California Environmental Associates

the David & Lucile Packard Foundation

Tracking Change in the U.S. Seafood Market

October 2010

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Executive Summary

We've made some notable gains in the marketplace…

- Retailers, restaurants and food service companies in the US and Europe continue to strengthen their sustainable seafood commitments, with the help of several NGOs.
- General interest in sustainability from the seafood industry is increasing. Business attendance at Seafood Summit and use of FishSource has increased in recent years.
- Fishery Improvement Partnerships are taking root.
- Certification systems continue rapid growth. MSC is now 8% of the wild seafood market. Aquaculture certification standards are in development.

… but cannot yet see much impact on consumption patterns or ocean health.

- The ratio of red to yellow to green seafood consumption in the US has remained fairly stable over the last decade.
- Though we are making progress in the sustainable seafood market, gains are slow to be realized on the water: 63% of global fishery stocks are in need of rebuilding.

Growth in the sustainable seafood market has been made in the context of a growing market for sustainable products in general.

- A majority of companies with sales over $1billion are increasing investments in green products.
- Though the recent recession has made environmental concerns take a back seat to economic ones.

Overview of CEA’s Project

PURPOSE

- Initiate systematic tracking effort to gauge impact of program to change the market for seafood
- Effort broadly maps to the NGO Community’s Theory of Change (see next slide)
- Gather data that was readily-available

METHODOLOGY

- Simple and replicable
- Quantitative
- Informative for long-term adjustments to strategy and other market-based approaches to environmental issues

LIMITATIONS

- Lack of time series data - most data will only serve as a baseline
- Difficult to attribute direct cause and effect relationship given market-orientation of grantee tools

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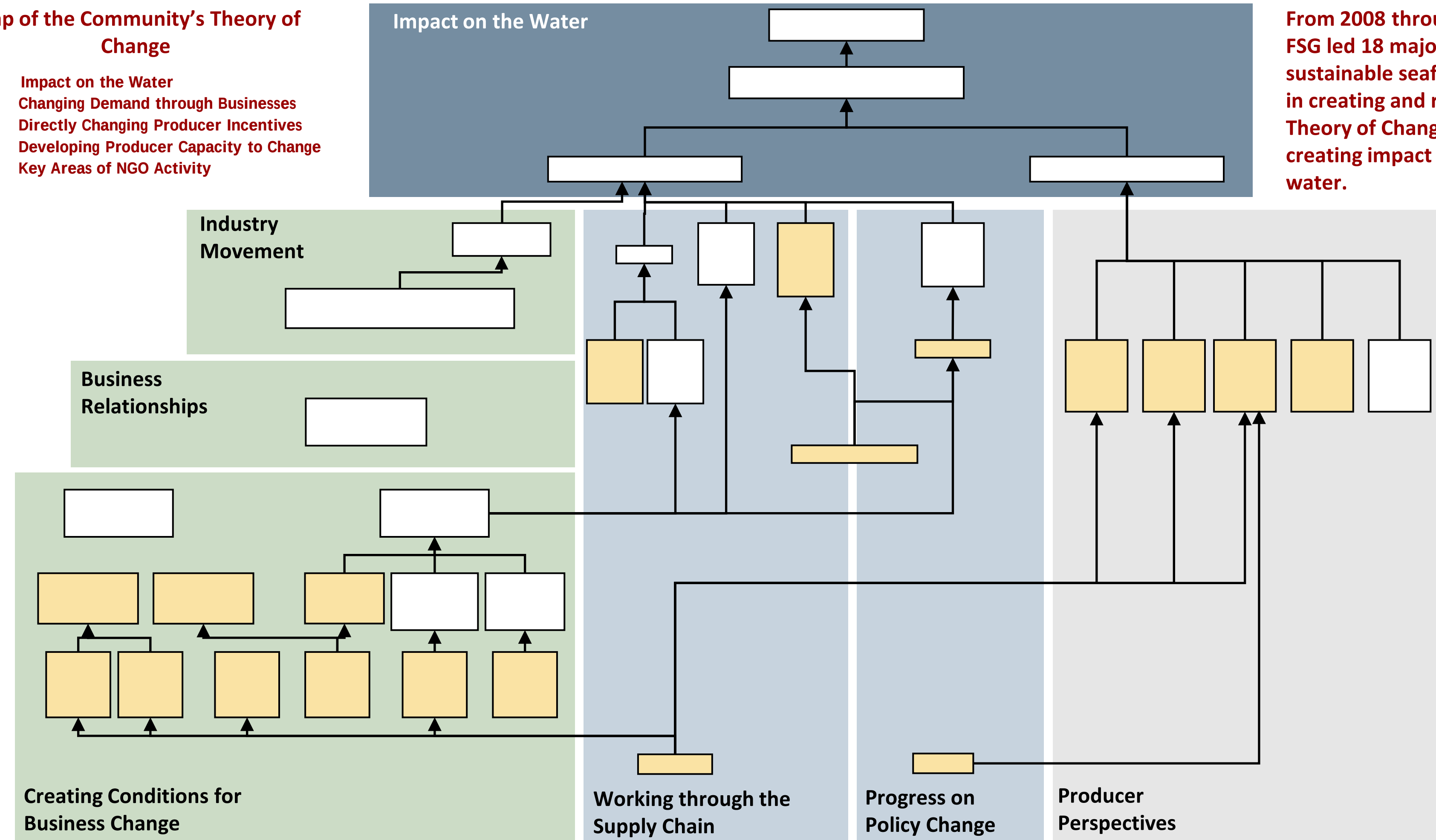
Overview of CEA's Project

METRICS WERE MAPPED TO THE NGO COMMUNITY'S THEORY OF CHANGE

Map of the Community's Theory of Change

- Impact on the Water
- Changing Demand through Businesses
- Directly Changing Producer Incentives
- Developing Producer Capacity to Change
- Key Areas of NGO Activity



From 2008 through 2010, FSG led 18 major sustainable seafood NGOs in creating and refining a Theory of Change for creating impact on the water.

Overview of CEA's Project

FSG'S THEORY OF CHANGE

IMPACT ON THE WATER

METRICS INCLUDED: US trends in fishery exploitation

METRICS INCLUDED: Global trends in fishery exploitation

INDUSTRY MOVEMENT

- US seafood consumption
- FMI's Sustainable Seafood Group
- Industry Media
- Industry Event Attendance

PROGRESS ON POLICY CHANGE

- Policy progress

BUSINESS RELATIONSHIPS

- Retail/Food Service - NGO Partnerships
- Greenpeace's scorecard data

WORKING THROUGH THE SUPPLY CHAIN

- Traceability data

CREATING CONDITIONS FOR BUSINESS CHANGE

- Media and Literature Penetration
- Seafood Card Distribution
- FSG FMI survey data
- LOHAS data
- FishChoice data
- FishSource data

PRODUCER PERSPECTIVES

- Certification Data
- Fishery Improvement Partnerships

OUTLINE

US trends in fishery exploitation

IMPACT ON THE WATER

Global trends in fishery exploitation

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CREATING CONDITIONS FOR BUSINESS CHANGE

PRODUCER PERSPECTIVES

Certification Data
Fishery Improvement Projects

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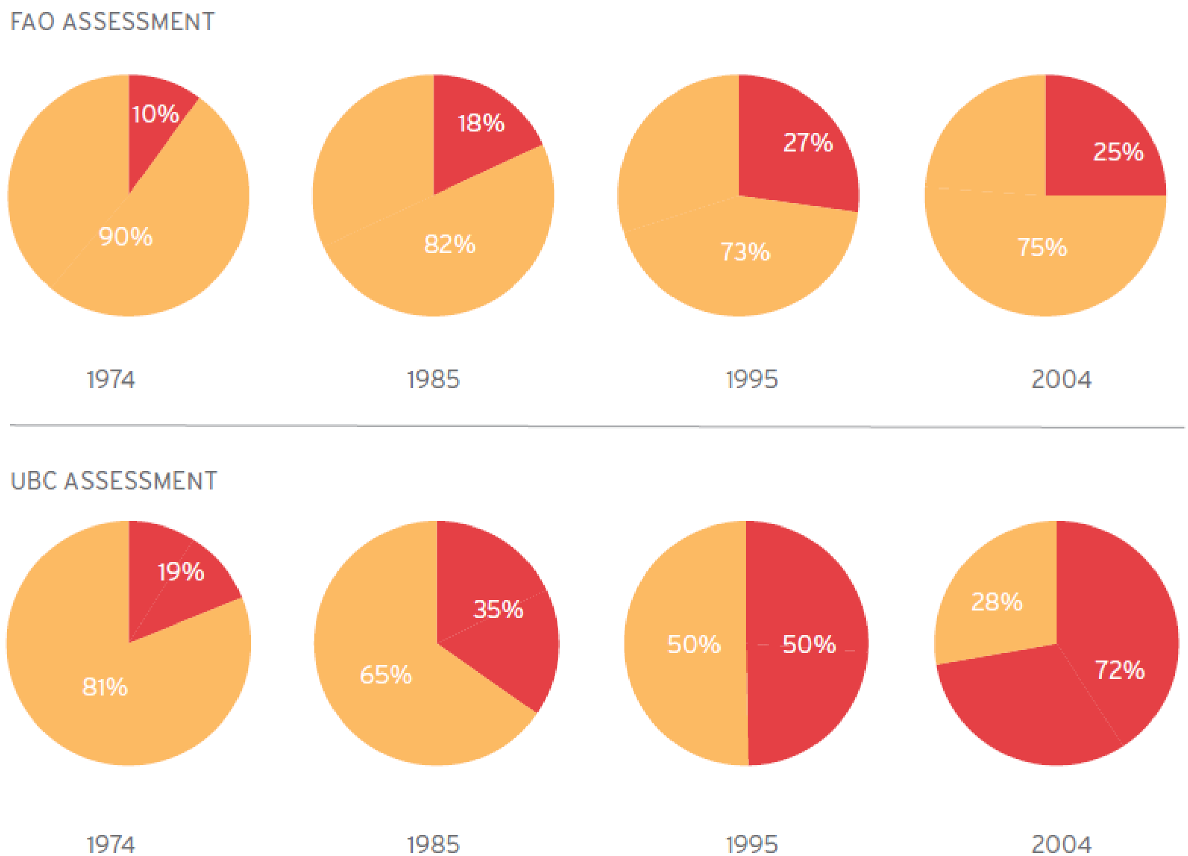
FAO only reports ~25% of assessed stocks are in bad shape. However, UBC takes the same dataset, and indicates that over 70% of global fisheries have collapsed

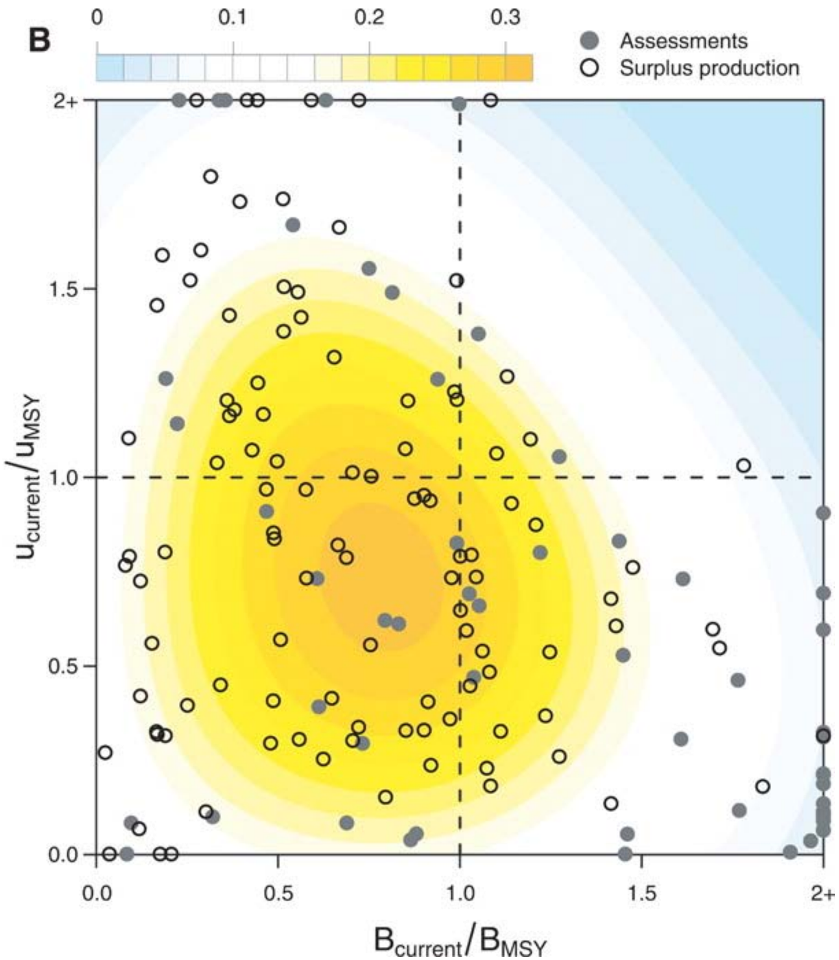
Global trends in fishery exploitation



The number of commercial fisheries that are overfished is steadily increasing and the number of underexploited fisheries is decreasing. While the FAO (top) and scientists at the University of British Columbia (bottom) provide different interpretations of the same data, the overall trends are the same (FAO, 2008; Pauly *et al.*, 2008; www.seaaroundus.org)

Source: FAO SOFIA 2008

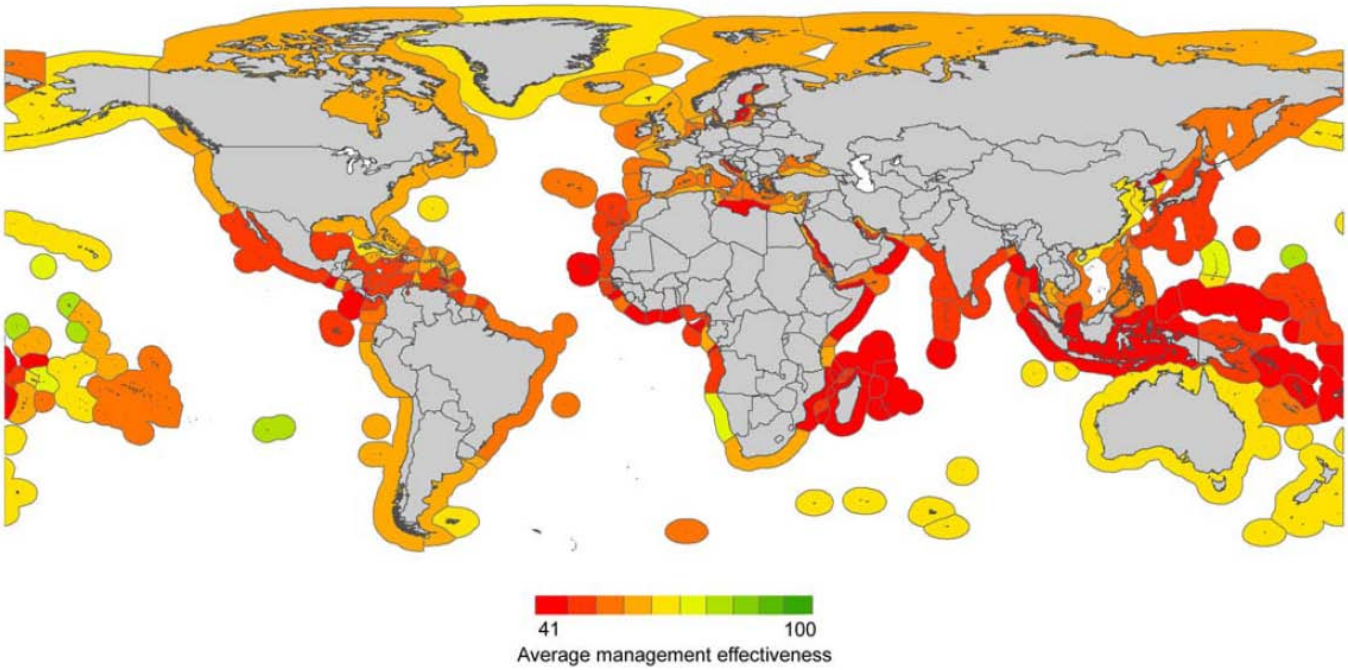
Worm et al. 2009 report probably the most balanced assessment: indicates that 63% of assessed stocks are in need of rebuilding



- 37% of assessed stocks do NOT need rebuilding. Of those, 77% are in the Pacific.
- We want fisheries to be in the lower right quadrant, near the cross-hairs

Source: FAO SOFIA 2008

However, management is suspect in most regions of the world, so even currently intact stocks may be vulnerable to future collapse



- ~7% of coastal states use rigorous scientific assessments
- ~1% have “robust mechanisms to ensure the compliance with fishing regulations”

Source: Mora et al., 2009

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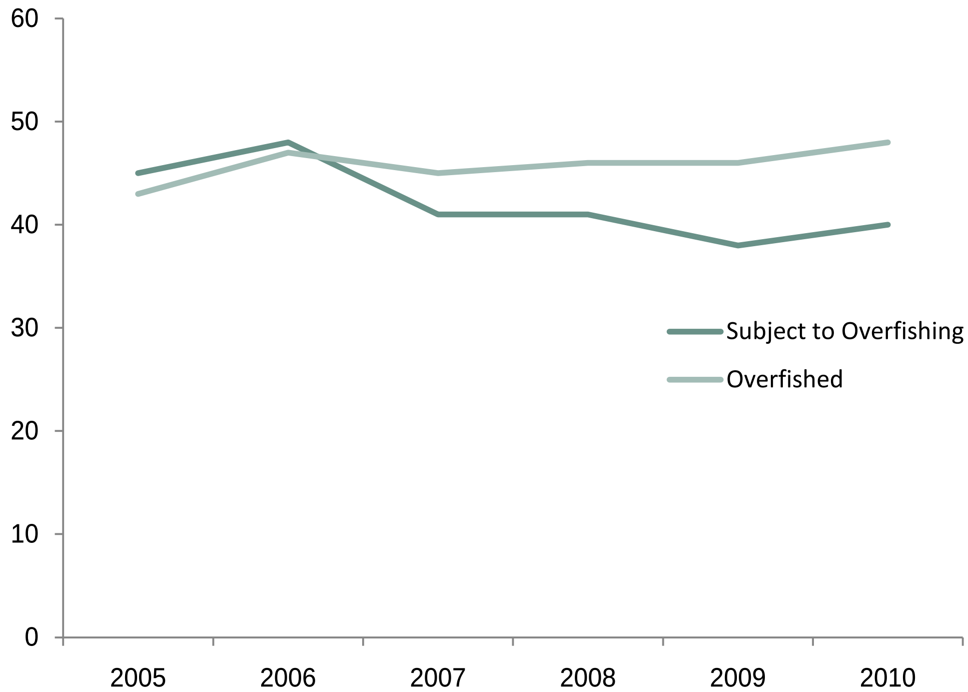
Additionally, many fisheries in the U.S. remain overfished, despite mandatory rebuilding targets

Number of Fisheries That Are Overfished or Subject to Overfishing in the U.S.



Of the federally managed fisheries that have been assessed, ~20% are subject to overfishing and ~25% are overfished, as of April, 2010.

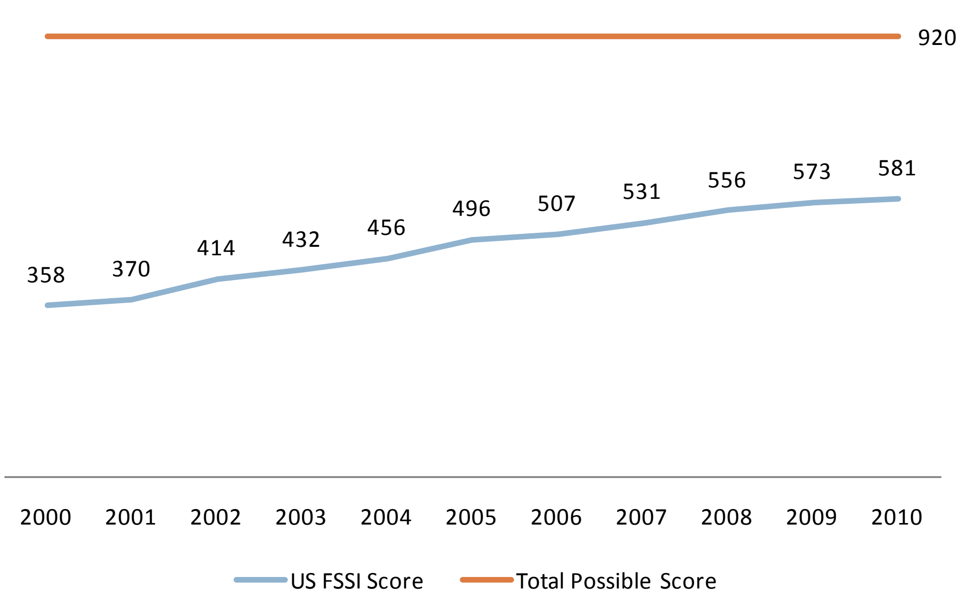
As of April, 2010, 192 stocks or stock complexes are known with respect to their overfishing status and 179 stocks or stock complexes are known with respect to their overfished status.

NOTE: This information is based only on federally managed fisheries for which an assessment has been done.

Source: National Marine Fisheries Service, Status of U.S. Fisheries (2009, 2008, 2007, 2006, 2005)

The NMFS Sustainability score of 230 key US fish stocks has been increasing over the last decade. However, progress has been largely due to additional fishery assessments.

NMFS's Fish Stock Sustainability Index (FSSI)



- The Fish Stock Sustainability Index measures the performance of 230 key U.S. fish stocks and increases as:
    1. Additional assessments are conducted
    2. Overfishing is ended and stocks rebuild to the level that provides maximum sustainable yield.
- FSSI is calculated by assigning a score for each fish stock based on the following criteria and point allocation:
    - "Overfished" status is known (0.5)
    - "Overfishing" status is known (0.5)
    - Overfishing is not occurring (for stocks with known "overfishing" status (1.0)
    - Stock biomass is above "overfished" level defined for the stock (1.0)
    - Stock biomass is at or above 80% of the biomass that produces maximum sustainable yield (B_{MSY}) (1.0)
- The maximum score that each stock may receive is 4. The maximum total FSSI score is 920 (achieved if all 230 stocks each receive a score of 4.

- **The 60% increase in the FSSI in 9 years is primarily due to progress in conducting additional fishery assessments.**

Source: National Marine Fisheries Service, Status of U.S. Fisheries (2009)

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OVERVIEW

US trends in fishery exploitation

IMPACT ON THE WATER

Global trends in fishery exploitation

US seafood consumption

FMI's Sustainable Seafood Group

Industry Media

Industry Event Attendance

INDUSTRY MOVEMENT

PROGRESS ON POLICY CHANGE

Policy progress

Retail/Food Service - NGO Partnerships

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Greenpeace's scorecard data

BUSINESS RELATIONSHIPS

WORKING THROUGH THE SUPPLY CHAIN

Traceability data

Media and Literature Penetration

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FSG FMI survey dat

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CREATING CONDITIONS FOR BUSINESS CHANGE

PRODUCER PERSPECTIVES

Certification Data

Fishery Improvement Partnerships

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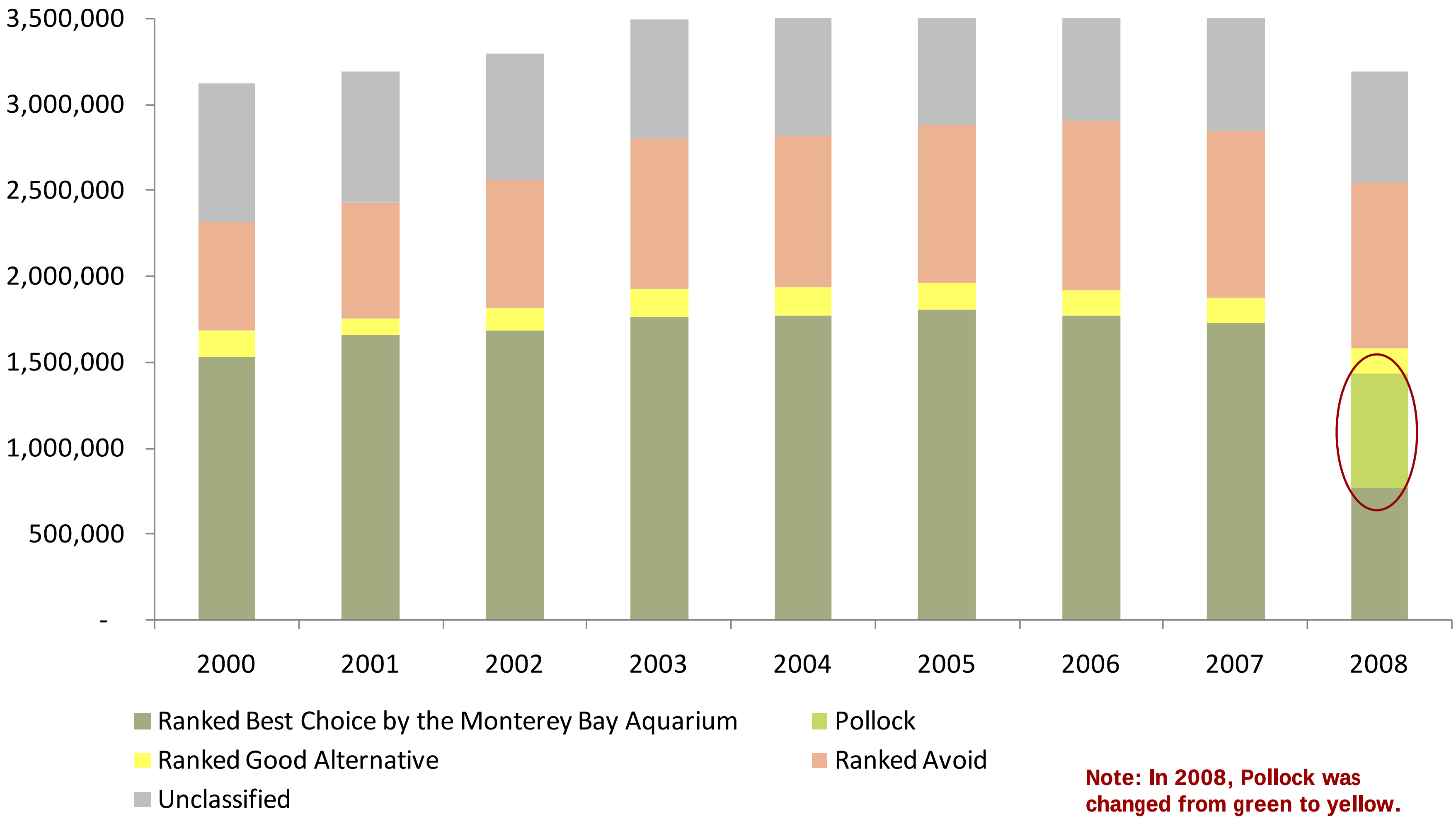
Consumption of red vs. yellow vs. green has remained fairly stable – though reclassification of pollock changes distribution significantly



NOTE: This chart was developed based on analysis of the top 31 consumed species in the U.S. – this represents 99% of total US seafood supply.

Source: FAO FishStat & NMFS

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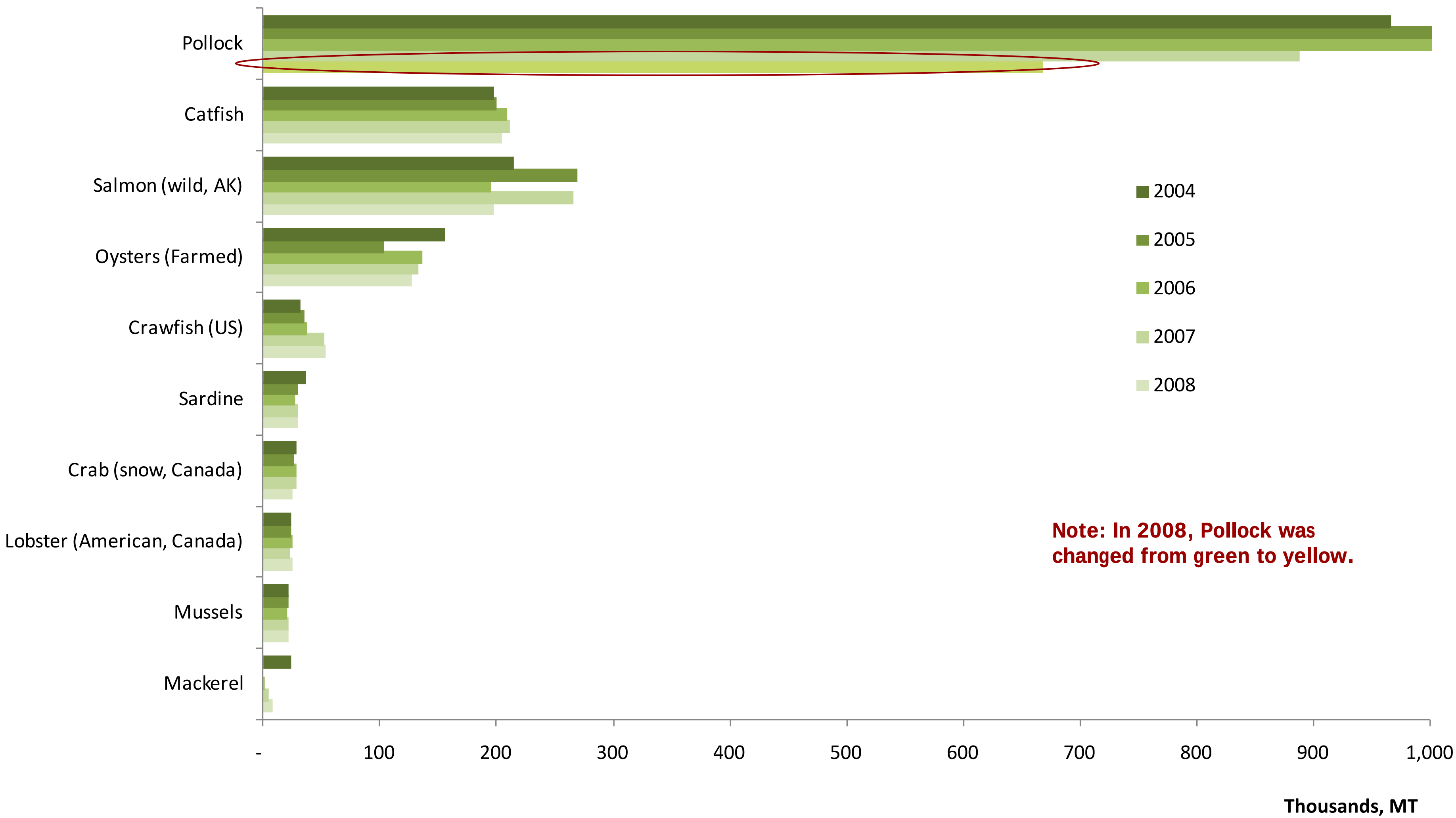
Changes in U.S. Consumption of Seafood Considered "Best Choice"



Source: FAO FishStat & NMFS

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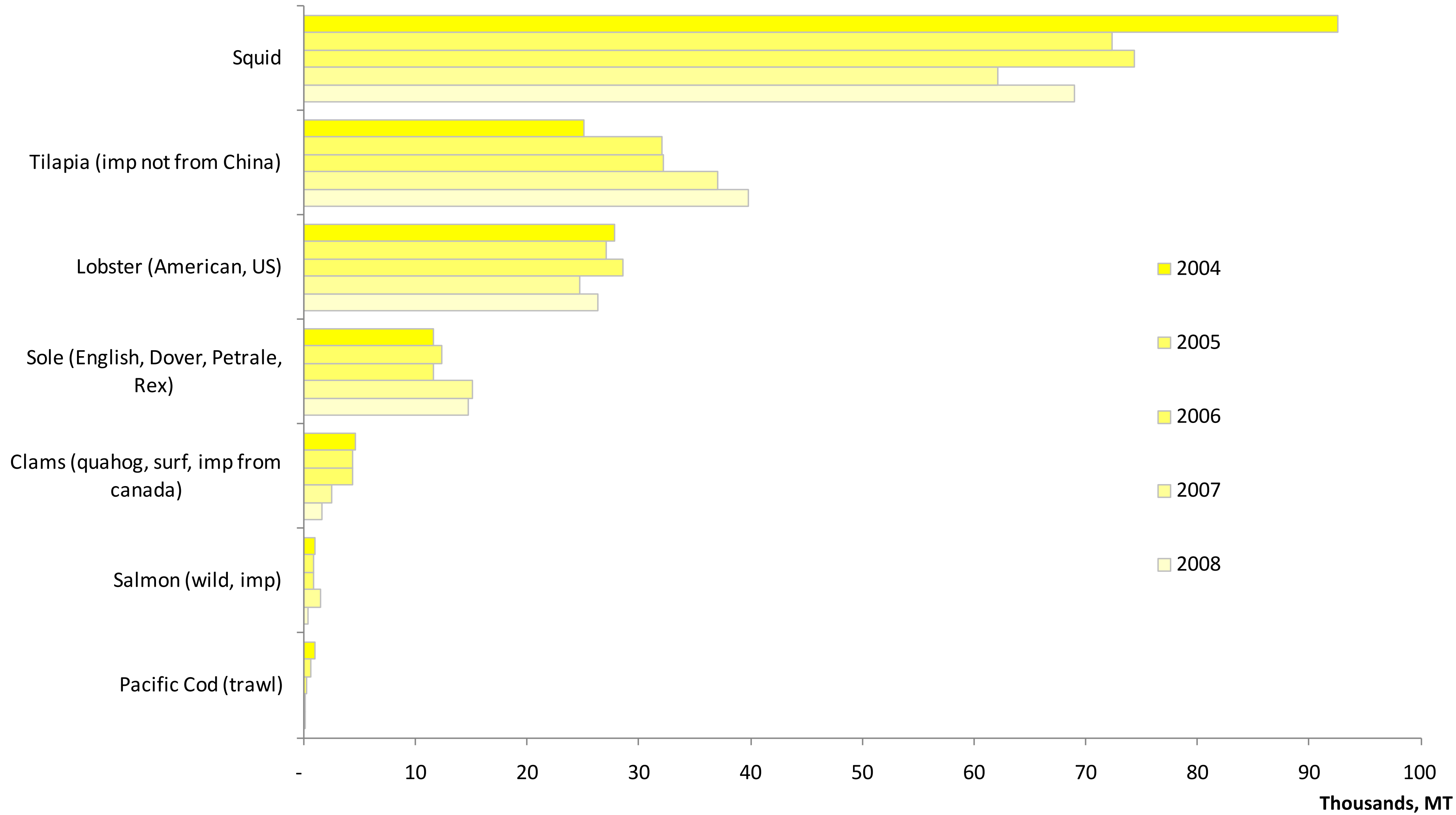
Changes in U.S. Consumption of Seafood Considered "Good Alternative"



Source: FAO FishStat & NMFS

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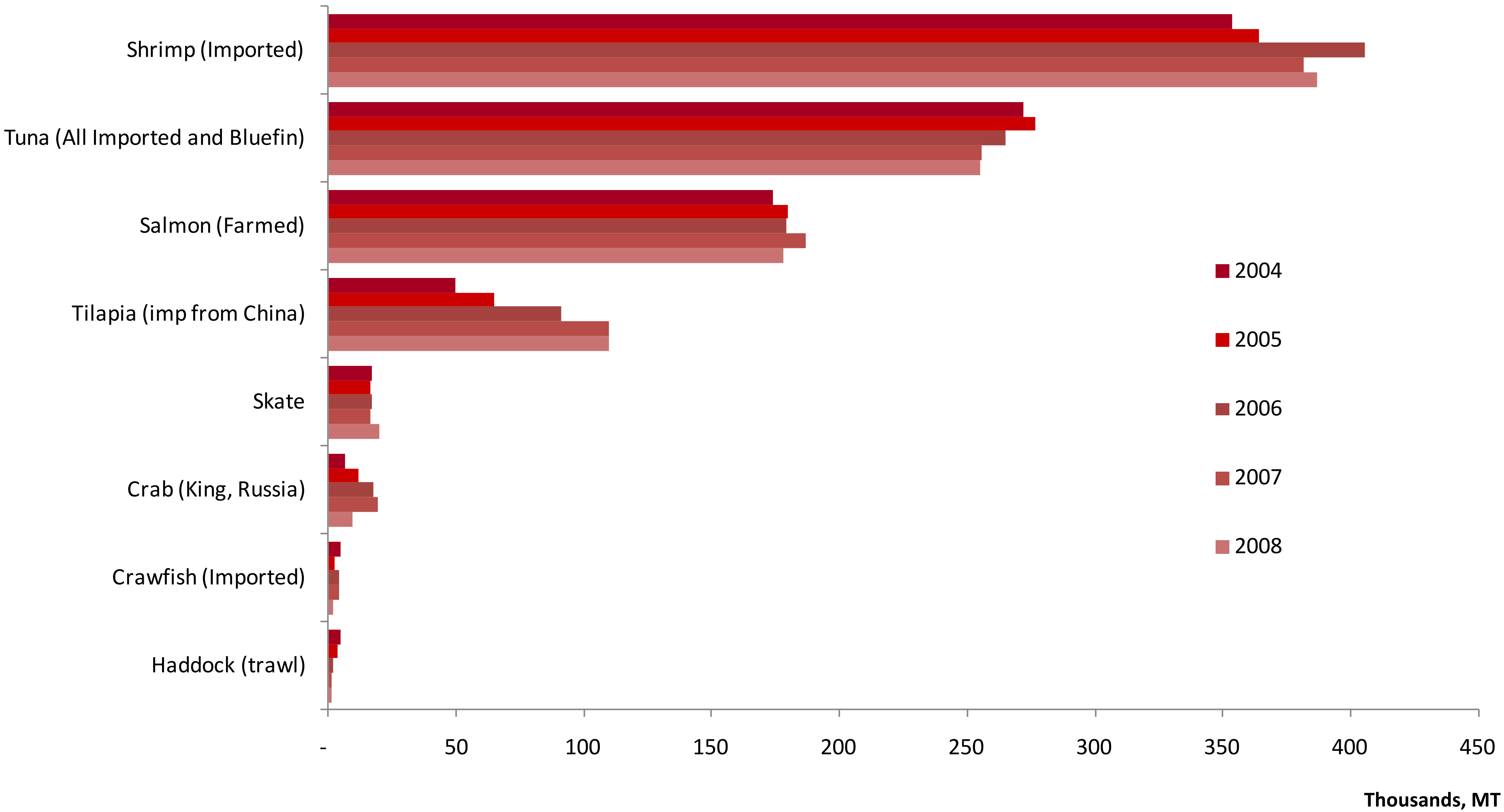
Changes in U.S. Consumption of Seafood Considered "Avoid"



Source: FAO FishStat & NMFS

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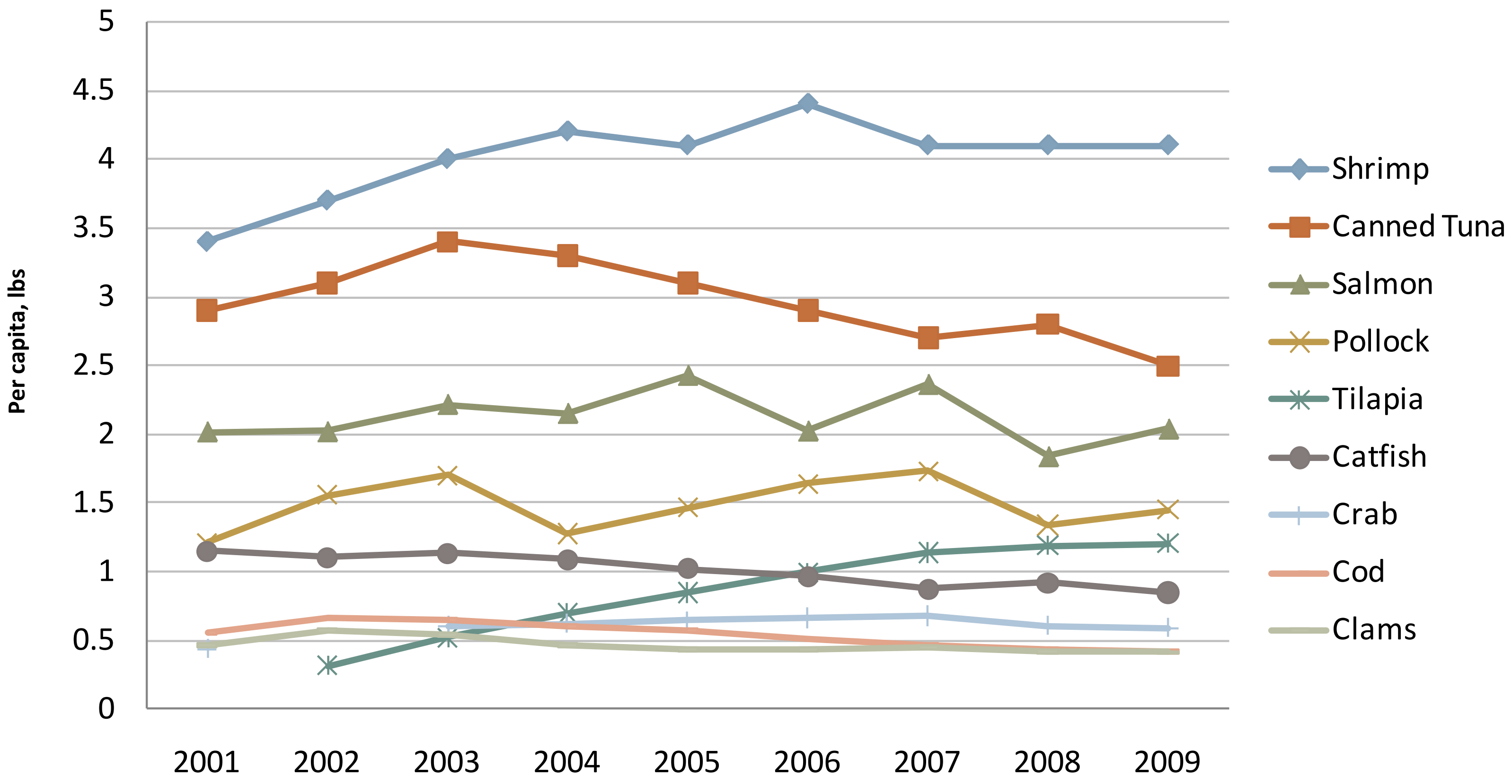
Changes in per capita consumption of top species - US

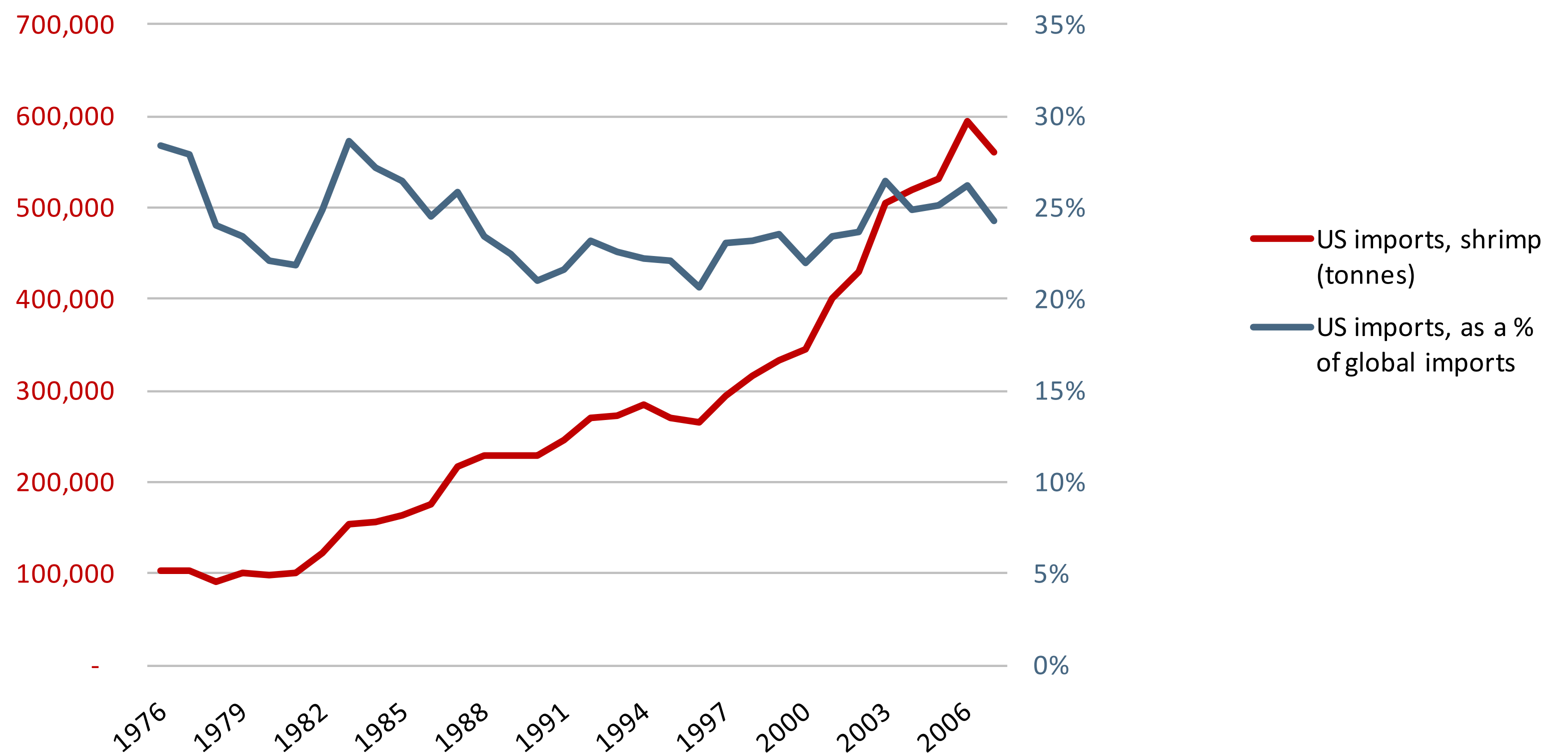
Steady growth in shrimp and tilapia consumption. Steady decline in tuna, catfish, and cod consumption.



Source: National Fisheries Institute

Species of particular interest – imported shrimp

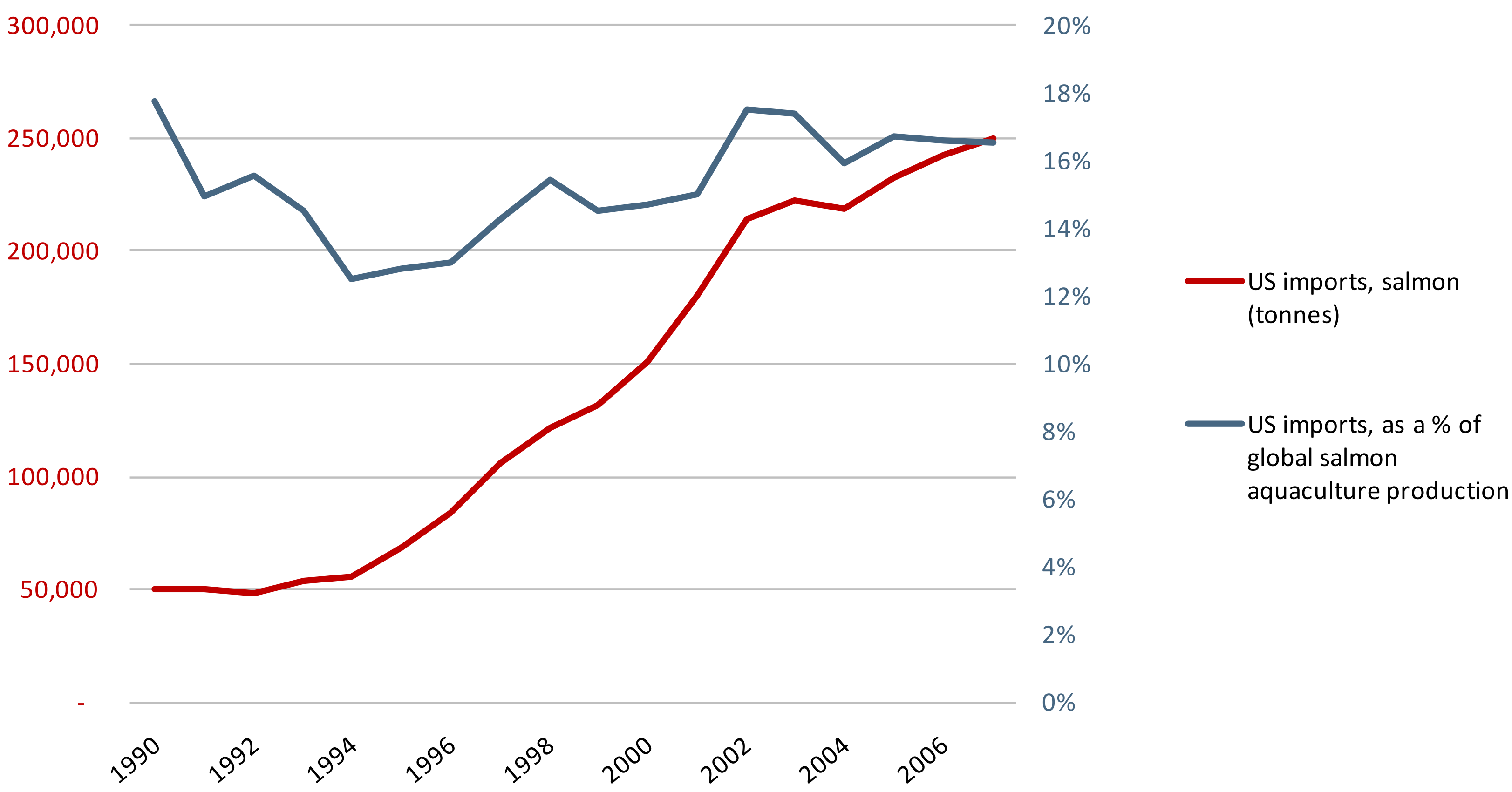
US shrimp imports declined approximately 5% in 2007. As a share of global imports, US shrimp imports have remained fairly stable over the last two decades.



Source: FAO FishStat

Species of particular interest – farmed salmon

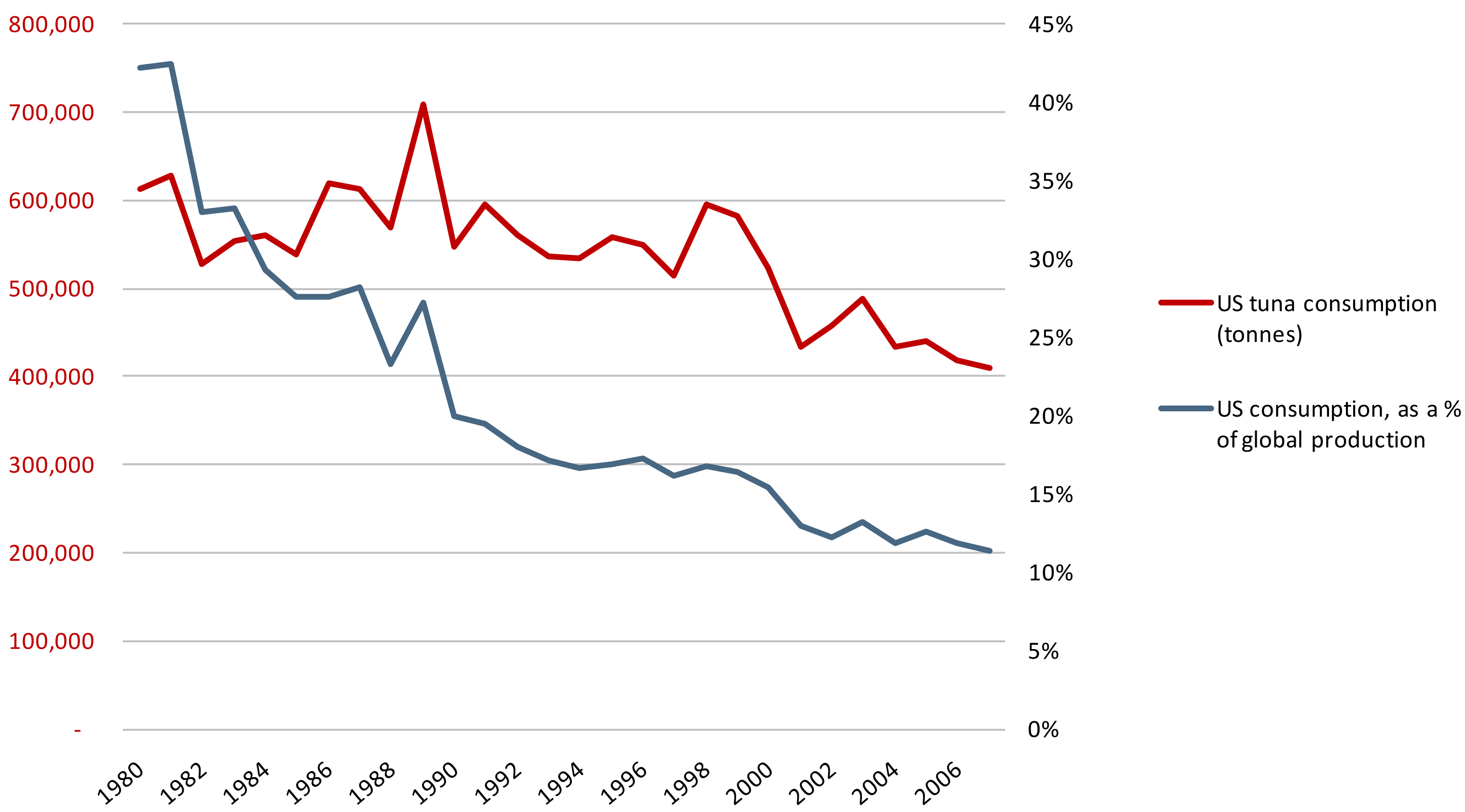
US imports of farmed salmon continue to rise, though growth has slowed in the past five years. As a percentage of global aquaculture production, US salmon imports has been relatively stable.



Source: FAO FishStat

Species of particular interest – tuna

US tuna consumption generally declining, both in volume and as a share of global consumption



Source: FAO FishStat

FMI continues to move towards supporting sustainable seafood

2007 – 22 Food Marketing Institute (FMI) member companies formed a "sustainable seafood working group" with this mission: To identify priorities and issues, find ways to cut through the confusing, complicated and complex subject and develop industry guidelines, tools and resources to help retailers, suppliers, consumers and NGOs work together for solutions.

2008

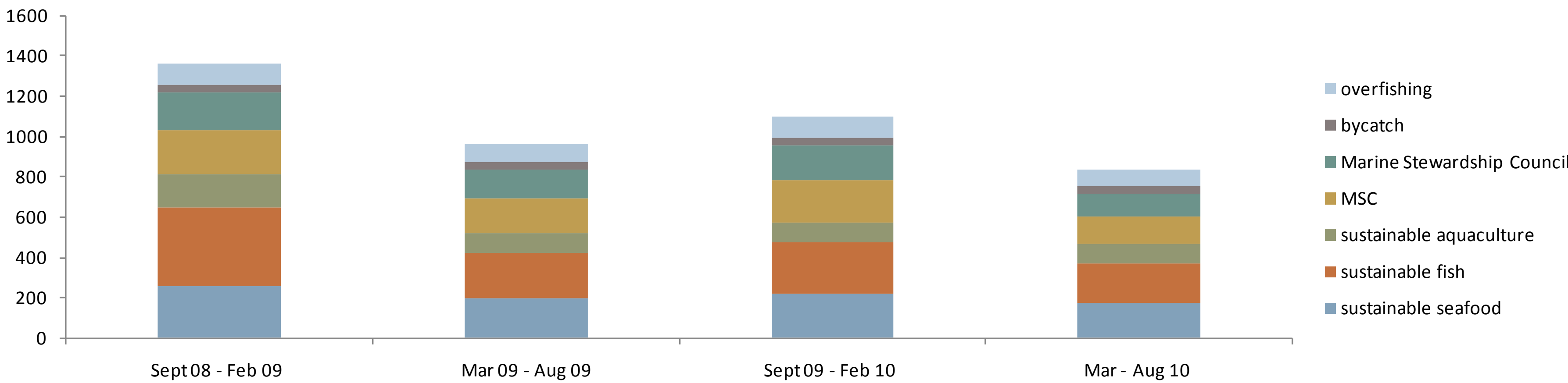
- FMI announced that it is developing guidelines, best practices, case studies and other resources to help the supermarket industry address seafood sustainability issues.
- FMI board members approved an Industry Position on Sustainable Seafood

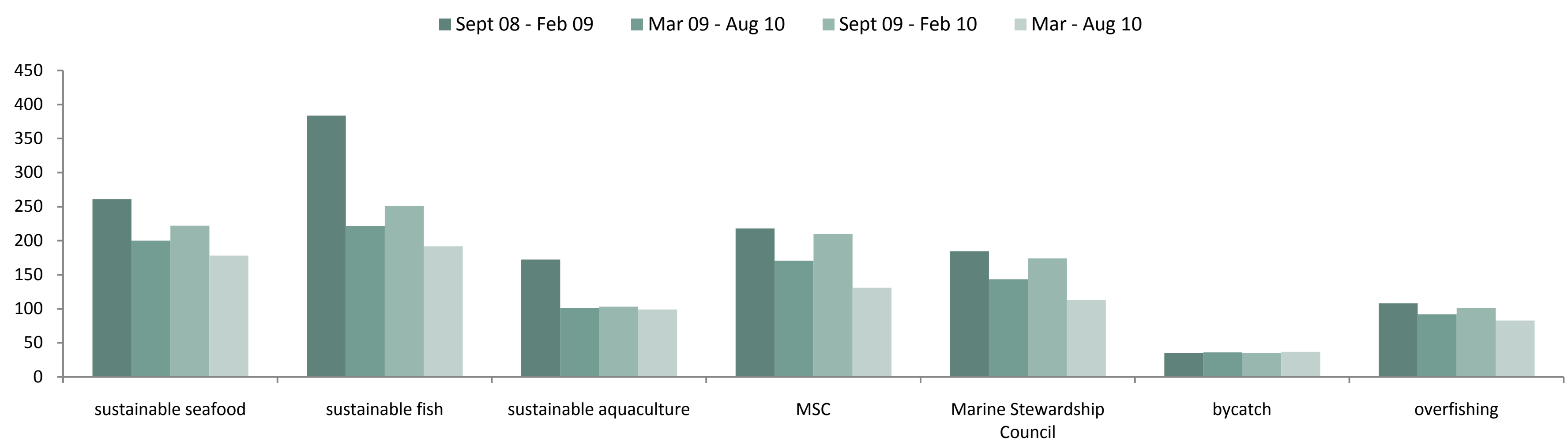
2009 – 2010 — In the past two years, FMI has developed the following tools to help the supermarket industry address seafood sustainability:

- Developed "Seafood Sustainability 101" – a resource for buyers and category managers on sustainable seafood for use in purchasing, training, and educating customers and staff.
- FMI's Sustainable Seafood Working Group has developed and published four case studies that showcase successful partnerships between retailers and NGOs.
- Published a directory of resources that retailers can use to develop their sustainable seafood programs. Resources include business associations, certification programs, and environmental organizations. This resource list is posted at: http://www.fmi.org/sustainability/?fuseaction=seafood
- Developed a Supplier Advisory Group and an NGO Advisory Group which are working together to develop sustainable seafood tracing and tracking systems.

Coverage by industry media (IntraFish.com) slightly declining

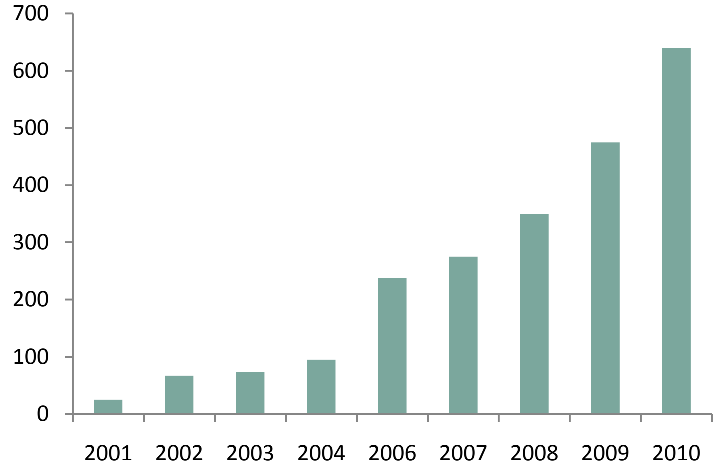
Number of articles per 6-months containing key terms published by www.IntraFish.com





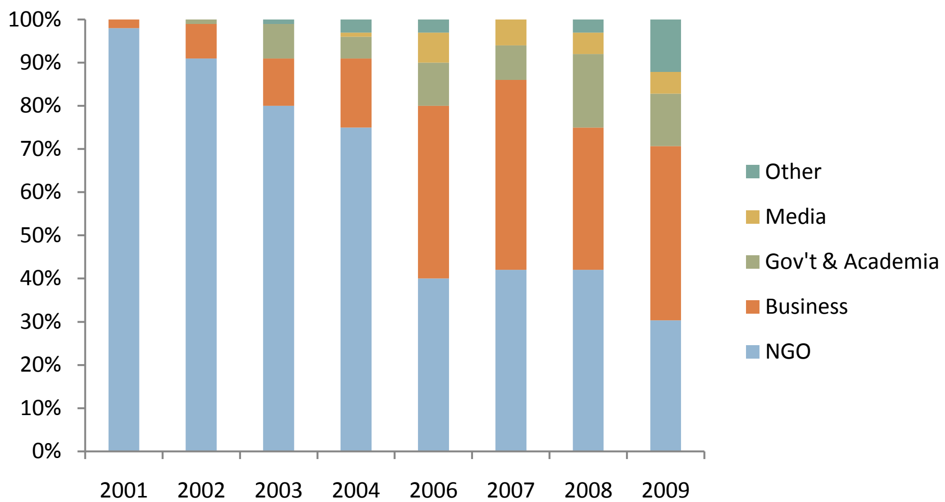
Seafood Summit Attendance is Steadily Increasing

Number of Seafood Summit Attendees



- Seafood Summit attendance has been increasing steadily since the event's inception in 2001.
- Attendance increased by 36% in 2009 and by 35% in 2010.

Seafood Summit Attendees, by sector



- The percentage of business attendees increased from 33% in 2008 to 40% in 2009.

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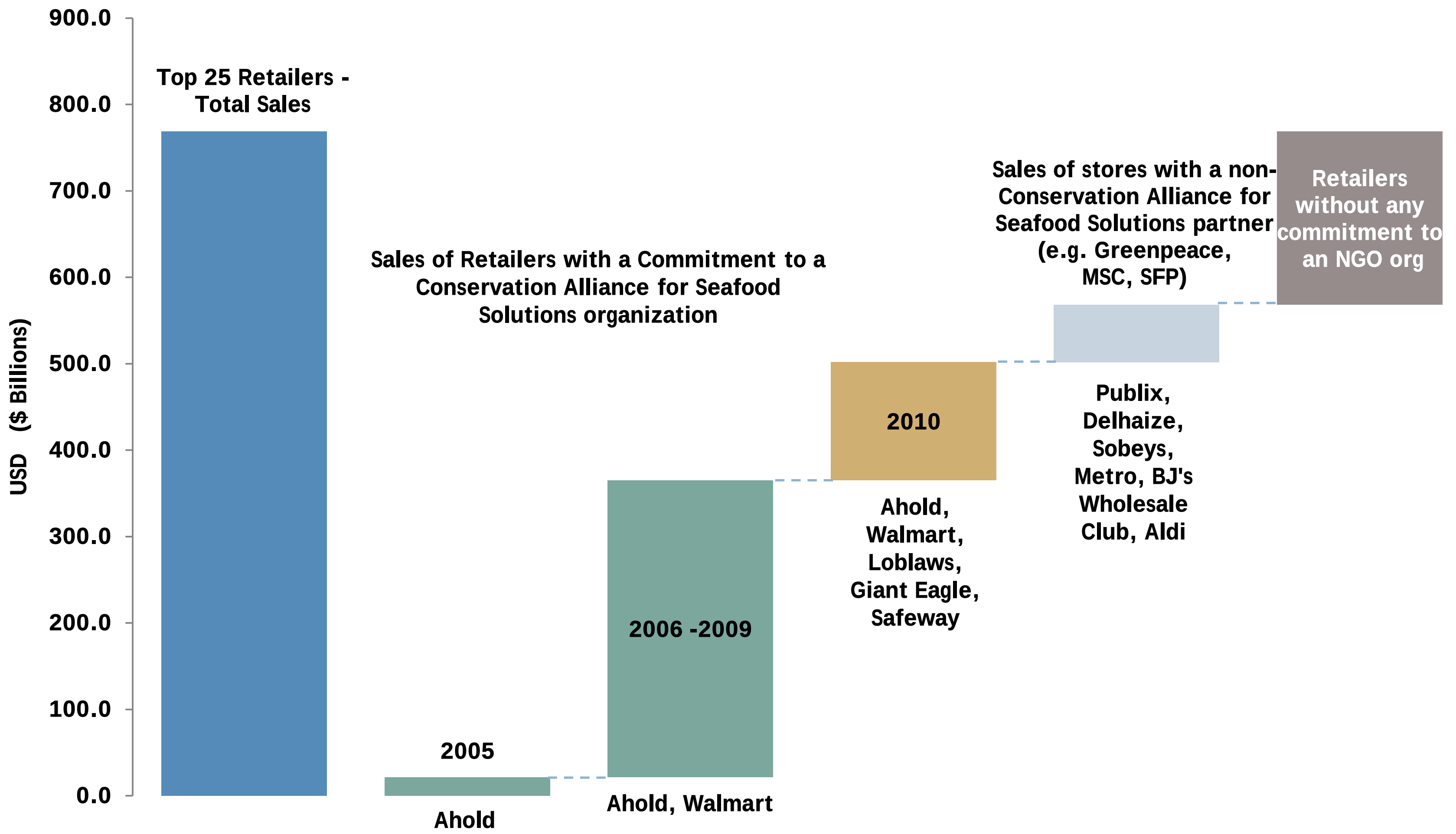
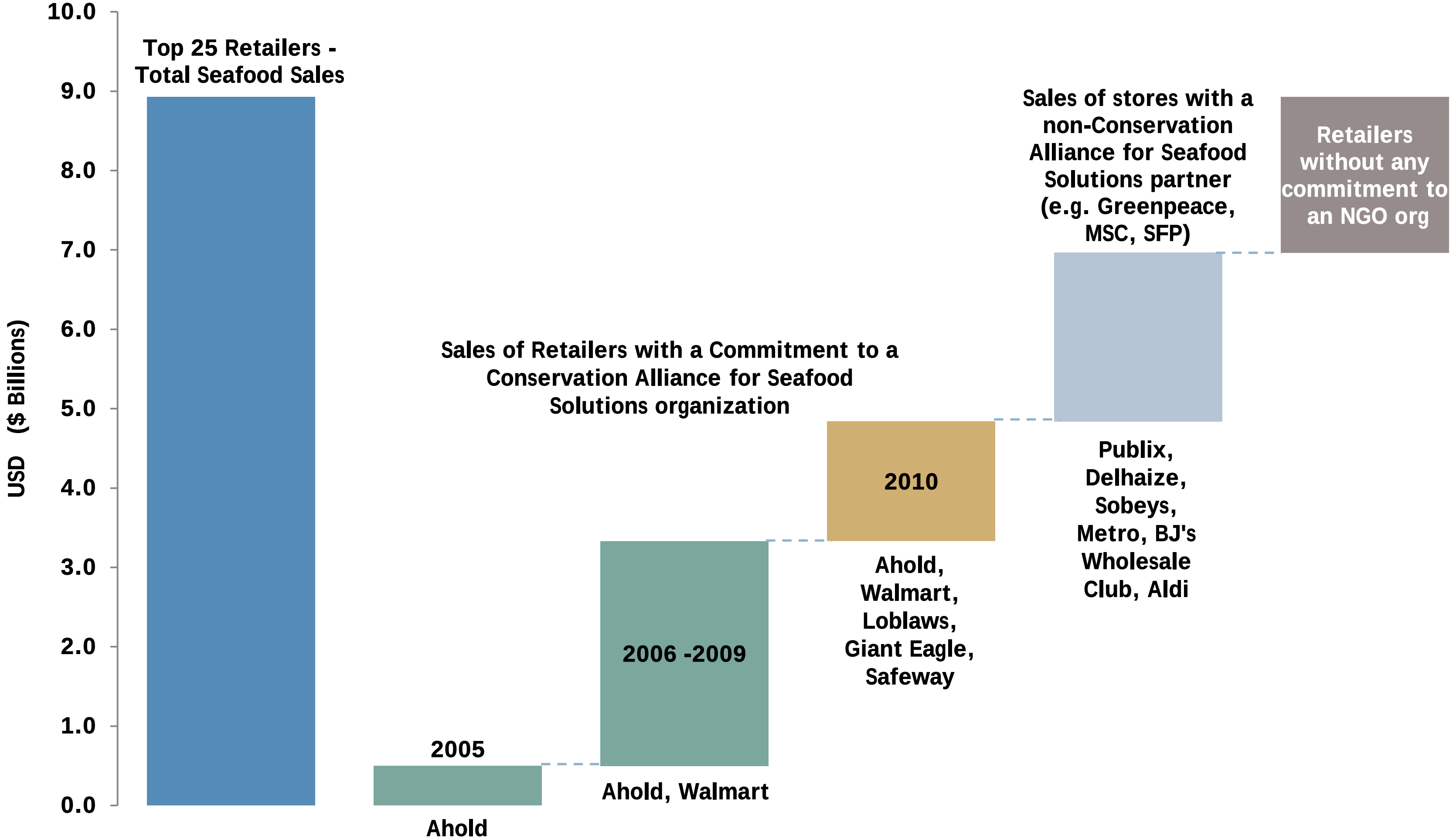
Top-25 US retailer commitments to sustainable seafood continue to grow substantially



Source: Supermarket News and Sustainable Fisheries Partnership data

Top-25 US retailer commitments to sustainable seafood (by seafood sales)



Source: Supermarket News and Sustainable Fisheries Partnership data

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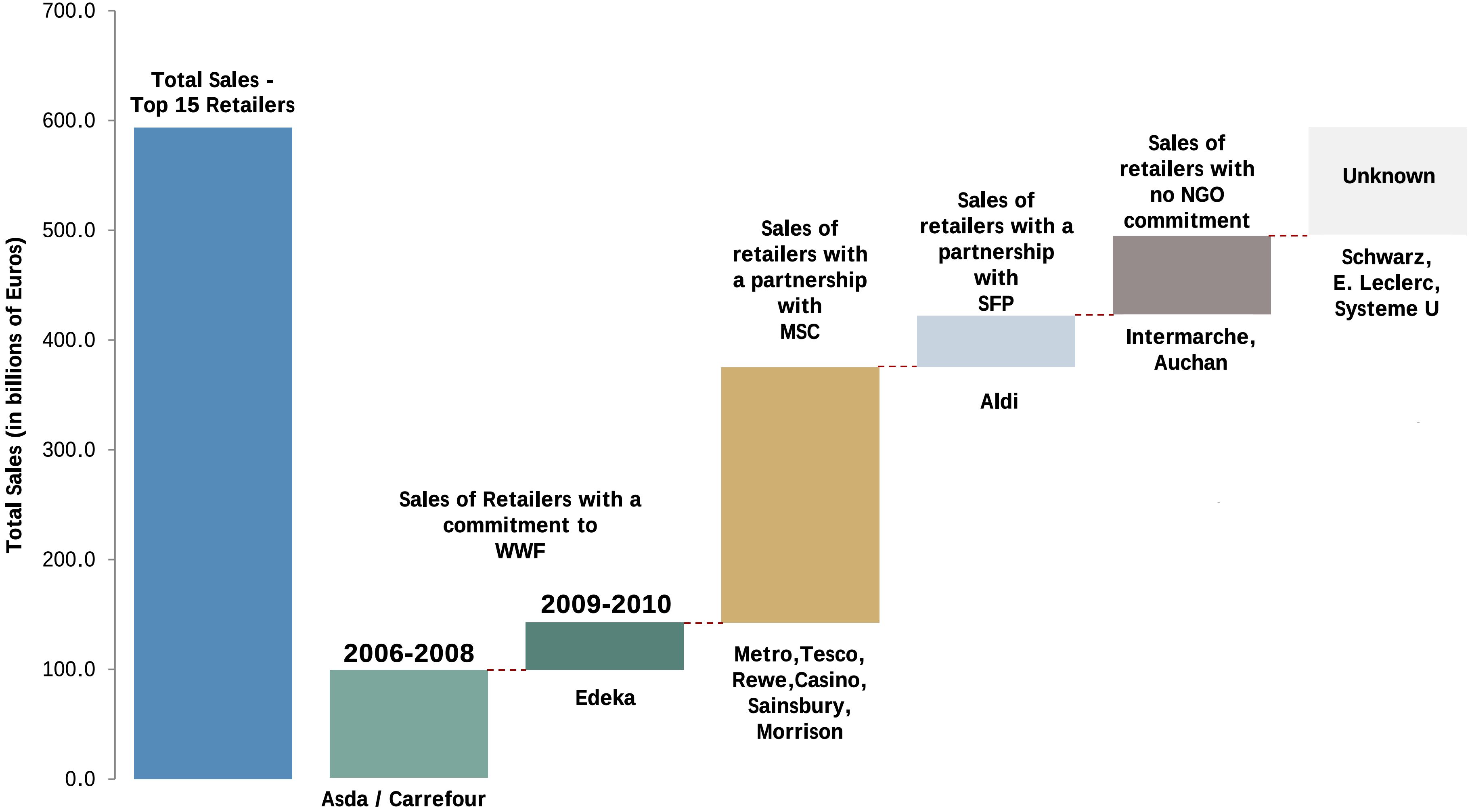
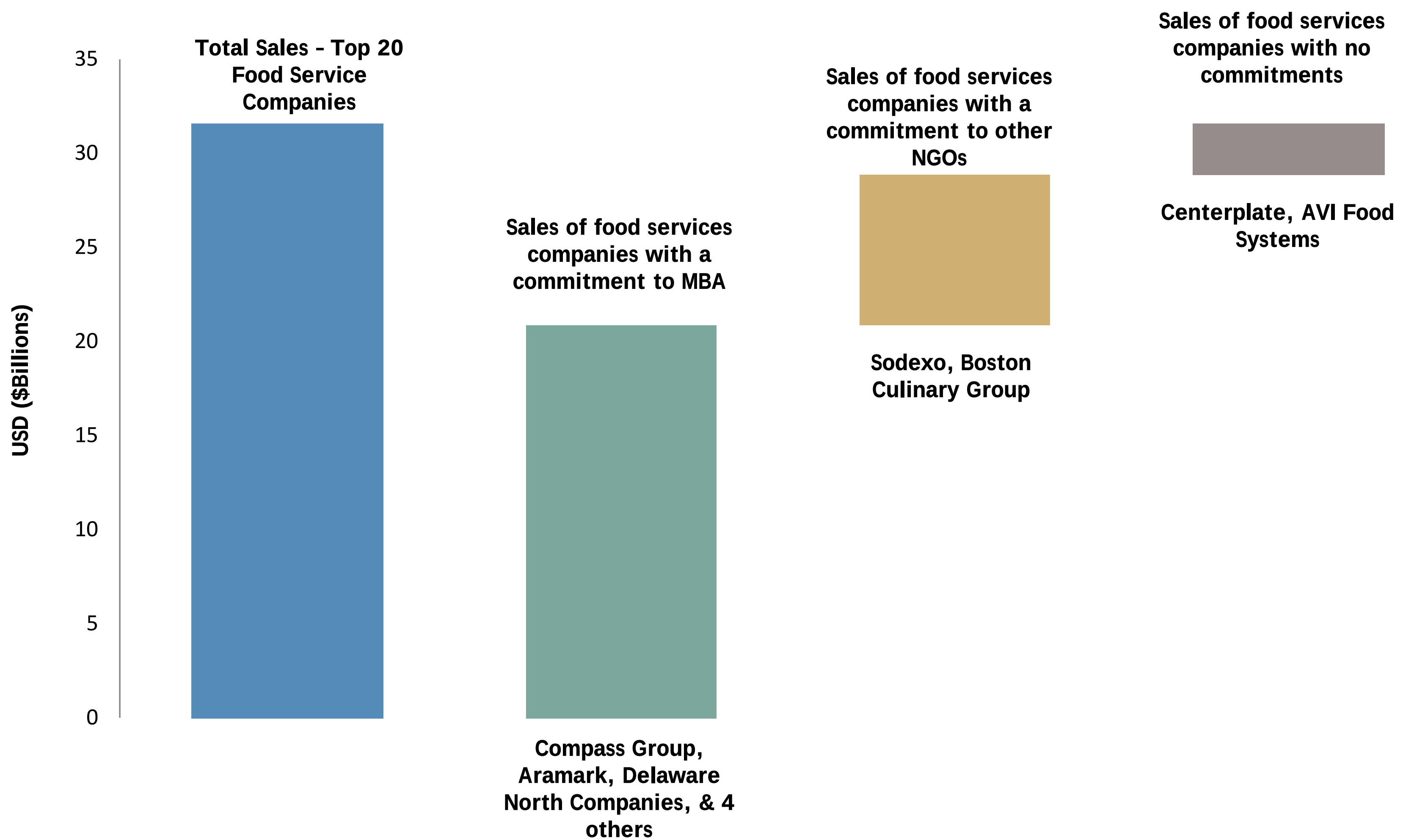
Top-15 European retailer commitments to sustainable seafood (by total sales)



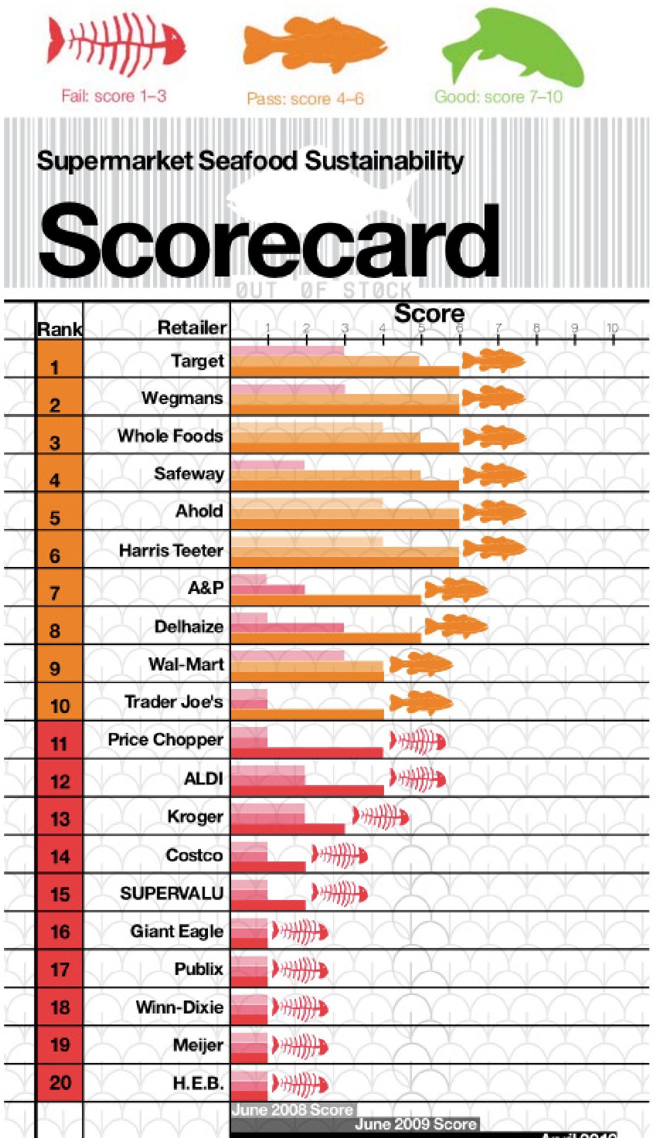
Source: Veraart Research Group (retail-index.com), SeafoodSource.com, company websites

Top-20 North American food service commitments to sustainable seafood (by total sales)

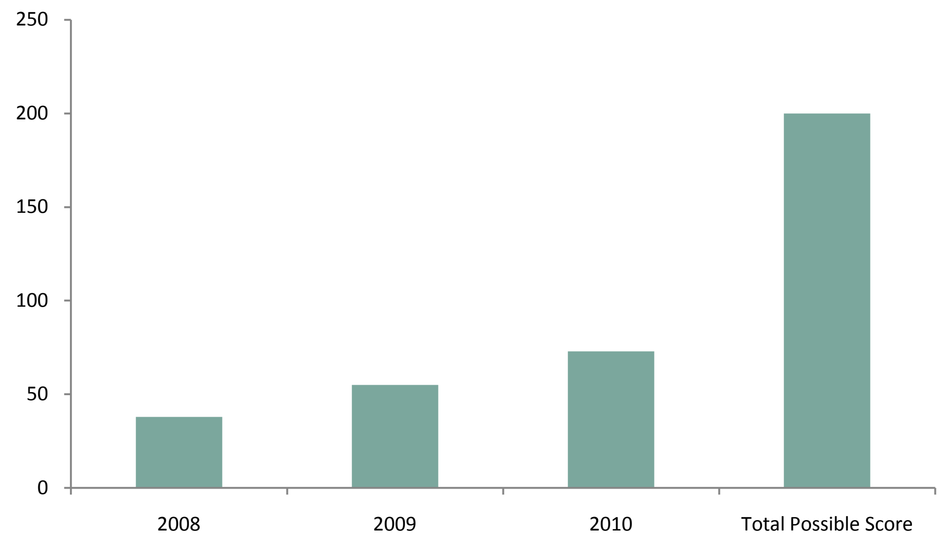


Source: Food Management and Sustainable Fisheries Partnership

Retailer sustainability scores have improved, but overall many are still quite low



Cumulative Sustainable Seafood Scores for Top-20 Retailers



- The Greenpeace Supermarket Seafood Sustainability Scorecard rates seafood retailers on whether they have a sustainable seafood sourcing policy, sustainability initiatives, labeling and transparency, and/or sales of "red list" seafood.
- While the cumulative score of the top-20 stores continues to increase, in 2010 not one store had a score higher than 6 (out of 10).
- Five stores had a score of 1.

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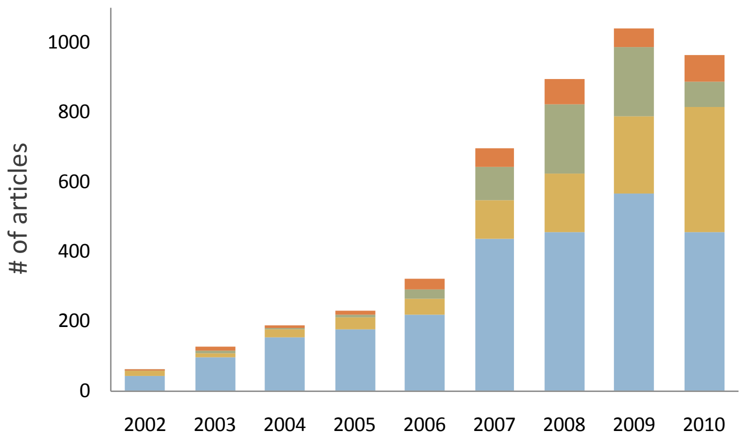
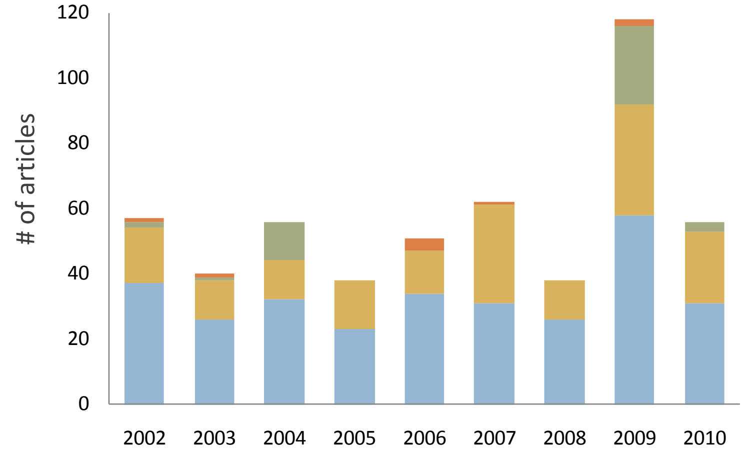
Media coverage of sustainable seafood has stabilized or continued to increase

“Sustainable seafood” anywhere in document

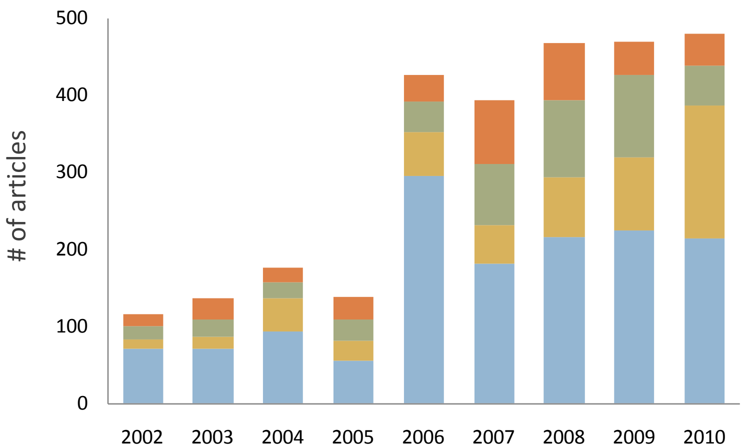


“environment” and “fish” in headline

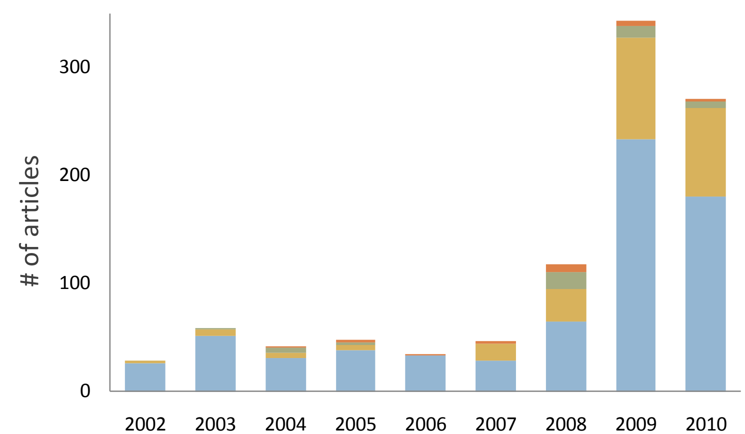


Newspapers | Newswires and press releases | Industry Trade Press | Magazines & Journals

“Marine Stewardship Council” anywhere in document



“catch shares” and “fish” anywhere in document



Note: 2010 data through Sept. 16, 2010

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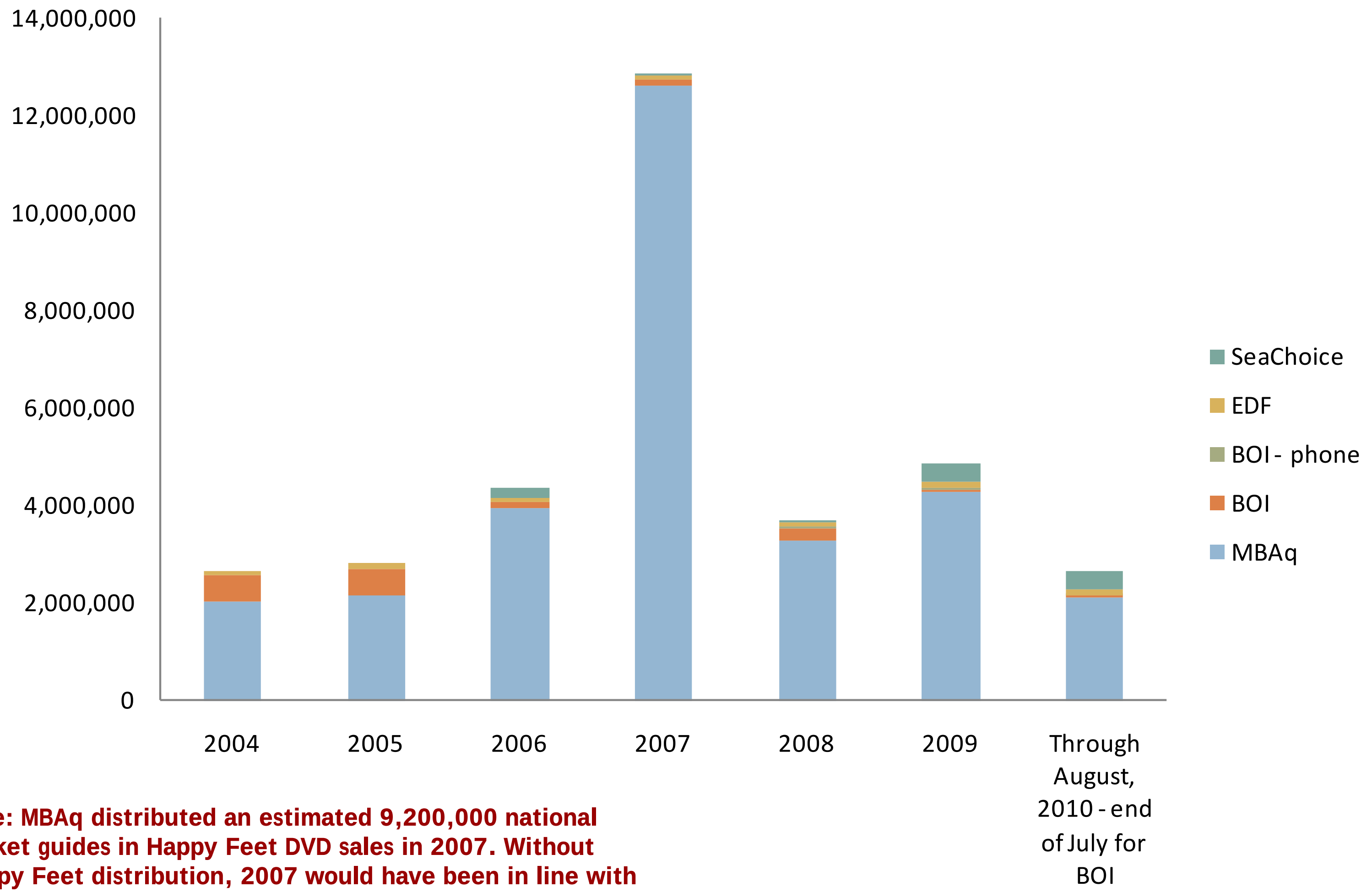
Seafood Card Distribution

Monterey Bay Aquarium leads in seafood card distribution. Distribution is relatively steady with 2007 as an outlier year because of 9.2 million cards were distributed through Happy Feet DVD sales.



note: MBAq distributed an estimated 9,200,000 national pocket guides in Happy Feet DVD sales in 2007. Without Happy Feet distribution, 2007 would have been in line with 2006 & 2008.

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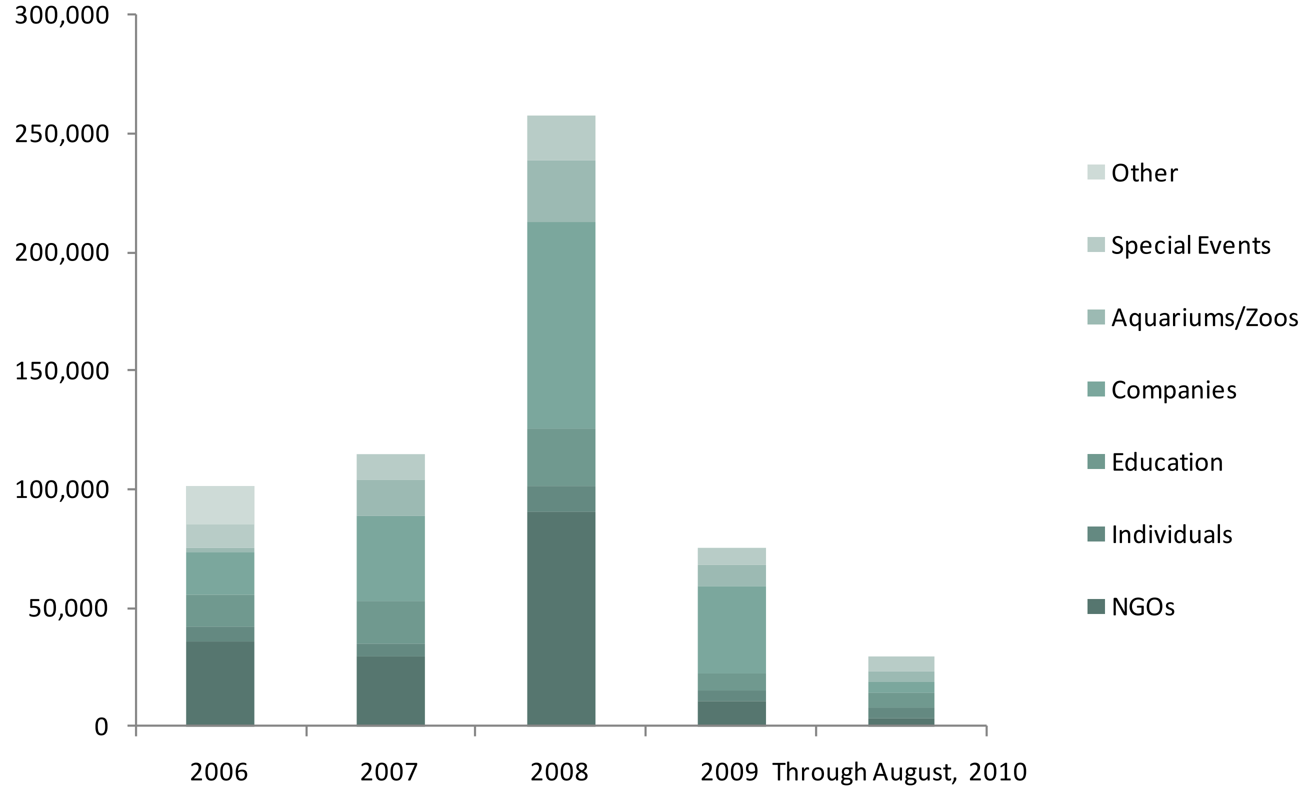
Seafood Card Distribution - BOI

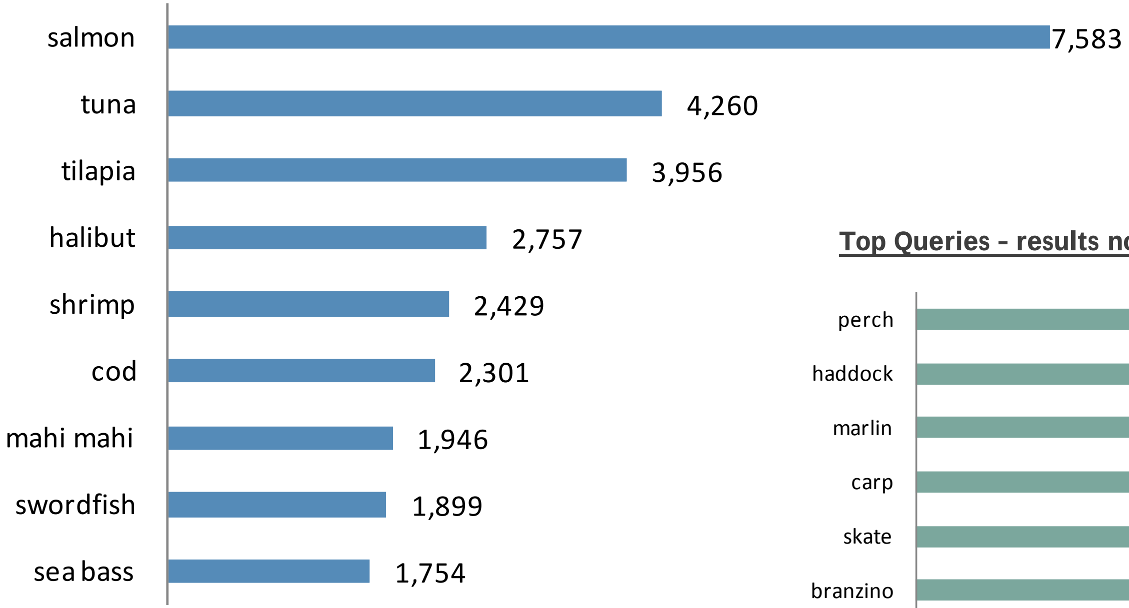
Blue Ocean Institute provides breakdown of distribution: primarily to NGOs and companies, though distribution has been slowing in the last two years.



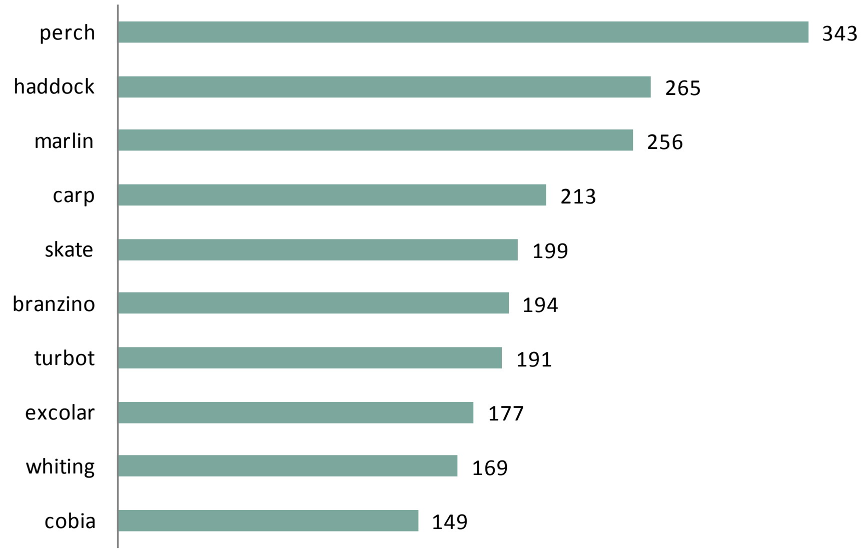
Seafood Card Distribution

Blue Ocean Institute's FishPhone texting service has limited reach, but shows what information users are seeking.

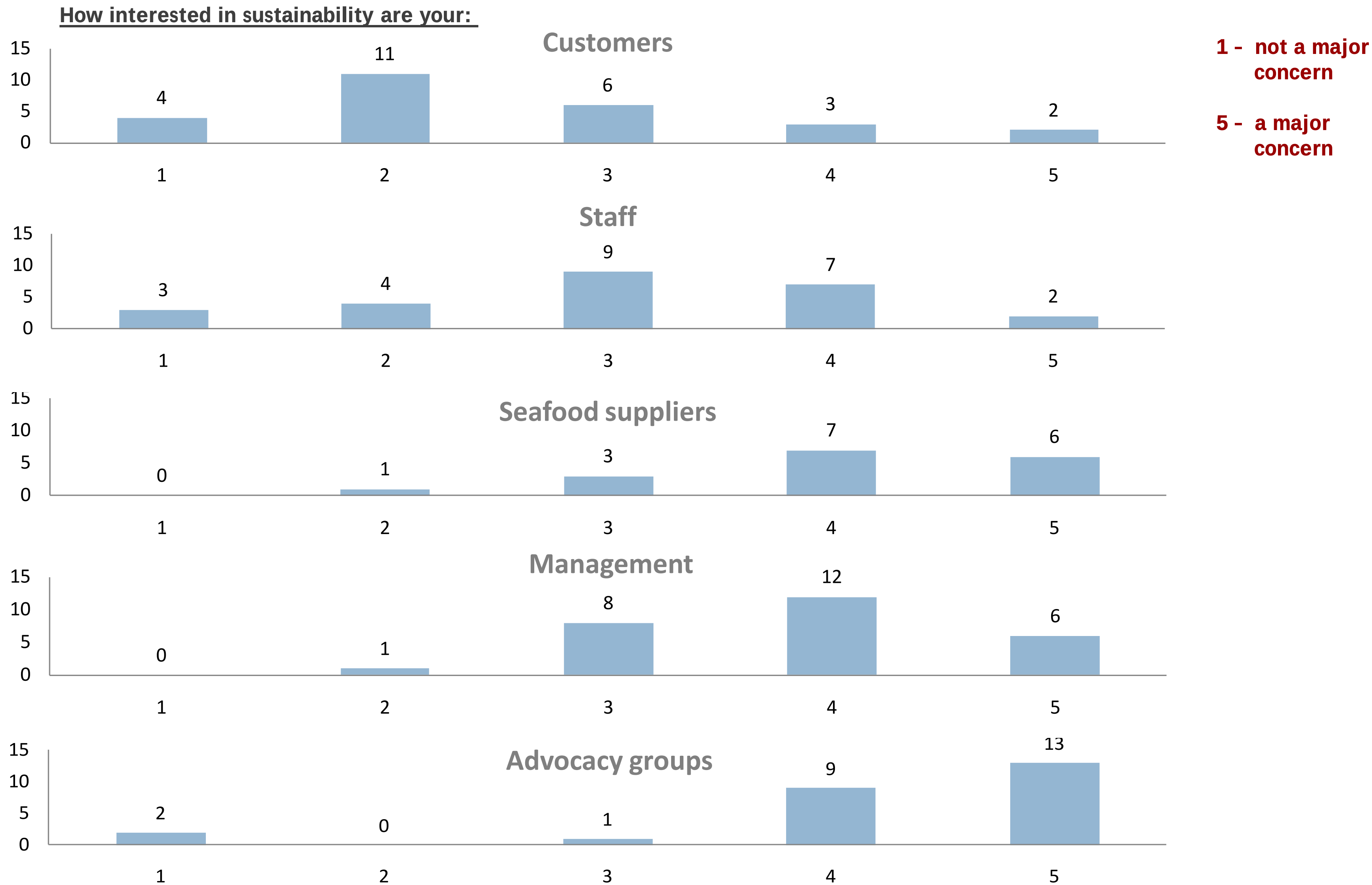
Top Queries



Top Queries - results not found



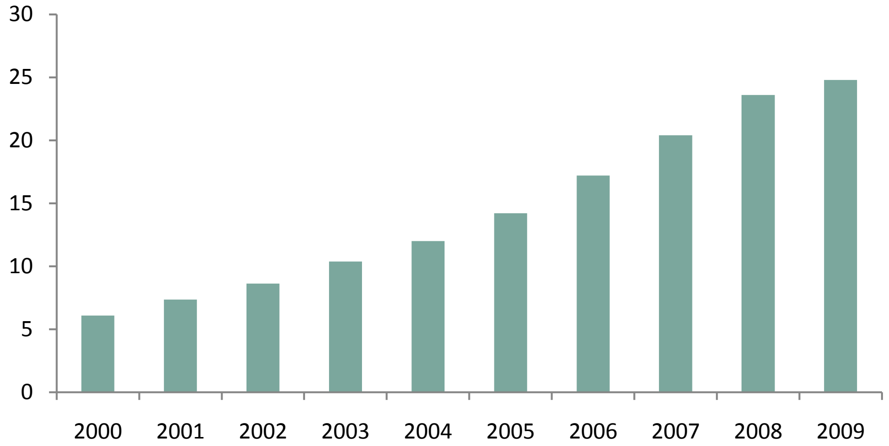
For US retailers, sustainability is driven more by staff, suppliers, and management than by customers



Source: FMI Survey, FSG, June 2010.

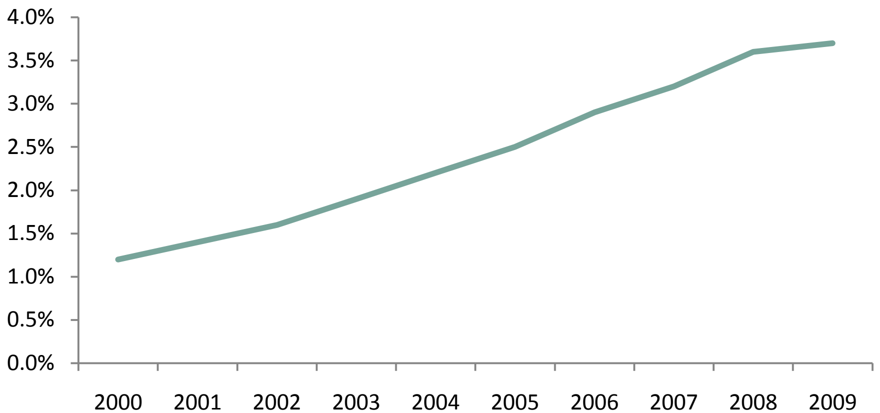
Organic Sales and Market Share Continue to Increase

Growth in Organic Food and Beverage Sales (in $ billions)



- "Despite the economic recession…in 2009, the organic market continued to experience growth. In 2009, total U.S. organic consumer product sales grew 5.1% to reach $24.8 billion."
- "Organic sales growth continued to outpace total sales of comparable conventional food items by a significant margin. While organic food sales were up 5.1% in 2009, total food sales were up by only 1.6%."

Growth in Market Penetration of Organic Food Sales

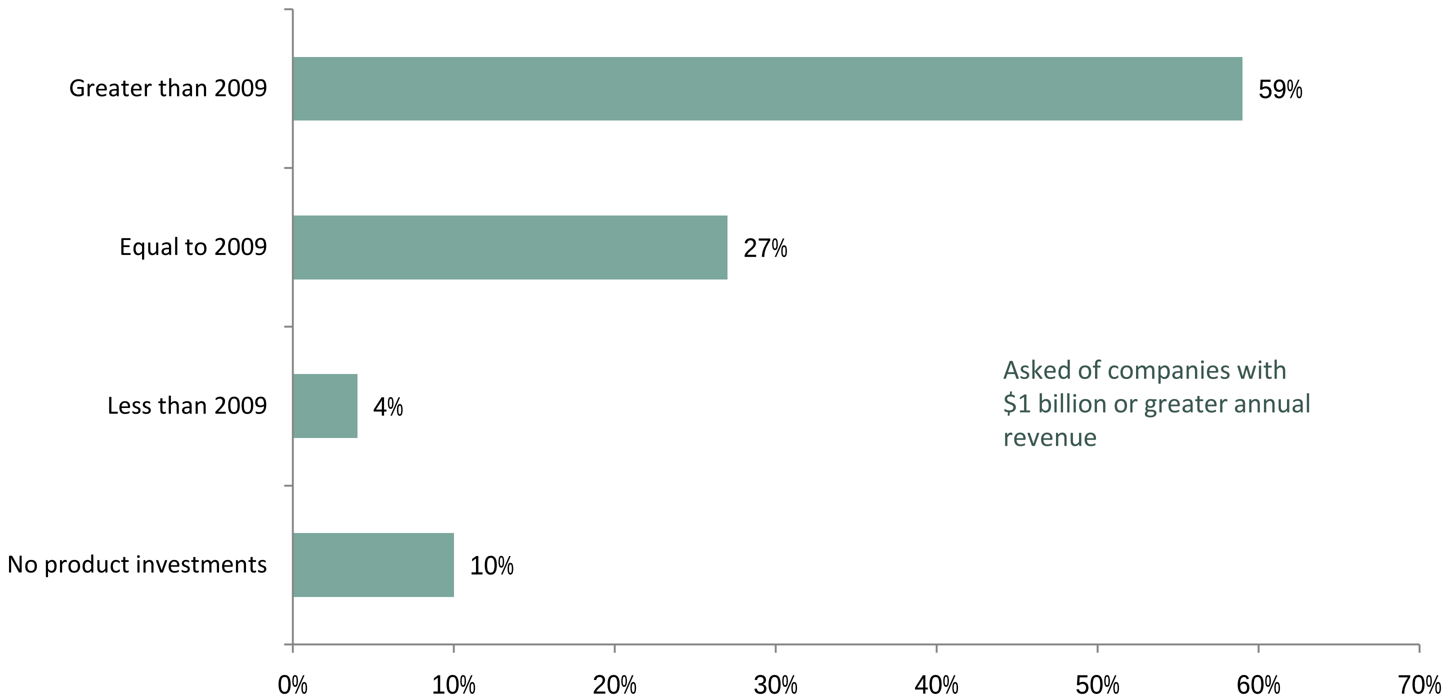


- Penetration rate has increased almost 3.5 times from 2000 to 2009
- Organics still represent less than 4% of total food and beverage market

Source: Organic Trade Association's 2010 Organic Industry Survey (2010) www.ota.com/pics/documents/2010OrganicIndustrySurveySummary.pdf

Investments in green product development expected to grow

Will your green products and investments in green product development in 2010 be . . .



Source: Greenbiz: State of Green Business Report 2010

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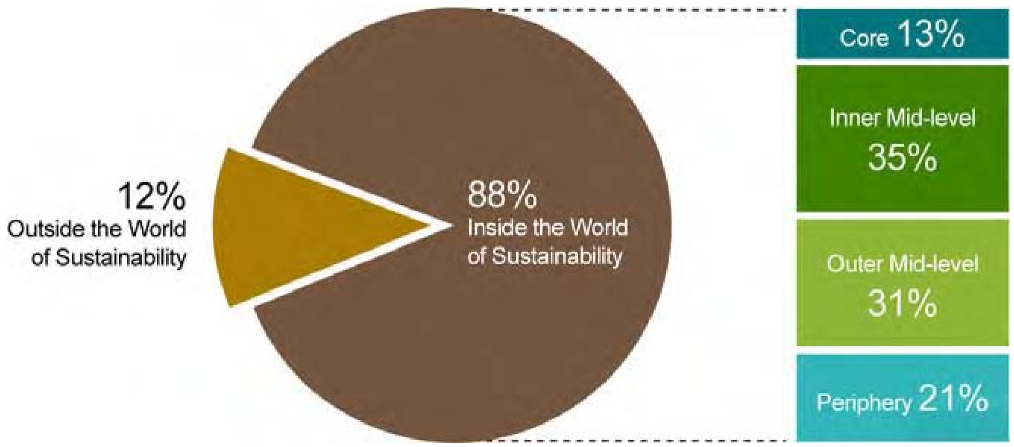
Consumers identify themselves as concerned

Consumer Behavior in the World of Sustainability

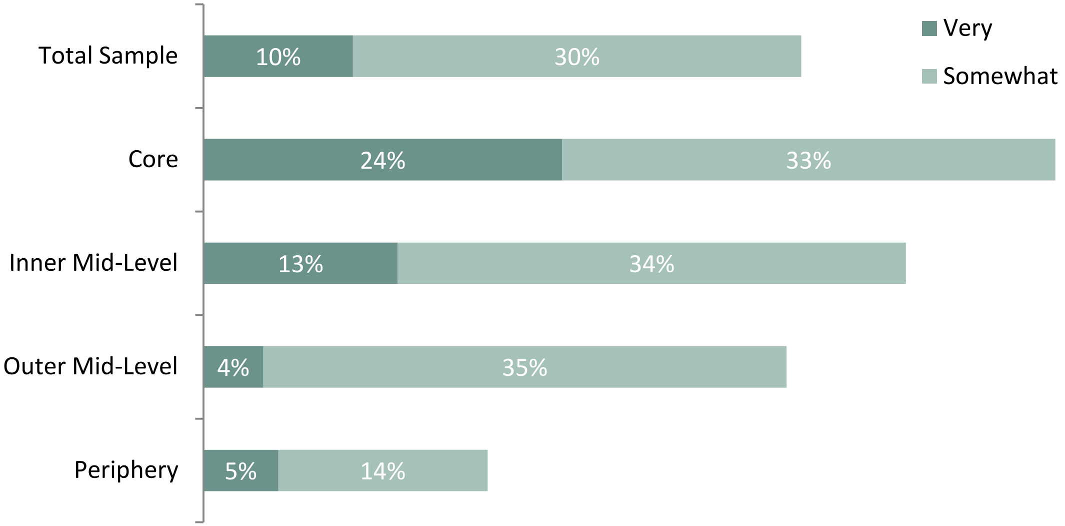


Source: Sustainability: The Rise of Consumer Responsibility report. The Hartman Group, Inc. January 2009.

- Segments Defined:
  - Core — These consumers display high involvement in a sustainability lifestyle and adherence to pro-sustainability attitudes.
  - Inner and Outer Mid-level — Inner Mid-level consumers have a more integrated approach to sustainability, they are likely to have not only adopted many of the behaviors identified as Outer Mid-level, but have likely surpassed them with more intense behaviors and attitudes.
  - Periphery — These consumers display only minimal, infrequent and less intense involvement in sustainability.
- The report presents results from an online survey of 1,856 U.S. adults conducted in September 2008 to understand consumer attitudes and behaviors related to sustainability — its practices, products and companies.

40% of Consumers Inside World of Sustainability View Certification As Important

How important is certification to you?



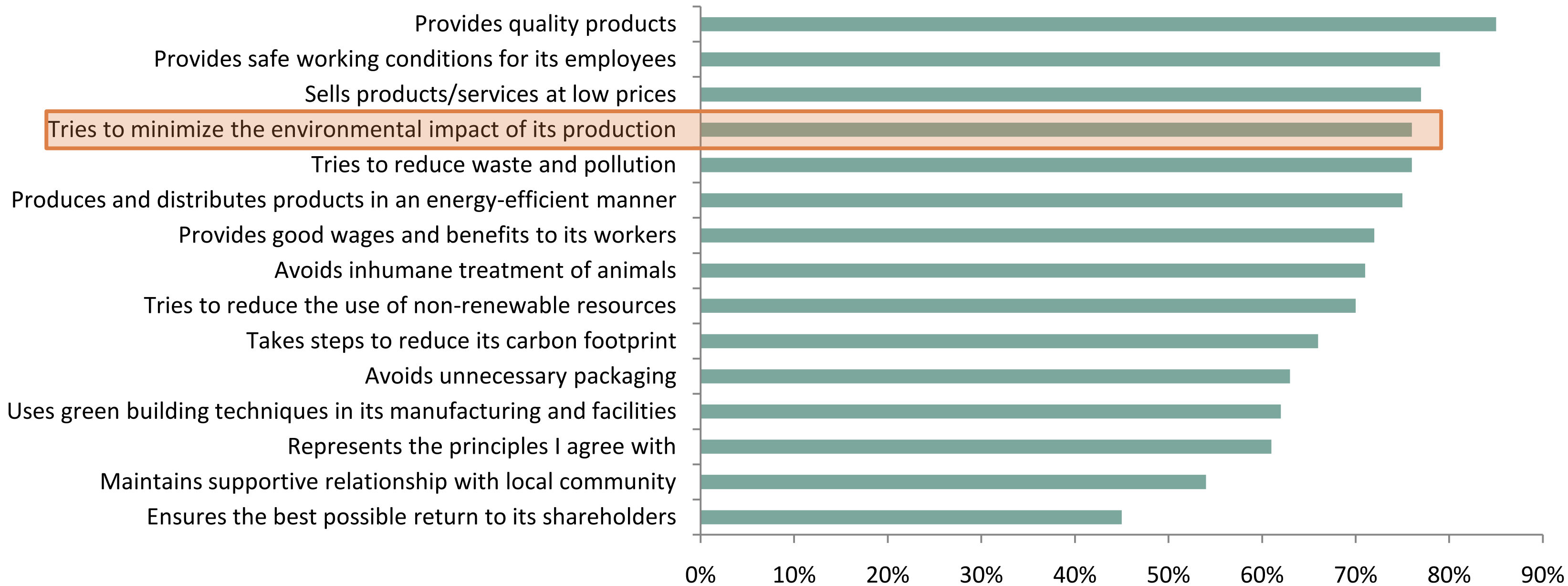
Consumers are the most aware of the following certification schemes :

- USDA Organic
- Fair Trade
- Reduce, Recycle, Reuse
- Not Tested On Animals / Cruelty Free
- Energy Star

Source: Sustainability: The Rise of Consumer Responsibility report. The Hartman Group, Inc. January 2009.

Consumer Purchasing Behavior - It Isn't Just about the Environment

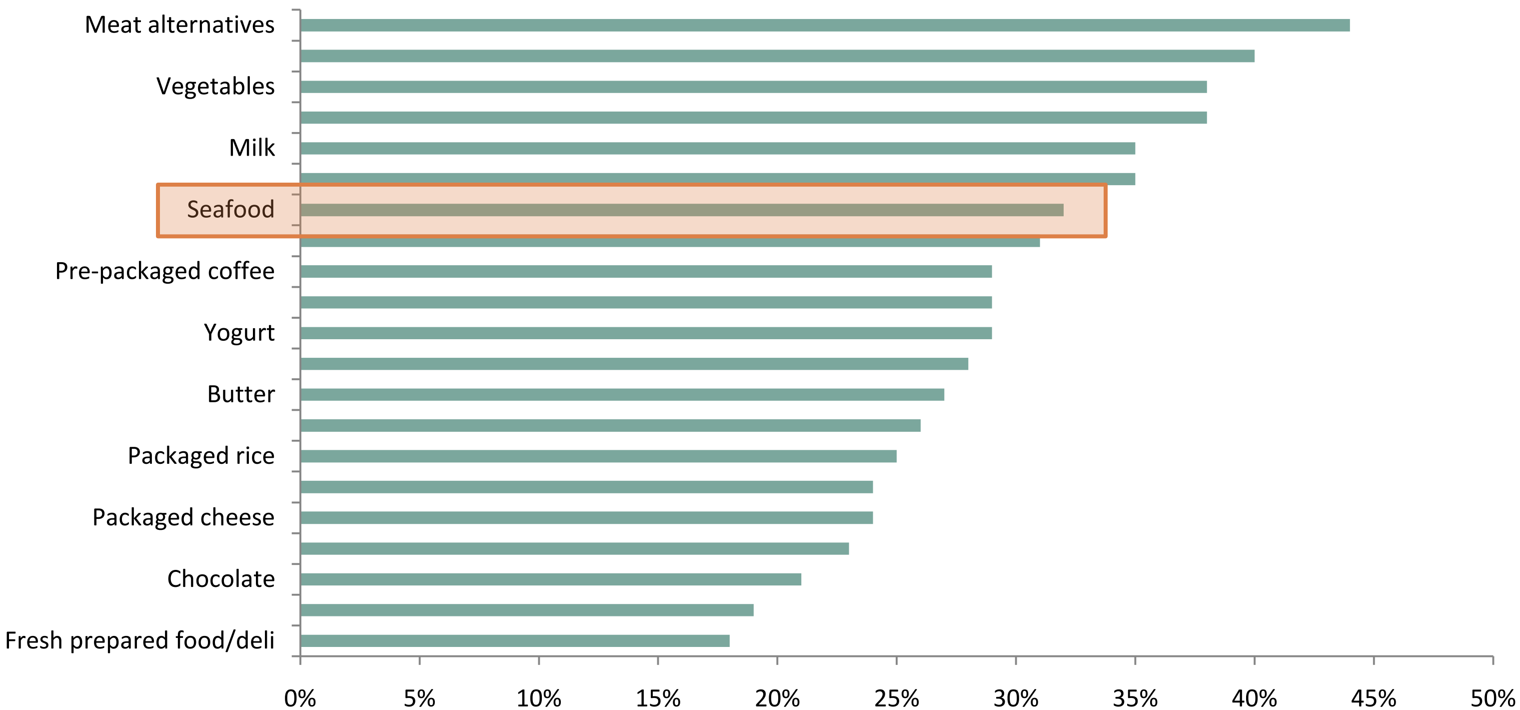
When deciding which product to purchase, how important is it that the company that produces the product…



Source: Sustainability: The Rise of Consumer Responsibility report. The Hartman Group, Inc. January 2009.

32% of people who buy seafood willing to pay 20% more for sustainable products

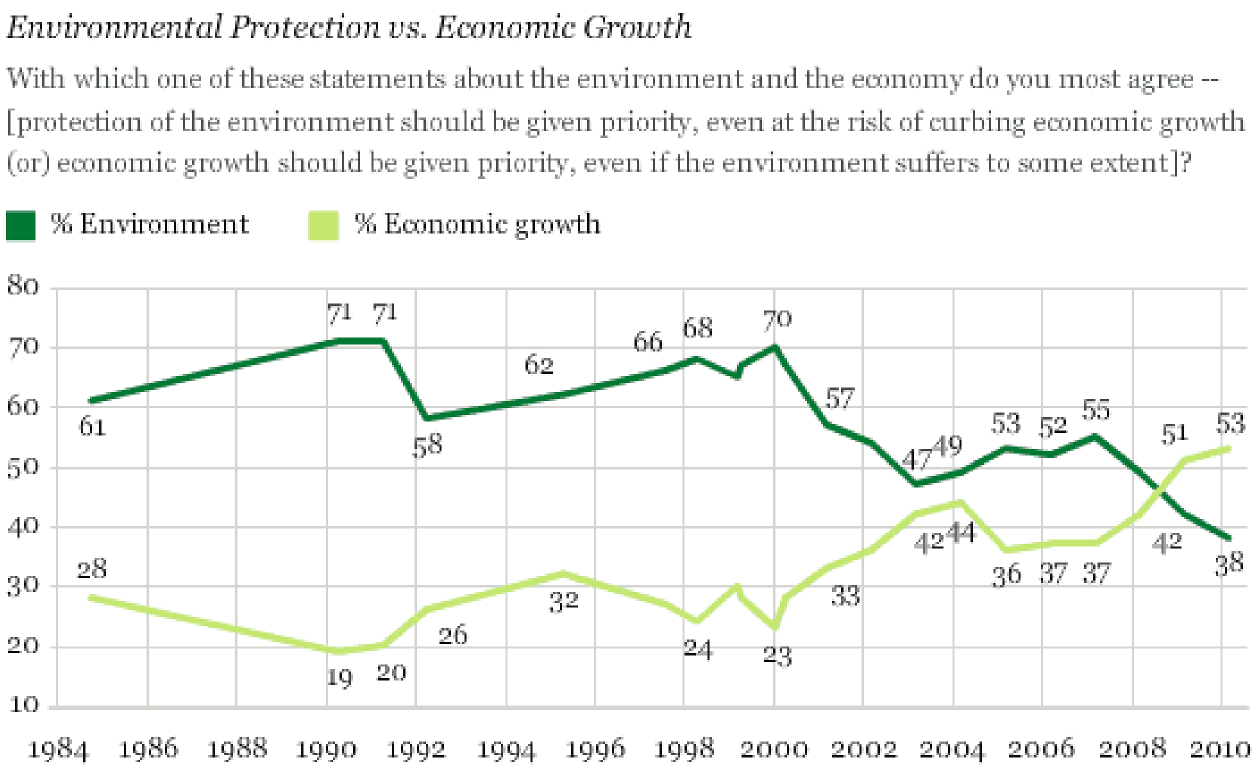
Willingness to Pay a 20% Premium for Sustainable Foods



Source: Sustainability: The Rise of Consumer Responsibility report. The Hartman Group, Inc. January 2009.

Americans say economic growth should take precedence over environment

In the last two years, American consumers have switched their preference – for the first time in recent history – from environmental protection over economic growth to economic growth over environmental protection.



Source: Gallup Poll. Results are based on telephone interviews with a random sample of 1,014 national adults, aged 18 and older, conducted March 4-7, 2010.

CALIFORNIA ENVIRONMENTAL ASSOCIATES

Consumer Survey Data

Findings from online survey conducted by the Perishables Group, which polled more than 1,000 consumers:

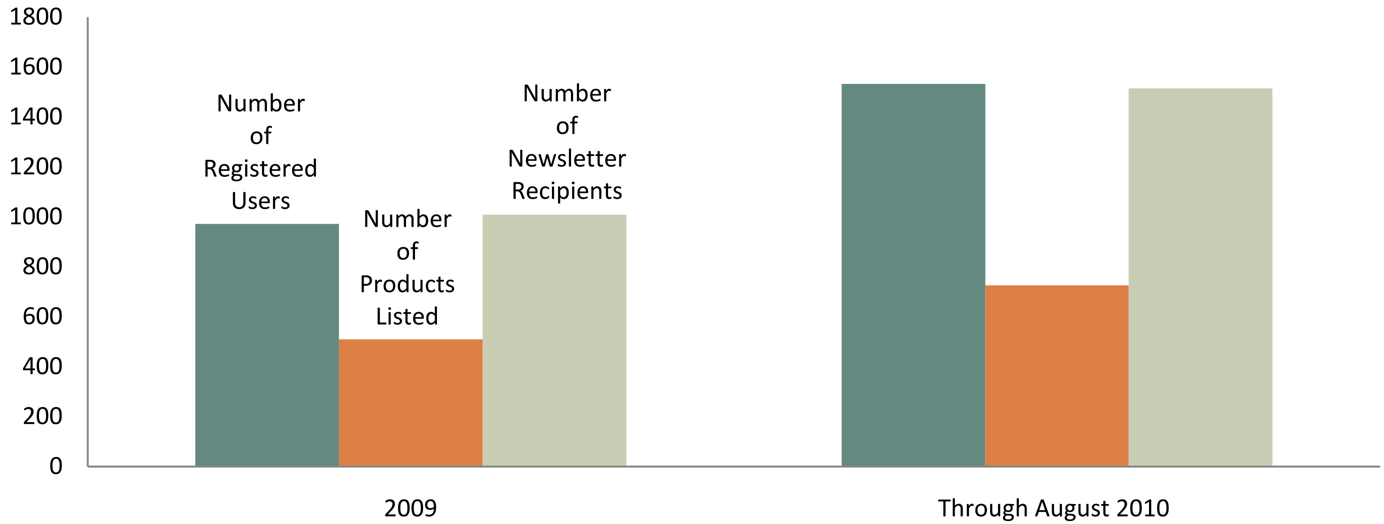
1. Sustainability awareness over-shadowed by seafood safety
2. Un-aided preference for “sustainability” is relatively low and falls significantly below other purchase drivers (safety, price, type)
3. For a majority of consumers, “sustainability” is most easily linked to long term species viability
4. Awareness of “eco-labels” is relative low and, at least as a concept, not powerfully persuasive
5. Aided awareness of sustainability groups themselves is low.
6. Farmed raised products generally receive higher sustainability ratings than similar wild products. U.S. generally ranks higher than imports
7. Self-described “knowledgeable” buyers and consumers under age 35 are much more likely be aware of sustainability, use available seafood guides and note signage/menu information
8. Heavier seafood users rank sustainability higher
9. The best, most consistent supermarket seafood consumers are likely to have the most interest in sustainability issues and are on the lookout for retail messaging.

Source: Perishables Group

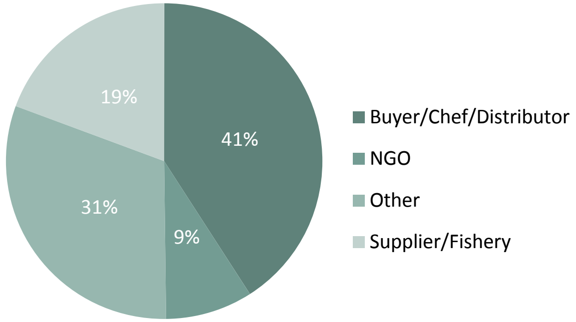
CALIFORNIA ENVIRONMENTAL ASSOCIATES

The Use of FishChoice Is Increasing

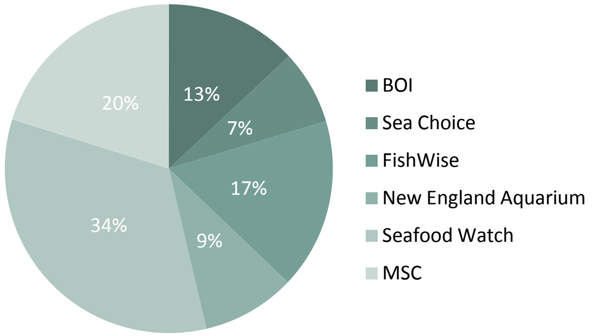
FishChoice Users, Listed Products and Newsletter Recipients



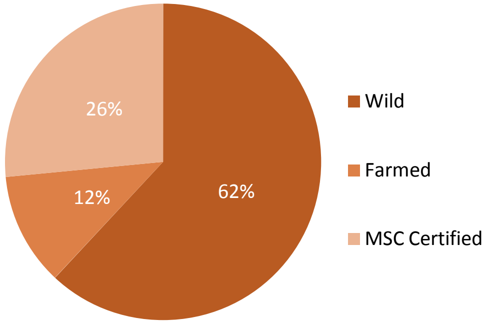
Types of Registered Users



Registered Users by Rating System



Types of Products



Source: Personal Communication with Rich Boot, FishChoice

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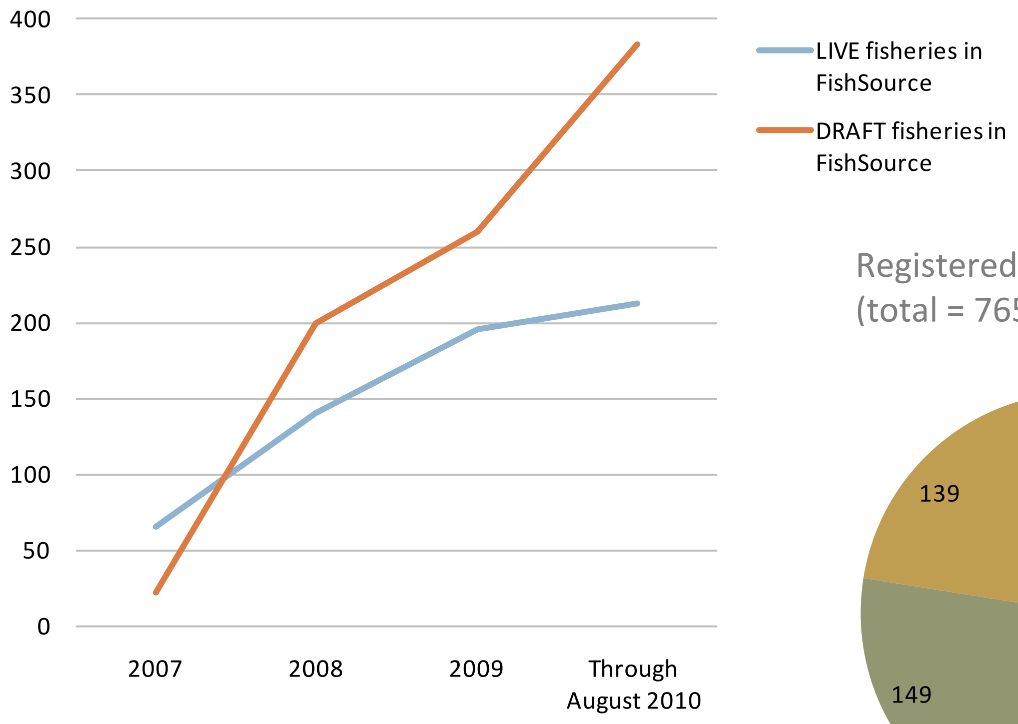
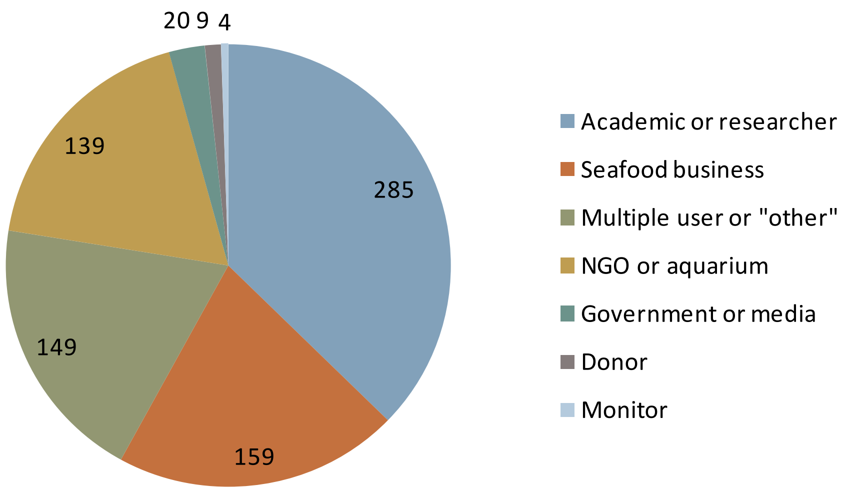
FishSource data

FishSource is growing as an information source. ~20% of its users are from the seafood industry.

Fisheries in FishSource as of Sept. 2, 2010



Registered FishSource users (total = 765, up from 62 in 2008)



OVERVIEW

US trends in fishery exploitation

IMPACT ON THE WATER

Global trends in fishery exploitation

US seafood consumption

FMI's Sustainable Seafood Group

Industry Media

Industry Event Attendance

INDUSTRY MOVEMENT

PROGRESS ON POLICY CHANGE

Policy progress

Retail/Food Service - NGO Partnerships

Greenpeace's scorecard data

BUSINESS RELATIONSHIPS

WORKING THROUGH THE SUPPLY CHAIN

Traceability data

Media and Literature Penetration

Seafood Card Distribution

FSG FMI survey data

LOHAS data

FishChoice data

FishSource data

CREATING CONDITIONS FOR BUSINESS CHANGE

PRODUCER PERSPECTIVES

Certification Data

Fishery Improvement Partnerships

Timeline of major marine policy legislation

2006
- Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006

2007
- Catch share program implemented for Gulf of Mexico Red Snapper fishery
- MLPA - MPA plan for California's Central Coast is approved
- North Pacific Fishery Management Council closes the northern Bering Sea to bottom trawl fishing

2008
- Massachusetts Ocean Act enacted
- IFQ system approved for West Coast groundfish trawl fleet

2009
- MLPA - MPA plan for California's North Coast is approved
- Final regulations released protecting almost 200,000 square miles of U.S. Arctic waters from industrial fishing

2010
- Catch share program implemented for Gulf of Mexico Tilefish and Grouper fisheries
- Obama signs Executive Order establishing a National Ocean Policy
- NMFS implemented a sector-based management system for groundfish in New England
- Nantucket Sound offshore wind farm approved by federal government

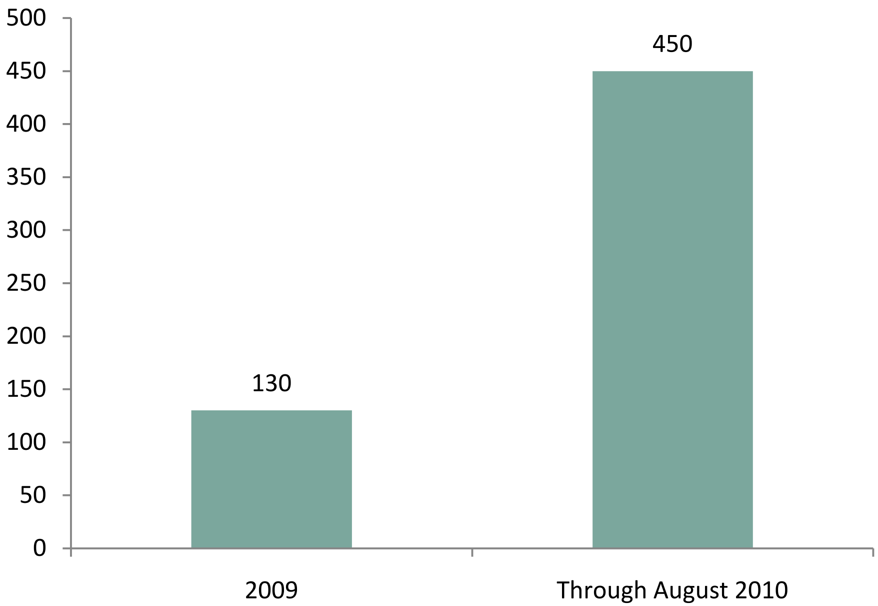
OVERVIEW

US trends in fishery exploitation	IMPACT ON THE WATER		Global trends in fishery exploitation
US seafood consumption FMI's Sustainable Seafood Group Industry Media Industry Event Attendance	INDUSTRY MOVEMENT	PROGRESS ON POLICY CHANGE	Policy progress
Retail/Food Service - NGO Partnerships Greenpeace's scorecard data	BUSINESS RELATIONSHIPS	WORKING THROUGH THE SUPPLY CHAIN	Traceability data
Media and Literature Penetration Seafood Card Distribution FSG FMI survey data LOHAS data FishChoice data FishSource data	CREATING CONDITIONS FOR BUSINESS CHANGE	PRODUCER PERSPECTIVES	Certification Data Fishery Improvement Partnerships

CALIFORNIA CEA ENVIRONMENTAL ASSOCIATES

Interest in traceability is expanding

Number of companies using the TraceRegister System is increasing



Source: Personal Communication with Andy Furner, TraceRegister

- From 2009 to 2010, there was a 350% increase in companies using the TraceRegister system.
- TraceRegister's current customer base includes a high percentage of leading retailers in the U.S. and a good number of the leading seafood suppliers.

Continued efforts to improve access to traceability data

- The National Fisheries Institute and GS1 US are developing Guidelines for Seafood Traceability in an effort to enhance product tracing and support food safety.
- The final guidelines should be available by September or October, 2010.
- The guidelines will cover traceability from "vessel to retailer," including raw materials, ingredients, food contact packaging and finished goods.

http://supermarketnews.com/news/seafood_traceability_0611/

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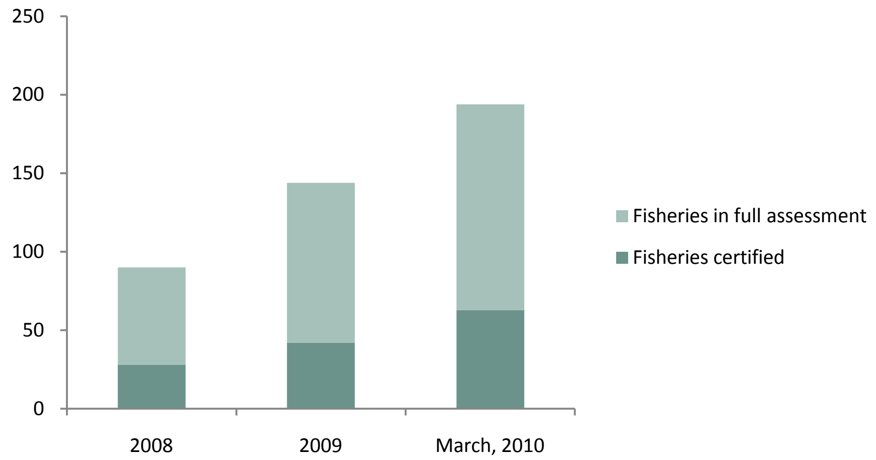
CALIFORNIA ENVIRONMENTAL ASSOCIATES

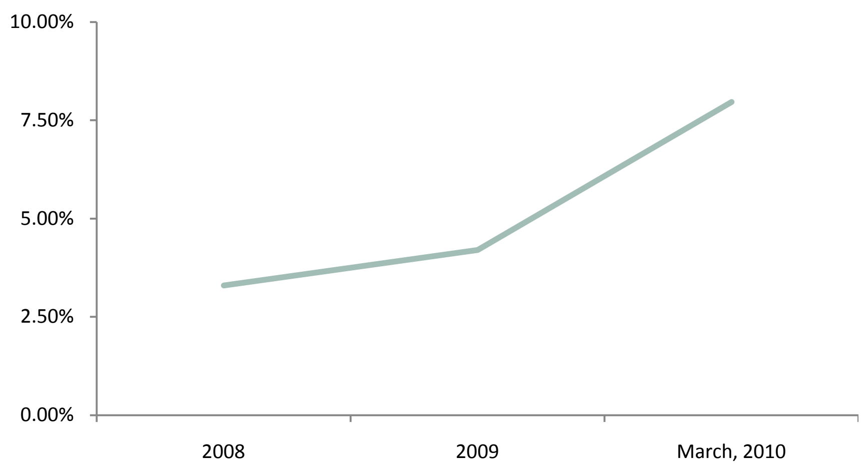
The Number of MSC Certified Fisheries Continues to Increase…

MSC Certified Fisheries and Fisheries in Full Assessment



The number of certified fisheries and fisheries in full assessment has doubled since 2008

MSC Certified Fisheries as a Percentage of Total Wild Catch



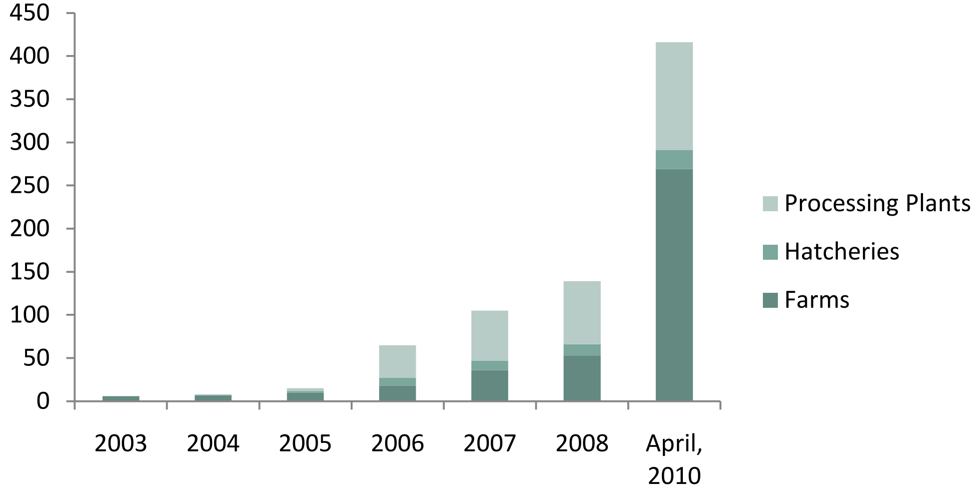
Source: Personal Communication with Mike DeCesare, MSC

MSC certified seafood is now 8% of global wild seafood landings; 12% if we include fisheries in full assessment

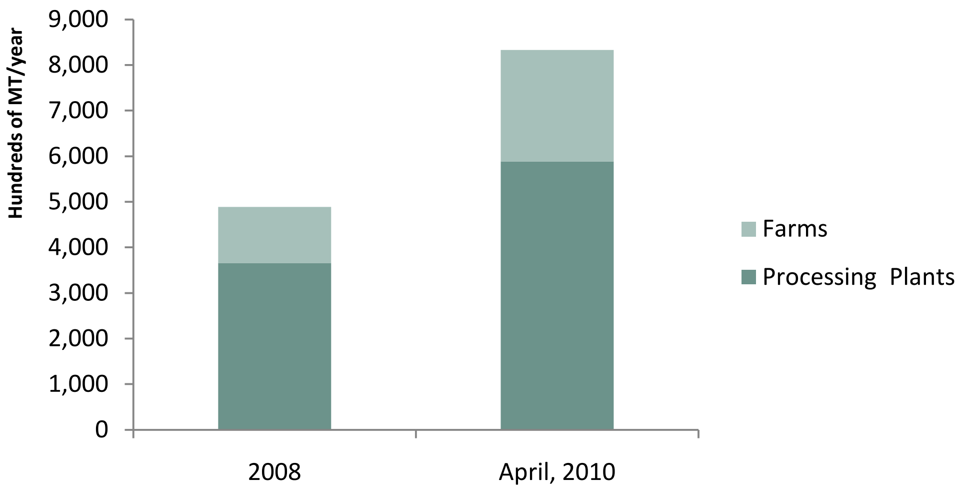
In the U.S., 60% of landings are certified or in full assessment

The Number of GAA Certified Farms Continues to Increase…

GAA Certified Farms, Hatcheries and Processing Plants



GAA Certified Volume

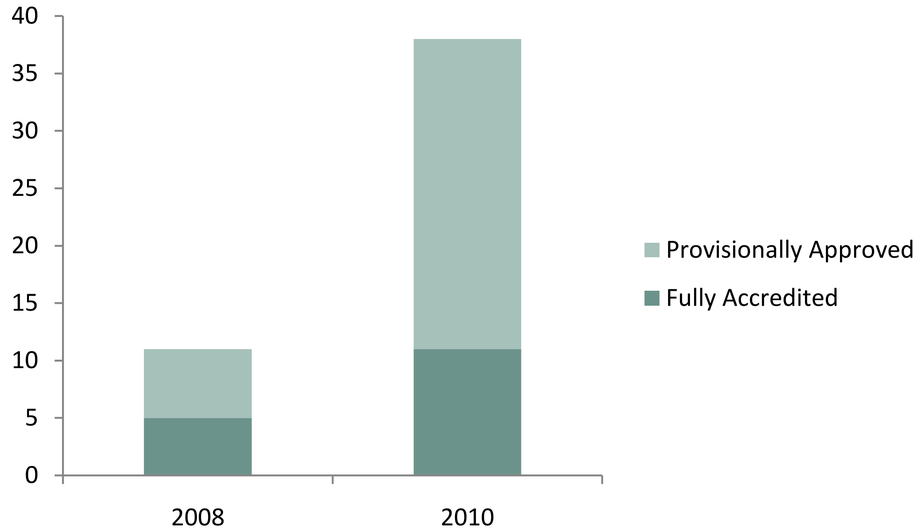


Source: Personal Communication with Daniel Lee, Global Aquaculture Alliance

- The number of GAA certified farms has increased five times since 2008.
- But GAA Certified seafood remains only .18% of the market for farmed seafood.
- GAA has developed standards for:
  - Shrimp
  - Catfish
  - Tilapia
- GAA is developing standards for:
  - Pangasius
  - Salmon
  - Mussels

GlobalGAP

GlobalGAP Accredited and provisionally approved certification bodies



- GlobalGAP has developed standards for:
  - Salmonids
  - Shrimp
  - Tilapia
  - Pangasius

Source: GlobalGAP website

ASC

Aquaculture

By volume, almost half of the seafood we eat is from aquaculture – the fastest growing food production system in the world – and aquaculture's contribution is expected to continue to rise. There are a host of negative environmental impacts from aquaculture operations including pollution, the use of reduction fisheries in fish feed, disease, and mixing of genetics from escaped fish. However, no existing certifications are effective in making the aquaculture industry more sustainable.

Aquaculture Dialogues

Eight multi-stakeholder groups are creating global standards designed to minimize the key negative environmental and social impacts related to 12 aquaculture species: salmon, shrimp, tilapia, trout, pangasius, Seriola, cobia, abalone, mussels, clams, oysters and scallops. With minor exceptions, the standards will be quantitative performance levels farmers must reach to become certified. More than 2,000 aquaculture producers, conservationists, scientists and others are involved in the process, which is coordinated by World Wildlife Fund (WWF). The first set of standards, for tilapia, was completed in December 2009 and the remainder are expected to be finalized in 2010.

Aquaculture Stewardship Council (ASC)

The ASC is being created by WWF and The Dutch Sustainable Trade Initiative (IDH) to work with independent, third party entities to certify farms that are in compliance with the standards for responsible aquaculture being created by participants of the Aquaculture Dialogues. WWF and IDH also have committed to being two of the funders of the ASC when it is created, but will not have a controlling interest in ASC. The ASC will be the most credible entity for environmental and social standards because its standards will be measurable, based on sound science, created by a broad and diverse group of stakeholders, and developed through a transparent process.

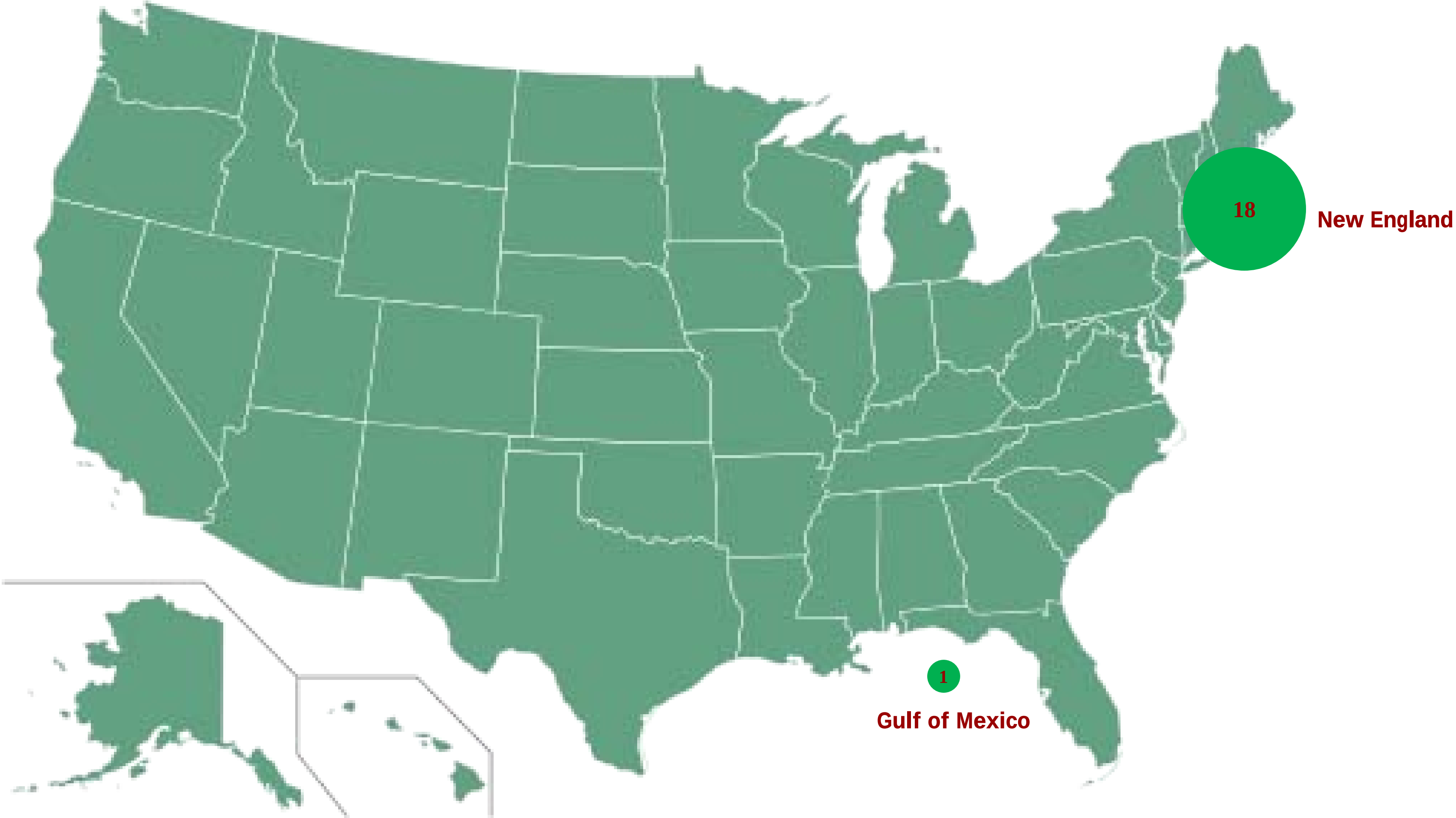
Source: GlobalGAP website

FIPs are growing in popularity worldwide, and show promise as a new tool for increasing buyer engagement and pressure

Source: CEA survey of NRDC, EDF, SFP, WWF, GMRI

CALIFORNIA ENVIRONMENTAL ASSOCIATES (CEA)

Number of domestic FIPs by region (with market partners)



19 **Total Number of FIPs Identified in Survey**

Survey respondents estimated landings of 640k MT covered by FIPs in the US

Source: CEA survey of NRDC, EDF, SFP, WWF, GMRI