

Seafood Market Tracking Metrics

June - December 2008

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Executive summary

Overarching Findings

- Substantial penetration and growth in business engagement over the last several years - “sustainability” becoming an accepted concept.
- Certification is growing quickly, though from a small base. MSC has made huge strides in certification, though fewer in labeling. Aquaculture certification is a more diverse effort.
- Issue salience of sustainable seafood grew through 2007, though outreach efforts (publications, etc.) may be slowing. Danger of issue fatigue.
- With the limited data available to date (2004 & 2006), we cannot demonstrate any significant changes to US consumption.
- General engagement of consumers in the LOHAS space is increasing - shows promise.

Overview of CCIF's project

Project description

- Purpose: Initiate systematic tracking effort to gauge impact of program to change the market for seafood
 - Effort broadly maps to Bridgespan's 2004 recommendations to Packard
 - Gathered all readily-available data

- Important qualities of 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

Overview of CCIF's project (cont'd)

Data Compiled

Metrics divided across Bridgespan's three pillars of the sustainable seafood movement. Additional metrics on seafood consumption and overarching consumer demographics added.

- Retailer engagement
- Restaurants
- Foodservice operators
- Broadline and specialty distributors
- Seafood industry media

Industry
Engagement

Certification

- MSC
- ACC
- Organic (Naturland)
- GlobalGAP
- FMI
- Aquaculture Dialogues

- General media hits
- Consumer engagement

Issue
Salience

Consumption

- US seafood consumption
- Key red list species and campaign species

Consumer
Demographics

- General trends in the LOHAS space
- Academic research into ecolabels/WTP

Industry engagement

Industry engagement > Certification > Issue salience > Consumption > Consumer demographics

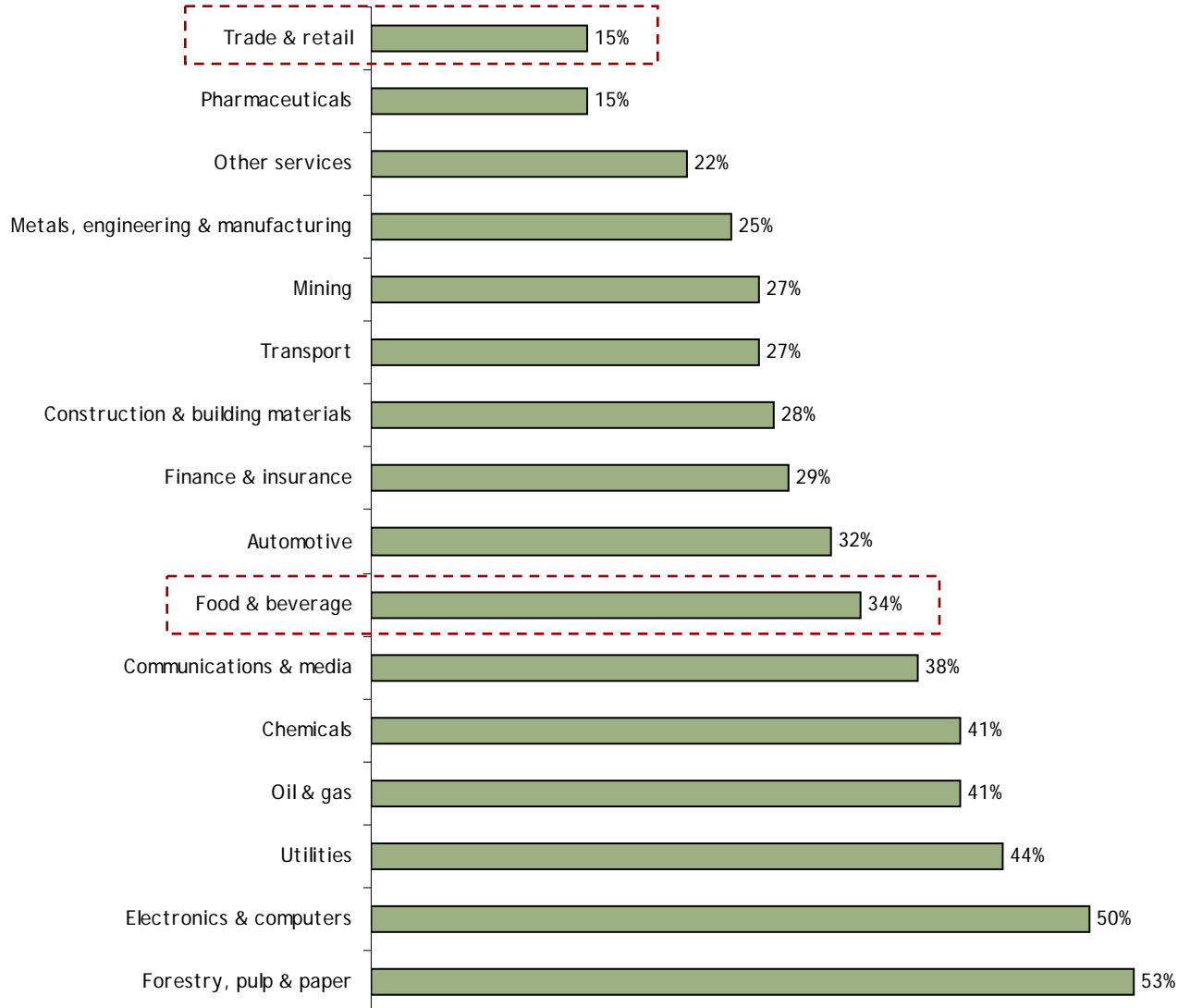
Progress has been substantial with retail & foodservice, though elusive with processors and distributors

	# companies w/NGO	% market share w/NGO	Rating (weighted by % market share)				Details (\$ millions)
			CASS	FMI STF	Sustainable seafood policy	General sustainability	
Top 75 retail chains	4 (of top 75)	35% of top 75 retail chains	1.6	1.9	1.6	2.2	Partnerships: 1. Ahold - NEAq 2. Wegmans - EDF 3. Wal-Mart - WWF, SFP, MSC 4. Overwaitea Food Group - Sea Choice Sales of companies with NGO partner = \$268,000 Total sales of top 75 retail chains = \$776,000
Top 10 seafood restaurant chains	2 (of top 10)	72% of top 10 restaurant chains	1.2	N/A	1.7	2.8	Partnerships: 1. Red Lobster - NEAq, WWF 2. King's Fish House - Long Beach Aq 3. McDonalds - SFP Sales of companies with NGO partner = \$10,512 Total sales of top 10 restaurant chains = \$14,681
Top 7 foodservice operators	3 (of top 7)	89% of top 7 foodservice operators	2.5	N/A	1.1	2.9	Partnerships: 1. Compass Group - MBA 2. Sodexo - MBA and Seafood Choices Alliance 3. Aramark - MBA Sales of companies with NGO partner = \$18,815 Total sales of top 7 foodservice operators = \$21,238
Top 25 processors	3 (of top 25)	6% of top 25 processors	1.1	N/A	1.7	1.4	Partnerships: 1. Orion Seafood - NEAq 2. Eastern Fish Co - SFP 3. Phillips - SFP Sales of companies with NGO partner = \$734 Total sales of top 25 processors = \$11,598
Top 10 broadline distributors	0	0% of top 10 broadline distributors	N/A	N/A	N/A	N/A	Sysco in discussions Sales of companies with NGO partner = \$0 Total sales of top 10 broadline distributors = \$74,965
Top 44 speciality distributors	2 (of top 44)	No public information	N/A	N/A	N/A	N/A	Plitt - Ocean Conservancy Santa Monica Seafood - Ocean Conservancy

▪ Number of retail chains and stores partnered with FishWise: 19 chains with 46 stores

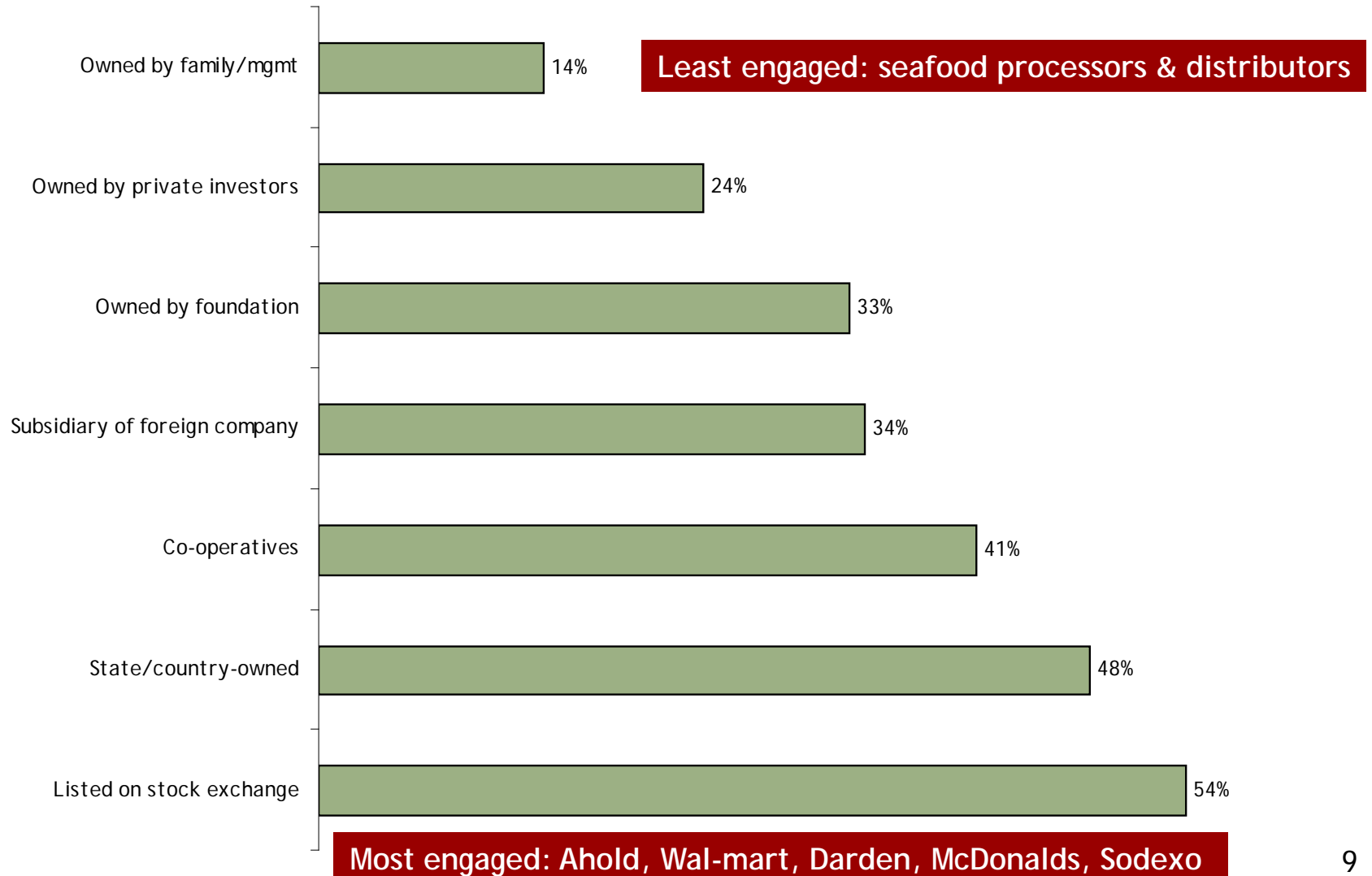
Seafood industry appears average to below-average in general CSR engagement

Percentage of N100 reporting business value of CSR



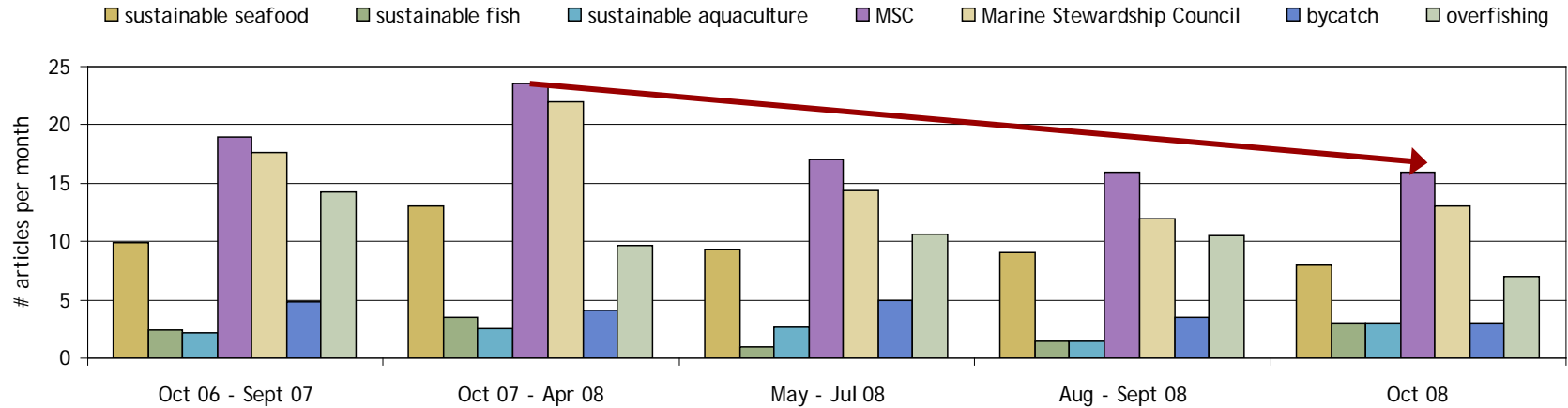
CSR engagement influenced by corporate ownership structure

Percentage of 100 largest companies by revenue in 22 countries (N100) with publically available CSR strategy

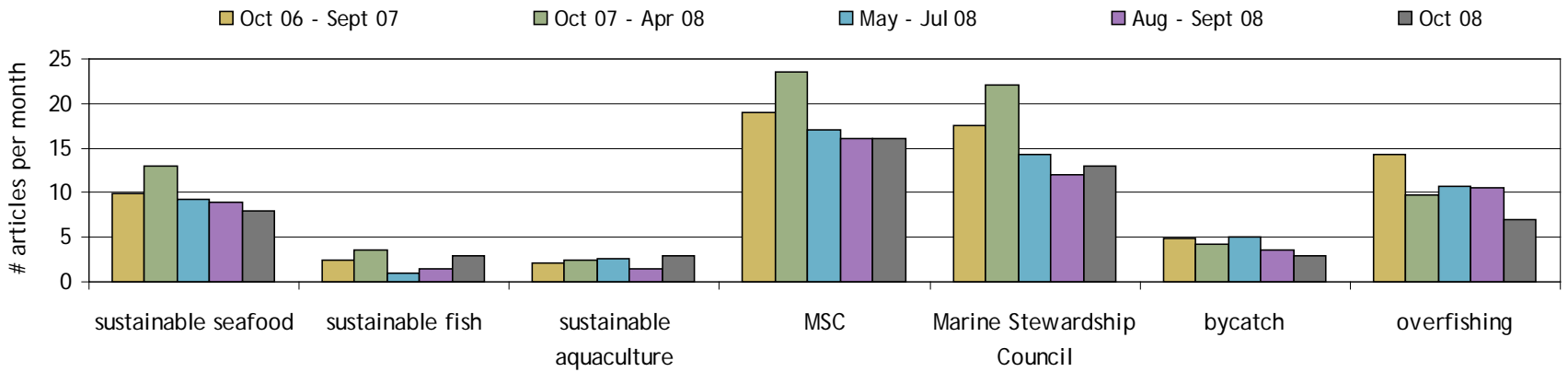


Coverage by industry media (IntraFish.com) no longer growing: coverage has fallen from its peak last year

Number of articles per month containing key terms published by www.IntraFish.com

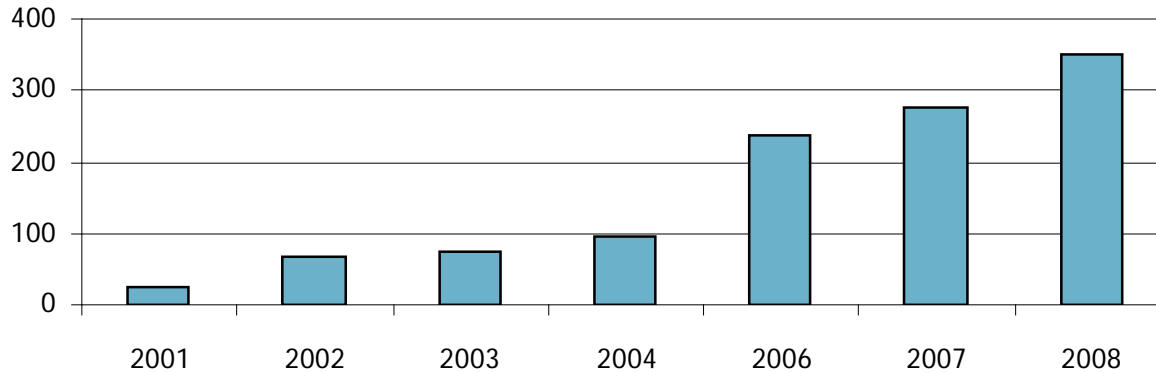


Trend shows slight decline, but stabilization over the last 6 months



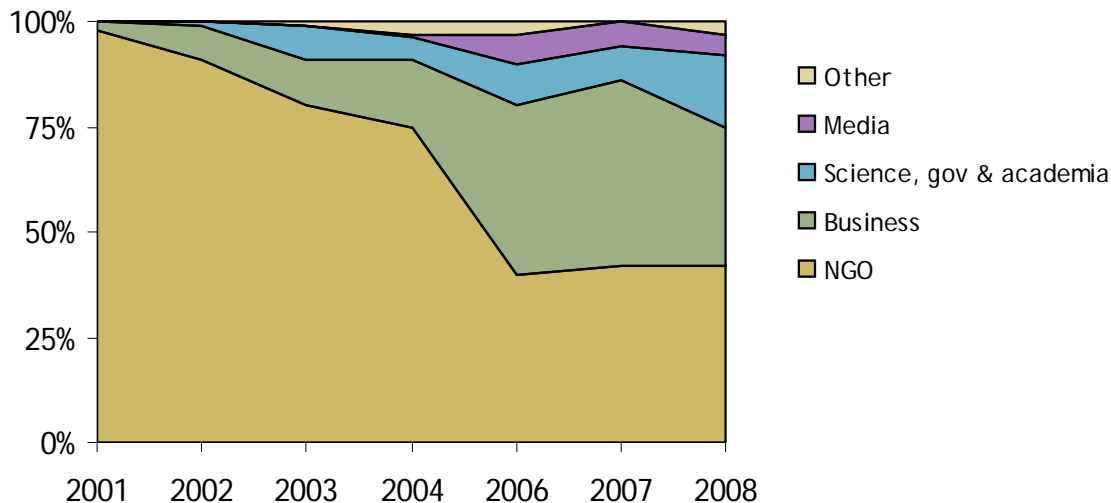
Business attendance at Seafood Summit also peaked in 2007

Total number of attendees



YOY growth	2002	2003	2004	2006	2007	2008
	168%	9%	30%	151%	16%	27%

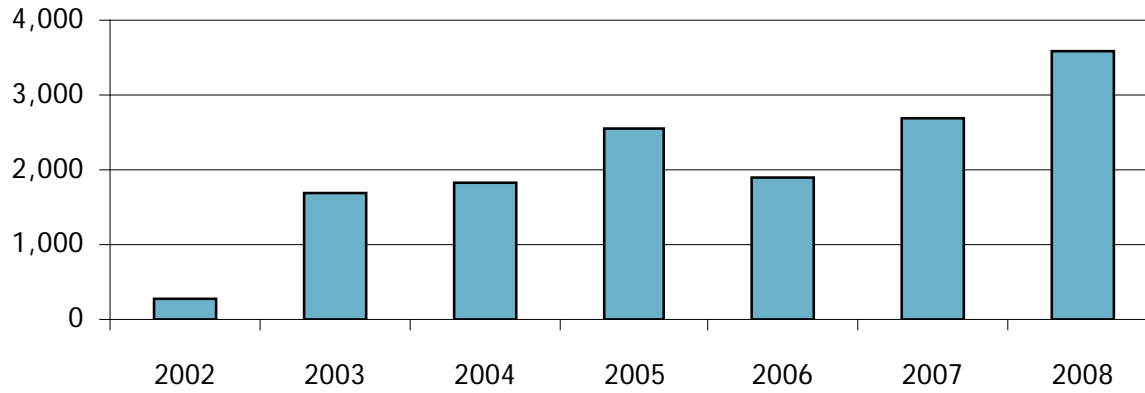
Composition of attendees



**In last 3 years,
business accounted
for ~40% of
attendance,
compared to ~10%
in first 4 years**

Interest from chefs/restaurants in seafood publications has increased

Total number of Afishianado subscribers



YOY growth

550%

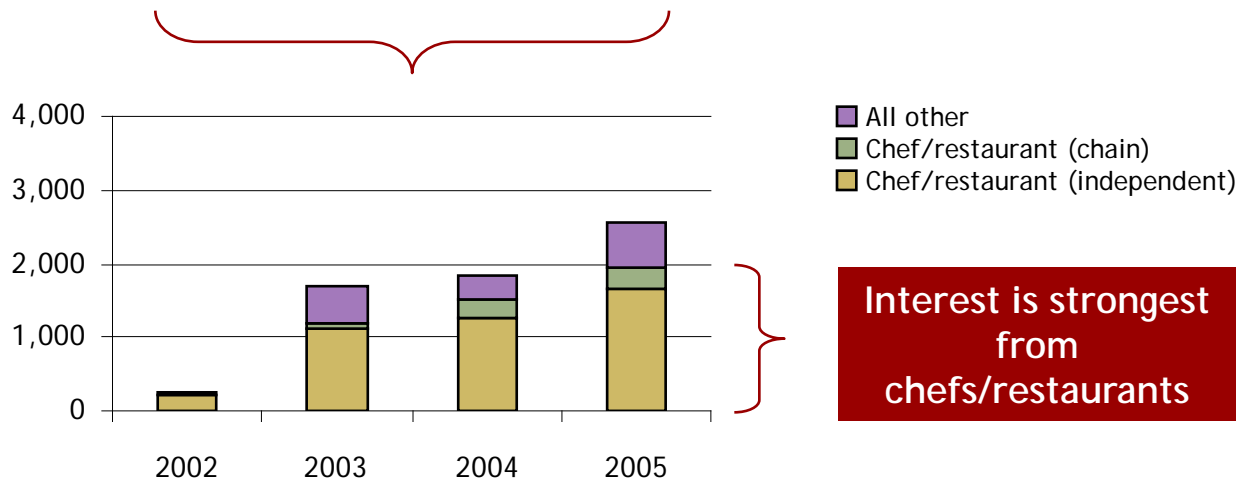
8%

40%

(26%)

42%

33%



Interest is strongest
from
chefs/restaurants

Coverage on sustainability by seafood industry publications shows higher buy-in and development of a more nuanced understanding

Accepting there is a problem and understanding the problem

- Importance of sustainability
 - “Sustainability” has become a part of seafood industry’s lexicon
 - Long-term profitability (via secure and abundant supply) was original impetus for first-mover companies (i.e. Unilever), and continues to be a driver
 - A secondary driver has emerged: “green” marketing to increase sales and product differentiation
- Definition of sustainability
 - Has become more nuanced and expansive
 - No longer just wild vs. farmed debate, or bycatch and habitat impacts
 - Now includes packaging and carbon footprint of fishing/processing operations, food miles and form of transportation (i.e. air vs. ocean freight)
- Stage of sustainability movement
 - At (or maybe past) the tipping point?
 - But still at early stage, in search of solutions and consensus (between industry and NGO, and among NGOs)

Increasingly, seafood industry media has moved past describing the problem, and towards discussing solutions and barriers

Common viewpoints on solutions and barriers to implementation

- Aquaculture
 - Strong disagreement still exists between industry/government and NGOs on whether aquaculture lessens pressure on wild fisheries
 - Preference for farmed, non-carnivorous species benefits China (safety tradeoff)
- Certification and eco-labels
 - Widely viewed as an important tool for promoting sustainability, but not the only tool
 - Proliferation of standards and lack of consensus hindering market adoption and consumer trust
 - Expect harmonization/convergence and consolidation of regimes
- Consumer education
 - Red/yellow/green cards are important, but so is increasing familiarity of new, more sustainable species and cooking preparation
- Market premiums
 - Higher production costs for sustainable seafood generally viewed as unavoidable (at present)
 - Price premiums for producers still do not exist; producers experience pushback from retailers, unable to pass costs onto consumers
 - Cooperative buying and volume purchases by major buyers are beginning to remove cost barriers

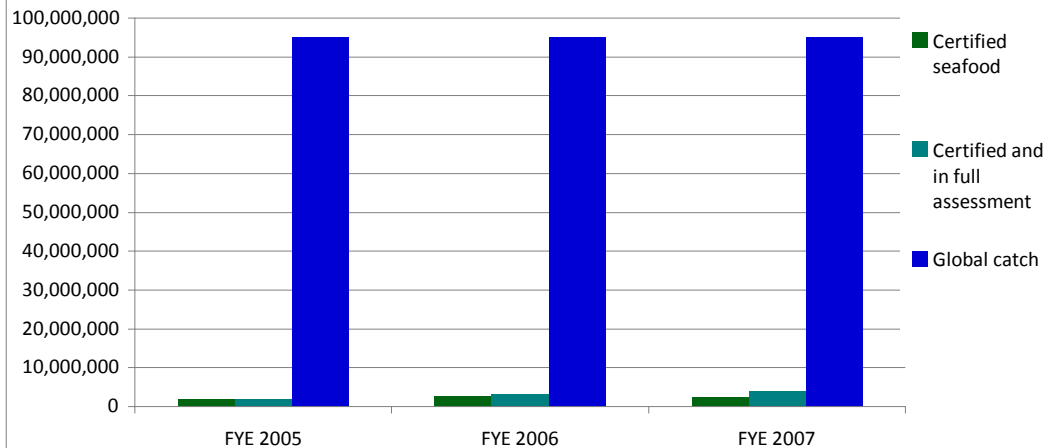
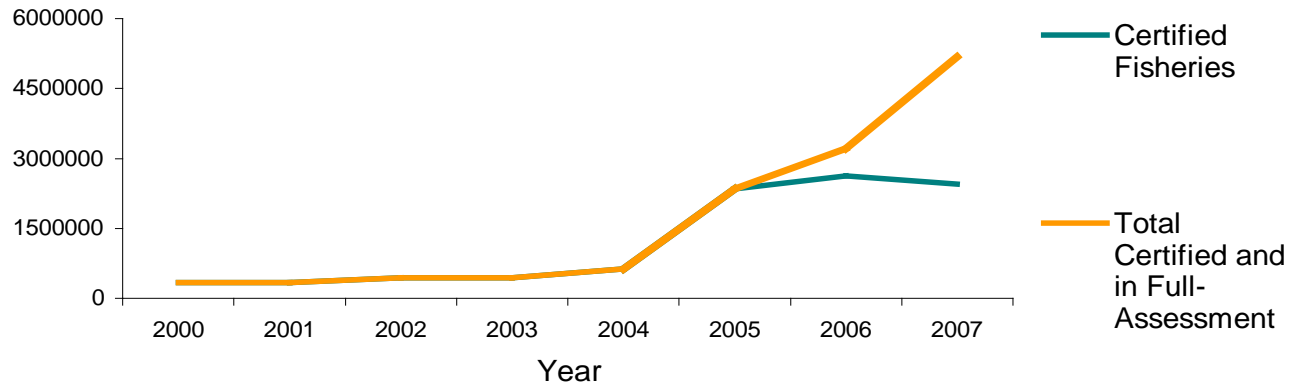
Certification

Industry engagement > **Certification** > Issue salience > Consumption > Consumer demographics

MSC certification steadily growing

Steady increase in volume of MSC certified fisheries since 2004

Total Allowable Catch (TAC) of MSC-Certified Fisheries and Fisheries in Full Assessment (2000-2007)

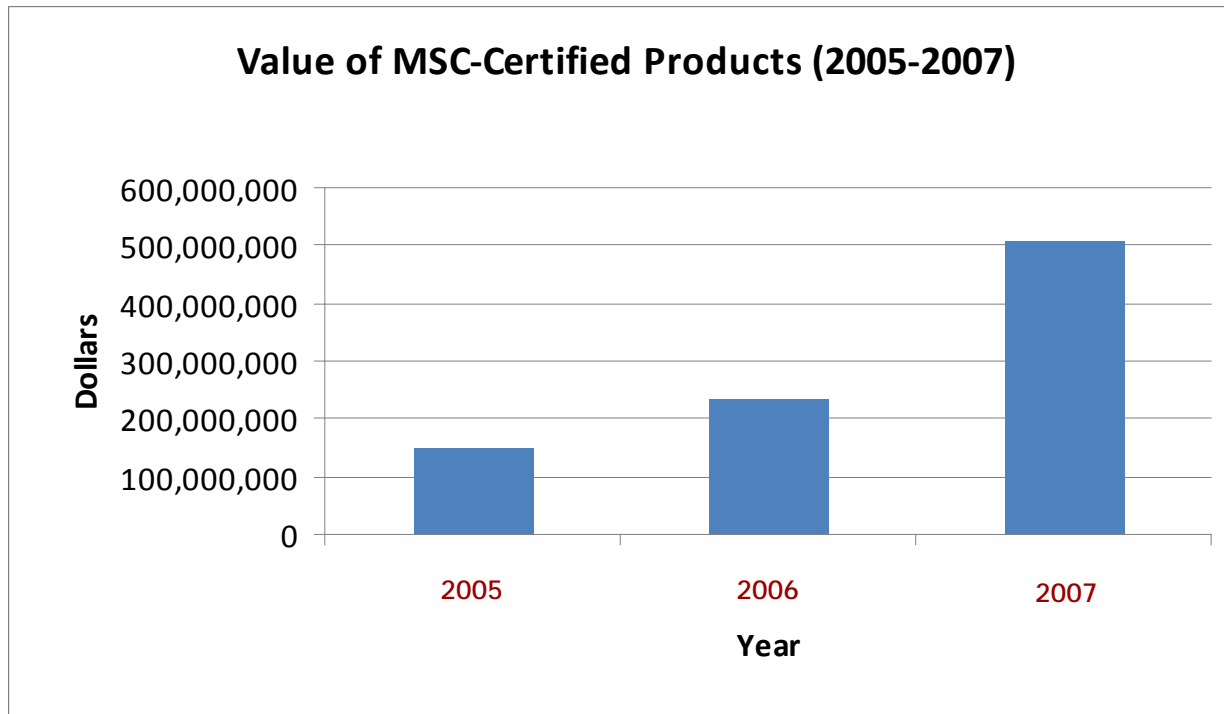


Number of fisheries

- 35 fisheries certified
- 78 fisheries in full assessment
- 20-30 fisheries in pre-assessment

MSC certification steadily growing

Steady increase in value of MSC certified products, but from a low baseline

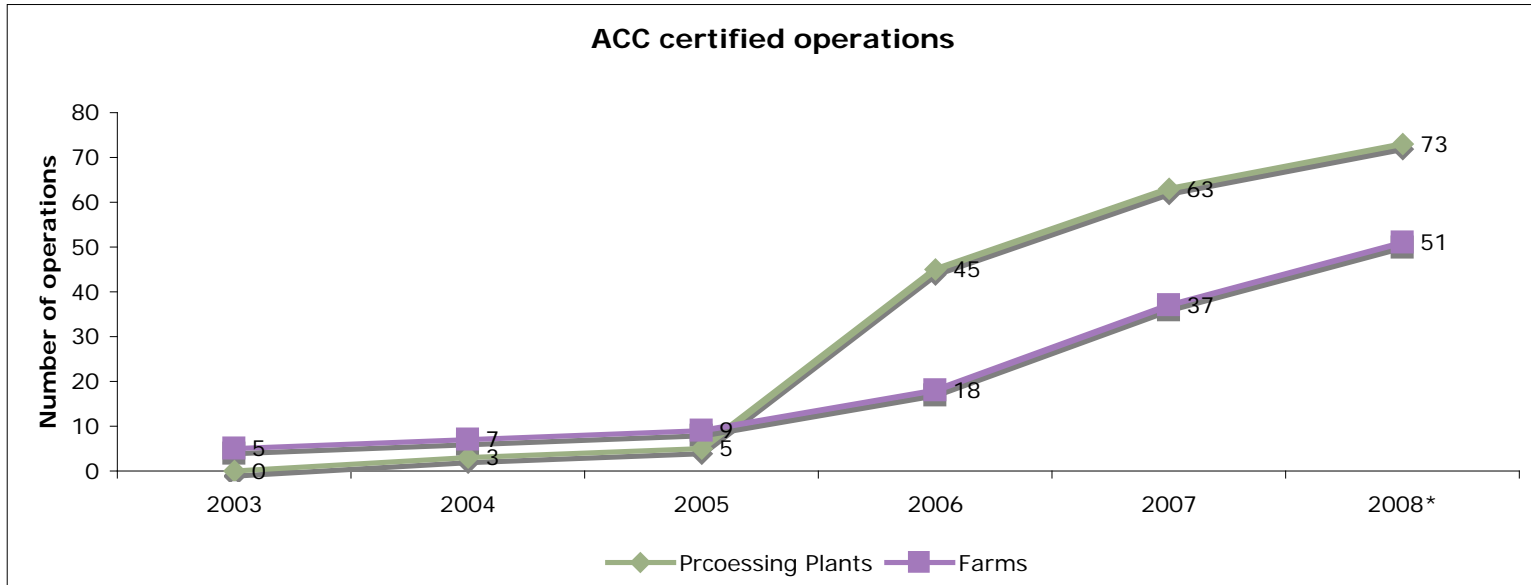


Number of products

- Products bearing the MSC label: 1,800+
- Retail value of products bearing the MSC logo in 2008: approximately \$1 billion

ACC certification also growing, though not as rapidly

Steady increase in ACC certification, almost exclusively shrimp



Certification mostly just at the processor level

- 2008 certified product through Oct. 31
 - 123,000 MT shrimp farmed
 - 365,700 MT shrimp processed
- Farming & processing standards exist for tilapia, catfish and shrimp.
- Hatchery standards only for shrimp.

Additional metrics

- 23 registered buyers
- 113 independent inspectors

Organic certification underway - Naturland is the organic leader*

Naturland Organic Aquaculture Operations as of October 2008

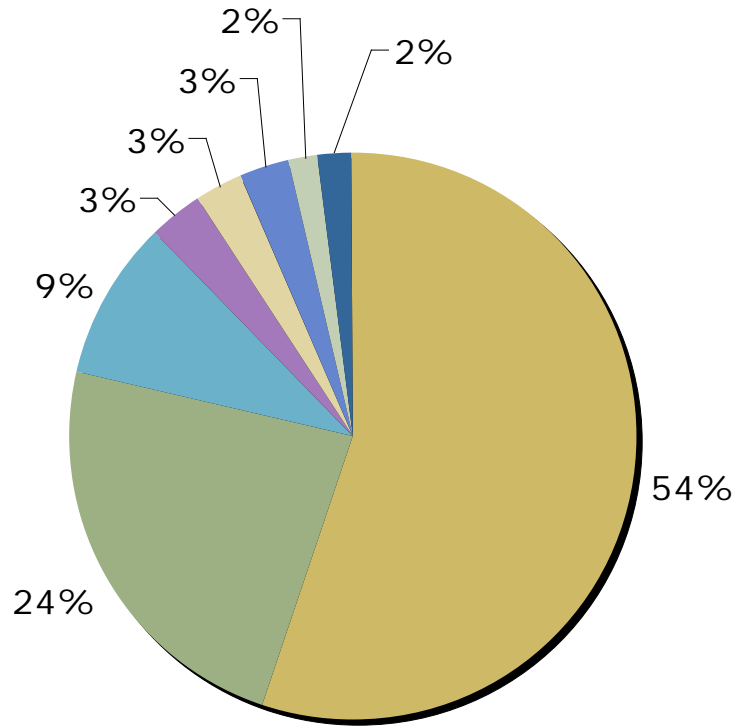
Country	No. farms per count	Trout	Seabass and Seabream	Carp	Salmon	Shrimp	Tilapia	Pangasius	Cod	Micro algae	Silver Carp	Mullet	Grass Carp	(Red) Drum
Germany	10	9		1										
Ireland	5				5									
Norway	1								1					
Spain	1	1												
Italy	1	1												
France	1	1												
Greece	2		2											
UK	2				2									
Ecuador	7					6	1							
Peru	1						1							
Vietnam	2						1	1						
China	2									2				
Taiwan	1									1				
Thailand	1						1							
Israel	7			1			2				1	1	1	1
India	2									2				
Brazil	2					2								
Honduras	1						1							
Volume (T)		380	700	55	12300	5300	590	2000	640	300	32	30	4	25

* Naturland will be publishing a global organic aquaculture survey in December 2008 that will provide additional baseline data about the status of organics. 19

Natural certification diverse

Production concentrated in salmon and shrimp

Natural Aquaculture - Production by Species

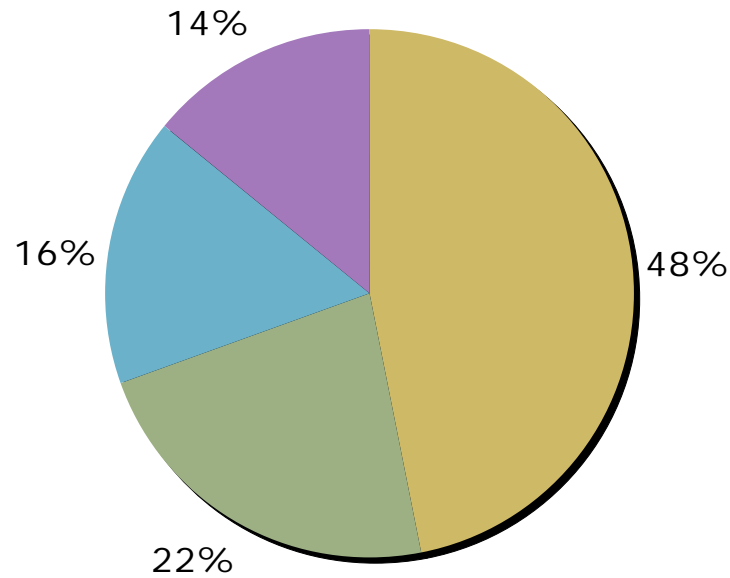


■ Salmon ■ Shrimp ■ Pangasius ■ Seabass ■ Cod ■ Tilapia ■ Trout ■ Other

Naturland certification diverse

Production concentrated in Europe (trout) and South America (shrimp)

Naturland Aquaculture - Operations by Region



■ Europe ■ South America ■ Asia ■ Israel

GlobalGAP certification starting up

ALL GLOBALGAP Standards are scheduled for completion 1st Q 2009

Timeline for GLOBALGAP Aquaculture Standard Development

Milestones	Salmonids	Shrimp	Tilapia	Pangasius
Application	complete	complete	complete	complete
Acceptance	complete	complete	complete	complete
1st Public Consultation	complete	complete	Oct-08	Mar-08
Trial Audits	complete	complete	complete	May-08
2nd Public Consultation	complete	complete	?	Oct-08
Interim Final Version	complete	complete	?	?
Final Approval	complete	complete	1st Q 2009	1st Q 2009

Currently accredited and provisionally approved certification bodies

	Salmonids	Shrimp	Tilapia	Pangasius
Fully Accredited	5	-	-	-
Provisionally Approved	2	4	-	-

Aquaculture Dialogues also underway

All Aquaculture Dialogue standards are projected to be completed by the end of 2010

Timeline for Aquaculture Dialogue Standard Development

Milestones	Abalone	Molluscs	Pangasius	Salmon	Seriola/Cobia	Shrimp	Tilapia	Trout
Impacts	complete	complete	complete	complete	Feb-09	complete	complete	complete
Goals and Objectives	complete	complete	complete	complete	Feb-09	Nov-08	complete	complete
Steering Committee Structure	Feb-09	complete	complete	complete	Feb-09	complete	complete	complete
Steering Committee Members	Feb-09	Jan-09	complete	complete	Apr-09	complete	complete	complete
Dialogue-specific process document	Feb-09	Apr-09	complete	complete	Jul-09	Dec-08	complete	Apr-09
Principles	complete	complete	complete	complete	May-09	complete	complete	complete
Criteria	Feb-09	complete	Dec-08	Mar-09	Oct-09	Mar-09	complete	Apr-09
Indicators	Jun-09	May-09	Dec-08	Jun-09	Dec-09	Jun-09	complete	Apr-09
Standards	Jun-09	Jul-09	Jun-09	Dec-09	Feb-10	Jun-09	complete	Nov-09
1st public comment period begins	Jun-09	Aug-09	Jul-09	Jan-10	Mar-10	Jun-09	complete	Nov-09
2nd public comment period begins	Aug-09	Oct-09	Oct-09	May-10	Jul-10	Sep-09	Dec-08	Feb-10
Final standards posted	Nov-09	Dec-09	Dec-09	Sep-10	Dec-10	Dec-09	Mar-08	Jun-10

Breakdown of Dialogue attendees (from inception to April 2008)

	Industry	NGO	Gov't	Academia	Buyers	Others	Total	% of total that is industry
Tilapia	14	9	6	8	4	3	44	32%
Molluscs	51	7	7	24	0	0	89	57%
Salmon	30	62	24	31	7	24	178	16%
Pangasius	22	3	7	8	6	9	55	40%
Shrimp	10	9	11	6	0	7	43	23%

Note: Only includes entities (not total number of people per entity) represented at Dialogue meetings.

Number of Dialogue meetings through Oct 2008

Abalone	1
Trout	1
Molluscs	10
Shrimp	5
Tilapia	6
Salmon	12
Pangasius	3

FMI signaling movement towards supporting sustainable seafood

In 2008, FMI developed a sustainable seafood working group

- The Food Marketing Institute (FMI) is developing guidelines, best practices, case studies and other resources to help the supermarket industry address seafood sustainability issues.
- FMI has 1,500 retailer and wholesaler member companies operating about 26,000 food store stores with a combined annual sales volume of \$680 billion.
- FMI recently formed a Sustainability Task Force (see right)

FMI Sustainability Task Force

CHAIR:

Bob Garrity
(Giant Eagle, Inc.)

Scott Buehler
(Buehler Food Markets, Inc.)

Wade Carmichael
(Ukrop's Super Markets, Inc.)

Patti Council
(The Great A&P Tea Co., Inc)

Caren Epstein
(Hannaford Bros., Co.)

Brad Graham
(Harris Teeter, Inc.)

Michael Hewett
(Publix Super Markets, Inc.)

Jennifer McLeod
(The Great A&P Tea Co., Inc.)

Jeanne Colleluori
(Wegmans Food Markets Inc.)

Rod Van Bebber
(Unified Western Grocers, Inc.)

Jason Wadsworth
(Wegmans Food Markets, Inc.)

VICE CHAIR:

Tom McIntyre
(Supervalu, Inc.)

Shannon Campagna
(Safeway, Inc.)

Bill Rhyne
(Harris Teeter, Inc.)

John Domino
(Supervalu, Inc.)

Megan Glynn
(The Kroger Co.)

Megan Hellstedt
(Hannaford Bros., Inc.)

Mike Smith
(Hy-Vee, Inc.)

Sandy Sandhal
(Target Corporation)

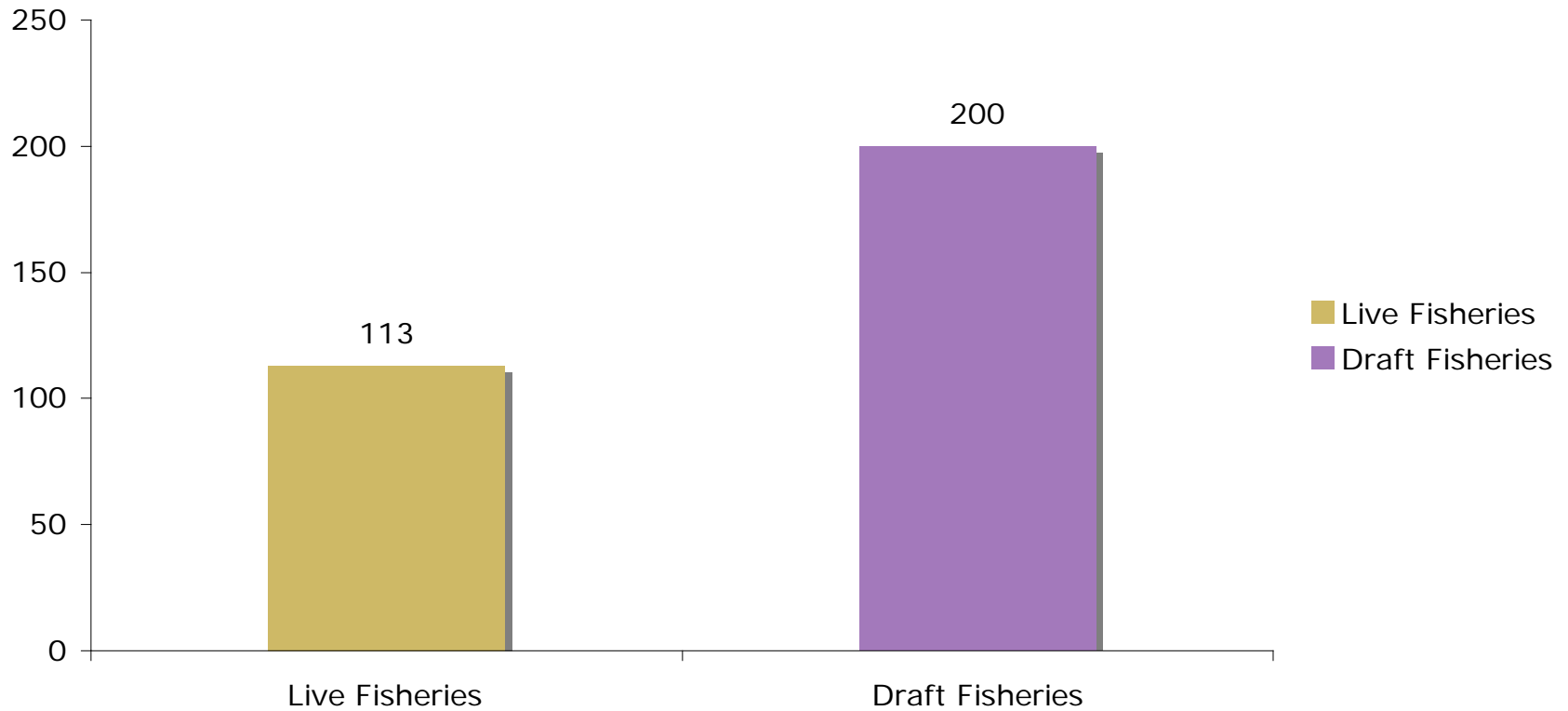
Joanie Taylor
(Schnuck Markets, Inc.)

Jeanne von Zastrow
(FMI)

FishSource emerged as another information source...

FishSource growing strongly as a certification alternative, though access limited

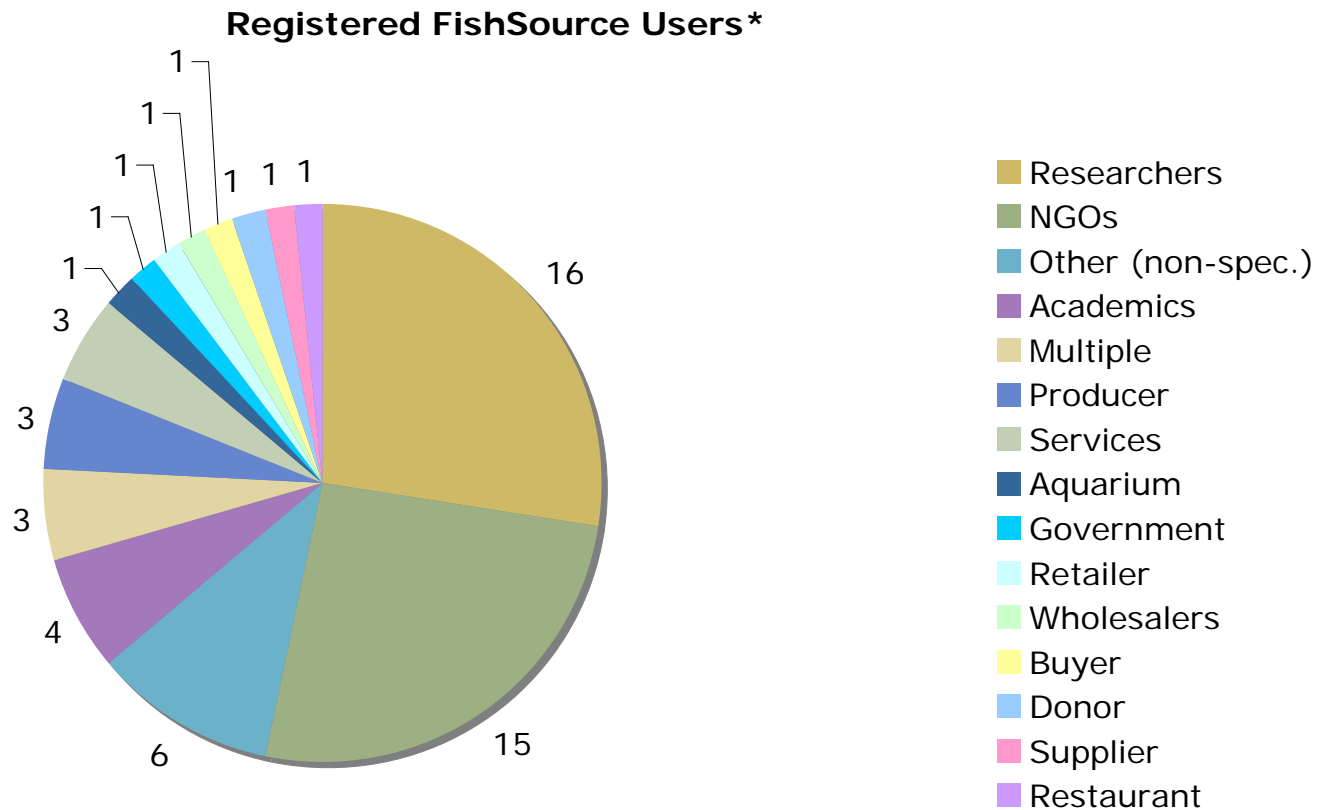
Fisheries in FishSource as of Oct. 30 2008



* For reference, in December 2007 there were fewer than 50 live fisheries.

...though few businesses can be demonstrated to be using it thus far

Diverse range of users



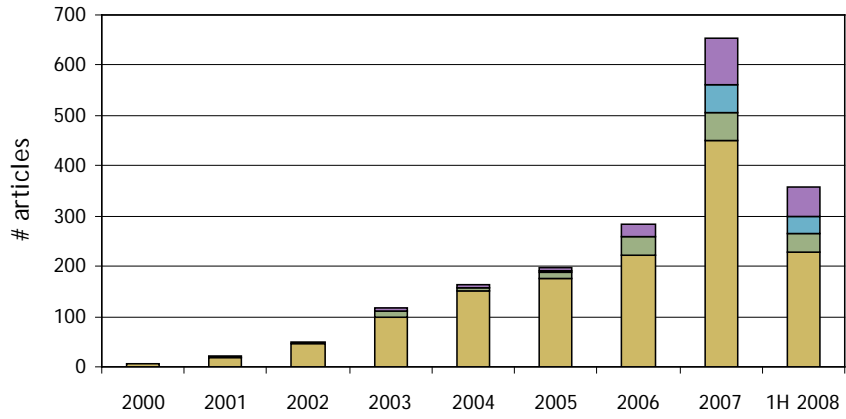
* There are currently 62 registered, active users of FishSource. However, users do not have to register to access FishSource, which is public-access. Registration is only required to publish reviews, rate fisheries or comment. Additionally, some regular users access FishSource through an intermediary: e.g. Wal-Mart and Sam's Club suppliers / buyers use a separate metrics system SFP has created to act as an interface between the companies and FishSource.

Issue salience

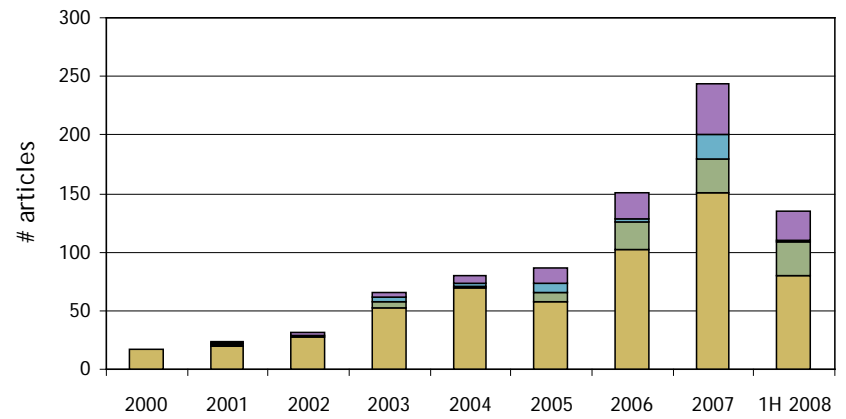
Industry engagement > Certification > **Issue salience** > Consumption > Consumer demographics

In general, media coverage of sustainable seafood has increased

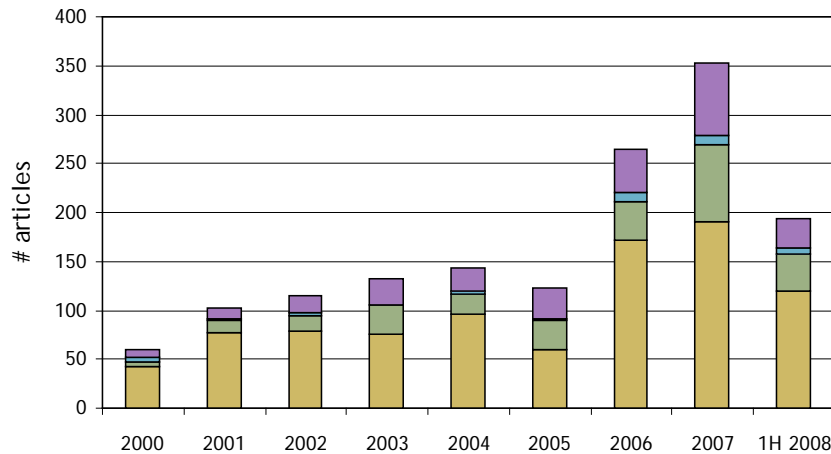
"Sustainable seafood" in body



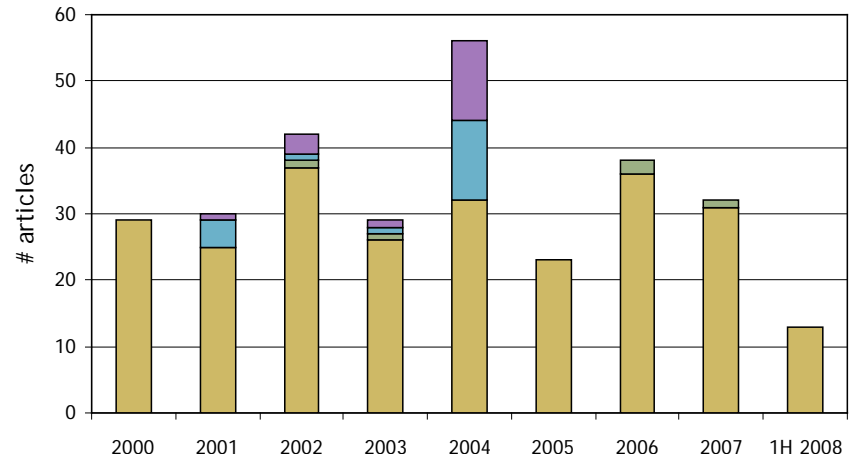
"Sustainable" and "seafood" in headline or lead



"Marine Stewardship Council" in body

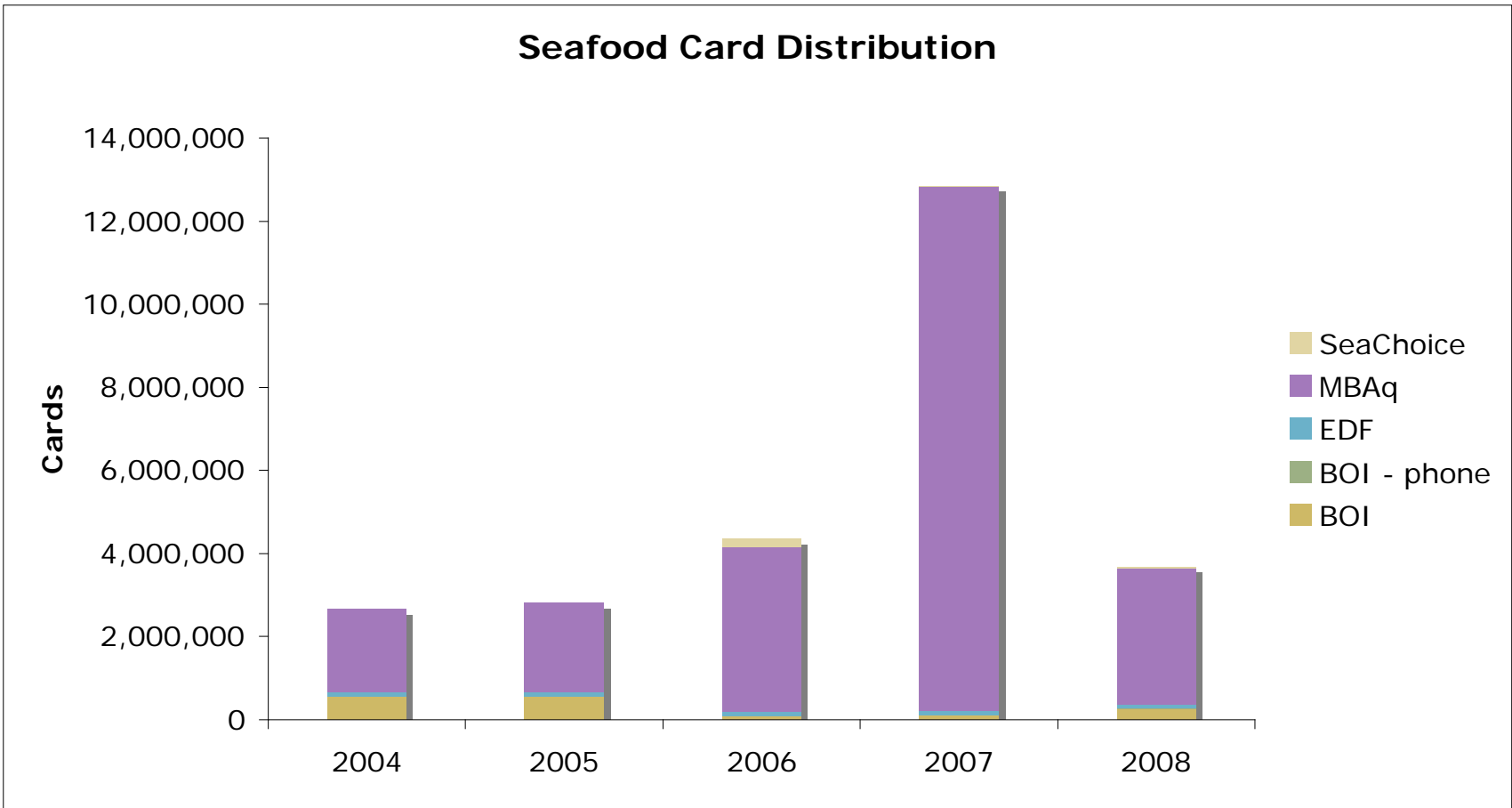


"Environment" and "fish" in headline or lead



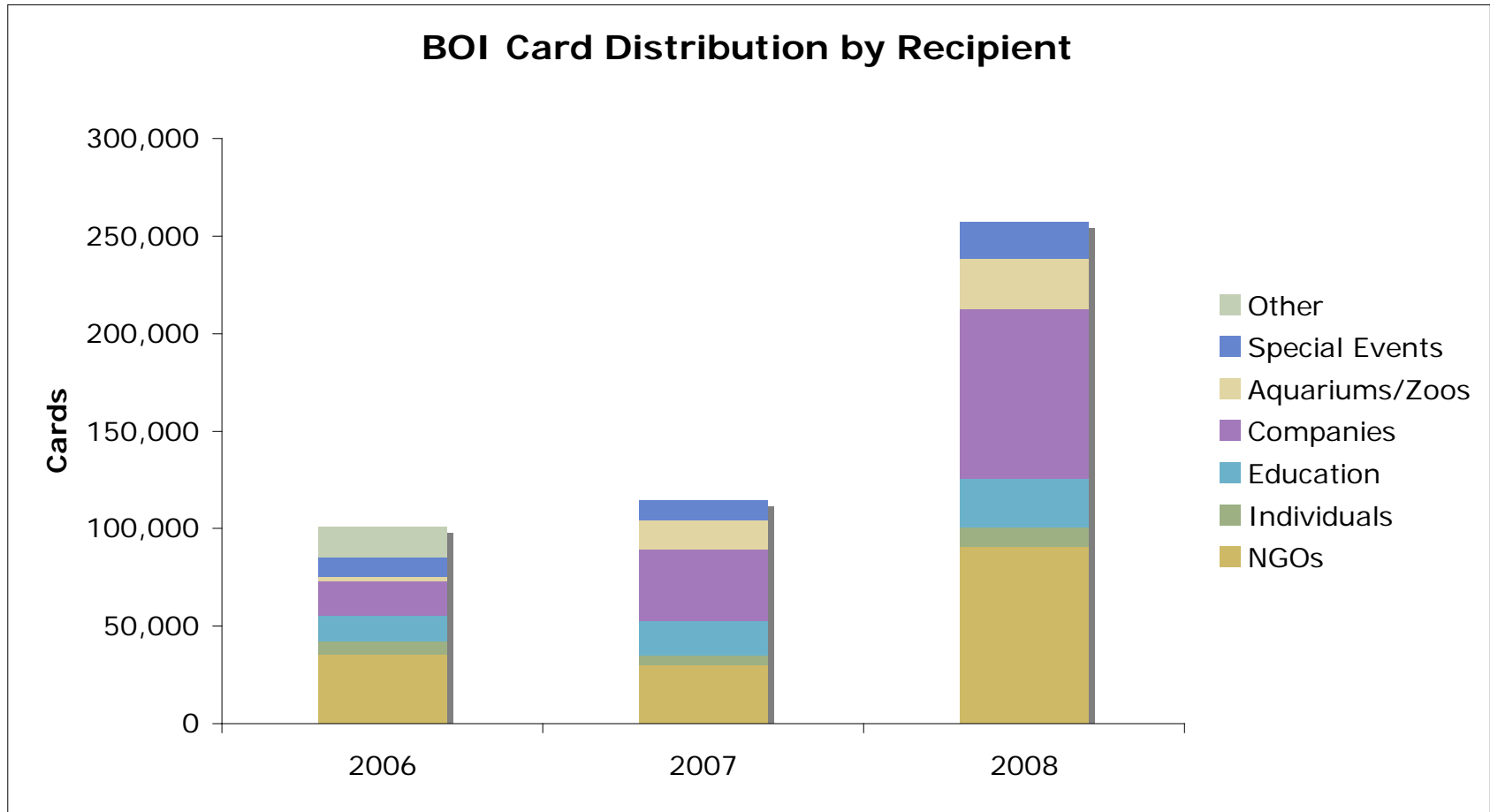
Distribution of consumer advisory cards peaked in 2007

Strong distribution, primarily from MBAq, peaking in 2007



BOI card distribution is a small piece, but good end-user data available

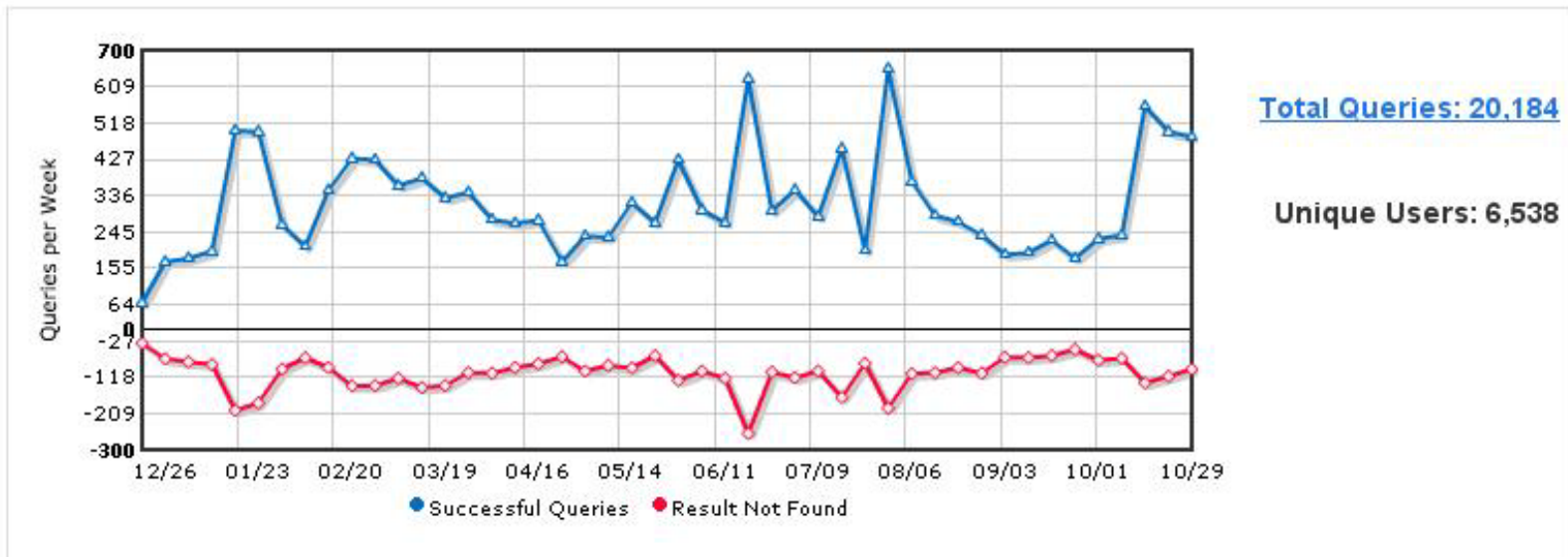
Growth in BOI cards mainly from greater distribution to companies and partner NGOs in 2008



BOI also has rolled out a phone search function in 2008

Relatively limited use, but BOI's texting system reveals consumer information needs

FishPhone : Report



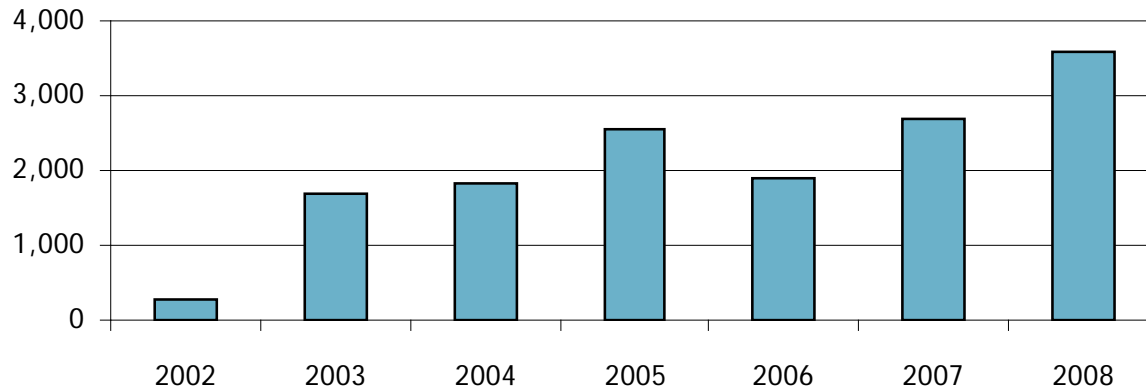
Top Queries (All Query Statistics)

■ Successful Query ■ Result Not Found

1. salmon	1879	■	1. haddock	-168	■
2. tuna	1062	■	2. yellowtail	-116	■
3. tilapia	871	■	3. perch	-90	■
4. halibut	728	■	4. skate	-66	■
5. <blank>	672	■	5. escolar	-55	■
6. cod	598	■	6. branzino	-49	■
7. shrimp	549	■	7. barramundi	-46	■
8. swordfish	474	■	8. octopus	-44	■
9. mahi mahi	433	■	9. turbot	-44	■
10. trout	387	■	10. carp	-42	■

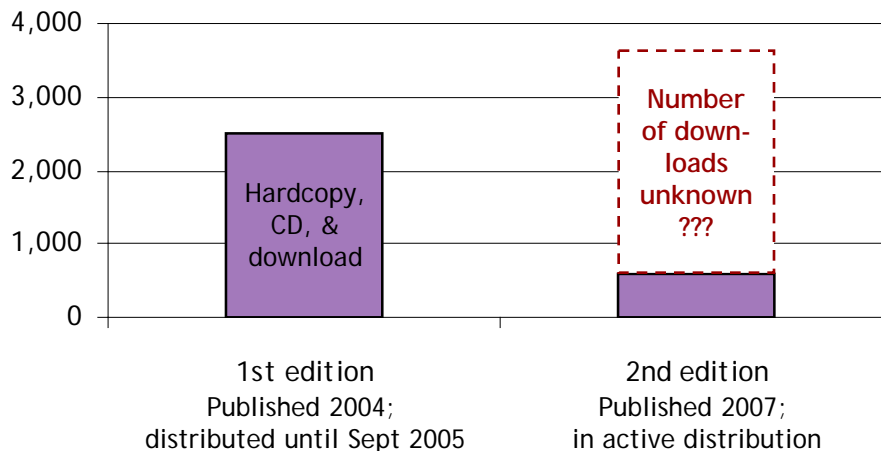
Interest in SCA seafood publications appears to be increasing

Number of Afishianado subscribers



YOY growth	2002	2003	2004	2005	2006	2007	2008
		550%	8%	40%	(26%)	42%	33%

Distribution of Sourcing Seafood Guide



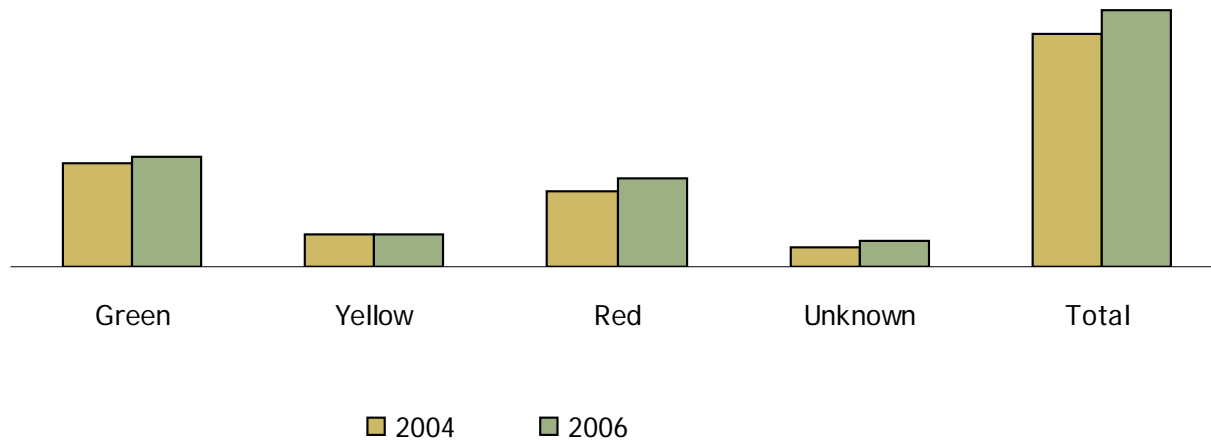
- 2nd edition data is incomplete
 - Still in active distribution
 - Number of downloads not included and not tracked by SCA
 - Of 600 distributed to date: 400 hardcopies and 200 CDs

Consumption

Industry engagement > Certification > Issue salience > **Consumption** > Consumer demographics

Estimated US seafood consumption, by MBA environmental ranking

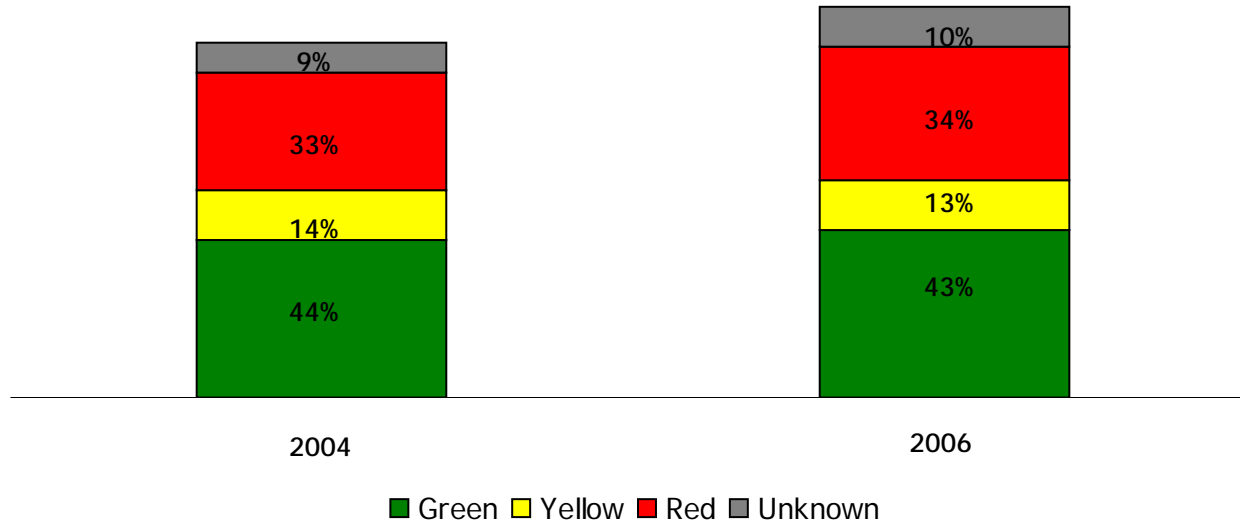
US per capita seafood consumption (kg) in 2004 & 2006 - excluding menhaden, Fish Meal, Fish Oil



	2004 Total consumption	Per capita consumption		2006 Total consumption	Per capita consumption
Green	1,500,509,747	5.09	Green	1,604,655,492	5.44
Yellow	483,552,617	1.64	Yellow	476,538,976	1.62
Red	1,111,434,910	3.77	Red	1,276,147,310	4.33
Unknown	297,982,930	1.01	Unknown	378,752,895	1.28
Total	3,393,480,204	11.50	Total	3,736,094,673	12.66

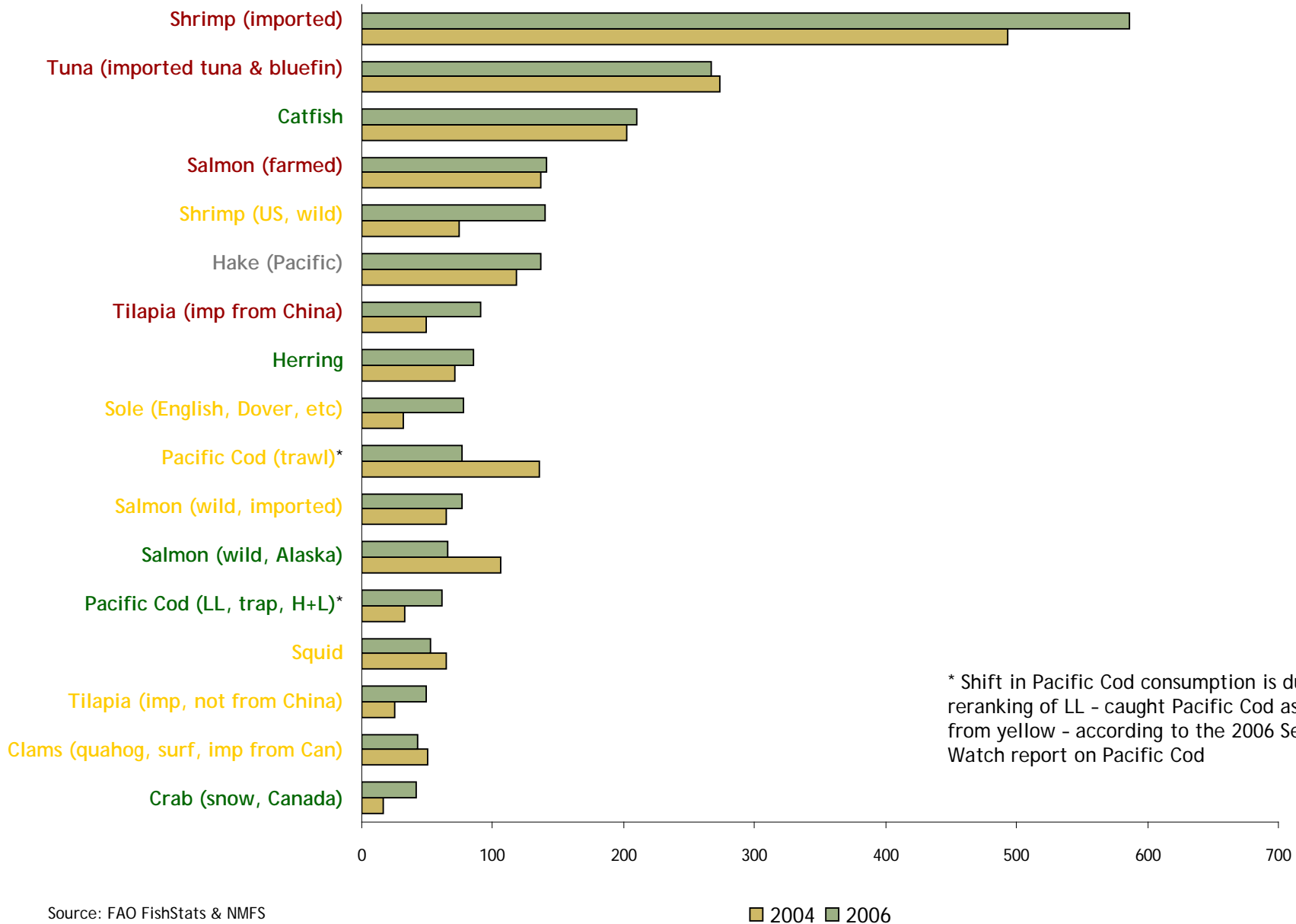
Overall seafood consumption increased 10% from 2004-2006

No substantial movement in environmental categories between 2004 and 2006

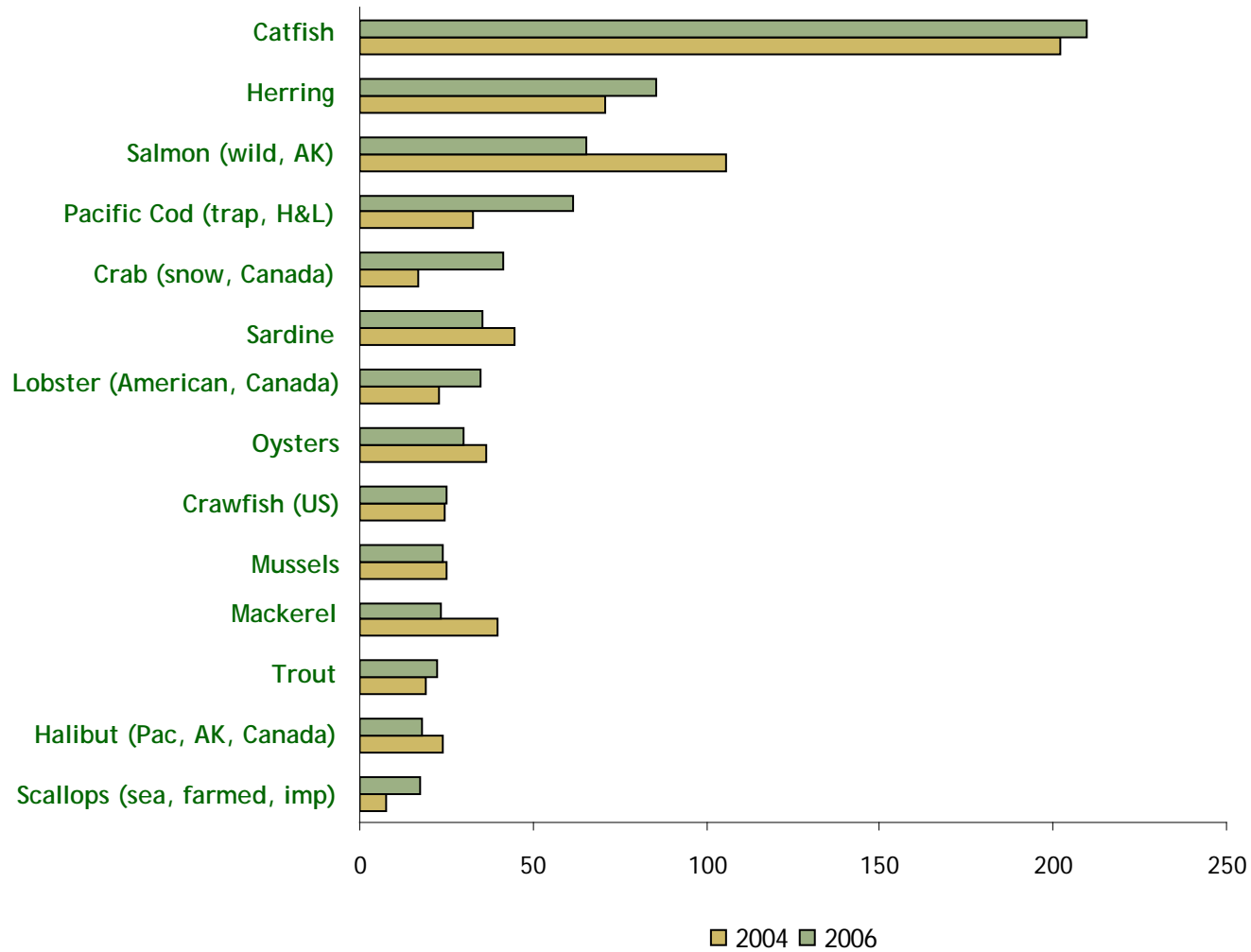


US consumption by kg

Top species for human consumption (million kg) in 2004 & 2006



Top Green species consumption, 2004 & 2006



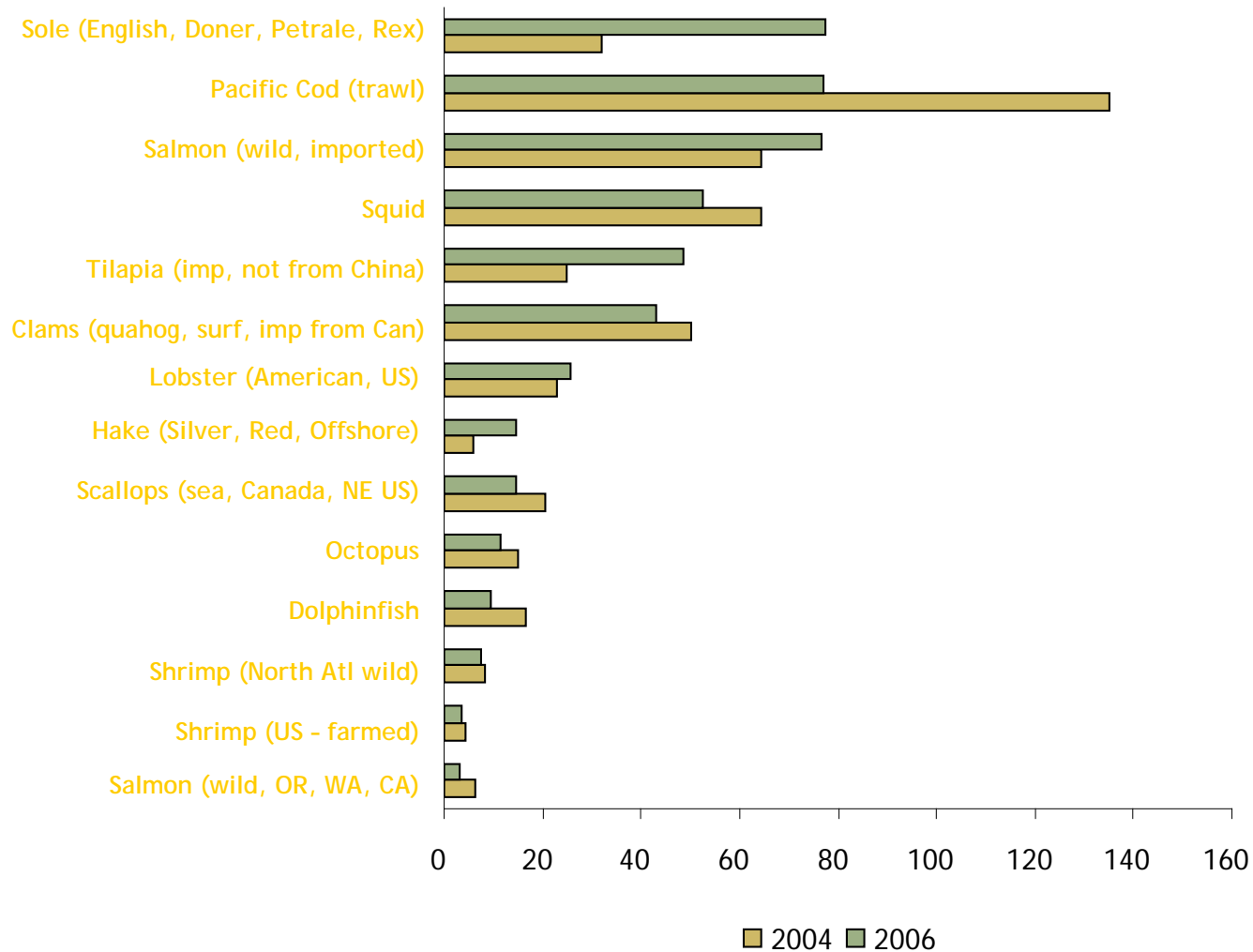
Total consumption (million kg), not including Pollock

Top Green species consumption, 2004 & 2006

	Total consumption (million kg) 2004	Total consumption (million kg) 2006	PC consumption - 2004 (kg)	PC consumption - 2006 (kg)	% delta
Pollock	760.72	838.52	2.579	2.842	10.2%
Catfish	202.21	209.83	0.685	0.711	3.8%
Herring	71.04	85.26	0.241	0.289	20.0%
Salmon (wild, AK)	105.76	65.61	0.359	0.222	-38.0%
Pacific Cod (trap, H&L)	32.57	61.72	0.110	0.209	89.5%
Crab (snow, Canada)	16.73	41.13	0.057	0.139	145.8%
Sardine	44.67	35.42	0.151	0.120	-20.7%
Lobster (American, Canada)	22.92	34.95	0.078	0.118	52.5%
Oysters	36.60	30.12	0.124	0.102	-17.7%
Crawfish (US)	24.33	25.14	0.082	0.085	3.3%
Mussels	25.03	24.11	0.085	0.082	-3.7%
Mackerel	39.85	23.26	0.135	0.079	-41.6%
Trout	19.30	22.13	0.065	0.075	14.7%
Halibut (Pacific, AK, Canada)	24.13	18.21	0.082	0.062	-24.5%
Scallops (sea, farmed, imp)	7.37	17.37	0.025	0.059	135.1%

Top Yellow species consumption, 2004 & 2006

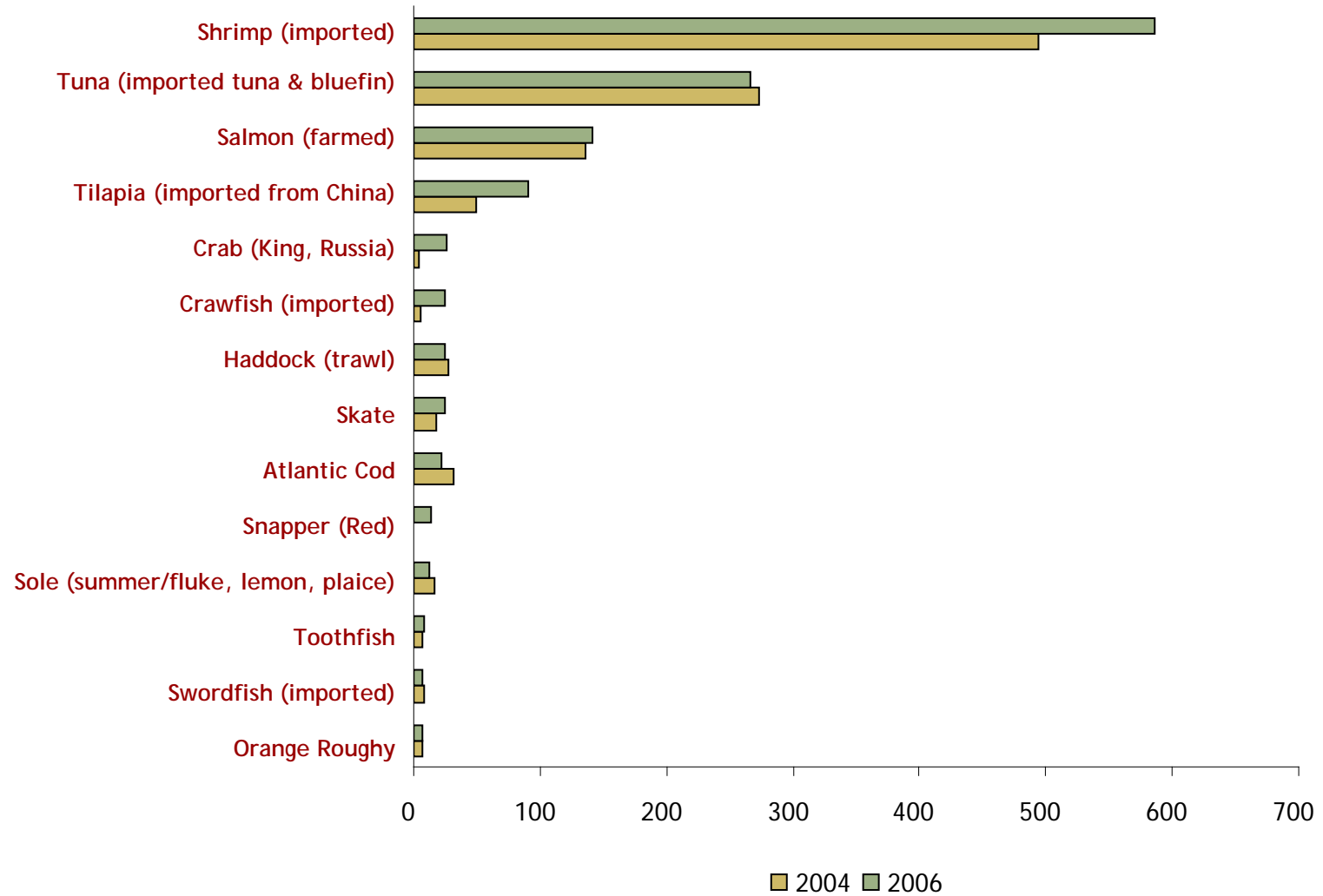
Total consumption (million kg)



Top Yellow species consumption, 2004 & 2006

	Total consumption (million kg) 2004	Total consumption (million kg) 2006	PC consumption - 2004 (kg)	PC consumption - 2006 (kg)	% delta
Sole (English, Dover, Petrale, Rex)	32.00	77.44	0.11	0.26	142.0%
Pacific Cod (trawl)	135.14	77.04	0.46	0.26	-43.0%
Salmon (wild, imp)	64.43	76.78	0.22	0.26	19.2%
Squid	64.38	52.70	0.22	0.18	-18.1%
Tilapia (imp not from China)	25.02	48.69	0.08	0.17	94.6%
Clams (quahog, surf, imp from canada)	50.01	42.96	0.17	0.15	-14.1%
Lobster (American, US)	22.92	25.85	0.08	0.09	12.8%
Hake (Silver, Red, Offshore)	5.98	14.75	0.02	0.05	146.8%
Scallops (sea, Canada, NE US)	20.70	14.54	0.07	0.05	-29.7%
Octopus	15.21	11.50	0.05	0.04	-24.4%
Dolphinfish (Mahi Mahi)	16.75	9.48	0.06	0.03	-43.4%
Shrimp (North Atl wild)	8.48	7.43	0.03	0.03	-12.3%
Shrimp (US - farmed)	4.23	3.46	0.01	0.01	-18.2%
Salmon (wild, OR, WA, CA)	6.19	3.04	0.02	0.01	-50.8%

Top Red species consumption, 2004 & 2006



Top Red species consumption, 2004 & 2006

	Total consumption (million kg) 2004	Total consumption (million kg) 2006	PC consumption - 2004 (kg)	PC consumption - 2006 (kg)	% delta
Shrimp (imported)	493.61	586.26	1.67	1.99	18.8%
Tuna (imported tuna & bluefin)	273.54	266.61	0.93	0.90	-2.5%
Salmon (Farmed)	136.48	140.77	0.46	0.48	3.1%
Tilapia (imp from China)	49.70	90.87	0.17	0.31	82.9%
Crab (King, Russia)	4.05	25.55	0.01	0.09	531.0%
Crawfish (Imported)	5.84	25.14	0.02	0.09	330.3%
Haddock (trawl)	27.07	24.99	0.09	0.08	-7.7%
Skate	18.24	24.90	0.06	0.08	36.5%
Atlantic Cod	30.96	21.98	0.10	0.07	-29.0%
Snapper (Red)	1.49	13.50	0.01	0.05	806.0%
Sole (Summer/fluke, lemon, etc)	16.48	12.70	0.06	0.04	-22.9%
Toothfish	7.08	8.43	0.02	0.03	19.1%
Swordfish (Imported)	8.51	7.03	0.03	0.02	-17.4%
Orange Roughy	6.57	6.44	0.02	0.02	-1.9%

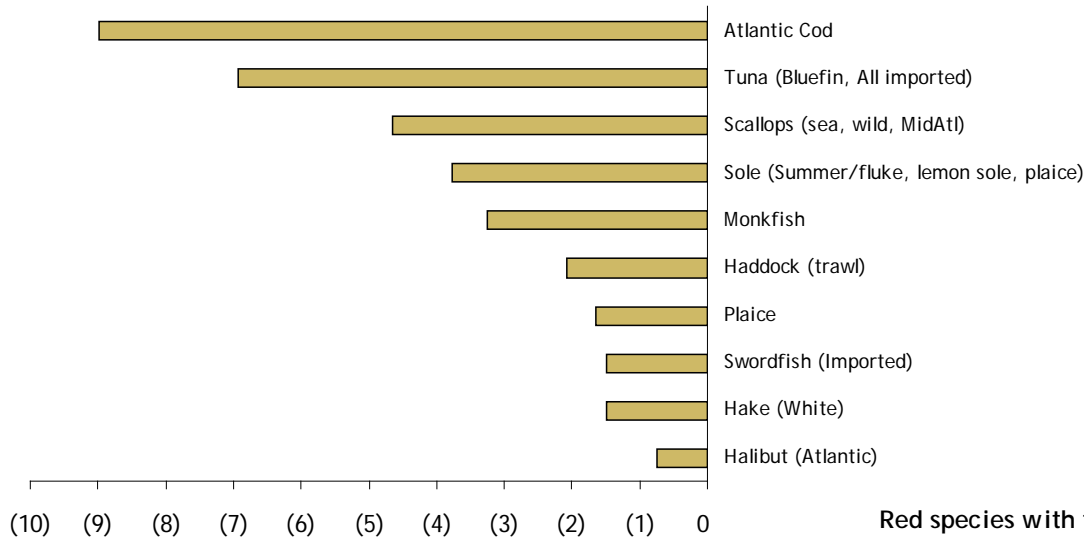
The set of species of highest concern has not changed substantially

Top Red Species, 2004	PC consumption (kg)	Top Red Species, 2006	consumption (kg)	Rank	Rank in 2004
Shrimp (imported)	1.67	Shrimp (imported)	1.99	1	1
Tuna (Bluefin, All imported)	0.93	Tuna (Bluefin, All imported)	0.90	2	2
Salmon (Farmed)	0.46	Salmon (Farmed)	0.48	3	3
Tilapia (imp from China)	0.17	Tilapia (imp from China)	0.31	4	4
Atlantic Cod	0.10	Crab (King, Russia)	0.09	5	16
Scallops (sea, wild, MidAtl)	0.09	Crawfish (Imported)	0.09	6	14
Haddock (trawl)	0.09	Haddock (trawl)	0.08	7	7
Skate	0.06	Skate	0.08	8	8
Sole (Summer/fluke, lemon sole, plaice)	0.06	Atlantic Cod	0.07	9	5
Monkfish	0.03	Snapper (Red)	0.05	10	21
Swordfish (Imported)	0.03	Sole (Summer/fluke, lemon sole, plaice)	0.04	11	9
Toothfish	0.02	Toothfish	0.03	12	12
Total	3.72	Total	4.21		

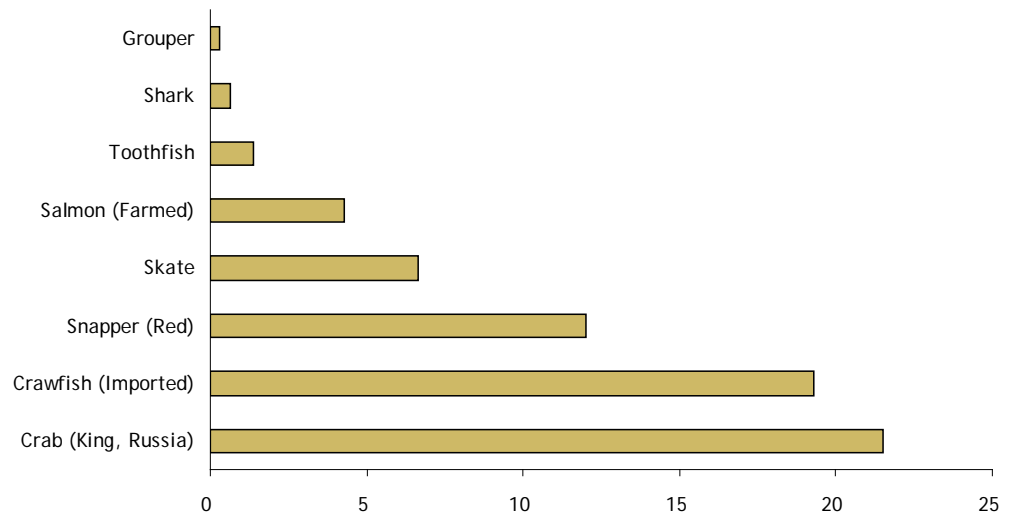
Increased consumption for King Crab from Russia, imported Crawfish, and Red Snapper

Changes in key Red species

Red species with the largest decrease in consumption (million kg)



Red species with the largest increase in consumption (million kg)



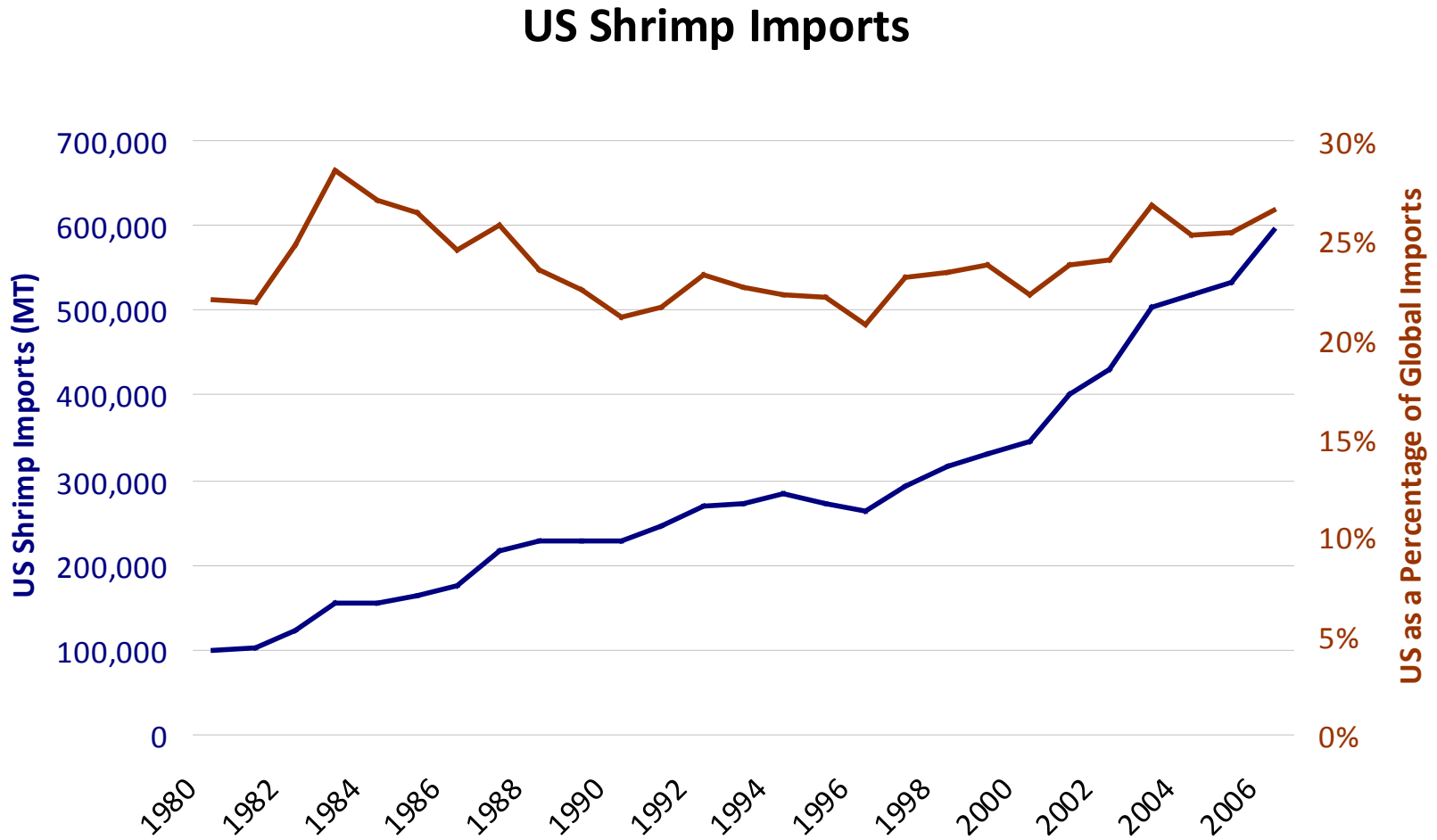
Species of particular interest

Consumption of key Red species has increased significantly (total of 2.4 kg-PC in 2004 vs 3.0 kg-PC in 2006)



Species of particular interest - imported shrimp

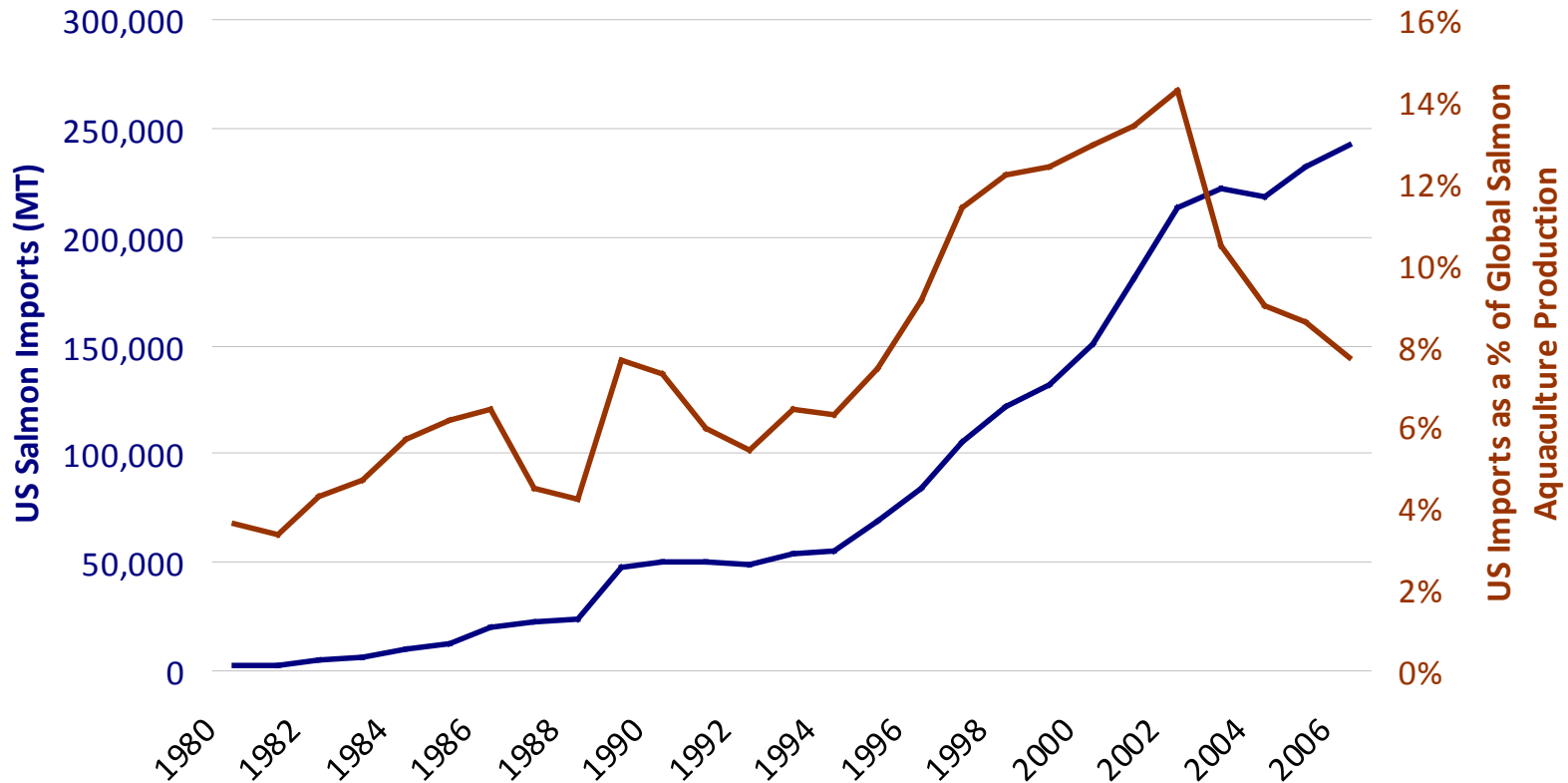
US shrimp imports continue to rise through 2006, as does the US share of all globally traded shrimp



Species of particular interest - farmed salmon*

Salmon imports also continue to rise, however the US market share appears to have declines substantially

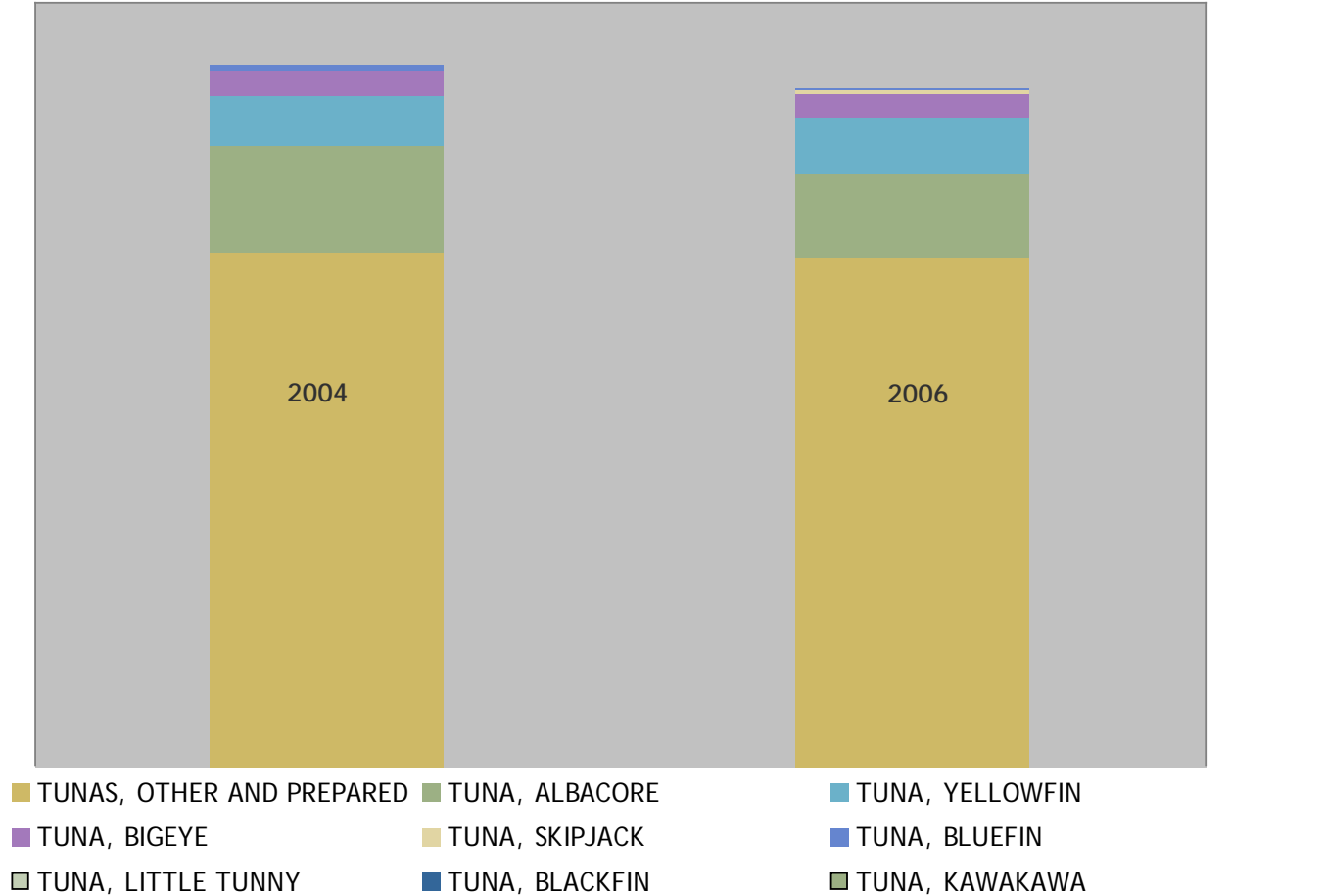
US Salmon Imports



- All imported salmon used as a proxy for farmed salmon consumption. Domestic salmon aquaculture only 1-2% of US farmed salmon consumption.
- However, the globally traded salmon includes wild harvested salmon.

Species of particular interest - tuna

US Tuna consumption declined slightly between 2004 & 2006



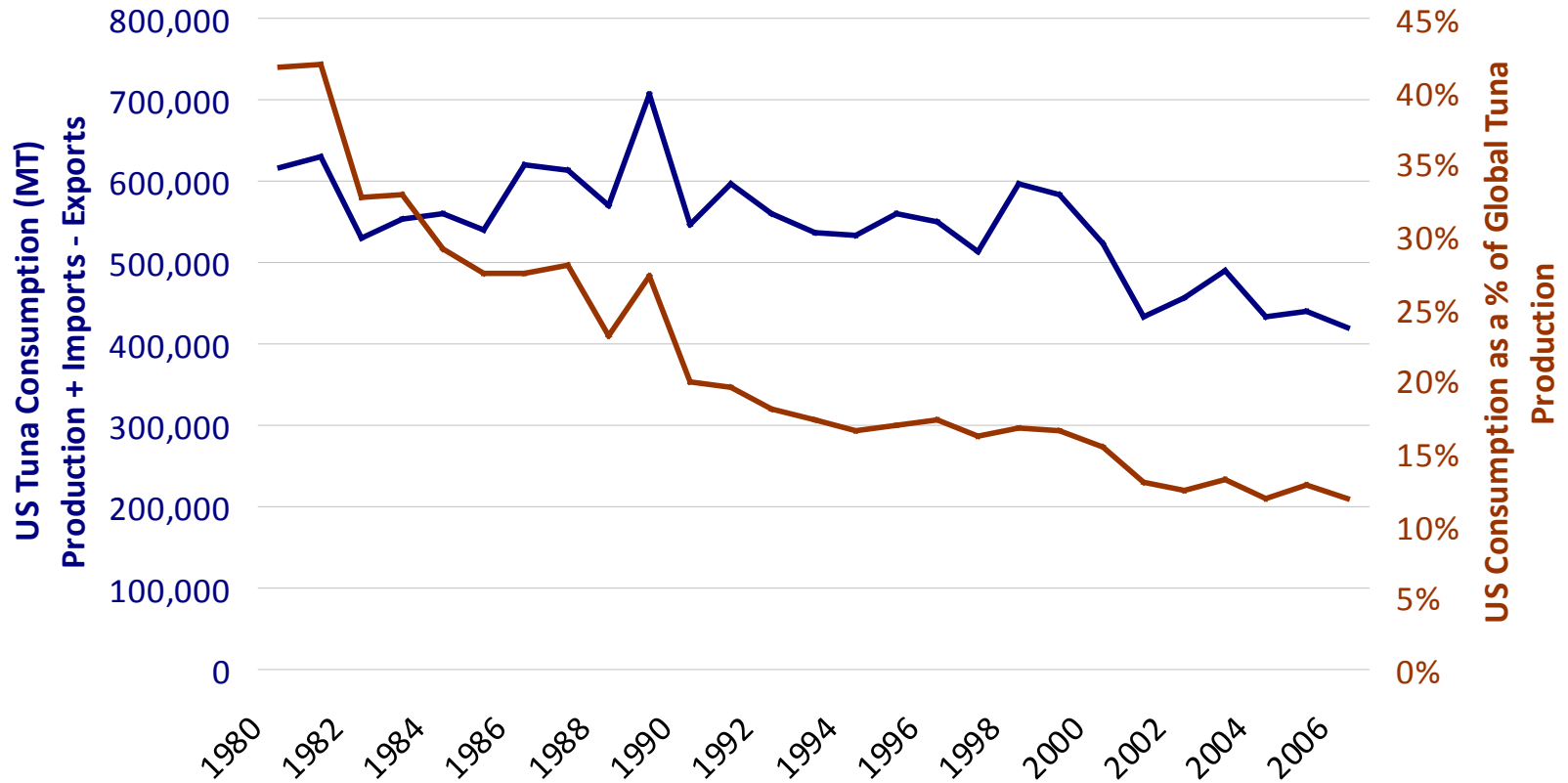
	2004	2006		2004	2006
TUNAS, OTHER AND PREPARED	214,703	212,979	TUNA, BLUEFIN	1,430	866
TUNA, ALBACORE	36,544	28,725	TUNA, LITTLE TUNNY	149	196
TUNA, YELLOWFIN	17,115	19,609	TUNA, BLACKFIN	15	10
TUNA, BIGEYE	8,302	7,632	TUNA, KAWAKAWA	1	1
TUNA, SKIPJACK	425	977			
			Total consumption (1,000 kg)		

Source: FAO FishStats & NMFS

Species of particular interest - tuna

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

US Tuna Consumption

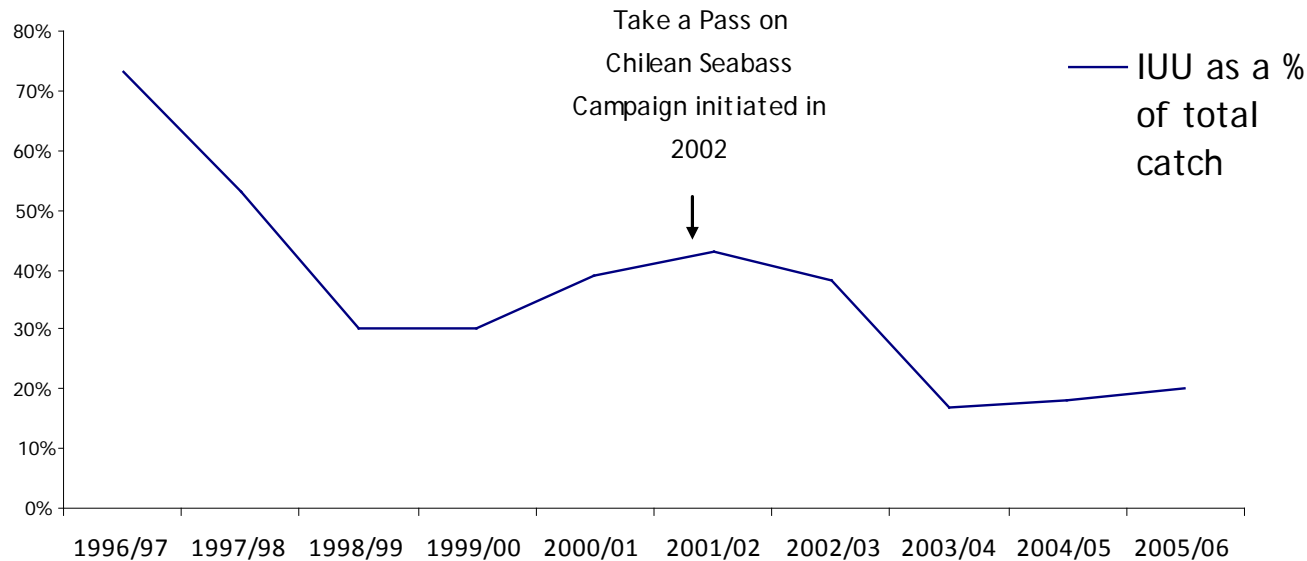


Estimates of IUU toothfish catches (tonnes) in the CCAMLR Convention Area

1996/97 to 2005/06 fishing seasons

Fishing season	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06
IUU as a % of total catch	73%	53%	30%	30%	39%	43%	38%	17%	18%	20%

Trends in Illegal and Unreported Fishing in the Patagonian Toothfish Fishery

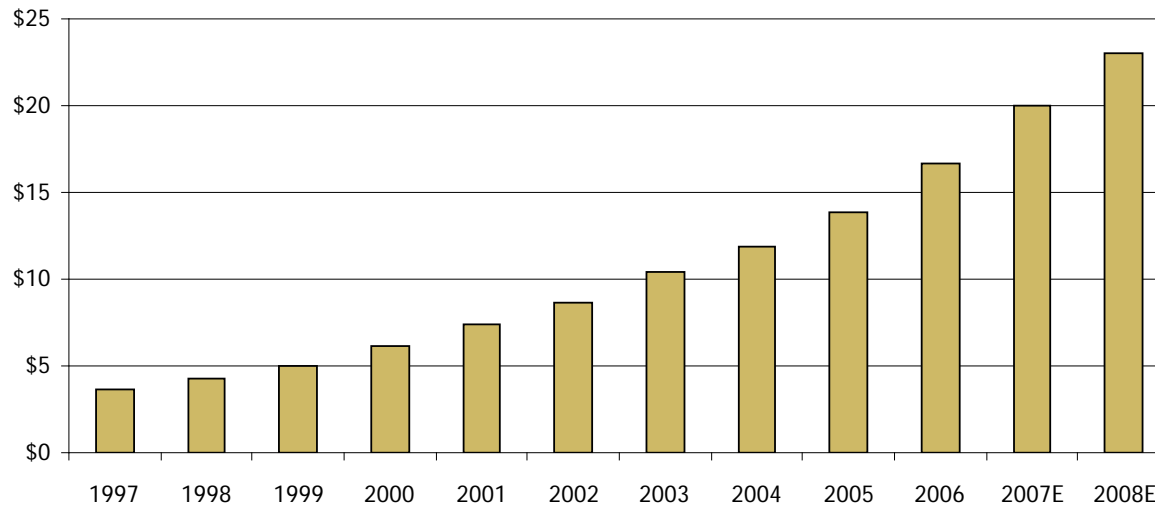


Consumer demographics

Industry engagement > Certification > Issue salience > Consumption > **Consumer demographics**

Growth in organic food & beverage sales and market penetration continue...

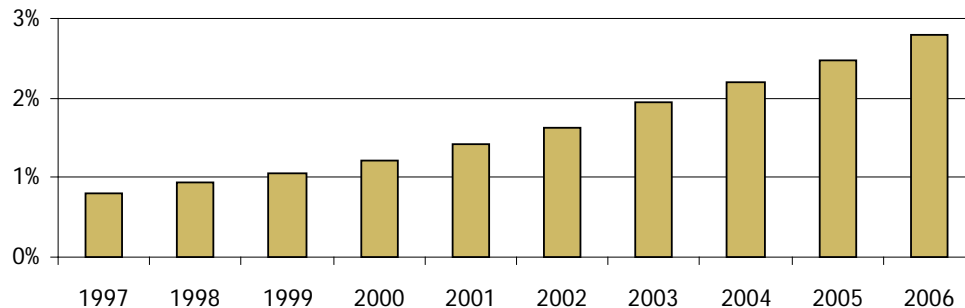
Sales of organic food and beverage (\$ billions)



- Historical annual growth averaged 18%
- Same annual growth is expected from 2007 to 2010

Market penetration is steadily rising

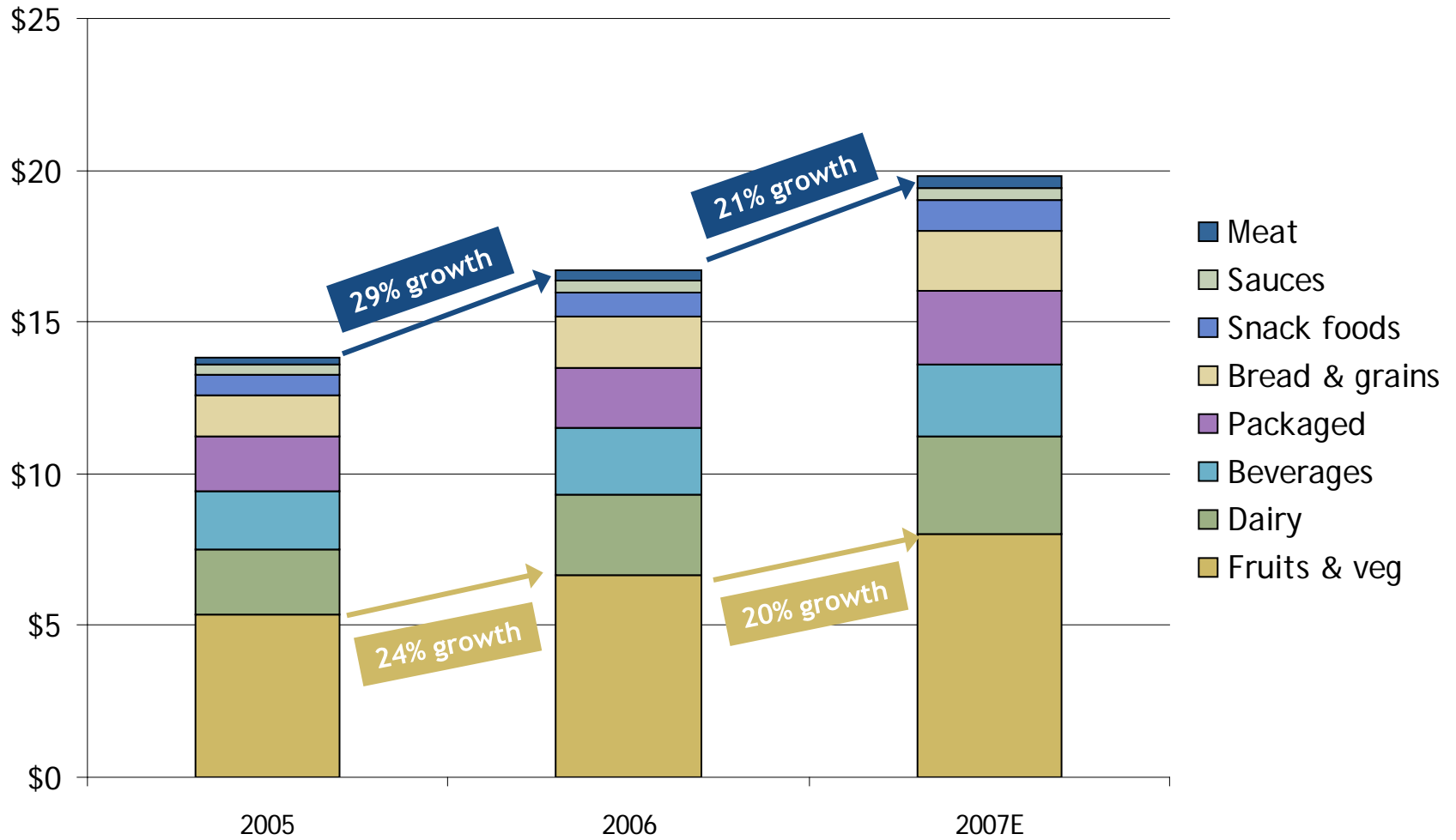
Organic sales as % of conventional and organic sales



- Penetration rate has increased almost 3.5 times from 1997 to 2006
- Organics still represent less than 3% of total food and beverage market
- Conventional sales have grown on average only 3.5% per year, versus 18% for organics

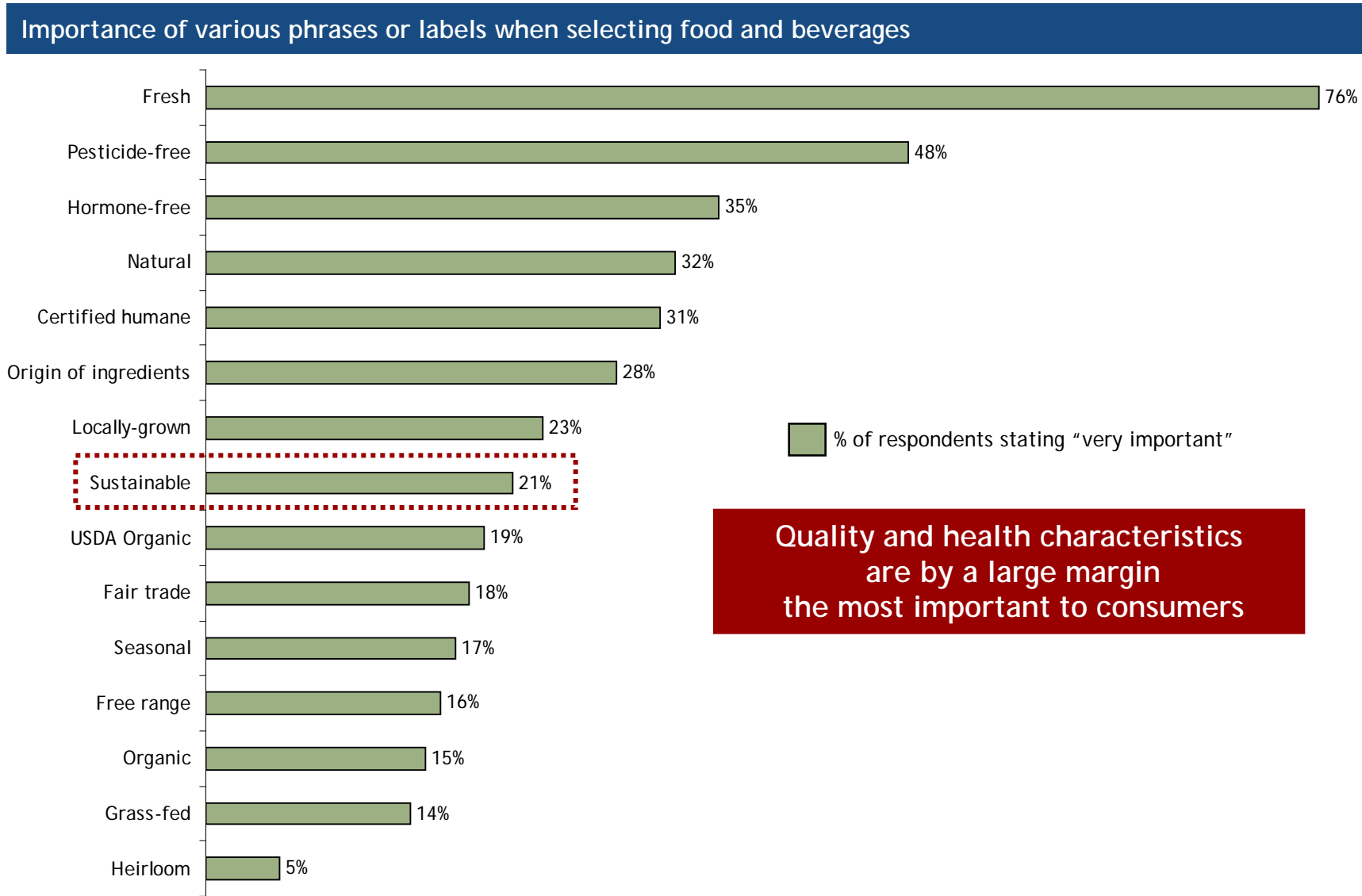
...and meat is the fastest growing category (albeit smallest)

Sales of organic food and beverage (\$ billions)



Source: Organic Trade Association, 2007 Manufacturer Survey

“Sustainable” is very important to roughly 1 out of 5 consumers



Consumers incorporate their values into their purchasing decisions

Which has a greater impact on society: your purchasing decision or your voting decisions?

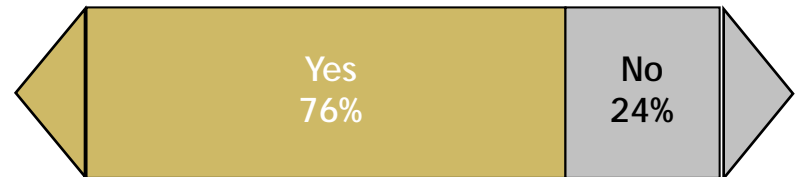
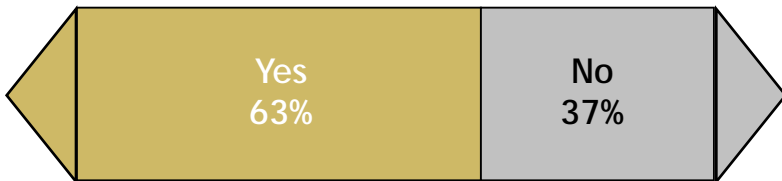


More than 70% of consumers "vote" with their dollars

Note: Survey sample size unknown
Source: The Hartman Group, "Fresh Thinking on Organic" April 9, 2008

Have you ever purchased a particular brand because the brand supports a cause you believe in?

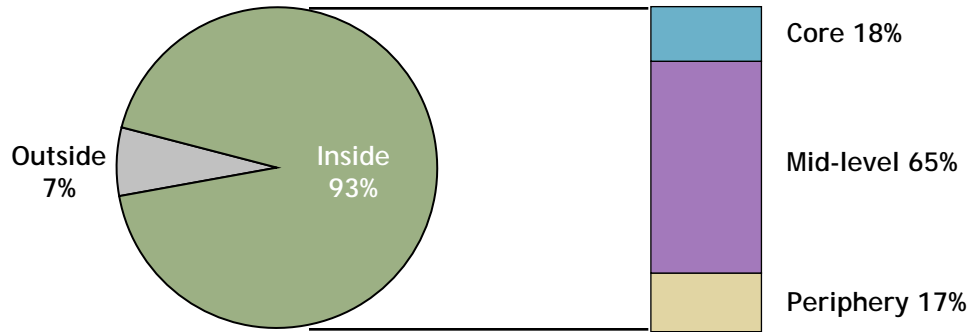
Would you recommend a brand to others because it supports a cause you believe in?



Note: Survey sample size 500 female respondents
Source: PRWeek, "Cause Survey 2008" October 27, 2008

...and self-identify themselves as concerned consumers

"The World of Sustainability"

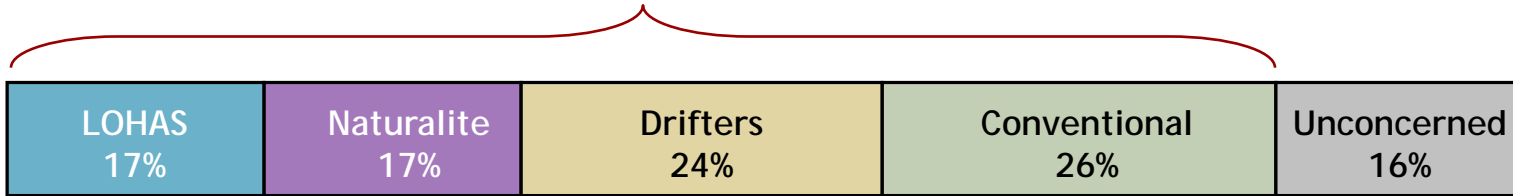


- Food and beverages are the primary pathways to consumer participation in sustainable purchasing behaviors
- Adoption process most often begins with organic, natural and local foods, then with health and wellness personal care or home products

Note: Survey sample size 1,606 respondents
Source: The Hartman Group, "Sustainability: Understanding the Consumer Perspective" 2007

LOHAS segmentation is expanding

More than 80% of consumers are motivated by sustainability



- | | | | | |
|--|---|---|--|--|
| <ul style="list-style-type: none"> • Driven by personal health & wellness • Highest consumers of eco-products • Least price sensitive | <ul style="list-style-type: none"> • Adhere to healthy lifestyle • High consumers of eco-products | <ul style="list-style-type: none"> • Driven by trends • Concerned with sustainability if affected personally • Price sensitive | <ul style="list-style-type: none"> • Driven more by cost savings or desire to waste less, than by environmental consciousness | <ul style="list-style-type: none"> • Not actively engaged in sustainability |
|--|---|---|--|--|

Source: Natural Marketing Institute, LOHAS Market Report

Additional data collected by FMI confirms this trend

Customers perceived as engaging in sustainability

- 92% of consumers agree with the statement that it is important for the U.S. food industry, both food manufacturers and supermarkets, to be more proactive about addressing environmental concerns.
FMI-Harris Poll 2007
- 89% of consumers are interested in “eco-friendly” products and 30% actively look for them. *Information Resources, Inc. 2007*
- 43% of Americans think that they will be extremely green in the next five years while only 11% classify themselves as extremely green now. *Wal-Mart Live Better Index 2007*
- Sales of “green” cleaning products increased 52% in 2006.
Information Resources, Inc.
- Organic food sales were up 109% between 2001 to 2005 and up 22% in 2006. *Mintel Research/Organic Trade Association*

General economic research on ecolabels and consumer willingness to pay remains very limited: only 20 economic articles in recent years

Data sources and data collection process

Database	Search term	Search criteria	Findings
EBSCO Host	<ul style="list-style-type: none"> ecolabel sustainability and price premium organic and price premium sustainable and price premium Willingness to pay and certification 	<ul style="list-style-type: none"> All text, academic journals All text, academic journals All text, academic journals All text, academic journals All text, academic journals 	<ul style="list-style-type: none"> Early indications of market impacts from the MSC Price Premiums for Organics Do Consumers Care? WTP for FT Coffee None Forest certification costs <p>4 articles</p>
EconBiz	ecolabel	Metasearch	<ul style="list-style-type: none"> Measuring consumer preferences for ecolabel seafood Can eco-labels tune a market (case of dolphin safe tuna) Eco certification, differentiation in retailing and upstream market power Voluntary eco-labeling and the price premium Price premiums for eco-friendly commodities Willingness to pay for enviro practices: implications for eco-labeling Economics of Information: markets for seafood attributes Green consumerism and eco-labeling: a strategic behavioral model Measuring consumer demand for eco-label apples <p>9 articles</p>
EconLit	<ul style="list-style-type: none"> ecolabel sustainability and price premium organics and price premium sustainability and price premium sustainable and price premium certification and willingness to pay 	<ul style="list-style-type: none"> Anywhere, after 1987 Anywhere, after 1987 Anywhere, after 1987 Anywhere, after 1987 Anywhere, after 1987 Anywhere, after 1987 	<ul style="list-style-type: none"> Do Consumers respond to ecolabels? Global Social Preference and the Demand for Socially Responsible Products None None Eco-labelling and the price premium Voluntary Eco-labelling and the price premium Willingness to Pay for Eco-labelled Wood Furniture Eco information and its effect on consumer values for environmentally certified forest products Is there a commercial case for tropical timber certification? <p>7 articles</p>
Lexis Nexis Academic	<ul style="list-style-type: none"> ecolabel sustainability and price premium (in BOI) 	<ul style="list-style-type: none"> Major U.S. and world publications, previous 2 years Major world publications, previous 5 years 	<ul style="list-style-type: none"> None None <p>0 articles</p>
			20 articles TOTAL

Most relevant academic publications (1 of 4)

Thalassorama: Early Indications of Market Impacts from MSC's Ecolabeling of Seafood - 2003

Overview of publication

- Written in 2003 (first fishery certification occurred in 2000)
- In 2003, only 6 fisheries were certified; 7 in full-assessment and more than 2 dozen in other various stages
- As empirical data was insufficient, only anecdotal evidence provided

MSC statistics on consumer access

- In 2002, over 105 products in 10 countries carried the MSC label and over 60 companies had chain-of-custody certification

Impact of MSC certification on fisheries

- Western Australian Rock Lobster: 15% increase in association membership after announcement of MSC certification
- New Zealand Hoki: share price of largest fishing company was at all-time high after MSC certification; in first year, price of hoki block rose 10% over previous year
- No available data at the time on South West Mackerel Handline, Burry Inlet Cockles, and Alaska Salmon

Implications or recommendations on future studies

- Measure price volatility of certified products as indicator of success for ecolabeling: lack of substitutability should lower price volatility

Most relevant academic publications (2 of 4)

Price Premiums for Organic Crops -1998

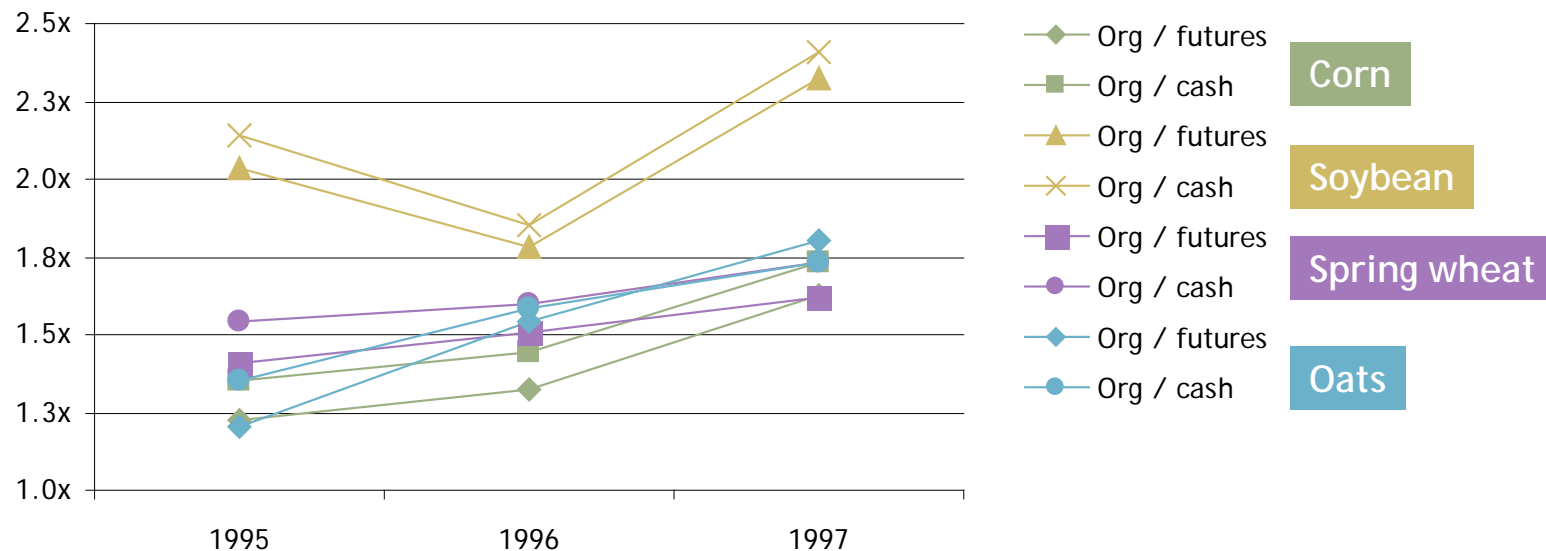
Overview of publication

- Written in 1998 (USDA published national organic standards in October 2002)
- Compared U.S. organic grain commodity prices to cash prices and future prices of conventional crops

Data observations

- Prices for organic corn consistently higher than for conventional
- Gap between organic and conventional prices was much higher for soybeans than for corn, wheat, and oats (high preference for organic soybean by Japanese market)

Ratio of \$ per bushel of organic crop to conventional crop (future or cash price)



Most relevant academic publications (3 of 4)

Do Consumers Care about Ethics? Willingness to Pay for Fair-Trade Coffee - 2005

Overview of publication

- A 2005 survey of 808 Belgium respondents on WTP for fair-trade coffee

Market penetration of fair-trade coffee

- Most ethical labeling initiatives often have market shares of less than 1%
 - Market share of fair-trade coffee in Belgium is 1%
 - Similar to 0.9% in France and 1% in Germany
 - Between high range (5% Switzerland, 3% Netherlands, 2.5% Denmark) and low range (0.8% Norway, 0.4% Finland)

Data observations

- Consumers were willing to pay an average price premium of 10%
 - “Fair-trade lovers” were willing to pay a 36% premium
- Only 10% of consumers were willing to pay the 27% price premium observed in Belgium
- Branding was most important product attribute to consumers
- Fair-trade label and flavor tied for 2nd place
- Packaging was least important
- Confirmed that ethical buying behavior is not influenced by gender, but by age and education level
- Green consumer: 31-44 yr age group with more than 12 yrs of education

Most relevant academic publications (4 of 4)

Forest certification costs and global forest product markets and trade: a general equilibrium analysis - 2005

Overview of publication

- A 2005 modeling analysis to examine incremental costs of forest certification and its impacts on trade of forest products
- Track demand substitution between tropical and temperate forest products, and between wood and non-wood materials

Forest certification statistics

- In 1996, about 70% of world's certified forests were in developing countries
- Yet by 2004/2005, over 90% certified forests were in developed countries

Data modeling observations

- Forestry production costs would increase 5-25% due to certification, leading to:
 - Decline in global output of up to 5%
 - Increase in price of 1.5%-35%
- Production shift between tropical and temperate forest products would be significant, implying that certification of only temperate forests may lead to deforestation in tropical forests

Implications or recommendations on future studies

- Without restrictions on land conversion, certification may not necessarily curb tropical deforestation; leakages (i.e. deforestation elsewhere) and shifts in land-use may occur

Appendices

1. Methodology Slides >

2. New England Groundfish Stock Assessment

Methodology - industry engagement (partnerships)

Data sources and contacts

- Barry Horwitz's Conservation Alliance for Seafood Solutions industry map
- Surveyed company websites, press releases, CSR reports

Data time frame (e.g. time series or specific year)

- Research performed during Oct-Nov 2008 on active webpages
- Limitation: no archived webpages

Assumptions and decision-making process

- Noted discussion of sustainability on several fronts, including seafood: organic or local food, energy, packaging, transportation, recycling, greenhouse gas emissions, etc.
- Noted potential "greenwashing"

Concerns on data accuracy or recommendations

- Difficult to assess degree of commitment to announcements or policies
- With development of GRI food/seafood standards, monitor inclusion of metrics in companies' CSR reports

Methodology - industry engagement (SCA)

Data sources and contacts

- Data provided by Seafood Choices Alliance
- Contact: Valerie Craig, Seafood Choices Alliance Italy
 - vcraig@seaweb.org

Data time frame (e.g. time series or specific year)

- Data is timeseries
- 2008 is current up to October 2008

Assumptions and decision-making process

- NA - used available data

Concerns on data accuracy or recommendations

- No concerns on accuracy, though SCA stopped closely tracking Afishianado and Sourcing Seafood data to focus on quality, not quantity, of subscribers
- Recommendation: SCA should resume tracking closely distribution of sourcing guides (especially downloads) as Major Buyer/NGO work continues 65

Methodology - certification (MSC)

Data sources and contacts

- Private data provided by the MSC
- Contact: Lisa Bailey, MSC Seattle
 - Lisa.bailey@msc.org

Data time frame (e.g. time series or specific year)

- Data is a snapshot, current as of October 2008

Assumptions and decision-making process

- NA - used available data

Concerns on data accuracy or recommendations

- No concerns on accuracy
- Recommendation: MSC does not collect information on “leakage” - I.e. the percentage of certified product that is not labeled as MSC certified. Packard should consider asking for this information in grant reports

Methodology - certification (ACC)

Data sources and contacts

- Private data provided by ACC
- Contact: Bill More
 - [insert email address]
- ACC website
 - www.aquaculturecertification.org
 - Accessed Oct. 16, 2008
 - Last updated Oct. 1, 2008

Assumptions and decision-making process

- Farms and processing facilities are only those registered at the end of the calendar year: excludes farms that have let their certification lapse.

Data time frame (e.g. time series or specific year)

- 2004 through October 31, 2008
- 2008 data based on 10 months of certifications

Concerns on data accuracy or recommendations

- Self-reported data but presumably reliable

Methodology - certification (Naturland)

Data sources and contacts

- Private data provided by Dr. Stefan Bergleiter, Naturland
 - bergleiter@naturland.de

Data time frame (e.g. time series or specific year)

- Data is a snapshot, current as of October 2008

Assumptions and decision-making process

- NA - used all available data

Concerns on data accuracy or recommendations

- No concerns about accuracy of data.
- Additional data on farm-level production, label leakage, and price premiums would be valuable.

Methodology - certification (GlobalGAP)

Data sources and contacts

- General data from: www.globalgap.org
- Emailed Valeska Weymann (who is responsible for GLOBALGAP's aquaculture program) - weymann@foodplus.org - No response

Data time frame (e.g. time series or specific year)

- From inception to October 2008

Assumptions and decision-making process

- None

Concerns on data accuracy or recommendations

- None

Methodology - certification (FMI)

Data sources and contacts

- FMI website

Data time frame (e.g. time series or specific year)

- Through November 2008

Assumptions and decision-making process

- None

Concerns on data accuracy or recommendations

- Specific data is not yet publicly available

Methodology - certification (ASC & Aquaculture Dialogues)

Data sources and contacts

- Data provided by: Jose Villalon -
Managing Director, Aquaculture, WWF
jose.villalon@wwfus.org

Data time frame (e.g. time series or specific year)

- Data is a snapshot, current as of
October 2008, unless otherwise noted

Assumptions and decision-making process

- NA - used all available data

Concerns on data accuracy or recommendations

- No concerns about accuracy of data.

Methodology - issue salience (LexisNexis)

Data sources and data collection process

- www.lexis.com
- Search terms included:
 - “sustainable seafood” in body
 - “sustainable” and “seafood” in headline or lead
 - “Marine Stewardship Council” in body
 - “environment” and “fish” in headline

Assumptions and decision-making process

- None

Data time frame (e.g. time series or specific year)

- Annual, time series data from 1997 to first-half of 2008

Concerns on data accuracy or recommendations

- No concerns on data accuracy
- Recommend searching for emerging popular key terms (i.e. market tools—catch shares, IFQ/ITQ—and lifecycle analysis)

Methodology - issue salience (IntraFish)

Data sources and data collection process

- www.IntraFish.com
- Search terms included:
 - “sustainable seafood,” “sustainable fish,” “sustainable aquaculture,” “MSC,” “Marine Stewardship Council,” “bycatch” and “overfishing”

Data time frame (e.g. time series or specific year)

- Limited to two-year online archive
- Data is time series
 - Timeframe is relative to point in time when search is performed (late Oct 2008)

Assumptions and decision-making process

- Excluded other publications in the IntraFish family due to:
 - Questionable accuracy of several search engines and lack of subscription access to check accuracy
 - Subscribership is more Euro-centric

Concerns on data accuracy or recommendations

- Recommend performing search at the same time each year (preferably at year-end) to remove seasonal fluctuations

Methodology - issue salience (SeaFood Business)

Data sources and data collection process

- <http://seafoodbusiness.com/archives>
- Also used Google search engine
- Same search terms as IntraFish

Data time frame (e.g. time series or specific year)

- Search performed late Oct 2008
 - Published first-ever Sustainable Seafood Buyer's Guide in Nov 2008
- Magazine website limited to two-year online archive
- Google limited to two timeframes: past year and all years

Assumptions and decision-making process

- Quantitative analysis was limited by lack of numerical functionality on SeaFood Business website
- Performed qualitative synthesis of articles

Concerns on data accuracy or recommendations

- Quantitative analysis could be performed using LexisNexis (if specific publications can be selected)?

Methodology - issue salience (seafood cards)

Data sources and data collection process

- Private data provided by Monterey Bay Aquarium, Blue Ocean Institute, Environmental Defense Fund, SeaChoice, and FishSource.
- Sheila Bowman: Sbowman@mbayaq.org
- Tim Fitzgerald: Tfitzgerald@edf.org
- Mercedes Lee: Mlee@blueocean.org
- Taina Uitto: seafood@cpawsbc.org
- Jim Cannon:
jim.cannon@sustainablefish.org

Assumptions and decision-making process

- Used all provided data from all major seafood card publishers

Data time frame (e.g. time series or specific year)

- MBA: 2000 to October 2008
- EDF: 2006 to 2008
- BOI: 2004 to 2008
- SeaChoice: May 2006 to October 2008
- FishChoice: TBD

Concerns on data accuracy or recommendations

- All data self-collected
- EDF data very vague
- SeaChoice data has different starting months than other data
- BOI data averaged from 2003-2005.

Methodology – consumption

Data sources and contacts

- National Marine Fisheries Service
 - Trade, Landings, and US Farmed
- FAO Fish Stats
- Monterey Bay Aquarium Seafood Watch

Data time frame (e.g. time series or specific year)

- 2004 vs 2006 data on US consumption (landings + imports - exports)

Assumptions and decision-making process

- NMFS data was the primary source
- Seafood Watch guides were used to categorize fish as Red, Yellow, Green
- Menhaden and other reduction fisheries were left out for most analysis
- Used NMFS data and Seafood Watch reports to determine gear-type split when relevant

Concerns on data accuracy or recommendations

- NMFS and FAO data do not always match
- Both provide data that is difficult to categorize (eg: “ground fish” or “fish fillets”)
- Recommend using only NMFS in future studies

Methodology – consumer demographics

Data sources and contacts

- www.lohas.com
- USDA Economic Research Service
- Organic Trade Association
- The Hartman Group
- Natural Marketing Institute

Data time frame (e.g. time series or specific year)

- Searched for reports since 2005

Assumptions and decision-making process

- None; relied on third-party data

Concerns on data accuracy or recommendations

- No concerns
- Recommend tracking evolution of consumer identification as LOHAS consumer
- Nutrition Business Journal publishes a report on organic food industry each year for ~\$3,000. The Foundation could purchase if relevant.

Methodology – consumer demographics (publications)

Data sources and data collection process

- Search performed on-campus at UC Berkeley
- Databases searched:
 - EBSCO Host
 - EconBiz
 - EconLit
 - Lexis Nexis Academic

Data time frame (e.g. time series or specific year)

- Search performed on October 1, 2008

Assumptions and decision-making process

- None

Concerns on data accuracy or recommendations

- None
- Recommend searching for emerging popular key terms (i.e. market tools—catch shares, IFQ/ITQ—and lifecycle analysis)

Appendices

1. Methodology Slides
2. New England Groundfish Stock Assessment >

Stock Assessments of New England Groundfish Populations

New England Fisheries Service Center: November 2007 - August 2008

- Stock Assessments from the third Groundfish Assessment Review Meeting (GARM)
- November 2007 - August 2008
- Scientific, peer review process
- Benchmark assessment of 19 groundfish stocks managed under the Northeast Multispecies Fishery Management Plan

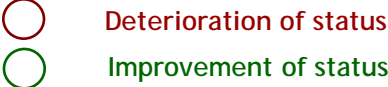
“This stock assessment shows that current efforts to rebuild New England’s groundfish populations are not working.”

Peter Baker, Pew Environment Group’s New England Fisheries Campaign Manager

Species Reviewed:

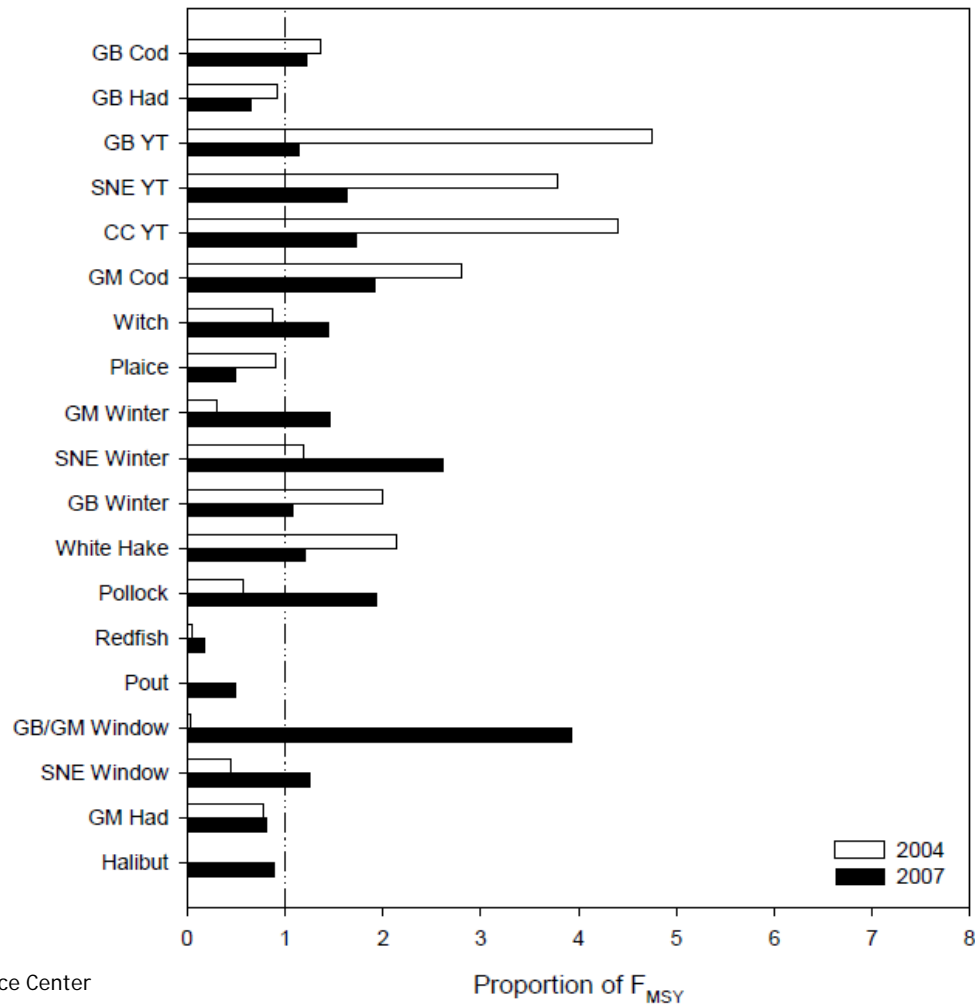
Georges Bank Cod
 Georges Bank Haddock
 Georges Bank Yellowtail Flounder
 Southern New England/Mid-Atlantic Yellowtail Flounder
 Gulf of Maine/Cape Cod Yellowfin Flounder
 Gulf of Maine Cod
 Witch Flounder
 American Plaice
 Gulf of Maine Winter Flounder
 Southern New England/Mid-Atlantic Winter Flounder
 Georges Bank Winter Flounder
 White Hake
 Pollock
 Acadian Redfish
 Ocean Pout
 Gulf of Maine/Georges Bank Windowpane
 Southern New England/Mid-Atlantic Windowpane
 Gulf of Maine Haddock
 Atlantic Halibut

Stock Assessments of New England Groundfish Populations

Overfished and experiencing Overfishing	Overfished, but not Overfishing	Not Overfished, but Overfishing	Not Overfished or experiencing Overfishing
2007 (11) - georges bank cod - georges bank yellowtail flounder - southern new england/mid-atlantic yellowtail founder - gulf of maine/ cape cod yellowtail flounder - southern new england/mid-atlantic winter founder - pollock - witch flounder - georges bank winter flounder - gulf of maine winter flounder - northern windowpane	2007 (2) - ocean pout - halibut	2007 (2) - gulf of maine cod - southern windowpane	2007 (4) - redfish - american plaice - georges bank haddock - gulf of maine haddock
			
2004 (7) - georges bank cod - georges bank yellowtail flounder - southern new england/mid-atlantic yellowtail founder - gulf of maine/ cape cod yellowtail flounder - southern new england/mid-atlantic winter founder - white hake - gulf of maine cod	2004 (5) - georges bank haddock - gulf of maine haddock - southern windowpane - plaice - ocean pout	2004 (1) - georges bank winter flounder	2004 (5) - pollock - redfish - northern windowpane - gulf of maine winter flounder - witch flounder

Stock Assessments of New England Groundfish Populations

F 2004 and 2007 as a Proportion of F_{MSY}



Stock Assessments of New England Groundfish Populations

B 2004 and 2007 as a Proportion of B_{MSY}

“For most groundfish stocks, $F_{REBUILD}$ (the fishing mortality estimated to ensure recovery of B_{MSY} by the end of the rebuilding period) is lower than the 2007 fishing mortality.”

