OPPORTUNITIES FOR SUSTAINABLE FISHERIES IN JAPAN
THIS REPORT OFFERS PRACTICAL RECOMMENDATIONS TO HELP RESTORE FISHERIES AND COASTAL FISHING COMMUNITIES ACROSS THE JAPANESE ARCHIPELAGO
Introduction/Summary

If you want to witness a display of marine abundance and diversity unrivaled nearly anywhere on planet earth, don’t go to the Coral Triangle. Instead, head straight to the heart of Tokyo, grab your rubber boots and take a stroll through the cavernous Tsukiji fish market. From wild Kamchatka sockeye salmon to giant tuna from the Mediterranean to Maine lobster, Tsukiji sells it all in the largest seafood market in the world.

The freshest and highest quality seafood in Tsukiji still comes from waters surrounding the Japanese archipelago, which hold some of the most productive fishing grounds on the planet. But domestic fisheries have been in decline for decades, due to overfishing, degraded ecosystems, and negative socio-economic factors. For the average Japanese consumer, this decline has caused higher prices at the market and increasing difficulties in enjoying traditional “washoku” food items. “Unagi” (eel), for example, went from a peak commercial catch of 232 metric tons in 1963 to a measly 5 tons by 2011. Meanwhile, the price quadrupled in the last decade alone. For coastal communities and fishery cooperatives across Japan that have bear the brunt of the fishery crisis, the situation is severe: a whopping 800,000 jobs have been lost since the fishing industry’s peak in the 1960s.

Ocean Outcomes (O2) compiled this report as our humble attempt to better understand the complexities of Japanese wild fisheries and to put forth a handful of practical recommendations to restore fisheries and coastal communities across the Japanese archipelago. The report findings are based on several decades of collective experience and hard earned lessons implementing sustainability in Japan.

We organized this report into three sections. The first section contains an overview of Japanese fisheries, policy, and supply chain issues that set the context for how fisheries in Japan operate. Section two includes a series of recommendations that we hope the growing sustainable seafood community in Japan will consider and act upon in the coming years. A separate addendum contains profiles of eleven rapid assessments completed by the O2 team to evaluate key fisheries in Japan against the MSC standard and to identify opportunities for certification and/or fishery improvement projects (FIPs).

We are always learning and these are still the early days. We need and value your feedback as we go forth together.

-The O2 team
Japan is one of the world’s top ten leading fishing nations by volume. Wild fisheries in particular are a critical culinary, economic, and cultural resource, providing about half of the country’s seafood supply. In 2013, about 80% of domestic seafood production was from wild sources, with the remainder coming from aquaculture (Fig. 1). However, both catches and overall seafood supply have been in decline for more than a decade in Japan (Fig. 2). Total annual catches from domestic wild capture fisheries fell from 4.7 million metric tons (mt) to 3.7 million mt from 2003 to 2014, with catches declining in myriad species including Pacific saury, tunas, billfishes, skipjack, mackerels, and Japanese eel.

There are reasons to be concerned. Numerous fish stocks are at low status and declining, and the

**State of Japanese Fisheries**

Figure 1. Approximate proportions of Japan’s 2013 seafood production from wild capture fisheries, aquaculture production, and imports of fresh/frozen product. Data from Japan Ministry of Agriculture, Forestry, and Fisheries (MAFF).
country lacks a robust system for restoring depleted fisheries. Overall declines in
domestic production are due to a combination of factors including an exhausted re-
source base, habitat loss, increased competition in and/or closures of high seas fish-
eries, as well as overarching demographic and economic changes. Import volumes
have declined as well, falling from 2.4 million mt in 2003 to 1.7 million mt in 2014
as a reflection of reduced domestic consumption, rising prices, and increased com-
petition from other markets.\textsuperscript{4} There is a clear need to implement recovery programs,
which will help Japanese fisheries stay globally competitive.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure2.png}
\caption{Japan marine seafood production (wild capture and aquaculture) and import volumes (fresh and frozen product) over time. Information from MAFF and the Japan Ministry of Finance.}
\end{figure}

Each year, scientists from Japan’s Fisheries Research Agency (FRA) conduct stock as-
essments on about 84 fish stocks belonging to 52 species or species groups. According to assessments from 2014, 50\% of these stocks had low (negative) stock status, 33\% had medium status, and 17\% had high status. In terms of abundance trends, 36\% of stocks were decreasing, 42\% were stable, and 22\% were increasing.

In addition to these domestically assessed stocks, there is particular concern about
the status of Pacific bluefin tuna and Japanese eel, which are included on the IUCN
Red List as vulnerable and endangered, respectively. Japan’s Environment Ministry
indicated the Japanese eel could “face extinction in the wild in the very near fu-
ture.”\textsuperscript{1} The estimated number of Pacific bluefin tuna adults is at a historic low, and
catches of Japanese eel fry have been small for many years, with an especially poor
catch in 2010.\textsuperscript{5} These two species are associated with iconic Japanese “washoku”
dishes, and Japan has great interest in and responsibility for their sustainable use.
THE JAPAN FISHERIES AGENCY (JFA) HAS THREE CATEGORIES FOR MARINE FISHERIES:

HIGH SEAS

High seas fisheries operate outside of the Japanese Exclusive Economic Zone (EEZ). In the past, high seas fishing vessels provided as much as 41% of Japan's total harvest. This proportion decreased after the establishment of EEZs in 1975, which restricted high seas fishing activities. The 2013 high seas harvest proportion was 11% of overall harvest.

OFFSHORE

Offshore fisheries currently provide about 50 to 60% of Japan's harvest. However, catch compositions have changed substantially over the past 50 years. Mackerels were the main target species in the 1970s, but after mackerel populations declined in the 1980s, Japanese sardine became the main target species. Japanese sardine abundance crashed in the 1990s, while Japanese horse mackerel and Pacific saury abundances increased.

COASTAL

Coastal fisheries currently account for about 30% of marine fisheries production volume, and in 2005 their value was estimated at JPY 509 billion, about half of marine fishery production value that year. Coastal fisheries have a wider range of target species than high seas and offshore fisheries and tend to focus on high end and/or fresh markets.

In addition to wild capture fisheries, Japan has substantial aquaculture production for species such as Japanese amberjack. In some Western countries like the US, aquaculture carries a negative stigma due to the impacts that aquaculture operations can have on the environment and on wild populations of aquatic organisms. This stigma is rare in Japan: the Japanese public generally views aquaculture as a beneficial method for increasing, stabilizing, and/or restoring wild seafood production. As an example, large-scale hatchery production of chum salmon is viewed as a huge success story.
According to fishery census information, in 2012 there were more than 170,000 commercial fishermen in Japan, of which more than 85% operated in coastal fisheries. Overall, 1.5-2 million people in Japan depend on commercial fishing and other seafood jobs, including fish processing, transport, and sales.

An important factor in the Japanese commercial fishing sector is that the age distribution is extremely skewed: nearly half of the workforce is over the age of 60 and less than 3% of the workforce is under the age of 25. These statistics reflect a profound demographic and socio-economic change underway in coastal communities across much of Japan.

In Japan, approximately one thousand fishery cooperatives maintain exclusive access rights to fish in coastal areas. Some of these cooperatives have been in operation since the feudal era when fishermen guilds were formed and given specified areas of nearshore coastal waters for their exclusive use. These ad hoc fishery rights were formalized and given legal status in the beginning of the 20th century and continue to this day.

Cooperatives range in size from several dozen fishermen to several thousand, with an average cooperative size of about fifty. A strong sense of historical ownership over the resources in their particular section of coastline brings these fishing associations together. While the use of harvest control rules propagated in the west (e.g., ITQs), they have generally been limited in Japan, cooperative members can and do coordinate their fishing effort to maximize equity and efficiency. For example, fishery cooperatives will often rotate access to prime fishing grounds for different boats on a daily or other periodic basis. In some cases, income will be pooled and shared, which can eliminate the need to race to fish. Peer pressure constitutes the basic principle of monitoring and enforcement in cooperatives. Coordinated marketing and sales are probably the most common collective actions taken in Japanese fishery cooperatives.

There are many potential advantages to the fishery cooperative system in Japan including better use of local knowledge, increased management flexibility, higher levels of compliance, and lower transaction costs. In an environment where top-down governance is limited and/or ineffective, cooperatives can take collective action to successfully manage aspects of the fishery. However, as environmental conditions have worsened in many areas in Japan, the softer, bottom-up, consensus-driven approach cooperatives use has shown its limits. Moreover, an estimated 70% of cooperatives are facing financial losses; nearly all receive significant funding and technical assistance from the federal government. Fishery cooperatives are a critical piece of the sustainable fisheries puzzle in Japan. As the ones that are closest to the problem, they will need to guide the pathway to solutions.
The dominant force in the Japanese seafood market is a single wholesale market in Tokyo called Tsukiji, which acts as a key node in the global seafood supply chain. No other market in Japan—indeed no other market in the world—handles the volume of seafood that pass through its auctions daily: some 2,345 metric tons.\(^1\)

**Auction Houses** ("oroshiuri gyosha")—are the most important mode of sale for fresh and high-value seafood (e.g. tuna) in Japan. Auction houses act as the central institution for seafood sales and the fulcrum between primary producers and consumers. They are by far the most important mode of sale for fresh and high value products like tuna in Japan.

Intermediate **wholesaler/traders** ("nakaoroshi gyosha")—900 in Tsukiji alone—buy and sell inside wholesale markets and may, for example, act as agents for supermarkets, restaurant chains, hotels and other large volume purchasers of seafood.

**Trading Houses** ("sougou shousha")—deal in foreign product and in the growing out-of-Tsukiji-market channels such as direct to retail. The “Big Three” trading houses (Maruha Nichiro, Nippon Suisan and Kyokuyo) are among the world’s largest seafood companies. **Maruha Nichiro’s** 200 individual companies are active in almost every aspect of fisheries production, processing, distribution, and marketing. Taken together, they represent the largest seafood company in the world. **Nippon Suisan (Nissui)** employs nearly 40,000 people. These giants are known as “keiretsu” in Japan.
Japan: traditional company groups that are vertically integrated and have interlocking stock ownership, exchanges of personnel, and coordinated fiscal and/or marketing strategies. All are heavily invested in overseas businesses including fisher/processors in North America (e.g., Gortons/Nissui and Peter Pan/Maruha), China, and elsewhere.

**Large restaurant and retail chains**– the growth of supermarkets and other large scale buyers has become a major force in Japan seafood markets over the last several decades. Major retailers include AEON Group (see “AEON Japan”), Seiyu (owned by Walmart), and Seven and i. Retailers often rely on out-of-wholesale-market channels and may have significant influence over both trading houses and primary producers. AEON has been one of the first out of the gate in Japan to make a commitment to selling MSC and ASC certified seafood.

**AEON Japan**– is the largest seafood retail company in Japan. In 2006, AEON became one of the first in Japan to sell MSC certified products. Currently, AEON offers 23 MSC products across 13 species. The lion’s share of these are imported from abroad such as MSC certified salmon from Alaska. AEON’s original commitment was to have 10% of seafood sales be MSC certified by 2017, but they recently extended the deadline to 2020, a reflection of the on-going challenge in sourcing certified product. This change was different from the approach US retailers used when they faced the same problem.

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Figure 4. Distribution channels around central wholesale markets. Solid lines represent established channels of the market system, while dashed lines represent newer channels. Figure from Tsukiji by T. Bestor.12
Despite seafood imports that declined by nearly a third in the last decade and a half, Japan is still the top importing nation in the world, followed closely by the US, China and various western European countries (Fig. 3). In 2014, Japan imported 2.5 million metric tons of seafood: shrimp, tuna, salmon, crab and cod were top products. China was the largest supplier country followed by Chile, USA, Russia, and Thailand.

Meanwhile, Japan’s seafood exports have grown in recent years; 2014 was a record high in sales. In addition to the US market, booming markets in Asia, including Hong Kong and mainland China, are driving much of this growth. The main species for export are scallops (+/-100,000 mt annually), mackerel and salmon. It is no coincidence that two of the first Japanese fisheries that went for MSC certification were scallops (successful) and salmon (unsuccessful): both of these seafood products are exported to markets that care about sustainability.

In 2012, the Ministry of Agriculture, Forestry and Fisheries announced an ambitious goal to double the Japanese seafood exports by 2020. This may provide increasing opportunities to leverage foreign markets to encourage sustainable fisheries and ecolabeling uptake in Japan.
SPECIES IN FOCUS: TUNA SUPPLY CHAIN

The Japanese market is the world’s largest for wild tuna, particularly for high value species like bluefin, bigeye, and albacore. Tuna in Japan is processed into three main product types: sashimi, canned, and katsuobushi. Domestic demand is primarily for sashimi, and almost 80% of global sashimi grade products are consumed in Japan. To satisfy increasing demand, Japan started increasing domestic catch effort in the 1950s, with fishing effort reaching its peak in 2002. Japan also significantly increased tuna imports from overseas. Japanese tuna buyers have become key players in tuna markets globally and Japanese prices set the market. Commercial tuna fisheries from Spain to Indonesia ramped up their fishing effort so they could capture higher Japanese prices. These market developments have triggered overfishing for tuna species globally, such as Pacific Bluefin, Atlantic bluefin, and bigeye tuna, which are primarily consumed as sashimi (Table 1). In recent years, Japanese consumption of canned tuna has started to decline along with domestic production of canned tuna, which has high production costs. Annual consumption of katsuobushi, flakes or shavings of dried and smoked skipjack tuna, has been steadily declining as well.13

<table>
<thead>
<tr>
<th>Species</th>
<th>Global production (tonnes), % consumed by Japan</th>
<th>Japan production (tonnes)</th>
<th>Primary gear types</th>
<th>Primary products</th>
<th>Primary fishery co-ops</th>
<th>Wholesale price per kg (fresh/frozen)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skipjack</td>
<td>2.5 million t, 12%</td>
<td>307,297 t</td>
<td>pelagic and offshore purse seine, pole and line</td>
<td>katsuobushi, canned</td>
<td>Yaizu, Ishinomaki, Nichinan</td>
<td>383/187 JPY</td>
</tr>
<tr>
<td>Yellowfin</td>
<td>1.2 million t, 9%</td>
<td>75,000 t</td>
<td>Pelagic purse seine, longline</td>
<td>sashimi, canned</td>
<td>Yaizu, Ichikikushikino, Kesennuma</td>
<td>767/419 JPY</td>
</tr>
<tr>
<td>Bigeye</td>
<td>443,000 t, 32%</td>
<td>68,717 t</td>
<td>pelagic longline</td>
<td>sashimi</td>
<td>Ichikikushikino, Kesennuma</td>
<td>1339/877 JPY</td>
</tr>
<tr>
<td>Albacore</td>
<td>266,000 t, 26%</td>
<td>65,035 t</td>
<td>Pelagic and offshore longline, pole and line</td>
<td>canned, sashimi</td>
<td>Nichinan, Yaizu, Kesennuma</td>
<td>301/305 JPY</td>
</tr>
<tr>
<td>Southern and Pacific bluefin</td>
<td>44,000 t, &gt; 70%</td>
<td>14,612 t (Pacific bluefin)</td>
<td>purse seine, set net, longline, troll</td>
<td>sashimi</td>
<td>Sakaiminato, Tsushima</td>
<td>2180/2499 JPY (Pacific bluefin)</td>
</tr>
</tbody>
</table>

Table 1. Summary of production and consumption information by tuna species.
TUNA SUPPLY CHAIN MAP

Three major companies dominate canned tuna trading activities in the Western Central Pacific Ocean (WCPO) - Tri Marine, Itochu and FCF Fishery Co. Ltd. Collectively, these companies source more than 70% of their product from the WCPO. The ‘Big Three’ tuna traders have established an integral position for themselves in this tuna fishery, a position unlikely to be challenged by other companies anytime soon given the Big Three’s well-established, long-term relationships with fishing and processing clients, as well as their strong financial backing.

In 2006, four major trading companies, Taiyo A & F Co., Kyokuyo Suisan Co. Ltd., Fukuichi Gyogyo Co., and Otoshiro Gyogyo Co., controlled an estimated 65% of sashimi supply in the Japanese market. The most significant sashimi trading company is Toyo Reizo, subsidiary of the trading company giant, Mitsubishi, followed by Yashima, Nissho Iwai, Itochu Fresh and Marubeni.

TUNA CATCH SECTOR OVERVIEW

The vast majority of the Japanese tuna harvest is from purse seine, longline, and pole and line fisheries (Table 4). Broadly speaking, most of the purse seine catch is processed into canned and katsuobushi products, while longline and pole and line catches primarily go to the sashimi market (Fig. 5). In addition to regional cooperatives (see Table 1), there are a few industry level fishery coops organized by gear types and species (Fig. 5). These coops support the tuna industry in line with Japan Fishery Agency policy; however, some domestic policy reform activists have pointed out that the members of these industry level coops are mostly retired government officials. This creates a powerful bond between industry and government, leading to a lack of independence and healthy competition in the seafood industry. For each product type, there are important trading companies (Fig. 5). Japan is the primary market for both katsuobushi and tuna sashimi products, although foreign markets for sashimi are growing. Canned tuna is more popular outside of Japan (Fig. 5).
The principal laws that regulate commercial fishing activities in Japan include “The Fisheries Act”, the “Living Aquatic Resources Protection Law” and the “Law Concerning Conservation and Management of Marine Living Resources.” The Fisheries Act provides the legal foundation to restrict the number/size of commercial vessels, operating periods, and fishing gear. It also defines the system of exclusive “fishery rights” and “fishery permits,” which allows individual operators the exclusive right to fish for specific species in specific areas.

Traditional top-down regulations and strict catch limits as used in the West are not common in Japanese fisheries, with the exception of harvest limits placed on Pacific bluefin tuna and Total Allowable Catch (TAC)-managed species (see Table 2). Acceptable biological catch (ABC), a scientific calculation of the sustainable harvest level of a fishery, is estimated for every assessed stock. However, ABCs are used as guidance for sustainable harvest levels rather than as catch restrictions.

POLICY/MANAGEMENT

“It is also necessary for Japan to strengthen its fishery management for domestic fisheries, in order to give more credibility to an effective leadership role at international fora.”

- Minister Akamatsu, Ministry Agriculture, Forestry and Fisheries

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KEY GOVERNMENT AGENCIES

JFA
Japan Fisheries Agency (JFA)- Under the umbrella of the Ministry of Agriculture, Forestry and Fisheries of Japan (MAFF), the JFA is the national government body in charge of all Japan’s fisheries management. JFA is also the lead entity to deal with international/high-seas issues, RFMOs, and whaling.

FRA
Fisheries Research Agency (FRA)- FRA is the primary fisheries research organization in Japan. FRA is responsible for conducting stock assessments and making forecasts for priority fisheries. The agency encourages practical use of their findings in the field. FRA also serves as the umbrella organization for 10 regional research institutes throughout Japan, such as the Hokkaido National Institute of Fisheries.

FPC
Fisheries Policy Council (FPC)- FPC sets catch quotas for TAC species in Japan. Council members are often former JFA staff and critics have questioned the independence of this agency and whether its recommendations are free from political considerations.
TOTAL ALLOWABLE CATCH (TAC)

Triggered by the ratification of the UN Convention on the Law of the Sea in 1996, Japan designated seven species (Alaska pollock, jack mackerel, sardine, mackerel, saury, common squid, and snow crab) under TAC Regulation. All are major species of high economic value which are caught in large volumes and are in particular need of management. Together, they covered about 30% of total fishing in Japan in 2000. Unfortunately, in some cases TAC is set above recommended catch levels for achieving maximum sustainable yield (MSY), based on taking social and economic needs of the fishery community into consideration. Furthermore, TAC is almost always set above typical harvest levels, resulting in harvests never exceeding quotas (Table 2).

<table>
<thead>
<tr>
<th>Species</th>
<th>TAC</th>
<th>Catch Volume</th>
<th>Catch to quota ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mackerel</td>
<td>701,000</td>
<td>430,622</td>
<td>61%</td>
</tr>
<tr>
<td>Saury</td>
<td>338,000</td>
<td>147,095</td>
<td>44%</td>
</tr>
<tr>
<td>True Sardine</td>
<td>388,000</td>
<td>200,509</td>
<td>52%</td>
</tr>
<tr>
<td>Jack Mackerel</td>
<td>214,000</td>
<td>140,297</td>
<td>66%</td>
</tr>
<tr>
<td>Walleye Pollock</td>
<td>275,000</td>
<td>206,559</td>
<td>75%</td>
</tr>
<tr>
<td>Japanese squid</td>
<td>329,000</td>
<td>151,490</td>
<td>46%</td>
</tr>
<tr>
<td>Snow Crab</td>
<td>5,273</td>
<td>3,865</td>
<td>73%</td>
</tr>
</tbody>
</table>

Table 2. 2013 catch information for species managed by TAC. TAC and catch volume data, in metric tonnes, from the JFA.

The JFA appears reluctant to adopt a number of fishery management policies that are more commonly used in other countries. One example is maximum sustainable yield. The JFA has stated that MSY is an overly simplistic and unrealistic model that cannot be applied to all situations. Although ABC estimates for some stocks are aimed at achieving MSY, ABCs for stocks of data-limited species (e.g., Arabesque greenling) may be based primarily on past catch volumes. The JFA also feels it is too early to introduce an individual transferable quota (ITQ) system to Japan. Their concerns are that quota trading will lead to a highly competitive system, and that the limited number of quota holders will dominate and push small-scale fishermen out of business.

The JFA partly blames declining catches on environmental conditions and predation, particularly from sea lions and whales. In inland waters, increasing abundance of invasive species (e.g., largemouth bass, bluegill) and great cormorants (Phalacrocorax carbo) has become a problem. Inland and coastal fisheries are also strongly affected by habitat alteration and loss due to the effect of public works that are ubiquitous across Japan, including structures for flood control, waste water from factories and households, and reductions in river flow and water quality.
ILLEGAL HARVEST

Although illegal harvest does not appear to be a systemic problem for most Japanese fisheries, violations do occur. The National Coast Guard, police, and the prefectural governments recorded 1,713 legal violations in 2013. Poaching is particularly common for resources that can be harvested on or near beaches, such as sea urchin and abalone, and some of these poaching activities are instigated by organized crime bodies. Other commonly reported violations include fishing without an appropriate permit, false or missing fishery logbook entries, and refusal to participate in on-site inspections. Unauthorized fishing by Chinese vessels has been a particular concern, with a recent example of more than 200 vessels illegally harvesting jewelry-grade coral around Ogasawara and Izu Islands. At a local level, fishery cooperatives can engage in poaching prevention activities such as fishery ground patrols.

ENDANGERED SPECIES

The Japanese Ministry of the Environment complies and oversees regulations for endangered species in Japan. The current Japanese Red List includes more than 130 species that are already extinct or vulnerable to extinction in Japan. The primary species types include birds and mammals. If listed, species are protected from hunting or fishing (commercial or sport) take. Until very recently, no commercial fisheries were ever listed on the Japanese red list. However, that changed when Japanese eel was added to both the IUCN and Japanese red lists in 2013, which garnered significant media attention in Japan and internationally. As a result, limits have been placed on the capture and use of juvenile eels for aquaculture, and management has recommended ceasing harvest in some areas from October through December when eels migrate to the ocean from freshwater.
The Marine Stewardship Council (MSC) is the leading eco-label for sustainable fisheries worldwide. MSC introduced eco-labelled products into the Japanese market in 2006. After nearly a decade operating in Japan, only two domestic fisheries are currently MSC certified. Additionally, one fishery is in full assessment and three fisheries withdrew from the program. Many of the assessed species in Japan appear unlikely to achieve MSC certification in the short-term. Preliminary research suggest most fisheries would find difficulty passing MSC Principles 1 and 2, due in part to limitations in stock assessment and monitoring systems. High cost is also a barrier. However, if significant improvement support is made available to fisheries, more may be able to achieve MSC.

A useful study published in 2014 investigated Japanese consumer's willingness to pay for eco-labeled seafood. The results showed that Japanese consumers are not yet ready to pay a price premium for MSC certified products. However, when provided with both information about the state of global fisheries and a clear description of programs like the MSC, evidence suggests that Japanese consumer behavior may change. One potential barrier to informed purchasing is that consumers believe that retailers are taking responsibility for their products, which allows them to defer responsibility for this issue. Nevertheless, there is evidence that a market for eco-labeled products in Japan could emerge if an effective education/outreach program was implemented and sufficient sustainable seafood supply was available.

Marine Eco-label (MEL) Japan is an industry-supported seafood eco-label which was developed in Japan by stakeholders in the seafood industry and government. Currently 23 fisheries are participating in the program, which reflects significant demand in Japan for a certification program that takes into account the unique cultural elements of domestic fisheries in Japan. According to experts, the MEL program-- as presently designed-- does not meet many of the eco-labeling requirements of key markets in Europe or North America. These experts highlight critical missing pieces such as a lack of public commentary period, insufficient verification and third party review, and no Chain of Custody program.
A recent survey of four hundred fishery managers and fishermen conducted by the JFA revealed a general consensus that stocks are declining in Japan but ongoing debate about the nature (and potential solutions) to crisis. Approximately half of respondents in the survey believed that declines were due to environmental factors while only a third attributed them to overfishing (Fig. 6). A lack of scientific consensus on the causes of fishery declines has limited the ability of fishery managers and policy makers to make comprehensive and effective recovery plans in Japan.
02 RECOMMENDATIONS

01 — Establish and strengthen a Japan-based community of sustainable fishery advocates.

Set up a steering committee that includes representatives of key supply chains and fisheries, academic institutions, agencies, and NGOs. The committee should meet regularly to share ideas, build trust, develop joint projects, and build consensus around a common vision for sustainable fisheries in Japan.

02 — Develop and rally organizations around a common vision for sustainable fisheries in Japan.

The steering committee should create a shared vision that clearly articulates what sustainable fisheries in Japan look like and what needs to be done to make this a reality. The vision should outline roles for different players and identify a problem(s) to solve with collective action. It could also include a menu of policy and management solutions and a list of “shovel-ready” projects that are practical and achievable in the next few years to demonstrate success.

03 — Support an independent and respected scientific authority.

This authority (e.g., professor/research group at a reputable Japanese university) can provide objective analysis and reports to defend a non-political scientific platform about the state of Japanese/global fisheries and the potential need for management/policy reforms.

04 — Develop and implement a strategy for fishery cooperatives, specifically for high priority regional fishery cooperatives.

Given that cooperatives are the primary organizational entity within the fishing sector in Japan, we should look for opportunities to customize and co-design sustainability approaches based on their needs. Local acceptance and adoption of sustainability solutions will be critical to long-term success.

05 — Support a FIP incentives program that results in seafood buyers rewarding Japanese fisheries that that can clearly document their improvements with appropriate incentives.

We need a FIP outreach and awareness building strategy for retailers in Japan, but we also need an approach for high-end restaurants or food service that could give status or reputational benefits to Japanese fisheries in improvement processes.
Strategically connect market initiatives work to existing policy reform efforts at domestic and/or international scales (e.g., RFMO).

Identify policy reform needs of various FIPs as well as existing reform efforts that can be linked to FIPs or other market programs.

Prepare for a multiple eco-label world in Japan.

Many parts of the Japanese seafood industry will likely continue to demand a homegrown, low-cost eco-label option. For this reason, MEL Japan continues to operate even though it is not considered credible or particularly useful in either domestic or international fisheries. A scheme improvement program for MEL Japan could be an opportunity, but it is not clear if there is real intent to improve within industry and government sectors. Other possibilities include developing a Seafood Watch Japan, a regional fisheries seal (e.g., similar to Gulf of Maine Research Institute), or a FIP branding effort. All of these avenues warrant further exploration.

Use 2020 Tokyo Olympics as a catalyst for reform.

Take advantage of this one-time-only event to build issue salience and consumer awareness about sustainability, as well as the crisis situation many domestic fisheries face in Japan. Link this crisis to the need for Japanese consumers and businesses to take a more proactive role in addressing fisheries issues both locally and globally. We recommend that a team is quickly mobilized to lead a multi-organizational effort to leverage public, market and government interest in the Tokyo Olympics.

CONCLUSION

Few countries in the world are more important to the future of the global fisheries and the sustainability of global seafood supplies than Japan. From seafood consumption to seafood production to international fishery policy fora such as Regional Fish Management Organizations (RFMOs), Japan plays an outsized role. But as Minister of Fisheries Akamatsu once said, for Japan to truly achieve a leadership role in promoting effective and equitable management of global fish stocks, it needs to strengthen its own fishery management and play a more active role in restoring its own domestic fisheries. And to this end, the growing sustainable seafood community in Japan plays a critical role in terms of developing the vision of what sustainability looks like in Japan and for leading the way in establishing the collaborative pathways and shared solutions that can lead to healthy fish stocks and fishing communities.
REFERENCES


10. Japan Fisheries Agency. 2007. [Strengthening the organization, administration, and business foundation of the fisheries cooperative system.] (In Japanese.) <http://www.maff.go.jp/j/kikaku/wpaper/h22_h/trend/1/t1_2_2_2_03.html>


12. Figure 46, “Visible Hands” by Bestor, Theodore, C. in Tsukiji: The Fish Market at the Center of The World, pp. 185 by the Regents of the University of California. Published by University of California Press.


**Ocean Outcomes** conducted eleven rapid assessments of strategically important Japanese fishery species to better articulate the Japanese fisheries landscape and to clearly map out the potential for fishery improvement and third party certification of fisheries targeting these species.

We chose ten Japanese fishery species to evaluate from an initial list of the top 20 species by production volume, selecting those that are important to the global market or that appeared to have good potential for implementing improvements. We also assessed a specific Pacific bluefin tuna fishery for FIP scoping purposes given the importance of this species in Japan. First, we developed a rapid assessment protocol based on a select group of 19 performance indicators within the three Marine Stewardship Council (MSC) principles.

MSC previously determined that these specific indicators are especially predictive of scores at the principle level. We gathered fishery information and conducted the assessments, in which we summarized information within each MSC principle and assigned a scoring range (0-40, 40-60, 60-80, 80-100) to each performance indicator. Many of these species are harvested by multiple gear types, so we conducted the assessments at a more general level rather than focusing on specific gear types. Based on the information summaries, we identified key sustainability issues for each species as well as those shared across species. We also made an initial determination as to whether the fisheries for each species appeared suitable for MSC certification within the near term (roughly the next 5 years).

**These assessments** will help inform policy, management, funding, and the direction of sustainable seafood work in Japan.

**MSC Fisheries Standard:**

**Principle 1:** Sustainable fish stocks - The fishing activity must be at a level which ensures it can continue indefinitely

**Principle 2:** Minimizing environmental impact - Fishing operations must be managed to maintain the structure, productivity, function, and diversity of the ecosystem

**Principle 3:** Effective management - The fishery must comply with relevant laws and have a management system that is responsive to changing circumstances
To conduct the assessments we used information from stock assessments conducted by scientists at the Fisheries Research Agency of Japan (FRA) and from policy documents posted by the Japan Fisheries Agency (JFA). In the summaries below, we refer to FRA stock status determinations (low, medium, or high). The status may not be linked to actual fish abundance because it is often determined by dividing the range of past catches into thirds, and then seeing whether the most recent catch falls within the lower third (low), middle third (medium), or higher third (high). This FRA evaluation method is straightforward but fails to consider whether stock abundance is being maintained at an ecologically sustainable level. For tuna species we used reports from the International Seafood Sustainability Foundation and the Regional Fisheries Management Organizations (RFMOs) that manage the respective tuna stocks.

Across all of the eleven species assessed, scoring ranges for performance indicators were lowest for MSC Principle 1 (Fig. 1). The lowest scores were for species that appear to have low population abundances based on stock assessments. For Principle 2, most performance indicators scored in the 60-80 range, largely due to uncertainty about the identity and status of non-target species as well as fishery impacts on these species. Scores were highest within Principle 3, but a substantial proportion of performance indicators did score below the 80 level. Any score below 60, that is orange or red, would cause the fishery to automatically fail the MSC assessment process.

Figure 1. Percentages of performance indicators in different scoring ranges, within the three MSC principles, across all eleven species assessed. Scores are especially low in Principle 1, which focuses on stock status.
Japanese amberjack

**Seriola quinqueradiata**

- **Stock status:** High status according to the FRA, but actual abundance uncertain.
- **Gear types:** large and small purse seines, set nets, gillnets, and longlines
- **Japan catch volume:** 118,234 metric tons in 2013, ranked 13th by catch volume
- **Region:** throughout Japan’s coastal waters except east of Hokkaido
- **Markets:** Japan; imported into the USA, Canada, and Hong Kong

**Key Sustainability Issues:**

Aquaculture produces over 50% of total amberjack supply, with wild capture fisheries supplying the remainder. The FRA assessment rates stock status as high due to large catches in recent years, but actual wild abundance is unknown because catch volumes are not directly tied to population sizes, and the JFA does not monitor catch-independent indices of abundance for this species group. There are also concerns about high exploitation rates of juveniles, which are removed from wild populations for use in aquaculture. Information on retained and bycatch species is needed.

**Certification Ready?**

Without significant improvement the fishery is unlikely to achieve MSC certification due to the uncertainty about wild stock status.
**Arabesque greenling**

*Pleuragrammus azonus*

**Stock status:** The Dohoku, Donan, and Nemuro Strait-Doto-Hidaka-Iburi stocks have low status according to the FRA.

**Gear types:** purse seines, set nets, stick held dip nets, scoop dip nets, vertical longlines

**Japan catch volume:** 51,700 metric tons for all stocks in 2013, ranked 11th by catch volume

**Region:** around Hokkaido

**Markets:** Japan

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**Key Sustainability Issues:**

Arabesque greenling are a commercially valuable species often caught in fisheries that also target Pacific cod, walleye pollock, or Pacific salmon. Limited biological information makes it difficult to estimate and predict abundance, but rapidly declining catches-- despite little reduction in fishing effort-- indicate that stocks are in decline. Habitat impacts of fishing gear, especially bottom otter trawls, may be substantial and require investigation.

**Certification Ready?**

Without significant improvement the fishery is unlikely to achieve MSC certification due to indications of declining stock abundances.

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**Rapid assessment scoring**

<table>
<thead>
<tr>
<th>Principle</th>
<th>0-40</th>
<th>40-60</th>
<th>60-80</th>
<th>80-100</th>
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<td>Principle 1</td>
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<td><img src="image2" alt="Graph" /></td>
<td><img src="image3" alt="Graph" /></td>
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<tr>
<td>Principle 3</td>
<td><img src="image1" alt="Graph" /></td>
<td><img src="image2" alt="Graph" /></td>
<td><img src="image3" alt="Graph" /></td>
<td><img src="image4" alt="Graph" /></td>
</tr>
</tbody>
</table>
Bigeye tuna

**Stock status:** Western and Central Pacific Ocean bigeye tuna are considered overfished and are listed as vulnerable on the IUCN Red List.

**Gear types:** longlines, purse seines (sometimes used in conjunction with Fish Aggregating Devices (FADs)), pole and line, handline

**Japan catch volume:** averaged 46,000 metric tons from 2009 to 2013, ranked 16th by catch volume

**Region:** worldwide in tropical and subtropical waters of the Pacific, Indian, and Atlantic oceans

**Markets:** Japan; imported into Thailand, Guam, and Hong Kong

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**Key Sustainability Issues:**

The Western Central Pacific Fisheries Commission (WCPFC) manages Western and Central Pacific Ocean (WCPO) bigeye tuna, the primary stock harvested by Japanese fisheries. The stock is considered overfished, but there are still no official harvest control rules and no clear plan for rebuilding the stock. Bycatch of protected species can occur, particularly for longline gear and purse seines set near FADs.

**Certification Ready?**

Without significant improvement the fishery is unlikely to achieve MSC certification due to the overfished status of the WCPO stock.

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[Graph and chart showing catch and rapid assessment scoring]
Chub and blue mackerel
マサバ、ゴマサバ
Scomber japonicus and Scomber australasicus

Stock status: According to the FRA, the Pacific Ocean and Tsushima Current chub mackerel stocks have low status, Pacific Ocean blue mackerel have high status, and East China Sea blue mackerel have medium status.

Gear types: purse seines, set nets, stick held dip nets, scoop dip nets, vertical longlines

Japan catch volume: 429,000 metric tons for all stocks in 2013 (284,000 mt of chub mackerel and 145,000 mt of blue mackerel), ranked 1st by catch volume

Region: Sea of Japan and East China Sea south of Akita, Pacific Ocean south of Nemuro

Markets: Japan; imported into Egypt, China, and Thailand

Key Sustainability Issues:

Catch information suggests that chub mackerel stocks are depleted while blue mackerel stocks are more abundant. However, these two species are managed together under a single Total Allowable Catch (TAC) due to their similar physical appearance and overlapping geographic distributions, which will not aid recovery of the depleted stocks. There is a need for standardized monitoring of retained and bycatch species, and data on habitat impacts of fishing gear are lacking.

Certification Ready?

Without significant improvement the fishery is unlikely to achieve MSC certification due to the low stock status of chub mackerel stocks and lack of a harvest strategy that allows for stock rebuilding.
Japanese flying squid
スルメイカ
*Todarodes pacificus*

**Stock status:** The fall and winter stocks have high and medium status, respectively, according to the FRA.

**Gear types:** squid jiggling, set nets, otter trawls, purse seines, gillnets

**Japan catch volume:** 251,500 metric tons in 2013, ranked 7th by catch volume

**Region:** all around Japan for winter stock, fall stock in the Sea of Japan

**Markets:** Japan, imported into Korea, China, and Russia

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**Key Sustainability Issues:**

Japanese flying squid are not being harvested to the the point of impairing population productivity, but management should consider assessing stock status against reference points based on achieving maximum sustainable yield (MSY). This would help ensure that stocks are being harvested at a sustainable level. Better monitoring information is needed for catches of non-target species, although jigging and handline gear are selective and have low bycatch rates.

**Certification Ready?**

Japanese flying squid fisheries could be good candidates for MSC certification because stocks are not overfished. This is particularly true for handline or jigging fisheries because catches of non-target species are limited for these gear types.

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*Rapid assessment scoring*

- **Principle 1**
  - 80-100
  - 60-80
  - 40-60
  - 0-40

- **Principle 2**
  - 80-100
  - 60-80
  - 40-60
  - 0-40

- **Principle 3**
  - 80-100
  - 60-80
  - 40-60
  - 0-40

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*Ocean Outcomes*
Japanese jack mackerel
マアジ
Trachurus japonicus

**Stock status:** The Pacific Ocean and Tsushima Current stocks both have medium status according to the FRA, but actual abundances are unclear.

**Gear types:** purse seines and set nets

**Japan catch volume:** 148,000 metric tons in 2013, ranked 10th by catch volume

**Region:** Pacific Ocean, Sea of Japan, and East China Sea from Akita and Iwate prefectures and southward

**Markets:** Japan

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**Key Sustainability Issues:**

There is substantial aquaculture production of this species, so aquaculture impacts may need to be considered. The FRA rates stock status as medium, but it is uncertain if stock abundances are stable because maximum sustainable yield (MSY)-based reference points are not used. Additionally, the JFA manages both stocks under a single total allowable catch (TAC), which is not a precautionary strategy. If one of the stocks becomes depleted, the single TAC will not effectively limit catches on the depleted stock unless the TAC is significantly reduced. The fishery lacks catch monitoring information and management objectives for non-target species.

**Certification Ready?**

Without significant improvement the fishery is unlikely to achieve MSC certification because the harvest strategy is not precautionary, and there is some uncertainty about stock status.

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**Rapid assessment scoring**

- **Year:** 2002 to 2014
- **Catch (metric tons):** 5,000 to 30,000
- **Principle 1:** Score: 0
- **Principle 2:** Score: 10
- **Principle 3:** Score: 2.5

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*Ocean Outcomes* Japan Rapid Assessments 2015
Pacific bluefin tuna

Stock status: Pacific bluefin stock is depleted and listed as vulnerable on the IUCN Red List.

Gear types: purse seines, longlines, set nets, gillnets, pole and line

Japan catch volume: averaged 14,600 metric tons from 2002-2013

Region: throughout the North Pacific Ocean with a limited distribution in the Southern Hemisphere

Markets: Japan

Key Sustainability Issues:
The Pacific bluefin tuna stock status is depleted, with the 2014 stock assessment estimating the spawning stock biomass to be at a historic low. The Western Central Pacific Fisheries Commission has recommended reducing catches of juveniles but has not implemented an effective, precautionary harvest strategy that will allow for stock rebuilding. Official stock reference points are lacking, and catch information for non-target species will need to be collected for smaller domestic fisheries.

Certification Ready?
Without significant improvement, the fishery is unlikely to achieve MSC certification due to depleted stock status.
**Pacific saury**

*Cololabis sara*

**Stock status:** Stock status is high according to the FRA, but actual abundance is uncertain.

**Gear types:** stick held dip nets, and to a much smaller extent, gillnets and set nets

**Japan catch volume:** 404,148 metric tons in 2013, ranked 5th by catch volume

**Region:** Pacific Ocean north of Chiba Prefecture, and Hokkaido coastal areas in the Okhotsk Sea

**Markets:** Japan, imported into Russia, Korea, and Thailand

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**Key Sustainability Issues:**

The FRA evaluates the stock status of Pacific saury on the basis of catch per unit effort data and does not use maximum sustainable yield (MSY)-based benchmarks, resulting in uncertainty about population abundance. Additionally, effective management will require international coordination because the stock is harvested by other countries. Catch of non-target species appears minimal for stick-held dipnet fisheries, the primary gear type used to fish Pacific saury.

**Certification Ready?**

Uncertainty about stock status makes achieving MSC certification unlikely. If that issue can be resolved, however, stick held dip net fisheries appear well suited for MSC certification.
Skipjack tuna
カツオ
Katsuwonus pelamis

Stock status: The Western and Central Pacific Ocean and Indian Ocean skipjack tuna stocks appear healthy, at a level that can produce maximum sustainable yield (MSY).

Gear types: purse seines (sometimes used in conjunction with Fish Aggregating Devices (FADs)), pole-and-line, troll, and set nets

Japan catch volume: averaged 268,000 metric tons from 2009 to 2013, ranked 3rd by catch volume

Region: throughout tropical and warm-temperate waters except the Black Sea

Markets: Japan; imported into Thailand for processing; canned product exported to the USA, EU, Middle East, Australia, and Canada

Key Sustainability Issues:
Skipjack tuna stocks are above the level at which productivity will be impaired, but scientists have concerns about the ongoing high exploitation rates. Tuna Regional Fisheries Management Organizations have not implemented a precautionary harvest strategy or adopted official stock reference points. Purse seine fisheries have substantial catches of non-target species, some of which are depleted.

Certification Ready?
Skipjack tuna fisheries using more selective gear, such as pole-and-line, are reasonable candidates for MSC certification. The Meiho pole-and-line skipjack and albacore tuna fishery entered MSC assessment on March 31, 2015. Purse seine fisheries are less suitable for certification due to bycatch issues.
**Walleye pollock**

**Stock status**: According to the FRA, the Pacific Ocean and and Southern Okhotsk Sea stocks have medium status, while the Northern Japan Sea and Nemuro Strait stocks have low status.

**Gear types**: gillnets set nets, bottom otter trawls, traditional seine (かけまわし), and longlines

**Japan catch volume**: 210,000 metric tons in 2013, ranked 8th by catch volume

**Region**: mainly around Hokkaido, with some fish distributions extending to northern Honshu

**Markets**: Japan, imported into Korea, China, and Russia

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**Key Sustainability Issues:**

Current stock abundances are substantially lower than they were before the 1990s, and a recovery plan has been implemented for the Pacific walleye pollock stock. Despite the FRA determining that two stocks have low status, the JFA sets allowable catches substantially higher than biologically recommended levels. There is little information on catches of non-target species, and one of the gear types (bottom otter trawl) likely has detrimental impacts on habit.

**Certification Ready?**

Without significant improvement the fishery is unlikely to achieve MSC certification because two stocks have low status, and the harvest strategy is not precautionary.
Yellowfin tuna

**Key Sustainability Issues:**

Yellowfin tuna stocks generally appear healthy, but Regional Fisheries Management Organizations have not implemented a precautionary harvest strategy or adopted official stock reference points. Some gear types incidentally catch depleted species (sharks and birds for longlines, bigeye tuna for purse seine fisheries on FADs). Pole-and-line and handline are more selective gear types that have less bycatch.

**Certification Ready?**

Pole-and-line fisheries are reasonable candidates for MSC certification, while longline and purse seine fisheries may be better candidates for improvement projects since these gear types have greater impacts on Endangered, Threatened, or Protected (ETP) or depleted species.

**Stock status:** The Western and Central Pacific Ocean and Indian Ocean yellowfin tuna stocks appear healthy, at a level that can produce maximum sustainable yield (MSY).

**Gear types:** purse seines (sometimes used in conjunction with Fish Aggregating Devices (FADs)), longlines, pole and line, handline

**Japan catch volume:** averaged 62,000 metric tons from 2009 to 2013, ranked 14th by catch volume

**Region:** throughout tropical and warm-temperate seas except the Mediterranean Sea

**Markets:** Japan; canned product exported to the USA, European Union, Middle East, Australia, and Canada