework for establishing marine protected areas within the high seas. Nations should be encouraged to ratify, accept or approve the BBNJ Agreement, and the BBNJ Agreement should look to biodiversity-focused processes, such as the IUCN’s Important Marine Mammal Areas and Important Shark and Ray Areas, to identify and prioritize important biodiversity areas on the high seas for protection.

In addition, MPAs both outside and within national jurisdictions need to be developed thoughtfully in order to maximize benefits for marine ecosystems and human populations. For example, studies have found that MPA networks, rather than individually established MPAs, can lead to increased environmental and economic benefits.<sup>72</sup> Additionally, MPAs that are developed and managed by local communities

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<sup>67</sup> Elizabeth McLeod, *Designing Marine Protected Area Networks to Address the Impacts of Climate Change*, 7 *Frontiers in Ecology and the Environment* 362 (2009), <https://doi.org/10.1890/070211>; Alison L. Green et al., *Designing Marine Reserves for Fisheries Management, Biodiversity Conservation, and Climate Change Adaptation*, 42 *Coastal Management* 143 (2014), <https://doi.org/10.1080/08920753.2014.877763>.

<sup>68</sup> M.E. Gilmour et al., *Evaluation of MPA Designs that Protect Highly Mobile Megafauna Now and Under Climate Change Scenarios*, 35 *Global Ecology and Conservation* e02070 (2022), <https://doi.org/10.1016/j.gecco.2022.e02070>.

<sup>69</sup> The World Bank, *Ending Overfishing: An Urgent Need to Protect Our Oceans*, ATLAS of Sustainable Development Goals 2023 (last visited Nov. 14, 2024), <https://datatopics.worldbank.org/sdgtlas/goal-14-life-below-water/?lang=en>.

<sup>70</sup> Nieminen et al., *supra* note 62, at 2.

<sup>71</sup> *Kunming-Montreal Global Biodiversity Framework*, Convention on Biological Diversity (Oct. 1, 2024), <https://www.cbd.int/gbf>.

<sup>72</sup> Kirsten Grorud-Colvert, *Marine Protected Area Networks: Assessing Whether the Whole is Greater than the Sum of its Parts*, 9 *PLOS ONE* e102298 (2014), <https://doi.org/10.1371/journal.pone.0102298>.

have been found to reduce conflict and improve local perceptions on conservation without sacrificing ecological benefits.<sup>73</sup>

#### **IV. Conclusion**

Overfishing is one of the greatest threats to global marine biodiversity. Eliminating overfishing would be an enormous step forward in protecting marine ecosystems and promoting the rights of the billions of people who value and depend on marine environments. While significant progress has been made in improving fisheries management, more effort is needed, particularly at the international level, to ensure that the tragedy of overfishing is resolved once and for all.

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<sup>73</sup> Angelica A.D. Chirico et al., *Community- and Government-Managed Marine Protected Areas Increase Fish Size, Biomass and Potential Value*, 12 PLOS ONE e0182342 (2016), <https://doi.org/10.1371/journal.pone.0182342>.