



# Seafood Commodity Trade Analysis

## Supplement to “Progress toward Sustainable Seafood: 2015 Edition”

California Environmental Associates

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# Introduction

# The short-term reach of market-based incentives will largely be driven by how many fisheries are closely linked to markets that have strong demand for sustainable seafood

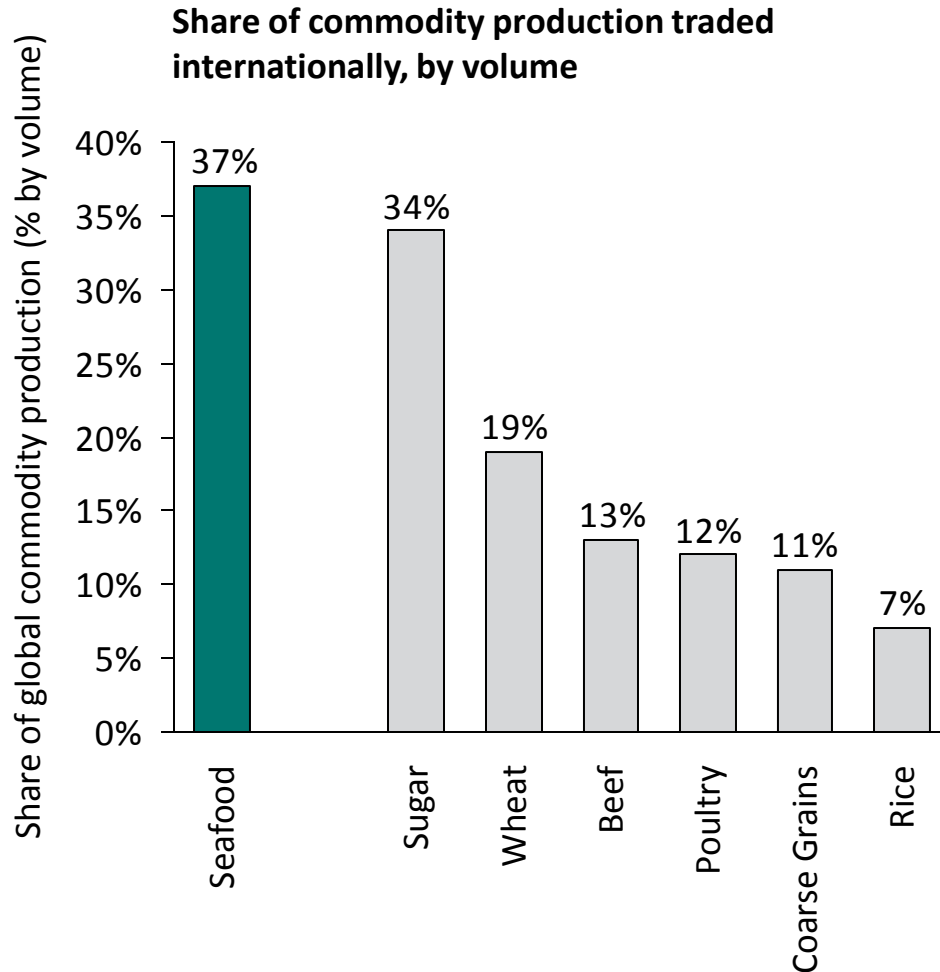
**The demand for “sustainable” seafood is largely limited to the United States and Northern Europe, which together account for roughly a third of imported seafood globally**

- The reach of market-based conservation interventions extends only as far as the demand for sustainable seafood. Currently that demand resides exclusively in North America (driven largely by the United States) and Northern Europe, which together account for roughly 32% of global imports by value.
- This import demand pressure is somewhat diluted by significant levels of intra-European trade.

**These markets have strong preferences for a handful of commodities, and many fisheries for these commodities are already certified or in a fishery improvement project (FIP). Opportunities for further engagement of fisheries vary greatly across commodities:**

- **Crab:** Achieving impact in existing swimming crab FIPs is a priority. Market dynamics will make expansion of market incentives challenging for other crab species.
- **Lobster:** Few *good* candidates for new lobster FIPs remain; achieving impact in existing FIPs (e.g., in Brazil) may be more impactful than expanding to new fisheries.
- **Octopus:** Market programs have not had much traction with octopus fisheries, and market dynamics are challenging.
- **Salmon:** Limited expansion opportunities exist given strong current certification of Alaskan fisheries already certified, achieving progress in existing FIPs is likely the best near-term opportunity.
- **Shrimp:** Cold-water shrimp is largely certified, with few additional opportunities. Progress in tropical shrimp fisheries remains elusive; market pressure is thus far insufficient to address the scale of difficulty in these fisheries.
- **Small pelagics:** As the sustainability bar, industry has settled on IFFO RS, which has certifications in ~80% of small pelagic fisheries by volume. Need to change buyer standards in order to empower other market-based programs.
- **Snapper/grouper:** Difficult context in which to achieve short-term success.
- **Squid:** Market programs have not had much traction with squid fisheries, and market dynamics are challenging for this commodity.
- **Tuna:** ISSF has strong coverage of tuna; potential gains could be made by improving coordination of FIPs.
- **Whitefish:** Limited expansion opportunities exist, given current wide adoption of MSC and FIPs.

# Almost 40% of global seafood production by volume is traded internationally each year

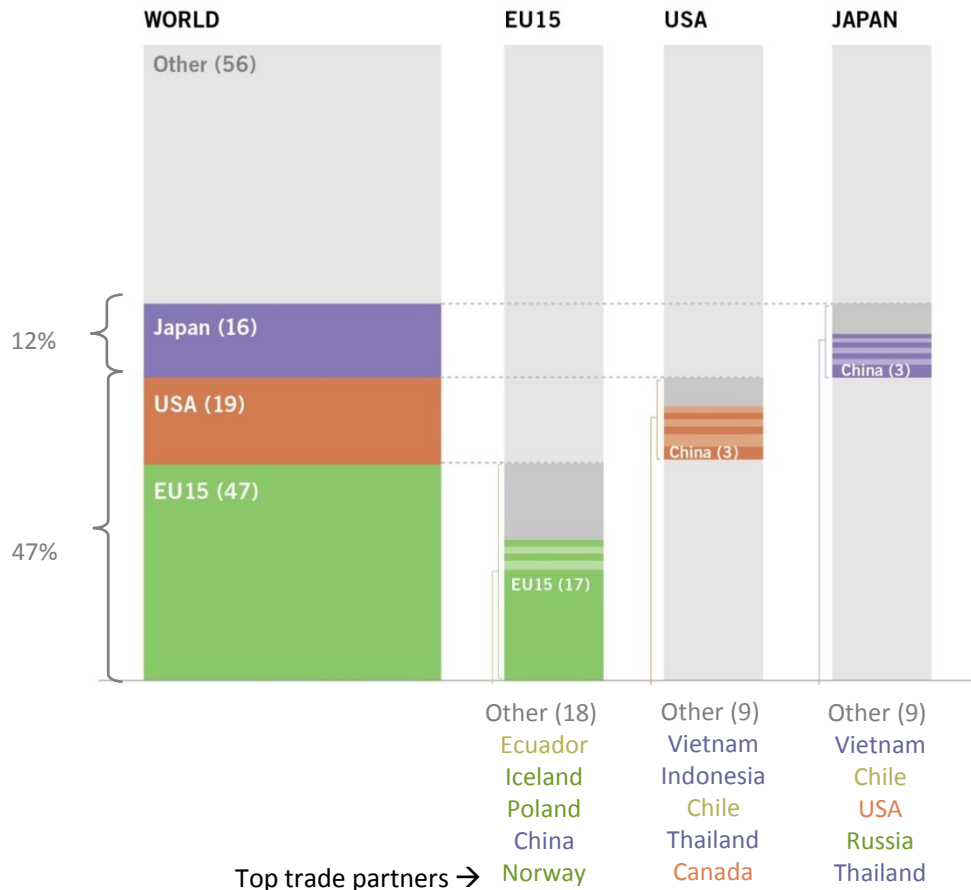


- To date, the sustainable seafood movement has used international market pressure (e.g., retailers in the EU and the US) to compel fisheries to get certified, participate in FIPs, or make improvements in response to seafood ratings.
- Seafood is one of the most heavily traded commodities in the world, making it an excellent target for international market pressure.

# The United States and the EU15 account for ~47% of global seafood imports; Japan accounts for an additional 12%

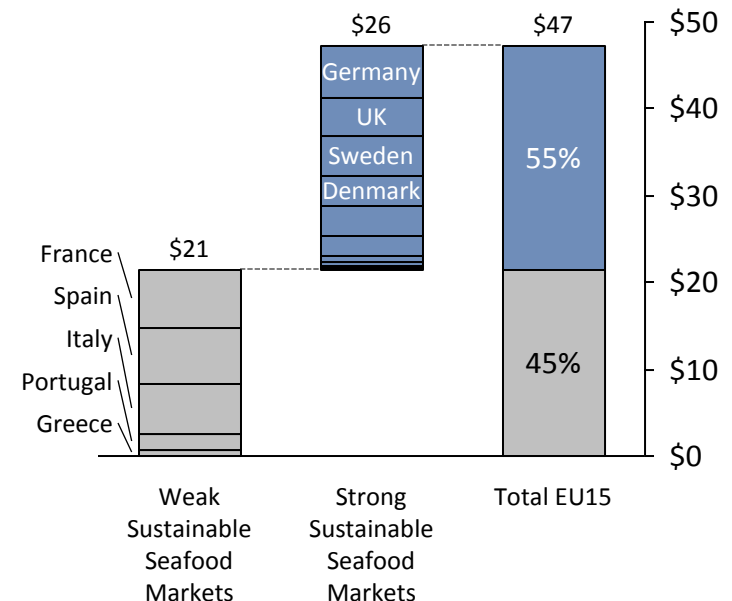
## TOP IMPORT VALUES

(billions of USD) Top trade partners highlighted.



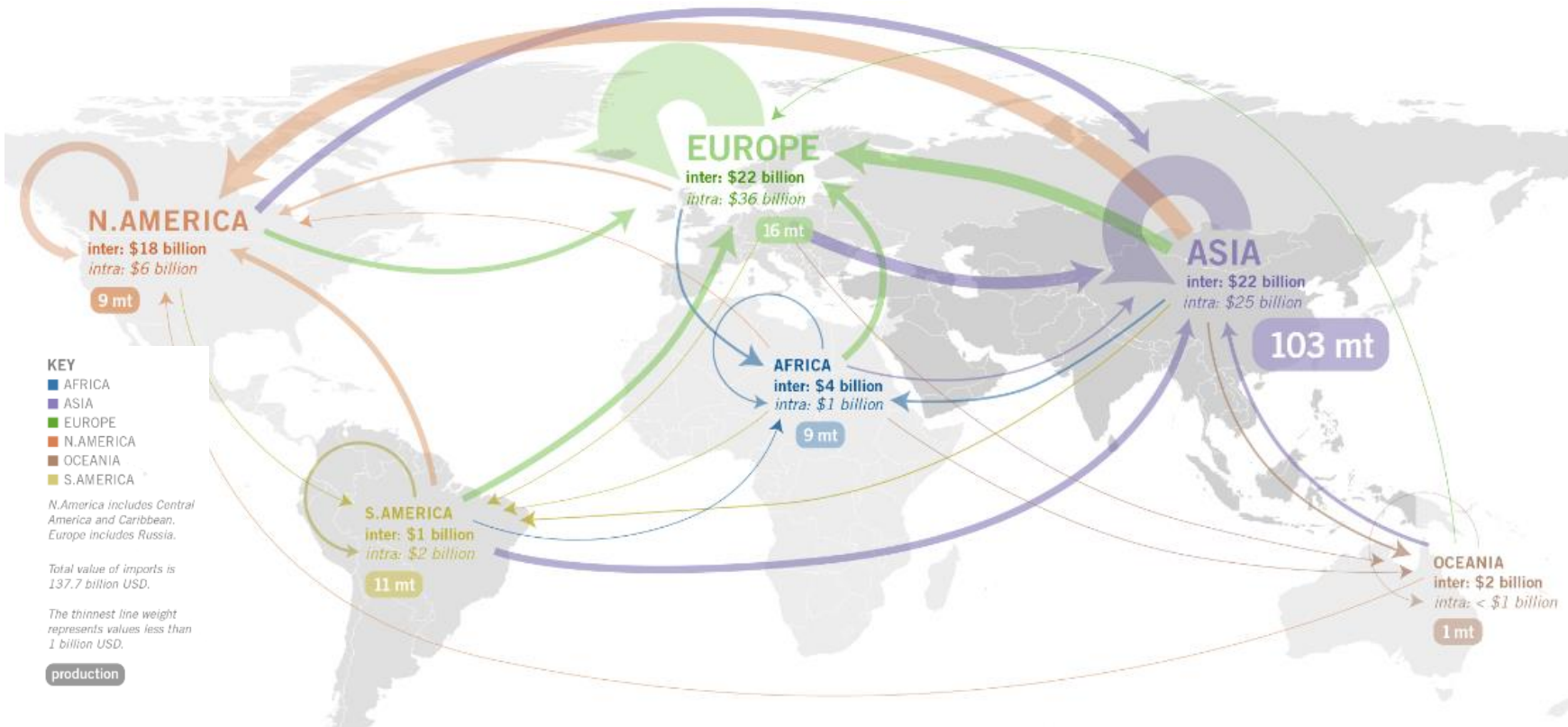
- The United States and EU15, where sustainable seafood markets are most developed, account for 47% of global seafood imports by value.
- Japan, a country that is commonly identified as a next logical target for cultivating sustainable seafood markets, accounts for an additional 12% of global seafood markets. However, Japan's imports are chiefly confined to shrimp and tuna.
- Southern Europe (including France) is also a logical target for further demand-side cultivation, and accounts for 45% of the EU15's total seafood imports by value.

## Imported value of seafood for EU15 member countries





# Large volumes of intra-continental trade mean that the influence of core markets may not be as great as overall trade data suggest



- **Intra-European trade:** More than 60% of seafood imports into European countries come from other European countries, most notably Norway (e.g., salmon).
- **Intra-Asian Trade:** Asia appears to be the place where the EU and NA markets may have the most potential to influence developing world fisheries, but strong intra-Asian trade limits the overall influence in these markets outside of a few key commodities.



# Commodity Analysis

# Commodity analysis overview

## Overview

The following sections provide an overview of some of the main seafood commodities, including their engagement with market-based conservation tools and high-level assessments of the prospects for expanding the use of market-based tools within these commodities. In this analysis, fisheries that export a large share of their product to Northern Europe and the United States are generally assumed to be good candidates for additional market-based interventions. Although there are exceptions to this rule, this filter should provide a good first-order assessment of what fisheries are most likely to respond to Western market pressure. This filter is not sufficient to determine whether market-based approaches will work well, but additional information (e.g., key supply chain partners, governance context) is beyond the scope of this overview.

## Data

We used the following data sources in the analysis:

- FAO Fishstat – Landings data for each commodity by country
- WCPFC, ICCAT, IATC, IOTC – Tuna landings data
- FAO Fishstat – Total volume (by product weight) of seafood exports by commodity
- FAO – Product weight to round weight (i.e., weight of whole fish/seafood product) conversions
- International Trade Centre – Detailed seafood trade data by value (including identification of trading partners)
- Marine Stewardship Council – Volume estimates for certified fisheries
- [Fisheryimprovementprojects.org/FishSource](http://fisheryimprovementprojects.org/FishSource) – Volume estimates for FIPs
- Sustainable Fisheries Partnership, 2014. Small Pelagics: SFP Fisheries Sustainability Overview

# Data limitations (1 of 2)

## Limitations of trade data

Analysis in this presentation uses international trade data. When interpreting these data, a few important factors should be considered.

- 1) A substantial portion of traded seafood is classified in generic categories (e.g., frozen fish fillets not elsewhere specified). This means that not all traded seafood can be accurately classified into a specific commodity group. Our hypothesis is that this characteristic of trade data has the largest impact on freshwater species (e.g., tilapia, catfish) and snapper/grouper. This is probably less of a concern for products that are easily classified (e.g., lobster, shrimp).
- 2) Trade volumes are reported in product weight. This creates a challenge in estimating apparent consumption because traded volume must be converted to round weight of fish. We have used product to round-weight conversion factors from FAO (unpublished). While we believe these conversion factors to be well-vetted, using these conversion factors induces some margin of error.
- 3) Reporting accuracy varies from country to country. In some of the most obvious cases of inaccurate reporting of trade data (e.g., Vietnam, Russia), we have used “mirror data” as a substitute. For example, instead of using Russia’s reported crab exports, we used the sum of all of the other countries’ reported crab imports from Russia. Data was only available to use this “mirror data” method for traded value.

## Data limitations (2 of 2)

### **Volume data**

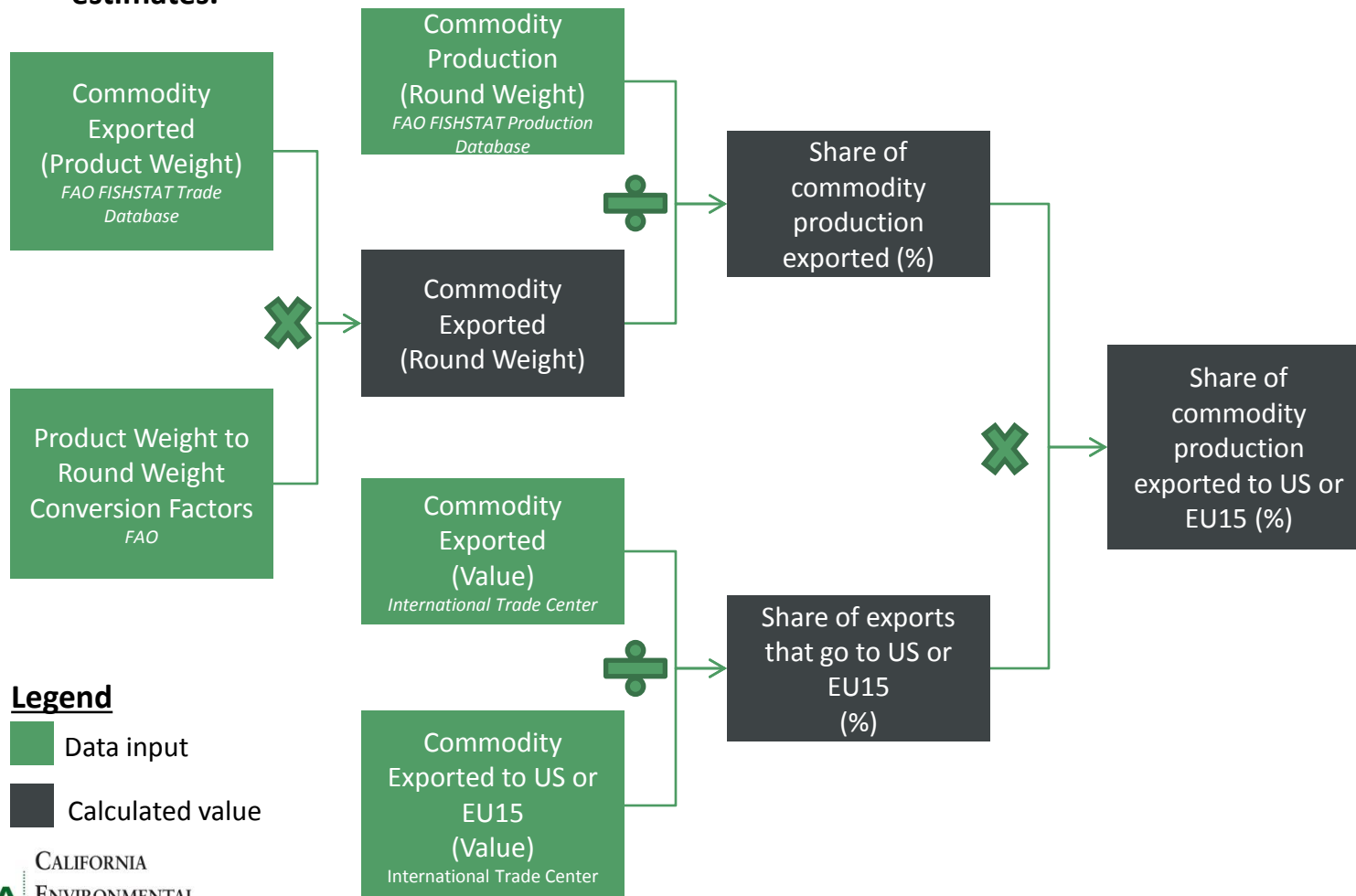
We have used volume information reported on MSC's website and on fisheryimprovementprojects.org to assess the share of a commodity that is certified or in a FIP. This is a rough calculation because landings of species can fluctuate substantially from year to year, while the year reflected in a given landings report from a FIP or certified fishery is not always clear. Thus, the charts that illustrate the volume/share of a commodity that is in a FIP or certified should be treated as a rough estimate that can fluctuate from year to year.

### **Certification and Fishery Improvement Project data**

For certain commodities, we identify the presence of fisheries that are either MSC certified or engaged in FIPs. These data are from 2014 and may not reflect all contemporary engagements.

# Flow diagram for estimating the share of commodity production that is destined for US or EU15 markets

Throughout the report we estimate how much of a country's commodity production is exported to EU15 or US markets. The following flow diagram outlines our methodology for generating these estimates.



# Trade data provides a high-level assessment of the opportunity for market incentives, but has important limitations

## **Limitations of the approach**

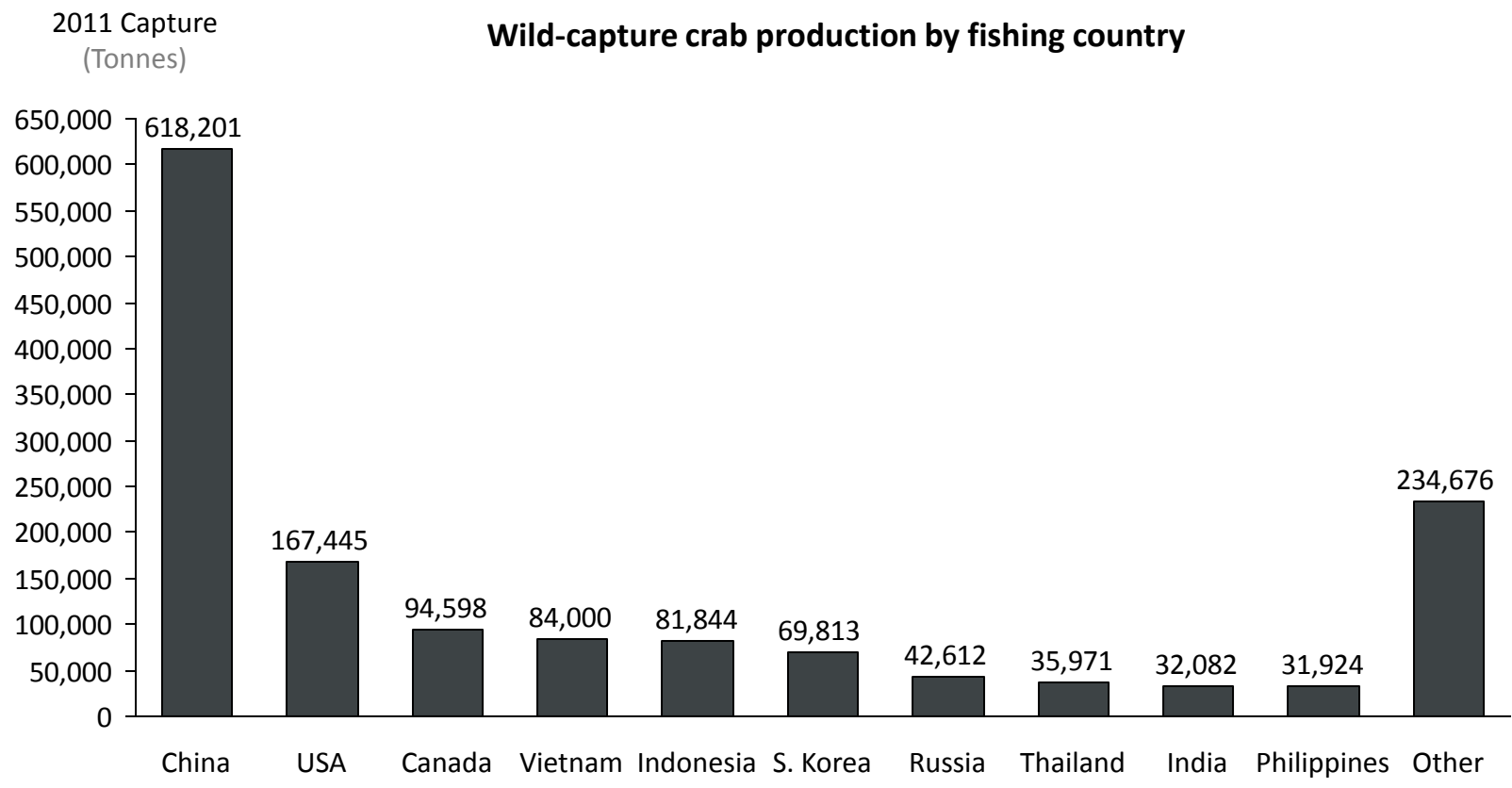
Identifying major producers of seafood commodities that export a large share of their product to EU and North American markets is a helpful screen for identifying good targets for market-based incentives. That said, it is a coarse analysis and will likely gloss over some discrete opportunities that exist in places that, at first glance, may not appear to have the fundamentals in place to leverage market pressure for fishery reform.

The analysis in this presentation is also entirely desktop-based. Those who work intimately with specific seafood supply chains will have insights beyond what can be discerned from reported production and trade data alone. We would welcome any feedback on where the publicly available data that we are using does not accurately reflect the dynamics of a specific seafood commodity.



## Crab commodity analysis

# Top 10 Producers: China is, by far, the largest producer of crab



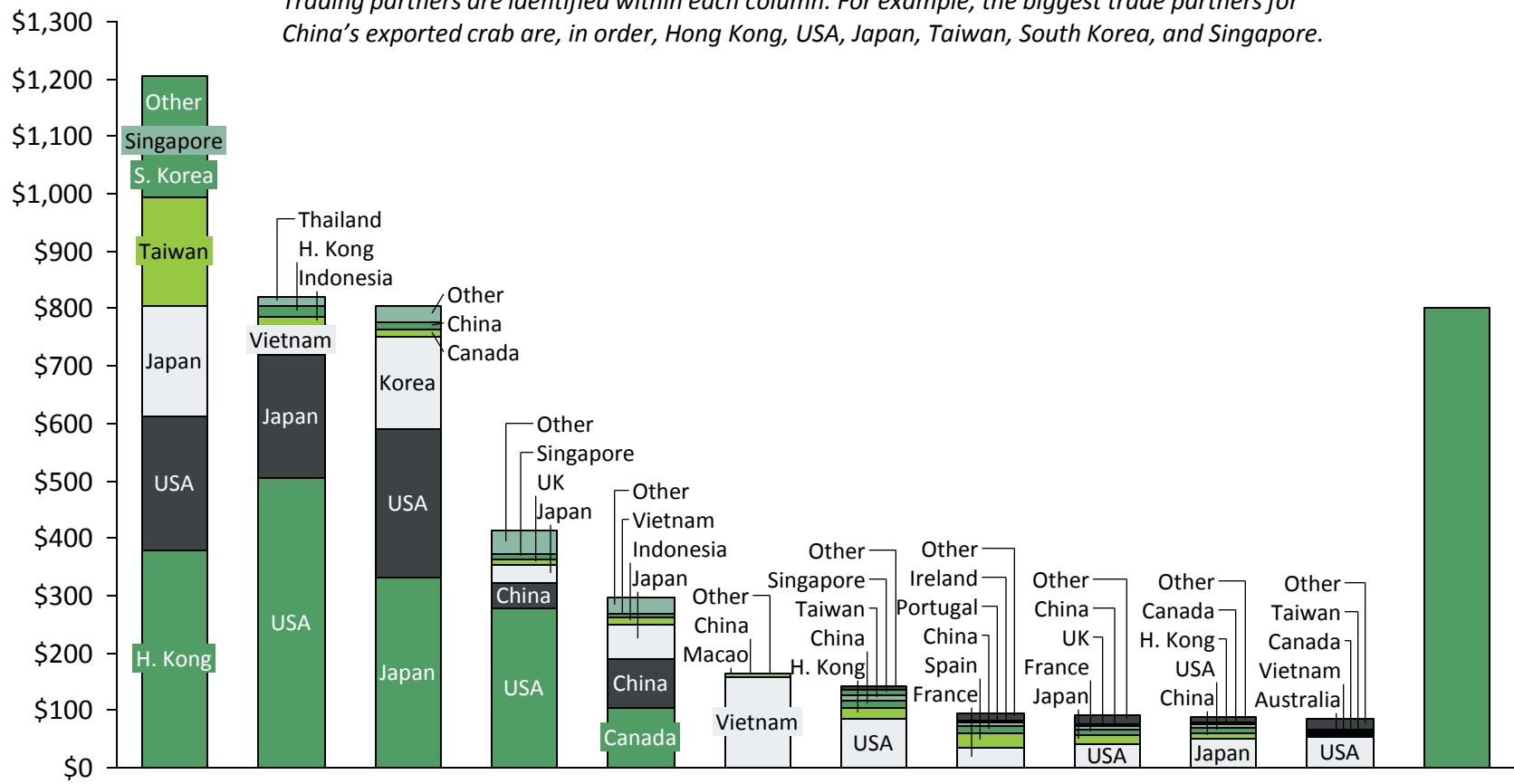


# Top 10 Exporters: China, Canada, and Russia are the main crab exporters

2014 Exports  
(USD millions)

**Top crab exporters and their largest trading partners**

*Trading partners are identified within each column. For example, the biggest trade partners for China's exported crab are, in order, Hong Kong, USA, Japan, Taiwan, South Korea, and Singapore.*

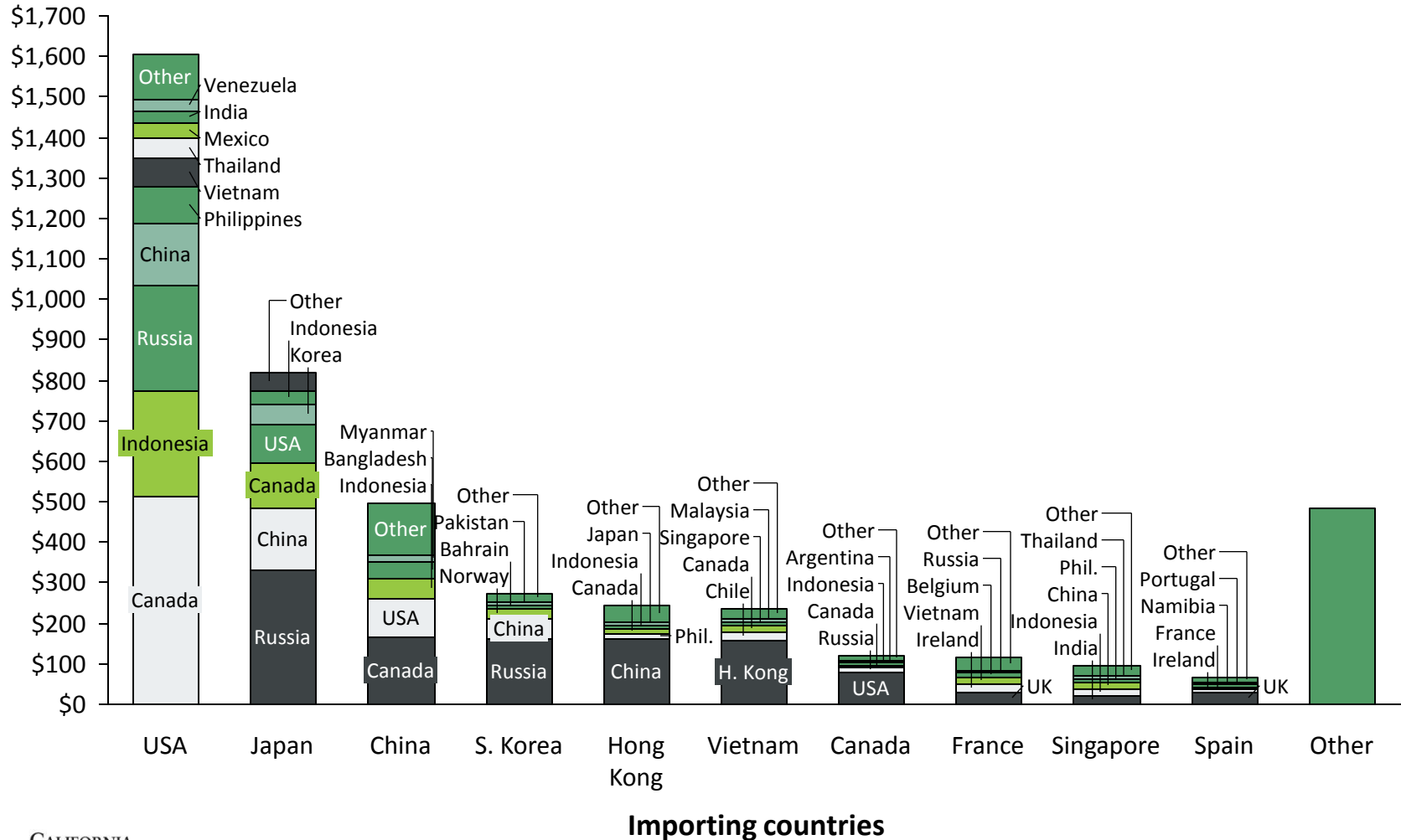


**Exporting countries**

# Top 10 Importers: The United States is the largest importer of crab, and Japan is also an important market

2014 Exports  
(USD millions)

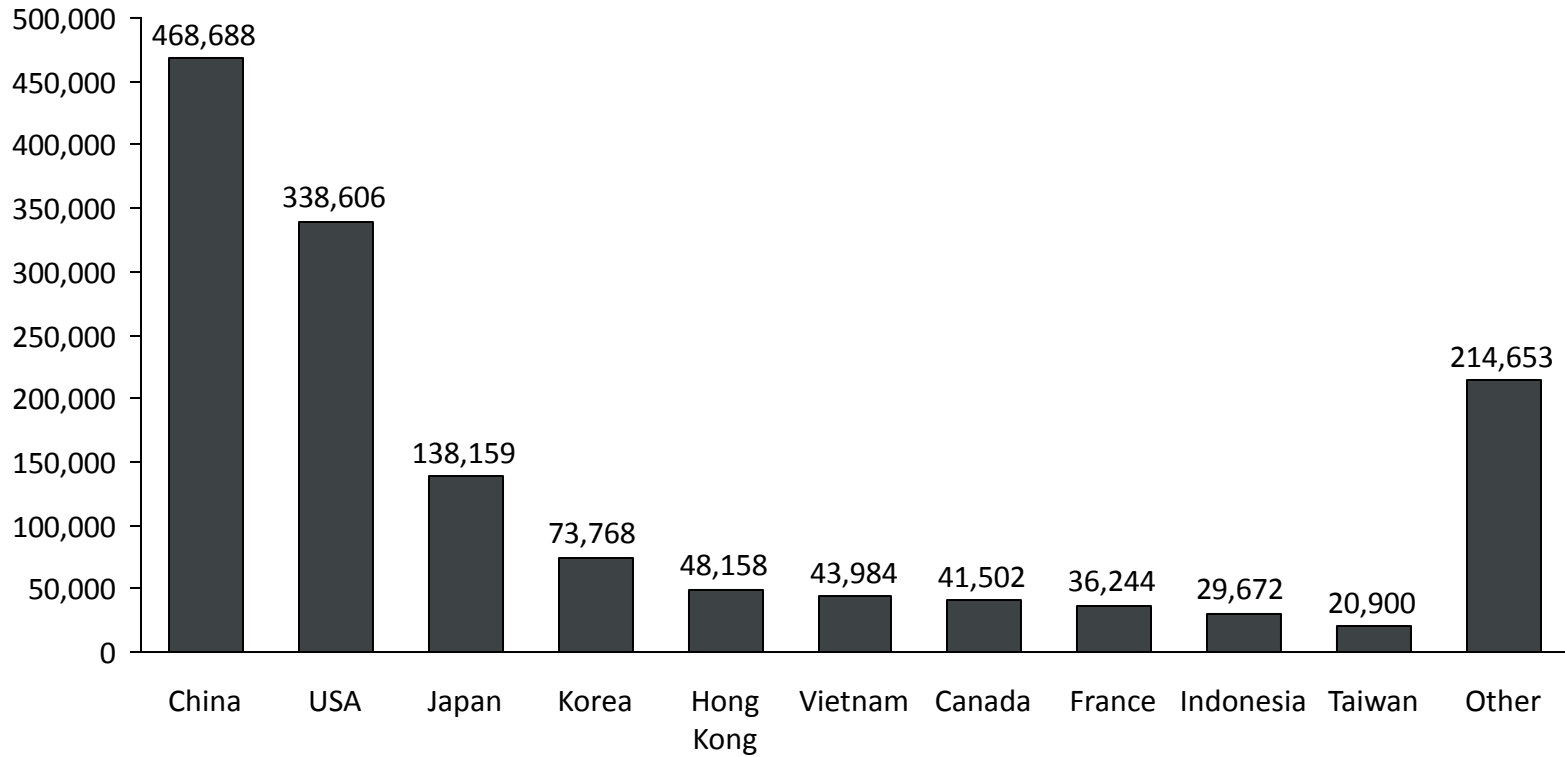
### Top crab importers and their largest trading partners



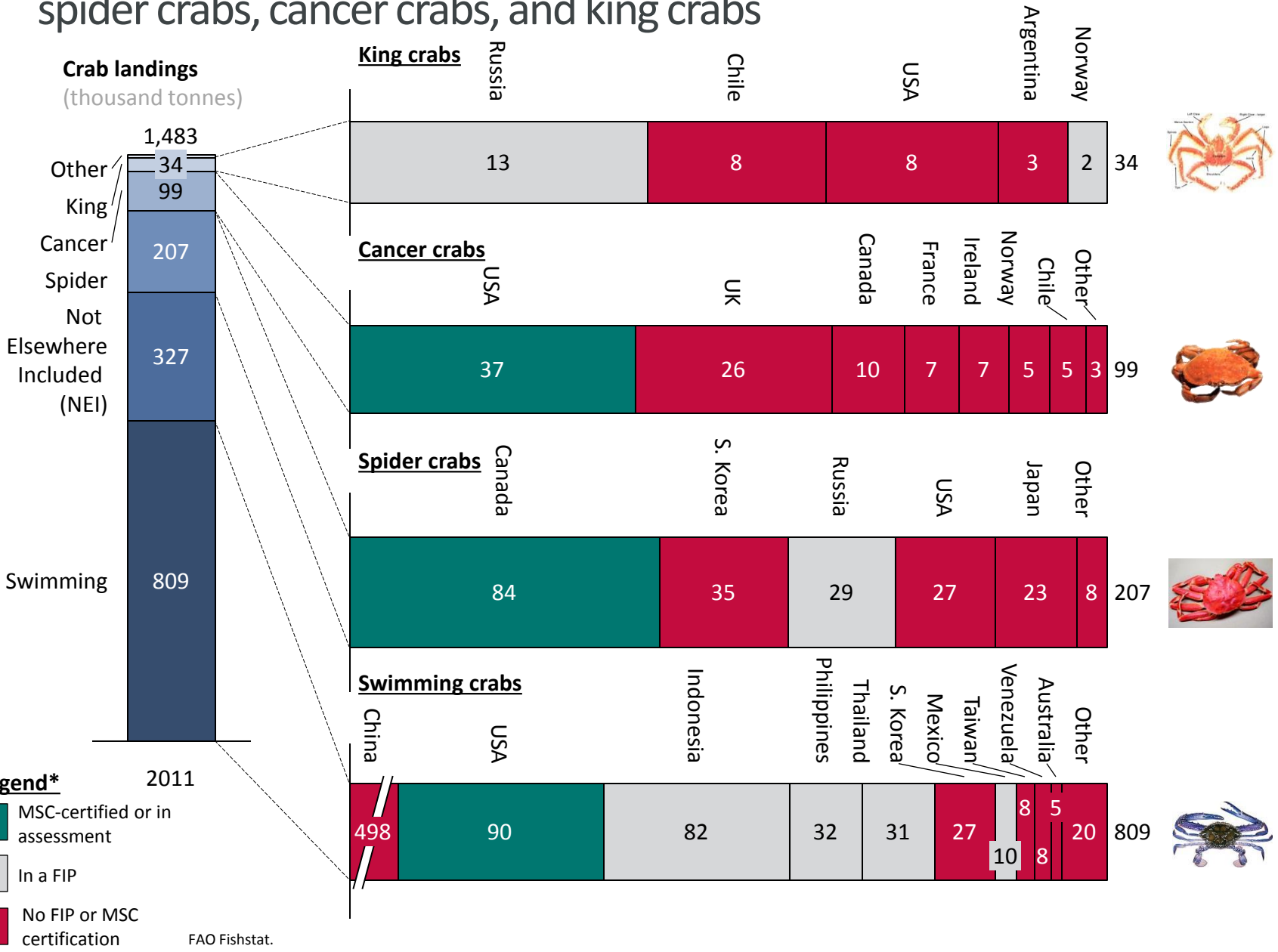
# Top 10 Consumers: The United States, Canada, and Asia are the main crab consuming regions of the world

2011 Apparent Consumption  
(Tonnes Round Weight)

Top crab consumers



# There are four main families of crab species: swimming crabs, spider crabs, cancer crabs, and king crabs



# Crab Overview: Swimming crab presents a question of pursuing depth vs. breadth for FIPs; market dynamics for other crab commodities are challenging

## Market-based conservation programs engage fisheries accounting for ~20% of global crab production

### Swimming crab raises the question of depth versus breadth for FIPs

- FIPs are being implemented in many of the largest swimming crab fisheries, but the diffuse nature of these fisheries is making it a challenge to deliver changes on the water. Although there are some opportunities for expansion (India, China, S. Korea, Taiwan, Venezuela), an argument could be made that the FIP model should be proven in an existing swimming crab FIP before undertaking further expansion.
- Ultimately, achieving commodity-wide transformation could require working in China (60% of swimming crab landings).

### Cancer crabs: Seafood Watch appears to be the program of choice for cancer crabs in N. America; market dynamics for European brown crab fisheries are not favorable

- Oregon Dungeness crab voted to leave the MSC program in 2015. The fishery is not seeing sufficient value in the program since N. American retailers continue to buy California Dungeness crab, which remains uncertified. Dungeness crab that is exported goes primarily to Asian markets with weak sustainability demands.
- Similarly, the primary goal of the Jonah crab fishery in New England is to be delisted from the MBA red list.
- Edible crab products in Europe are exported primarily to S. European markets with weak sustainability demands.

### King and spider crabs: Some potential but market dynamics are a challenge

- Market-based programs have taken root in these fisheries, with MSC-certified Canadian snow crab and two FIPs underway for Russian king and spider crabs.
- Market pressure may be limited as Asia is the main consumer of these species, and Alaska's pursuit of Alaska Seafood Marketing Institute (ASMI) certification, developed by Global Trust, may be indicative of the relatively weak pressure for sustainability seals.
- Growing fisheries in Chile and Argentina *may* be potential candidates for FIPs.

# Swimming Crab Summary

## **Some additional swimming crab targets remain for FIPs**

- India, Malaysia, and Venezuela appear to have favorable market dynamics for blue swimming crab FIPs.
- In total, these three countries would add about 50,000 tonnes of landings to FIPs, or about 6% of global swimming crab landings.
- The United States also has room for expansion of market-based incentives, with just 20% of swimming crab landings in the MSC program and no FIPs.

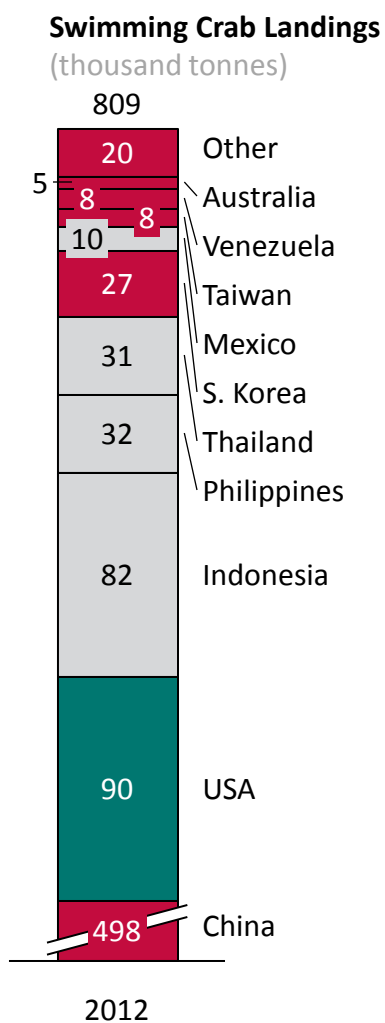
## **China, and to a lesser extent South Korea, are important swimming crab producers, but market dynamics appear unfavorable for market interventions like FIPs**

- China produces a huge share (60%) of the world's swimming crab, but China exports predominantly to Asian markets. Market programs have yet to gain a foothold in Chinese fisheries, which presents another barrier to creating a FIP for the swimming crab fishery.
- South Korea is also a substantial producer (3.5%), but has tenuous ties to markets that value sustainable seafood.

## **Balancing depth vs. breadth**

- Although there are opportunities for expansion, swimming crab fisheries have proven to be very challenging FIPs. Opportunities for expansion should be balanced against the potential benefit of deeper investment in existing swimming crab FIPs.
- The crab industry has pursued a strategy of serial exploitation to meet growing demand. To date, this strategy has been effective for the industry and may inhibit strong investment in FIPs (i.e., the availability of underexploited crab fisheries is a disincentive to undertaking the difficult task of improving a fishery).

# China is the key remaining target for market-based pressure on swimming crabs; South Korea, Venezuela, and Taiwan are also top producers without a market-based program



Country	Production volume (swimming crab)	Share exported (all crab species)	Share of exports sent to the EU15 and US (all crab species)	Share of production within reach of EU15 and US markets	Status
Indonesia	81,844	91%	65%	59%	FIP
Thailand	31,376	81%	70%	57%	FIP
Mexico	9,505	57%	98%	55%	FIP
Philippines	31,924	49%	49%	24%	FIP
Venezuela	7,620	21%	100%	21%	<b>No Program</b>
S. Korea	26,608	50%	18%	9%	<b>No Program</b>
China	497,639	44%	13%	6%	<b>No Program</b>
Australia	4,591	20%	3%	1%	3% of total volume is MSC-certified
United States	90,433	NA	NA	NA	<b>20% of total volume is MSC-certified</b>
Taiwan, Province of China	7,729	0%	0%	0%	<b>No program</b>

\* Note that some key producing countries (e.g., Vietnam) are missing from the list since they report all crab landings as crab NEI.

FAO Fishstat; International Trade Centre; [www.msc.org](http://www.msc.org); [www.fisheryimprovementprojects.org](http://www.fisheryimprovementprojects.org).

## Major barriers must be overcome to reach the next tier of blue swimming crab producers



China

- China is the white whale of swimming crab producers, accounting for 60% of global production. **Market-based incentives, however, have not yet been able to crack China** beyond MSC CoC certifications and a couple of nascent FIPs.
- The trade flows from China present an additional barrier. **The majority of Chinese crab exports (80%) go to other Asian countries.** Hong Kong (27%), Japan (18%), the United States (17%), and Taiwan (11%) are the most important export markets for Chinese crab.



S. Korea

- **South Korea produces ~3.5% of the world's swimming crab.**
- South Korea also produces a large quantity of spider crab (e.g., tanner crab), which may be clouding the trade data, but **the bulk of crab exports go to Asian markets;** Japan (63%), China (14%), and the United States (12%) are the main export markets for Korean crab.
- **No FIPs or MSC certifications exist in S. Korea.**



Venezuela

- **Venezuela produces a relatively small amount** of swimming crab (<1%).
- Market dynamics may be the best among countries with no market-based programs; **100% of crab exports are destined to the United States market.**
- No FIPs or certifications exist yet in Venezuela.
- Political instability would be the major concern.



Taiwan

- **Taiwan produces a small amount** of swimming crab (<1%).
- **Less than 1% of crab product is exported,** so any market pressure for sustainability would have to come from domestic markets.



## Some swimming crab FIP opportunities may exist in countries with low-quality crab landing data

Several countries report substantial volumes of crab landings, but do not identify the species. Vietnam is one of these countries, which we know to be a major producer and exporter of swimming crab. Two other countries with substantial volumes of unidentified crabs, which are likely swimming crabs are Malaysia and India. The NFI-Crab Council and other associated industry partners may provide additional insight into the potential relevance of Indian and Malaysian crab fisheries.



India

- India reports 32,000 tonnes of NEI crab landings, a large portion of which are likely swimming crabs. India's swimming crab production is probably comparable to that of the Philippines and Thailand.
- 34% of India's crab exports are destined for the EU and United States. Asian countries receive almost all of the remainder; Singapore (37%) and China (14%) are the most important markets.
- The large volume going to Asian markets is a concern, but **India may present a good remaining opportunity for a swimming crab FIP.**



Malaysia

- Malaysia reports 13,000 tonnes of crab landings, a large portion of which are likely swimming crabs. This would put Malaysia roughly on par with Mexico in terms of total production.
- **47% of Malaysia's crab exports are destined for the United States.** Other important export markets include Vietnam (16%), Australia (12%), and Singapore (8%).
- **Malaysia may also represent a good opportunity for an additional crab FIP.**

Canadian (MSC), US (ASMI), and Russian (FIP) spider crab fisheries are involved in market-based programs; N. Asian producers are not engaged in programs

Country	Production volume (spider crab)	Share exported (all crab species)	Share of exports sent to the EU15 and US (all crab species)	Share of production within reach of EU15 and US markets	Status
Canada	84,372	75%	66%	49%	MSC-certified
South Korea	35,087	50%	18%	9%	No market program
Russia	29,275	97%	18%	17%	Far East Crab FIP
USA	27,223	NA	NA	NA	ASMI-certified
Japan	22,574	23%	6%	1%	No market program

## Asia is a major consumer of spider crabs, which makes expansion of FIPs a challenge



Alaska (USA)

- The bulk of US snow crab catch comes from Alaska, which has chosen to pursue ASMI certification.
- Trade data does not differentiate between species of crab, but **the main market for Alaskan crab is Japan**, which does not have strong demand for sustainable seafood.
- **Dynamics for Alaskan crab seem to be unfavorable for a FIP or MSC certification at this time.**



Japan

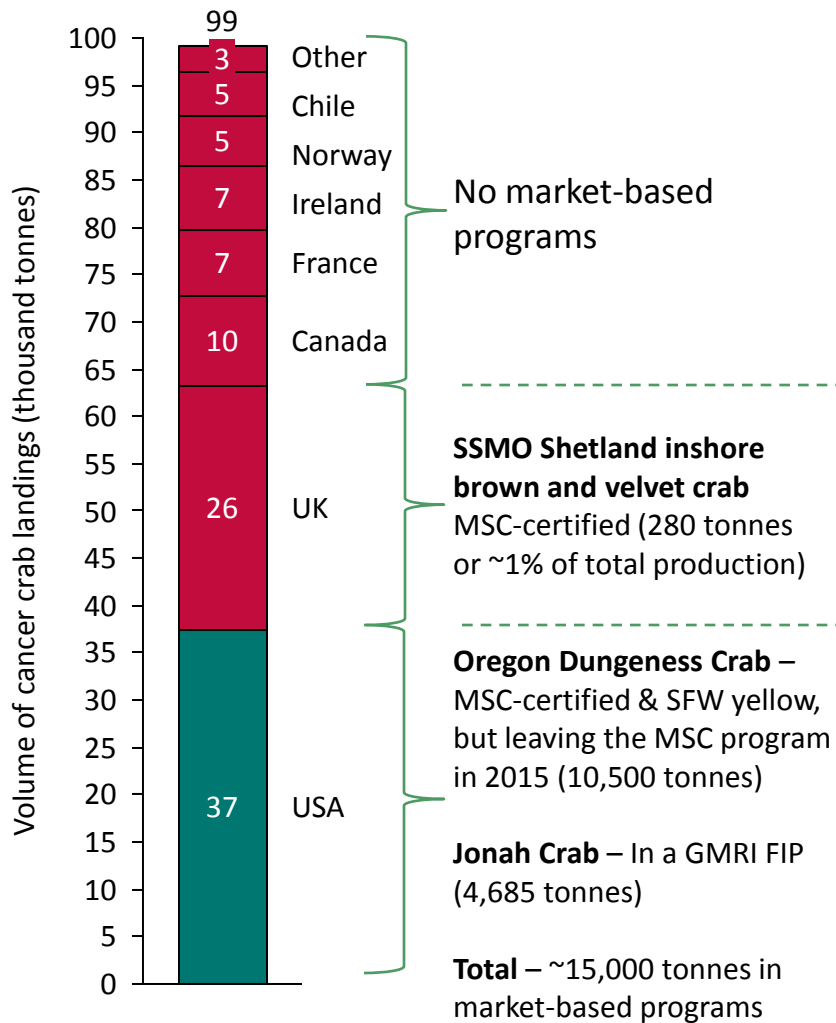
- Japan's major spider crab fishery is red snow crab. There is a robust local market for spider crabs – Japan is a major importer of crab from the United States and Russia.
- The small share of crab that Japan exports goes to markets with no demand for sustainable seafood – Namibia (29%), Taiwan (22%), S. Korea (15%), Hong Kong (15%).
- **The prognosis for market-based programs in Japan's spider crab fisheries seems poor, unless sustainable seafood demand is cultivated in Japan and other N. Asian markets.**



S. Korea

- Korea's major spider crab fishery is red snow crab, which has a robust domestic market. The crab that Korea does export goes primarily to N. Asian markets – Japan (63%), China (14%) – as well as the United States (12%).
- **The prognosis for market-based programs in Korea's spider crab fisheries seems poor, unless sustainable seafood demand can be cultivated in Japan.**

# Market programs have struggled to gain traction with Dungeness and edible crabs (cancer crabs)



### Little leverage on European producers

France, Spain, and Portugal are the main markets for European brown crab. These markets have little demand for sustainable seafood.

### Opportunity in Canada and Chile is unknown

We know little about the market dynamics affecting Canadian Atlantic rock crab or Chilean mola crab. Further investigation is required to assess the potential for market-based interventions in these fisheries.

### Market leverage appears to be limited

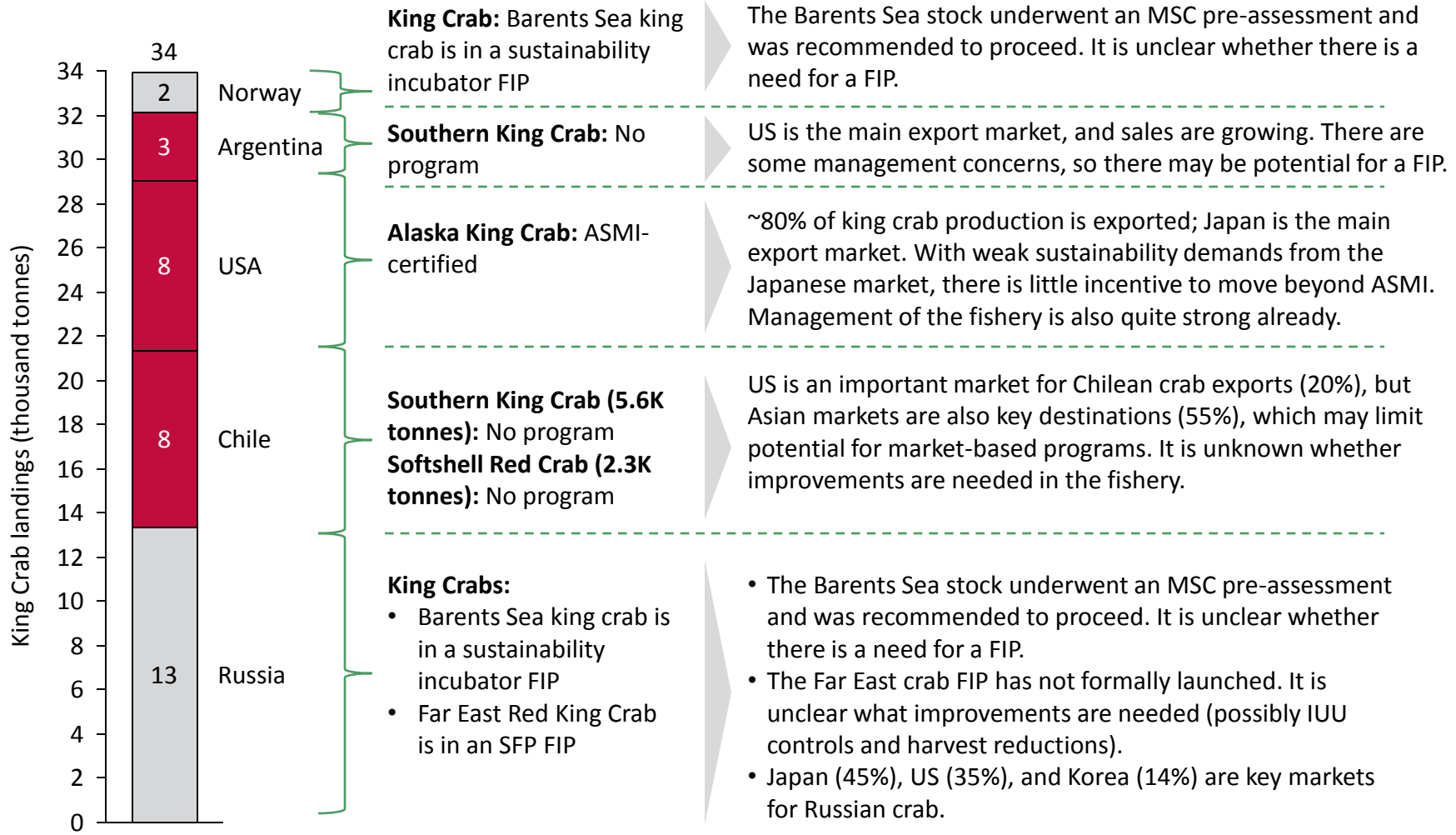
Product is destined for the local market and the rest of Europe – primarily France and Spain. Financial costs of certification were paid by a philanthropic fund, so it is unclear whether there is a true business case for certification.

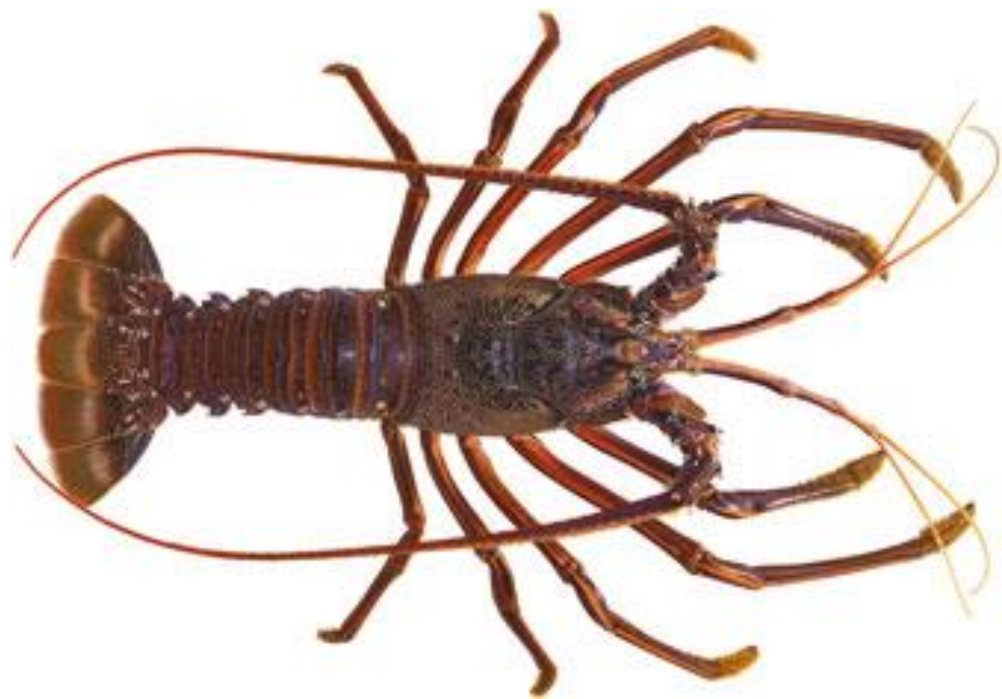
### Seafood Watch seems to be a more important player for Dungeness and Jonah crab fisheries

**Oregon Dungeness** is dropping out of the MSC program because retailers continue to buy California Dungeness crab, which is not certified but has a yellow rating from MBA. Additionally, most exported Dungeness goes to markets that do not value sustainable seafood (e.g., China). In sum, the fishery is not seeing sufficient value from MSC certification.

**Jonah crab** is MBA red listed. The fishery is using the FIP to improve its rating and gain access to Northeast retailers.

# Market dynamics of king crabs may not be well suited for additional FIPs





## Lobster commodity analysis

# Lobster: Introduction

## Low volume, but high value

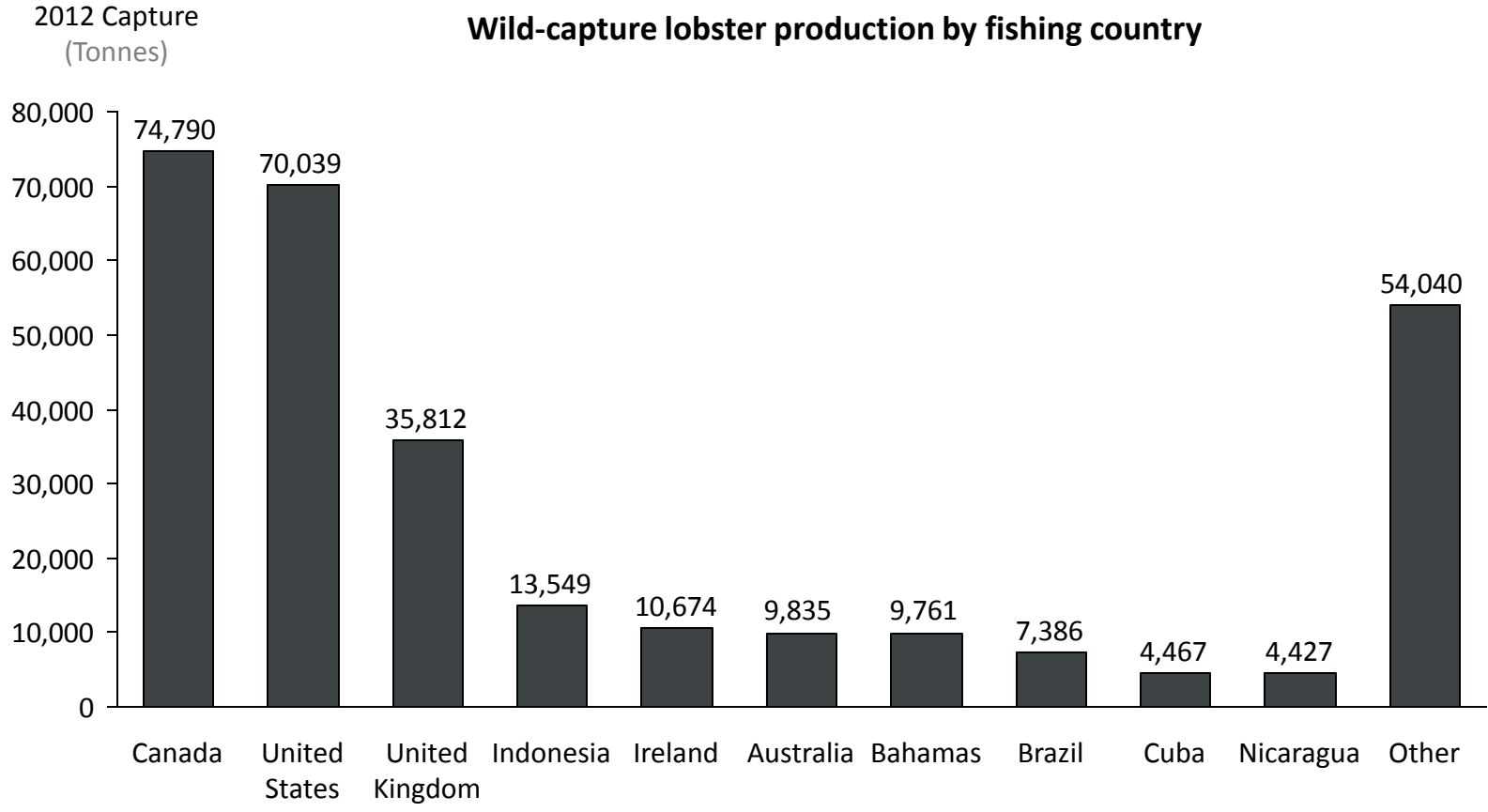
With just 300,000 tonnes of annual wild capture production, lobster fisheries represent a small portion of global fisheries landings. But, with average prices on the order of \$20 per kilo for internationally traded product, lobster is an economically important species on the global market. On a per-pound basis, lobster is the most valuable of all the major seafood commodities.

## Brief product overview

Lobster can be broken into a few main product groups: clawed lobster, spiny/rock lobster, and langoustines.

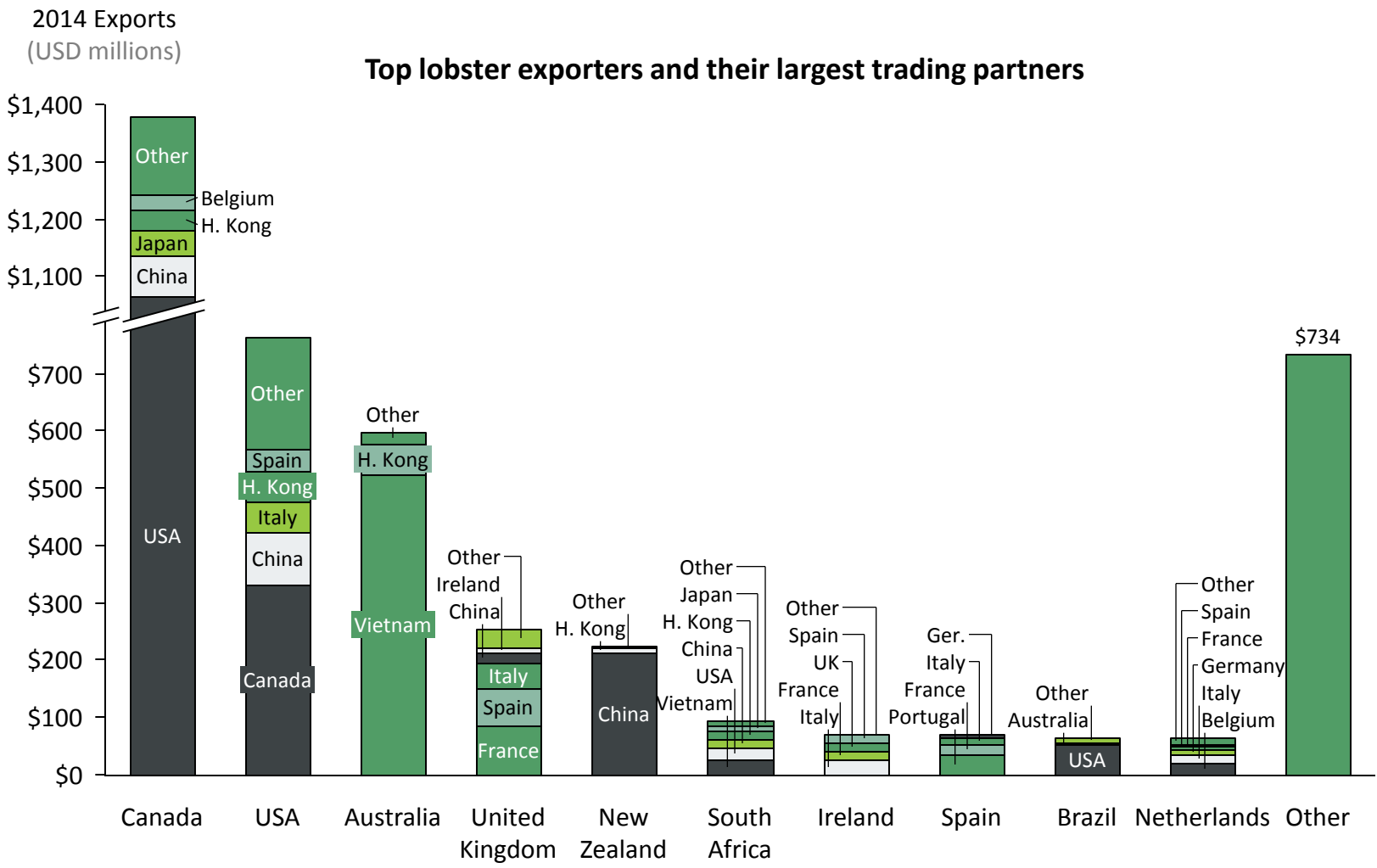
- **Clawed lobster** – Canada and the United States dominate global production of clawed lobster, which is commonly sold live or whole. Clawed lobster is also processed into tails, which also yields claw and knuckle meat.
- **Spiny lobster** is produced in warm water regions, with significant production in Australia, Central America, and South Africa. Some product is sold live, but the dominant form is frozen tails.
- **Langoustines**, commonly known as scampi in the market, are produced primarily in Northern Europe and caught with trawlers. The main importing countries are in Southern Europe (France, Italy, and Spain), and product is typically in the form of fresh or frozen tails.

# Top 10 Producers: The US, Canada, and UK dominate global lobster production; warm-water production is more widely distributed





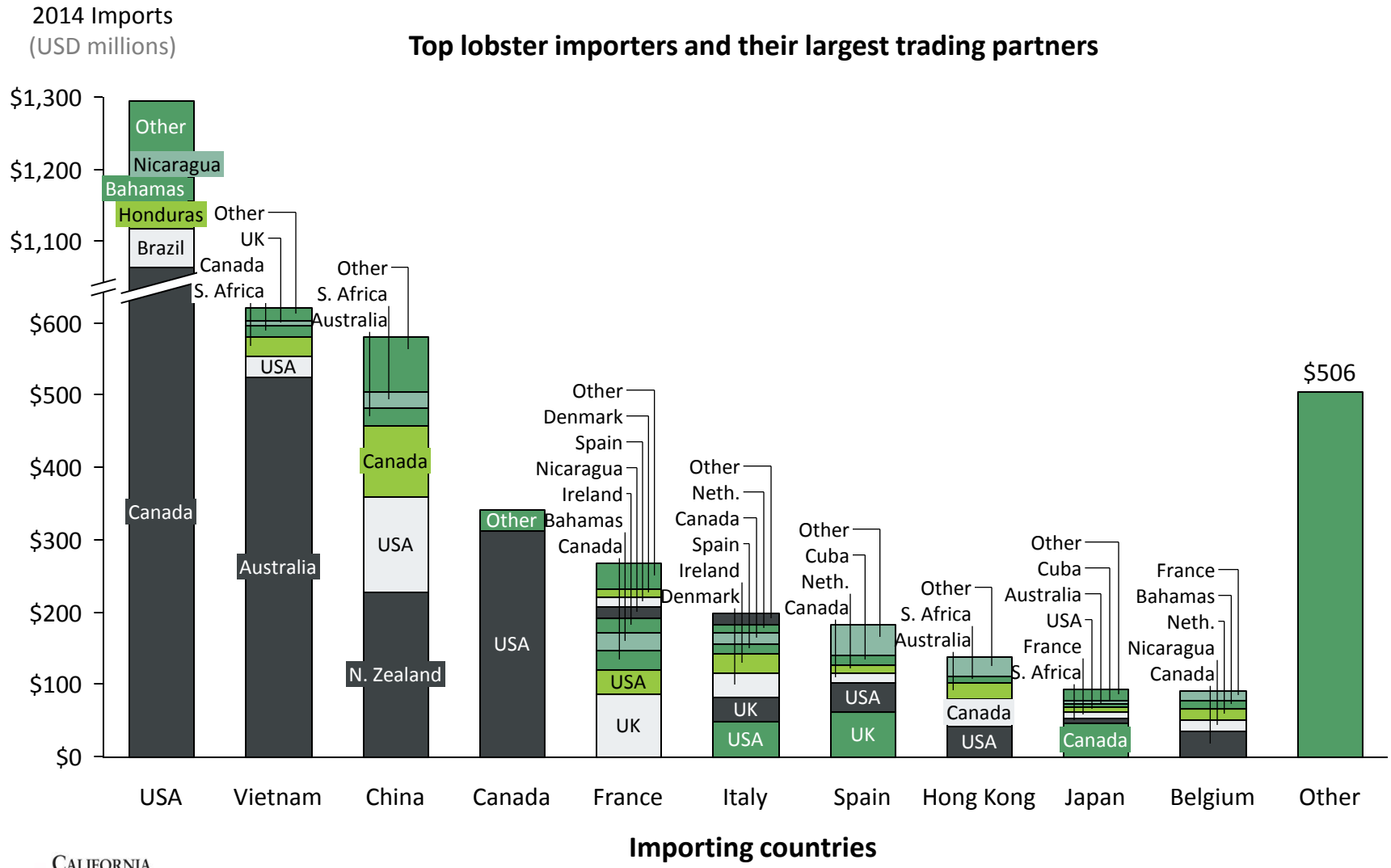
# Top 10 Exporters: The US and Canada are the largest exporters; Australia, N. Zealand, and S. Africa are major suppliers to Asia



Exporting countries

# Top 10 Importers: The US and Canada are the only major importers of lobster with strong sustainability commitments

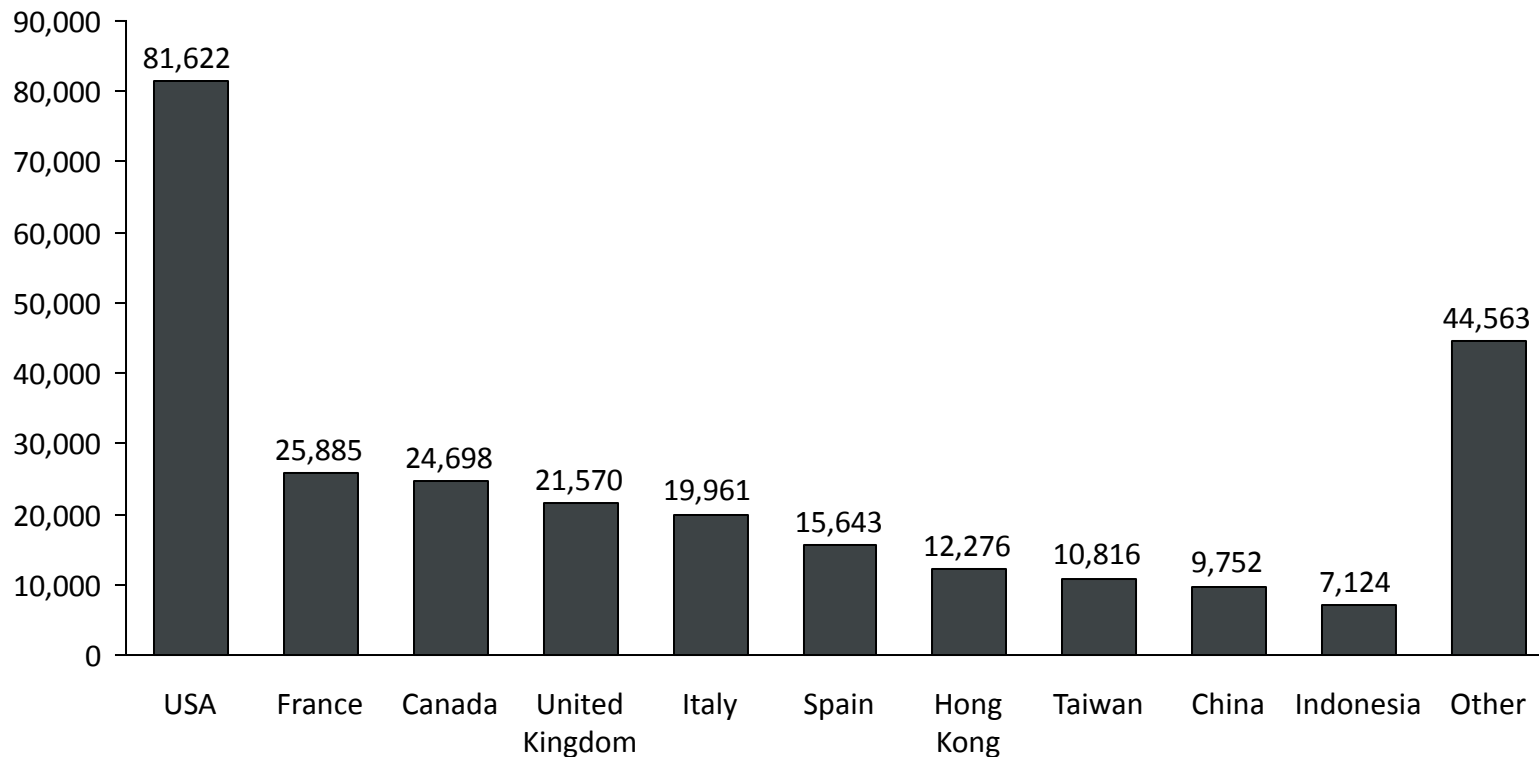
### Top lobster importers and their largest trading partners



## Top 10 Consumers: The US is the world's largest consumer of lobster; S. Europe and parts of Asia are also large consumers

2011 Apparent Consumption  
(Tonnes Round Weight)

### Top lobster consumers



# Top Producers: Lobster production can be broken down into clawed, spiny, langoustines, and slipper lobsters



FAO Fishstat.  
\*FIP or certification may only cover a portion of a country's production.

# Most lobster producers that have tight connections to Northern EU and US markets are certified or in a FIP

## **Market-based conservation programs engage fisheries accounting for more than half of global lobster production (by volume)**

### **Clawed lobster largely MSC-certified already**

- Almost all of the landings from Canadian and US clawed lobster fisheries are MSC-certified. These fisheries make up approximately 98% of clawed landings globally.

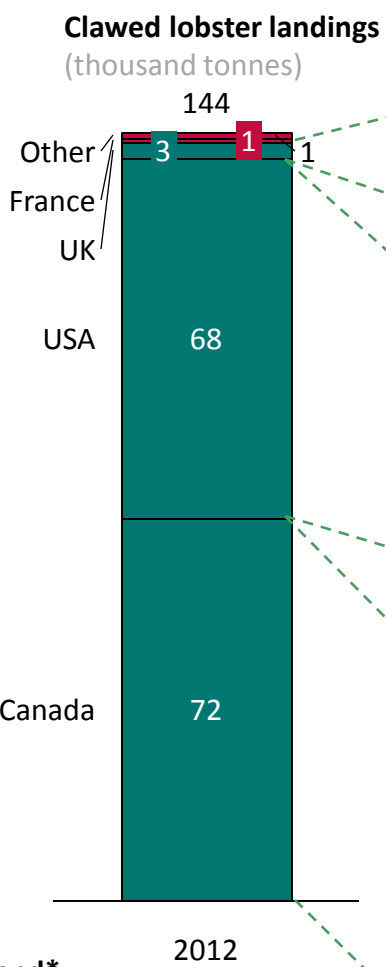
### **Lobster FIPs have targeted spiny lobster fisheries, but few good candidates remain for additional FIPs**

- Almost all of the largest spiny lobster producers that are well-connected to EU and US markets are already in FIPs.
- Jamaica, Belize, and the Dominican Republic have good market connections but produce relatively modest volumes (<1%, <1%, and ~3%, respectively).
- Larger spiny lobster fisheries that are not in FIPs (Indonesia, New Zealand, S. Africa, Mauritania, Morocco, Cuba) have challenging market characteristics in that their exports go primarily to S. European or Asian markets with weak sustainability demands.

### **Langoustines as an unknown**

- Langoustines have so far remained largely outside the reach of market-based conservation approaches. We are not familiar with langoustine fisheries, but there are a couple of possibilities for the lack of market engagement to date, including:
  - S. Europe as the primary market – France, Spain, and Italy account for 80% of langoustine imports. These markets have fairly weak demands for sustainability.
  - Environmental concerns – Langoustines are caught primarily through bottom trawling, and the environmental challenges of bycatch and habitat impacts of this fishing method may be precluding the pursuit of market-based conservation tools.

# Clawed lobster is almost entirely MSC-certified or under assessment



**Legend\***

- MSC-certified or in assessment
- In a FIP
- No FIP or MSC certification

**UK/France – A small subset of European clawed lobster landings are certified in the UK and France.**

Fishery	MSC status	Estimated tonnage
Normandy and Jersey lobster	Certified	280
<b>Total</b>		<b>280</b>

**US – Landings in the Gulf of Maine, the source of most US clawed lobster landings, are certified and under assessment.**

Fishery	MSC status	Estimated tonnage
Gulf of Maine lobster trap**	In assessment	57,000
Maine lobster trap**	Certified	57,000
<b>Total</b>		<b>~57,000</b>

\*\* These two certifications are of the same fishery, the result of a dispute over how to share the certificate of the original certification.

**Canada – Almost all lobster is MSC-certified or under assessment.**

Fishery	MSC status	Estimated tonnage
Bay of Fundy, Scotian Shelf, and Southern Gulf of St. Lawrence lobster trap	In assessment	54,290
Prince Edward Island lobster trap	Certified	13,281
Iles-de-la-Madeleine lobster	In assessment	2,668
Gaspesie lobster trap	Certified	1,032
Eastern Canada Offshore lobster	Certified	720
<b>Total</b>		<b>~72,000</b>

\* Certifications or FIPs may only cover a portion of the landings.

With the exception of Cuba and S. Africa, every spiny lobster fishery that is closely linked to EU or US markets is certified or in a FIP

Country	Spiny lobster production volume	Share exported (A)	Share of lobster exports sent to the US and EU15 (B)	Share of production sold to EU15 and US (A x B)	Status
Honduras	1,556	70%	90%	63%	WWF FIP
Nicaragua	4,427	41%	94%	39%	WWF FIP
Cuba	4,467	54%	65%	35%	No market-based projects
Brazil	7,386	36%	87%	32%	SFP FIP
Bahamas	12,051	24%	93%	23%	WWF FIP
South Africa	2,507	90%	25%	22%	No market-based projects
Mexico	3,041	30%	71%	21%	~50% of production is MSC-certified
Dominican Republic	2,505	18%	76%	14%	No market-based projects
Australia	9,195	59%	3%	2%	~60% of production is MSC-certified
Nigeria	4,289	1%	100%	1%	No market-based projects
New Zealand	3,406	78%	0%	0%	No market-based projects
Indonesia	13,549	34%	0%	0%	No market-based projects
South Korea	1,303	1%	14%	0%	No market-based projects
Zanzibar	1,682	0%	0	0	No market-based projects

# Potential reasons for a lack of market-based programs for spiny lobster in South Africa, Cuba, and Dominican Republic

Based on the trade and production data analysis on the previous slide, South Africa, Cuba, and the Dominican Republic appear to be good candidates for additional lobster FIPs (i.e., the EU and US buy a large share of production). But digging deeper into the data reveals that the Dominican Republic may be the only country that is a good candidate.



**South Africa**

- Although the United States imports ~22% of South African lobster, **Asia is the main market, importing about 70% of South Africa's lobster production.**
- Top importers from South Africa are Vietnam, the United States, China, Hong Kong, and Japan.



**Cuba**

- Setting aside the political challenges of working in Cuba, **Cuba sells primarily to markets with little pressure for sustainability.**
- Top importers of Cuban lobster are Spain (57%), Japan (14%), and Taiwan (8%).
- With the opening of relations between Cuba and the United States, it is unclear how these trade dynamics may change in the future.



**Dominican Republic**

- The Dominican Republic could be a good target for the next lobster FIP. More than 75% of the country's exports are sent to the United States.
- The key questions for are whether the domestic market is as important as the trade data indicate (**more than 80% of product stays in the domestic market**), and how that would impact a market-based approach. Much of this domestic consumption serves the tourist market, which could be another avenue to exert market pressure.



## Getting into the long tail of spiny lobster producers, some additional Caribbean and W. African countries are candidates for additional market engagement, but all have serious drawbacks



Japan

- Japan accounts for 1.5% of global spiny lobster production, **almost all of which is destined for the domestic market.** Building domestic demand for sustainable seafood seems to be a prerequisite for market pressure to influence Japanese lobster fisheries.



Morocco

- Morocco produces 0.75% of global spiny lobster, and approximately 80% of production is destined for EU markets. But **the main countries that Morocco exports to, Spain and Portugal, are laggards in sustainable seafood demand.**
- Without additional market development in S. Europe, pushing sustainability demands onto Moroccan lobster fisheries seems like a futile endeavor.



Mauritania

- Mauritania produces 1% of global spiny lobster, and approximately 55% of production is destined for EU markets. However, **the main EU countries to which Mauritania exports (Spain, Italy, Portugal) are laggards in sustainable seafood demand.** Mauritania also exports substantial volume to Vietnam, China, and Taiwan.
- Market leverage on Mauritanian lobster fisheries appears to be weak at the present time.



Jamaica

- Based solely on trade statistics, Jamaica could be a good candidate for a FIP. Almost all of the product is exported to the United States (80%), and the second-largest market is France (14%).
- However, **production quantity is quite low, representing <0.5% of the world's total spiny lobster production.**



Belize

- Belize accounts for just under 1% of global spiny lobster production. Most of the product is exported, with 90% destined for the US market. **EDF is already heavily involved in the lobster and conch fishery in Belize,** and it is unclear whether the addition of a FIP would provide any additional leverage.

## Without cultivation of new markets that demand sustainable seafood, there are few attractive candidates for additional market engagement with spiny lobster fisheries

### **Potential for market engagement with additional spiny lobster fisheries seems low**

Of the top 15 spiny lobster producers that are not currently certified or engaged in FIPs, few exhibit the ideal characteristics for market engagement. The largest producers (e.g., Indonesia, South Africa, New Zealand), ship their product primarily to Asian markets that do not value sustainability. Some of the more modest producers export to the EU (e.g., Cuba, Morocco, Mauritania), but the main markets are S. European countries that have not embraced sustainability. The best candidates (e.g., Jamaica, Belize, Dominican Republic) produce relatively small amounts of lobster, and the effort required to create a FIP or pursue certification would need to be weighed against the possible impact on the commodity.

### **Supporting existing FIPs appears to have more potential for impact than spreading a wider net for spiny lobster**

Although FIPs are present in many of the largest spiny lobster fisheries, significant effort is needed to see them through to durable results on the water. The Honduran and Nicaraguan FIPs are quite new, and the Brazilian lobster FIP has experienced a number of challenges. Strengthening these existing FIPs would cover approximately 30% of global spiny lobster landings. The prime candidates for additional market engagement would add small amounts of volume (e.g., DR 3%, Belize 0.75%, Jamaica 0.5%). Full transformation of the commodity would require tackling fisheries where the market dynamics are not currently aligned (e.g., Indonesia, W. Africa, New Zealand, Japan). In addition, some of the countries with MSC certifications for spiny lobster have substantial portions of landings that remain uncertified (e.g., Mexico, Australia).

## Market-based programs for conservation have not reached the largest langoustine fisheries (e.g., Norway lobster)

### **Mediterranean countries are the main importers of langoustines**

France, Italy, and Spain account for more than 80% of langoustine imports; these countries do not have strong demand for sustainable seafood.

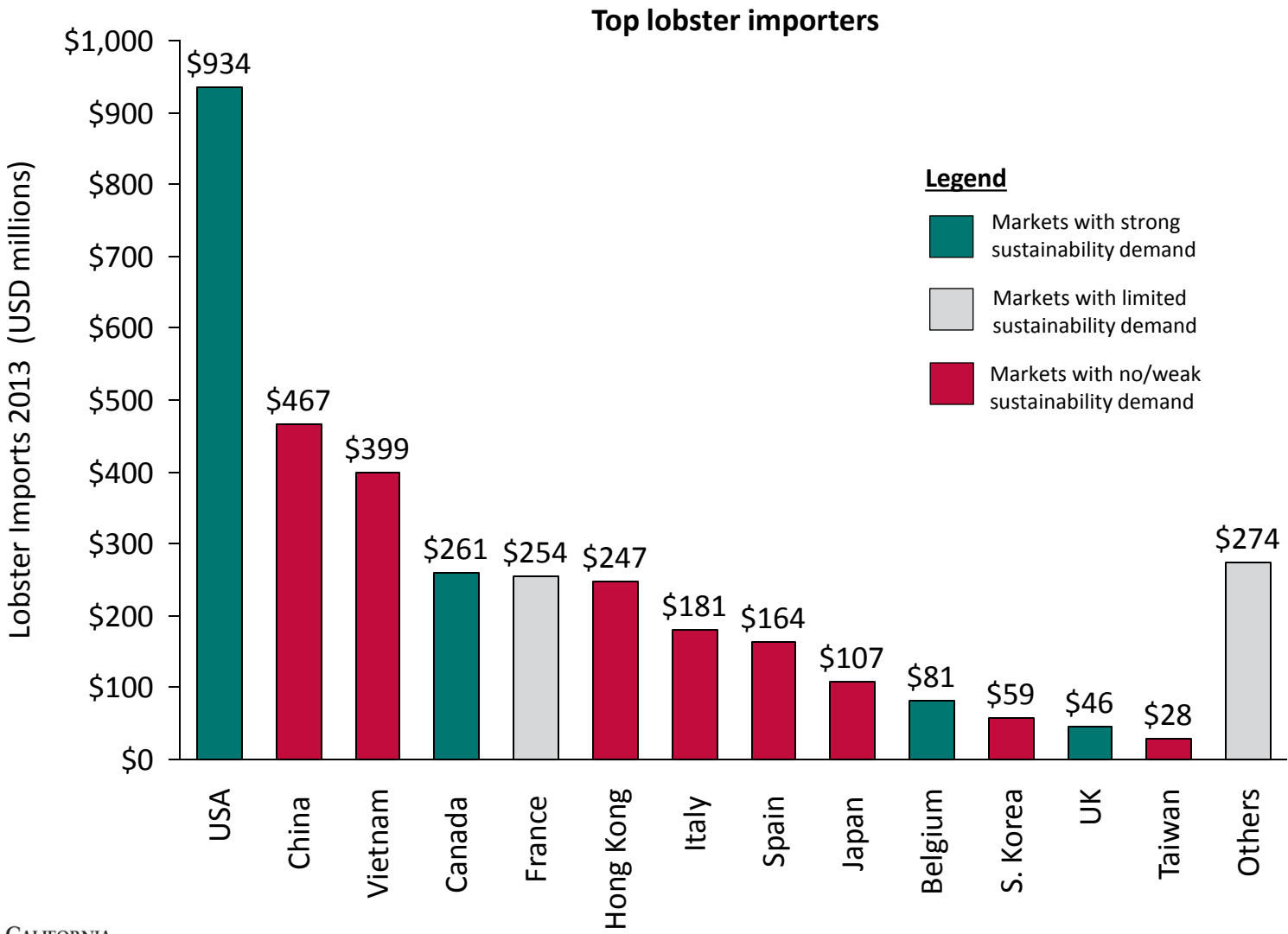
### **Fishing method may be a barrier to certification**

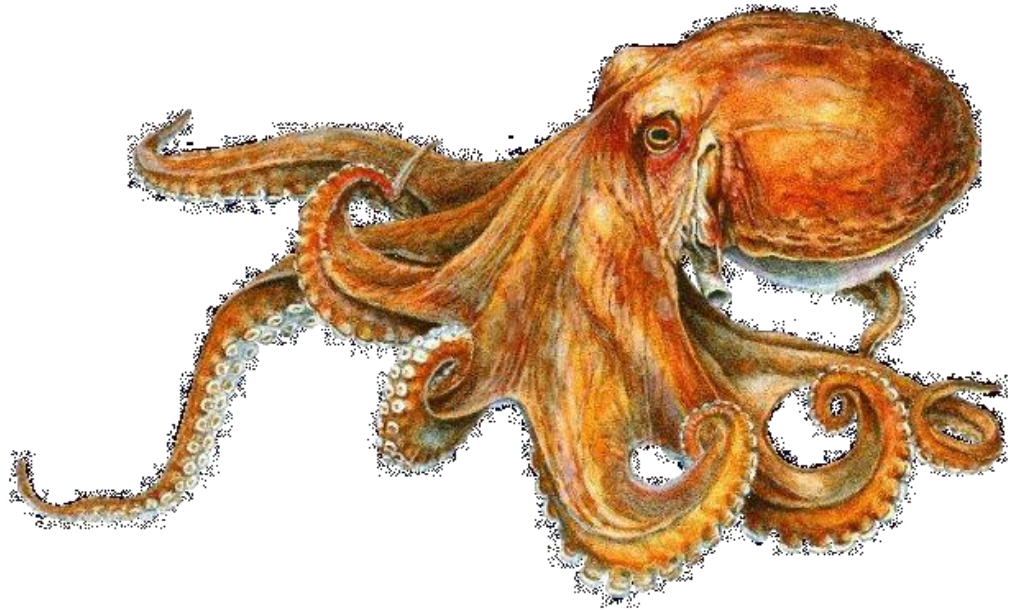
Like shrimp, Norway lobsters are caught using bottom trawls. These fisheries catch substantial bycatch and negatively impact habitat, which may make widespread certification a challenge.

### **We are uncertain about prospects for langoustines**

We are not familiar with langoustine fisheries. Although there appear to be some barriers to applying market-based mechanisms for the commodity group, we cannot judge the prospects with confidence.

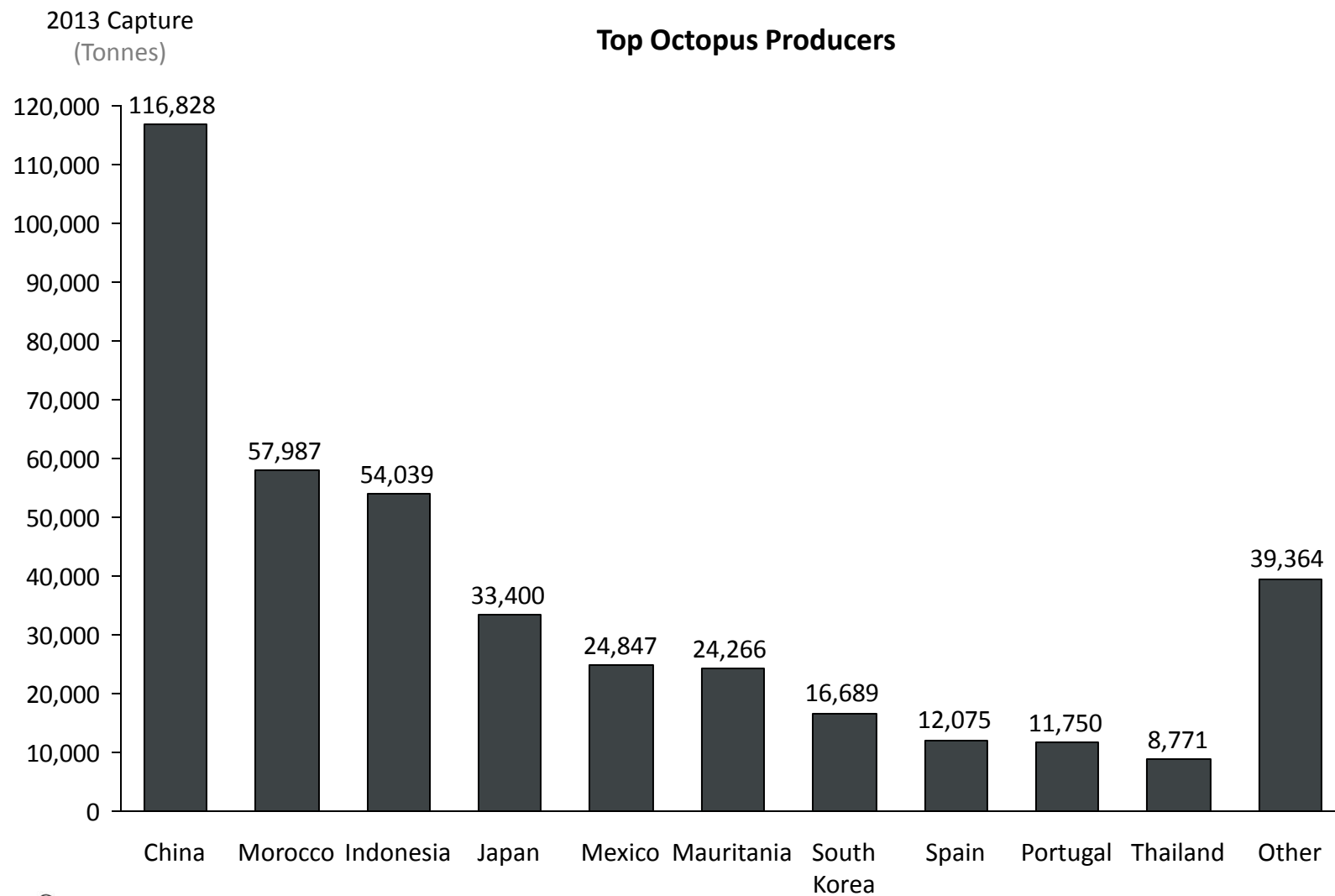
# Based on import data, developing sustainable seafood demand in S. Europe and Asia could expand pressure on lobster fisheries





# Octopus

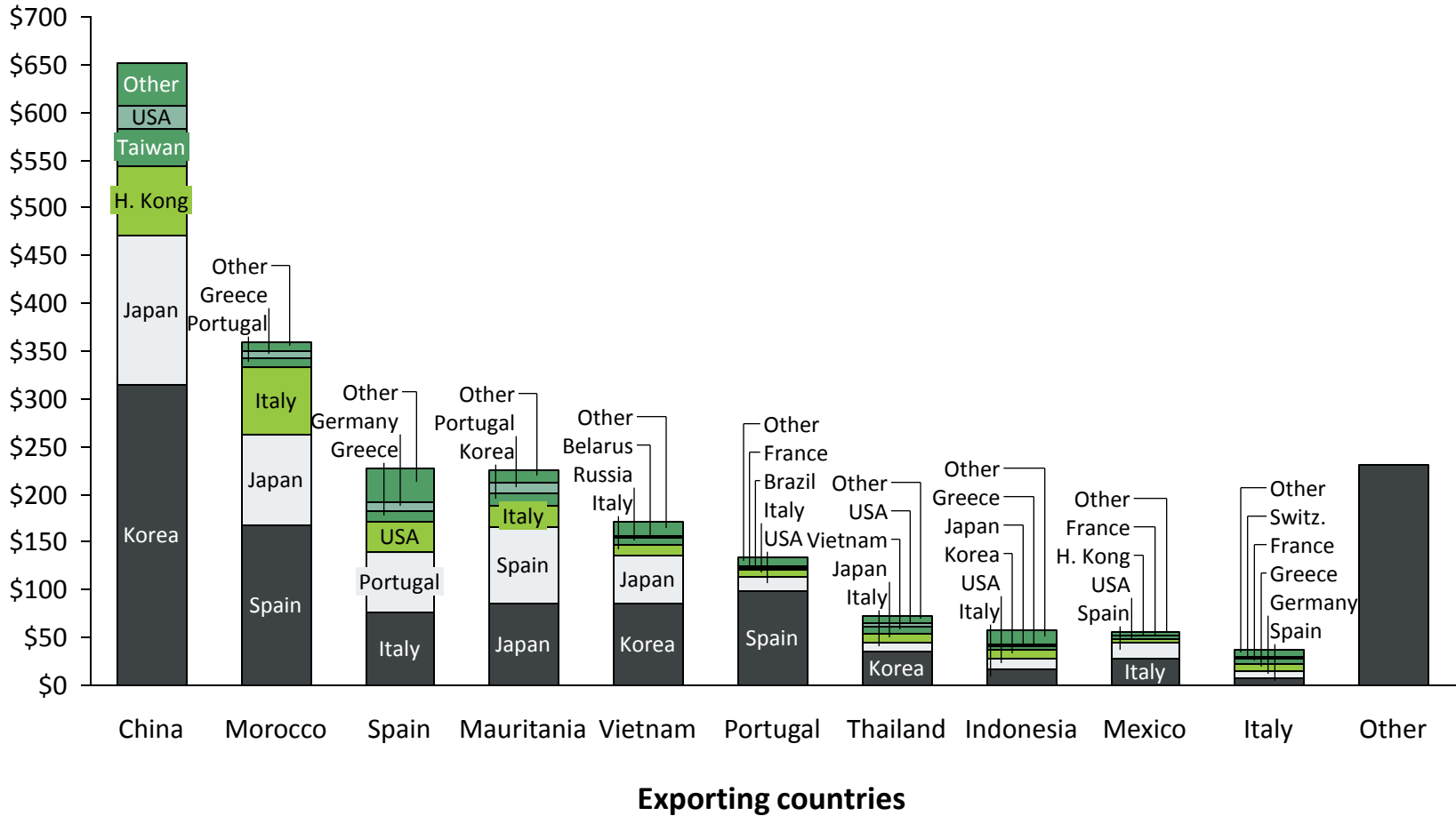
# Top 10 Producers: China is the world's largest octopus producer



# Top 10 Exporters: China, Morocco, and Spain are the world's largest octopus exporters

### Top octopus exporters and their largest trading partners

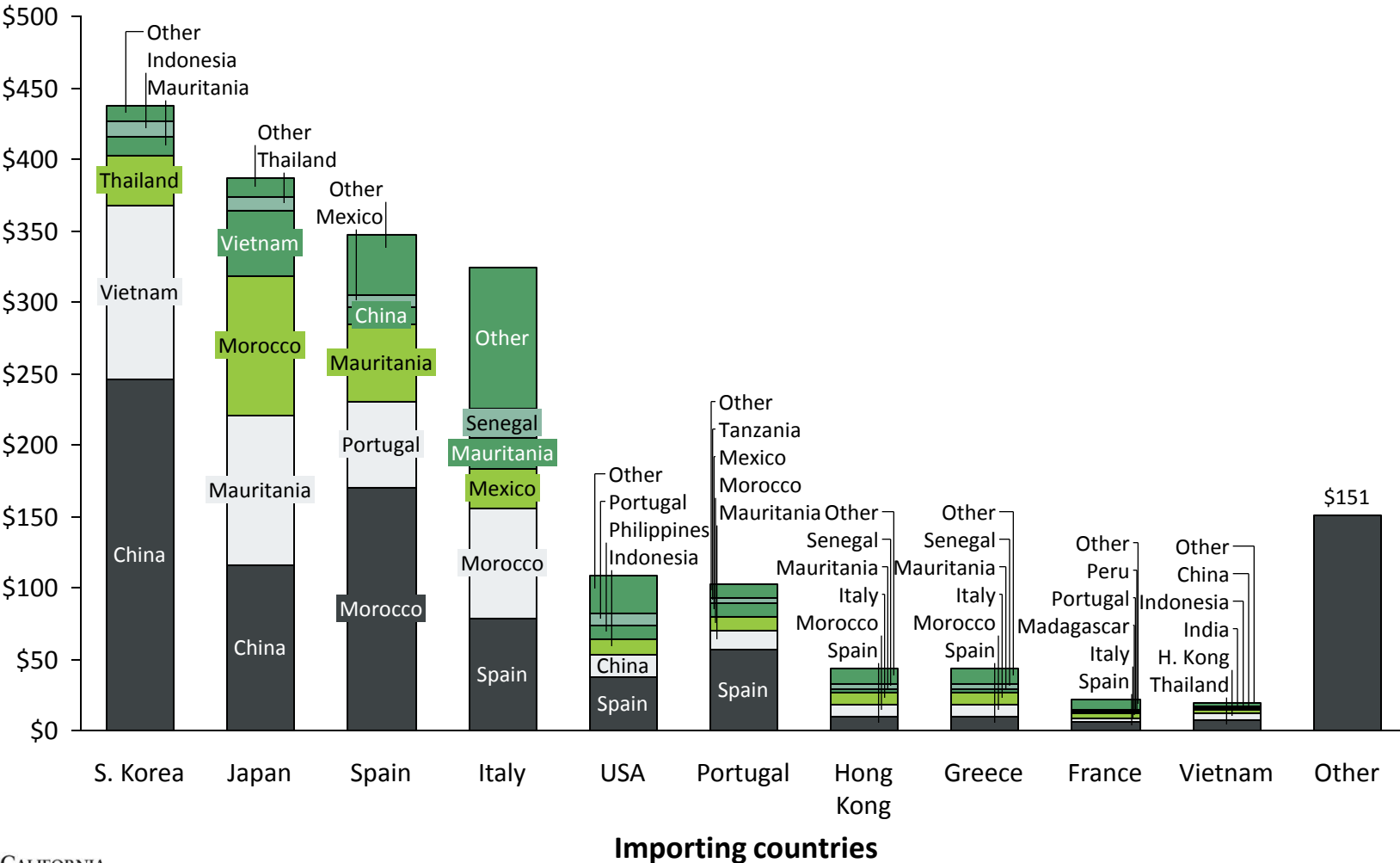
2014 Exports  
(USD millions)



# Top 10 Importers: Asia and S. Europe are the main importing markets for octopus

2014 Imports  
(USD millions)

Top octopus importers and their largest trading partners

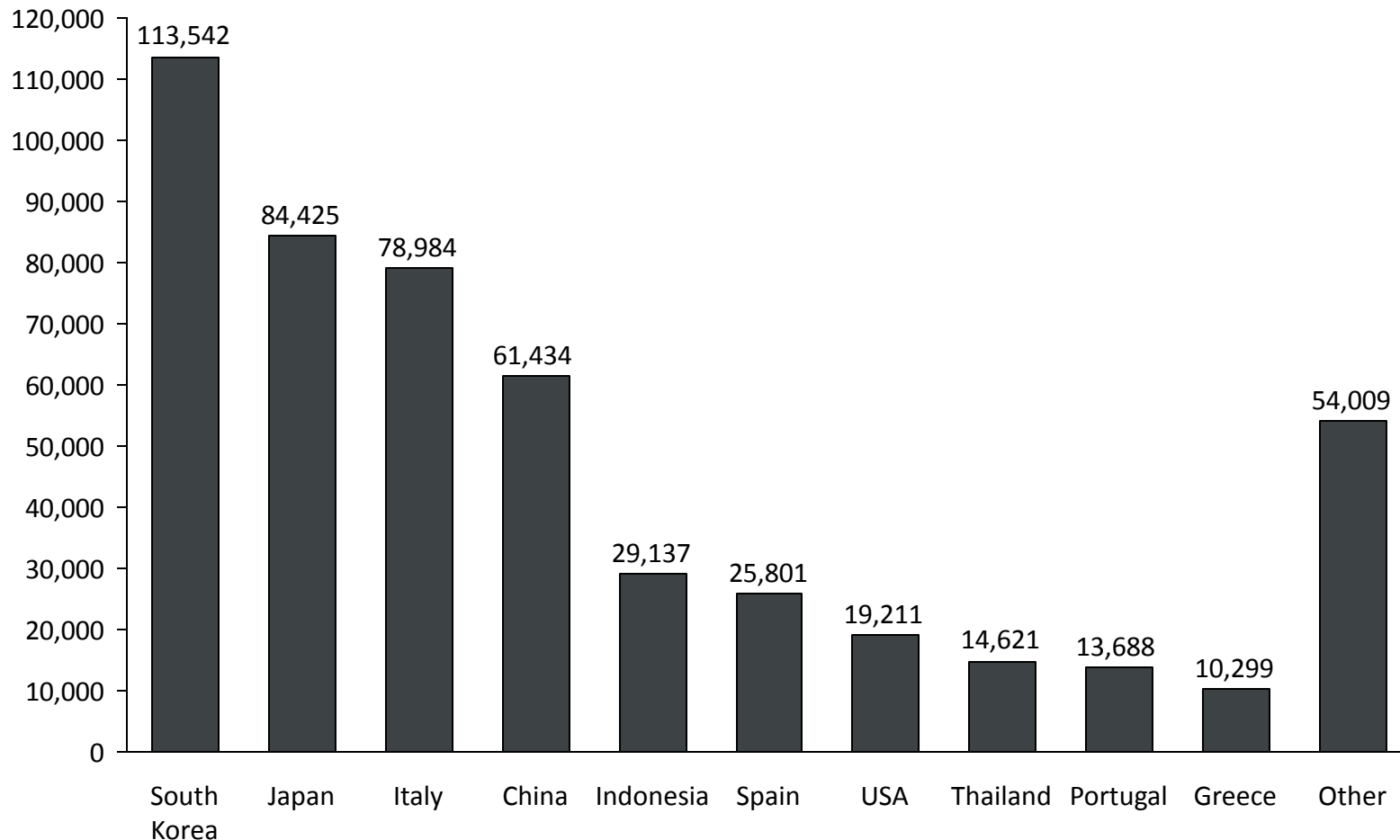




# Top 10 Consumers: N. Asia and S. Europe are the main consumers of octopus

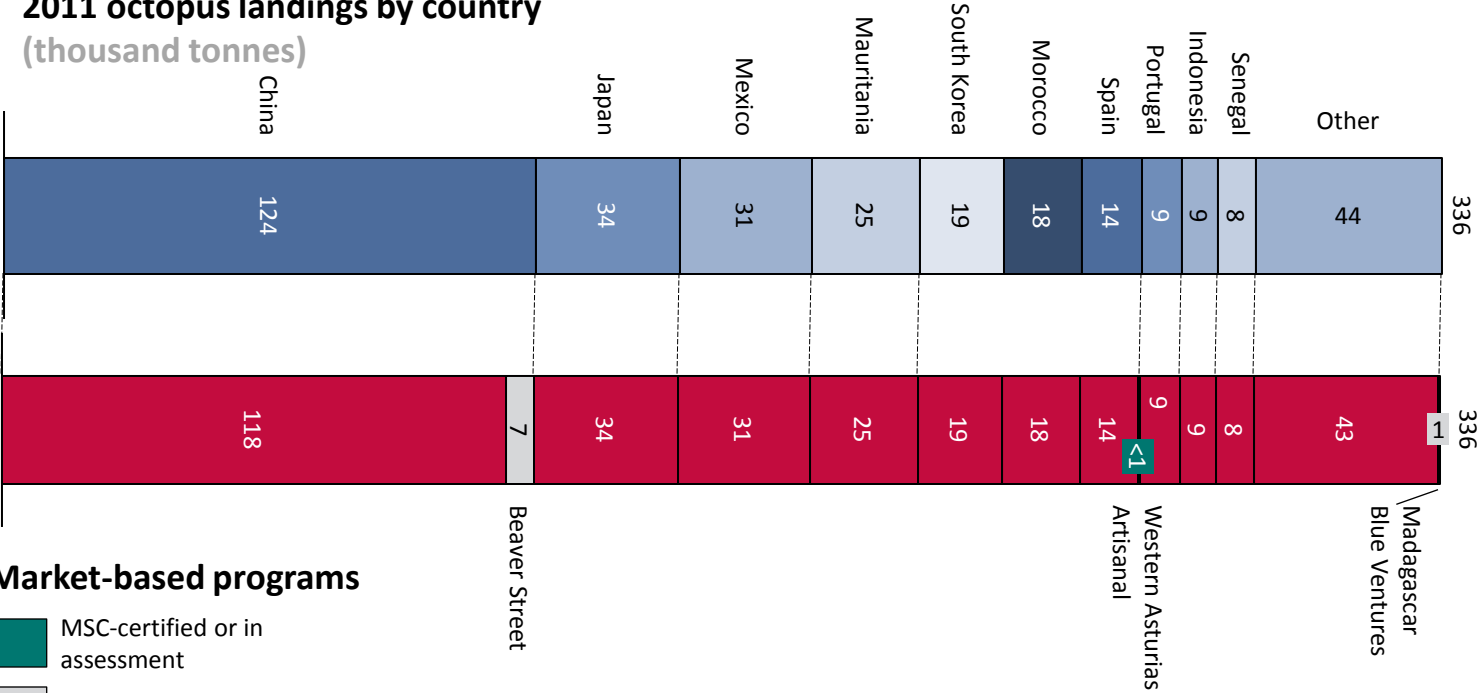
2011 Apparent Consumption  
(Tonnes Round Weight)

Top Octopus Consumers



# Market incentives have not gained much traction with octopus fisheries

**2011 octopus landings by country**  
(thousand tonnes)



**Market-based programs**

- MSC-certified or in assessment
- In a FIP
- No FIP or MSC certification

FAO Fishstat; [www.msc.org](http://www.msc.org); [www.fisheryimprovementprojects.org](http://www.fisheryimprovementprojects.org).

\*FIP or certification may only cover a portion of a country's production.

# Market dynamics, fishing methods, and the low value of octopus make it a challenging commodity for market-based approaches

## **Low sustainability demands in key octopus markets present barrier to adoption of market-based programs**

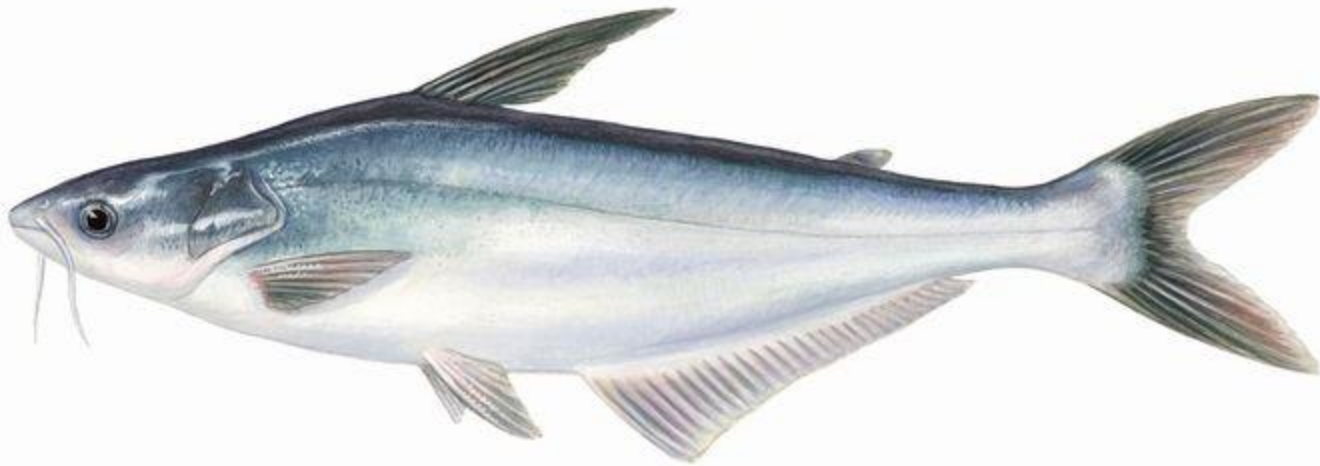
- Just 2% of octopus fisheries are in the MSC program or a FIP.
- Markets for exported octopus are primarily in Asia and Southern Europe: Japan (26% of global exports), South Korea (17%), Italy (14%), and Spain (14%).
- The US is the only main importer of octopus that has sustainability demand. The US imports 5% of globally traded octopus, primarily from Spain (28%), China (19%), the Philippines (11.5%), Indonesia (8%), and Japan (8%).

## **Fishing methods are also a barrier**

- Large-scale octopus fisheries typically use bottom trawl gear with low target-catch to bycatch ratios, which may be a barrier to engagement with sustainability oriented programs.

## **Few clear additional opportunities**

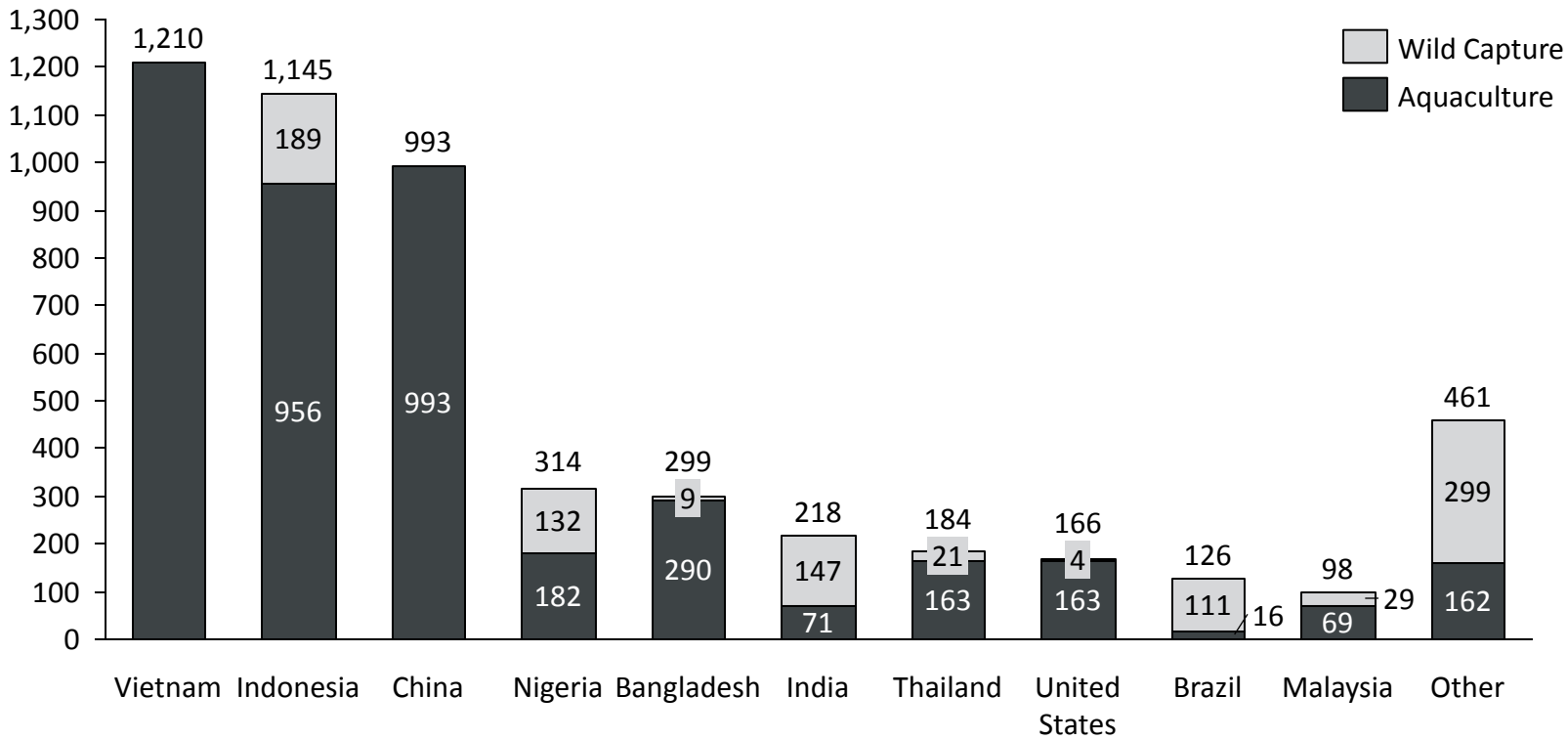
- Market-based programs have successfully engaged some artisanal fisheries. There may be an opportunity for more FIPs in these small-scale fisheries (e.g., Mexico), but they are generally low volume.



## Pangasius and other catfish

# Top 10 Producers: Vietnam, Indonesia, and China account for almost 65% of global catfish production

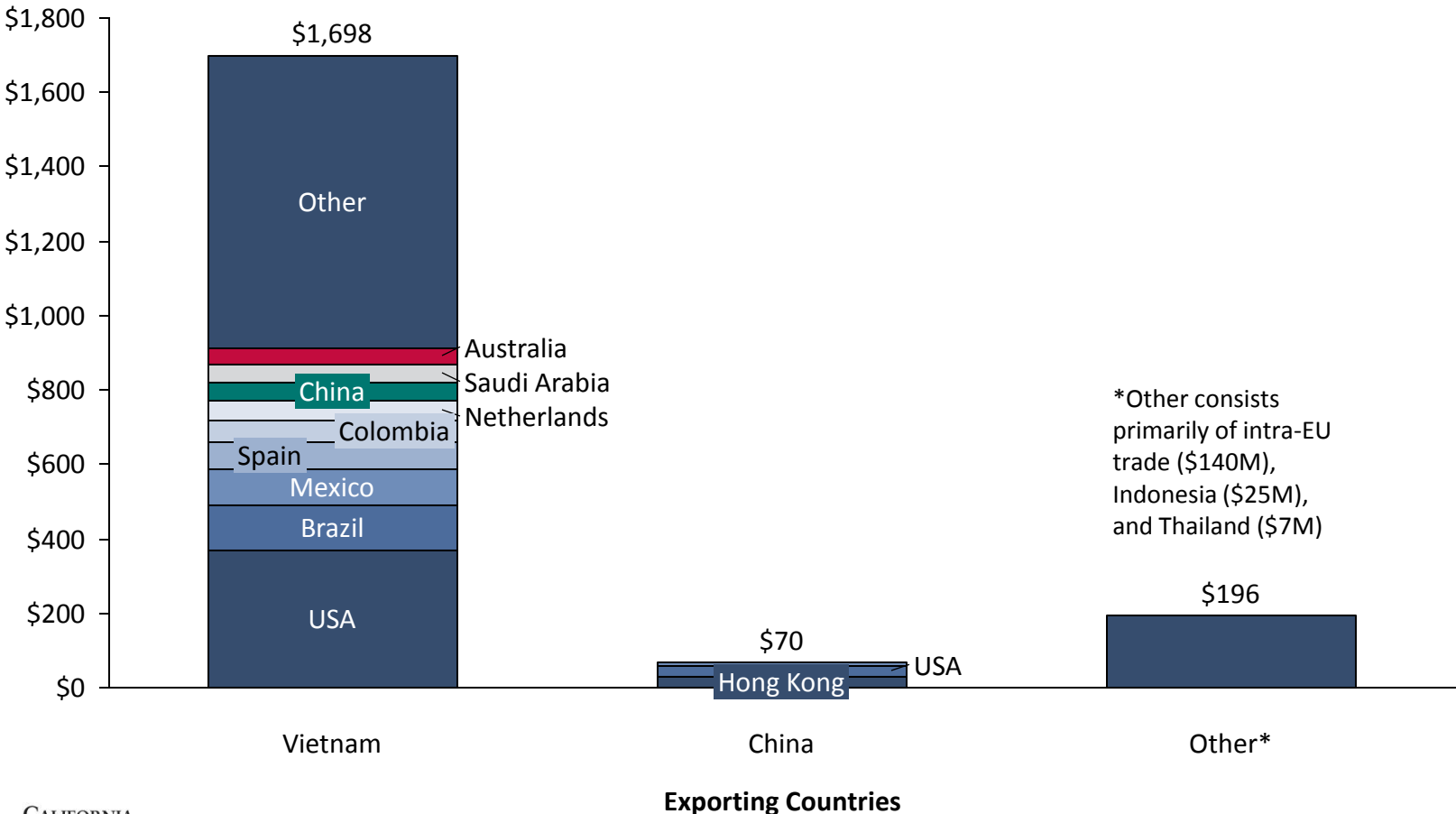
2013 Production  
(Thousand Tonnes)



# Top Exporters: Vietnam controls almost all of the international pangasius market; China may be a growing player; and Indonesia has developed a domestically focused industry

2013 Exports  
USD millions

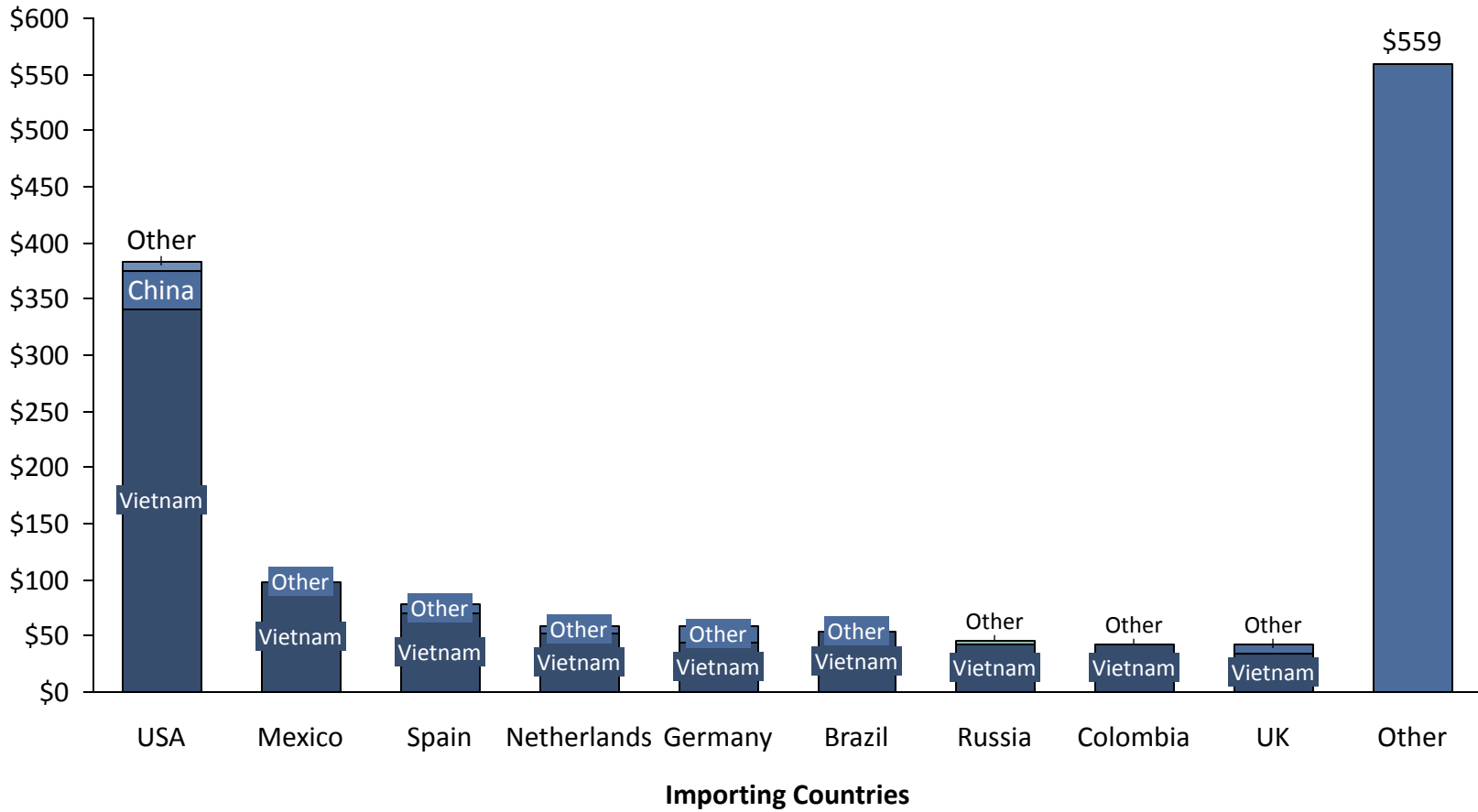
Top catfish/pangasius exporters and their main trade partners



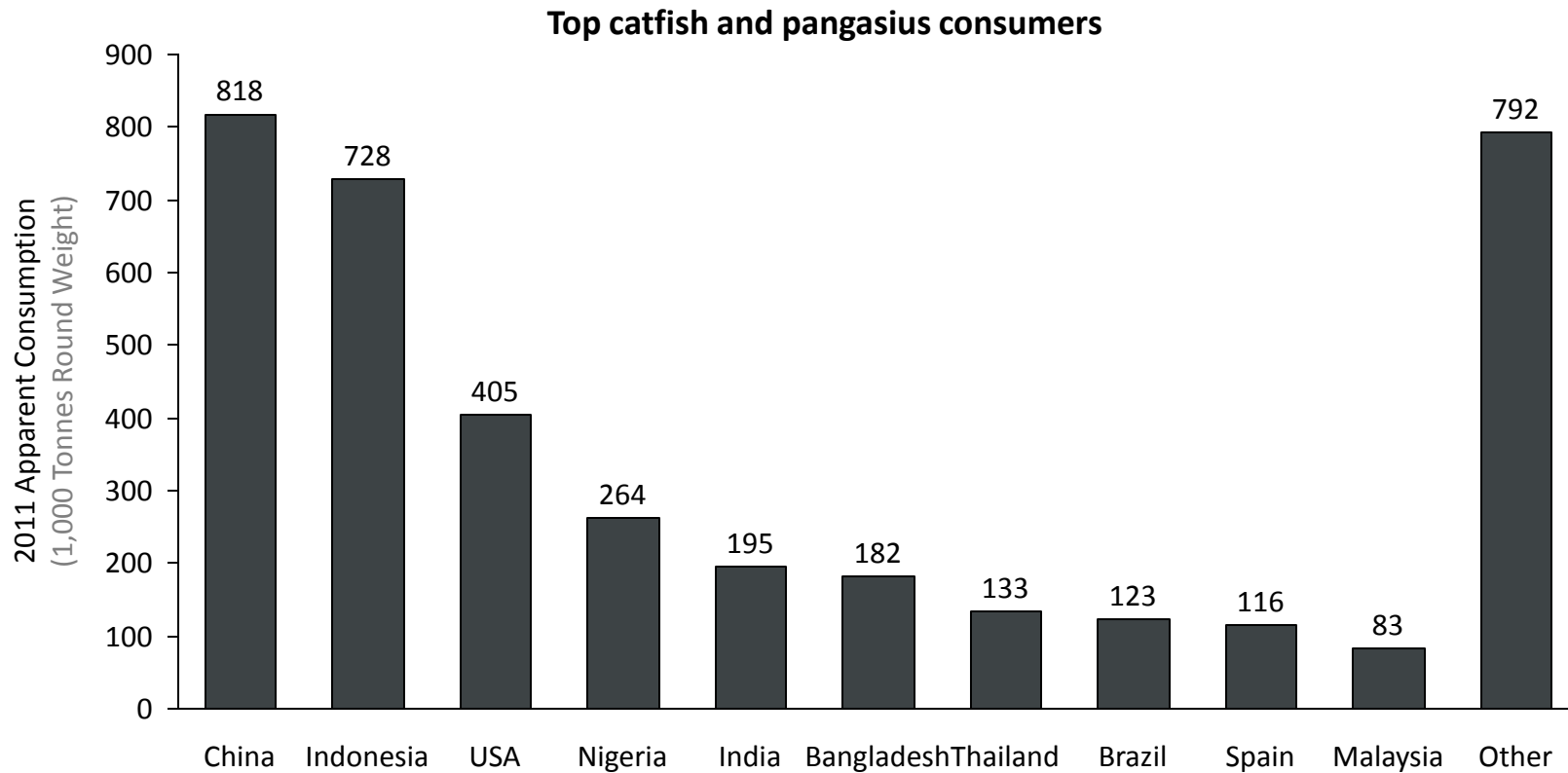
# Top Importers: US, Mexico, Brazil, and EU are the primary export markets for pangasius

2013 Imports  
USD millions

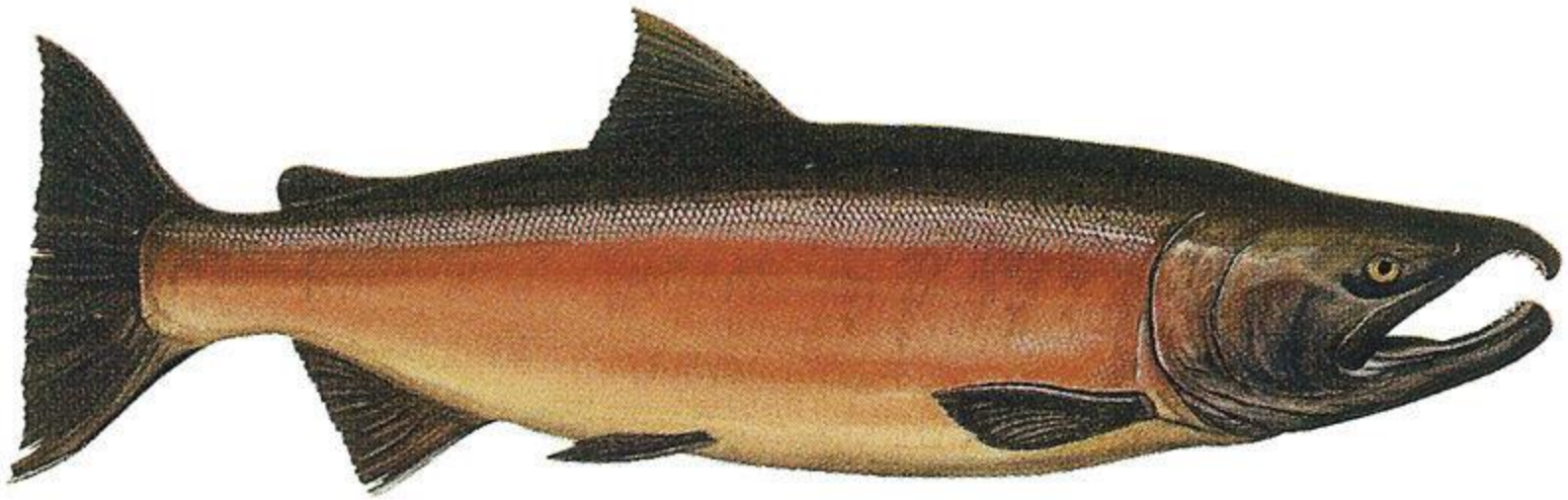
### Top pangasius importers and their main trade partners



**Apparent Consumption:** According to production and trade data, China, Indonesia, and US are the largest catfish consumers, but resolution of trade data may limit this assessment's accuracy



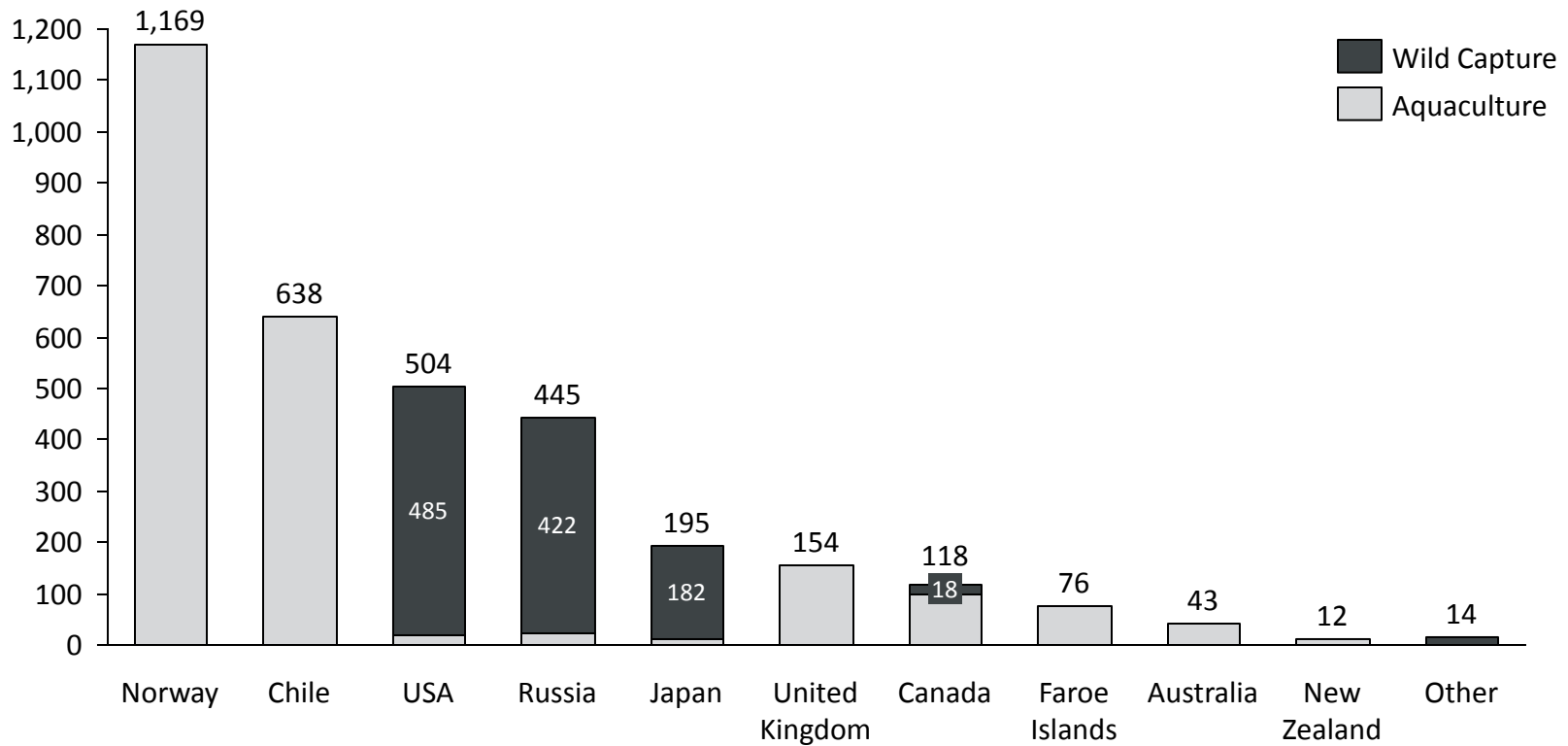




# Salmon

# Top 10 Producers: The top 4 producers supply more than 80% of salmon by volume

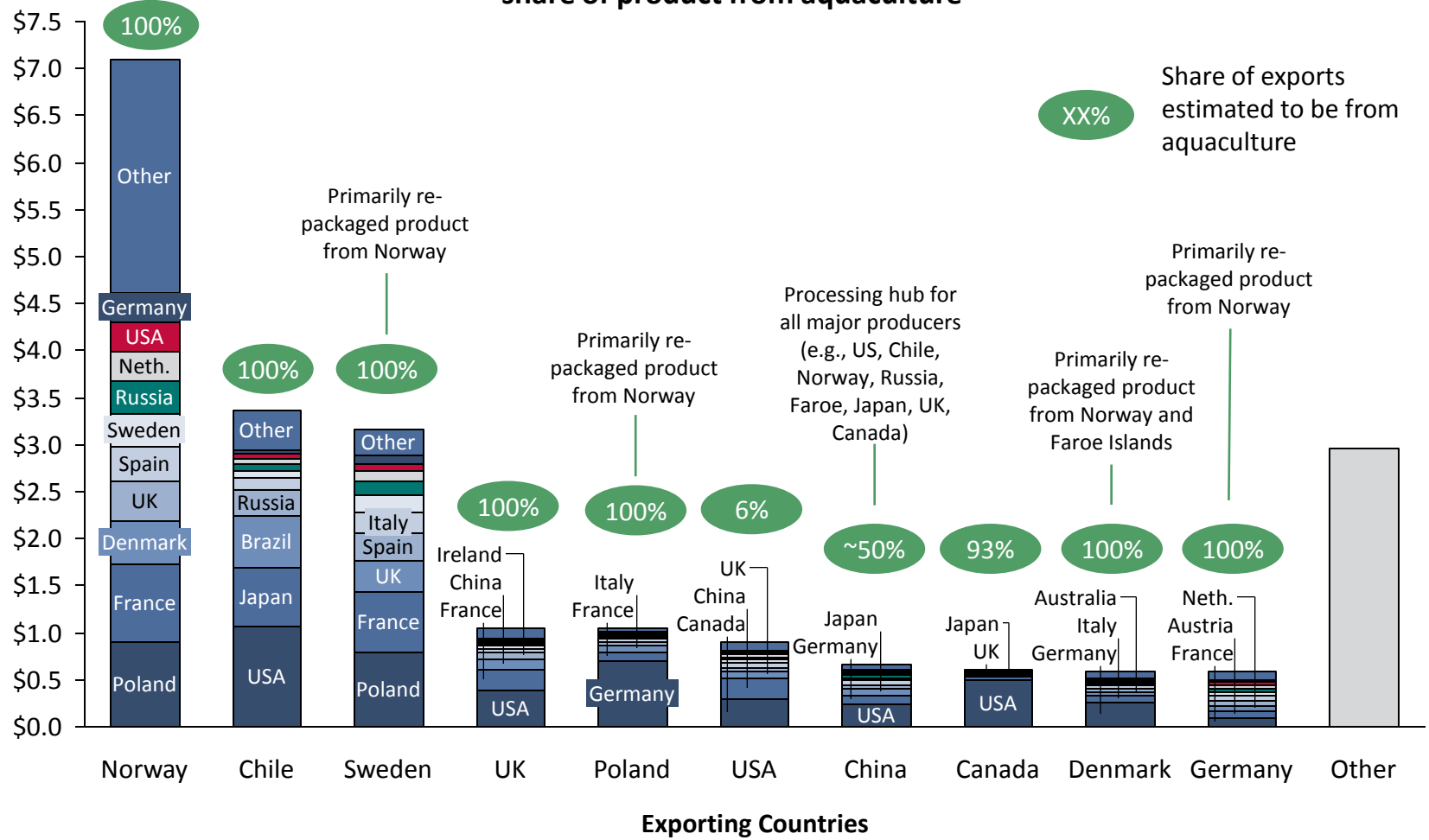
2013 Production  
(Thousand Tonnes)



# Top 10 Exporters: Most of the main salmon exporters produce farm-raised product

Exported Value  
2014 (USD billions)

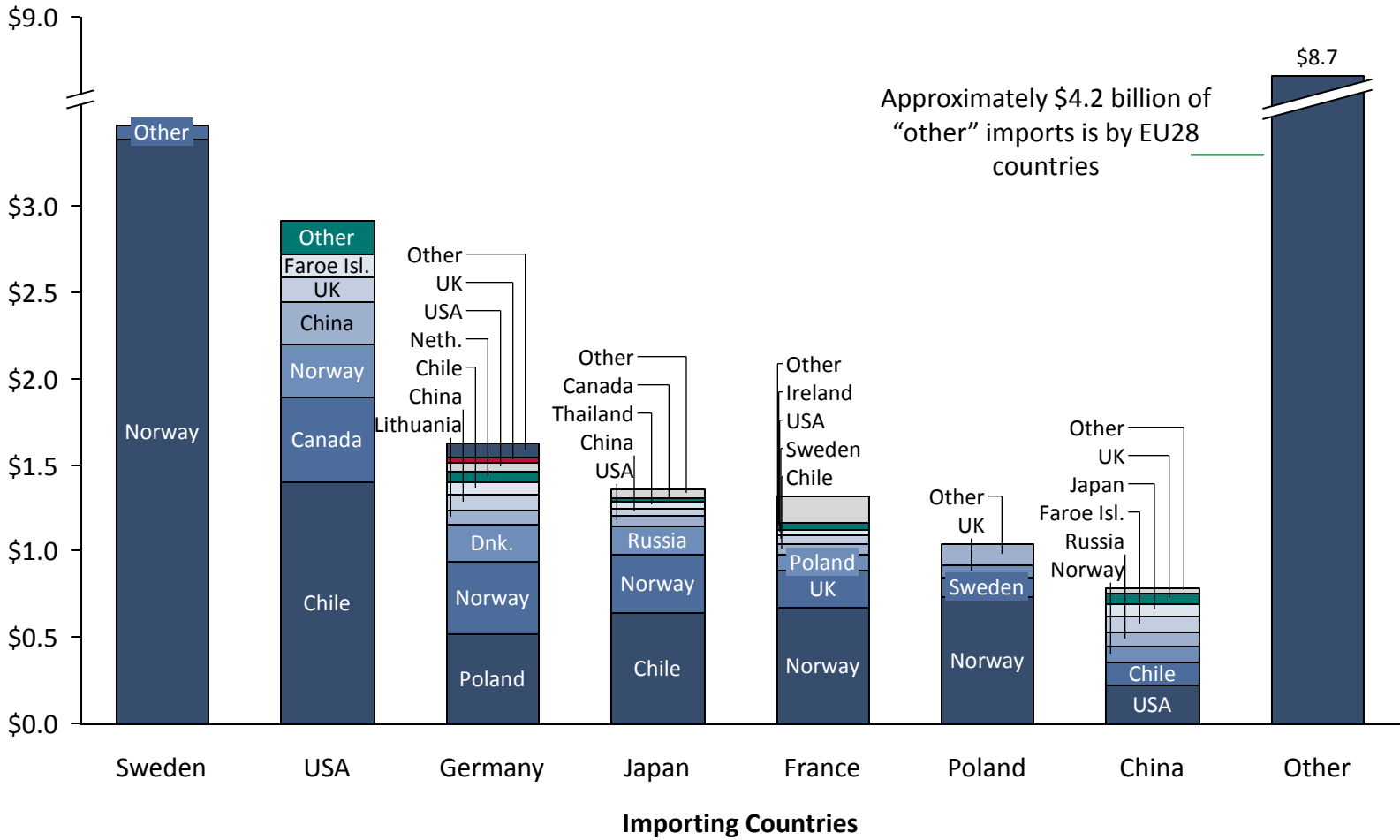
**Top salmon exporters, their trade partners, and estimated share of product from aquaculture**



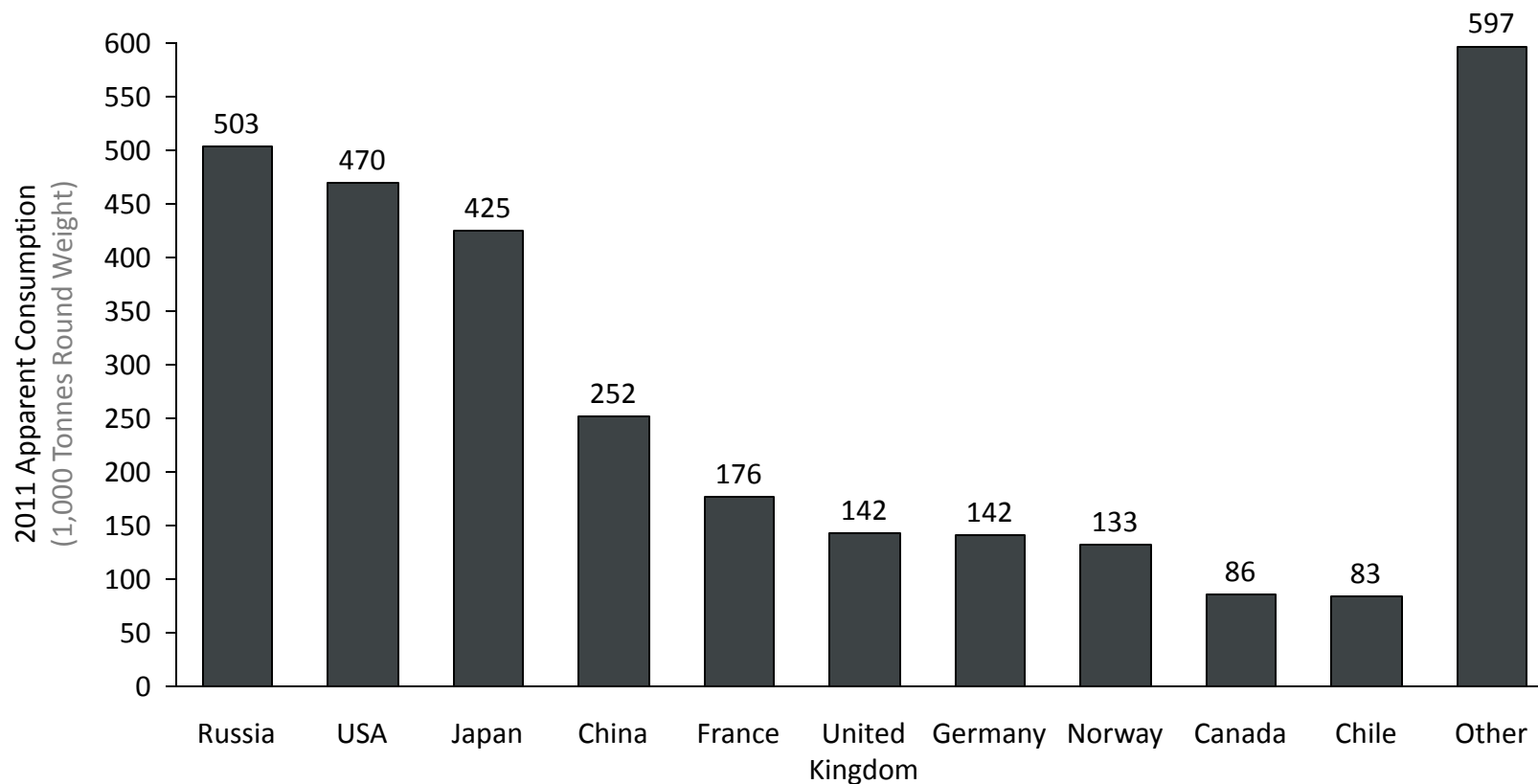
# Top Importers: EU and US are the key markets for salmon exports

Imported Value  
2014 (USD billions)

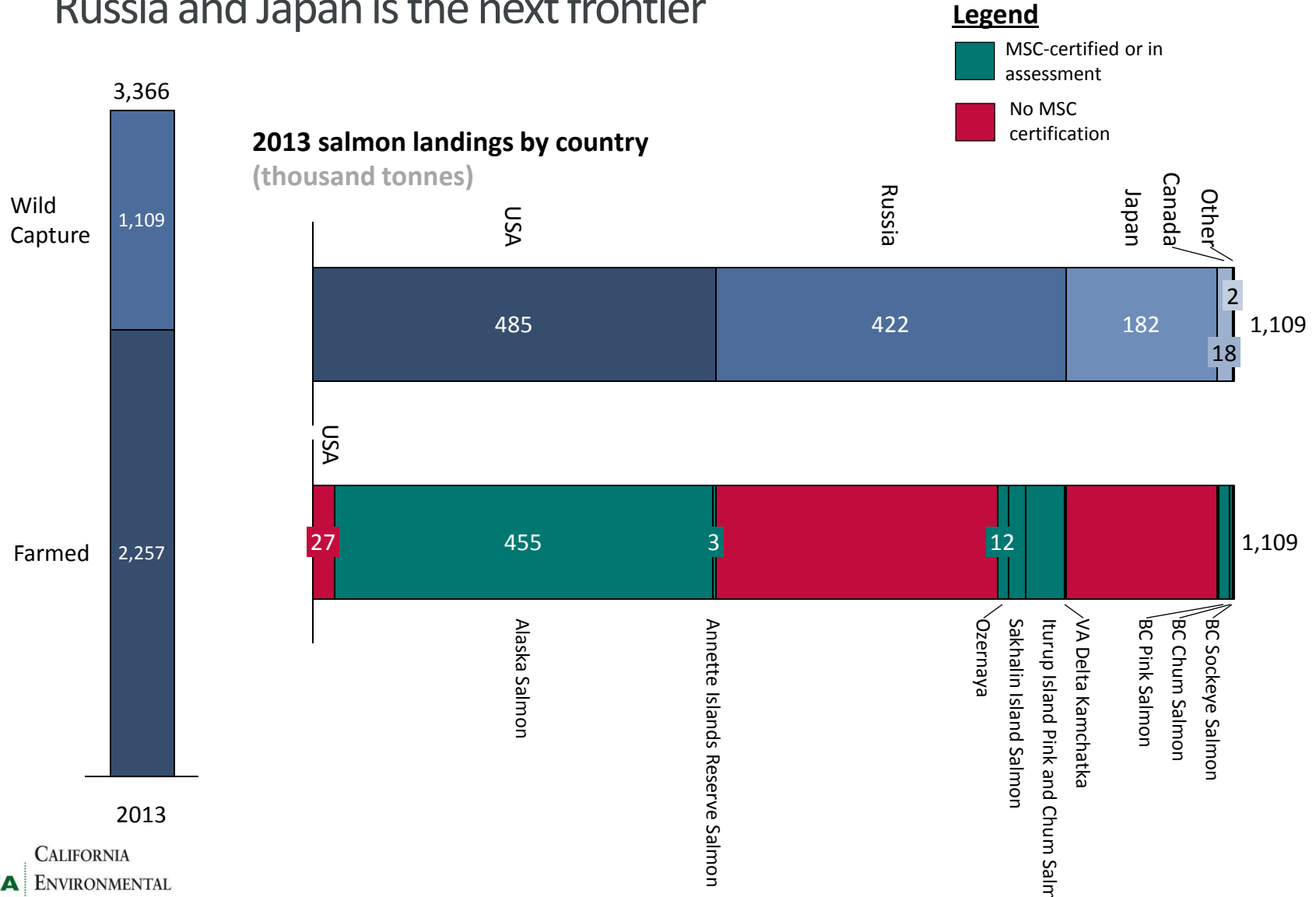
### Top salmon importers, their trade partners



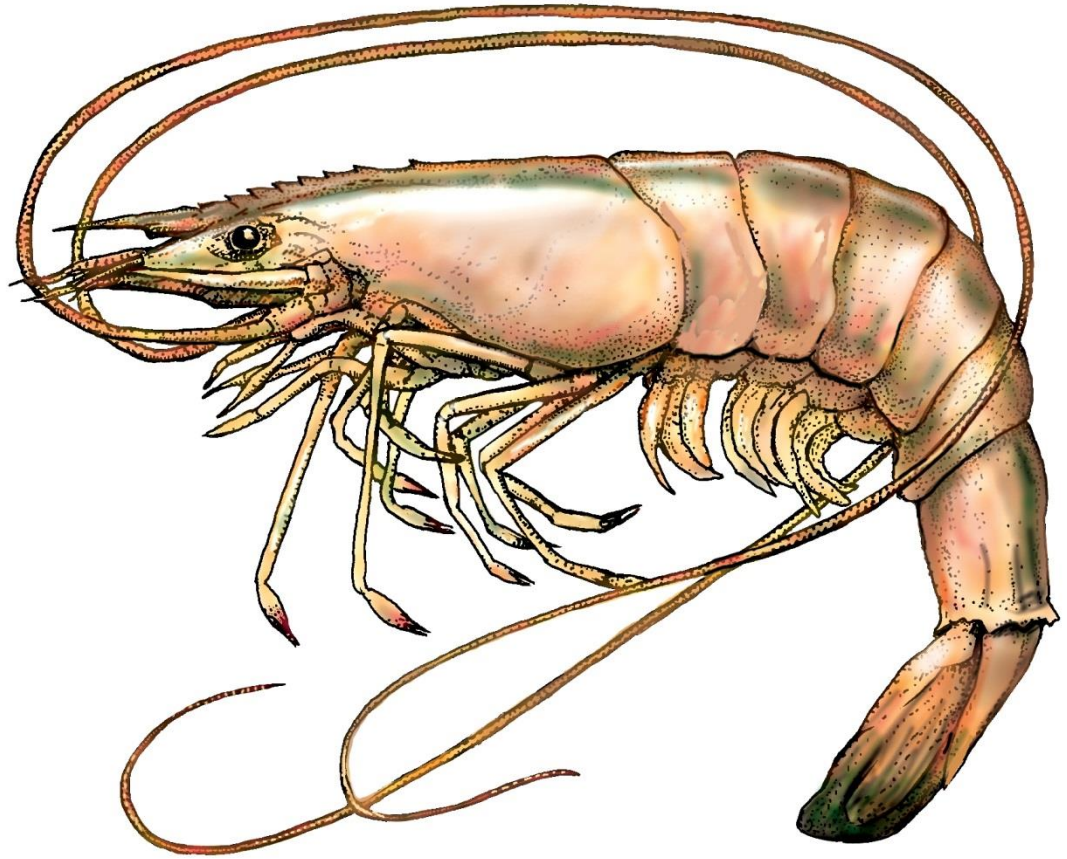
## Top 10 Consumers: Russia, US, Japan, China, and N. EU countries are key salmon consumers; Russian apparent consumption may be overstated due to lower-quality trade data



# A large share of salmon—especially salmon from Alaskan fisheries—is already MSC-certified; gaining a stronger foothold in Russia and Japan is the next frontier



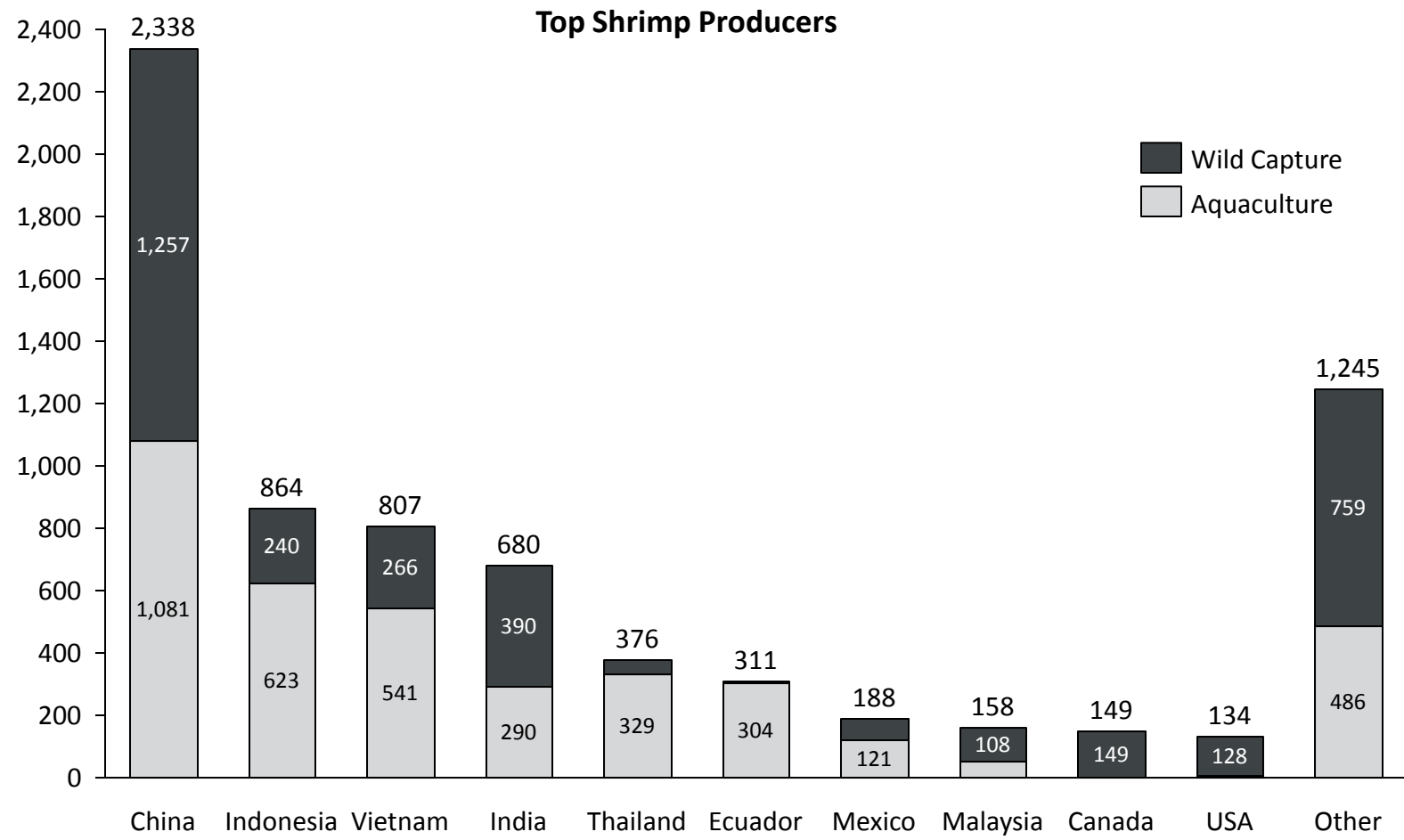
\*FIP or certification may only cover a portion of a country's production.



Shrimp

# Top 10 Producers: Farmed producers in Asia are the largest suppliers of shrimp worldwide

2013 Production  
(Thousand Tonnes)



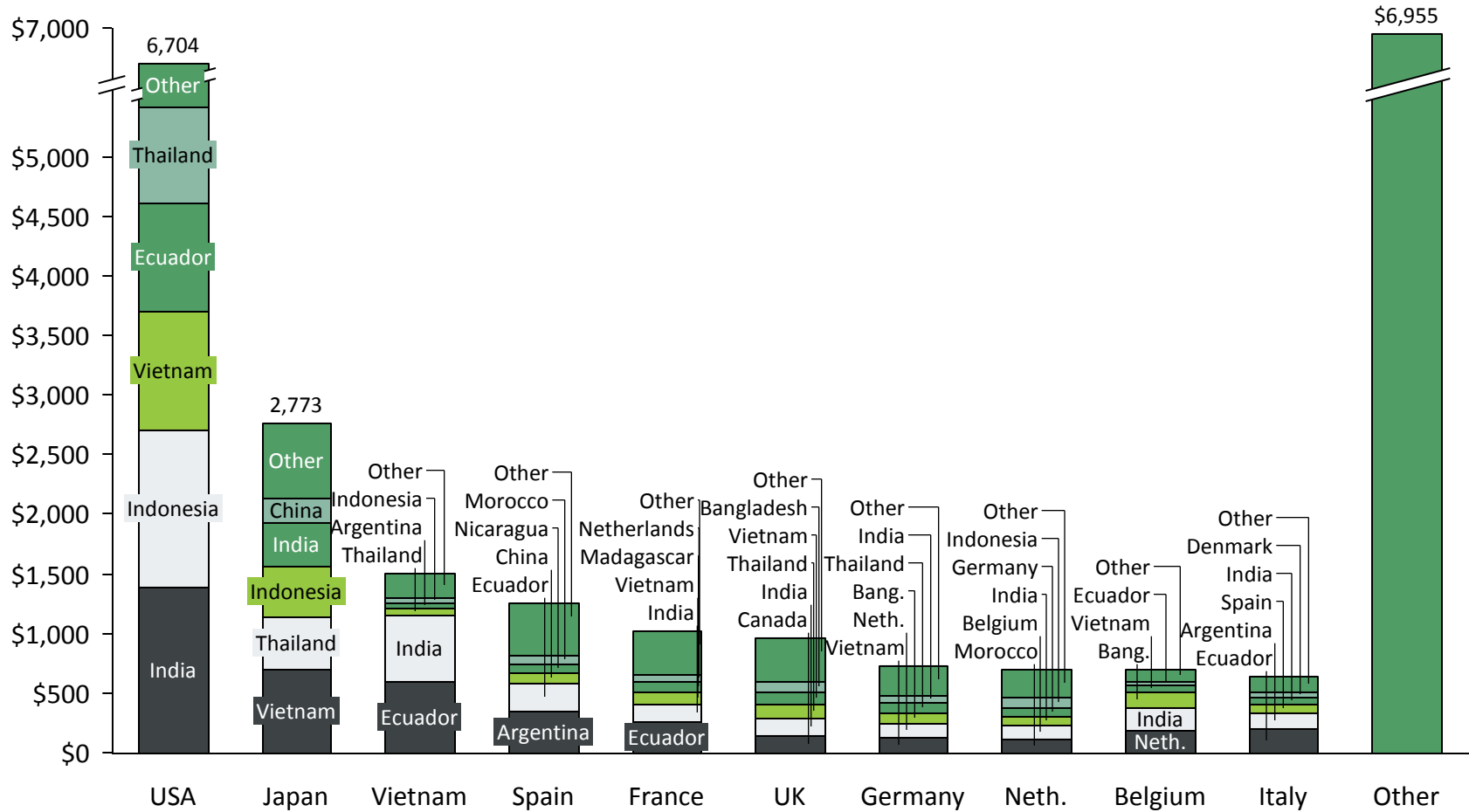


# Top 10 Exporters: Farmed shrimp producers are the main exporters, with the US, EU, and N. Asia as their key trade partners



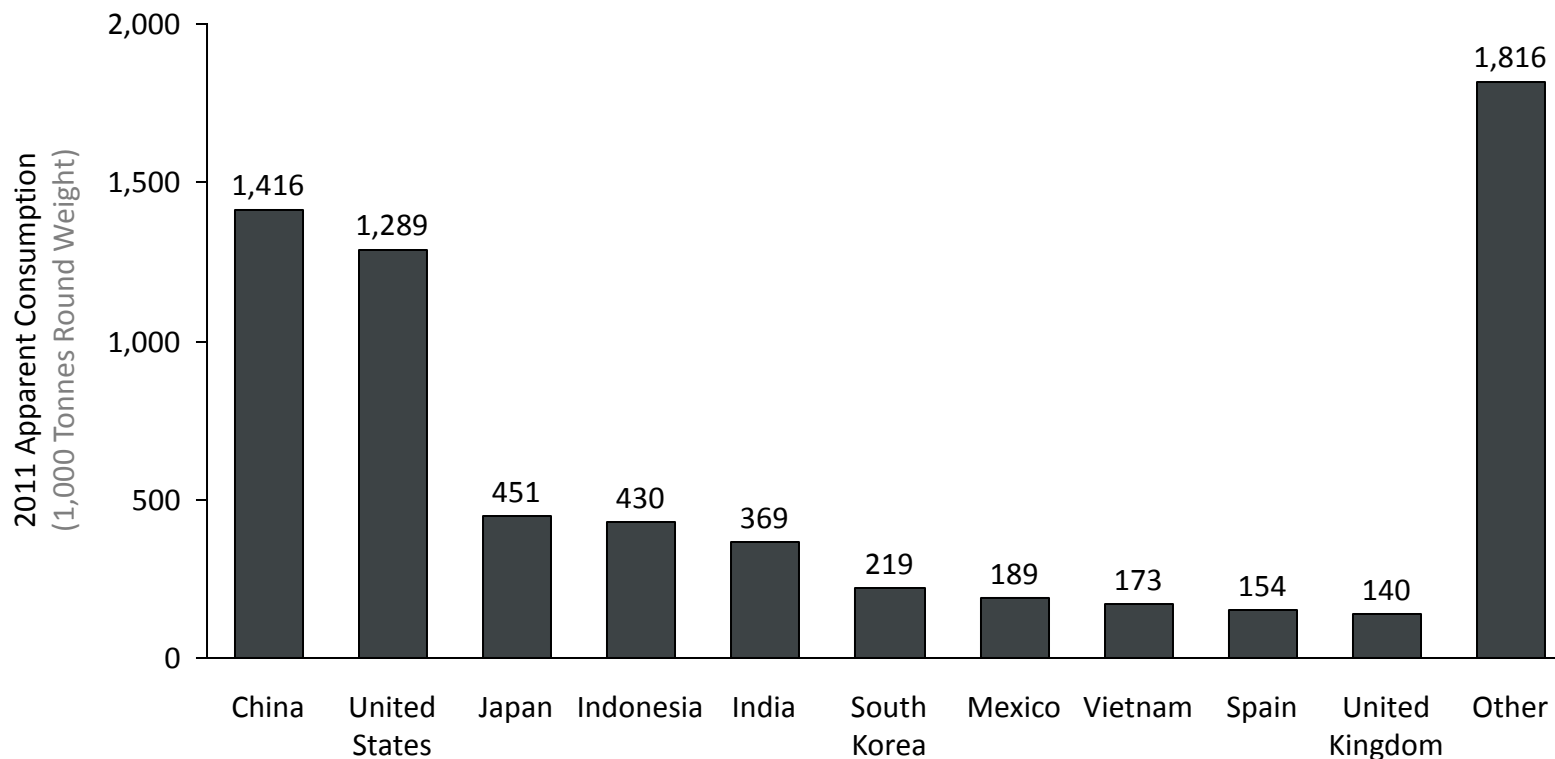
# Top 10 Importers: The US and N. EU, which have demand for sustainable seafood, are important shrimp importers, as is Japan

2014 Imports  
(USD millions)



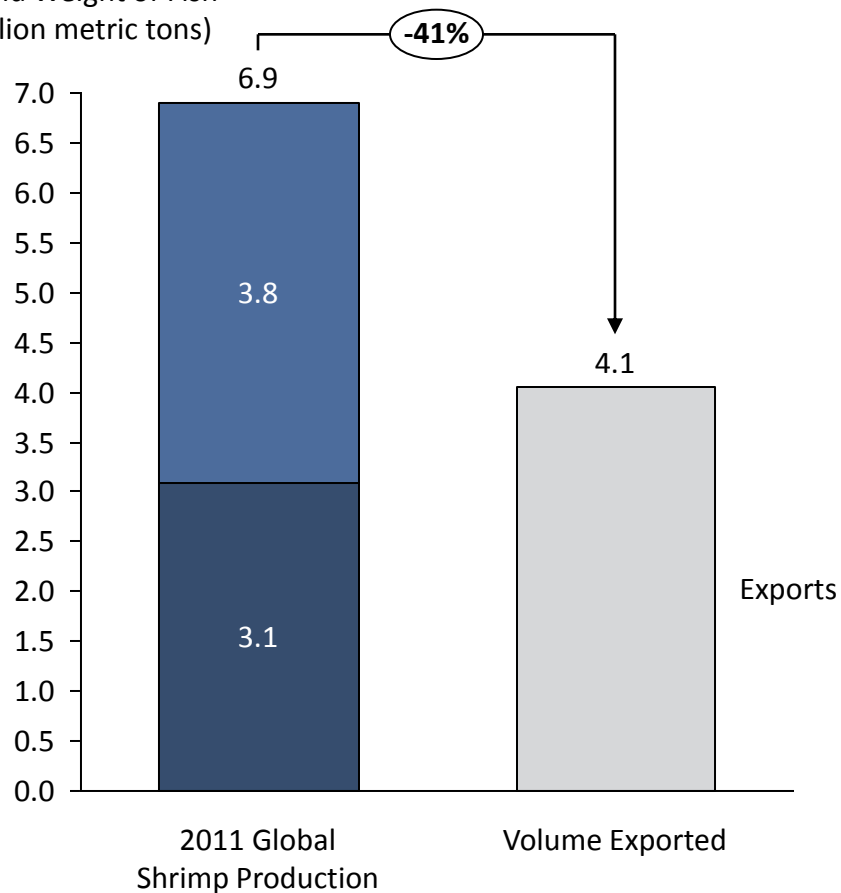
# Apparent Consumption: China, the US, and Japan are the main consumers of shrimp

Top Shrimp Consumers



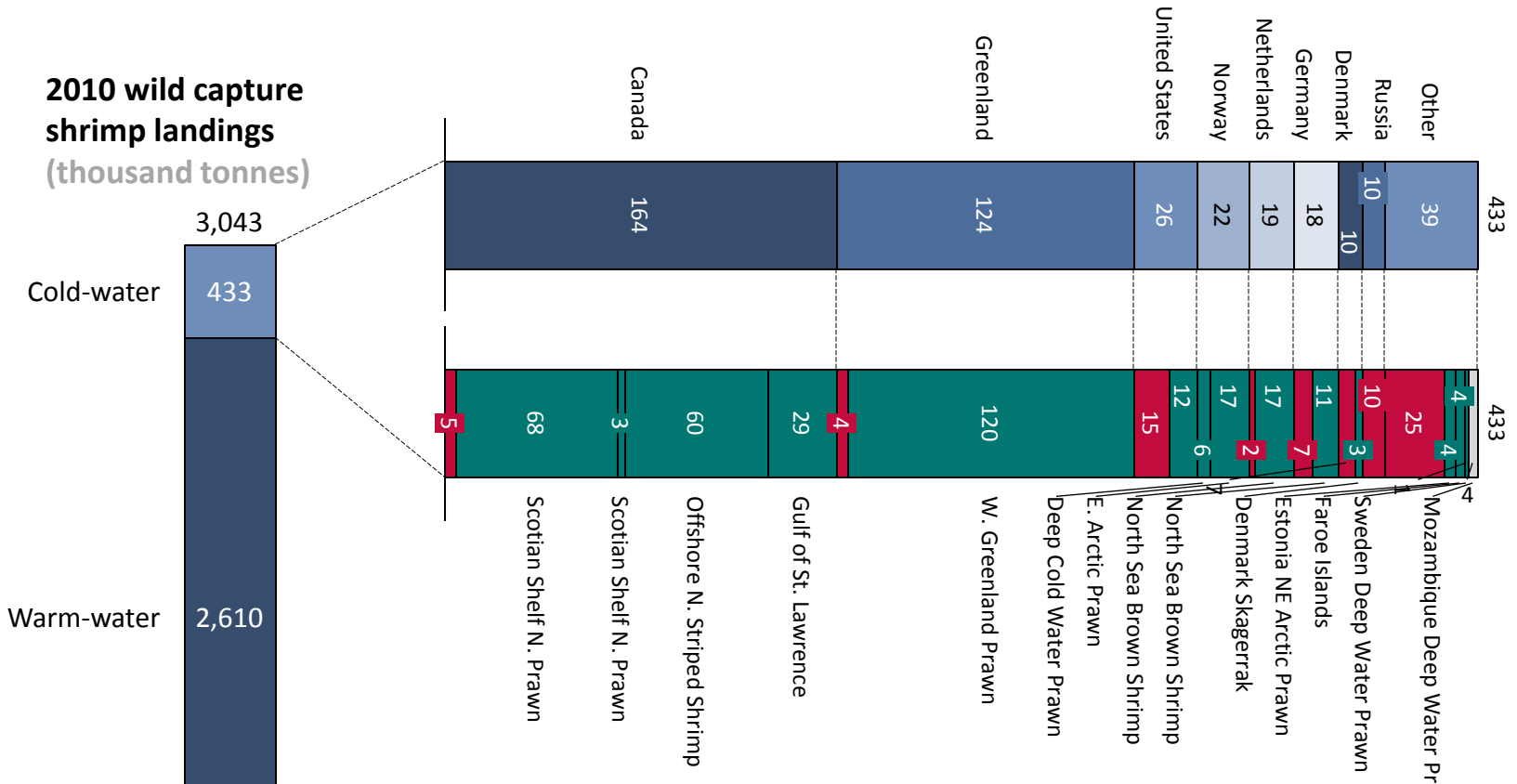
## Almost 60% of global shrimp production is traded internationally; it is the most valuable traded seafood commodity

Round Weight of Fish  
(million metric tons)



- Approximately 55% of shrimp production is farmed.
- Globally, shrimp exports in 2011 were valued at almost 20 billion USD, making shrimp the most valuable traded seafood commodity.

# Shrimp: Cold-water shrimp is largely certified



### Market-based programs

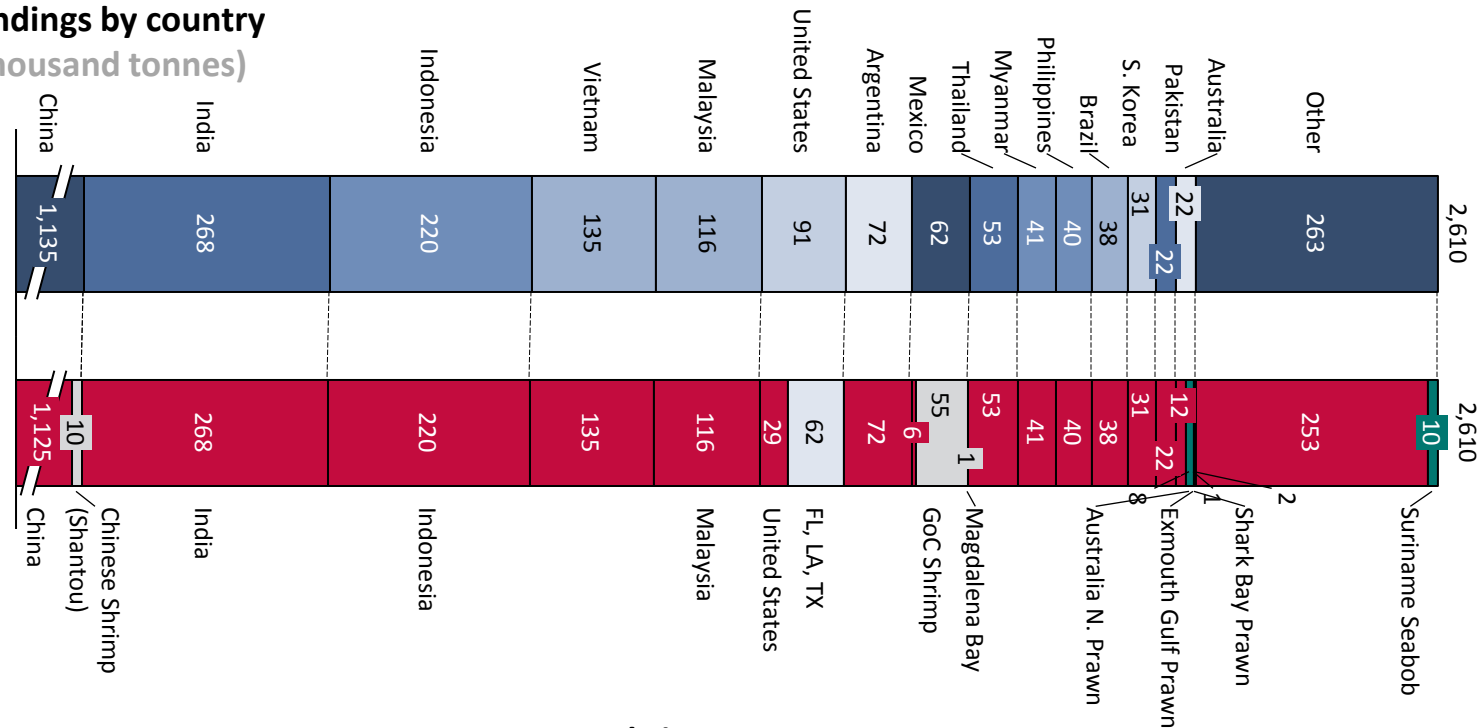
- MSC-certified or in assessment
- In a FIP
- No FIP or MSC certification

### Cold-water shrimp

- More than three-quarters of the global production of cold-water shrimp is already in the MSC program.
- Mozambique deep water prawn is the only FIP for cold water species.

# Progress in tropical shrimp fisheries remains elusive; market pressure seems insufficient for the scale of difficulty in these fisheries

## 2010 warm-water shrimp landings by country (thousand tonnes)



### Market-based programs

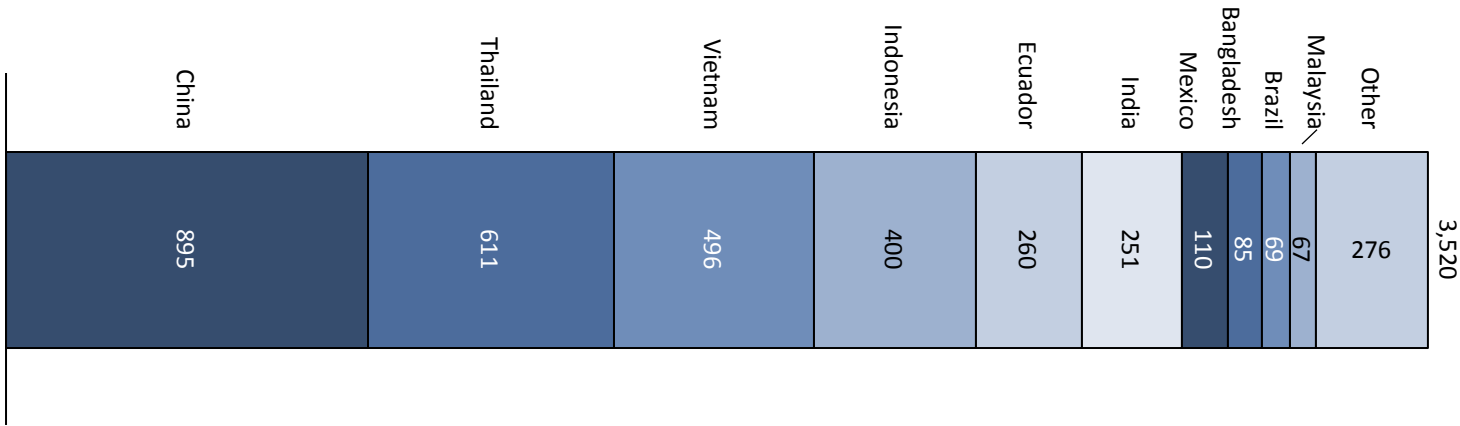
- MSC-certified or in assessment
- In a FIP
- No FIP or MSC certification

### Warm-water shrimp

- Less than 5% of warm-water shrimp fisheries are in the MSC program or a FIP.
- Weak governance in fishing countries, significant environmental issues with these fisheries, and the availability of cultured product (roughly 60% of traded product) conspire to make the market pressure on these fisheries insufficient for the scale of change needed.
- The GoC industrial fishery probably has the best chances for certification among major warm-water shrimp fisheries in the near-term, but even that will be a heavy lift.

Data on certification of farmed shrimp is confidential; we hope to add this information to future reports

**2011 farmed shrimp production by country**  
(thousand tonnes)



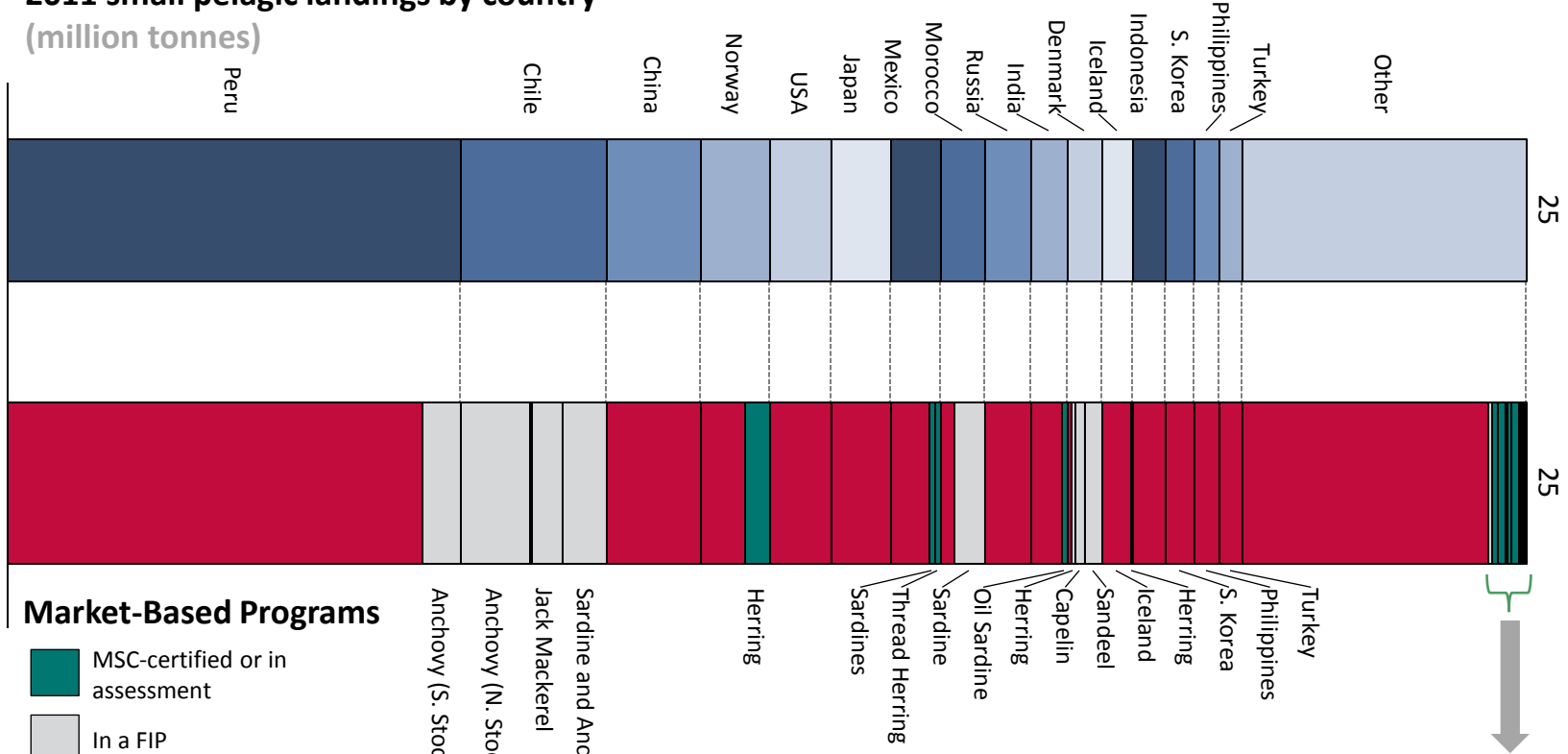


## Small pelagic commodity analysis



# Market-based programs have been implemented primarily in N. European, Mexican, and South American small pelagic fisheries

**2011 small pelagic landings by country**  
(million tonnes)



**Market-Based Programs**

- MSC-certified or in assessment
- In a FIP
- No FIP or MSC certification

FIPs	MSC in assessment	MSC-certified
Panama small pelagics	Australia blue grenadier	Argentina anchovy
	Canada herring	Canada herring
	French anchovy	Faroe smelt
	French herring	French sardine
	German herring	Ireland herring
	Netherlands blue whiting	Netherlands herring
	Spain sardine	New Znd. blue whiting
	Sweden herring and sprat	Sweden herring
	UK herring and mackerel	UK herring

\* Peruvian anchoveta is still recognized as being in a FIP, but based on our interviews we believe the FIP to be stalled.

\*\* Excludes mackerel fisheries other than Chilean jack and chub mackerel that supply reduction markets.

\*FIP or certification may only cover a portion of a country's production.

## **Small pelagic summary:** As the sustainability bar, industry has settled on IFFO RS, which covers a large share of reduction fisheries

**Approximately 25% of small pelagic volume is engaged in a FIP or are in the MSC program**

**The fishmeal industry seems to have coalesced around IFFO RS, which already has certifications in fisheries that cover approximately 80% of small pelagic fisheries landings**

- If the conservation movement wants to drive further improvements in small pelagic fisheries, the sustainability bar for the fishmeal sector will need to be raised.
- FIPs are present in the largest small pelagic fisheries that are not IFFO RS approved (e.g., Chilean jack mackerel, Baltic sprat, Morocco sardines).
- More rigorous requirements are slated to come on line for aquaculture standards (e.g., ASC in 2017), but it is unclear whether they will transform the small pelagic industry.

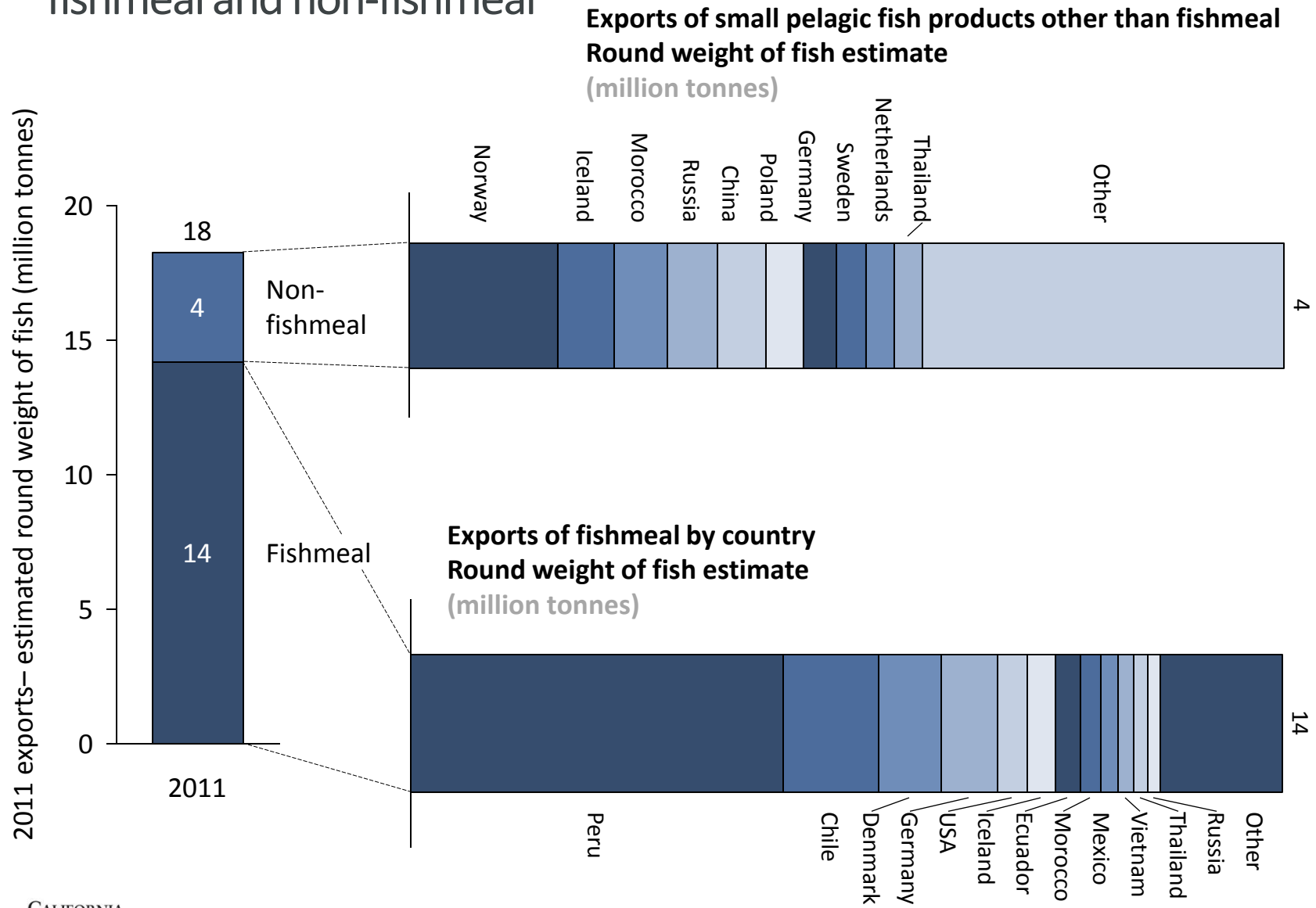
**Some discrete opportunities exist to work with fisheries that serve human consumption markets in Northern Europe**

- Fisheries that have pursued MSC certification are typically ones that supply the human consumption markets (e.g., herring). Some discrete opportunities may exist for further certifications, but volumes are low and lack of strong sustainability demands in S. Europe limit the potential of this approach.

**Trash fish fisheries as the next frontier**

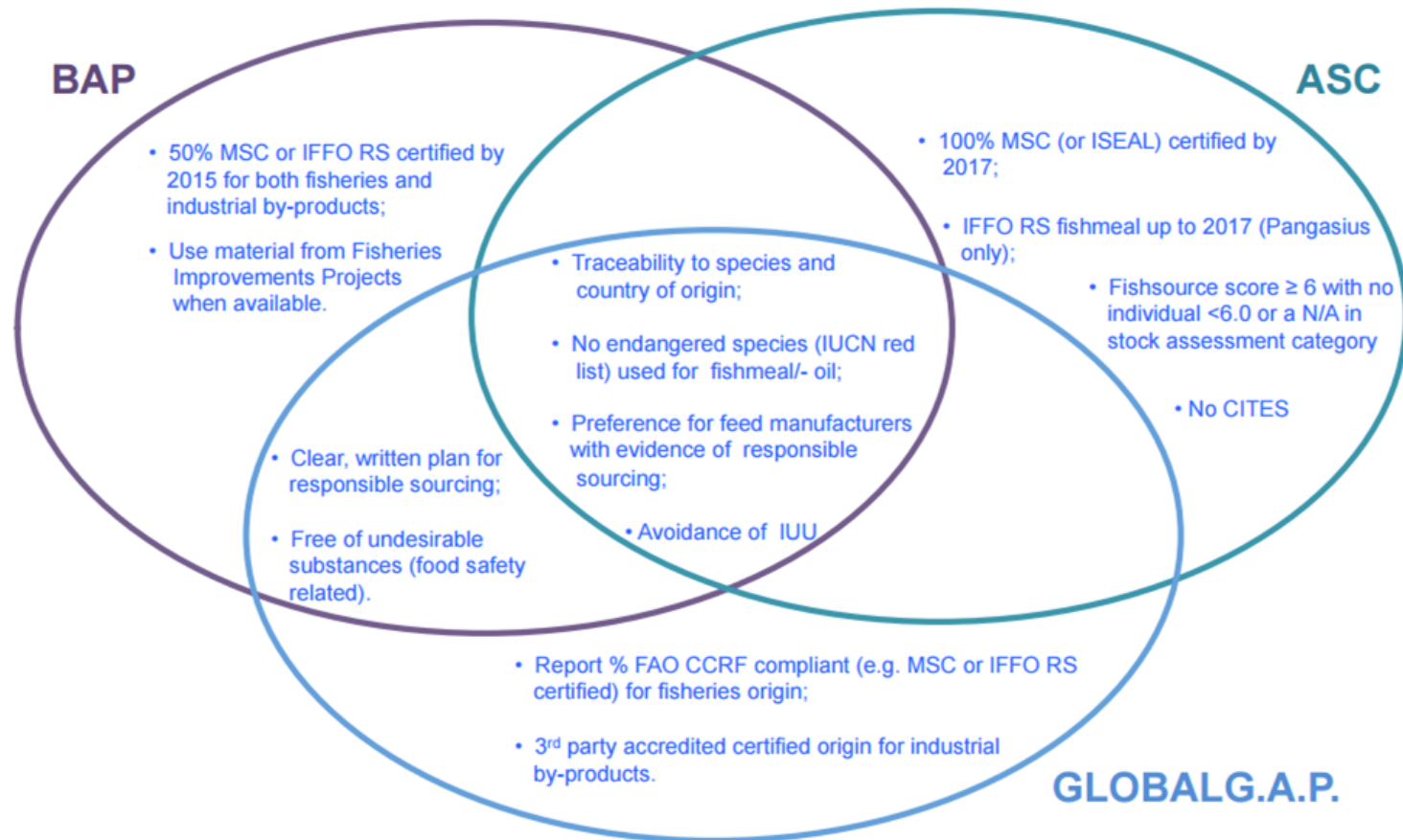
- SFP has been working on roundtables for SE Asian trash fisheries for several years. While not necessarily small pelagic fisheries, they serve the same fishmeal markets. Several FIPs are now underway (e.g., Ben Tre trawl, Kien Giang trawl), but the efficacy of the FIP approach in these very challenging fisheries is still a question in this early stage.
- The IFFO improvers program may become an important player for these reduction fisheries.

# Exports of small pelagic fish can be broken down broadly into fishmeal and non-fishmeal



Currently, IFFO RS or Fish Source scores of 6 or greater are sufficient to meet sustainability demands from aquaculture for fish feed

**Requirements for sourcing of fishmeal and fish oil (from whole fish and fishery by-products)**



*NOTE: All ASC requirements included at farm level standards, most BAP and GLOBALG.A.P. requirements included as feed mill standards.*

Most of the main small pelagic fisheries have IFFO RS certifications or Fish Source scores of 6 or more; raising the sustainability bar in the fishmeal sector will be required if further improvements are a priority

### **The fishmeal industry has coalesced around IFFO RS**

- “Most of the aquaculture people have gathered around IFFO RS. It is easy to identify what product is in the program, and for us the goal is to get our supply to IFFO RS.” *Aquafeed representative*
- “ASC is starting to have some impact, and in 2017 it will require MSC-certified meal. I must say, that when the standard was made, it was in the belief that there would be pressure from the aquaculture industry on the fishmeal industry. The ASC does not have that power right now, and the aquaculture industry has declared that they would embrace IFFO.” – *Aquafeed representative*

### **The vast majority of reduction fisheries (80% of global volume) already supply IFFO RS approved fishmeal factories**

- As of 2014, IFFO RS certifications existed in fisheries that account for 80% of the volume of the main small pelagic reduction fisheries.
- The largest volume fisheries that remain outside of IFFO RS are Chilean jack mackerel (In a stalled FIP), Baltic sprat (In a FIP), and Northwest African sardines (most landings a part of the newly initiated Moroccan sardine FIP).

### **The majority of small pelagic catch also meets FishSource score benchmarks<sup>1</sup>**

- ASC currently allows for fishmeal from fisheries where each of the five FishSource scores of 6 or above. Two thirds of small pelagic reduction fisheries already meet this benchmark.

## Market programs have struggled to make progress in S. American small pelagic fisheries; low sustainability demands from the fishmeal industry and no links to EU food fish markets may be partly to blame



Peru

**Small pelagic production:** 7.4M tonnes

**Share exported:** ~80%

**Share of small pelagic exports as fishmeal:** 99%

Peru has been involved with several market-based programs for its anchovy fishery, but all of these efforts have stalled. Just a couple of years ago, the fishery was considered a prime candidate for MSC certification, but it has not moved ahead. Similarly, the fishery was in an SFP FIP starting in 2007, but in the last year the FIP stalled and is no longer recognized as an active project. The shared border stock with Chile is still in a FIP, but is struggling to gain traction. The main producers are motivated to improve the fishery, with a primary objective to bring the artisanal sector, which is largely unregulated, into a more rigorous management system. The artisanal fleet is politically powerful, and industry has been unable to generate enough pressure to improve management in the fishery. Unfortunately, the FIP has not been able to tip the balance of political will. With a portion of the fishery already IFFO RS-certified, market demand for further improvements is somewhat muted.



Chile

**Small pelagic production:** 2.4M tonnes

**Share exported:** ~66%

**Share of small pelagic exports as fishmeal:** 99%

Chile has FIPs for all of its major small pelagic fisheries (anchovy, sardine, jack mackerel), but all three FIPs are struggling to make progress. The anchovy and sardine fisheries already meet the current bar for sustainability in the fishmeal industry (IFFO RS), and the main fishmeal producers are not active participants in the FIPs. The small-scale sector is the main stakeholder, and it is trying to leverage the FIP to access new food fish markets. It has yet to find a market that values sustainability, so the FIP seems to be struggling to bring enough pressure to drive meaningful improvements in the fishery.

# Capelin and sandeel have limited market engagement; these fish primarily supply the aquafeed market, and the limited human consumption goes to markets with few sustainability demands



Capelin

**Production:** 853 thousand tonnes

**Main producers:** Norway (42%), Iceland (38%), Russia (10%), Canada (3%)

**Key food export markets:** Russia, China

N. European capelin fisheries have not entered into a FIP or MSC certification. The two main stocks, Barents Sea and Iceland, have IFFO RS certifications, which is a sufficient sustainability bar for the fishmeal market. Product destined for human consumption, primarily roe, goes to E. European and Chinese markets that do not have sustainability demands.

---

**Production:** 443 thousand tonnes

**Main producers:** Denmark (64%), Norway (25%), Sweden (7%)



Sandeel

The North Sea sandeel has been in a FIP since 2009, but activities have been limited to an annual roundtable meeting and having industry representatives send a letter to fisheries managers once a year. N. European sandeel fisheries are IFFO RS-approved, so industry motivation is not strong to aggressively push beyond IFFO RS. The FIP, however, does provide a forum that helps stakeholders to stay abreast of sustainability trends in the fishmeal industry.

## Herring and sprat have seen more progress with market-based tools; their importance as food fish in N. EU markets with strong sustainability demands may be a driver



Sprat

**Production:** 577 thousand tonnes

**Main producers:** Denmark (28%), Turkey (15%), Sweden (10%), Poland (10%)

**Key food export markets:** N. Europe

Denmark is the largest sprat producer; Danish product almost exclusively supplies the fishmeal market. The Danish fishery is in a FIP with the main aquafeed producers, EWOS, Biomar, and Skretting, as the main stakeholders. The North Sea stock of sprat is IFFO RS-approved, but the Baltic stock is not. Similar to the Danish sandeel FIP, activities have been limited to an annual meeting and drafting a letter to fisheries managers. These fisheries in the North Atlantic are reasonably well managed and there is little pressure in the feed industry for more demanding certification schemes. Sweden, on the other hand, sends a significant portion of its sprat to food fish markets that have strong sustainability demands, and a portion of the Swedish fishery is now undergoing MSC assessment.



Herring

**Production:** 2.5 million tonnes (Atlantic 70%)

**Main producers:** Norway (25%), Russia (17%), Iceland (8%), Finland (4%)

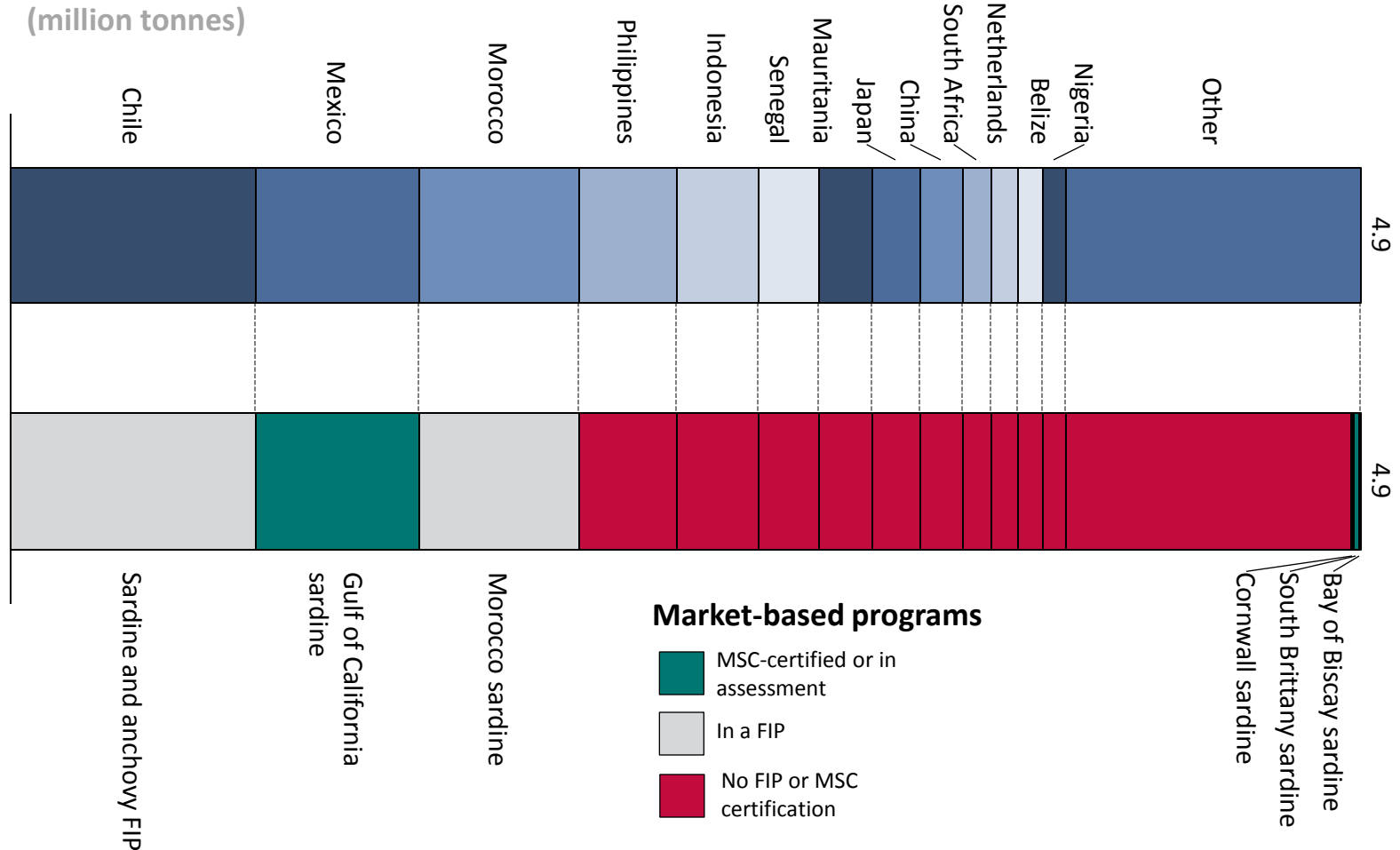
**Key food export markets:** N. Europe

Herring has been one of the biggest success stories for MSC. The fish is popular in N. European markets that have a strong demand for sustainability, and there are now 15 certified fisheries and an additional five in full assessment. More herring could be brought into the MSC program, but market pressure has already been applied and management fundamentals are quite good, so there is no significant need for FIPs. Not surprisingly, no FIPs target herring fisheries at present.

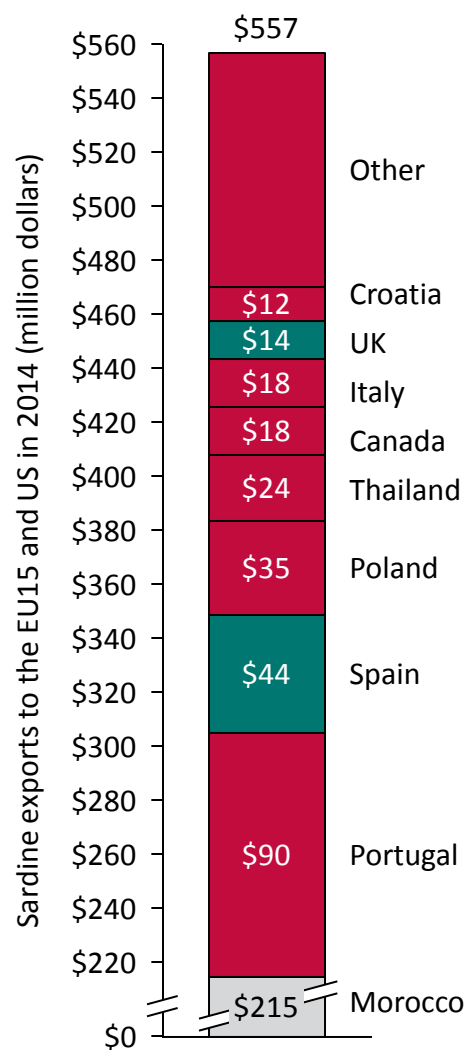


FIPs and MSC have made some headway with sardines, but there are few large sardine fisheries remaining that are good candidates for a FIP or MSC certification

**2011 sardine landings by country**  
(million tonnes)



# Cultivating more demand for sustainable seafood in S. Europe may be required to unlock more sardine certifications or FIPs



**Croatia** – Sardine exports go primarily to S. European countries with limited demand for sustainable seafood (~65% to Serbia, Italy, Spain). Management improvements *may* be needed, but market pressure is limited.

**UK** – The Cornwall sardine fishery is currently certified, but lands just 1,200 tonnes. The main export markets are S. Korea, France, the US, and Ireland.

**Italy** – Sardine exports go primarily to S. European countries with limited demand for sustainable seafood (~75% to Spain and France). Management improvements *may* be needed, but market pressure is limited.

**Canada** – The Pacific sardine fishery is reasonably well managed. Exports mainly go to US markets, which could support a market-based program.

**Thailand** – Thailand produces about 60K tonnes of sardines a year. Thailand is a difficult country for FIPs, and the market dynamics are somewhat challenging because S. Africa, Brazil, the US, and Japan are the largest export markets.

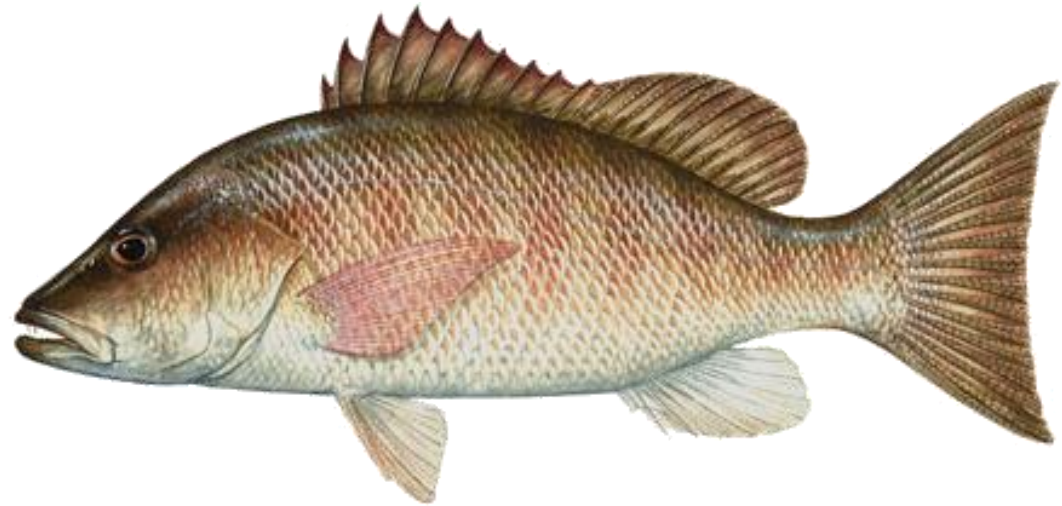
**Poland** – Poland is a relatively small sardine producer (24K tonnes), but it exports a large share of its product to the US and N. Europe. Much of the exported product may in fact be sprat, which falls under the same trade codes as sardines. Poland may be worth further investigation.

**Spain** – Spain exports a large share of sardines to the EU, but primarily to countries with limited demand for sustainable seafood: Portugal, France, and Italy. A portion of Spain’s sardine fleet in the Bay of Biscay is MSC-certified (8,000 tonnes). It is unclear whether more of Spain’s sardine landings can be targeted.

**Portugal** – Portuguese sardine fisheries have important links to French, UK, and Spanish markets. The connection to the former two markets was a driver for the fishery to pursue MSC certification in 2011. Since that time the fishery has been suspended from the program, reinstated, and suspended once more. We are not aware of all the dynamics surrounding this fishery, so we cannot say whether a FIP would help in securing the fishery’s MSC certification.

**Morocco** – There are substantial sardine exports to the US and EU15 markets. Germany and France are key markets. Germany has strong sustainable seafood demand, while France has relatively strong demand in comparison to other S. European countries. The new FIP seems to be well targeted.

CALIFORNIA 2011



## Snapper and Grouper

## Snapper and grouper: Difficult context to achieve short-term success

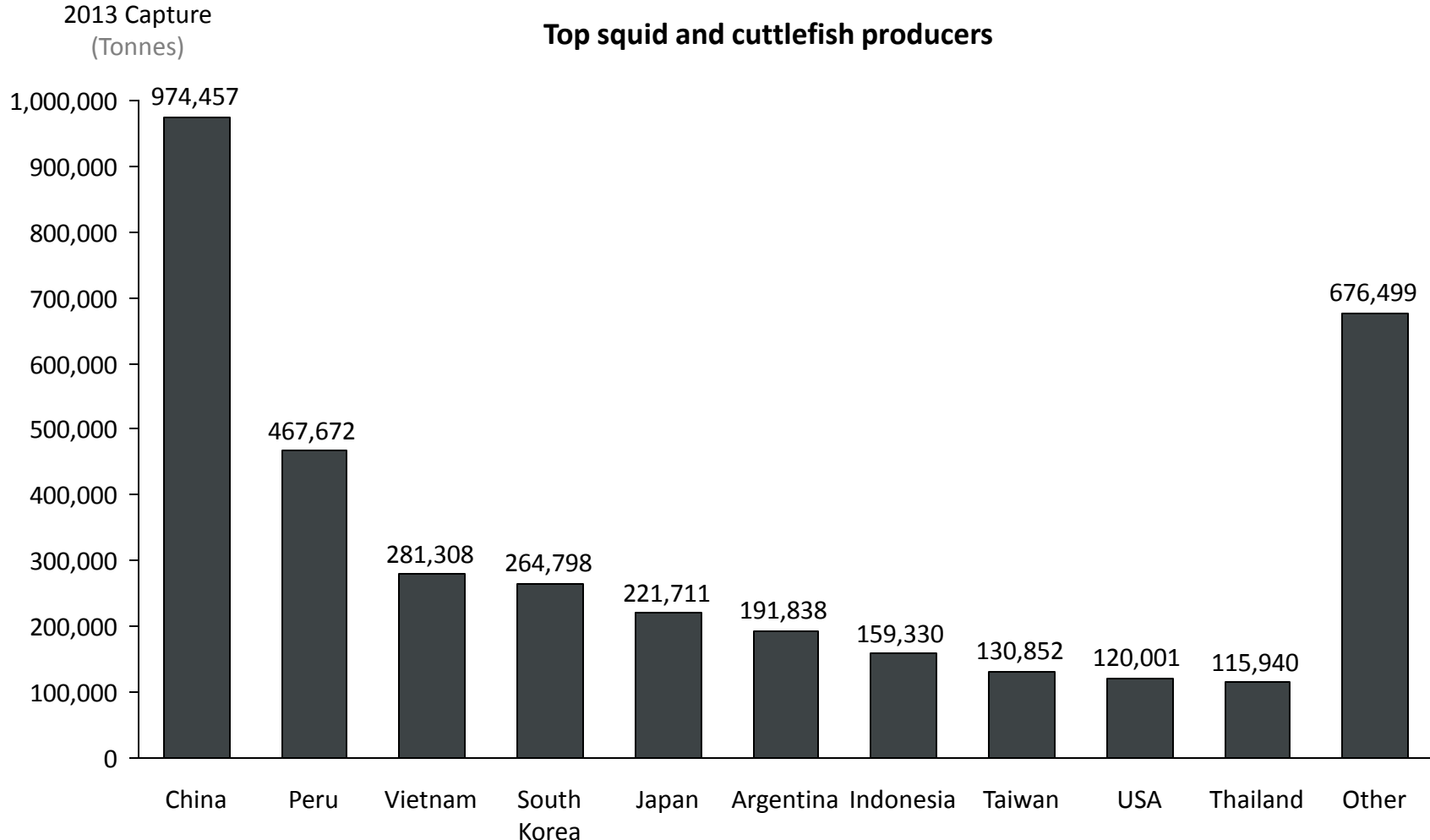
Several FIPs have been created in snapper/grouper fisheries, but to date they have proven difficult fisheries in which to achieve progress at a meaningful scale. Just one snapper complex is in the MSC program (Nicoya Peninsula in Costa Rica is under assessment), and snapper FIPs generally have achieved progress only within the fence-line of participating companies (e.g., they have not been able to influence fisheries management). In the near term, achieving substantial progress in existing snapper/grouper FIPs would be an important accomplishment, and would help make the case that market approaches can be successful in fisheries with challenging fisheries management and market contexts.

Unfortunately, production and trade data is not a very helpful tool when looking for leverage points in snapper/grouper fisheries. These species are often classified in broad product groups (e.g., fish not elsewhere included), which makes it difficult to tease out where EU and US markets have the potential for leverage.



# Squid

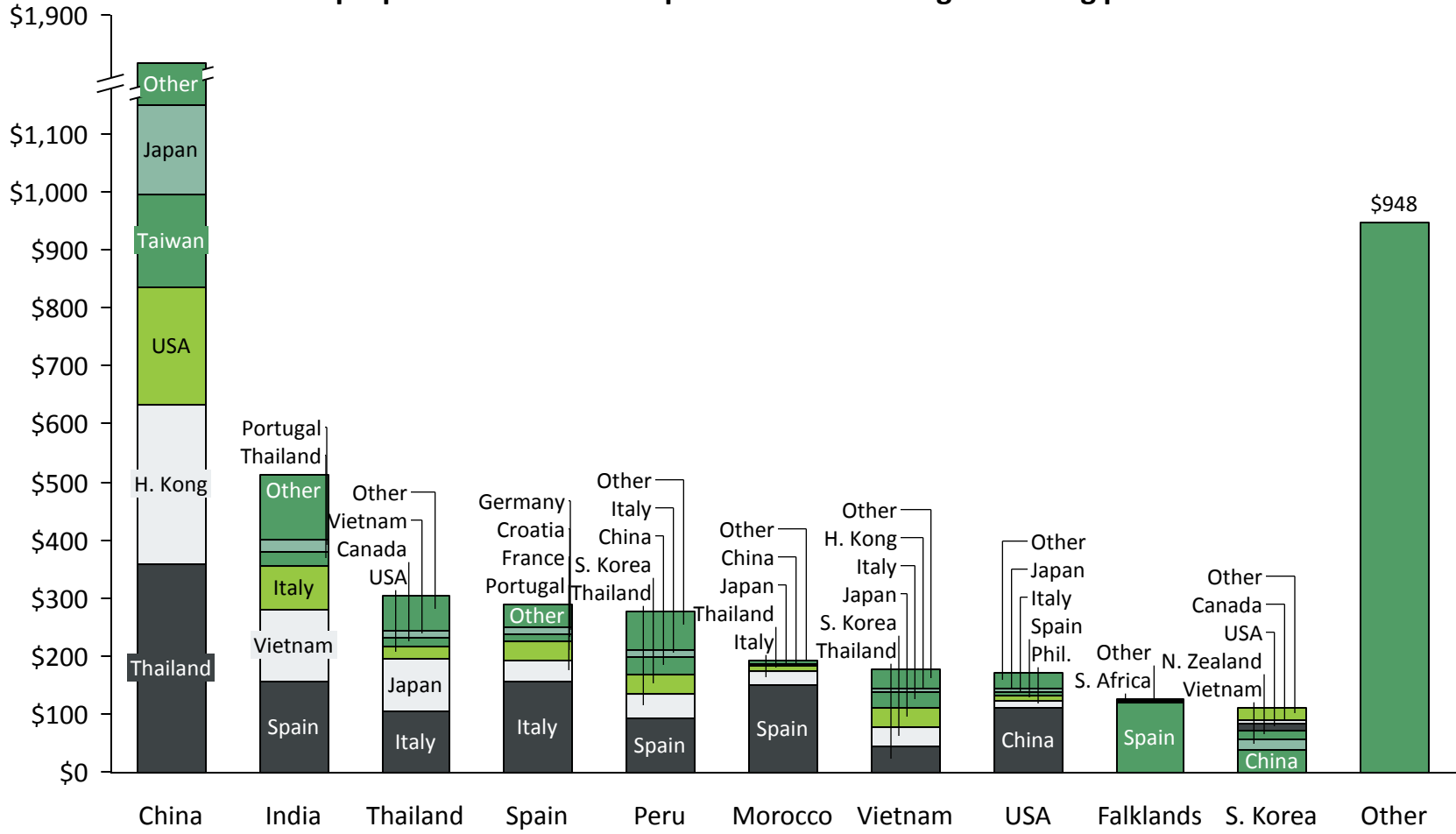
# Top 10 Producers: Asian and S. American countries are the world's leading squid and cuttlefish producers



# Top 10 Exporters: China, India, and Thailand are the world's largest squid and cuttlefish exporters

2014 Exports  
(USD millions)

### Top squid and cuttlefish exporters and their largest trading partners

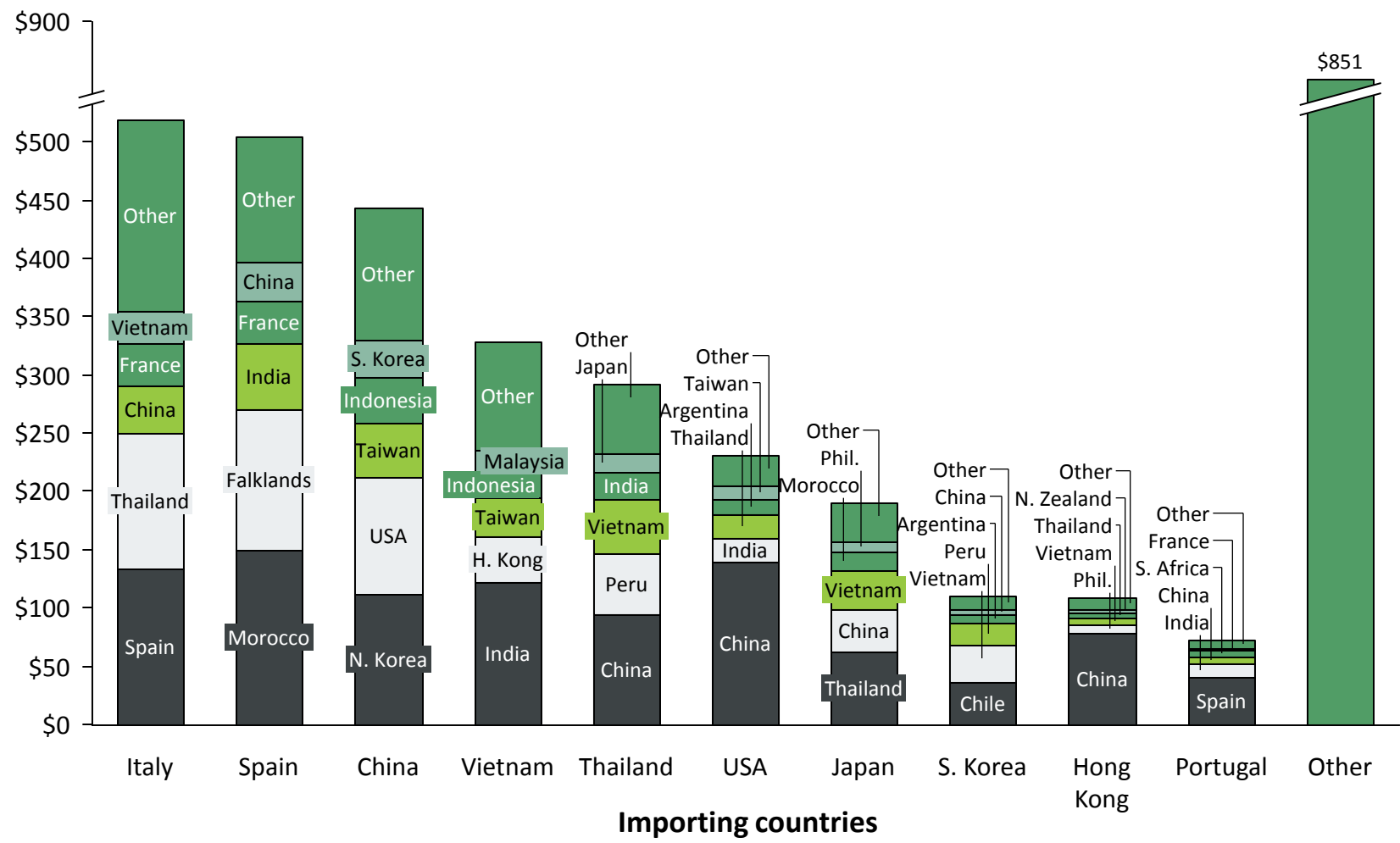


Exporting countries

# Top 10 Importers: The main squid importing markets are in S. Europe and Asia

2014 Imports  
(USD millions)

Top squid and cuttlefish importers and their largest trading partners



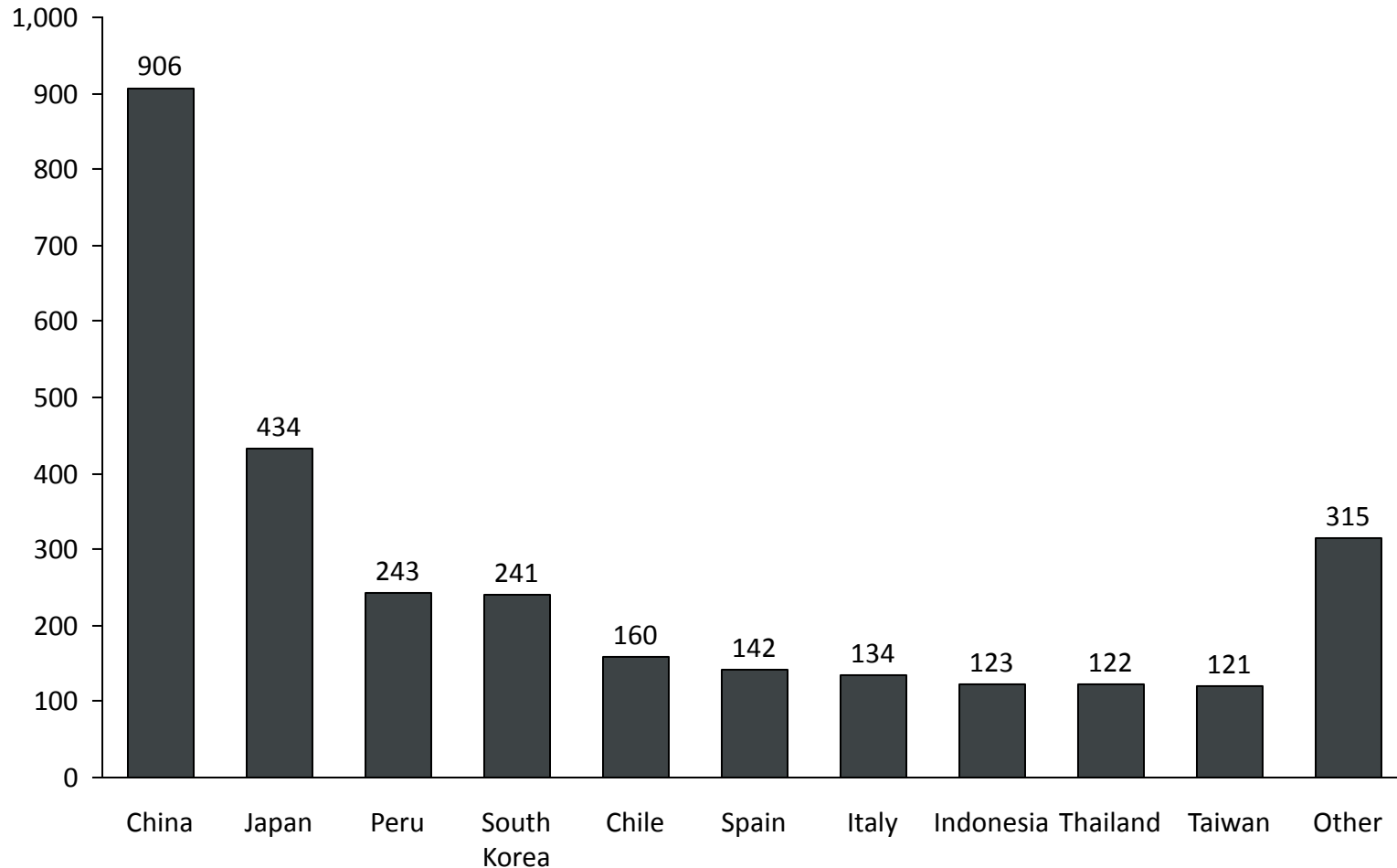
Squid



## Top 10 Consumers: The main squid consumption markets do not have well-developed demand for seafood sustainability

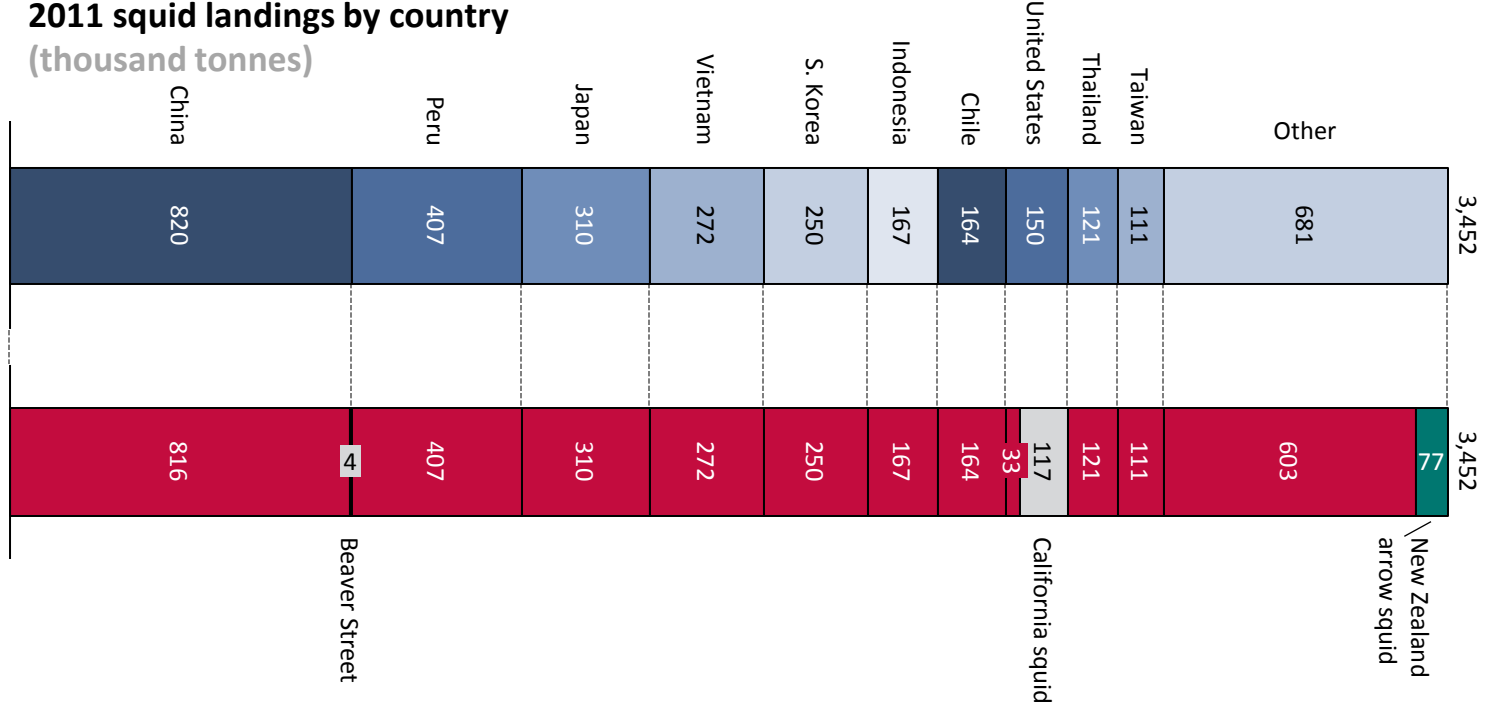
2011 Apparent Consumption  
(1,000 Tonnes Round Weight)

### Top squid consumers



# Squid: Market programs have not had much traction with squid fisheries

**2011 squid landings by country**  
(thousand tonnes)



## Market-based programs

- MSC-certified or in assessment
- In a FIP
- No FIP or MSC certification

Beaver Street Landings represents the landings processed in the FIP stakeholders facility. Overall fishery landings are higher.  
New Zealand Arrow Squid is in a Sustainability Incubator FIP, and under MSC full assessment.

**\*FIP or certification may only cover a portion of a country's production.**

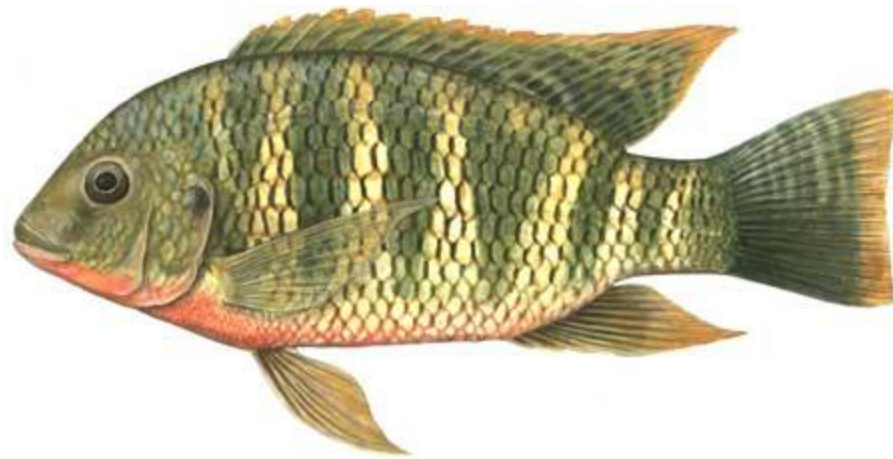
# Market dynamics of squid and cuttlefish are challenging for the advancement of market-based interventions

## **Few squid fisheries are certified or in a FIP**

- Just 6% of global squid landings are in a FIP or are MSC-certified.
- The science of squid populations and fishery management is not well-established. Without strong population models, it is difficult to say what a FIP would aim to accomplish in these fisheries.
- Southern European and Asian markets are important consumers for many of the largest squid fisheries, so there is limited market pull for sustainability.

## **Opportunities may be discovered by tracing US imports**

- The US is the only major squid importer with well-developed sustainable seafood demand. Tracing US supply chains may be the best way to identify additional FIP opportunities. The US imports squid primarily from China (60%), India (9%), and Thailand (9%).
- The Chinese common squid FIP (Beaver Street), initiated in 2013, provides an interesting case study about how an exporter to the US can influence fisheries management in China.

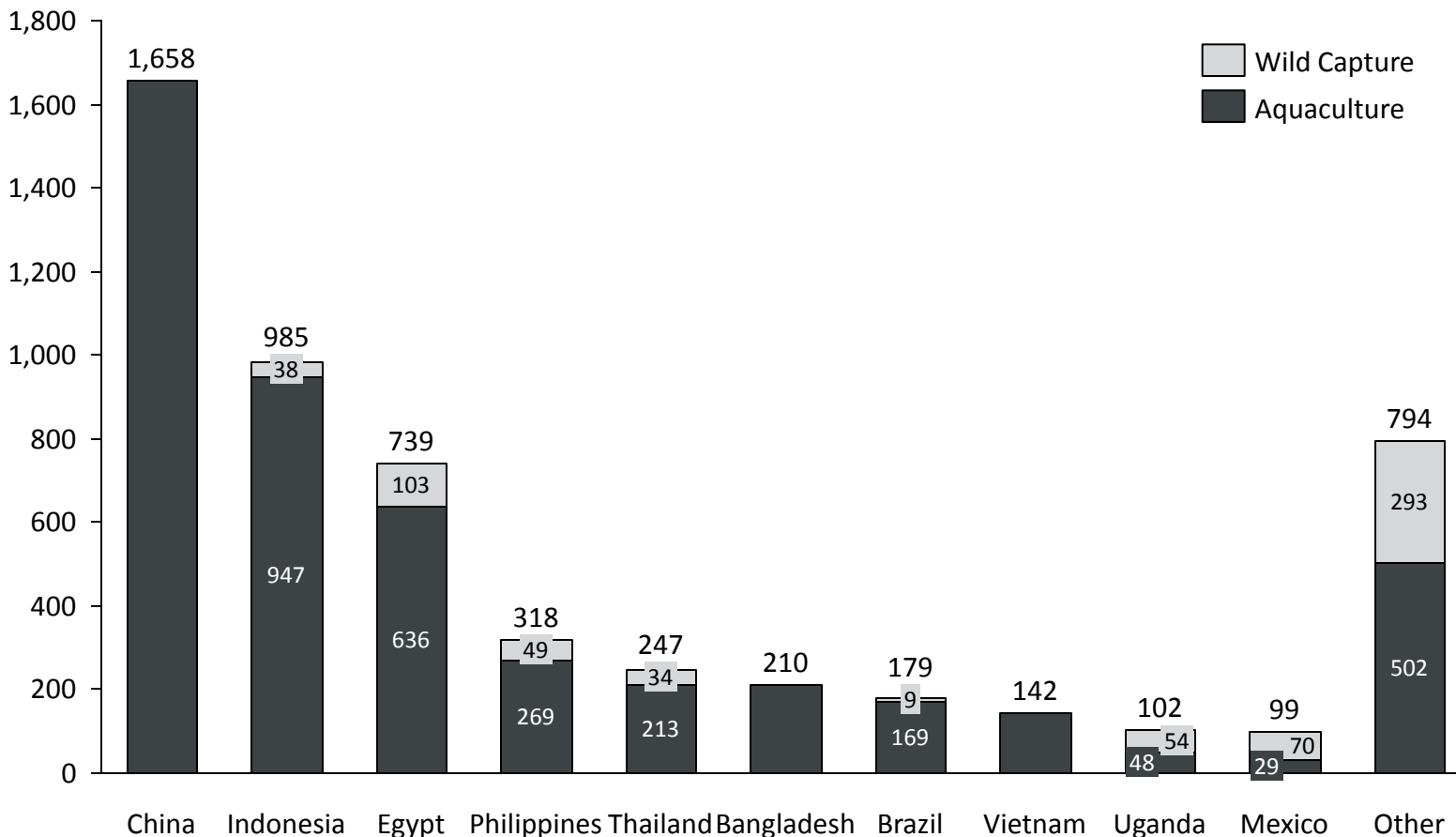


# Tilapia

# Top Producers: The world's top three tilapia producers – China, Indonesia, and Egypt – account for more than 60% of global production

2013 Production  
(Thousand Tonnes)

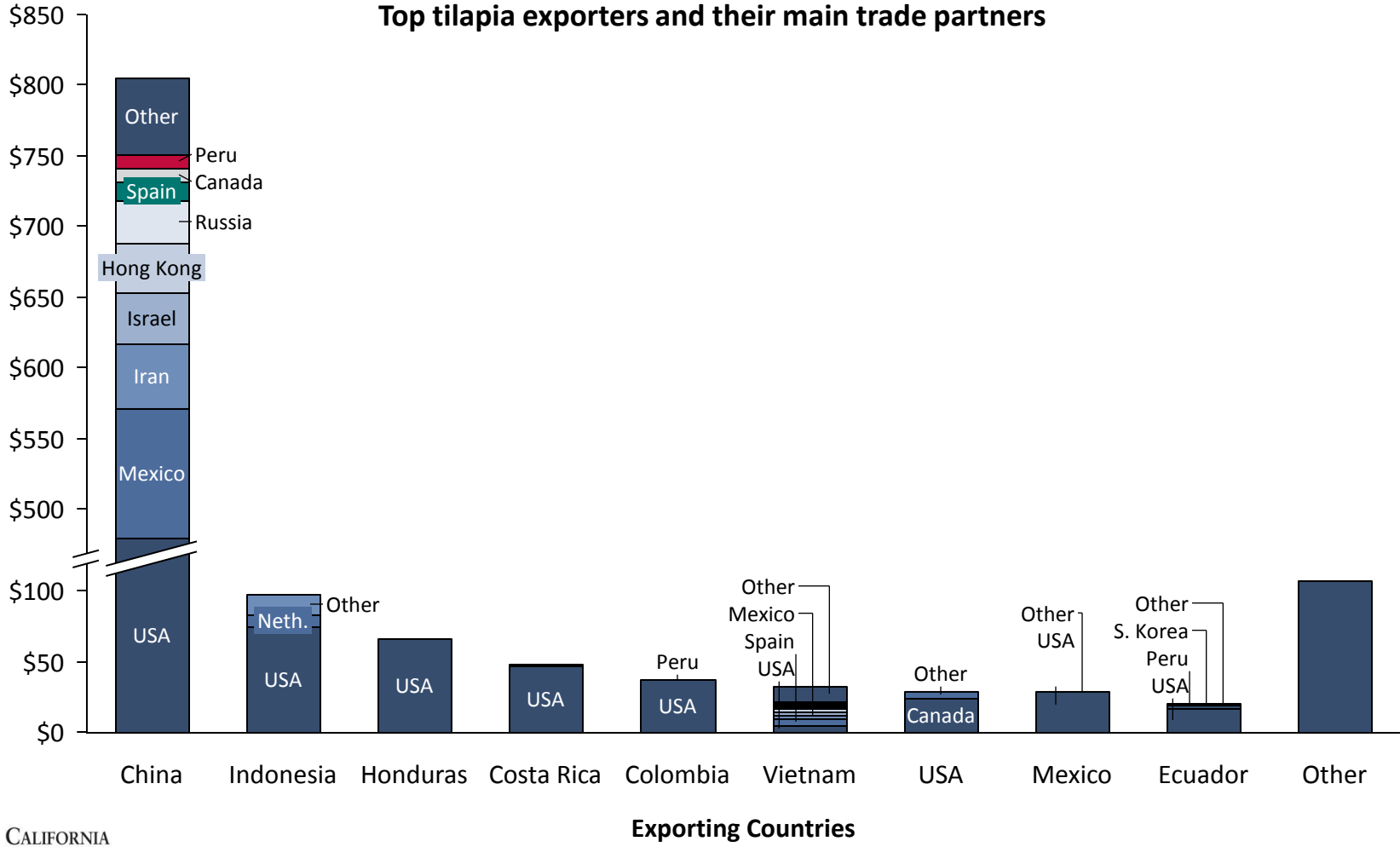
Top tilapia producers



# Top Exporters: China is the dominant exporter of tilapia, accounting for more than 60% of global exports by value

2014 Exports  
USD millions

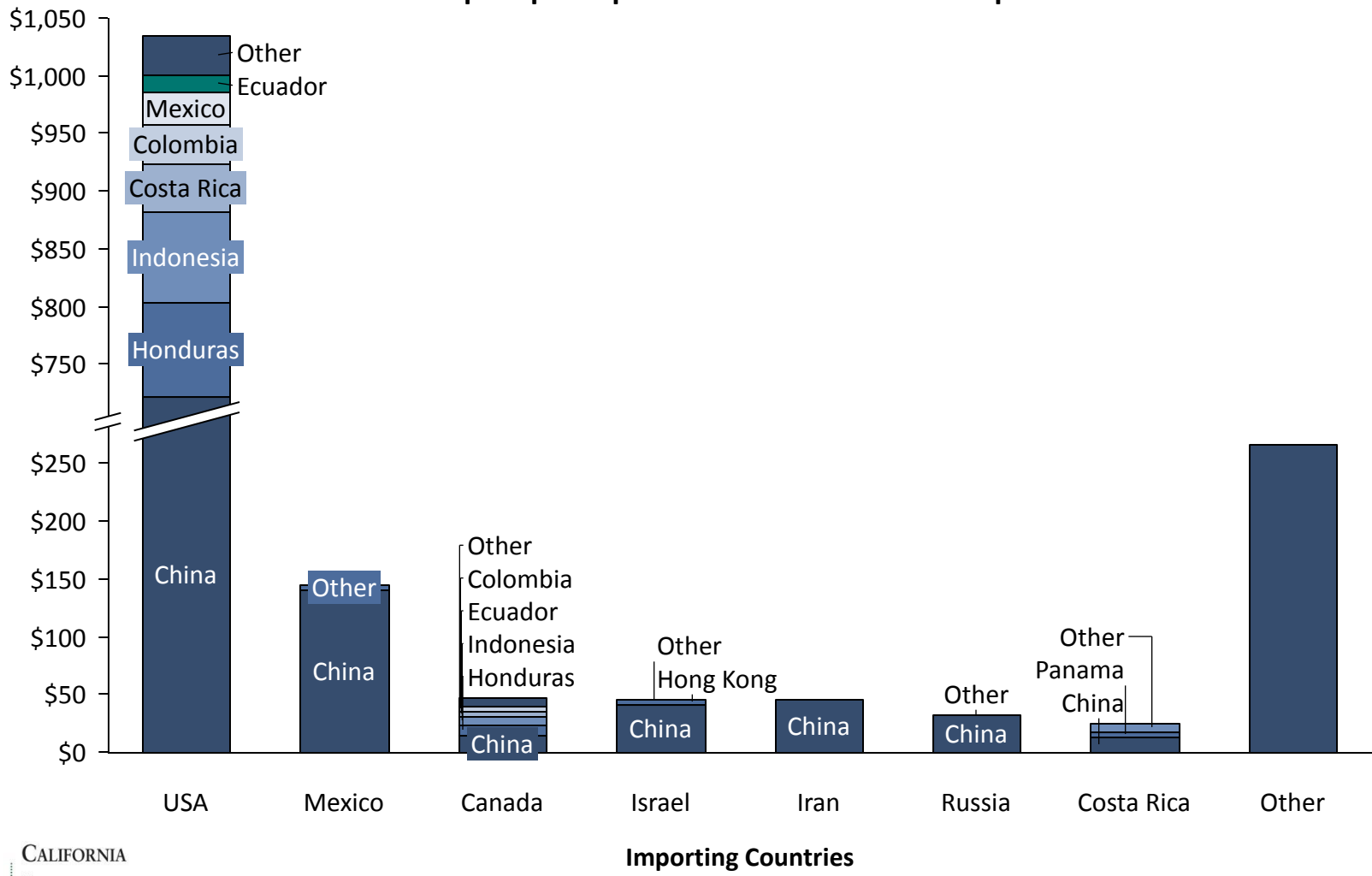
Top tilapia exporters and their main trade partners



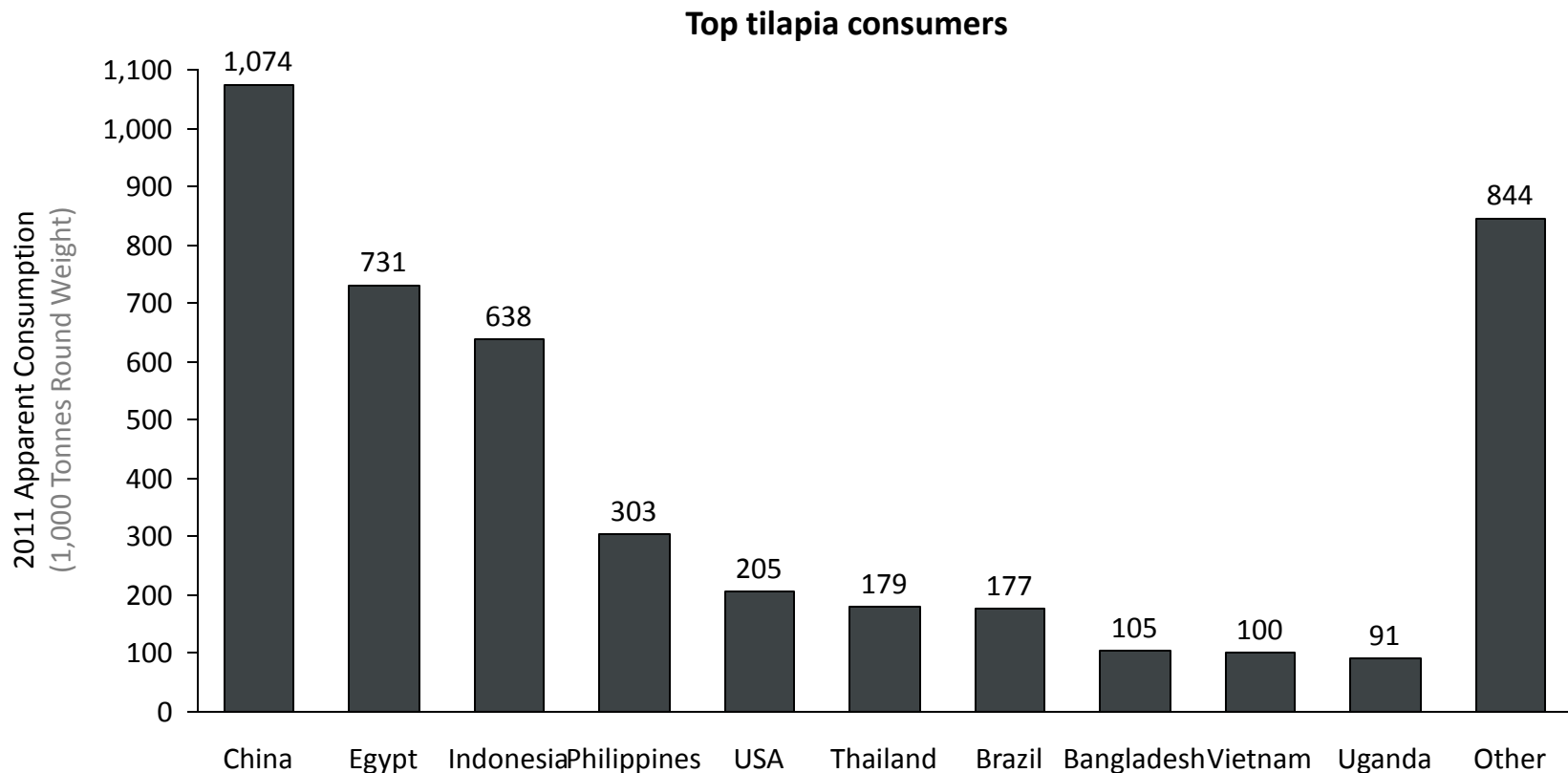
# Top Importers: The United States imports approximately 65% of internationally traded tilapia by value

2014 Imports  
USD millions

Top tilapia importers and their main trade partners



**Top Consumers:** According to trade data, key producing countries are also the top consumers, which may be an artifact of poor product classification in the trade data



According to international trade data, less than 10% of tilapia is traded. This seems extremely low, so we hypothesize that much tilapia is in fact classified under generic product codes (e.g., fish meat) that do not identify the commodity group. That said, there are some robust domestic markets for tilapia production (e.g., Indonesia).





# Tuna commodity analysis

# **Tuna Summary:** ISSF has strong coverage of tuna; potential gains could be made by improving coordination of FIPs below the RFMO level

**Approximately 80% of global tuna landings are a part of ISSF efforts, in a FIP, or in the MSC program**

**Yellowfin and bigeye landed with gear other than purse seine offer the best opportunity for expanded FIPs**

- ISSF does not formally report on gear groups other than purse seines for YFT and BET.
- Approximately 62% of the volume of these species is engaged with market-based programs.

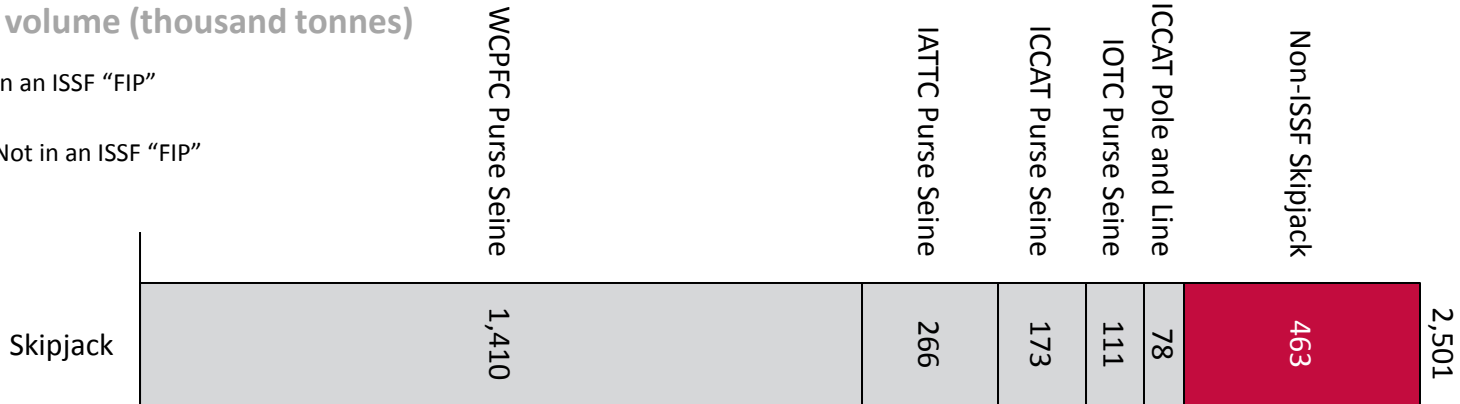
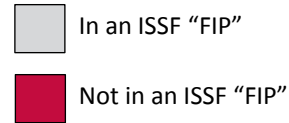
**Better coordination of tuna FIPs may improve efficacy of tuna FIPs**

- There are several examples of multiple FIPs working on the same fishery. Indonesia is the most obvious example, with ISSF working at the RFMO level, WWF executing a national tuna FIP, and several organizations (MDPI, IPNLF, PT Intimas Surya) operating on a specific gear type and/or a subnational level. These efforts are communicating with each other to a certain degree, but it is not clear whether the efforts enjoy much synergy or coordination.

Through ISSF, the majority of skipjack tuna is already in improvement projects, while MSC covers ~25% of skipjack volume

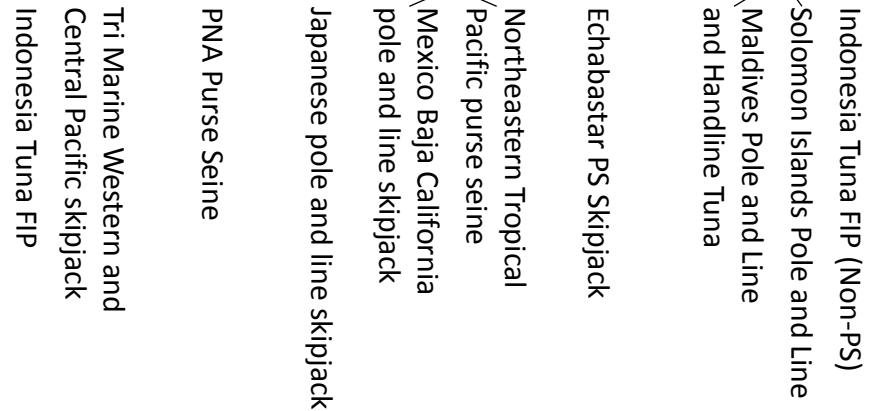
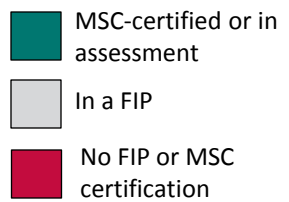
**Skipjack in ISSF "FIPs"**

2012 volume (thousand tonnes)



**Skipjack in all market-based programs**

2012 volume (thousand tonnes)



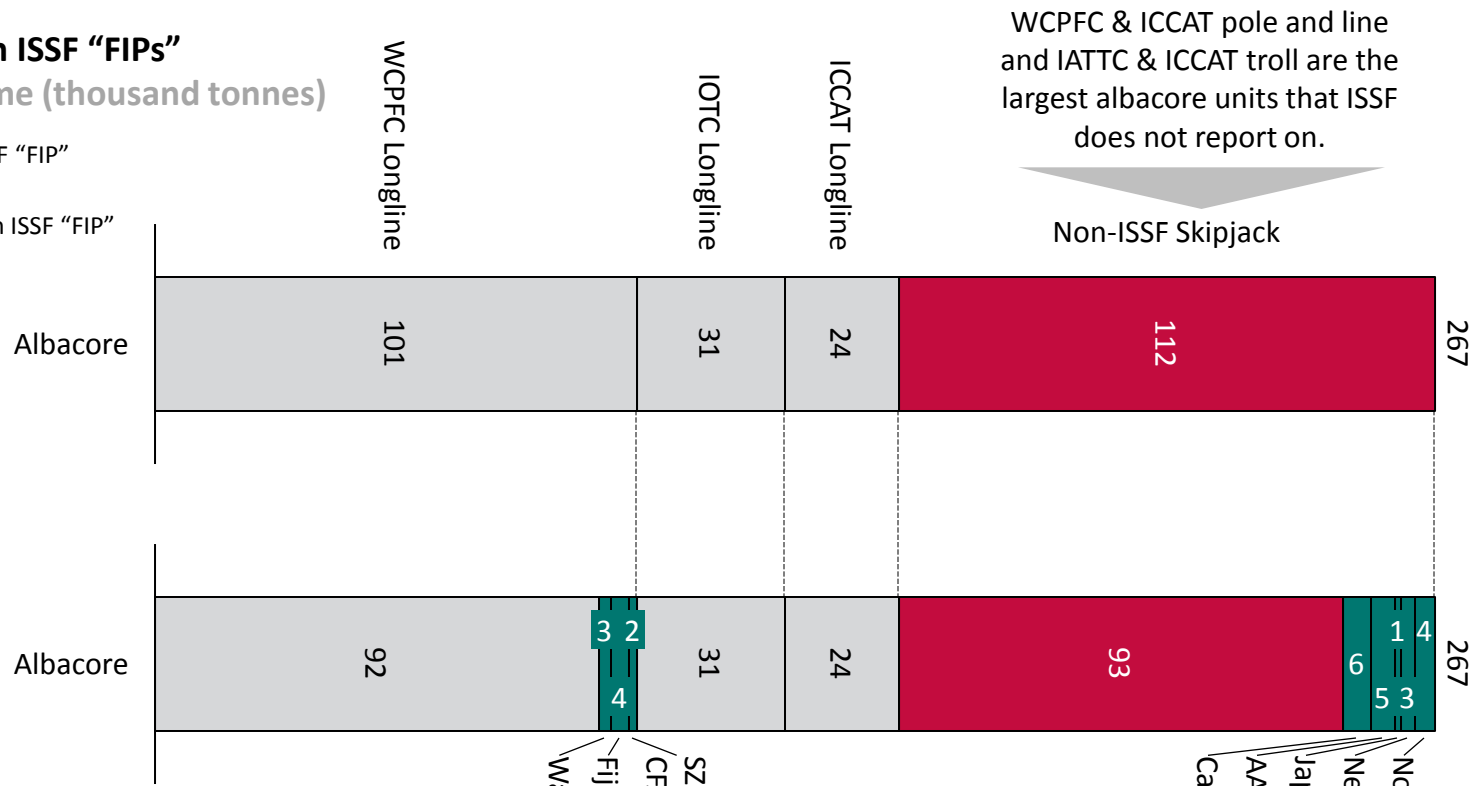
\*FIP or certification may only cover a portion of a country's production.

# 65% of albacore is also covered by ISSF or MSC

## Albacore in ISSF "FIPs"

2012 volume (thousand tonnes)

- In an ISSF "FIP"
- Not in an ISSF "FIP"



WCPFC & ICCAT pole and line and IATTC & ICCAT troll are the largest albacore units that ISSF does not report on.

Non-ISSF Skipjack

## Albacore in all market-based programs

2012 volume (thousand tonnes)

- MSC-certified or in assessment
- In a FIP
- No FIP or MSC certification

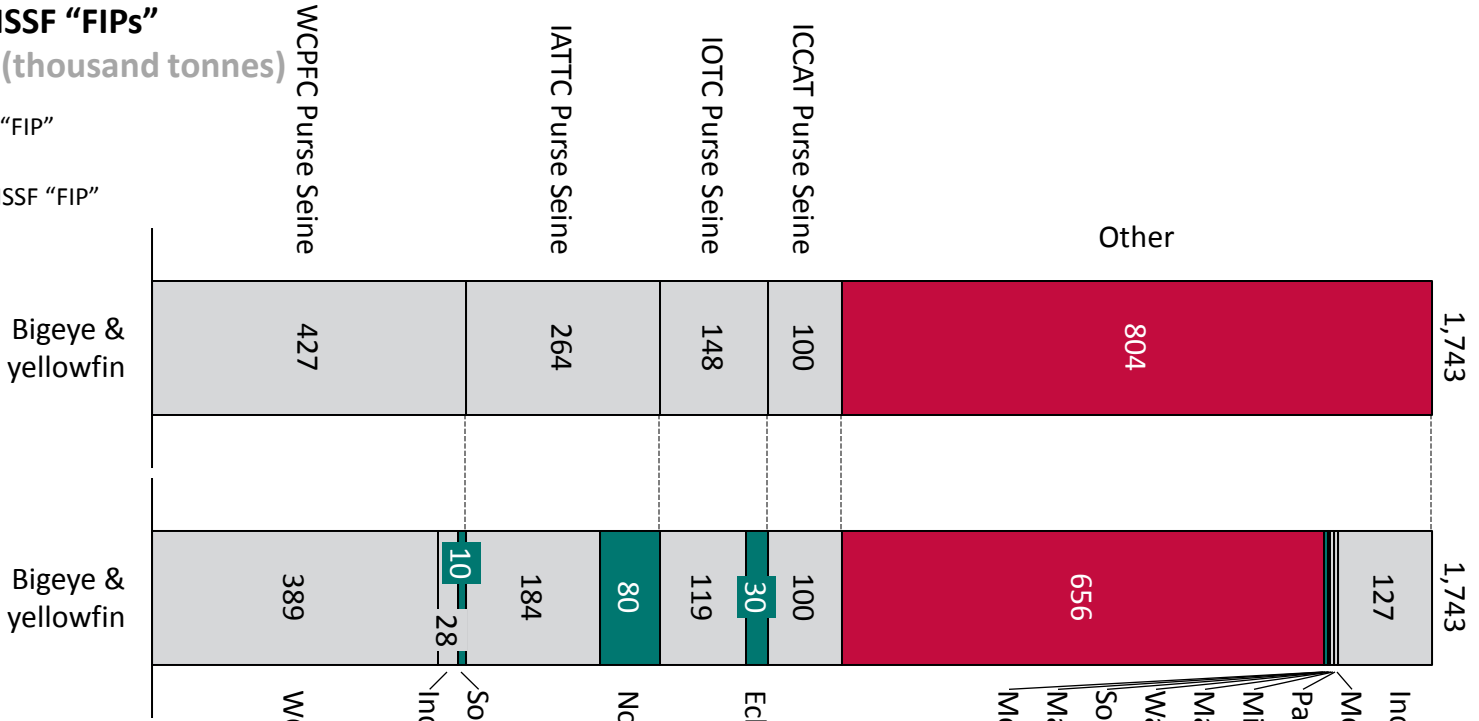
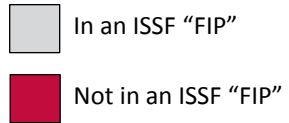
Walker Seafood Australia  
 Fiji Longline  
 SZLC, HNSFC & CFA Cook Islands  
 Canadian HMS  
 Japanese Pole and Line  
 AAFa and WFOA Pacific  
 New Zealand Troll  
 North Atlantic artisanal

\*FIP or certification may only cover a portion of a country's production.

# ISSF is working on purse seine yellowfin and bigeye, but a large share is caught using other gears

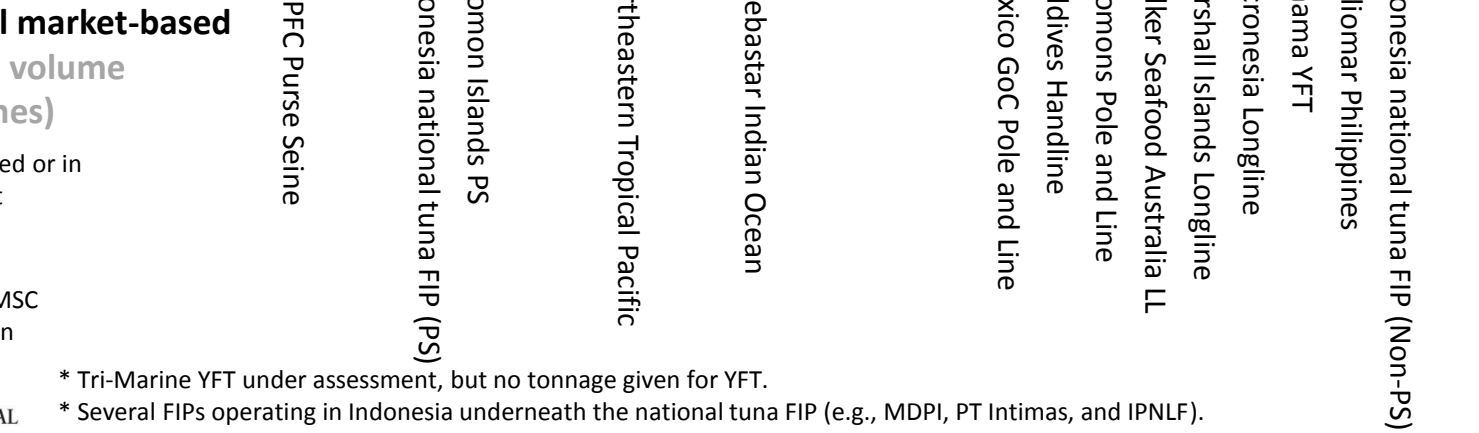
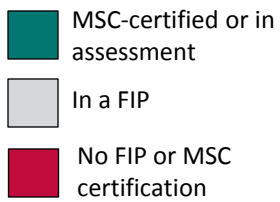
## YFT & BET in ISSF "FIPs"

2012 volume (thousand tonnes)



## YFT & BET in all market-based programs

2012 volume (thousand tonnes)



\* Tri-Marine YFT under assessment, but no tonnage given for YFT.

\* Several FIPs operating in Indonesia underneath the national tuna FIP (e.g., MDPI, PT Intimas, and IPNLF).

\*FIP or certification may only cover a portion of a country's production.

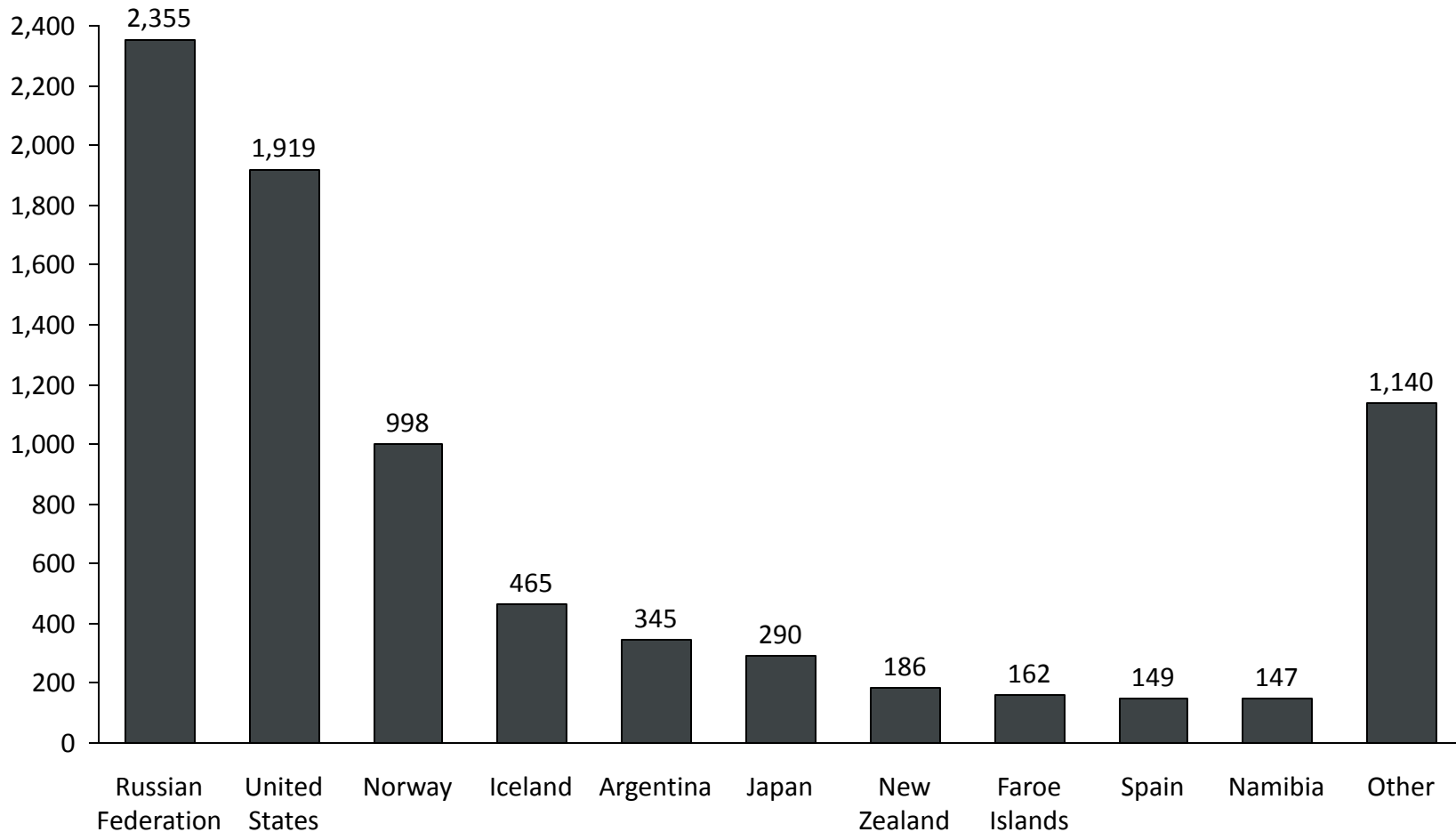


# Whitefish

# Top 10 Producers: Top whitefish-producing countries generally have strong fisheries management (e.g., US, Norway, Iceland)

2013 Capture  
(Thousand Tonnes)

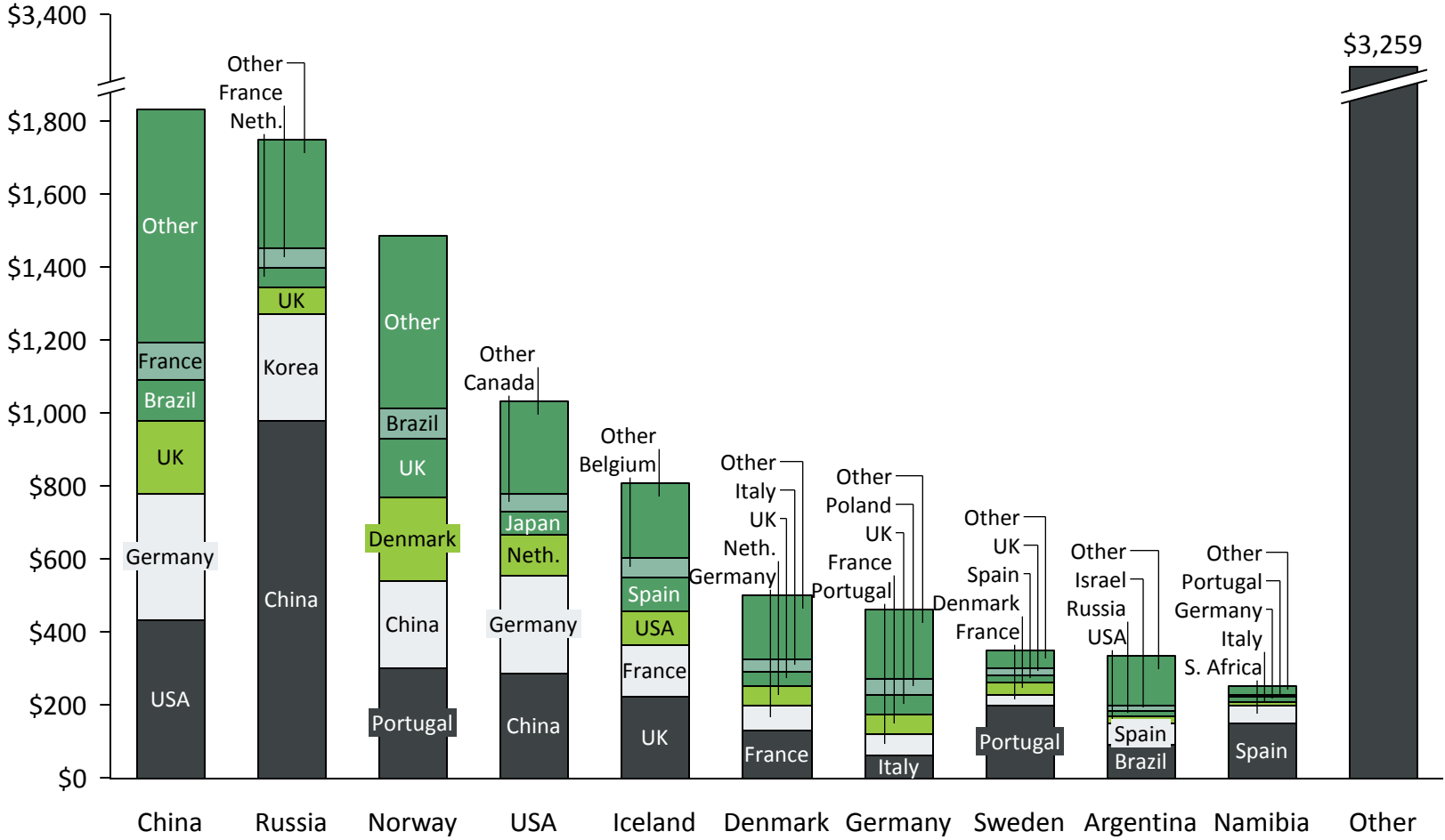
### Wild-capture whitefish production by fishing country



# Top 10 Exporters: Although China does not land any whitefish, it is a key processing hub and the world's largest whitefish exporter

2014 Exports  
(USD millions)

Top whitefish exporters and their largest trading partners



Exporting Countries

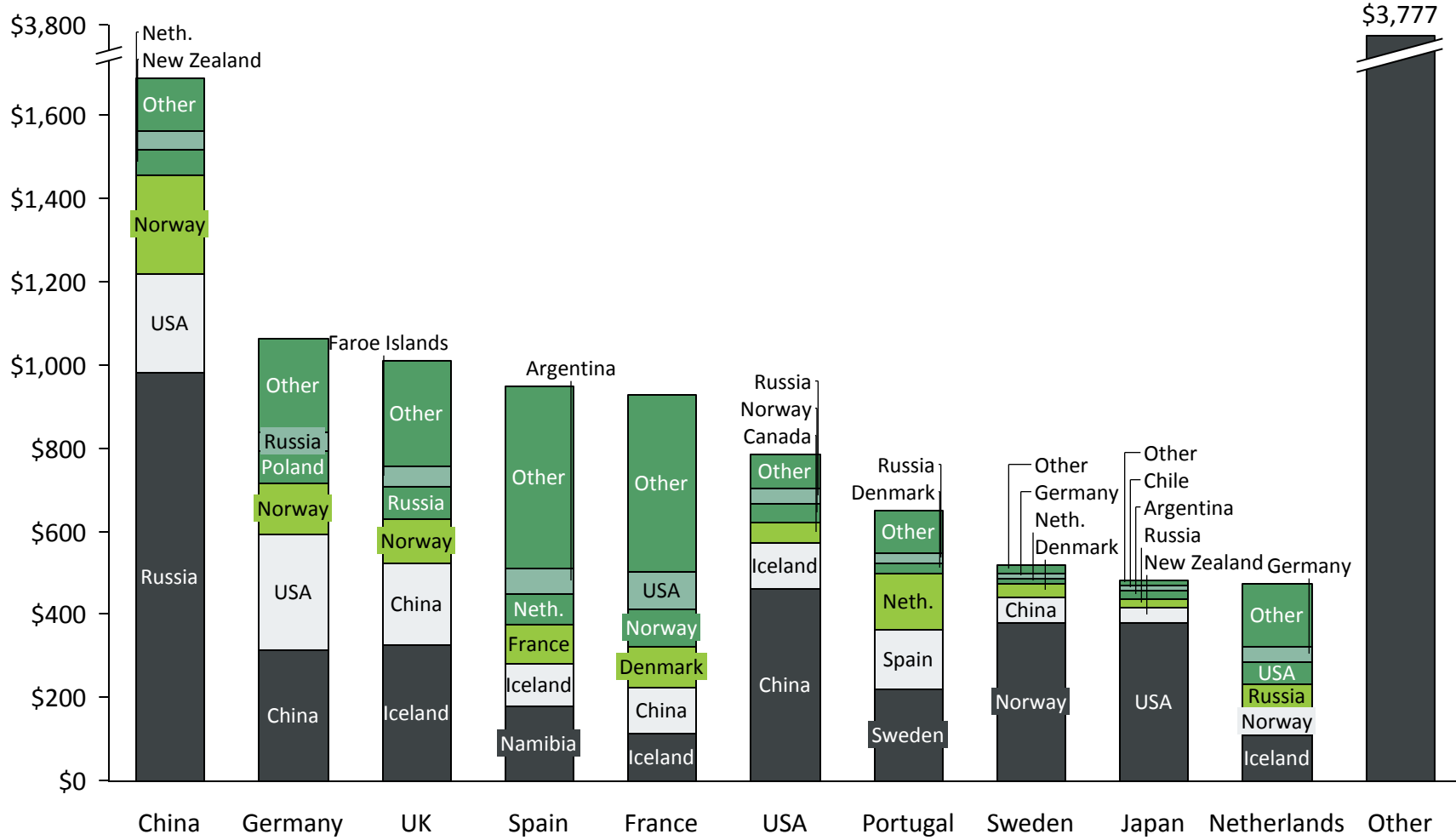
Whitefish



# Top 10 Importers: Many of the top whitefish importers have well-developed sustainable seafood demand

2014 Imports  
(USD millions)

### Top whitefish importers and their largest trading partners

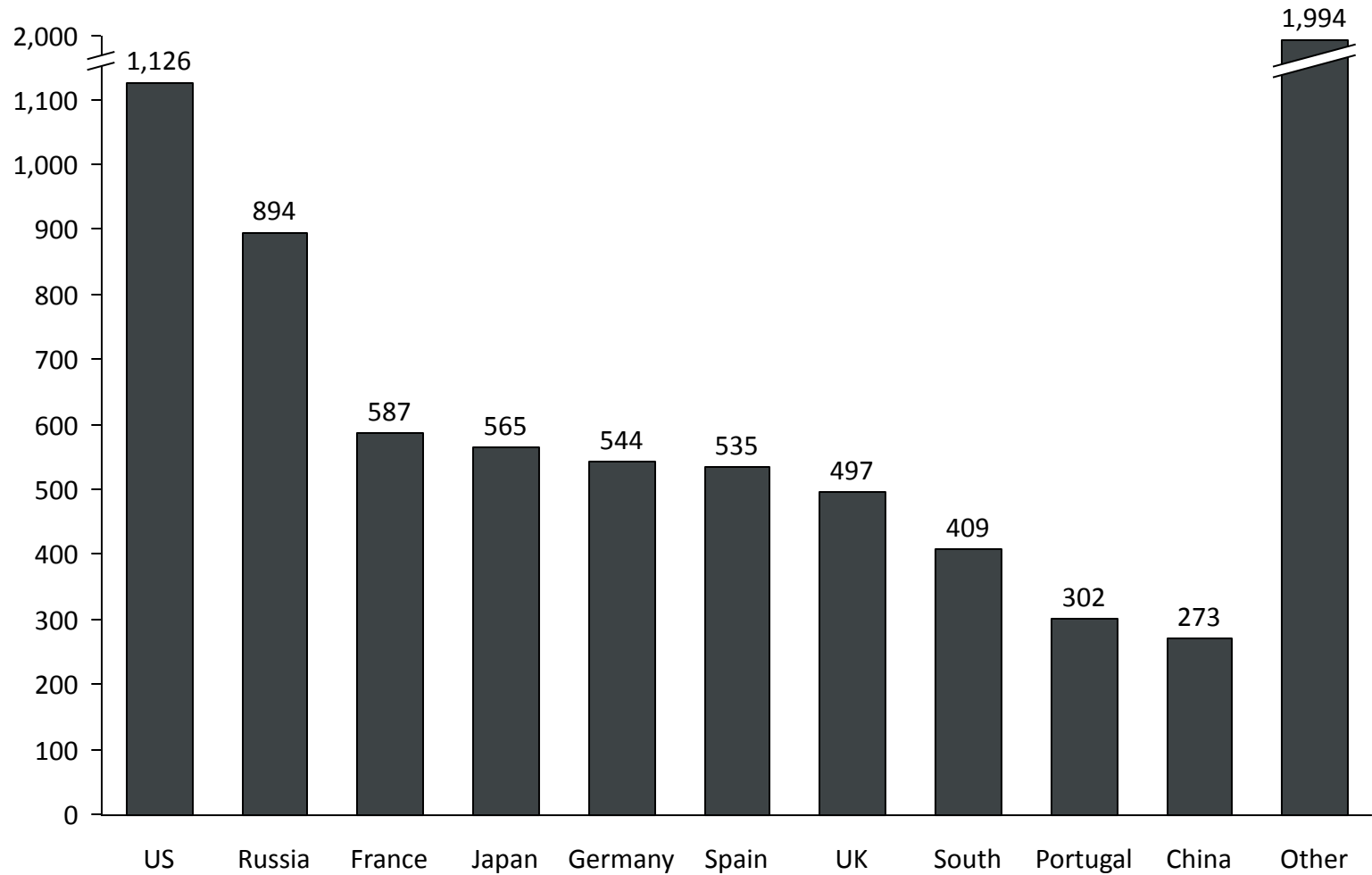


Whitefish

# Apparent Consumption: The US, Russia, Japan, and the EU are the main consumers of whitefish

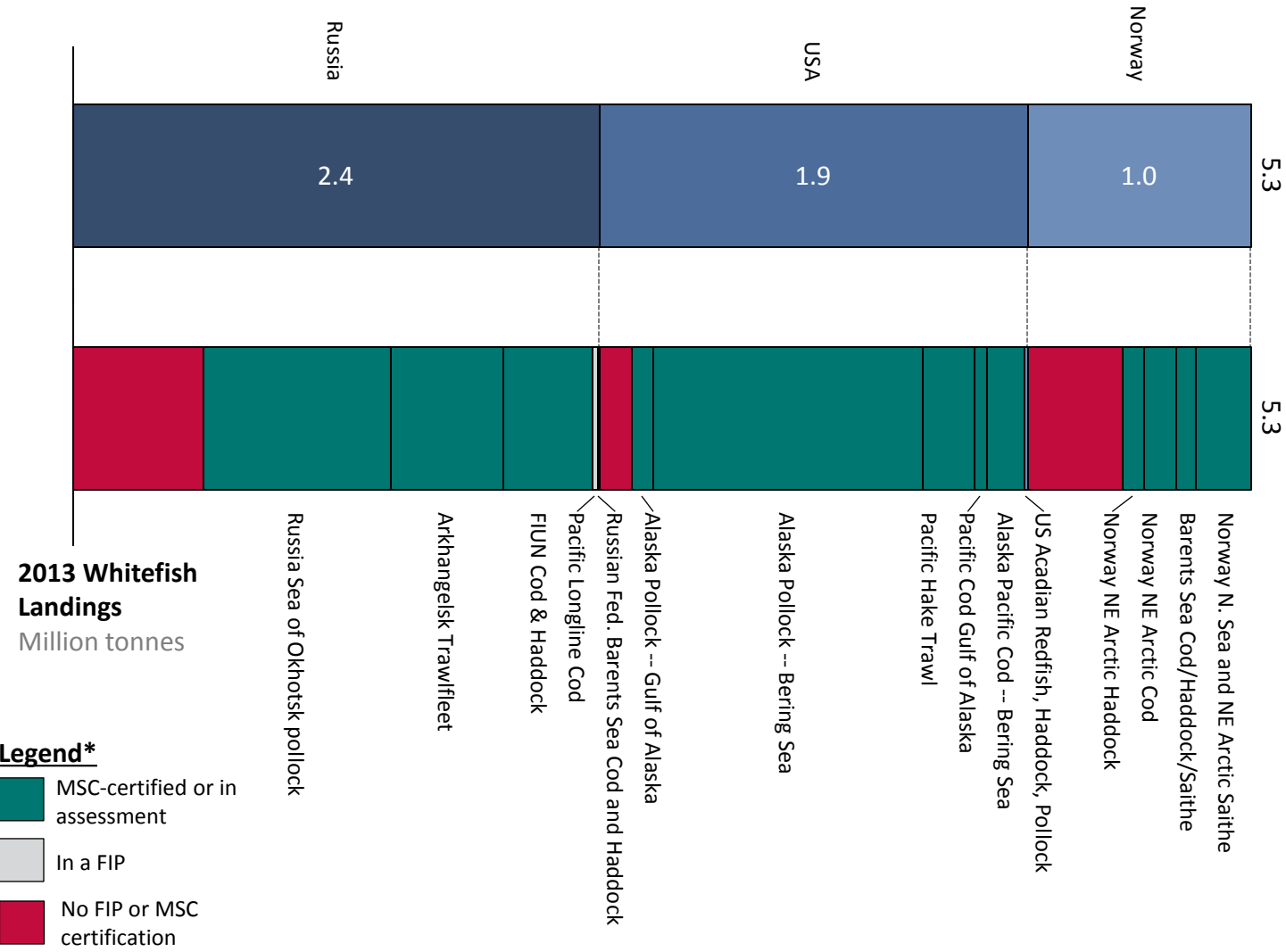
2011 Apparent Consumption  
(Thousand Tonnes Round Weight)

Top whitefish consumers



Whitefish

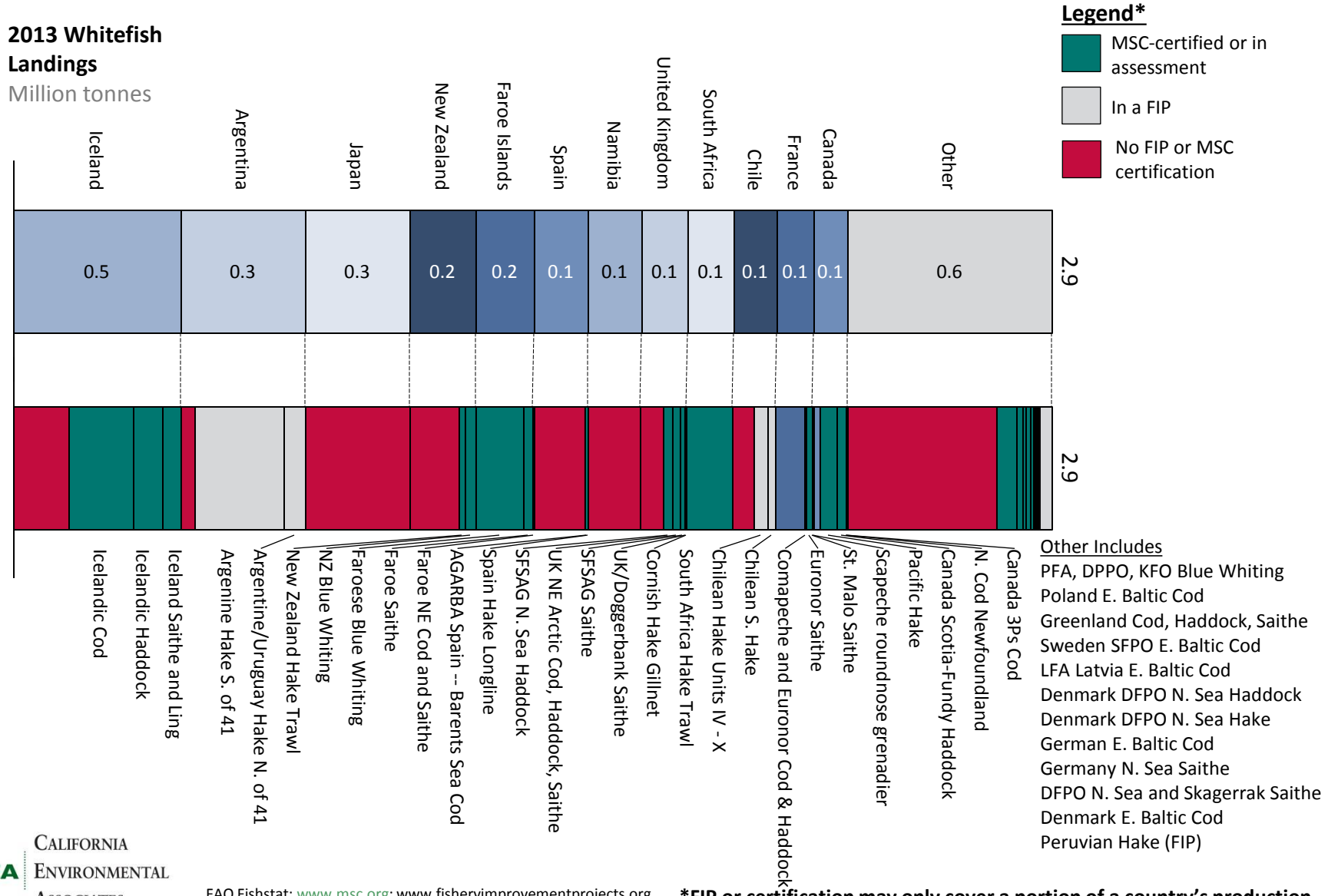
# The largest whitefish producers (Norway, US, and Russia) have certified most of their whitefish landings



\* Allocation of certified landings between Russia and Norway is not clear for the Barents Sea certifications.

# Just a handful of other large whitefish fisheries remain outside the reach of market programs (e.g., whiting, Japanese pollock, grenadier)

**2013 Whitefish Landings**  
Million tonnes



# Whitefish Summary: An ideal commodity for market-based interventions

## **Ideal characteristics for market interventions**

Whitefish is an ideal commodity for market-based interventions. Approximately 90% of landed volume is traded internationally, though this figure is somewhat exaggerated by product that is shipped to processing hubs and subsequently exported again. Almost 60% of whitefish is consumed in countries with well-developed or developing markets for sustainable seafood. Almost all production takes place in countries with relatively strong fisheries management (e.g., EU, US, Australia, New Zealand, Norway, Russia).

## **Just a handful of targets remain, but most have challenging dynamics**

The largest remaining uncertified whitefish fisheries are S. American hake fisheries that primarily supply markets without strong demand for sustainable seafood (e.g., Spain); Japanese cod and pollock fisheries that largely supply domestic markets; and other fisheries that produce low-value species (e.g., blue whiting). A few whitefish fisheries that have been severely overfished also remain outside the reach of market programs.