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What's the Catch? Challenges and Opportunities of the U.S. Fishing Industry

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The economic importance of the fishing sector extends well beyond the coastal communities for which it is a vital industry. Commercial fishing operations, including seafood wholesalers, processors, and retailers, all contribute billions of dollars annually to the U.S. economy. Recreational fishing—employing both fishing guides and manufacturers of fishing equipment—is a major industry in the Gulf Coast and South Atlantic. Estimates suggest that the economic contribution of the U.S. fishing industry is nearly $90 billion annually, and supports over one and a half million jobs (National Marine Fisheries Service [NMFS] 2014).

A host of challenges threaten fishing's viability as an American industry. Resource management, in particular, is a key concern facing U.S. fisheries. Since fish are a shared natural resource, fisheries face traditional "tragedy of the commons" challenges in which the ineffective management of the resource can result in its depletion. In the United States, advances in ocean fishery management over the past four decades have led to improved sustainability, but more remains to be done: 17 percent of U.S. fisheries are classified as overfished (National Oceanic and Atmospheric Administration [NOAA] 2014), and even those with adequate fish stocks may benefit economically from more-efficient management structures.

Meeting the resource management challenge can lead to improved economic activity and better sustainability in the future. Rebuilding our nation's ocean fish stocks can drive up sales by billions of dollars and lead to hundreds of thousands of new jobs for American workers (Rauch 2013), while lowering public disaster payments to fisheries, reducing commercial fishing fatalities, and raising the quality of fish for American consumers.

A founding principle of The Hamilton Project's economic strategy is that long-term prosperity is best achieved in a changing global economy by promoting sustainable, broadly shared economic growth. One important way to fulfill the goals of this strategy is to encourage the efficient use of our nation's natural resources. In this policy memo, The Hamilton Project considers the economic challenge of ocean fishery management, which has important implications for the commercial and recreational fishing industries and to the economic viability of myriad coastal communities around the country.

The Economic Significance of the U.S. Fishing Industry

Commercial harvesters at U.S. fisheries in 2012 directly generated $7.0 billion in economic activity, but the industry's significance extends well beyond fishing harbors. All told, the U.S. fishing industry contributed $89.4 billion to the U.S. economy in 2012 and accounted for 1.7 million jobs nationwide. The economic contribution of the fishing industry is split between commercial and recreational fishing, contributing $59.0 billion and $30.4 billion in 2012, respectively (NMFS 2014). As shown in figure 1, the economic contribution of the commercial fishing industry is far more than the value of landings (i.e., fish brought to shore), with substantial contributions by harvesters, wholesalers and distributors, retailers, importers, as well as processors and dealers. Similarly, recreational fishing drives economic activity not only through guided fishing trips, but also through the manufacture of boats and other fishing equipment.

Fishing is especially important to select local coastal economies, particularly those located in Alaska and Maine, and in the Pacific Northwest. Table 1 shows the areas with the most fishing-intensive local economies, as defined by share of total earnings.[1] In Alaska's Petersburg Census Area, for example, nearly one fifth of all wages in 2012 were earned from fishing.

Fish are also an important part of our nation's food supply. The United States ranks as the third-largest consumer of seafood in the world, following only China and Japan. In 2012, Americans consumed over 4.5 billion pounds of seafood, or 14.4 pounds of fish and shellfish per person (Lowther 2013). In the past half-century, seafood's share of total caloric intake in the United States has steadily risen: between 1961 and 2011, the caloric intake from fish increased by over 40 percent (Food and Agriculture Organization of the United Nations [FAO] 2012; U.S. Department of Agriculture [USDA] 2003).

Much of the growing demand for seafood in this country is met by imported fish and shellfish. Imports accounted for an estimated 94 percent of seafood consumed in the United States in 2012 (Lowther 2013), although accurate estimates are hampered by the fact that the United States exports some fish for processing before importing them for consumption. More than half of all imported seafood comes from Asia, while about a third comes from South America and elsewhere in North America.

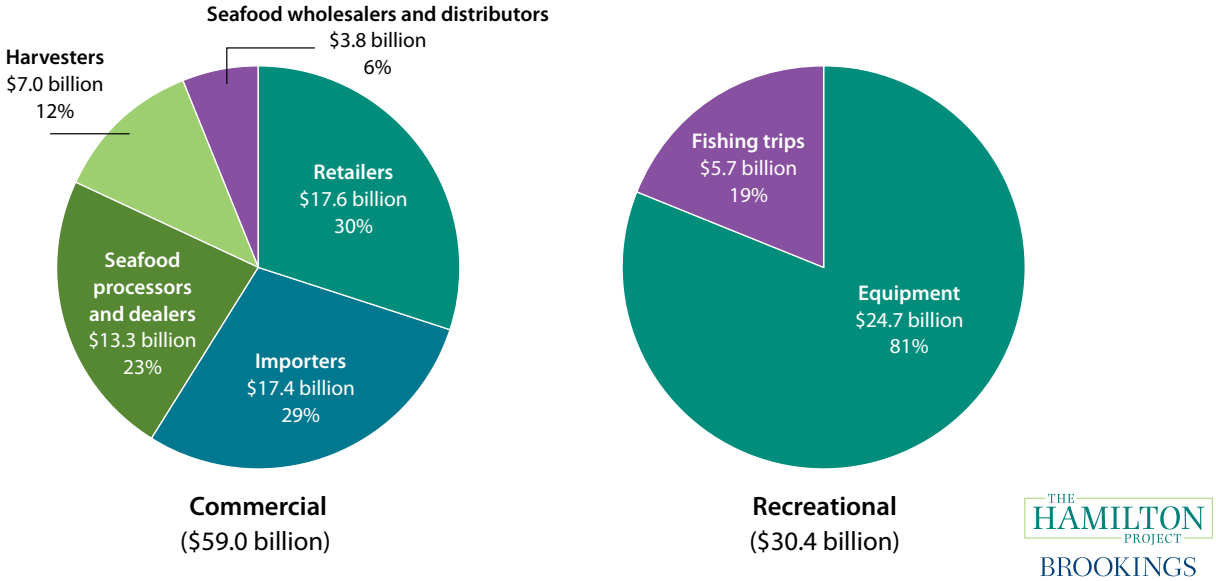
In 2013, the United States exported 1.5 million tons of seafood, valued above $5 billion (NOAA Fisheries 2013). Fresh and frozen items made up the majority of exports and consisted mainly of salmon, lobster, and surimi (imitation crab meat, made mostly of pollock). Much of the domestic fish catch is exported rather than consumed at home due to a variety of factors, such as inexpensive foreign processing of fish, seasonal availability, and demand for different varieties of the same fish.

A Natural Resource Challenge

Unlike other industries dependent on natural resource extraction, such as the oil and logging industries, fishing generally takes place without well-defined property rights.

FIGURE 1.

Economic Contribution of the U.S. Fishing Industry, 2012



Source: National Marine Fisheries Service 2014.

TABLE 1.

Most Fishing-Intensive Local Economies by Share of Total Earnings, 2012

Area	State	Percent	Value (in millions)
Petersberg Census Area	AK	18.9%	$24.4
Knox County	ME	5.6%	$54.2
Hoonah-Angoon Census Area	AK	5.3%	$2.3
Pacific County	WA	4.6%	$13.7
Washington County	ME	3.9%	$22.0
Dillingham Census Area	AK	3.7%	$6.1
Del Norte County	CA	3.2%	$14.9
Prince of Wales-Hyder Census Area	AK	2.7%	$3.4
Kenai Peninsula Borough	AK	2.4%	$35.9
Curry County	OR	2.4%	$7.8
Lincoln County	OR	2.3%	$21.4
Ketchikan Gateway Borough	AK	2.2%	$12.6
Franklin County	WA	1.8%	$30.8

Source: Bureau of Economic Analysis 2014.

Note: Local economies are counties or county equivalents. Values include earnings from fishing, hunting, and trapping.

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While an oil well or an acre of timberland typically belongs to a single owner, a patch of lake or ocean is common property, open to all. The lack of well-defined property rights in the fishing industry can create incentives that discourage sustainability.

Consider an open access fishery, where fishing can occur without any regulation or agreements. In such a setting, a fishing company has a strong incentive to continue catching fish until it is no longer cost effective for the particular firm to do so. Sensible management of overfished stocks by any individual fishing company will likely be offset by additional catch and landings by another company. In this free-for-all, if the fish are harvested faster than the population can be replenished, stocks will inevitably decline either until they are exhausted or until it is no longer cost effective to harvest them, likely harming both consumers and fishermen. Such a situation currently exists in West Africa, where international fleets are overfishing off the coast, threatening the livelihood of African fishermen (Africa Progress Panel 2014); it also has occurred in the United States in the recent past, with the near-depletion of the Atlantic Northwest cod in the 1990s.

This general phenomenon, termed the "tragedy of the commons" by biologist Garret Hardin in 1968, was actually described formally in the context of fishing by the economist H. Scott Gordon in 1954. It can arise in the context of what economists call a common good: a good that cannot be used by more than one consumer (rivalrous) and that is available to all (nonexcludable). Fishing is rivalrous because a fish caught by one fisherman cannot be caught by another, and for much of U.S. history it was nonexcludable, because access to fish was open to everyone.

In general, states have jurisdiction up to three nautical miles from shore, while the federal government has jurisdiction, overseen by NOAA, between three and two hundred nautical miles from shore. Until the Magnuson-Stevens Fishery Conservation and Management Act was passed in 1976, there was no concerted federal effort to regulate fishing. After fish stocks continued to decline over the 1970s and 1980s, exacerbating economic hardship for workers in the fishing industry, the Magnuson-Stevens Act was amended in 1996 and again in 2006 in attempts to restore fish stocks.

Although the potential for overfishing was understood even before the twentieth century, two key factors made salient the need to better manage resources and improve regulation. First, technological advances in locating and catching fish grew rapidly after World War II. Devices like electronic fish finders that use radar and sonar, synthetic fibers to make stronger nets, and motorized power blocks to place and haul in nets all allowed the catch yield to increase (FAO 2005). Second, the world market for fish skyrocketed between the early 1950s and late 1970s, with volume of fish harvested more than tripling over this period (FAO 2012). These productivity and demand trends elevated the rate of fish extraction relative to fish stocks' ability to replenish, leading to faster rates of depletion. Only with these dramatic reductions in available supply did efforts to better manage fish stocks increase.

Housed within the Department of Commerce, NOAA guides the use and protection of the nation's marine resources, including many high-value fisheries. Early attempts at management that began during the 1970s and 1980s typically consisted of limitations on fishing equipment and the areas and times fishing could occur. These restrictions, determined by the regional fishery management councils created by the Magnuson-Stevens Act, are still practiced as an exclusive form of management in the United States, but sole reliance on these restrictions has decreased worldwide (Darcy and Matlock 2000). These sorts of limitations have fallen out of favor, in part because they tend not to be that effective in protecting fish stocks or the economic well-being of fishermen (Homans and Wilen 1997). Without controlling the number of fishermen allowed to operate in a given fishery, these regulations' impact on sustainability is often temporary, and is offset by additional entrants to the area.

Fisheries in the United States today tend to be regulated by a controlled entry system of permits in conjunction with limited season lengths, total catch quotas, or both. This framework, particularly if there are total quotas, is more effective in guarding against depletion of fish stocks. However, because there are no limits on what each fisherman may catch, competition among them and the ensuing expenditures on better gear and larger boats raise fishermen's costs and their uncertainty over what their catch—and their profits—will be. For communities that depend on the fishing industry as an important part of their economies, such a management system may not be sustainable.

Fishing Catch Shares

With the goal of improved economic and ecological sustainability of U.S. fisheries, several governmental and nonprofit organizations, as well as a growing number of economists and natural scientists, have proposed catch shares—a management system based on property rights—as an alternative to traditional management structures (Holliday 2009). Catch share programs assign property rights to various stakeholders, including individuals, communities, and cooperatives, with the goal of establishing incentives to promote long-term sustainability of fish stocks.

Catch shares are a family of policies—rather than a one-size-fits-all solution—that can be customized to the particular circumstances of a community. All catch shares enable fishery management councils to establish the total amount of fish that can be caught based on sustainability criteria. But catch shares differ in their implementation. One version of catch shares assigns tradable fishing rights to individuals, giving each fisherman a share of the total allowable catch. This design aims to encourage fishermen with low costs to purchase shares from those with high costs, improving catch efficiency while compensating those who choose to sell their shares. Another type of catch shares allows a group of fishermen to explicitly cooperate on harvest strategies, co-management, and marketing. And yet another type gives a fishing community an exclusive privilege to harvest a designated area of the ocean.

Since they were first implemented in 1990, fifteen catch share programs have been adopted in the United States (NMFS 2014). Interestingly, these programs were not imposed by government regulators: they were implemented voluntarily by regional councils, the membership of which includes the fishermen themselves. Perhaps reflecting this trend, legislators acknowledged the potential of catch shares to improve the management of U.S. fisheries in the 2006 revision of the Magnuson-Stevens Act.

Today, roughly half of the fish caught in the United States are harvested from a fishery under catch share management. However, as shown in figure 2a, catch share adoption varies widely by region, with fisheries in Alaska and on the West Coast establishing catch shares more readily than other U.S. regions. As a whole, the United States lags behind other countries in catch share adoption. As illustrated in figure 2b, nearly all fish caught in Australia, New Zealand, South Africa, and South America, and 76 percent of fish caught in Europe, are caught under catch shares, compared to 50 percent of fish caught in the United States (Melnychuk et al. 2012).

The primary justification for catch share management, according to many economists, is that it discourages depletion and leads to more-sustainable management of fish stocks. For example, one study found that catch shares on average reduced extractions from roughly twice the efficient level to the efficient level (Grimm et al. 2012). Researchers have also noted that catch shares reduce bycatch—non-targeted species harvested accidentally—and lead to improved ecological health of the ocean (Branch 2009). Proponents argue that catch shares also eliminate the so-called race to fish, and dramatically elongate the fishing season, leading to gains in long-term employment opportunities among fishermen, higher safety and fewer fishing deaths, and improved availability of fresh fish for consumers. Many economists believe that by allowing trade between fishermen, catch shares can encourage the most efficient fishermen to participate in the market, potentially leading to lower costs and higher profits.

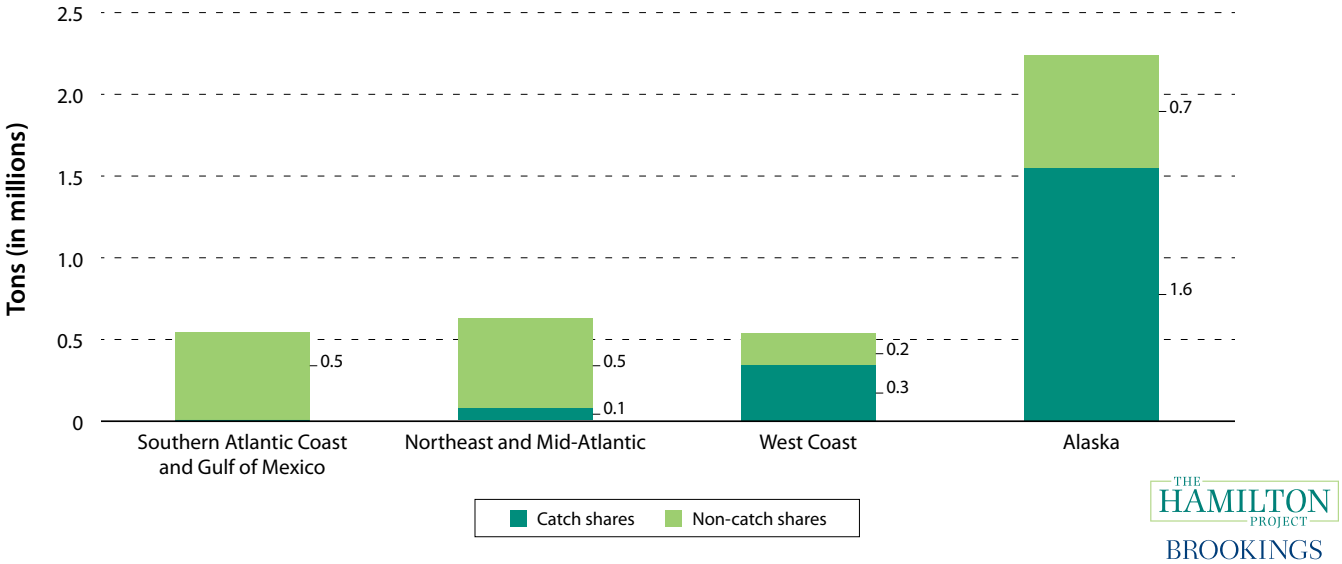
The catch share approach is not without its critics. By allowing tradable permits, some argue, catch shares can encourage consolidation and eliminate the presence of smaller operators, potentially altering the character of coastal communities that have long depended on the fishing industry (Rust 2013). Other skeptics contend that catch shares can reduce the number of fishing boats in the water, leading to declines in sales for boat manufacturers (Gaines 2011). Some researchers question the claims made by catch share proponents, finding

limited gains to ecological health owing to catch share adoption (Brewer 2011; Essington 2009). In addition, some recreational fishermen oppose catch shares on the grounds that recreational interests may be underrepresented in the allocation of fishing rights.

In a new Hamilton Project discussion paper, Christopher Costello of the University of California, Santa Barbara proposes reforms that would require fisheries meeting certain criteria to undertake a transparent comparison of the economic, social, and ecological trade-offs between status quo management and alternative management structures, including different forms of catch shares (Costello forthcoming). Costello contends that such a comparison would provide fishermen and other stakeholders with the necessary information to better advocate for management approaches that reflect their diverse goals.

FIGURE 2A.

U.S. Catch Volume by Management System and Region, 2009

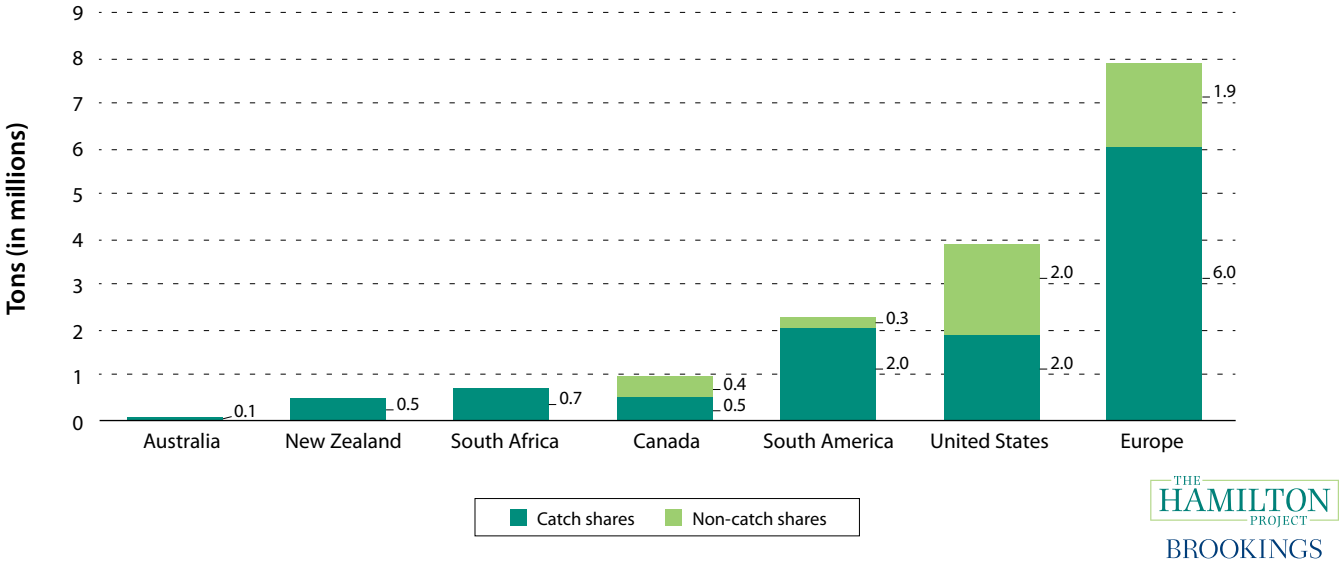


Sources: Personal communication with Michael Melnychuk, School of Aquatic and Fishery Sciences, University of Washington, July 14, 2014; authors' calculations.

Note: Catch share data include partial catch share systems. Non-catch shares refer to quota or effort-control management.
In the Southern Atlantic Coast and Gulf of Mexico, the volume of fish caught under catch shares is negligible.

FIGURE 2B.

Global Catch Volume by Management System and Region, 2009



Sources: Personal communication with Michael Melnychuk, School of Aquatic and Fishery Sciences, University of Washington, July 14, 2014; authors' calculations.

Note: Catch share data include partial catch share systems. Non-catch shares refer to quota or effort-control management.
In Australia, New Zealand, and South Africa, the volume of fish caught under non-catch shares is negligible.

Fish Sustainability and Industry Revenue

Effective management systems are an important component of a sustainable and prosperous fishing industry. Indeed, the consequences of ineffective management systems include depleted fish stocks and diminished economic value. The overfishing or depletion of a specific stock has the potential to lead to the collapse of the related fisheries, with concomitant ecological and economic repercussions. For example, in 2009 alone, commercial fishermen in New England lost at least $149 million and captured only 21 percent of their potential revenue due to the overfishing of species such as cod, flounder, and halibut (The Pew Charitable Trusts 2011).

Not surprisingly, given the ecological-economic dynamic within fisheries, fish sustainability and fishery revenue move together. Figure 3 compares U.S. fishery revenue, denoted by the blue line, to a measure of sustainability called the Fish Stock Sustainability Index (FSSI), represented by the purple line. NOAA Fisheries captures the ecological status of the nations' fisheries by assigning a sustainability score to the most important commercial and recreational fisheries, which collectively cover the bulk of total U.S. fish landings (NOAA Fisheries 2012). The maximum possible FSSI is 920; in this best-case scenario, no fish stock is overfished, which is a status in which a stock's ability to maintain maximum sustainable yield is jeopardized. Between 2000 and 2012, fish sustainability increased by 72 percent as revenues grew by 4 percent (adjusted for inflation). Over the past fifteen years, thirty-four out of 230 U.S. marine fish stocks have recovered from an overfished status (NOAA Fisheries 2014). Perhaps contrary to conventional wisdom, most U.S. fisheries are not overfished, although a handful still struggle to end overfishing.

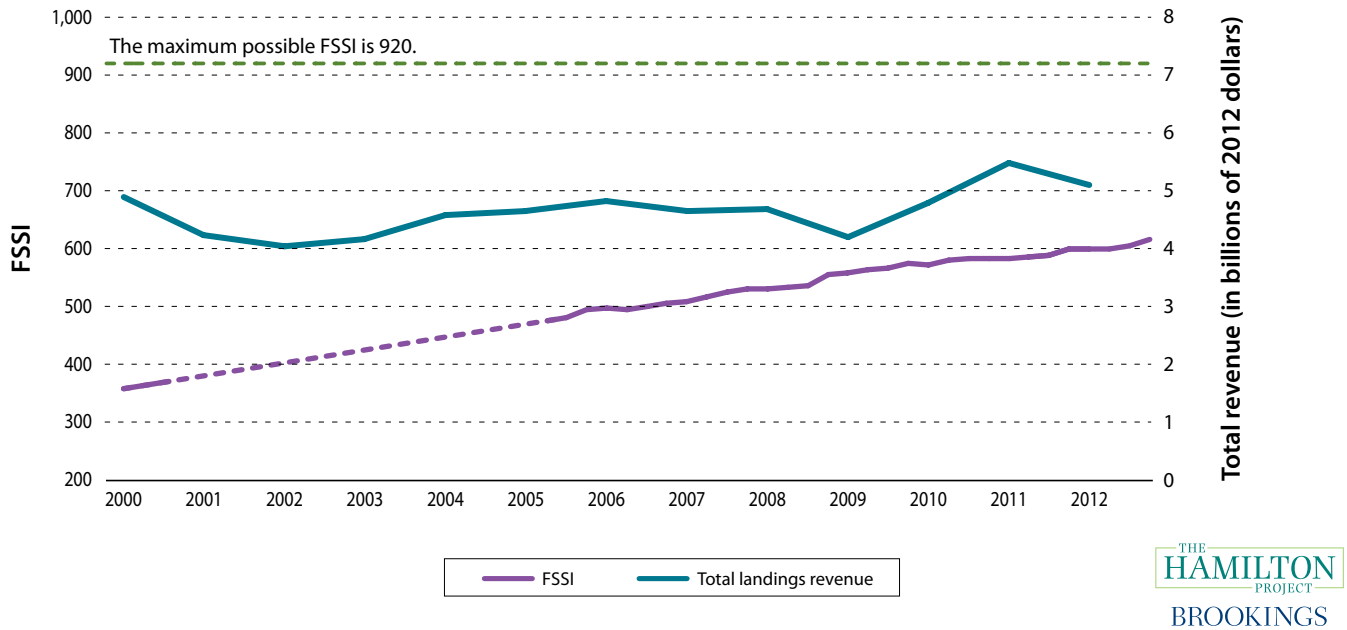
The NMFS estimates that rebuilding all U.S. fish stocks would have strong positive effects on the fishing industry, generating billions of dollars in sales and adding hundreds of thousands of jobs (Rauch 2013). Given these significant effects on the economy, rebuilding fish stocks and managing fisheries effectively should be a part of our national economic agenda.

Conclusion

Despite the gains in sustainability over the past three decades, overfishing and mismanagement of resources continue to threaten the U.S. fishing industry and coastal communities. Improved management of fishing resources can benefit commercial and recreational fishermen, the ecological health of our oceans, and American consumers alike. This improved management will likely be achieved through innovative policies that implement economic incentives to promote efficiency and long-run sustainability.

FIGURE 3.

Fish Stock Sustainability Index (FSSI) and Total Landings Revenue, 2000–2012



Sources: National Marine Fisheries Service (NMFS) 2007; National Oceanic and Atmospheric Administration Fisheries (NOAA) n.d.a, n.d.b; authors' calculations.

Note: Total landings revenues were derived from NMFS (2007) and are adjusted to 2012 dollars using the Consumer Price Index Research Series. FSSI data from 2000 are from NOAA Fisheries n.d.a; FSSI data from 2005–12 are from NOAA Fisheries n.d.b. FSSI data are unavailable for 2001–4. The dashed line represents a linear interpolation between the data points from 2000 to 2005.

Endnote

1. The Bureau of Economic Analysis groups fishing, hunting, and trapping into a single category, and we assume that hunting and trapping make a negligible contribution to this category in these coastal census areas.

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The Hamilton Project seeks to advance America's promise of opportunity, prosperity, and growth. We believe that today's increasingly competitive global economy demands public policy ideas commensurate with the challenges of the 21st Century. The Project's economic strategy reflects a judgment that long-term prosperity is best achieved by fostering economic growth and broad participation in that growth, by enhancing individual economic security, and by embracing a role for effective government in making needed public investments.

Our strategy calls for combining public investment, a secure social safety net, and fiscal discipline. In that framework, the Project puts forward innovative proposals from leading economic thinkers—based on credible evidence and experience, not ideology or doctrine—to introduce new and effective policy options into the national debate.

The Project is named after Alexander Hamilton, the nation's first treasury secretary, who laid the foundation for the modern American economy. Hamilton stood for sound fiscal policy, believed that broad-based opportunity for advancement would drive American economic growth, and recognized that "prudent aids and encouragements on the part of government" are necessary to enhance and guide market forces. The guiding principles of the Project remain consistent with these views.

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