

**FISHING WITH A PORPOISE: ECONOMIC INCENTIVES AND HUMAN  
DIMENSIONS OF CONSERVATION MUST ALIGN WITH REGULATORY  
EFFORTS TO SAVE THE VAQUITA**

NOTE

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**ABSTRACT**

*Fondly nicknamed the “panda of the sea” for its prominent eye markings, the vaquita is the world’s most critically endangered marine mammal. Fishing nets illegally placed in its habitat strangle and drown the small porpoise. For decades, the global community has been aware of the vaquita’s plight; yet, despite knowing precisely where vaquitas live and what is killing them, efforts to save the species have resoundingly failed. This Note explores what has gone wrong in legal, policy, and programmatic efforts to save the vaquita. After tracing key dynamics that contributed to the failure of previous efforts, the Note synthesizes lessons from deterrence theory, fisheries economics, and successful endangered species campaigns to suggest approaches and legal opportunities that could bring this vulnerable species back from the brink of extinction.*



## INTRODUCTION

The vaquita (*Phocoena sinus*), a small porpoise endemic to Mexico, is on the verge of extinction.<sup>1</sup> Vaquitas have the smallest geographic range of any cetacean.<sup>2</sup> These marine mammals inhabit an area roughly 7 by 15 miles<sup>3</sup> in Mexico's Upper Gulf of California (UGC)—less than half the size of Chicago.<sup>4</sup> Despite longstanding recognition of the species' endangered status, as well as the relatively small area they inhabit, efforts to protect vaquitas from the sole threat driving their extinction—gillnet fishing<sup>5</sup>—have been unsuccessful.<sup>6</sup> Only eight individual vaquitas are estimated to remain.<sup>7</sup> Notwithstanding this critically low number, and the previously held view that the species “is doomed to extinction by genetic factors,” recent studies indicate that the remaining vaquita population is genetically viable—they could survive in the wild if the environment allowed them to.<sup>8</sup> If gillnets were immediately removed

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1 Enrique Sanjurjo-Rivera et al., *An Economic Perspective on Policies to Save the Vaquita: Conservation Actions, Wildlife Trafficking, and the Structure of Incentives*, FRONTIERS IN MARINE SCI., Aug. 12, 2021, at 1.

2 *Id.* at 5.

3 *Id.*

4 Chicago's area is 228 square miles, compared to the 373 square miles of the UGC that comprise vaquita habitat. Perry R. Duis, *Chicago*, BRITANNICA, <https://www.britannica.com/place/Chicago> (last visited Nov. 2, 2022).

5 A gillnet is a “wall of netting” designed to hang vertically in the water column and allow just the head of a fish to pass through. See *Fishing Gear: Gillnets*, NOAA FISHERIES, <https://www.fisheries.noaa.gov/national/bycatch/fishing-gear-gillnets> (Feb. 22, 2021). The fish's gills get caught in the net when it tries to back out, and the ensuing struggle entangles the panicked animal more. *Id.* Marine mammals like the vaquita, which need air to breathe, eventually drown. *Id.*

6 Sanjurjo-Rivera et al., *supra* note 1, at 1–2. See also Marissa Grenon, *Saving the ‘Panda of the Sea’: Aligning Economic Incentives with Regulations to Save the Critically Endangered Vaquita*, YALE ENV'T R. (Nov. 7, 2022), <https://environment-review.yale.edu/saving-panda-sea-aligning-economic-incentives-regulations-save-critically-endangered-vaquita>.

7 Associated Press, *Only 8 Critically Endangered Porpoises Remain, Scientists Say*, WASH. POST (Apr. 6, 2022), <https://www.washingtonpost.com/kidspost/2022/04/06/only-8-critically-endangered-porpoises-remain-scientists-say/>.

8 See Miguel A. Cisneros-Mata et al., *Viability of the Vaquita, Phocoena sinus (Cetacea: Phocoenidae) Population, Threatened by Poaching of Totoaba macdonaldi (Perciformes: Sciaenidae)*, 69 REV. DE BIOLOGÍA TROPICAL 588, 588, 596 (2021) (explaining that demographically, vaquita population is likely viable at low numbers, so genetic makeup will govern species' long-term survival; further, citing “encouraging” recent genetics research indicating that despite present diminished population size, “the vaquita maintains the genetic diversity of a healthy population”); Jacqueline A. Robinson et al., *The Critically Endangered Vaquita Is Not Doomed to Extinction by Inbreeding Depression*, 376 SCI. 365, 368 (2022) (integrating genomic

from their habitat, the vaquita could recover.<sup>9</sup>

In response to the extinction crisis, Mexico imposed an emergency gillnet ban in 2015 that extends over the species' entire known habitat in the UGC.<sup>10</sup> However, increasing compliance with Mexico's existing gillnet ban in vaquita habitat will require more than simply strengthening enforcement efforts. A participatory, rights-based fishery management scheme must be implemented to align economic incentives with vaquita conservation.<sup>11</sup> Such an approach would likely improve regulatory compliance and community support for conservation in the UGC, which could benefit both vaquitas and local residents if combined with appropriate government and private-sector actions.

At the regional level, the approaches most likely to keep vaquita alive for another year include the adoption of rights-based fishery management and the implementation of systematic enforcement efforts optimized to deter illegal fishing.<sup>12</sup> For long-term species recovery, however, additional policies are needed to create a sustainable coastal economy and address the social, political, and institutional underpinnings of the current crisis.<sup>13</sup> Although the burden of taking immediate action to save the vaquita falls primarily on the Mexican government and coastal communities of the UGC, there are actions that individuals, politicians, and companies can and should take to aid conservation efforts.<sup>14</sup> With coordinated local action and international collaboration, efforts to conserve the vaquita could help not just one but two endangered marine species battle back to sustainable population levels: the vaquita and the totoaba.

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information in population viability analysis to quantitatively analyze inbreeding depression and recovery potential and concluding "that there is a high potential for vaquita recovery in the absence of gillnet mortality, refuting the view that the species is doomed to extinction by genetic factors").

9 See Cisneros-Mata et al., *supra* note 8, at 588, 596; see Robinson et al., *supra* note 8, at 1.

10 Sanjurjo-Rivera et al., *supra* note 1, at 5, 10; *What Efforts Have Been Made to Save the Vaquita?*, PORPOISE.ORG: KNOWLEDGE BASE, <https://porpoise.org/knowledge-base/efforts-made-save-vaquita/> (last visited July 27, 2022).

11 Sanjurjo-Rivera et al., *supra* note 1, at 12, 14.

12 See *id.* at 14.

13 See *id.* at 14–15.

14 See, Section II.B, discussing the individual, legal, and market-based actions the international community should implement to promote conservation and save the vaquitas.

## I. BACKGROUND

### A. *Despite Critically Low Numbers, the Vaquita Could Recover if Gillnets Were Immediately and Permanently Removed from Their Habitat*

Recent scientific research suggests that if gillnets were immediately and permanently removed from their habitat, vaquitas could recover to a sustainable population.<sup>15</sup> The few remaining individuals appear to be healthy,<sup>16</sup> and a recent analysis of the species' reproductive biology indicates a high likelihood that annual calving might be possible.<sup>17</sup> Genetic sequencing has revealed that vaquitas have the lowest genomic-wide diversity observed among all mammalian species to date—a characteristic that would typically indicate poor viability—but research has also shown that the species has existed at low population counts with attendant low genomic diversity for hundreds of thousands of years.<sup>18</sup> Moreover, an examination of the bodies of vaquitas that perished between 2016 and 2018 indicated that the cause of each of these deaths was gillnet entanglement, not pollution.<sup>19</sup> Taken together, these findings demonstrate individual animal health, demographic stability, and adequate environmental quality. Thus, if unintentional gillnet drownings were stopped, the vaquita population could not only survive, but expand.

While genetic, demographic, and environmental analyses provide hope that vaquitas could return from the brink of extinction,

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15 See Cisneros-Mata et al., *supra* note 8, at 588, 595; Robinson et al., *supra* note 8; Phillip A. Morin et al., *Reference Genome and Demographic History of the Most Endangered Marine Mammal, the Vaquita*, 21 *MOLECULAR ECOLOGY RES.* 1008, 1016 (2020); Grenon, *supra* note 6.

16 Morin et al., *supra* note 15.

17 See generally Barbara L. Taylor et al., *Likely Annual Calving in the Vaquita, Phocoena sinus: A New Hope?* 35 *MARINE MAMMAL SCI.* 1603, 1603–12 (2019) (examining photographic evidence to conclude that “annual calf production in vaquitas is possible”).

18 Morin et al., *supra* note 15, at 1009.

19 Francis Gulland et al., *Vaquitas (Phocoena sinus) Continue to Die from Bycatch Not Pollutants*, *VETERINARY REC.*, Oct. 2020, at 1, 2, 4 (finding deceased vaquitas in “good nutritional status,” with no evidence of toxins naturally produced by algae (i.e., saxitoxin, domoic acid) and relatively low levels of organochlorine pesticides (e.g., DDTs) and endocrine-disrupting chemicals (i.e., polychlorinated biphenyls (PCBs), polybrominated diphenyl ethers (PBDEs) present). The absence of toxicological and nutritional risk factors, along with distinct bruising, cuts, and lesions consistent with monofilament cross-hatching, indicates death from net entrapment. *Id.*

it is important not to interpret these results as reason for complacency or inaction. The vaquitas' perilously low population count makes them particularly vulnerable to stochastic (i.e., chance) events.<sup>20</sup> An unpredictable illness, injury, or extreme weather occurrence could trigger the collapse of the remaining population by affecting a single individual.<sup>21</sup> Moreover, recovery of the vaquita population hinges on the survival of juveniles,<sup>22</sup> which take at least three years to reach reproductive age.<sup>23</sup> Because there is no evidence indicating that other adult females will care for orphaned calves, protection of adult females is integral to prevent death from starvation during the first year of a vaquita's life.<sup>24</sup> These unique vulnerabilities underscore the importance of taking urgent action to protect and conserve vaquitas, particularly where the key threat causing their extinction is controllable. Because recovery of the species is expected to take decades,<sup>25</sup> a dual conservation approach is needed: first, immediate steps must be taken to protect the few remaining individuals and prevent imminent extinction; and second, longer-term efforts must be designed and implemented to sustainably transition UGC fisheries away from gillnets and toward vaquita-safe equipment and methods.<sup>26</sup>

*B. Vaquita Extinction Is Driven by Pressure from International Markets and Entwined with the Plight of an Endangered Fish: Totoaba Macdonaldi*

The path to vaquita extinction has largely been paved by economic pressures from markets outside of Mexico. Despite their illegality, gillnets continue to be used in the UGC for both shellfish (e.g., shrimp) and finfish (e.g., corvina, sierra, chano, and totoaba).<sup>27</sup> Although gillnet fishing for corvina and sierra within the vaquita's range

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20 See Cisneros-Mata et al., *supra* note 8, at 589.

21 See *id.*

22 *Id.* at 588.

23 *Vaquita*, NOAA FISHERIES, <https://www.fisheries.noaa.gov/species/vaquita> (Dec. 29, 2021).

24 Cisneros-Mata et al., *supra* note 8, at 590, 595 (noting death of nursing mothers may result in a "double death").

25 Sanjurjo-Rivera et al., *supra* note 1, at 5.

26 *Id.*

27 *Id.* at 3; Victoria Dunch, *Saving the Vaquita One Bite at a Time: The Missing Role of the Shrimp Consumer in Vaquita Conservation*, 145 MARINE POLLUTION BULL. 583, 583 (2019); Nat. Res. Def. Council, Inc. v. Ross (*Ross I*), 331 F. Supp. 3d 1338, 1348–49 (Ct. Int'l Trade 2018).

is permitted, gillnet use for shrimp, chano, and totoaba in the UGC is illegal, yet continues anyway.<sup>28</sup> For vaquitas, gillnets set for totoaba (*Totoaba macdonaldi*) present the greatest threat to vaquitas because of the intense fishing for totoaba, the spatial overlap between totoaba and vaquita habitats, and the use of gillnets with larger mesh sizes.<sup>29</sup> In fact, catching totoaba by any means is illegal because the species is itself endangered from years of intensive fishing.<sup>30</sup>

Totoaba demand emanates from its use in traditional Chinese medicine: a soup prepared with the fish's swim bladder is believed to provide various health benefits.<sup>31</sup> Such benefits include the alleviation of pregnancy discomfort to alleged aphrodisiac and anti-aging beauty effects.<sup>32</sup> Totoaba swim bladders fetch such an exorbitant price by weight on the Chinese black market that they have been dubbed "aquatic cocaine."<sup>33</sup> Depending on size and quality, swim bladder value can range from \$5,000 to \$255,000.<sup>34</sup> The illicit trade in totoaba swim bladders is so lucrative that cartels now dominate the poaching scheme in the UGC,

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28 *Ross I, supra* note 27, at 13.

29 Sanjurjo-Rivera et al., *supra* note 1, at 4.

30 *See id.*; Sarah Uhlemann & Brendan Cummings, *Petition for Certification of Mexico Pursuant to the Pelly Amendment for Trade in Violation of the Convention on International Trade in Endangered Species*, CTR. FOR BIOLOGICAL DIVERSITY, (Sept. 29, 2014), [https://www.biologicaldiversity.org/species/mammals/vaquita/pdfs/Totoaba\\_Pelly\\_Petition\\_9\\_29\\_14.pdf](https://www.biologicaldiversity.org/species/mammals/vaquita/pdfs/Totoaba_Pelly_Petition_9_29_14.pdf); *See Grenon, supra* note 6.

31 Priyanka Sundareshan, *Prosecution for a Porpoise: Strengthen U.S. Enforcement Against Criminal Networks to Address International Trafficking of Endangered Species*, 10 ARIZ. J. ENV'T. L. & POL'Y 216, 221 (2020). *See Grenon, supra* note 6.

32 Lucy Pasha-Robinson, *China's Demand for Rare \$50,000 'Aquatic Cocaine' Fish Bladder Pushing Species to Extinction*, INDEPENDENT (Sept. 20, 2016), <https://www.independent.co.uk/news/world/americas/china-totoaba-fish-bladder-trade-aquatic-cocaine-money-maw-endangered-species-report-a7317256.html>; Kyung Lah & Alberto Moya, *'Aquatic Cocaine': Fish Bladders Are Latest Mexican Smuggling Commodity*, CNN (May 23, 2016) (updated 12:13 PM), <https://www.cnn.com/2016/05/23/health/aquatic-cocaine-totoaba-bass-smuggling/index.html>; Conor Grant, *Border Authorities Struggle to Get a Grip on the Slimy Business of 'Aquatic Cocaine'*, THE HUSTLE (June 19, 2019), <https://thehustle.co/border-authorities-smugglers-cartel-totoaba-fish-bladders/>; Gwynn Guilford, *How China's Fish Bladder Investment Craze Is Wiping Out Species on the Other Side of the Planet*, QUARTZ (Aug. 25, 2015), <https://qz.com/468358/how-chinas-fish-bladder-investment-craze-is-wiping-out-species-on-the-other-side-of-the-planet/>.

33 Grant, *supra* note 32; Pasha-Robinson, *supra* note 32; Mark Stevenson, *China Bladder Trade Sending Porpoise to Extinction*, SAN DIEGO UNION-TRIBUNE (Aug. 1, 2014) <https://www.sandiegouniontribune.com/sdut-china-bladder-trade-sending-porpoise-to-extinction-2014aug01-story.html>.

34 C4ADS, HOOKED: HOW DEMAND FOR A PROTECTED FISH LINED THE POCKETS OF MEXICAN CARTELS AND SUNK THE FUTURE OF AN ENDANGERED PORPOISE 62 (2017).

taking advantage of dependable trafficking routes to get the product out of Mexico and relying on intimidation tactics to prevent interference from community members and authorities.<sup>35</sup>

Demand for totoaba has increased over recent decades for several reasons. Yellow croaker, a species endemic to China, is the only species whose swim bladder is considered to have comparable medicinal properties.<sup>36</sup> Decimation of that population from overfishing consequently shifted demand to totoaba, which—like the vaquita—are found only in the UGC.<sup>37</sup> In the wake of the 2008 global financial crisis, many individuals sought the valuable species as a relatively stable investment.<sup>38</sup> A compilation of research shows that there is a clear link between rising totoaba demand and vaquita extinction: following a resurgence of demand in the early 2010s for totoaba bladders in China, vaquitas began experiencing their “most precipitous population decline on record”—a loss of approximately 50 percent of the population each year.<sup>39</sup>

## II. EFFORTS TO SAVE THE VAQUITA HAVE BEEN UNDERMINED BY ECONOMIC INCENTIVES, POLITICAL AND INSTITUTIONAL SHORTCOMINGS, AND THE CONSTRAINTS OF INTERNATIONAL LAW

### A. *Mexico’s Efforts to Conserve the Vaquita Have Failed Due to Lack of Systematic Enforcement and Misalignment of Economic Incentives*

Located between the Baja California peninsula and the western coast of mainland Mexico, the UGC lies within the sole jurisdiction of the Mexican government.<sup>40</sup> As international pressure has mounted

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35 See Sundareshan, *supra* note 31, at 222–24 (discussing trafficking routes and the “great personal risk” required to defy cartels).

36 *Id.* at 221.

37 *Id.* at 220–21.

38 *Id.* at 221.

39 Grenon, *supra* note 6 (citing Sanjurjo-Rivera et al., *supra* note 1, at 2, 5).

40 See Jorge A. Vargas, *Mexico’s Legal Regime Over Its Marine Spaces: A Proposal for the Delimitation of the Continental Shelf in the Deepest Part of the Gulf of Mexico*, 26 U. OF MIA. INTER-AM. L. REV. 189, 205 (1995) (noting northern portion of Gulf of California considered “internal waters” of Mexico). The significance of this designation is that, under the U.N. Convention on the Law of the Sea—to which Mexico is a party and the United States abides as customary international law—other nations cannot lawfully enter the UGC to enforce the gillnet ban or otherwise protect vaquitas. See generally, FLETCHER SCH. L. & DIPL., LAW OF THE SEA: A POLICY PRIMER 12 (John Burgess et. al., eds. 2017), <https://sites.tufts.edu/lawofthesea/files/2017/07/LawoftheSeaPrimer.pdf>.

over the past two decades, Mexico has deployed various policies and programs intended to protect vaquita from gillnets while supporting local fishers, spending more than \$145 million from 2007 to 2018 alone.<sup>41</sup>

At first glance, it appears that Mexico has exhausted every conceivable approach to save the vaquita. Spatial and regulatory protections for the vaquita's habitat have been repeatedly expanded.<sup>42</sup> Following designation of a vaquita refuge in 2005, Mexico elevated the status to a "no take zone" (NTZ) in 2008,<sup>43</sup> expanded the NTZ tenfold,<sup>44</sup> and instated an emergency gillnet ban encompassing and extending *beyond* the NTZ in 2015.<sup>45</sup> They declared the ban permanent in 2017.<sup>46</sup>

Commercial and sport fishing for totoaba has been banned since 1975, and both species have been listed as endangered on multiple domestic and international wildlife conservation lists for decades.<sup>47</sup> In April 2017, Mexico raised "extraction of endangered species" from a minor offense to a felony on par with organized crime.<sup>48</sup> Other efforts have included a fishing license buyout program with seed grants for alternative livelihood development; payments to fishers for ecosystem services gained by their abstention from fishing in the NTZ; a voluntary exchange of gillnets for vaquita-friendly gear; and programs in which fishers were paid to develop and test alternative gear.<sup>49</sup>

Although some of these initiatives have achieved varying degrees of fleeting success, Mexico's efforts have ultimately failed to protect the dwindling vaquita population. In August 2021, a panel of

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41 Sanjurjo-Rivera et al., *supra* note 1, at 5, 7, 20. See Grenon, *supra* note 6.

42 Sanjurjo-Rivera et al., *supra* note 1, at 5–8.

43 The No Take Zone (NTZ) is outlined in aqua blue (B) in Figure 1, p. 174. Sanjurjo-Rivera et al., *supra* note 1, at 9–10. Figure 1 is used with permission from Sanjurjo-Rivera. *Id.* at 5; email from Sarah L. Mesnick, Ecologist/Sci. Liaison, Sw. Fisheries Sci. Ctr., NOAA Fisheries and U.S. Dep't of Com., to author (June 11, 2022) (on file with author).

44 *Id.* at 10.

45 *Id.* at 5–6 (the gillnet exclusion zone is outlined in a dotted white line (C) in Figure 1, p. 174).

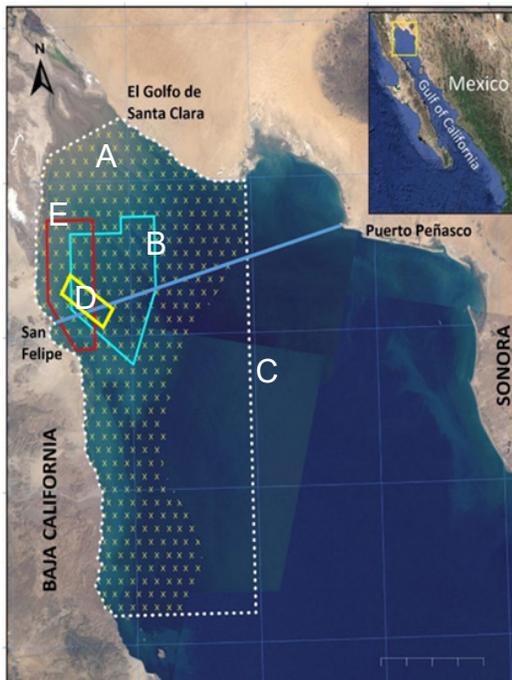
46 *Id.* at 7.

47 *Id.* at 4, 6. Vaquita have been listed under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) Appendix I since 1979; under the U.S. Endangered Species Act since 1985; on the Mexican List of Species at Risk of Extinction since 1994; and on the International Union for Conservation of Nature (IUCN) "Critically Endangered" list since 1996. *Id.* at 4. Totoaba were listed on the CITES Appendix I in 1977; added to the U.S. Endangered Species List in 1979; added to the Mexican List of Endangered Species in 1994; and listed as "Critically Endangered" by the IUCN in 1996. *Id.*

48 *Id.* at 6. See Grenon, *supra* note 6.

49 Sanjurjo-Rivera et al., *supra* note 1, at 6, 8, 10.

experts affiliated with the North American Association of Fisheries Economists published an analysis of Mexico's conservation actions from 2007 to 2018, evaluating their impact on the vaquita and the UGC coastal communities that may have contributed to this failure.<sup>50</sup> These multidisciplinary experts found that a myriad of social, institutional, and economic factors in the UGC continue to incentivize gillnet use, and previous policies intended to conserve vaquitas have failed to meaningfully reorder these incentives.<sup>51</sup> Specific shortcomings of five policy approaches that were implemented in the UGC are explored in more detail below.



*Figure 1.*<sup>43</sup> A map of the UGC, including the regulatory protections for the vaquita within the region. The historical distribution of vaquitas in the UGC is marked by the yellow hatched area (A). The NTZ is outlined in aqua blue (B). The gillnet exclusion zone is outlined in a dotted white line (C). The Zero Tolerance Area (ZTA) is outlined in yellow (D). An additional enhanced enforcement zone (recommended by CIRVA to protect against frequent illegal totoaba fishing) is outlined in red (E). [Editor's Note: Letters have been superimposed on this map for publishing purposes and are not a part of the original image.]

<sup>50</sup> See *id.* at 1.

<sup>51</sup> *Id.* at 8–11.

## 1. Spatial Protections Are Ineffective When Not Enforced

Iterative expansion of spatial protections for vaquitas in the UGC has been ineffective because restrictions have not been consistently and systematically enforced.<sup>52</sup> Many factors determine the effectiveness of Marine Protected Areas (MPAs). For example, their shape plays a key role in facilitating both compliance and enforcement.<sup>53</sup> MPAs with simpler shapes—delineated, for example, by lines of latitude and longitude—are easier to recognize, comply with, and enforce.<sup>54</sup> Although the NTZ is irregularly shaped, Mexico’s gillnet exclusion zone in the UGC is delineated by a single line of latitude and longitude, consistent with best practice.<sup>55</sup> However, effective enforcement of MPAs takes precedence over design in determining a species’s recovery.<sup>56</sup> While enactment of spatial protections in the UGC has been accompanied by significant investments in surveillance technology (e.g., “personnel, high speed military-style boats, drones, and special cameras”), the Mexican government has lacked a coordinated strategy on how to systematically deploy these assets.<sup>57</sup> Consequently, enforcement has been haphazard and inconsistent.<sup>58</sup> This problem has been exacerbated by corruption, bribery, and a lack of political will to enforce spatial and regulatory protections.<sup>59</sup> Any benefits to vaquita from banning legal shrimp and finfish fisheries in the NTZ have likely been offset by increased totoaba poaching.<sup>60</sup>

A 2019 report by the Comité Internacional para la Recuperación de la Vaquita (International Committee for the Recovery of the Vaquita,

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52 *See id.* at 5–7.

53 *Connectivity*, REEF RESILIENCE NETWORK, <https://reefresilience.org/management-strategies/marine-protected-areas-2/resilient-mpa-design/connectivity/> (last visited Jan. 11, 2023) (recommending use of compact shapes for MPAs and stating that “[t]he shape of an MPA is a critical factor in effective delineation and enforcement”).

54 *Id.*; INT’L UNION FOR CONSERVATION OF NATURE WORLD COMM’N ON PROTECTED AREAS, ESTABLISHING MARINE PROTECTED AREA NETWORKS—MAKING IT HAPPEN 59 (2008).

55 *See* Sanjurjo-Rivera et al., *supra* note 1, at 5 (Figure 1, p. 174).

56 *See* Mary Gleason et al., *Designing a Network of Marine Protected Areas in California: Achievements, Costs, Lessons Learned, and Challenges Ahead*, 74 OCEAN & COASTAL MGMT. 90, 100 (2013) (noting importance of effective management, enforcement, and monitoring of MPAs “cannot be underestimated”).

57 Sanjurjo-Rivera et al., *supra* note 1, at 12.

58 *Id.* at 12–14.

59 *Id.* at 12–14.

60 *Id.* at 10.

or CIRVA)<sup>61</sup> called on the Mexican government to “fully mobilize” its enforcement resources in the Zero Tolerance Area (ZTA).<sup>62</sup> The ZTA, which comprises a portion of the NTZ, has been designated by CIRVA as an enhanced enforcement zone because surviving vaquitas are believed to frequent the area and illegal totoaba fishing activity is high.<sup>63</sup> CIRVA has stated that the enforcement goal within the ZTA should be for enforcement agents to identify and remove any illegal net within hours of its placement.<sup>64</sup> In its 2019 report, CIRVA recommended that the Mexican government immediately improve enforcement within the ZTA by taking four actions, particularly during peak totoaba poaching season (March and April):

1. Fully fund and expand net removal efforts to maintain the area as a net-free zone;
2. Provide 24-hour surveillance and monitoring;
3. Take all necessary measures to protect net removal teams; and
4. Arrest and prosecute illegal fishermen by, for example, placing a law enforcement agent on net removal ships and Navy vessels to facilitate arrest.<sup>65</sup>

These monitoring and enforcement recommendations have not, to date, been implemented.<sup>66</sup>

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61 CIRVA is an international team of scientists assembled by the Mexican government to develop a recovery plan for the vaquita based on the best available scientific evidence. CIRVA, PORPOISE.ORG: KNOWLEDGE BASE, <https://porpoise.org/knowledge-base/cirva/> (last visited July 27, 2022).

62 SW. FISHERIES SCI. CTR., REPORT OF THE ELEVENTH MEETING OF THE COMITÉ INTERNACIONAL PARA LA RECUPERACIÓN DE LA VAQUITA (CIRVA) 1, 2 (2019) [hereinafter CIRVA 2019 Report].

63 Sanjurjo-Rivera et al., *supra* note 1, at 5 (Figure 1, p. 174).

64 CIRVA 2019 Report, *supra* note 62, at 2.

65 *Id.* at 2. CIRVA also strongly recommended acoustical monitoring to refine data on vaquita distribution and movement patterns. *See id.* at 7.

66 *See Vaquita Update I: A New Totoaba Season Begins with no Assurance that Mexico Will Enforce the Gillnet Fishing Ban to Protect the Vaquita*, IUCN – SSC CETACEAN SPECIALIST GROUP (Dec. 5, 2022), <https://iucn-csg.org/vaquita-update-i-a-new-totoaba-season-begins-with-no-assurance-that-mexico-will-enforce-the-gillnet-fishing-ban-to-protect-the-vaquita/>; Barb Taylor & Jay Barlow, *Vaquita Update II: Illegal Fishing Continues with Impunity in the Area Where the Last Vaquitas Survive*, IUCN – SSC CETACEAN SPECIALIST GROUP (Dec. 5, 2022), <https://iucn-csg.org/vaquita-update-ii-illegal-fishing-continues-with-impunity-in-the-area-where-the-last-vaquitas-survive/>.

## 2. Regulations Are Not Optimized to Achieve Deterrence

There is a long history of corruption and tacit acquiescence to illegal activity in UGC fisheries.<sup>67</sup> Corruption plays a central role in empowering the illegal totoaba trade, as it erodes the ability of law enforcement to combat poaching and organized criminal networks.<sup>68</sup> Moreover, “many fishers are willing participants in poaching . . . [and] view regulations as illegitimate or an imposition of conservation values that contradict their economic interests,” further disintegrating respect for the rule of law.<sup>69</sup> Enforcement of laws preventing fishing in the NTZ and prohibiting the use of gillnets in the gillnet exclusion zone has thus become both practically and politically untenable.<sup>70</sup>

Inconsistent enforcement undermines the deterrent effect of legal penalties. Under an economic framework, an individual’s propensity to break controlling law can be understood by analyzing three factors: (1) the expected gain; (2) the severity of the sanction if caught; and (3) the likelihood of being not only caught, but also prosecuted and convicted.<sup>71</sup> A fisher’s choice boils down to a comparison of expected profit from illegal fishing (revenue minus anticipated “costs” if caught) and expected income from legal activity.<sup>72</sup> In the UGC, expected gains from illegal fishing (particularly for totoaba) far outweigh anticipated costs.<sup>73</sup> The extremely high sum fetched by swim bladders and low chance of being caught and convicted skews economic incentives strongly toward illegal fishing.<sup>74</sup> This leaves fishers with little motivation to use different gear, fish elsewhere, or find work outside of the fishing sector.<sup>75</sup>

In September 2020, new regulatory guidelines were published following a change in Mexico’s political administration.<sup>76</sup> The new

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67 Sanjurjo-Rivera et al., *supra* note 1, at 13.

68 *Id.*

69 *See id.*

70 *See id.*

71 *Id.* at 12.

72 *Id.*

73 *See id.*

74 *See id.* *See also* Sundareshan, *supra* note 31, at 229 n.98.

75 *See* Sanjurjo-Rivera et al., *supra* note 1, at 12. *See also* Sundareshan, *supra* note 31, at 229 n.98.

76 *See* Sanjurjo-Rivera et al., *supra* note 1, at 12.

guidelines,<sup>77</sup> which became effective in July 2021,<sup>78</sup> create a system in which different degrees of surveillance, monitoring, and spatial protection are triggered in response to the level of illegal fishing detected in a given area.<sup>79</sup> Although the official government statement on the new rules claims they do not “undermine or diminish” the degree of protection in the ZTA, but rather “strengthen” protections by making them more flexible,<sup>80</sup> environmental advocacy groups vehemently disagree.<sup>81</sup> Rather than maintaining the clarity that the former “zero tolerance” approach implies and focusing resources on improving enforcement consistency, advocacy groups argue that the new guidelines will serve only to muddy the water and, in effect, roll back protections for the vaquita.<sup>82</sup> Based on observations reported from volunteer conservation groups, it appears that this bleak outlook on the new regulations is warranted. During a mere two months of the 2021 shrimp season, 117 fishing vessels were documented in the ZTA, with a combined total length of gillnets that could have stretched the entire span of the ZTA five times.<sup>83</sup> Moreover,

77 Agreement that Regulates Gear, Symbols, Methods, Techniques and Schedules for Carrying Out Fishing Activities with Smaller and Larger Vessels in Mexican Maritime Zones in the North of the Gulf of California and Establishes Landing Sites, As Well As the Use of Monitoring Such Systems, *Diario Oficial de la Federación* [DOF] [Official Journal of the Federation] 24-09-2020 (Mex.).

78 Press Release, Secretaría de Agricultura y Desarrollo Rural, Establece el Gobierno de México Esquemas para Determinar Cierres de Zonas de Pesca para Proteger a la Vaquita Marina [Secretary of Agriculture and Rural Development, The Government of Mexico Establishes Schemes to Determine Closings of Fishing Zones in Order to Protect the Vaquita] (July 14, 2021), <https://www.gob.mx/agricultura/prensa/establece-el-gobierno-de-mexico-esquemas-para-determinar-cierres-de-zonas-de-pesca-para-proteger-a-la-vaquita-marina-en-el-alto-golfo-de-california?idiom=es>.

79 Kari Birdseye, *Mexico Drastically Eases Enforcement in Vaquita “Zero Tolerance” Area*, NRDC (July 16, 2021), <https://www.nrdc.org/media/2021/210716-1>.

80 *Gobierno Mexicano Refuerza Medidas para Proteger a la Vaquita Marina* [Mexican Government Strengthens Measures to Protect the Vaquita], SAN DIEGO TRIBUNE (July 17, 2021), <https://www.sandiegouniontribune.com/en-espanol/noticias/mexico/articulo/2021-07-17/gobierno-mexicano-refuerza-medidas-para-proteger-a-la-vaquita-marina> (“Es importante señalar que con estas acciones no se mina ni se disminuye la protección en la zona de tolerancia cero, establecida en el acuerdo marco. Por el contrario, se fortalece al posibilitar nuevas medidas de protección, más eficientes.” [“It is important to point out that these actions do not undermine nor diminish the protections in the zero tolerance zone, established in the agreement’s framework. On the contrary, it is strengthened by enabling new, more efficient protection measures.”]). See also Sanjurjo-Rivera, *supra* note 1, at 7. The Zero Tolerance Area (ZTA) is outlined in yellow (D) in Figure 1, p. 174. *Id.* at 5.

81 See, e.g., Birdseye, *supra* note 79.

82 See *id.*

83 *Illegal Fishing Remains the Sole Immediate Threat to Vaquitas*, IUCN CETACEAN

from October 2021 to May 2022, fishing vessels were observed unlawfully present inside the ZTA 88 percent of the time (120 out of 147 days), with no apparent enforcement response.<sup>84</sup>

### 3. License Buyouts Can Backfire if Not Combined with Enforcement

In an attempt to reduce total fishing efforts,<sup>85</sup> the Mexican government employed a “buyout program” between 2007 and 2015, offering to repurchase its previously issued fishing licenses.<sup>86</sup> Local fishers participating in the vaquita conservation effort were financially incentivized to exchange their gillnets for funds that could then be invested in alternative livelihoods.<sup>87</sup> Unfortunately, buyouts can—and did, in this case—backfire by triggering a phenomenon called “capital stuffing,” in which funds received for reducing a restricted input are invested in bolstering the capacity of non-restricted inputs.<sup>88</sup> In the UGC, this phenomenon took the form of fishers trading in one of multiple fishing licenses and then compensating for that loss by using bigger nets under their remaining licenses.<sup>89</sup> Consequently, Mexico’s buyback efforts resulted in an average doubling of net length, increasing the fishing capacity per legal unit (i.e., an increase in licenses).<sup>90</sup> Because gillnet length prior to this doubling was *already* double the legally permissible length,<sup>91</sup> this attempted solution only worsened the problem of extensive netting in vaquita habitat.

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SPECIALIST GROUP (Apr. 20, 2022), <https://iucn-csg.org/illegal-fishing-remains-the-sole-immediate-threat-to-vaquitas/>.

84 *Strong Evidence of Violations of Vaquita Zero Tolerance Area (ZTA)*, IUCN CETACEAN SPECIALIST GROUP (June 8, 2022), <https://iucn-csg.org/strong-evidence-of-violations-of-vaquita-zero-tolerance-area-zta/>.

85 “Fishing effort” is a measure of the amount of fishing that takes place within a defined spatial area. *Fishing Effort*, OECD GLOSSARY OF STATISTICAL TERMS, <https://stats.oecd.org/glossary/detail.asp?ID=994> (Mar. 5, 2003). It is normally expressed in terms of “inputs” into the fishing activity (e.g., hours or days spent fishing, number of nets in the water or kilometers of nets). *Id.*

86 Sanjurjo-Rivera et. al., *supra* note 1, at 8.

87 *Id.*

88 *Id.* at 9.

89 *See id.*

90 *Id.*

91 *Id.*

#### 4. Payments for Ecosystem Services Are a Short-Term Fix, Not a Sustainable Solution

Paying UGC fishers to refrain from fishing in the NTZ was another attempt to induce compliance that had counterproductive, unintended consequences. Payments through the program were disbursed only to license-holders, who lacked any incentive to share these funds with their crew.<sup>92</sup> This initiative thus inadvertently widened pre-existing economic disparities in affected communities and led many fishers to resort to totoaba poaching out of financial necessity.<sup>93</sup> Moreover, while the payments were intended as an emergency measure to buy the vaquita time and tie fishers over until alternative gear and livelihoods could be developed, spending on this initiative far eclipsed spending on longer-term solutions.<sup>94</sup> Lump-sum payments were made regularly for the duration of the program without any requirement that participating fishers invest in vaquita-friendly gear, switch to vaquita-friendly fisheries, or explore economic opportunities beyond the fishing sector.<sup>95</sup> This resulted in a missed opportunity to transition UGC fishers to vaquita-friendly livelihoods and amounted instead to a financially unsustainable short-term fix.<sup>96</sup>

#### 5. Alternative Gear and Livelihoods Have Not Been Prioritized

Mexico's failure to prioritize and consistently support alternative fishing methods and gear has been identified as a key shortcoming in vaquita conservation attempts to date.<sup>97</sup> Previous efforts by the Mexican government, academics, and conservation organizations have included testing suripera<sup>98</sup> nets for shrimp and alternative techniques and gear

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92 *Id.*

93 *Id.* at 6, 9. See Grenon, *supra* note 6.

94 *Supra* note 1.

95 *See id.* at 6, 10.

96 *See id.* at 6. For comparison, \$122 million were spent on compensatory payments to fishers for not fishing, while only \$23.1 million were invested in the development of alternative fishing methods, gear, and livelihoods. *Id.*

97 *Id.* at 12.

98 Suripera nets are considered "vaquita-safe" fishing gear, and conservationists have advocated for replacing gillnets with this alternative gear. See Vanda Felbab-Brown & Alejandro Castillo López, *Restore US-Mexico Seafood Trade and Save the Vaquita*, BROOKINGS INST. (May 7, 2021), <https://www.brookings.edu/articles/restore-us-mexico-seafood-trade-and-save-the-vaquita/>; *What is Suripera Shrimp?*, BLUE TURTLE SUSTAINABLE, (May 25, 2021), <https://www.blueturtlesustainable.org/blog/suripera-shrimp>.

(like encircling or using fish traps) for finfish species like corvina.<sup>99</sup> Obstacles including government delay in furnishing the necessary experimental permits, physical obstruction from illegally placed gillnets, and a lack of continued financial support have thwarted these efforts.<sup>100</sup> Although fishers who participated in testing alternative gear were initially paid to do so, participation fizzled out soon after funding evaporated.<sup>101</sup> The most recent initiative for alternative gear and market development ended in 2015, and sporadic efforts since then have not attained the degree of investment and scale necessary to achieve meaningful impact.<sup>102</sup>

## 6. Additional Efforts Have Fallen Short or Made Matters Worse

Additional campaigns to save the vaquita include efforts by conservation groups—assisted by local fishers and the Mexican Navy—to remove both recently placed (“active”) and long-abandoned (“ghost”) gillnets in vaquita habitat.<sup>103</sup> From October 2016 to March 2020, around 1,600 gillnets were removed from the UGC,<sup>104</sup> undoubtedly saving lives. However, without adequate enforcement to prevent the placement of new nets, these efforts amount to fighting the tide. Moreover, as the presence of organized crime has increased in the region over recent years, reports of violence against net-removers have become more frequent,<sup>105</sup> which may deter continued civilian participation in these efforts.

Perhaps saddest of all was the failed attempt by the Mexican government, aided by conservation groups and four U.S. Navy dolphins, to “rescue” as many vaquitas as possible and hold them in captivity until illegal gillnet use in the UGC was brought under control.<sup>106</sup> Although vaquitas resemble dolphins physically, they are far shyer and more averse

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99 See Sanjurjo-Rivera et. al., *supra* note 1, at 10.

100 *Id.*

101 *Id.* at 6.

102 *Id.* at 10.

103 *Id.* at 7; See *Mexico and Sea Shepherd Partner to Save Vaquita Porpoise*, SEA SHEPHERD, (Sept. 23, 2021), <https://seashepherd.org/2021/09/23/mexico-and-sea-shepherd-partner-to-save-vaquita-porpoise/>.

104 Sanjurjo-Rivera et. al., *supra* note 1, at 7.

105 See *id.* at 2, 4, 8, 12.

106 See Elizabeth Pennisi, *Update: After Death of Captured Vaquita, Conservationists Call off Rescue Effort*, SCIENCE (Nov. 9, 2017), <https://www.science.org/content/article/update-after-death-captured-vaquita-conservationists-call-rescue-effort>.

to human interaction.<sup>107</sup> The team captured two vaquitas, but one (a calf) was so stressed that it had to be released almost immediately, and the other (an adult female) suffered a fatal heart-attack within seven hours of capture.<sup>108</sup> Attempts to remove vaquitas from the UGC were abandoned after this drastic, “last-ditch” effort so tragically backfired.<sup>109</sup> Because vaquitas are too fragile to be removed from their ecosystem, their only hope of survival is making their habitat safe for them once more.

### *B. International Conservation Efforts Are Constrained in Scope and Enforcement Mechanisms*

There are a handful of legal and policy instruments that the United States can use to promote the protection of endangered species and prevent the trafficking of wildlife body parts outside of its jurisdiction. These include the Pelly Amendment;<sup>110</sup> the Marine Mammal Protection Act (MMPA);<sup>111</sup> the Eliminate, Neutralize, and Disrupt (END) Wildlife Trafficking Act of 2016;<sup>112</sup> and the Lacey Act.<sup>113</sup> At the global scale, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), an international agreement intended to prevent trade in wildlife in jeopardy of survival,<sup>114</sup> is a key legal tool for endangered species protection.<sup>115</sup> The trade of vaquitas has been regulated under CITES since 1979.<sup>116</sup> However, use of these tools to conserve the vaquita by eliminating the illicit totoaba trade—and gillnet fishing in the UGC more generally—have been unsuccessful due to restricted scope, weak enforcement measures, and procedural delays.<sup>117</sup>

107 *Vaquita*, ANIMALS NETWORK, <https://animals.net/vaquita/> (last visited Mar. 13, 2021); *Vaquita*, ONEKIND PLANET, <https://onekindplanet.org/animal/vaquita/> (last visited Nov. 6, 2022).

108 Morin et al., *supra* note 15, at 1009; Pennisi, *supra* note 106.

109 Pennisi, *supra* note 106.

110 22 U.S.C. § 1978.

111 16 U.S.C. §§ 1361–1423h.

112 Eliminate, Neutralize, and Disrupt (END) Wildlife Trafficking Act of 2016, 16 U.S.C. §§ 7601–7644 (2016).

113 16 U.S.C. § 3372(a)(2)(A)

114 Convention on International Trade in Endangered Species of Fauna and Flora, Mar. 3, 1973, 27 U.S.T. 1087, 993 U.N.T.S. 243 (entered into force July 1, 1975).

115 See *CITES*, U.S. FISH & WILDLIFE SERVS., <https://www.fws.gov/program/cites> (last visited Nov. 6, 2022) (noting CITES is the only treaty ensuring international trade in plants and animals does not threaten their survival in the wild).

116 Sundareshan, *supra* note 31, at 219.

117 See discussion *infra* Section II.B.ii.

## 1. Attempts to Conserve the Vaquita Using U.S. Laws Have Not Changed Behavior

The Pelly Amendment to the Fishermen's Protective Act of 1967<sup>118</sup> is often considered "the strongest U.S. law that allows for imposing trade measures on other nations as a punishment for their environmental violations."<sup>119</sup> The statutory provision authorizes a discretionary ban on importing fish products from another country when those products hinder conservation efforts.<sup>120</sup> The import ban occurs when the Secretary of Commerce certifies that nationals of an export country are directly or indirectly conducting fishing operations that "diminish the effectiveness" of international conservation efforts of threatened or endangered species.<sup>121</sup> In 2014, U.S. environmental organizations petitioned the Secretary of Commerce to certify that Mexico's failure to curb the trade and export of totoaba both "diminishes the effectiveness" of CITES and drives the vaquita to extinction.<sup>122</sup>

Following the agency's failure to respond, the organizations filed a notice of intent to sue in 2017<sup>123</sup> and subsequently filed suit in June 2020 in the U.S. District Court for the District of Columbia (D.C. District Court),<sup>124</sup> alleging that agency action had been "unlawfully withheld or unreasonably delayed" in violation of the Administrative Procedure Act (APA).<sup>125</sup> However, the Department of Justice moved to dismiss the case for lack of subject matter jurisdiction and improper venue, arguing that the U.S. Court of International Trade (CIT) held exclusive jurisdiction,<sup>126</sup>

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118 22 U.S.C. § 1978.

119 See, e.g., Charles R. Taylor, *Fishing with a Bulldozer: Options for Unilateral Action by the United States Under Domestic and International Law to Halt Destructive Bottom Trawling Practices on the High Seas*, 34 ENVIRONS: ENV'T. L. & POL'Y J. 121, 143 (2010).

120 22 U.S.C. §§ 1978(a)(1)–(2) (2017).

121 22 U.S.C. §§ 1978(a)(1)–(2) (2017).

122 See Letter from Sarah Uhlemann, Senior Attorney & Brendan Cummings, Senior Couns., Ctr. for Biological Diversity, to Penny Pritzker, Sec. of Com. et al. (Sept. 29, 2014), [https://www.biologicaldiversity.org/species/mammals/vaquita/pdfs/Totoaba\\_Pelly\\_Petition\\_9\\_29\\_14.pdf](https://www.biologicaldiversity.org/species/mammals/vaquita/pdfs/Totoaba_Pelly_Petition_9_29_14.pdf).

123 See Letter from Sarah Uhlemann, Senior Attorney & Brendan Cummings, Senior Couns., Ctr. for Biological Diversity, to Penny Pritzker, Sec. of Com. et al. (Jan. 5, 2017), [https://www.biologicaldiversity.org/species/mammals/vaquita/pdfs/Center\\_NOI\\_re\\_Totoaba\\_Pelly\\_Petition\\_1\\_5\\_17.pdf](https://www.biologicaldiversity.org/species/mammals/vaquita/pdfs/Center_NOI_re_Totoaba_Pelly_Petition_1_5_17.pdf).

124 See Compl., Ctr. for Biological Diversity v. Bernhardt, No. 1:20-cv-1532 (D.D.C. June 11, 2020).

125 *Id.* at 18; 5 U.S.C. § 706(1).

126 See Def. Mot. to Dismiss, Ctr. for Biological Diversity v. Bernhardt, No. 1:20-cv-1532-DLF (D.D.C. Aug. 24, 2020) (citing FED. R. CIV. P. 12(b)(1), (3) as grounds for

and the case was soon after voluntarily dismissed.<sup>127</sup>

In 2020, another lawsuit—brought in the CIT by the same two environmental organizations (plus a third)—was voluntarily dismissed.<sup>128</sup> The organizations sued the federal government pursuant to MMPA Section 101(a)(2), which authorizes the Secretary of the Treasury to ban the importation of fish and fish products caught using commercial fishing gear that causes incidental mortality or serious injury to marine mammals in excess of U.S. standards.<sup>129</sup> In 2018, the organizations' motion for a preliminary injunction was granted to prevent irreparable harm to the vaquita, resulting in a ban on importation of shrimp—as well as chano, corvina, and sierra—from the northern Gulf of California.<sup>130</sup>

Although the U.S. government initially contested the case on its merits, its position abruptly pivoted in March 2020, after the National Oceanic and Atmospheric Administration (NOAA), through the National Marine Fisheries Service (NMFS), revoked its comparability finding for certain Mexican fisheries in the UGC—a move effectively banning the U.S. from importing fish and fish products from UGC fisheries using gillnets.<sup>131</sup> NOAA's decision largely banned the importation of fish caught directly inside the vaquita's range and also expanded restrictions to include other products from the UGC that are likely contributing to vaquita bycatch.<sup>132</sup> Accordingly, the case was voluntarily dismissed

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dismissal).

127 See Notice of Voluntary Dismissal, *Ctr. for Biological Diversity v. Bernhard*, No. 1:20-cv-1532-DLF (D.D.C. Sep. 2, 2020).

128 *Nat. Res. Def. Council v. Ross*, (*Ross II*) No. 18-00055-GSK, slip op. at 1 (Ct. Int'l. Trade Apr. 22, 2020).

129 *Id.* at 2; 16 U.S.C. § 1371(a)(2).

130 *Ross I*, *supra* note 27, at 3, 5, 9–10, 48. As explained in the opinion, gillnet fishing for curvina (interchangeably spelled “corvina”) and sierra is legal, while gillnet use to catch shrimp and chano within the vaquita's range is illegal. *Id.* at 13.

131 See Notice of Revocation of Comparability Findings and Import Restrictions on Certain Fish Products from Mexico, 85 Fed. Reg. 13,626, 13,627–28 (Mar. 9, 2020) (to be codified at 50 C.F.R. pt. 216). To import certain fish or fish products into the U.S., a foreign fishery must receive a NMFS-issued comparability finding—which is used to ensure that a country harvesting fish meets the same standards as U.S. commercial fishing operations by satisfactorily demonstrating “a regulatory program comparable in effectiveness” to U.S. standards for reducing marine mammal bycatch. *Id.* at 13,627. As of January 1, 2022, “all fisheries must have a comparability finding in order to export fish and fish products from those fisheries to the United States.” *Id.* at 13,628.

132 See *id.* at 13,627 (stipulating “requirements that all other fish and fish products not within the scope of the import restrictions but imported under the Harmonized Tariff Schedule (HTS) codes associated with the prohibited fish and fish products be accompanied by a Certification of Admissibility . . .”). *Id.*

as moot in April 2020.<sup>133</sup> However, experts claim that this importation ban has not sufficiently altered fishing behavior because UGC fishers—particularly those who harvest shrimp—either launder their catch and sell to U.S. buyers or sell within Mexico’s domestic market.<sup>134</sup>

The Lacey Act of 1900 is one of the oldest U.S. laws protecting wildlife.<sup>135</sup> The Lacey Act makes it illegal to “import, export, transport, sell, receive, acquire, or purchase in interstate or foreign commerce” any wildlife (including parts of wildlife) “taken, possessed, transported, or sold in violation of any” federal, state, Tribal, or foreign law.<sup>136</sup> The Act provides for civil and criminal penalties, forfeiture of the prohibited animal or specimens, and criminal charges.<sup>137</sup> However, as recently noted by legal scholar Priyanka Sundareshan, the Lacey Act does not contain sufficient monetary penalties to deter highly profitable wildlife trafficking, such as that of totoaba.<sup>138</sup> The slim chance of getting caught—and then actually prosecuted—for a violation of the Lacey Act, plus the modest penalties that would be assessed if convicted, are easily outweighed by the substantial profitability of totoaba poaching.<sup>139</sup> Since the economic imbalance between profit and penalty is a common driver of wildlife trafficking, Sundareshan has suggested prosecuting financial crimes simultaneously with wildlife trafficking; the two often go hand-in-hand, and financial crimes carry higher penal and monetary sanctions, which could help tip the scales.<sup>140</sup>

The END Wildlife Trafficking Act of 2016 focuses on building international cooperation and capacity to reduce demand and strengthen enforcement efforts to combat wildlife trafficking.<sup>141</sup> In expert testimony presented during the legislative process of passing the Act, the role of organized crime syndicates and wildlife poaching in fueling

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133 *Ross II*, *supra* note 128.

134 Sanjurjo-Rivera et al., *supra* note 1, at 11.

135 *History of the U.S. Fish and Wildlife Service*, U.S. FISH AND WILDLIFE SERV. <https://www.fws.gov/history-of-fws#:~:text=The%20Lacey%20Act%20becomes%20the,and%20importation%20of%20injurious%20species> (last visited Jan. 11, 2023) (“1900: The Lacey Act becomes the first Federal law protecting wildlife”).

136 16 U.S.C. § 3372(a)(2)(A); *see also* KRISTINA ALEXANDER, CONG. RSCH. SERV. R42067, *THE LACEY ACT: PROTECTING THE ENVIRONMENT BY RESTRICTING TRADE* (2014) [hereinafter CRS Report] (explaining the Lacey Act’s prohibitions and penalties).

137 CRS Report, *supra* note 136, at 9.

138 *See* Sundareshan, *supra* note 31, at 234.

139 *See, e.g.*, Sanjurjo-Rivera et al., *supra* note 1, at 12.

140 *See* Sundareshan, *supra* note 31, at 233, 235.

141 Olonyi Bosire, *Risk Regulation and Management Against Illegal Wildlife Trade: Europe and America*, 21 SUSTAINABLE DEV. L. & POL’Y 17, 24 (2021).

the extinction of vaquitas, among other species, was specifically cited.<sup>142</sup> Although Mexico has been listed as a “Focus Country” in every annual END Wildlife Trafficking Report since the law’s inception,<sup>143</sup> continued decline of the vaquita population suggests that actions taken pursuant to this Act have not substantially enhanced Mexico’s capacity to counter the organized criminal networks that facilitate totoaba trafficking.

## 2. Attempts to Conserve the Vaquita Using CITES Lack Compliance Assurances and May Exacerbate Poaching

Vaquita are listed as a species threatened with extinction under CITES Appendix I—the designation affording the highest level of protection.<sup>144</sup> Trade in Appendix I species is prohibited under the Convention with limited exceptions.<sup>145</sup> As an instrument that seeks to balance conservation goals with economic development through sustainable trade, CITES has been hailed as one of the most successful international environmental treaties in the world.<sup>146</sup> Rather than neglecting trade interests in wild flora and fauna by adopting a strictly preservationist framework (largely to the disadvantage of the Global South), the Convention aspires to organize trade in species that may become endangered in such a way that ensures the species’ persistence while also generating revenue for investment in sustainable development and biodiversity conservation.<sup>147</sup> However, CITES lacks strong enforcement mechanisms: the Convention largely relies on self-enforcement by parties, and its leadership is mainly limited to a support

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142 See *Wildlife Poaching: Hearing on H.R. 2494 Before the S. Subcomm. on Africa and Glob. Health Pol’y of the S. Comm. on Foreign Relations*, 114th Cong. 10 (2015) (prepared statement of Ginette Hemley).

143 See, e.g., Bureau of Oceans and Int’l Env’t and Sci. Aff., *2017 END Wildlife Trafficking Report*, U.S. DEP’T OF STATE (Nov. 16, 2017), <https://www.state.gov/remarks-and-releases-bureau-of-oceans-and-international-environmental-and-scientific-affairs/2017-end-wildlife-trafficking-report/>; Bureau of Oceans and Int’l Env’t and Sci. Aff., *2021 END Wildlife Trafficking Report*, U.S. DEP’T OF STATE (Nov. 4, 2021), <https://www.state.gov/2021-end-wildlife-trafficking-strategic-review/>.

144 Convention on International Trade in Endangered Species, app. I, July 1, 2015, 993 U.N.T.S. 257.

145 Int’l Union for the Conservation of Nature, *How CITES Works*, [http://www.catsg.org/fileadmin/filesharing/3.Conservation\\_Center/3.5.\\_CITES/3.5.1.\\_How\\_it\\_works/How\\_CITES\\_works.pdf](http://www.catsg.org/fileadmin/filesharing/3.Conservation_Center/3.5._CITES/3.5.1._How_it_works/How_CITES_works.pdf) (last visited Mar. 13, 2022).

146 Christine Fuchs, *Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) – Conservation Efforts Undermine the Legality Principle*, 9 GERMAN L.J. 1565, 1565 (2008).

147 See *id.* at 1566, 1567–68.

and advisory role.<sup>148</sup>

Since 2019,<sup>149</sup> Mexico has been urged to report its efforts to curb the totoaba trade every six months.<sup>150</sup> However, the Secretariat report from the CITES Standing Committee meeting held in early March 2022—after consideration of the matter was delayed nearly a full year because of the COVID-19 pandemic<sup>151</sup>—notes that Mexico’s most recent report on illegal fishing activities and vessels in the UGC “stands in sharp contrast with information on the presence of vessels and gillnets in the zero-tolerance area received from other sources.”<sup>152</sup> The Secretariat further reports that the “indicators, triggers, and pre-determined actions” established in Mexico’s latest agreement for sustainable fishing have not been implemented.<sup>153</sup> While acknowledging that some progress has been made, the Secretariat urges stronger and more consistent surveillance and enforcement.<sup>154</sup> Despite concluding that Mexico has failed to effectively prevent fishers and vessels from entering the vaquita refuge area,<sup>155</sup> the Secretariat has still not initiated compliance procedures petitioned for by U.S. environmental organizations,<sup>156</sup> which

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148 *Id.* at 1569 (“The implementation itself is a task entrusted to the member states. CITES’ activities in this latter context are limited to supporting and assisting its members.”).

149 *See* Convention on Int’l Trade in Endangered Species of Wild Fauna & Flora, 18.292-18.295 *Totoaba (Totoaba macdonaldi)*, CITES, Doc. 28.5/S.C.74/C.o.P.18 (Geneva, Switz. 2019).

150 *See id.* at 18.293(a)(iii).

151 *See Illegal Fishing of Totoaba, the Associated Illegal Trade in Totoaba Swim Bladders, and the Protection of the Vaquita in the Gulf of California (Mexico)*, CITES, [https://cites.org/eng/Illegal\\_fishing\\_of\\_totoaba\\_the\\_associated\\_illegal\\_trade\\_in\\_totoaba\\_swim\\_bladders\\_and\\_the\\_protection\\_of\\_the\\_vaquita\\_in\\_the\\_gulf\\_of\\_california\\_mexico](https://cites.org/eng/Illegal_fishing_of_totoaba_the_associated_illegal_trade_in_totoaba_swim_bladders_and_the_protection_of_the_vaquita_in_the_gulf_of_california_mexico) (last updated July 16, 2021) (noting that in November 2020, the Secretariat was prepared to update the Standing Committee on Mexico’s progress implementing the Committee’s decisions, but “due to challenges posed by the COVID-19 pandemic,” the 73rd meeting of the Standing Committee was held online with a reduced agenda—and that matter did not make the cut).

152 Convention on the International Trade of Endangered Species [CITES], *Totoaba (Totoaba Macdonaldi): Report of the Secretariat*, at 6, SC74 Doc. 28.5 (Mar. 11, 2022) [hereinafter CITES Secretariat Report 2022].

153 *Id.* at 6–7 (referring to the “[a]greement regulating gear, systems, methods, techniques and schedules for carrying out fishing activities with smaller and larger vessels in Mexican Marine Zones in the Northern Gulf of California and establish landing sites as well as monitoring systems for such vessels,” published by the Secretary of the Environment and Natural Resources in the Official Federal Gazette of Mexico on July 9, 2021).

154 *Id.* at 7, 10.

155 *Id.* at 7.

156 *See* Letter from Zak Smith et al., Senior Atty. & Dir., Int’l Wildlife Conservation,

would suspend legal trade in CITES-listed species between Mexico and parties to the Convention.<sup>157</sup>

To make matters worse, the CITES Standing Committee has just approved an application for the first aquaculture facility in Mexico that will engage in the trade of captive-bred totoaba.<sup>158</sup> Although some have suggested that totoaba aquaculture as a way to help alleviate the impact of poaching on UGC totoaba stock<sup>159</sup> and provide alternative (legal) livelihoods, experience with the trafficking of other protected species' body parts suggests that this approach will likely do more harm than good to both the totoaba and vaquita.<sup>160</sup> The creation of a legal

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Nat. Res. Def. Council, to Ivonne Higuero, Secretary-General of the Convention on Int'l Trade in Endangered Species of Wild Fauna and Flora (Apr. 1, 2021) at 1, <https://www.biologicaldiversity.org/species/mammals/vaquita/pdfs/Letter-to-CITES-re-Vaquita-Update-for-Jan-2021-Regs-4-I-21.pdf>.

157 See Resol. Conf. 14.3 (Rev. CoP18), ¶ 30, <https://cites.org/sites/default/files/document/E-Res-14-03-R18.pdf> (last visited Mar. 13, 2022). While not the focus of this Note, the chronological of the vaquita population's steady deterioration—despite international pressures and resultant promises—illustrates the broader “need for improved accountability in multilateral environmental agreements.” See Choetsow Tenzin, “Save Them All”: *The Political and Environmental Implications of Vaquita Extinction*, HARVARD INT'L REV. (June 7, 2022), <https://hir.harvard.edu/save-them-all-the-political-and-environmental-implications-of-vaquita-extinction/>.

158 Andres M. Estrada, *In Mexico, the Green Light for Exporting Farmed Totoaba Divides Opinion*, CHINA DIALOGUE OCEAN (Aug. 18, 2022), <https://chinadialogueocean.net/en/governance/in-mexico-the-green-light-for-exporting-farmed-totoaba-divides-opinion/>; Press Release, Center for Biological Diversity, CITES Approves Totoaba Trade in Major Blow to Imperiled Vaquita Porpoise (Mar. 11, 2022), <https://biologicaldiversity.org/w/news/press-releases/cites-approves-totoaba-trade-in-major-blow-to-imperiled-vaquita-porpoise-2022-03-11/> [hereinafter CBD Press Release]. Although the aquaculture applicant agreed to “temporarily” prohibit the export of totoaba swim bladders and destroy stockpiled bladders, intending to sell totoaba meat instead, it is unclear how long this measure will remain in place as there is no demand for totoaba meat in any market. See *id.*

159 See Convention on the International Trade of Endangered Species [CITES], *Additional Information Regarding the Registration of the Operation “Earth Ocean Farms. S. DE R.L. DE C.V.” Breeding Totoaba Macdonaldi*, at 4–6, SC71 Inf. 2 (Aug. 16, 2022) (noting “conservation” purpose could be achieved by release of some portion of “fingerling” population, including juveniles, into the wild); Karlotta Rieve, *Can Aquaculture Save a Species from Extinction?*, THE FISH SITE (May 4, 2021), <https://thefishsite.com/articles/can-aquaculture-save-a-species-from-extinction-totoaba-mexico> (observing Earth Ocean Farms, the aquaculture facility that recently received CITES approval to engage in international trade in totoaba, “support[s] the restocking of wild populations by releasing thousands of juvenile Totoaba into their natural habitat and working with local schools to educate the upcoming generations on the importance of wildlife preservation”).

160 See Grenon, *supra* note 6. Cf., Solomon Hsiang & Nitin Sekar, *Does Legalization Reduce Black Market Activity? Evidence from a Global Ivory Experiment and Elephant*

alternative can exacerbate the underlying poaching crisis in several ways: it reinforces perceptions of scientifically unproven health benefits, allows illicit products to be more easily laundered and passed off as legal in commerce, and normalizes possession and use.<sup>161</sup> Sharply criticizing CITES leadership for having chosen “commerce over conservation,” the Center for Biological Diversity (CBD) issued a statement that the Committee’s decision could sound the vaquita’s death knell.<sup>162</sup> The CBD announcement explained that totoaba aquaculture will likely increase demand and further incentivize illegal totoaba fishing in the UGC because larger swim bladders that “can only be found in the wild” are valued more and are thus more lucrative.<sup>163</sup>

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*Poaching Data*, NAT’L BUREAU OF ECON. RES., [https://www.nber.org/system/files/working\\_papers/w22314/w22314.pdf](https://www.nber.org/system/files/working_papers/w22314/w22314.pdf) (last updated Apr. 2019) (noting that announcement of an experimental, one-time legal elephant ivory sale in 2008 led to a 66 percent increase in illegal ivory supply across two continents, an estimated 71 percent increase in ivory smuggling out of Africa, and as much as a ten-fold increase in its trend (i.e., demand)); Claudia Geib, *Fake It Till You Save It? Synthetic Animal Parts Pose a Conservation Conundrum*, MONGABAY (Feb. 19, 2021), <https://news.mongabay.com/2021/02/fake-it-till-you-save-it-synthetic-animal-parts-pose-a-conservation-conundrum/> (citing research indicating that herbal and synthetic chemical substitutes for bear bile, another ingredient popularly used in traditional Chinese medicine, have not alleviated demand driving harmful bear poaching and farming practices because consumers prefer wild-harvested bile when possible).

161 See, e.g., Petition from Ctr. for Biological Diversity to Sec’y of the Interior (Feb. 10, 2016), <https://wildaid.org/wp-content/uploads/2018/02/Petition-to-Ban-Cultured-Rhino-Horn.pdf> (discussing how legalization and commercial distribution of synthetic and cultured rhinoceros horns exacerbates the threat of poaching) [hereinafter CBD Rhino Petition]. See also Grenon, *supra* note 6.

162 CBD Press Release, *supra* note 158.

163 *Id.* As noted by Geib, *supra* note 160, this preference for “natural” over “synthetic” specimens is not uncommon in markets for wildlife parts, regardless of functional equivalence. In fact, introduction of smaller, and thus less desirable, totoaba bladders into the market could drive up the price of wild-caught swim bladders, worsening the existing poaching (and extinction) crisis. See Adam J. Dutton et al., *A Stated Preference Investigation into the Chinese Demand for Farmed vs. Wild Bear Bile*, 6 PLOS ONE 1, 1 (2011) (observing “the incumbent product may actually sell more items at a higher price when competing than when alone in the market”).

### III. MEXICO AND THE INTERNATIONAL COMMUNITY CAN SAVE THE VAQUITA BY ALIGNING ECONOMIC INCENTIVES AND HUMAN DIMENSIONS OF CONSERVATION WITH REGULATORY AND LEGAL EFFORTS

#### A. *Mexico Can Improve Regulatory Compliance by Integrating Top-Down and Bottom-Up Policy Solutions*

The vaquita extinction crisis is enmeshed in multifaceted and deeply-rooted socioeconomic issues.<sup>164</sup> Resolving the species conservation problem requires the strategic integration of both top-down and bottom-up policy approaches that are cognizant of the complexity and interrelationship of these issues.<sup>165</sup> Consistent regulatory enforcement must be combined with participatory, rights-based fisheries management that leverages economic incentives to win community support.<sup>166</sup> Additionally, other needs within UGC coastal communities cannot be viewed as detachable from the issue of vaquita conservation and must be addressed through a holistic, community-centered approach.

#### 1. Regulatory Enforcement Must Be Consistent and Carefully Calibrated to Help the Vaquita Without Hurting Coastal Communities

At present, the low likelihood of getting caught and sanctioned for gillnet fishing and the low penalty for doing so (compared to potential profit from totoaba catch) fail to deter illegal gillnet use in the UGC.<sup>167</sup> To change this, enforcement must be consistent and strict.<sup>168</sup> Evidence suggests that the probability of being sanctioned carries the heaviest weight among all variables in a risk calculus, and is thus more deterrent than penalty size.<sup>169</sup> Simply put, to effectively deter poaching, arrests and prosecutions must occur for a greater percentage of infractions.<sup>170</sup>

Determination of appropriate sanctions for illegal activity is more nuanced: it involves striking a balance among the competing

164 Sanjurjo-Rivera et al., *supra* note 1, at 13. See Grenon, *supra* note 6.

165 Sanjurjo-Rivera et al., *supra* note 1, at 13. See Grenon, *supra* note 6.

166 Sanjurjo-Rivera et al., *supra* note 1, at 13–14.

167 *Id.* at 12.

168 CITES Secretariat Report 2022, *supra* note 152, at 10.

169 See Sanjurjo-Rivera et al., *supra* note 1, at 12.

170 *Cf. id.* at 14 (noting deterrence of homicide not achieved until arrests and successful prosecutions reach 40 percent).

factors of fairness, civil liberties, and political palatability.<sup>171</sup> Tiered sanctions—in which heavier fines are imposed on repeat offenders and poachers affiliated with organized crime networks—should be implemented.<sup>172</sup> At the same time, penalties assessed to small-scale and low-level offenders must be carefully calibrated—and ideally, coupled with supportive pathways for offenders to avoid further violations<sup>173</sup>—so as not to drive UGC residents further into poverty and perpetuate the cycle of illegal activity.<sup>174</sup> A careful approach focusing, first and foremost, on severe prosecution of criminal networks is important to win community support. Otherwise, the UGC risks inadvertently deepening the perception that law enforcement authorities prioritize the porpoise over the people.<sup>175</sup> Ensuring that escalating sanctions (e.g., fines, license revocation, catch and boat seizure, jail time)<sup>176</sup> are commensurate with the socioeconomic condition of offenders is critical from both a criminal justice and poverty-elimination perspective, as well as an integral component in the shift toward a more progressive animal protection paradigm.<sup>177</sup>

## 2. Adopting a Participatory Approach to Rights-Based Fisheries Management in the UGC Could Improve Community Compliance, Reducing Enforcement Costs

Inconsistent enforcement efforts in the UGC are further undermined by weak fisheries management. The UGC is home to some of the most diverse and productive fisheries in all of Mexico, but unrestricted access (and ensuing overcapitalization) have contributed to economic hardship, inequality, and organized crime in coastal communities.<sup>178</sup> Creating a system of clearly defined fishery rights could foster a sense of ownership among UGC fishers, aligning their economic

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171 *Id.* at 12.

172 *Id.* at 14.

173 *See id.*

174 *See id.* at 13–14 (noting connection between poverty and illegal activity).

175 *See* Sundareshan, *supra* note 31, at 227–29 (explaining incarceration of low-income fishers has little impact on illegal poaching in UGC communities and fosters resentment against the species, causing some community members to “actively desire” extinction of the vaquita so they can return to their normal lives).

176 *See* Sanjurjo-Rivera et al., *supra* note 1, at 14.

177 *Cf.* JUSTIN MARCEAU, *BEYOND CAGES: ANIMAL LAW AND CRIMINAL PUNISHMENT* (2019) (arguing that the animal welfare movement must move beyond a carceral model of punishment and focus instead on systemic solutions).

178 *See* Sanjurjo-Rivera et al., *supra* note 1, at 13.

interests with sustainable management measures and thus fostering improved compliance with regulations.<sup>179</sup> Management regulations must involve more than a permit system. Instead, management should encompass access rights, capacity and effort parameters, catch-limits, gear transitions, and monitoring plans.<sup>180</sup> In addition to advancing environmental efforts, the pairing of rights-based fishery (RBF) management<sup>181</sup> with spatial protections has been shown to improve local food security and provide opportunities for poverty alleviation in small-scale coastal fishing communities.<sup>182</sup>

This approach could be particularly well-suited to the UGC, given that spatial protections (i.e., the vaquita refuge (NTZ) and gillnet exclusion zone) are already in place, albeit unenforced. A participatory approach to the development and implementation of an RBF program could also improve the perceived legitimacy of fishing restrictions to protect vaquitas in the UGC, building community buy-in and potentially easing some of the communities' resentment currently felt towards the endangered species.<sup>183</sup>

### 3. A Contextual, Holistic Approach Centered on Diversification of the Local Economy Is Needed to Benefit Both Vaquitas and UGC Coastal Communities

Mexico's approach to vaquita conservation must transcend enforcement measures and fisheries management to affect systemic, structural change that will enable long-term species recovery. Saving the vaquita requires a comprehensive approach that looks beyond the gear and management of fisheries to acknowledge the underlying socio-ecological and institutional challenges of the UGC region that

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179 *Id.* at 13–14.

180 *See id.* at 9.

181 Rights-based fishery (RBF) management programs assign fishers secure tenure rights to a fishery based on biologically determined annual catch limits. *See Allison K. Barner et al., Solutions for Recovering and Sustaining the Bounty of the Ocean: Combining Fishery Reforms, Rights-Based Fisheries Management, and Marine Reserves*, 28 *OCEANOGRAPHY* 252, 253 (2015). RBFs are commonly structured as harvest allocations (i.e., individual transferrable quotas) or organized spatially (i.e., territorial use rights in fisheries). *Id.*

182 *Id.* By guaranteeing fishery rights, RBF management schemes incentivize environmental stewardship rather than the typical “race to the bottom” that occurs with open-access fisheries. *See id.*

183 *See Sanjurjo-Rivera et al., supra* note 1, at 6 (noting “unprecedented” government expenditures on vaquita conservation with no discernable results have led to frustration and resentment in UGC coastal communities).

led to this point.<sup>184</sup> Creation of alternative livelihoods in the UGC with incomes comparable to fishing is critical not only to reduce pressure on marine species, including the vaquita and totoaba, but also to boost the economic resilience of coastal communities in a changing climate expected to increasingly wreak havoc on ocean ecosystems.<sup>185</sup>

To that end, the Mexican government must provide sustained, material benefits to support UGC coastal communities in the transition to a vaquita-friendly (and less fishing-dependent) economy.<sup>186</sup> For example, the provision of entrepreneurial micro-loans to facilitate diversification of incomes, combined with re-training opportunities, is one approach that could help.<sup>187</sup> Beyond the promotion of alternative livelihoods and the development or subsidization of alternative gear, government provision of public goods to ensure food security, healthcare, and education is essential.<sup>188</sup> Expanding the capacity of residents to acquire other skills and addressing land tenure issues currently preventing many community members from leaving the region could help further reduce fishing dependence in the UGC.<sup>189</sup> Experts have noted that approaches that empower women and girls are likely to be especially impactful in reducing economic dependence on fishing at the household scale.<sup>190</sup>

Because fishing will likely remain an important economic sector in the UGC<sup>191</sup> and fishers inherently rely on resources abundant in healthy

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184 See *id.* at 3, 13; Grenon, *supra* note 6.

185 See Sarjurjo-Rivera et al., *supra* note 1, at 1–2; see, e.g., Greg Bruno, *Climate Change Will Reshuffle Marine Ecosystems in Unexpected Ways: Sophisticated Model Reveals How Predator-Prey Relationships Affect Species' Ranges*, RUTGERS TODAY (Apr. 12, 2022), <https://www.rutgers.edu/news/climate-change-will-reshuffle-marine-ecosystems-unexpected-ways-rutgers-study-finds>.

186 Sanjurjo-Rivera et al., *supra* note 1, at 2.

187 See *id.* at 15.

188 See *id.* at 9.

189 See *id.* at 9, 15.

190 See *id.* at 8–9, 15.

191 See YANN HERRERA ET AL., EXPERT COMMITTEE ON FISHING TECHNOLOGY, A COMPREHENSIVE REVIEW OF THE RESEARCH ON ALTERNATIVE GEAR TO GILLNETS IN THE UPPER GULF OF CALIFORNIA (2004-2016) 5 (2017) [https://www.gob.mx/cms/uploads/attachment/file/379214/WP\\_Sept\\_1\\_High\\_Res\\_2\\_opt.pdf](https://www.gob.mx/cms/uploads/attachment/file/379214/WP_Sept_1_High_Res_2_opt.pdf) (observing that the UGC is “one of the most productive areas in Mexico, hosting a rich fishing ground for [small scale fisheries]”); *Baja California’s Pacific and the Sea of Cortez*, PEW CHARITABLE TRUSTS, <https://www.pewtrusts.org/en/projects/pew-bertarelli-ocean-legacy-baja-californias-pacific-and-the-sea-of-cortez> (last visited Feb. 2, 2023) (remarking that the UGC is “one of the most biologically diverse bodies of water on Earth” and was “[f]amously called ‘the world’s aquarium’ by oceanographer Jacques Cousteau”). The astonishing abundance and diversity of marine life in the UGC, combined with the lack of alternative economic

marine ecosystems, conservation actions must be structured to support the ability of local fishers to earn a living legally and sustainably.<sup>192</sup> Development of effective vaquita-safe fishing gear and methods is critical in ensuring that the vaquita population can fully recover in the years ahead. Consequently, devising a collaborative approach to accelerate the permitting, testing, and deployment of new types of gear at scale, as well as implementing a monitoring and traceability system that create market premiums for sustainable fish, should be priorities for the Mexican government and private sector.<sup>193</sup>

*B. The International Community Should Implement Individual, Legal, and Market-Based Actions to Halt Vaquita Extinction*

Urgent action from Mexico is undeniably the top priority in vaquita conservation; however, there are legal and economic actions the United States can take to ensure such steps are taken in a timely manner. Additionally, human dimensions of conservation can be intentionally leveraged in market-based approaches to create consumer demand for vaquita-safe shrimp (and other seafood) in the United States and reduce demand for totoaba swim bladders in China.

1. The United States Should Utilize the United States–Mexico–Canada Agreement Consultation Process to Obtain Meaningful Commitments and Follow-Through from Mexico

Prompted by a petition from several environmental organizations,<sup>194</sup> the Office of the United States Trade Representative (USTR) recently issued Mexico a request for consultation under the Environment Chapter of the United States–Mexico–Canada Agreement (USMCA).<sup>195</sup> In this first-of-its kind action, the USTR expressed concern

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opportunities in its coastal communities, suggest that marine resources—and specifically, fishing—will remain an economic pillar in these communities for as long as this biodiversity is maintained, underscoring the importance of its conservation. *See Sanjurjo-Rivera, supra* note 1, at 14.

192 Sanjurjo-Rivera, *supra* note 1, at 14–15; *see* Grenon, *supra* note 6.

193 *See* Sanjurjo-Rivera, *supra* note 1, at 10–11.

194 *See* Letter from Sarah Uhlemann et al., Int'l Program Dir. & Senior Att'y, Ctr. for Biological Diversity, to Ms. Kelly K. Milton, Assistant U.S. Trade Representative for Env't & Nat. Res. & Chair of the Interagency Env't Comm. for Monitoring & Enf't of the USMCA (Aug. 11, 2021), <https://www.biologicaldiversity.org/species/mammals/vaquita/pdfs/Letter-to-US-IEC-re-Vaquita-Enforcement-8-10-21.pdf>.

195 Press Release, Office of the U.S. Trade Representative, USTR Announces USMCA

about Mexico's compliance with treaty obligations to protect endangered species and to prevent illegal fishing and trafficking of totoaba.<sup>196</sup> On April 1, 2022, the Secretariat of the Commission for Environmental Cooperation (an environmental dispute body established under the USMCA) recommended a formal investigation to develop a factual record of Mexico's compliance with the "relevant laws and orders."<sup>197</sup>

If the investigation and consultation advance to a dispute settlement panel, the United States could impose tariffs or other trade sanctions on Mexico.<sup>198</sup> Because the United States represents a significant fraction of Mexico's export market,<sup>199</sup> the potential imposition of such economic sanctions may incentivize Mexico to intensify enforcement efforts and follow through on its commitments to eliminate gillnets from vaquita habitat. Trade sanctions could be, however, debilitating to communities already struggling with poverty.<sup>200</sup> Ideally, the mere threat of these measures will be sufficient to catalyze government action. The consultation could also provide opportunity for a partnership between Mexico and the United States in which the latter offers funding and technical assistance to facilitate more rapid implementation of vaquita-safe gear at scale, along with improved seafood traceability programs to reduce the laundering of unsustainably sourced seafood.<sup>201</sup> While the efficacy of the USMCA as a conservation tool remains to be seen, it could potentially strengthen economic incentives for Mexico to act, turning the tide in the fight to save the vaquita.

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Environment Consultations with Mexico (Feb. 10, 2022), <https://ustr.gov/about-us/policy-offices/press-office/press-releases/2022/february/ustr-announces-usmca-environment-consultations-mexico>.

196 Andrea Shalal & Caitlin Webber, *U.S. Seeks Trade Talks with Mexico over Endangered Vaquita Porpoise*, REUTERS (Feb. 10, 2022), <https://www.reuters.com/world/americas/us-seeks-trade-talks-with-mexico-over-marine-life-protections-2022-02-10/>.

197 *Secretariat Notification in Accordance with Articles 24.28 of the United States-Mexico-Canada Agreement*, COMM'N FOR ENV'T COOP, 1-2 (Aug. 11, 2022), [http://www.ccc.org/wp-content/uploads/wpallimport/files/21-2-adv\\_en.pdf](http://www.ccc.org/wp-content/uploads/wpallimport/files/21-2-adv_en.pdf).

198 Shalal & Webber, *supra* note 196.

199 CONGRESSIONAL RSCH. SERV., RL 32934 U.S.–MEXICO ECONOMIC RELATIONS: TRENDS, ISSUES, AND IMPLICATIONS at 2 (2020) (stating approximately 80 percent of Mexico's exports are to the United States).

200 See Tenzin, *supra* note 157. ("[T]he vitality of millions of citizens and critical markets is dependent on a strong US-Mexico [economic] partnership.").

201 See Felbab-Brown & Castillo López, *supra* note 98.

## 2. Efforts to Promote Vaquita-Safe Shrimp Should Leverage Innate Human Bias and Create a Market Niche for Vaquita-Safe Seafood

To serve as “insurance against the temptations of illegal markets,” legal fisheries must be able to provide jobs and economic security.<sup>202</sup> One way to remedy the comparatively low profitability of law-abiding fishing in the UGC is through creation of a market niche for shrimp—and other seafood—caught using vaquita-safe nets.<sup>203</sup> Such a niche would allow for premium pricing of sustainably sourced seafood, raising the return fishers get for their investment in alternative gear.<sup>204</sup> Interest in purchasing seafood harvested with “vaquita-friendly” gear among wholesale purchasers and chefs in southern California suggests at least regional market potential for this approach.<sup>205</sup> Successful implementation of such a program would require improving the traceability of seafood to make “[v]erifiable and transparent” sourcing information readily available.<sup>206</sup> Software like that developed for “Know Your Fish”<sup>207</sup> and “This Fish”<sup>208</sup> shows promise at the fishing-industry and commercial-purchase levels. Hopefully, similar smartphone applications for consumers will follow.

Cultivation of willingness to pay extra for vaquita-safe shrimp requires raising awareness about the vaquita among American seafood consumers. To expand market potential beyond southern California, development of “ecolabels” based on standards and certification in the seafood supply chain is necessary.<sup>209</sup> This initiative could be modeled after dolphin-safe tuna labeling, which is widely considered a “conservation success story.”<sup>210</sup> Such an approach should deliberately incorporate the “human dimensions” of conservation: the beliefs, values, and intrinsic motivations upon which attitudes and actions toward wildlife are based.<sup>211</sup> For example, taking full advantage of the vaquita’s charismatic

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202 Sanjurjo-Rivera et al., *supra* note 1, at 11.

203 *See id.* at 10-11; Grenon, *supra* note 6.

204 Sanjurjo-Rivera et al., *supra* note 1, at 10.

205 *See id.*; Dunch, *supra* note 27, at 584.

206 Sanjurjo-Rivera et al., *supra* note 1, at 11.

207 *Know Your Fish: Seafood Traceability Software*, VERICATCH, <https://vericatch.com/products/knowyourfish/> (last visited Mar. 14, 2022).

208 THISFISH, <https://this.fish/> (last visited Mar. 14, 2022).

209 Sanjurjo-Rivera et al., *supra* note 1, at 10.

210 Dunch, *supra* note 27, at 584.

211 *See id.* at 583.

megafauna attributes<sup>212</sup> by deliberately emphasizing its panda-like face could help increase sympathy among consumers, augmenting the efficacy of a market-based strategy. Centering conservation on charismatic megafauna is, ordinarily, deeply problematic.<sup>213</sup> However, given the well-documented lag in human sympathy towards fish compared to more easily anthropomorphized species,<sup>214</sup> accentuating the suffering of the “smiling panda”<sup>215</sup> may be the best hope for saving both the vaquita *and* the (arguably less adorable) totoaba from extinction.

A similar tack should be taken in China. The significance of pandas in Chinese culture<sup>216</sup>—particularly the panda’s symbolic connection to Chinese diplomacy<sup>217</sup>—should not be overlooked. Emphasizing visual parallels with the “panda of the sea” and including this nickname when raising awareness about the detrimental impacts of the totoaba bladder trade could help align cultural values with the desired conservation outcome: elimination of demand for totoaba swim bladder.<sup>218</sup>

### 3. Emulating Strategies from the Campaign to End the Shark Fin Trade Could Help Curb Totoaba Black Market Demand, Reducing Vaquita Deaths

To reduce the market demand driving totoaba poaching, experts have suggested an approach analogous to the public campaign against

212 Amber Pariona, *Who Are the Charismatic Megafauna of the World?* WORLD ATLAS (Apr. 25, 2017), <https://www.worldatlas.com/articles/who-are-the-charismatic-megafauna-of-the-world.html>.

213 See, e.g., Robert J. Smith et al., *Identifying Cinderella Species: Uncovering Mammals with Conservation Flagship Appeal*, 5 CONSERVATION LETTERS 205, 205–10 (2012) (discussing flaws of focusing conservation efforts on charismatic species).

214 See, e.g., James McWilliams, *Why Fish Can No Longer Escape Our Conscience*, FREE FROM HARM (July 30, 2013), <https://freefromharm.org/farm-animal-intelligence/why-we-have-no-compassion-for-fish/>.

215 Lottie Limb, *Vaquitas: Scientists Find Last of the Species Can Survive Interbreeding – If Illegal Fishing Stops*, EURONEWS, <https://www.euronews.com/green/2021/11/25/vaquitas-what-are-the-smiling-pandas-of-the-sea-and-why-are-they-going-extinct> (last updated May 21, 2022).

216 See Alexa Oleson, *Chinese People Used to Think Pandas Were Monsters*, FOREIGN POL’Y MAG. (Oct. 23, 2014) <https://foreignpolicy.com/2014/10/23/chinese-people-used-to-think-pandas-were-monsters/> (noting that the Giant Panda “has become synonymous with 5,000 years of Chinese history”).

217 See S.H., *Why China Rents Out Its Pandas*, THE ECONOMIST (Jan. 18, 2019), <https://www.economist.com/the-economist-explains/2019/01/18/why-china-rents-out-its-pandas> (explaining role of pandas in China’s diplomacy); Grenon, *supra* note 6.

218 Grenon, *supra* note 6.

the shark fin trade.<sup>219</sup> Similar to the strategy used to reduce demand for shark fin soup,<sup>220</sup> celebrities could speak out against the purchase of totoaba bladders. In combination with efforts to educate the public, celebrity campaigns can aid in denouncing possession of totoaba swim bladders—a shift in social norms that is essential to curbing long-term demand.<sup>221</sup> Another crucial aspect to reducing demand is widely publicizing that there is not yet any decisive scientific evidence indicating health benefits from consumption of totoaba bladder.<sup>222</sup> Raising awareness, through targeted campaigns, that the totoaba trade is directly responsible for the extinction of vaquitas is important and could benefit from integration of charismatic megafauna visuals, as noted above. As with the shark fin trade, direct pressure applied to governments and companies can help drive these changes.<sup>223</sup> Improved enforcement of the existing prohibition on the totoaba swim bladder trade under CITES—for example, through interception and seizure of the swim bladders by customs officials and law enforcement—is also critical.<sup>224</sup> Such efforts require strengthening inter-agency and inter-governmental collaboration, communication, and data-sharing.<sup>225</sup> Finally, sustained international political and diplomatic pressure on China to improve enforcement is necessary.<sup>226</sup>

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219 See Sanjurjo-Rivera et al., *supra* note 1, at 15.

220 *Id.*

221 See CBD Rhino Petition, *supra* note 161, at 14, 33 (discussing reduction of demand through education and noting role of “celebrity ambassadors” in education).

222 See Mayra L. González-Félix et al., *First Report on the Swim Bladder Index, Proximate Composition, and Fatty Acid Analysis of Swim Bladder from Cultured Totoaba macdonaldi Fed Compound Aquafeeds*, 21 AQUACULTURE REPS. 1, 7 (2021).

223 Cf. Alan Yu, *Shark Fin Trade Faces Troubled Waters as Global Pressure Mounts*, NPR (Nov. 7, 2017), <https://www.npr.org/sections/thesalt/2017/11/07/561900736/shark-fin-trade-faces-troubled-waters-as-global-pressure-mounts> (outlining actions taken by governments and companies in response to pressure from conservation organizations).

224 See Jen Sawada, *From Villain to Vulnerable: How a Decade Changed the Perception of Sharks*, PEW CHARITABLE TRS. (Mar. 1, 2019), <https://www.pewtrusts.org/en/research-and-analysis/articles/2019/03/01/from-villain-to-vulnerable-how-a-decade-changed-the-perception-of-sharks>.

225 See *id.*; Sundareshan, *supra* note 31, at 236, 239 (highlighting importance of inter-agency collaboration).

226 See Vanda Felbab-Brown, *China-Linked Wildlife Poaching and Trafficking in Mexico*, FOREIGN POL’Y BROOKINGS, Mar. 2022, at 20-21, [https://www.brookings.edu/wp-content/uploads/2022/03/FP\\_20220328\\_wildlife\\_trafficking\\_felbab\\_brown.pdf](https://www.brookings.edu/wp-content/uploads/2022/03/FP_20220328_wildlife_trafficking_felbab_brown.pdf) (noting “substantial pressure” from U.S. and Mexico drove China’s interdiction efforts against totoaba bladder smugglers and retailers in 2018, and Chinese authorities increased penalties for totoaba smuggling upon “urging” Mexican diplomats).

## CONCLUSION

The vaquita has been hanging on by a thread for far too long. Examining why and how efforts to conserve the species have fallen short sheds light on the steps that are urgently needed to prevent its imminent extinction. While improved enforcement of regulatory measures banning gillnet fishing in the vaquita's habitat is crucial to saving the species, long-term efforts to create a sustainable human and natural environment in which the vaquita population can recover and thrive are equally essential. Saving the vaquita demands a coordinated approach that focuses not just on eliminating the proximate cause of the species' near extinction, but also on adequately addressing the social, political, and economic obstacles affecting the surrounding coastal communities.<sup>227</sup> Hopefully, with help from the international community, the Mexican government can support a transition to alternative livelihoods and means of fishing for UGC coastal communities and create a new structure of incentives where the benefits of legal activities far outweigh the benefits of illegal activity.<sup>228</sup>

If these strategies prove successful, they could be applied in efforts to save other endangered species.<sup>229</sup> Rights-based fisheries management lessons from the UGC may apply to other small-scale fisheries where conservation policies to reduce bycatch and overfishing are seen as conflicting with local values, cultural identities, economies, and wellbeing. More broadly, vaquitas represent just one illustration of a growing trend where organized crime, wildlife trafficking, and biodiversity decline are intertwined.<sup>230</sup> Successfully resolving these problems requires untangling the complicated socio-ecological context in which they arise, along with the economic, political, and institutional challenges that allow them to flourish.<sup>231</sup> If marine wildlife conservation and fisheries management reforms are aligned with economic incentives and consideration for human wellbeing, conservation policies can benefit both communities and endangered species.

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227 See Grenon, *supra* note 6.

228 *See id.*

229 *See id.*

230 Sanjurjo-Rivera et. al., *supra* note 1, at 1; *see* Grenon, *supra* note 6.

231 *See* Grenon, *supra* note 6.

