



## GLOBAL FISHERIES: THE EMERGENCE OF A SUSTAINABLE SEAFOOD MOVEMENT

### GLOBAL FISHERIES DECLINE

Fisheries have long played an important role in sustaining human populations around the globe and are a key indicator of overall ocean health. Yet despite the sea's social and ecological importance, it was only relatively recently that the limits of the sea's bounty were tested and realized. In the past, the sea was perceived to be unending in abundance, as can be seen in oral, written, and archaeological records in locations as diverse as New Zealand<sup>1</sup> and the Caribbean.<sup>2</sup> This perception is reflected in Thomas Huxley's 1883 speech to the International Fisheries Exhibition in London, where he famously declared, "the cod fishery, the herring fishery...and probably all the great sea fisheries are inexhaustible; that is to say that nothing we do seriously affects the number of fish."<sup>3</sup> Within a matter of decades, technological and social changes in the fisheries sector would prove Huxley abysmally wrong.

### Technological and Social Changes Drive the Decline

Despite Huxley's optimism, technological advances allowed such extensive overfishing that it was impossible to ignore the sea's limits. With the advent of steam power at the turn of the 20th century came larger, more efficient vessels that traveled farther offshore and harvested greater quantities of fish.<sup>4</sup> Fishing pressure intensified through the 1920s with the introduction of on-

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<sup>1</sup> Atholl Anderson, "A Fourteenth-Century Fishing Camp at Purakanui Inlet, Otago," *Journal of the Royal Society of New Zealand*, 1981: 218.

<sup>2</sup> Jeremy B. C. Jackson, "What Was Natural in the Coastal Oceans?" *PNAS*, 2001: 5412.

<sup>3</sup> Quoted in: Edward H. Allison, "Big Laws, Small Catches: Global Ocean Governance and the Fisheries Crisis," *Journal of International Development*, 2001: 938.

<sup>4</sup> "Brief History of the Groundfishing Industry in New England," National Oceanic and Atmospheric Administration, <http://www.nefsc.noaa.gov/history/stories/groundfish/grndfish2.html#of> (June 6, 2016).

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Julia G. Mason, Alana F. Springer, and Professors Pamela Matson, Julia Novy-Hildesley and William Barnett prepared this case as the basis for class discussion rather than to illustrate either effective or ineffective handling of an administrative situation.

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board freezers, which allowed ships to stay at sea for months with expanded storage capacity. Freezing technology also created new markets, as frozen fish fillets could be transported inland, reaching more consumers.<sup>5</sup> Technological innovations thus contributed to overfishing by increasing catch efficiency and expanding the consumer base.

The aftermath of World War II marked an acceleration of overfishing. During the war, hungry troops created high demand for fish.<sup>6</sup> After the war, thousands of soldiers returned to their former fishing jobs, increasing fishing pressure abruptly and dramatically. The fishing industry adopted naval wartime technology, including faster ships and improved tracking and communications technologies, and some countries used wartime dividends to expand fishing fleets.<sup>7</sup>

Over the next several decades, technological advancements spread as fishing again became central to many countries' economies.<sup>8</sup> In Europe especially, the fishing industry focused on quantity over quality of seafood, as the sudden influx of fishers flooded seafood markets, driving down prices and forcing fleets to bring in larger catches to make a living. As more, larger, and more efficient boats proliferated, the first fisheries collapsed. One famous example is the Monterey Cannery Row sardine crash in the 1950s, which brought ruin to the region.<sup>9</sup> In Monterey and elsewhere, however, people were caught up in the bounty, and failed to heed the warning signs.

In the 21st century, global population growth and technological advancement continued to spur overfishing. In 2015, around 3 billion people, nearly half the world's population, looked to marine species as their major source of protein.<sup>10</sup> This reliance, along with a growing taste for fish in many developed nations, created a staggering demand for seafood, which fishers around the world met by harvesting in deeper and more remote waters. Improvements to vessels and fish-finding technology allowed fleets to harvest at depths of up to 2,000 meters and catch species that were longer-lived and slower to reproduce and replenish.<sup>11</sup> As early as the 1980s, it was becoming clear that increased demand and fishing efficiency would not lead to greater catches. Instead, declining stocks resulted in plateauing catch rates (Exhibit 1) as fleets worked harder and with better technology to catch the same amount of fish.

### **Government Regulations Attempt to Slow the Decline**

As fish stocks decreased in the 20th and 21st centuries, governments around the world implemented a variety of strategies to slow the decline. In the 1940s and 1950s, national governments began to stake claim over the waters adjacent to their coasts, creating Exclusive

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<sup>5</sup> Ray Hilborn and Ulrike Hilborn, *Overfishing: What Everyone Needs to Know*, Oxford University Press, 2012, p. 6.

<sup>6</sup> *Ibid.*

<sup>7</sup> Poul Holm, "WWII and the 'Great Acceleration' of North Atlantic Fisheries" *Global Environment* 10 (2012): 80.

<sup>8</sup> *Ibid.*, pp. 83-84.

<sup>9</sup> David Schmalz, "The modest little fish--and Monterey icon--contains grand teachings on how to manage fish populations," Monterey County Weekly, January 1, 2014, [http://www.montereycountyweekly.com/archives/2014/0102/the-modest-little-fish-and-monterey-icon-contains-grand-teachings/article\\_d68733a2-727e-11e3-95cc-0019bb30f31a.html](http://www.montereycountyweekly.com/archives/2014/0102/the-modest-little-fish-and-monterey-icon-contains-grand-teachings/article_d68733a2-727e-11e3-95cc-0019bb30f31a.html), (July 12, 2016).

<sup>10</sup> World Wildlife Fund, "Living Blue Planet Report: Species, habitats, and human well-being" (2015): 42.

<sup>11</sup> *Ibid.*, p. 26.

Economic Zones (EEZs) extending 200 nautical miles into the sea.<sup>12</sup> These zones granted coastal nations special rights to exploit natural resources found in these areas, including fisheries.<sup>13</sup> By 1982, EEZs were formalized for all coastal nations<sup>14</sup> in the hope that this would incentivize countries to manage their fisheries sustainably. By granting fishing rights to governments, however, EEZs often undermined traditional fishing and disempowered those most knowledgeable about the resource. Overfishing raged where governments did not devote ample time and resources to monitor fishing in their EEZs.

After the formalization of EEZs in 1982, many governments tried to curb overfishing by regulating who could fish, how they could fish, and how much they could catch. Permits limited the number of boats in a fishery, while gear restrictions regulating the size and type of boats or nets tried to level the playing field. Gear restrictions created a “technological arms race” as fishers innovated around regulations.<sup>15</sup> Other policies regulated effort through closed areas or seasons, or implementing a total allowable catch (TAC).<sup>16</sup> TACs set the total allowable tonnage per species in a fishery that could be landed per season and banned additional fishing once the TAC for that particular species was reached. TACs spurred a “race to fish”<sup>17</sup> as fishers rushed to harvest TAC-controlled species before competitors beat them to it. This rush prompted fishers to operate in dangerous conditions and encouraged short fishing seasons, as TAC limits could be reached in days by fishers trying to outdo one another.

To reduce the race to fish, and in so doing promote safe harvesting and provide fishers with reliable access to fishing, governments implemented individual transferrable quota (ITQ) in tandem with TACs. This privatized TAC shares by assigning them directly to fishers or organizations.<sup>18</sup> Unfortunately, this tactic incentivized fishers to toss fish overboard if they did not have the ITQ to land them or jettison smaller fish in order to “high-grade” their TAC portion.<sup>19</sup> Furthermore, the ITQ system concentrated fishing rights among wealthier fishers and corporations, as small-scale fishers were often bought out and left without the means to legally access fisheries. These unintended social, ecological, and economic consequences exposed the drawbacks of top-down, government-imposed fishing regulations.

Alongside national policies like TACs and ITQs, the late 20th century saw the introduction of international agreements to curb overfishing. One of the most well known was the United Nations Convention on the Law of the Sea (UNCLOS), which legitimized participating nations’ claims to various portions of the ocean, ranging from the nearshore to the seabed.<sup>20</sup> Another well-known policy was the United Nations Food and Agriculture Organization’s (FAO) Code of

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<sup>12</sup> Michael Earle, “Fishing in the Commons,” in *Genes, Bytes and Emissions: To Whom Does the World Belong?* (Heinrich Böll Stiftung: Berlin, 2008): p.1

<sup>13</sup> “What is the EEZ?,” National Oceanic and Atmospheric Administration, <http://oceanservice.noaa.gov/facts/eez.html> (June 29, 2016).

<sup>14</sup> Earle, loc. cit.

<sup>15</sup> Allison, op. cit., p. 940.

<sup>16</sup> Allison, loc. cit.

<sup>17</sup> B. A. Cook, “Maximum Social Returns for Canada’s Pacific Halibut Fishery,” *North American Journal of Fisheries Management* 10 (1: 1990).

<sup>18</sup> Allison, op. cit., p. 940.

<sup>19</sup> Barry Torkington, “New Zealand’s Quota Management System—Incoherent and Conflicted,” *Marine Policy* 63 (2016): 181.

<sup>20</sup> Allison, op. cit., p. 938.

Conduct for Responsible Fisheries, developed in 1994 and 1995.<sup>21</sup> While well intended, international agreements fell short because they lacked regulatory power and were unable to enact significant change on the water.<sup>22</sup>

### **Widespread Fisheries Collapse**

Despite national and international efforts to curb fisheries declines, fish stocks around the world were in poor shape by the latter half of the 20th century. Dick Jones, executive director of Ocean Outcomes and a fisherman in his youth, recalled: “We had a family business that was dependent on [fish] yet we did nothing to protect them. We trusted the government would do the right thing to protect the resource and protect us, but that didn’t happen.”<sup>23</sup> After three generations in the fishing industry, the Jones family was driven out of business because there were not enough fish to catch. This experience was reflected on a larger scale by a massive loss of livelihood in Newfoundland, Canada after cod stocks crashed in the early 1990s, putting 40,000 fishers out of work (see Box 2).<sup>24</sup> Despite all these efforts, fish stocks were crashing, hurting fishers worldwide and the oceans. This was a rude awakening: the seas were exhaustible and industry, government, and conservation organizations would have to take decisive action to ensure the future of fish.

## **FISHING FOR SOLUTIONS: THE RISE OF THE SUSTAINABLE SEAFOOD MOVEMENT**

### **Broader Environmental Momentum**

The sustainable seafood movement unfolded amidst general social-ecological trends of environmentalism, faith in markets, and concern about food. The U.S. environmental movement had emerged in the 1960s, sparked by Rachel Carson’s *Silent Spring*<sup>25</sup> and crises like the Cuyahoga River fire. These events led to environmental legislation like the 1970 establishment of the Environmental Protection Agency (EPA), the 1972 Clean Water Act, and the 1973 Clean Air Act. The organic food and fair trade movements began to gain traction internationally throughout the 1960s and 1970s as consumers grew concerned with the origins and impact of their foods and products.<sup>26</sup> The Forestry Stewardship Council (FSC), a community-driven certification and eco-labeling program, was established in 1993 to provide customers with certified, sustainable timber identifiable by a credible ecolabel.<sup>27</sup> The FSC demonstrated how consumer power could shape resource harvesting practices. Increasingly, environmentalists turned to market forces to promote sustainability.

In the seafood industry, meanwhile, legislators, managers, and fishers alike sought to promote sustainable fishing. Government responses to overfishing had realized few benefits and new

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<sup>21</sup> Ibid., p. 941.

<sup>22</sup> Ibid., p. 938.

<sup>23</sup> Interview with Dick Jones, executive director, Ocean Outcomes, May 12, 2016.

<sup>24</sup> “Cod recovery ‘quite spectacular,’ but George Rose calls for caution.” CBC News, October 28, 2015, <http://www.cbc.ca/news/canada/newfoundland-labrador/cod-fish-comeback-moratorium-1.3291994> (5 July 2016).

<sup>25</sup> Rachel L. Carson, *Silent Spring* (First Mariner Books: New York, New York, 1962).

<sup>26</sup> “History of the Organic Movement,” The Organics Institute, 2016, <http://theorganicsinstitute.com/organic/history-of-the-organic-movement/> (July 12, 2016).

<sup>27</sup> Stefano Ponte, “The Marine Stewardship Council (MSC) and the Making of a Market for ‘Sustainable Fish,’” *Journal of Agrarian Change* 12 (2: 2012): 304.

solutions were needed. As Michael Sutton, then the vice president of the World Wildlife Fund for Nature (WWF), described, “The sustainable seafood movement was born out of frustration.”<sup>28</sup> Exasperated with deteriorating fish stocks and futile remedies, industry and non-governmental organization (NGO) leaders looked to the environmental movement’s newest tool: the market.

### **Harnessing Markets: The Birth of the Marine Stewardship Council**

Market forces were first harnessed in an effort to promote sustainable seafood in 1997 when WWF initiated a novel partnership with Unilever, a Dutch transnational consumer products company that included the largest frozen seafood business in the world (See Box 3).<sup>29</sup> Sutton recalled that in order to succeed, this partnership of unlikely bedfellows required “persistence, pragmatism, and thick skin,” as the world’s largest environmental organization and the giant transnational corporation shared a common goal—sustainable seafood—but had very different motivations. WWF was interested in securing the long-term health of the world’s oceans and exploring routes to sustainability that did not rely on government interventions, as had been popular—and unsuccessful—in the past.<sup>30</sup> As Meredith Lopuch, then the director of WWF’s major buyers’ initiative team, described, “the market incentives represented a way to get at the personal motivations of many people and come at this problem from a different perspective.”<sup>31</sup> Unilever, meanwhile, was concerned with protecting its stake in the seafood market and the stability of its supply chains. As the public became aware of declining fish stocks, Unilever feared consumers would turn away from seafood, if there was any left.<sup>32</sup> As Dierk Peters, then Unilever’s international marketing manager, stated, “We are involved in certification because we want to assure a steady supply of fish to sell and maintain our leading brand image.”<sup>33</sup> Despite having very different motivations, WWF and Unilever came together to use market forces to promote sustainable seafood, realizing, as Brad Ack, senior vice president of WWF’s Oceans Program, put it, “if you don’t move together, you don’t move.”<sup>34</sup> Their collaboration produced the Marine Stewardship Council (MSC), launched in 1997.

The MSC, modeled after the FSC,<sup>35</sup> was a certification scheme that identified and verified sustainable seafood producers. The MSC’s vision and certification scheme incorporated previous policies, such as the FAO’s Code of Conduct for Responsible Fisheries, as well as input from hundreds of individuals and organizations in the fishing industry, government, scientific community and conservation groups worldwide.<sup>36</sup> Conservation NGOs now faced a new challenge: communicating the value of sustainable seafood and certification in a way that

<sup>28</sup> Interview with Michael Sutton, founding board member, Ocean Champions, May 5, 2016.

<sup>29</sup> Michael Sutton & Laura Wimpee, “Towards Sustainable Seafood: the Evolution of a Conservation Movement” in *Seafood Ecolabelling: Principles and Practice* (Blackwell Publishing: Oxford, 2008): pp. 406.

<sup>30</sup> D. J. Agnew, N. L. Gutierrez, A. Stern-Pirlot and D. D. Hoggarth, “The MSC Experience: Developing an Operational Certification Standard and a Market Incentive to Improve fishery sustainability” *ICES Journal of Marine Science* (2013): 1.

<sup>31</sup> Interview with Meredith Lopuch, program officer, Moore Foundation, May 4, 2016.

<sup>32</sup> Sutton & Wimpee, op. cit., p. 406.

<sup>33</sup> Quoted in: Robert Searle, Susan Colby, and Katie Smith Milway, “Moving Eco-Certification Mainstream” (The Bridgespan Group: July 2004) p. 14.

<sup>34</sup> Interview with Brad Ack, senior vice president, Oceans Program at WWF, May 23, 2016.

<sup>35</sup> Agnew et al., op. cit., p. 1.

<sup>36</sup> Lars H. Gulbrandsen, “The Emergence and Effectiveness of the Marine Stewardship Council” *Marine Policy* 33 (2009): 655.

resonated with business. Those that articulated the practical and economic value of sustainable seafood supply, couched in business language, were successful in encouraging corporate participation in MSC certification.<sup>37</sup>

Philanthropic foundations provided the financial support necessary to launch these partnerships. Their funding, for example, freed the MSC from business dollars that might have influenced certification standards.<sup>38</sup> Lopuch stated that, “the history of the sustainable seafood movement...rests on the shoulders of the work of the Packard and Walton foundations,” but the David and Lucile Packard Foundation, Walton Family Foundation, Moore Foundation, and Skoll Foundation have all recently supported the MSC.<sup>39</sup> These and other philanthropic organizations provided the financial backing necessary to initiate and dramatically expand a diverse group of organizations concerned with sustainable seafood.

### Raising Consumer Awareness

A successful market-based initiative would require consumer demand for sustainable seafood. While European and U.K. consumers sought ecolabels, awareness lagged in the United States. Despite scientific findings of threatened ocean ecosystems and crashing fisheries, the public was not concerned with overfishing. Several NGOs filled this gap, including SeaWeb, an organization that fostered inter-sector communication to tackle environmental issues.<sup>40</sup> SeaWeb took two major actions. The first was to train scientists to clearly convey the urgency of fisheries decline and work with media to spread this news publicly. In 1999, Vikki Spruill, SeaWeb’s founder, along with future NOAA Administrator Jane Lubchenco and the Packard Foundation, created COMPASS (originally Communication Partnership for Science and the Sea) to complement SeaWeb’s efforts to improve scientists’ communication skills. COMPASS helped launch landmark scientific papers, including Ransom Myers’s 2003 *Nature* paper revealing 90 percent of big fish were gone<sup>41</sup> and Boris Worm’s 2006 *Science* article predicting the end of wild-caught fish by 2048,<sup>42</sup> to international front-page news, spurring widespread public conversation and concern.<sup>43</sup>

SeaWeb’s second action was to conduct the first U.S. national ocean attitudes poll. The poll revealed that narratives of fish in peril did not resonate with the public because people did not care about fish as wildlife—they cared about fish as food. SeaWeb became one of the first organizations to connect ocean conservation to the plate<sup>44</sup> with a series of seafood boycott

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<sup>37</sup> Interviews with Teresa Ish, Marine Program officer, Walton Family Foundation, May 18, 2016; Phil Gibson, CEO, Resiliensea Group, Inc, May 10, 2016; and Jim Leape, consulting professor, Stanford University, May 2, 2016.

<sup>38</sup> Jim Leape, “The Marine Stewardship Council,” *Stanford Woods Institute for the Environment* (2015): p. 15.

<sup>39</sup> “Three Foundations Invest More than \$10 Million in Marine Stewardship Council to Grow Global Sustainable Seafood Market” Walton Family Foundation Press Release, September 4, 2012, <http://www.waltonfamilyfoundation.org/newsroom/three-foundations-invest-more-than-10-million-in-marine-stewardship-council> (July 6, 2016).

<sup>40</sup> SeaWeb, “Our Mission” <http://www.seaweb.org/about.php> (June 7, 2016).

<sup>41</sup> Ransom A. Myers and Boris Worm, “Rapid worldwide depletion of predatory fish communities,” *Nature*, 2009, 423 (6937): 280-283.

<sup>42</sup> Boris Worm et al., “Impacts of biodiversity loss on ocean ecosystem services,” *Science*, 2006, 314 (5800): 787-790.

<sup>43</sup> Interview with Vikki Spruill, president and CEO, Council on Foundations, May 20, 2016.

<sup>44</sup> Interview with Ned Daly, senior projects advisor, Seafood Choices Alliance, May 18, 2016.

campaigns. SeaWeb successfully captured the public with compelling slogans, simple asks, and partnerships with celebrity chefs. Their “Give Swordfish a Break” campaign convinced food service companies, cruise ship lines, and hundreds of chefs to remove overfished Atlantic swordfish from their menus until the population recovered. Within three years, the International Commission for the Conservation of Atlantic Tunas (ICCAT), which governed swordfish fishing, established quotas to rebuild Atlantic swordfish populations and the U.S. National Marine Fisheries Service established protected swordfish nursery areas. Those swordfish populations were declared 94 percent recovered in 2002, four years after SeaWeb’s campaign launched.<sup>45</sup>

Similar single-species campaigns followed. The National Environmental Trust’s “Take a Pass on Chilean Seabass” initiative enlisted premier chefs to stop serving the slow-growing Antarctic fish<sup>46</sup> while their “Pure Salmon” campaign partnered with organizations in the U.S., Canada, Europe, Australia, and Chile, to use publicized events and video testimonials to urge salmon farming companies to improve labor practices and reduce harmful waste disposal and antibiotic use.<sup>47</sup> The Institute for Ocean Conservation Science, SeaWeb, and National Resource Defense Council’s “Caviar Emptor” movement successfully pushed to list beluga sturgeon as endangered and encouraged consumption of sustainable caviar.<sup>48</sup> Spruill calls the sustainable seafood movement’s communications efforts its “secret sauce:” they initiated the public awareness needed to catalyze corporate and government actions.

Other groups developed rating systems to educate consumers. In 1998, Carl Safina and the National Audubon Society published the Seafood Lover’s Guide (Exhibit 3), the first consumer guide to sustainable seafood. It ranked the “least problematic” seafood green and the “most problematic” red.<sup>49</sup> The Monterey Bay Aquarium’s Seafood Watch program, established in 2001,<sup>50</sup> added science-based criteria to these rankings and labeled fisheries green for “best choice,” yellow for “good alternative,” and red for “avoid.” Rankings were distributed as wallet guides, turning aquarium visitors into informed seafood consumers. Originally intended as an “interim tool” while few MSC-certified products were available,<sup>51</sup> Seafood Watch became an integral player in sustainable seafood, distributing hundreds of thousands of wallet guides a year<sup>52</sup> and forming over 1,000 partnerships with conservation groups, zoos, aquariums, and museums to spread awareness of sustainable seafood. Seafood Watch also worked with

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<sup>45</sup> SeaWeb, “Give Swordfish A Break!” <http://seaweb.org/initiatives/swordfish/index.html> (June 30, 2016).

<sup>46</sup> Brian Handwerk, “U.S. Chefs Join Campaign to Save Chilean SeaBass,” National Geographic News, May 22, 2002, [http://news.nationalgeographic.com/news/2002/05/0522\\_020522\\_seabass.html](http://news.nationalgeographic.com/news/2002/05/0522_020522_seabass.html) (July 12, 2016)

<sup>47</sup> Center for Food Safety press release, “CFS and Pure Salmon Campaign Expose Hidden Costs of Farmed Salmon,” October 12th, 2006, <http://www.centerforfoodsafety.org/press-releases/889/cfs-and-pure-salmon-campaign-expose-hidden-costs-of-farmed-salmon>, (July 12, 2016).

<sup>48</sup> Ellen Pikitch and Phaedra Doukakis, “Caviar Emptor -- Educating the Consumer” Institute for Ocean Conservation: Projects, <http://oceanconservationscience.org/projects/sturgeon/caviar.shtml> (July 12, 2016).

<sup>49</sup> Lars H. Gulbrandsen, “The emergence and effectiveness of the Marine Stewardship Council,” *Marine Policy* 2009, 33 (4): 654-660; Jennifer Jacquet et al. “Conserving wild fish in a sea of market-based efforts,” *Oryx* 2009, 44 (1): 45-56; Audubon Seafood Wallet Card, 2002.

<sup>50</sup> Jennifer Dianto Kemmerly, “Monterey Bay Aquarium’s Seafood Watch Programme” in *Seafood Ecolabelling: Principles and Practice* (Blackwell Publishing: Oxford, 2008), p. 342.

<sup>51</sup> Kemmerly, op. cit., p. 343.

<sup>52</sup> Kemmerly, op. cit., p. 344.

restaurants and retailers in most major U.S. markets to provide consumers with sustainable choices.<sup>53</sup>

## CORPORATE PARTNERSHIPS MARK A TURNING POINT

### Keystone Corporations

The mid-2000s marked a shift in the movement's focus from consumers to corporations. Leaders of the movement realized that in the hourglass-shaped seafood market, the "neck" of the few hundred corporations and few dozen suppliers provided more leverage than the millions of fishermen and billions of consumers on either end.<sup>54</sup> Targeting corporations allowed for "choice-editing:" providing only sustainable options rather than relying on consumer decisions.<sup>55</sup> The time was ripe to focus on corporations, as communications efforts had created corporate concern over future availability of seafood supply and demand for sustainable fish. Furthermore, it was clear that sustainable seafood could increase revenue, mitigate risk of fish population collapses resulting in supply chain rebuilding, and meet demand while reducing consumer criticism. The business value of sustainable seafood had come into focus, and corporations were ready to come to the table.

The MSC and broader NGO community first sought out smaller, values-based companies, like Sainsbury's in the U.K. and Whole Foods in the United States, and identified a company champion who could embed sustainability in the businesses' everyday practices. One champion was Jones, then Global Seafood Director at Whole Foods. When the MSC approached Whole Foods in 1999, Jones "jumped on it." They were the first U.S. company to sell an MSC certified product—Western Australian rock lobster—and by Earth Day 2012 no longer stocked products on the Seafood Watch red list.<sup>56</sup> During this period, "shaming advocates" such as Greenpeace publicly exposed poor industry practice via accountability campaigns including "Carting Away the Oceans," nudging corporations into partnerships with moderate NGOs like the Environmental Defense Fund (EDF) and WWF.<sup>57</sup> By couching seafood sustainability in business terms and communicating it as a value proposition, NGOs were able to partner with corporations and lend credibility to the movement.

A major turning point in the movement was Walmart's 2006 commitment to sustainable seafood, brokered by Peter Redmond, then Walmart vice president of seafood and deli, and Scott Burns, then director of WWF's Marine Conservation Program (See Box 4). Walmart's leadership galvanized the seafood supply chain and a cascade of commitments followed. Many suppliers and producers needed Walmart's business; others did not want to seem less progressive. Within

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<sup>53</sup> "Our Partners," Monterey Bay Aquarium Seafood Watch, 2016, <http://www.seafoodwatch.org/businesses-and-organizations/partners> (June 7, 2016).

<sup>54</sup> Jason Clay, "How big brands can help save biodiversity," TED Talk, July 2010, [http://www.ted.com/talks/jason\\_clay\\_how\\_big\\_brands\\_can\\_help\\_save\\_biodiversity?language=en](http://www.ted.com/talks/jason_clay_how_big_brands_can_help_save_biodiversity?language=en) (July 8, 2016).

<sup>55</sup> Interview with Jim Cannon, CEO, Sustainable Fisheries Partnership, May 31, 2016.

<sup>56</sup> "No More Red-Rated Wild Seafood In Our Stores," Whole Story: The Official Whole Foods Market Blog, April 22 2012, <http://www.wholefoodsmarket.com/blog/whole-story/no-more-red-rated-wild-seafood-our-stores> (July 13, 2016).

<sup>57</sup> Gutierrez, Alexis and Morgan, Sian, "The influence of the Sustainable Seafood Movement in the US and UK capture fisheries supply chain and fisheries governance" *Frontiers in Marine Science* 2 (2015): 1-15.



a few years, retailers including McDonalds, Woolworths, and IKEA<sup>58</sup> and food service companies such as Sodexo,<sup>59</sup> Aramark, Compass Group North America, and Bon Appetit Management Company<sup>60</sup> also committed to sustainable seafood. Sustainability became the norm and businesses took initiative to safeguard their supply and reputation. As corporations sought to shift to sustainable seafood, new groups such as the Sustainable Fisheries Partnership (SFP) and FishWise emerged to guide them. In one instance, Phil Gibson, then Safeway's director of seafood, approached FishWise to design and implement Safeway's seafood sustainability policy.<sup>61</sup> Between 2010 and 2015, they made Safeway's fresh and frozen fish "environmentally responsible," shifting 29 million pounds of seafood to sustainable sources.<sup>62</sup> Businesses entered, as Jones put it, "the land of carrots," with certifications and ratings from the MSC and Seafood Watch, coupled with the support of groups like FishWise, making sustainable sourcing easier than ever. Corporations stood to gain consumer support, global reputation, and a secure supply. Over the next decade, corporate and producer participation in seafood certification schemes skyrocketed, without need for pressure from regulatory "sticks" (Exhibit 4).<sup>63</sup>

### **Unifying and Broadening the Movement**

Widespread corporate commitments to sustainable seafood revealed challenges that needed to be addressed for the movement to succeed. Most pressing, there was not enough certified product to meet demand from buyers like Walmart and McDonalds. The low-hanging fruit of large, fairly well-managed fisheries had been picked, and more challenging fisheries would need to be tackled. McDonalds CEO Gary Johnson, caught between sustainability commitments and maintaining relationships with trusted suppliers, challenged his supply chain to find a solution. He sent technical advisor Jim Cannon to consult with fisheries managers and suppliers in the Baltic Sea, and the first Fisheries Improvement Project (FIP) was born.<sup>64</sup> By rewarding fisheries making efforts toward sustainability, FIPs allowed fisheries to participate in the sustainable seafood market even if they could not meet the gold standard of certification. This created greater market penetration and involved fisheries from developing countries that could not afford full certification.<sup>65</sup>

Another issue was the proliferation of ecolabels and certifications in response to corporate interest. Over 50 ecolabels sprang up, covering various issues and geographic scales.<sup>66</sup> All had unique standards and companies tended to partner with the least stringent. To combat "greenwashing," or claims of sustainability with no actual environmental improvement, the FAO published ecolabeling guidelines in 2009 and 2011 for consistency and compliance with

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<sup>58</sup> State of Sustainability Initiatives (SSI) Review: Standards and the Blue Economy, 2016, p. 7.

<sup>59</sup> Jim Leape, *op. cit.*, p. 8.

<sup>60</sup> Sutton & Wimpee, *op. cit.*, p. 410.

<sup>61</sup> Interview with Phil Gibson.

<sup>62</sup> "Success Stories of the Common Vision: the FishWise and Safeway Partnership," Conservation Alliance for Seafood Solutions, March 14 2016, <http://www.solutionsforseafood.org/news/success-stories-of-the-common-vision-the-fishwise-and-safeway-partnership/> (July 13, 2016).

<sup>63</sup> Leape, *loc. cit.*

<sup>64</sup> Interview with Jim Cannon.

<sup>65</sup> Interview with Mike Sutton; "Are Fisheries Improvement Projects really delivering change on the water?" WWF Global, April 25, 2016, [http://wwf.panda.org/wwf\\_news/?266190/Are-Fisheries-Improvement-Programmes-really-delivering-change-on-the-water](http://wwf.panda.org/wwf_news/?266190/Are-Fisheries-Improvement-Programmes-really-delivering-change-on-the-water), (July 10, 2016).

<sup>66</sup> SSI *loc. cit.*

international agreements.<sup>67</sup> Third-party organizations like the Global Sustainable Seafood Initiative (GSSI) and International Social and Environmental Accreditation and Labeling Alliance (ISEAL) also emerged to evaluate and coordinate sustainability labels.<sup>68</sup> Under the guidance of the Packard Foundation, several NGOs formed the Seafood Choices Alliance and later the Conservation Alliance for Seafood Solutions. These groups created a clear, unified platform for NGOs and industry, barring businesses from resisting certification on the grounds that NGO standards were disorganized and contradictory. Their “A Common Vision for Sustainable Seafood” document provided six clear and achievable “asks” of business.<sup>69</sup> SeaWeb also hosted an annual Seafood Summit that began as a place to convene NGOs, but transitioned to include equal industry representation.<sup>70</sup>

The sustainable seafood movement was sparked by concern for wild-caught fisheries, but as it engaged seafood suppliers it became apparent that aquaculture, the source of over 40 percent of seafood,<sup>71</sup> could not be ignored. Not only was aquaculture a rapidly growing industry, but communications groups realized they had inadvertently pushed consumers toward farmed fish as a result of wild-caught fishery awareness campaigns. Certification agencies like the Global Aquaculture Alliance (GAA, founded in 1997) and Aquaculture Stewardship Council (ASC, founded in 2010) emerged to define criteria for sustainably farmed fish, while other evaluating bodies like Naturland and Seafood Watch began to address aquaculture as well.

Additionally, as more corporations implemented sustainable seafood programs, lack of supply chain transparency became an issue. Convoluted supply chains, coupled with the fact that 80 percent of fish was produced in developing countries,<sup>72</sup> made it difficult to determine if seafood was properly labeled, legally fished, and free of environmental and labor rights violations. While scientific and technological advances like DNA testing,<sup>73</sup> boat surveillance, data management and sharing, and direct-to-consumer approaches<sup>74</sup> improved supply chain traceability and legality, traceability remained a challenge as of the time of writing.

## **THE MOVEMENT MATURES: THE CURRENT AND FUTURE STATE OF SUSTAINABLE SEAFOOD**

### **Outcomes So Far**

In 2016, the sustainable seafood movement was maturing. While consumer education and corporate partnerships remained integral parts of the movement, NGOs began to move into a new phase of the movement: engaging with producers and broader national and international politics to make change on the water.<sup>75</sup> Under the guidance of the Packard Foundation, Walton

<sup>67</sup> FAO, “Guidelines for the Ecolabelling of Fish and Fishery Products from Marine Capture Fisheries,” 2009; FAO “Guidelines for the Ecolabelling of Fish and Fishery Products from Inland Capture Fisheries,” 2011.

<sup>68</sup> SSI op. cit. p. 8.

<sup>69</sup> Conservation Alliance for Seafood Solutions, “A Common Vision for Sustainable Seafood,” 2008, p.3.

<sup>70</sup> Interview with Ned Daly, program director, SeaWeb, May 18, 2016.

<sup>71</sup> FAO State of the World Fisheries and Aquaculture, 2014, p. 19.

<sup>72</sup> SSI op. cit., p. ix.

<sup>73</sup> MSC Global Impacts Report, 2016, p. 3.

<sup>74</sup> Future of Fish, “Getting There from Here: A Guide for Companies Implementing Seafood Supply-Chain Traceability Technology,” 2014; Fish 2.0 competition 2015 finalists, <http://www.fish20.org/images/2015%20Finalists.pdf>, (June 6, 2016).

<sup>75</sup> Interviews with Vikki Spruill, Brooke Smith, executive director, COMPASS, May 31, 2016, and Jennifer Dianto Kemmerley, director of global fisheries and aquaculture, Monterey Bay Aquarium Seafood Watch, July 15, 2016.

Foundation, and Moore Foundation, the major underwriters of the movement, NGOs and rating agencies began to adopt a more collaborative, systems-level approach to push for policy change. Seafood Watch, SFP, the MSC, ASC, GAA, and Fair Trade USA formed the Certification and Ratings Collaborative, moving away from exclusive partnerships and toward a more unified, cooperative body to help businesses, fisheries, and governments engage in sustainable seafood practices.<sup>76</sup>

Sustainable seafood leaders have celebrated incremental change, pointing to the movement's success in shifting industry attitudes: in the 1990s, sustainability was unheard of, while in the mid 2010s, every company was claiming sustainability at seafood expos.<sup>77</sup> Industry players had adopted the movement, improving the sustainability of their operations under their own initiative. In the International Seafood Sustainability Foundation (ISSF), for example, industry led efforts to engage regional management bodies in tuna conservation.<sup>78</sup> Consumer awareness campaigns also had a lasting impact on public perception of the sea.<sup>79</sup>

By 2016, the MSC had certified 281 fisheries in 33 countries,<sup>80</sup> representing 8.8 million tonnes of seafood, over 17,000 products, and about 9 percent of global landings.<sup>81</sup> An additional 10 percent of global landings came from fisheries in FIPs. Production under all certification bodies totaled 23 million tonnes valued at \$11.5 billion in 2015, 14 percent of global seafood production. Developing countries accounted for 58 percent of production. Demand for certified seafood came primarily from Japan, North America, and Europe, and the majority of certified seafood was produced in the United States, Peru, Norway, Chile, and Russia.<sup>82</sup> The MSC and Friend of the Sea (FOS) were leading certification bodies for wild-caught fish, while Global Partnership for Good Agricultural Practice (GLOBALG.A.P), ASC, and GAA were the dominant aquaculture certifiers (See Exhibits 5 and 6).<sup>83</sup> The Monterey Bay Aquarium's Seafood Watch criteria had become globally accepted definitions of sustainable seafood.<sup>84</sup>

Changes in policy, health of fish stocks and the marine environment, and wellbeing of fishers were harder to attribute to any particular action. A 2006 analysis reported "environmental gains" like reduction of accidental mammal mortality or increased stock density in all ten MSC certified and re-audited fisheries at the time, although it was difficult to link gains to certification.<sup>85</sup> Policy changes like the 1996 Sustainable Fisheries Act and 2007 Reauthorization of the Magnuson-Stevens Act in the United States, along with the E.U. Common Fisheries Policy reduced overfishing, but legislation in developing countries lagged.<sup>86</sup> The FAO 2014 State of the World Fisheries and Aquaculture report estimated that 29 percent of global fish stocks were

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<sup>76</sup> Interview with Jennifer Dianto Kemmerly

<sup>77</sup> Interview with Mike Sutton

<sup>78</sup> Interview with Teresa Ish; "About ISSF", International Seafood Sustainability Foundation, 2016, <http://issf-foundation.org/who-we-are/about/> (June 6, 2016).

<sup>79</sup> Interview with Vikki Spuill

<sup>80</sup> MSC op. cit., p. 2.

<sup>81</sup> MSC, "15 years of certified sustainable seafood: Annual Report 2014-2015," pp. 2 & 6.

<sup>82</sup> SSI, pp. ix & 13.

<sup>83</sup> SSI op. cit., p. 11.

<sup>84</sup> Interview with Julie Packard, executive director, Monterey Bay Aquarium, June 10, 2016.

<sup>85</sup> Agnew et al., "Environmental Benefits resulting from certification against MSC's Principles & Criteria for Sustainable Fishing," May 4, 2006, p. 6.

<sup>86</sup> CEA, op.cit., p. 4.

overfished, a number that remained stable over the preceding 5 to 10 years.<sup>87</sup> In the U.S. NMFS 2015 stock report, 16 percent of stocks were overfished and only 9 percent subject to continued overfishing.<sup>88</sup> A Packard Foundation synthesis concluded that assessed stocks, many in developed countries, were in recovery, while unassessed stocks were likely facing increased fishing pressure.<sup>89</sup>

Critics of the sustainable seafood movement claimed the MSC's criteria were too lenient, the certification process was too expensive and favored developed, industrial fisheries (although small-scale fisheries were also certified, see Box 5), and benefits did not reach fishers or the ecosystem.<sup>90</sup> Also, contradictory messages or lack of information (e.g. exactly how and where a restaurant meal was fished) overwhelmed and confused consumers, leading some to forgo seafood altogether.

### Looking Forward: Remaining Challenges

In 2016, leaders in the movement identified a number of pressing, remaining challenges:

- Climate change, pervasive in every aspect of ocean ecosystem health and a potential threat to even the best-managed stocks
- Aquaculture, fast overtaking wild-caught seafood and in desperate need of innovations in feed efficiency and husbandry practices.
- Human rights and labor issues, arguably more important to consumers and businesses than environmental issues, requiring collaboration among social and environmental organizations
- Engaging China, a huge producer and consumer of seafood and the biggest producer of aquaculture, as a critical step to achieving global sustainability goals
- Maintaining global demand for seafood, considered niche even before the sustainable seafood movement, which may have turned some consumers away from fish
- Reconciling trade-offs in sustainability of seafood and land-based protein production, considering land and water use and carbon emissions
- Streamlining the movement for efficiency and collaboration, looking critically at anything no longer needed or impeding progress
- Connecting movement efforts to consumer behavior and on-the-ground change
- Firmly embedding the movement in industry practice

Some solutions that leaders suggested included incorporating sustainable seafood into other movements and industry practices. Fisheries and aquaculture issues were enmeshed in environmental and social issues that could be addressed by development NGOs like Oxfam, especially in light of fisheries conservation targets in Goal 14 of the 2016 UN Sustainable

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<sup>87</sup> FAO, op. cit. p. 41.

<sup>88</sup> NOAA Fisheries, "Status of Stocks 2015: Annual Report to Congress on the Status of U.S. Fisheries," 2015, p. 1.

<sup>89</sup> CEA, op. cit., p. 7.

<sup>90</sup> Jacquet, op. cit.; Claire Christian et al., "A review of formal objections to Marine Stewardship Council fisheries objections," *Biological Conservation*, 2013, 161:10-17.

Development Goals.<sup>91</sup> Sustainable seafood funding could not depend on foundations indefinitely, and the investment sector—and venture capital—would be needed to finance the movement in the future. Technological innovation and investment in innovation would also be important factors.

Leaders recognized the movement was maturing and needed to adopt new thinkers and doers, ideally people within the seafood industry. New leaders needed to be big-picture thinkers; skilled storytellers; straightforward, honest, and respectful communicators across disciplines and sectors; able to identify and convene great people and run with favorable circumstances. The movement needed boundless optimists as well as keen critics, broad-reaching visionaries to push boundaries and methodical pragmatists to encourage incremental change. “Have courage in your convictions,” noted Michael Sutton. “You can accomplish a lot more than you think.”<sup>92</sup>

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<sup>91</sup> United Nations, “Goal 14: Conserve and sustainably use the oceans, seas and marine resources,” *Sustainable Development Goals*, January 1, 2016, <http://www.un.org/sustainabledevelopment/oceans/>, (June 10, 2016).

<sup>92</sup> This section was compiled from various interviews, see Exhibit 8.

**Caselets:****Box 1: SUSTAINABLE SEAFOOD IN THE U.S. AND EUROPE**

Although the roots and effects of the sustainable seafood movement can be found throughout the world, this note focused primarily on sustainable seafood efforts in the United States and Europe. This focus did not reflect a lack of sustainably sourced seafood elsewhere, but rather sought to emphasize a large-scale, intentional, and in many cases business driven shift towards sustainability that occurred in seafood markets in these areas. The markets in these regions were enormous and held significant sway over seafood harvesting practices worldwide; to see a commitment to sustainability in these areas marked an important, global shift away from detrimental fishing practices. Furthermore, the United States, U.K, and Europe were home to novel contributors to the sustainable seafood movement such as the business-NGO partnership that created the MSC, and McDonald's pressure on its supply chain that led to the first fishery improvement plan (FIP). There was no doubt that actors in both the United States and Europe had pioneering roles in the sustainable seafood movement. This note followed those actors and the changes they catalyzed.

**Box 2: NEWFOUNDLAND COD CRASH**

The Newfoundland cod crash was one of the most well-known instances of catastrophic fisheries decline. Prior to the crash, fishermen had harvested local cod fishery for decades with light environmental impact. With increasing technological innovation, however, communications, navigation, and location tools made it easier for fishers to find and capture large quantities of cod. The fishery peaked in 1968, when 800,000 tons of cod were caught.<sup>93</sup> However, by 1975, annual catch rates had plummeted by 60 percent, hinting that something had gone terribly wrong. Government officials ignored fishers' complaints of declining stocks, more interested in preserving their stakes in the fishing industry. Government-imposed catch limits were informed by faulty science that vastly overestimated the state of the fishery and the amount of fish that could be harvested from it. Rampant overfishing took place as a result, leading to the lowest ever recorded annual catch in 1992. The cod fishery had crashed.

The ecological and social effects of the cod crash were profound. Shrimp and crab numbers exploded, as the removal of cod effectively removed their major predator. On shore, the livelihoods of entire communities were eliminated—40,000 people lost their jobs practically overnight as a result of the crash and a subsequent moratorium on cod fishing. Suicide prevention teams were brought to the area to support fishers whose entire way of life was upended.<sup>94</sup> Riots erupted when the fishing moratorium was first introduced and the relationship between government and local fishers took a downturn. Fishing bans were intended to give cod stocks an opportunity to recover, but were perceived by fishers as barring them from their only opportunity of employment. As of 2015, the fishing moratorium remained in place and cod stocks were slowly recovering.

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<sup>93</sup> "The Collapse of the Grand Banks Cod Fishery," British Sea Fishing, <http://britishseafishing.co.uk/the-collapse-of-the-grand-banks-cod-fishery/http://britishseafishing.co.uk/the-collapse-of-the-grand-banks-cod-fishery/>, (July 9, 2016).

<sup>94</sup> Interview with Mike Sutton

### Box 3: WWF AND UNILEVER

The partnership between The World Wildlife Fund for Nature (WWF) and Unilever, launched in 1997, set the precedent for NGO-business collaborations in the sustainable seafood sector. This partnership was no accident, and came about due to the hard work and cooperation of key leaders at each organization. As Michael Sutton, then WWF vice president stated, “Anybody can have a good idea--putting it into practice is much more difficult.” Sutton and others were successful because they were able to speak across sectors and present information and perspectives in a manner that was comprehensible to both business and NGO personnel. They were also able to bring together people with vastly different interests in sustainable seafood. Leaders at WWF and Unilever acknowledged these different interests and found mutually beneficial “joint solutions.” Sutton emphasized that having patience and a thick skin was absolutely necessary to thrive in this space between business and NGO because, as he noted, “any time you do something important, somebody’s not going to like it.” Despite the difficulties of collaborating across sectors, the WWF-Unilever partnership successfully created the Marine Stewardship Council (MSC), establishing a novel way of certifying fisheries, raising consumer awareness, and promoting the production and consumption of sustainable seafood.

### Box 4: WALMART COMMITMENT

Walmart’s 2006 commitment to sourcing sustainable seafood was a watershed moment in the sustainable seafood movement. Peter Redmond, vice president of seafood and deli, credits CEO Lee Scott’s “vision and laser focus” and Walmart’s “action-oriented” culture for the landmark commitment. Scott, who was planning to retire, shifted his focus to sustainability, and national attention to dwindling fish stocks (brought about by successful awareness campaigns) made seafood a logical choice. “We did it because we were trying to safeguard our supplies...we wanted to take the risk out by using responsible suppliers,” Redmond said. He started by forming a committee with major NGOs like the Monterey Bay Aquarium, SFP, and even Greenpeace. Perhaps surprisingly, Redmond met the most hesitation not from company executives, who were “on board with doing the right thing,” but from the NGO community, which was conscientious about consensus building and accusations of pandering to industry.

Walmart had incredible buying power—150 million pounds of shrimp per year—and knew there would not be enough certified fish to fill their shelves. “We were basically placing a bet,” Redmond admitted. “We hoped it would trigger others to join in—it would be off to the races.” Their bet paid off: Walmart’s commitment may be the single most influential factor in the success of the sustainable seafood movement. Redmond acknowledges that Walmart’s customers, who “trusted us for low prices and not a lot else,” may have not been moved by the commitment. “Did it yield us more sales or more trust? Probably not. But we’re after long-term sustainability and viability. We have secured long-term viability, and more importantly made Walmart an absolute leader [in sustainable seafood].”<sup>95</sup>

### Box 5: BAJA LOBSTER FISHERY

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<sup>95</sup> Interview with Peter Redmond, vice president of BAP Business Development, Global Aquaculture Alliance, May 25, 2016.

Although the MSC has focused on developed, industrial fisheries, the Baja, Mexico lobster fishery provides a stellar example of how certification can apply to sustainable small-scale fisheries. The fishery, co-managed by Mexico's federal government and the Federación Regional de Sociedades Cooperativas de Baja California (FEDECOOP), an organization of fishing cooperatives, became the first MSC-certified small-scale fishery in 2004. The process began in 2000 when Comunidad y Biodiversidad (COBI), a Mexico-based NGO, sought to leverage MSC certification to promote and reward the fishery, which was one of the best-managed in the country. FEDECOOP had strict community-based standards such that every cooperative employed fewer boats and caught fewer lobsters than national quotas, and they used their own funds to patrol the remote coastline for poachers. Their lobster catches had been stable for decades, with regular monitoring and adaptive management.

All FEDECOOP officials voted to seek certification, hoping to gain national and international recognition and political sway, maintain competitiveness with certified lobster products (like Western Australia rock lobster), and expand into U.S. and E.U. markets, where there was demand for certified product. The 18-month certification process involved scientific experts, public and peer review, COBI, and FEDECOOP officials, although it has been argued that member fishermen should have been more actively included.

Although the fishery has not seen market benefits from certification--they were unable to expand into broader markets and their lobster is not labeled in Asian markets, where there's no demand for certification--FEDECOOP has used the certification for political benefits. They successfully negotiated for federal support in the form of secured permits, electricity and road infrastructure, and modernization of facilities and fishing gear. The combination of government support and invigorated community investment has led to the continued good management of the resource and stability of stocks, and the fishery was successfully re-certified in 2011.<sup>96</sup> "Certification gave us international recognition," said lobsterman Javier Ruiz in an International Sustainability Unit report. "Re-certification gives us reassurance that we will continue to have a good yield in the future."<sup>97</sup>

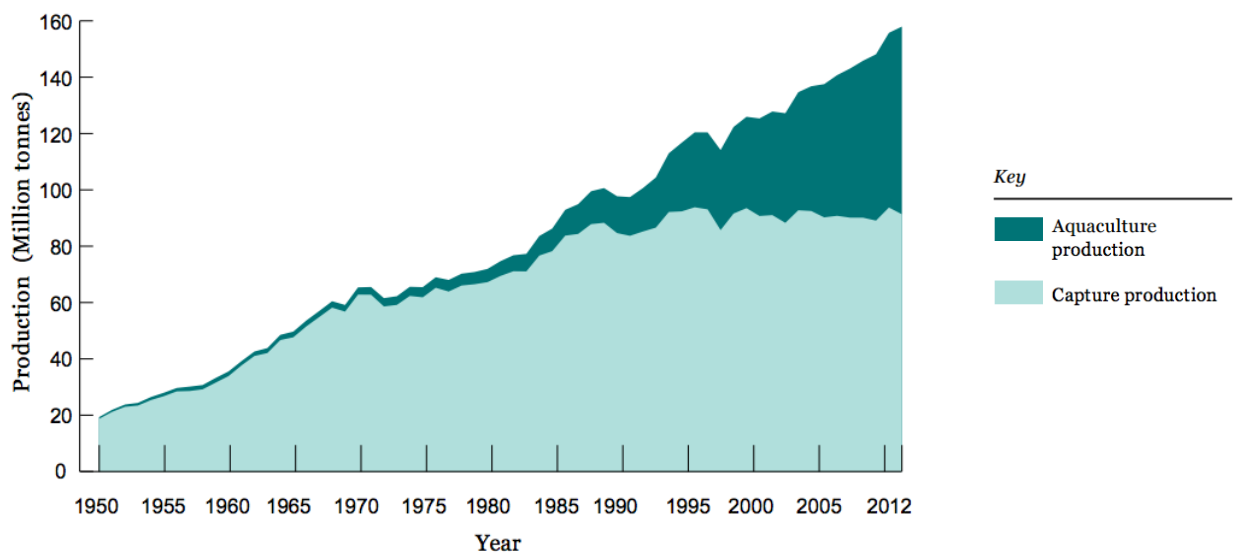
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<sup>96</sup> Bruce Phillips, Luis Bourillon and Mario Ramade, "Case Study 2: The Baja California, Mexico, Lobster Fishery" in *Seafood Ecolabelling: Principles and Practice* (Blackwell Publishing: Oxford, 2008).

<sup>97</sup> "Baja California Rock Lobster Fishery," International Sustainability Unit Case Study, 2011, <http://www.pcfisu.org/marine-programme/case-studies/baja-california-red-rock-lobster-fishery/> (June 7, 2016).



### Exhibit 1 Seafood production from aquaculture and wild-caught sources from 1950-2012



Source: FAO The State of the World Fisheries and Aquaculture 2014.

Exhibit 2  
Bad News Bear



The seafood industry was initially skeptical of the MSC.

Source: Seafood Business Magazine 1997, courtesy of Jim Leape.

### Exhibit 3 Audubon Wallet Guide

#### THE AUDUBON Seafood Wallet Card



**Your choices  
can help make  
our oceans  
healthy again**

Consumer demand has driven some fish populations to their lowest levels ever. But you can be part of the solution. You can choose seafoods from healthy, thriving fisheries.

Which fish you buy at the market and off the menu will determine the future of our oceans. You have the power to protect our marine life.



**Carry this card in your wallet.**

*Consult it when you go to restaurants or grocery stores with fish on your mind.*

choose your seafood wisely

THE AUDUBON  
Seafood  
Wallet Card

Farmed mussels and clams  
Alaska salmon  
Mahimahi, *troll caught*  
Crawfish  
Alaska halibut  
Dungeness crab

Fold along dotted line

Tilapia, *U.S. farmed*  
Yellowfin, bigeye, albacore tuna, *pole/troll caught*  
Catfish  
Striped bass  
Mahimahi, *longline caught*  
Pacific cod  
Pacific flounders and soles  
Rainbow trout

American (Maine\*) lobster  
Squid (calamari)  
Ahi Tuna (yellowfin and bigeye tuna steak)  
Canned tuna

Fold along dotted line

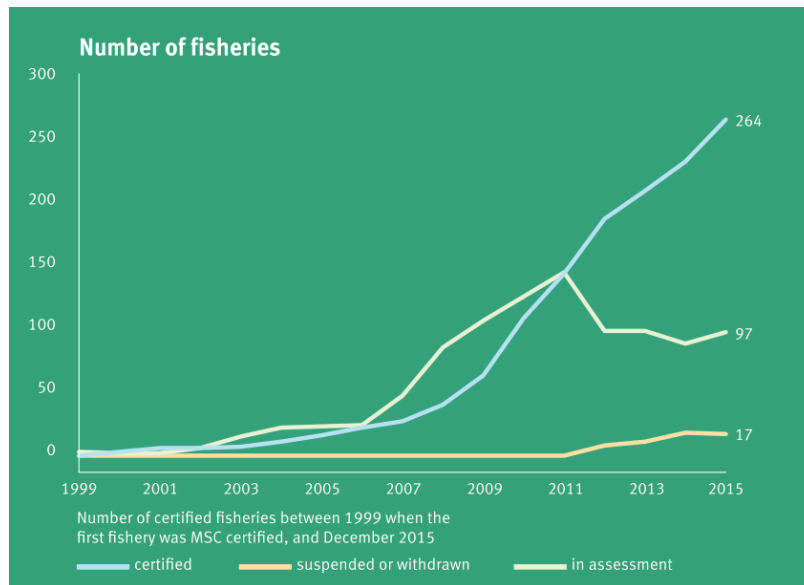
Swordfish  
Atlantic cod  
Groupers  
Shrimp  
Atlantic flounders and soles  
Monkfish  
Sharks  
Farmed salmon (including Atlantic)  
Orange roughy  
Snappers  
 Chilean seabass (toothfish)  
Atlantic halibut

\* frequently called "Maine" lobster but not always from Maine

DETACH, FOLD, & CARRY IN YOUR WALLET

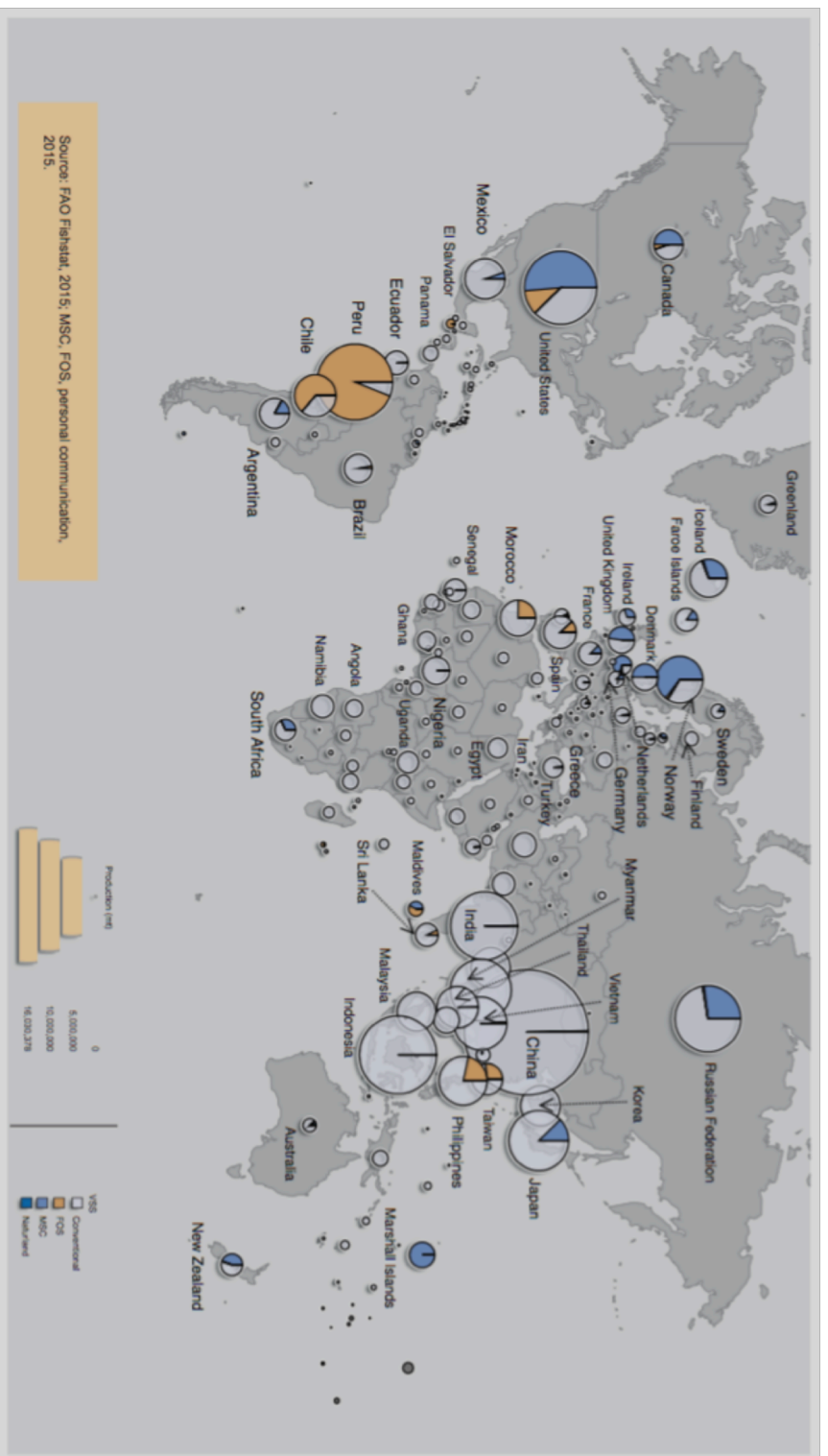
Source: Audubon Magazine

### Exhibit 4 Participation in MSC certification spikes following Walmart's 2006 sustainable seafood commitment



Source: MSC Global Impacts Report, 2016.

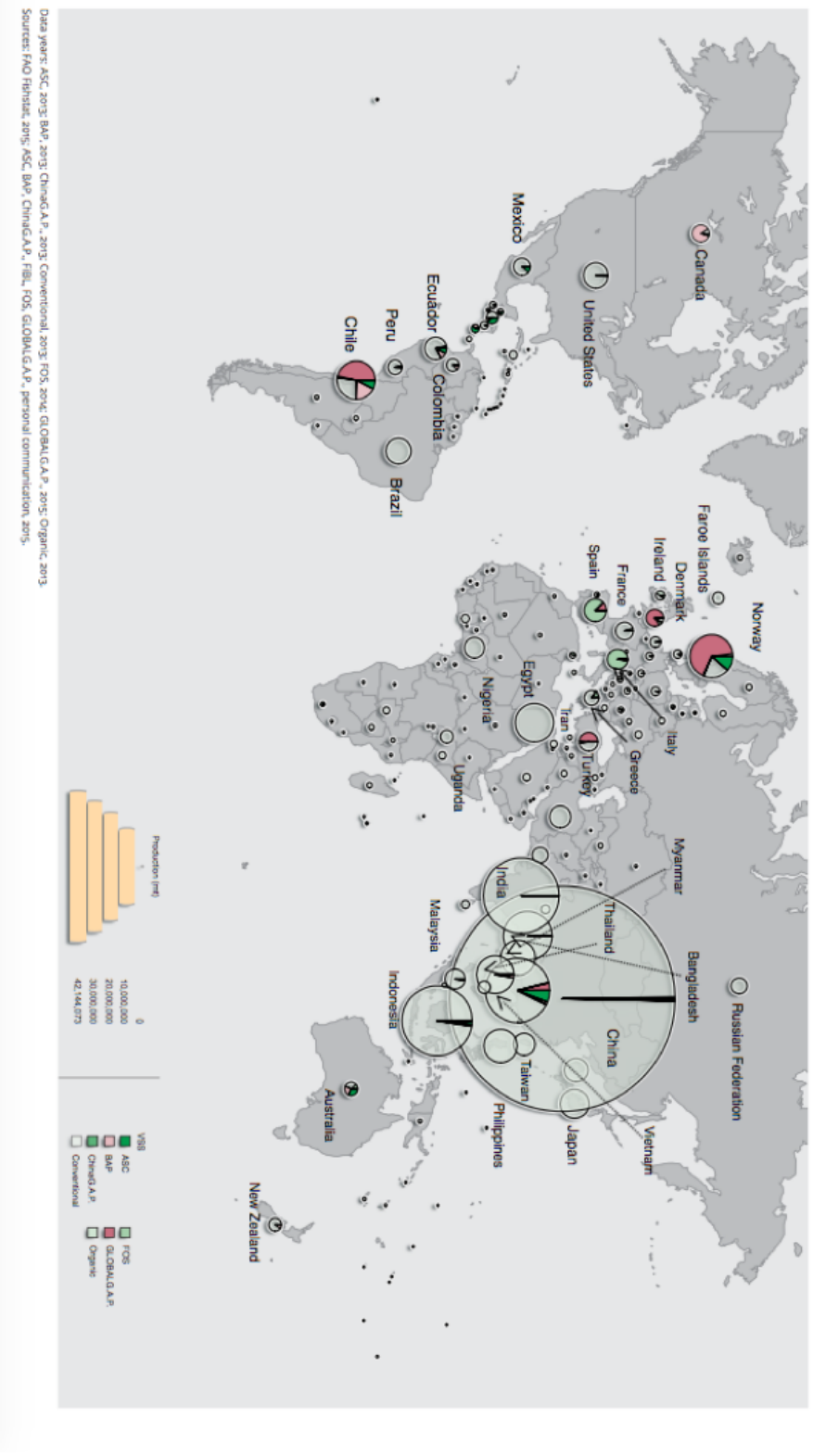
### Exhibit 5 Global distribution of certified wild-catch, 2015



Source: FAO Fishstat, 2015; MSC, FOS, personal communication, 2015.

Source: State of Sustainability Initiatives (SSI) Review: Standards and the Blue Economy, 2016, International Institute for Sustainable Development.

### Exhibit 6 Global distribution of certified aquaculture, 2015



Source: State of Sustainability Initiatives (SSI) Review: Standards and the Blue Economy, 2016, International Institute for Sustainable Development.

## **Exhibit 7 Sustainable Seafood Movement Timeline**

- 1953 Monterey sardine crash
- 1962 Rachel Carson's *Silent Spring* published
- 1970 U.S. Environmental Protection Agency (EPA) established  
Clean Air Act passed
- 1972 Clean Water Act passed  
Marine Mammal Protection Act passed
- 1976 Magnuson Stevens Act passed
- 1982 Exclusive Economic Zones (EEZs) formalized for all coastal nations
- 1986 New Zealand introduces ITQ program
- 1992 Newfoundland cod collapse triggers indefinite moratorium  
UN Conference on Environment and Development (Earth Summit)
- 1993 Forest Stewardship Council founded
- 1994 UN Convention on Law of the Sea (UNCLOS) goes into effect  
FAO Code of Conduct for Responsible Fisheries developed
- 1996 WWF-Unilever partnership begins  
SeaWeb founded  
U.S. Sustainable Fisheries Act—amendment to Magnuson Stevens Act
- 1997 MSC officially formed  
Global Aquaculture Alliance founded  
First US Status of Stocks published  
First FAO State of the World Fishery Resources published
- 1998 SeaWeb launches "Give Swordfish a Break" campaign  
Audubon magazine publishes first ranked seafood guide  
Packard establishes Marine Fisheries Subprogram  
  
Major scientific papers: Pauly et al., "Fishing down the food web," *Science*
- 1999 MSC partners with Whole Foods  
Packard launches Seafood Choice initiative, the first NGO market-based campaign for seafood  
COMPASS founded  
Monterey Bay Aquarium exhibit "Fishing for Solutions" focuses on overfishing  
Dow Jones Sustainability Index created
- 2000 Sainsbury's (U.K.) introduces MSC-certified fish  
"Caviar Emptor" campaign launches
- 2001 MBA Seafood Watch publishes wallet cards  
SeaWeb Seafood Choice Alliance program established  
  
Major scientific papers: Jackson et al. "Historical overfishing and the recent collapse of coastal ecosystems," *Science*

## **Exhibit 7 (continued) Sustainable Seafood Movement Timeline**

- 2002 First SeaWeb seafood summit  
FishWise founded  
“Take a Pass on Chilean Seabass” campaign launched  
Atlantic Swordfish declared 94 percent recovered  
Eastern Baltic Sea Cod FIP established  
USDA Organic Food label implemented
- 2003 McDonalds develops its Global Sustainable Fisheries Policy with Jim Cannon  
  
Major scientific papers: Myers and Worm, “Rapid worldwide depletion of predatory fish,” *Nature*  
Pauly et al., “The Future of Fisheries,” *Science*
- 2004 Baja, Mexico lobster fishery becomes the first MSC-certified small scale fishery  
GlobalG.A.P introduces standards for aquaculture  
U.S. government lists beluga sturgeon as “threatened” under the Endangered Species Act
- 2006 Walmart WWF partnership (G&M)  
Friend of the Sea founded  
Sustainable Fisheries Partnership founded  
“Pure Salmon” started  
Charles Clover *The End of the Line* documentary  
  
Major scientific papers: Worm et al. “Impacts of Biodiversity Loss on Ocean Ecosystem Services,” *Science*
- 2007 Magnuson Stevens Act reauthorized
- 2008 Greenpeace Carting Away the Oceans  
Conservation Alliance for Seafood Solutions (CASS) formed
- 2009 International Seafood Sustainability Foundation ISSF formed  
FAO publishes Guidelines for the Ecolabelling of Fish and Fishery Products from Marine Capture Fisheries
- 2010 Safeway and FishWise pledge to supply environmentally sustainable seafood by 2015  
Aquaculture Stewardship Council founded
- 2011 Eastern Baltic Sea Cod becomes first FIP to achieves MSC certification; McDonalds supplies MSC-labeled fillet-o-fish products in European stores  
FAO publishes Guidelines for the Ecolabelling of Fish and Fishery Products from Inland Capture Fisheries  
ClientEarth UK investigation into fraudulent ecolabels
- 2012 CASS publishes its first set of guidelines for Fishery Improvement Projects
- 2013 Global Sustainable Seafood Initiative founded  
FishWise publishes Trafficked, drawing attention to human rights violations in fisheries
- 2015 Safeway and Fair Trade USA introduce first Fair Trade certified seafood
- 2016 AP wins Pulitzer Prize for Seafood from Slaves coverage  
CASS updates Common Vision document, includes social issues in definition of sustainability  
Certifications and Ratings Collaborative formed



## **Exhibit 8**

### **List of interviewees**

Tremendous thanks to everyone we interviewed for this project, including:

**Brad Ack**, leader of U.S. Oceans program, World Wildlife Fund for Nature; **Mariah Boyle**, Traceability Division director, FishWise; **Scott Burns**, Sustainability consultant, Council Fire LLC; **Jim Cannon**, CEO and founder, Sustainable Fisheries Partnership; **Ned Daly**, senior projects advisor, Seafood Choices Alliance; **Matthew Elliott**, principal, California Environmental Associates; **Phil Gibson**, CEO, Resiliensea Group, Inc.; **Sarah Hogan**, program officer, David and Lucile Packard Foundation; **Theresa Ish**, marine program officer, Walton Family Foundation; **Dick Jones**, executive director, Ocean Outcomes; **Jennifer Dianto Kemmerly**, director of global fisheries and aquaculture, Monterey Bay Aquarium Seafood Watch; **Jim Leape**, Cox consulting professor, Stanford Woods Institute for the Environment; **George Leonard**, chief scientist, Ocean Conservancy; **Meredith Lopuch**, program officer, The Moore Foundation; **Julie Packard**, executive director, Monterey Bay Aquarium & trustee, The David and Lucile Packard Foundation; **Peter Redmond**, vice president of deli and bakery, Southeastern Grocers; **Brooke Smith**, executive director, COMPASS; **Vikki Spruill**, president and CEO, Council on Foundations; **Michael Sutton**, founding board member, Ocean Champion; **Laura Viggiano**, senior associate, California Environmental Associates; **Arlin Wasserman**, founder and partner, Changing Tastes