



The Pacific Sardine

(Sardinops sagax)

Federal Management Alternatives

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In association with the Panetta Institute for Public Policy

MPP Cohort IV – Spring 2009

CENTER FOR
OCEAN
SOLUTIONS

Summer Internship



Sardine
landings
peaked in
1937
at
726,124
metric
tons



Our Heritage Our Future



California Sardine Fishermen Face Major Threats to Their Livelihood

- Quota Decline
- Expansion in PNW
- High-Volume, Low Value Global Market
- Loss of Infrastructure
- Temperature Cycles

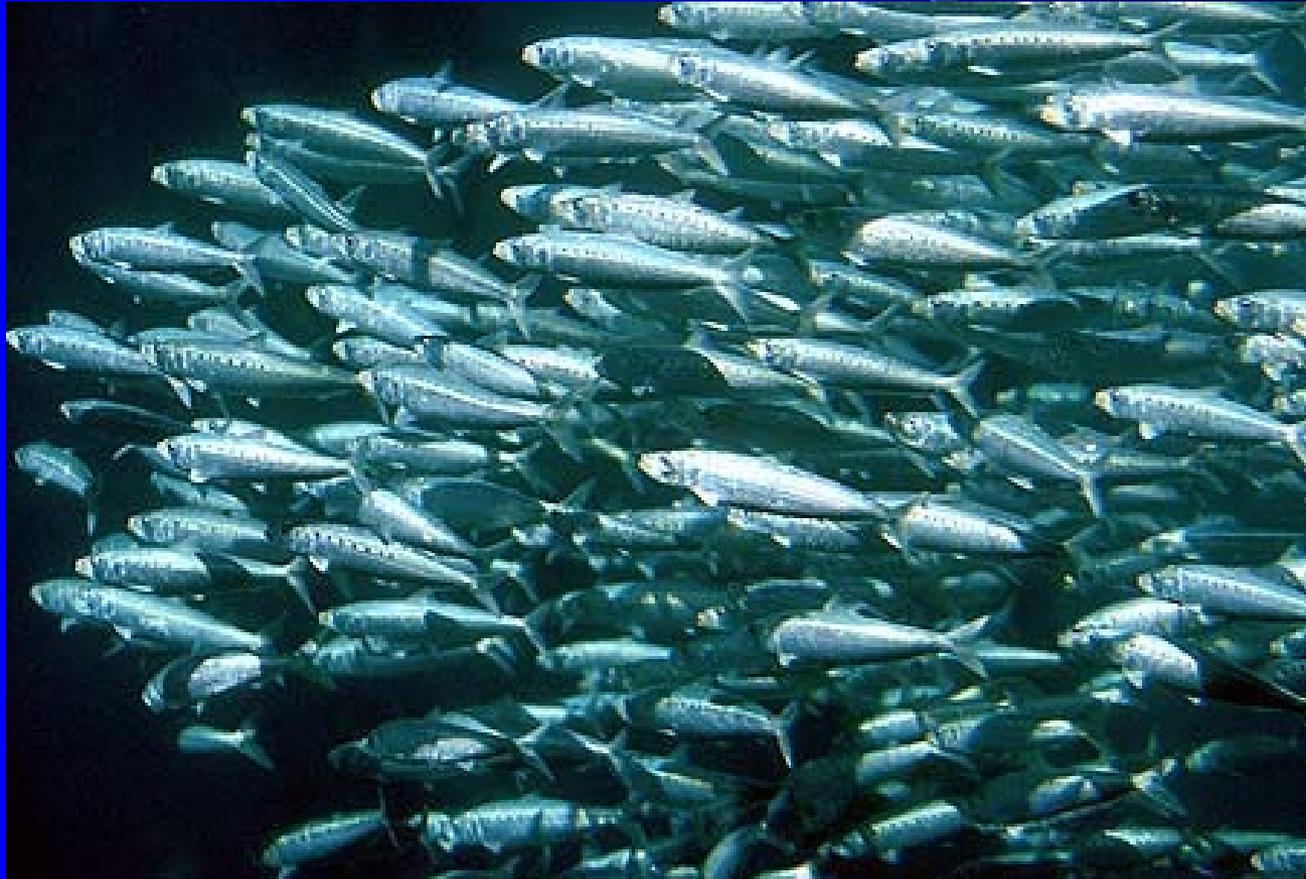
Royal Seafood's New Hours
Sorry for the inconvenience. Due to high fuel prices and low government fish quotas we have been forced to cut back.

Monday	12:00 noon to 6:00 pm
Tuesday	12:00 noon to 6:00 pm
Wednesday	12:00 noon to 6:00 pm
Thursday	12:00 noon to 6:00 pm
Friday	12:00 noon to 6:00 pm
Saturday	10:00 am to 5:00 pm
Sunday	10:00 am to 5:00 pm

Call ahead and we will let you no when the next boat will be in. Thanks again
831-655-8326



**Sardines are small fish
that swim in large schools**



The California Current





Sardine Policy Today

- Magnuson Stevens Fisheries Conservation (Reauthorization Act 2006) (MSY)
- National Marine Fishery Service
- Pacific Fishery Management Council
- Amendment 11 - Long-Term Sardine Allocation

Harvest Guideline Formula



$HG2009 = (Biomass2008 - Cutoff) * Fraction * Distribution$

$66,932 \text{ mt} = (662,886 \text{ mt} - 150,000 \text{ mt}) * 85\% * 15\%$

Tri-Annual Season Quota System

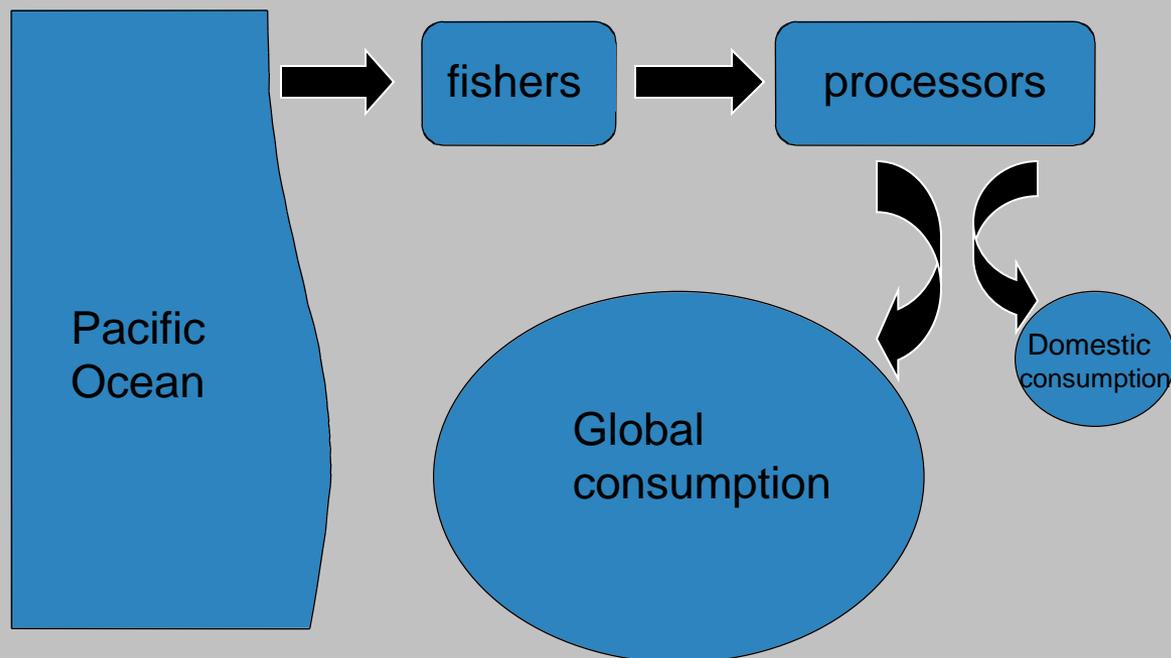
- 35% January – June
- 40% July – September 14
- 25% September 15 – December 31



90% of Pacific Sardines are exported:

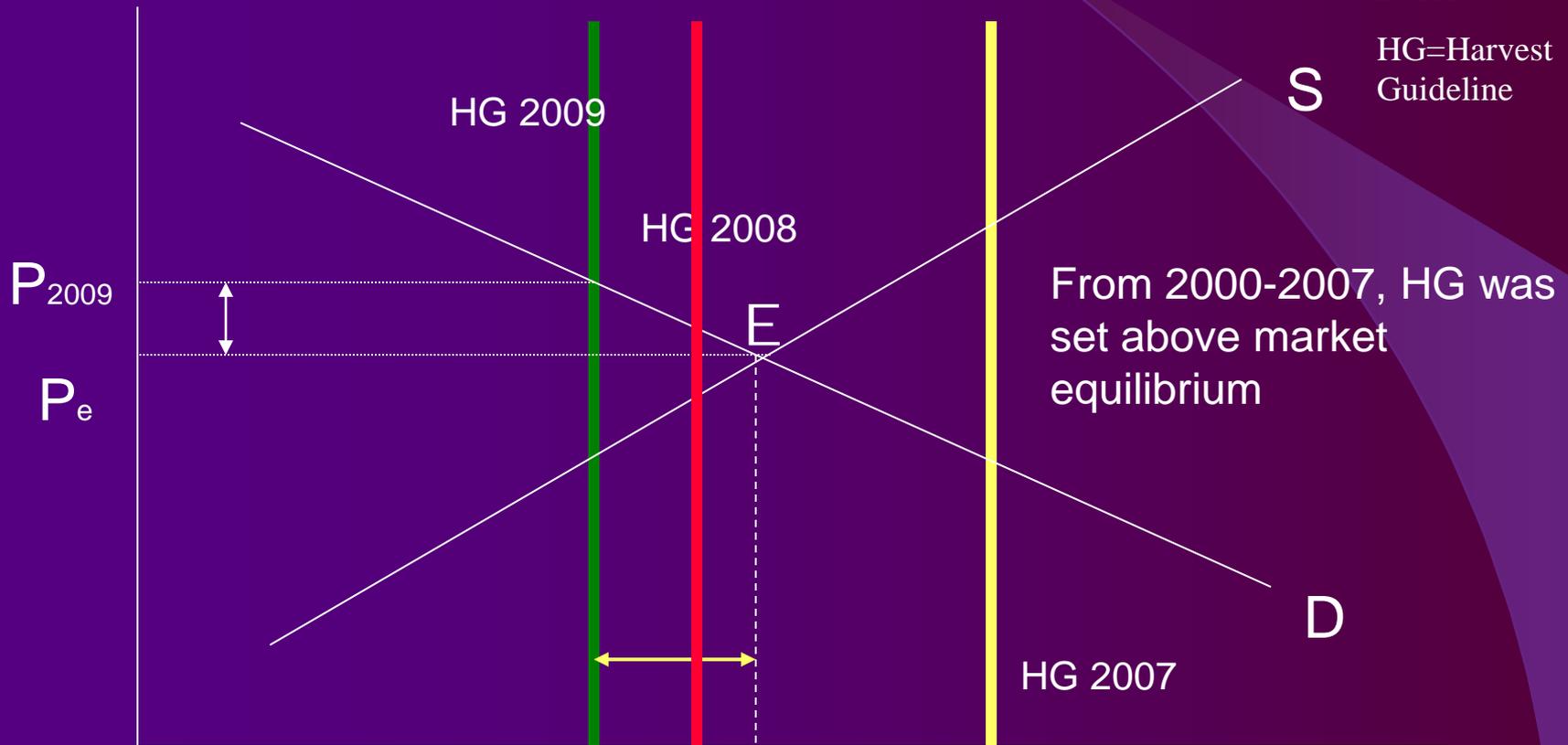
Japan 30% Australia 26%

The Sardine Industry



Amendment 11 - Long-Term Sardine Allocation

S=Supply
D=Demand
E=Equilibrium
P=Price
HG=Harvest
Guideline



HG has different effects in different years



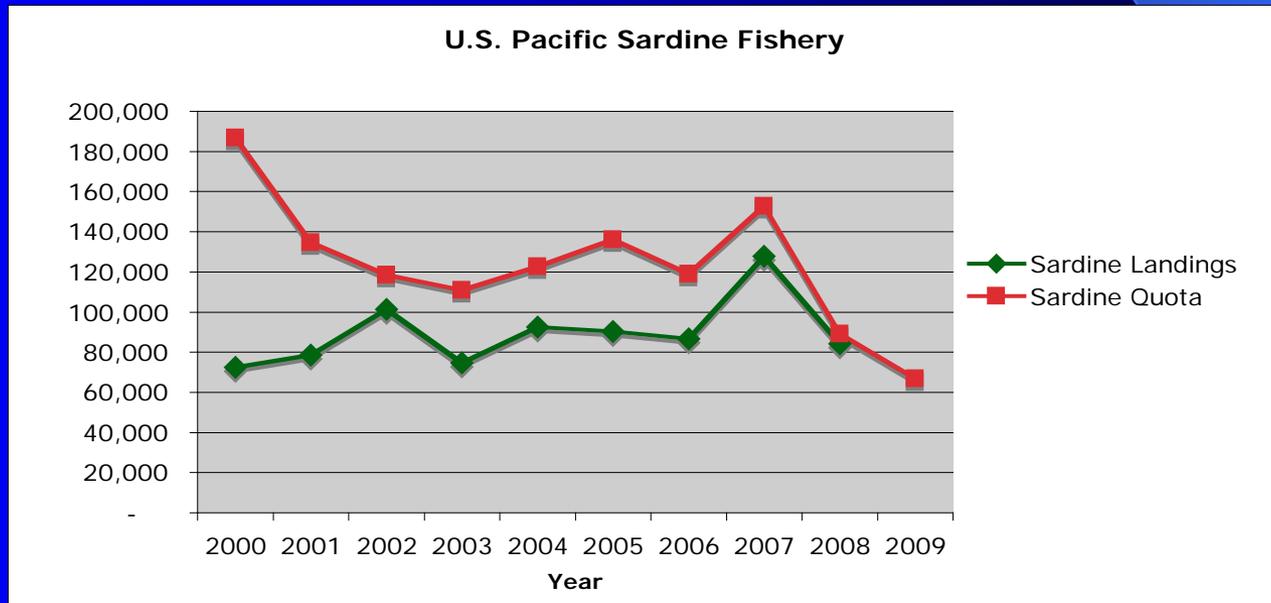
Policy Alternatives

- #1 Status Quo
- #2 Domestic Food Market Incentive & Permit Equity
- #3 Individual Fishing Quotas (ITQ)
- #4 Community Property Rights (CPR)



#1 Status Quo

- Command & Control
- Permit Inequity: CA & PNW
- Tri-Annual Quota





Alt. #2 Domestic Food Market Incentive & Permit Equity

- Command & Control
- Resolve Permit Inequity
- Tri-Annual Quotas for Export Market
- Annual Quota for Domestic Market

Alt. #2 Domestic Food Market Incentive & Permit Equity





Alt. #3 Individual Transferable Quota

- Grant Private Property Rights for Sardines
- Permit Holders have a right to “Shares”
- Share Quotas are based on historical catch



Alt. #3 Individual Transferable Quota

Who gets
the
Rights?

Year	California \$	PNW \$	Permits CA vs PNW
Pre 1999	100%	0%	65/0
2006	58%	42%	66/42
2007	62%	38%	65/44
2008	52%	48%	65/45

Permit participants vs Permits available				
	CA	OR	WA	Totals
Pre-1999	65+	0	0	65+
2006	61/65	16/26	7/15	84/106
2007	61/65	22/26	6/15	89/105



Alt. #4 Community Property Rights

- Area Management: SCA/NCA/PNW
- Limited Access Permits by Area
- Quota distributed by Area Management



Alt. #4 Community Property Rights

California Landings

58%	2006	46,579	0.05	\$5,100,090
62%	2007	80,980	0.05	\$8,220,294
52%	2008	57,799	0.06	\$7,583,654

Feasibility - Which powers Support?



- Management?
- PNW Industry?
- CA Industry?
- CA Conservationists?
- Global Conservation Orgs?



Evaluation Criteria

- Jurisdiction
- Administration
- Cost-Benefit
- Equity
- Sustainability
- Improvability
- Political Feasibility

Policy Evaluation Matrix

	<i>#1 Status Quo</i>	<i>#2 Innovation</i>	<i>#3 ITQ</i>	<i>#4 CPR</i>
<i>Jurisdiction</i>	4	4	4	4
<i>Administration</i>	4	3	1	2
<i>Cost-Benefit</i>	1	4	2	3
<i>Equity</i>	2	3	2	4
<i>Sustainability</i>	1	4	2	4
<i>Improvability</i>	2	4	1	4
<i>Political Feasibility</i>	2	3	2	3
<i>Average Score</i>	16	25	14	24



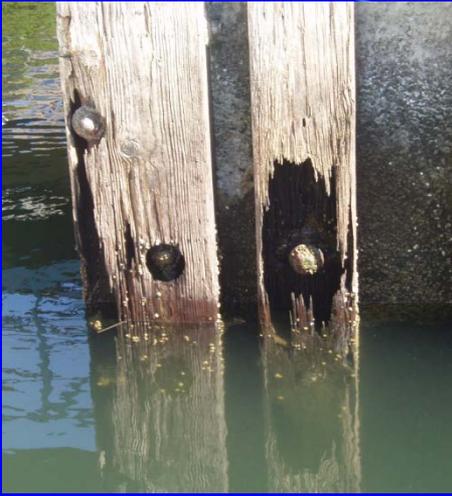
Policy Recommendation

SHORT-TERM

Alt. #2 Domestic Food Market Incentive & Permit Equity

LONG-TERM – 2011-2015

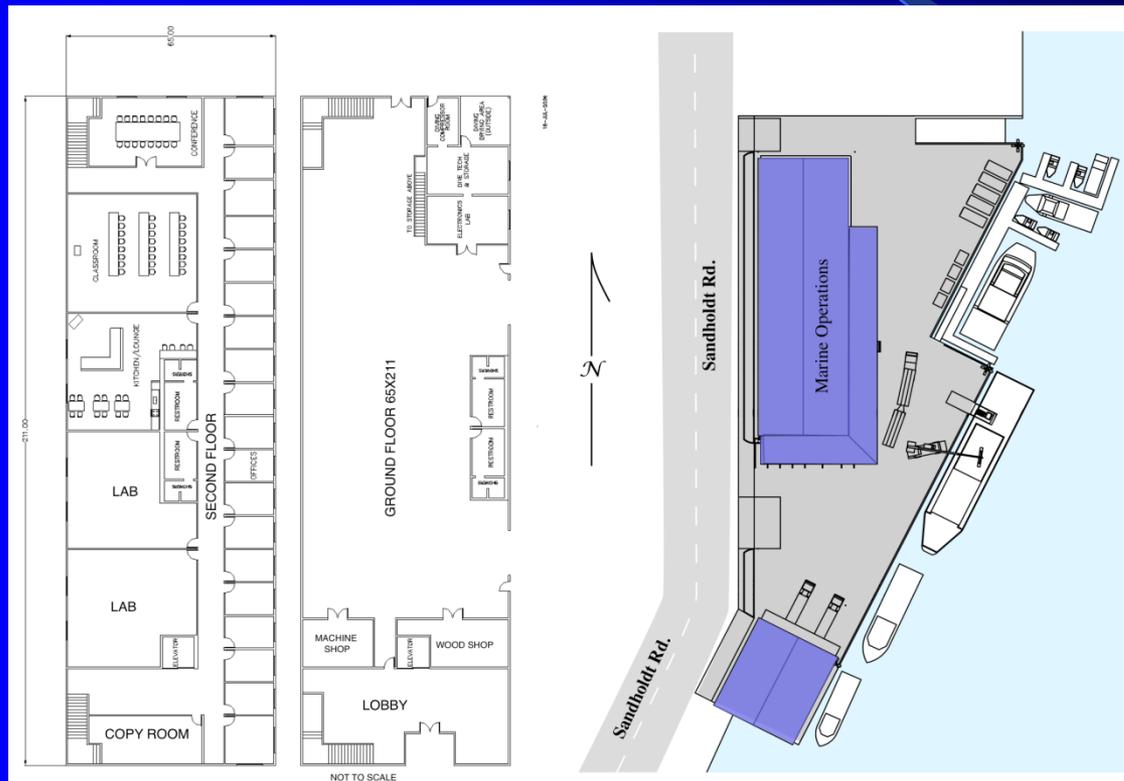
Alt. #4 Community Property Rights



Barriers to Implementation

- Sardines are an inferior good
- Sardines are a niche market in the U.S. - consumers prefer whiter fish without bones
- In the U.S. sardines have an ethnic or immigrant connotation
- Sardines are less expensive to process overseas

Moving Sardines into the American Diet: Collaborative Marine Operations and Coastal Pelagic Facilities at Moss Landing Marine Laboratories.



Marine Operations/Scientific Diving/Sustainable Fisheries Facility

Pacific Sardines Are Healthy to Eat & Sustainably Managed

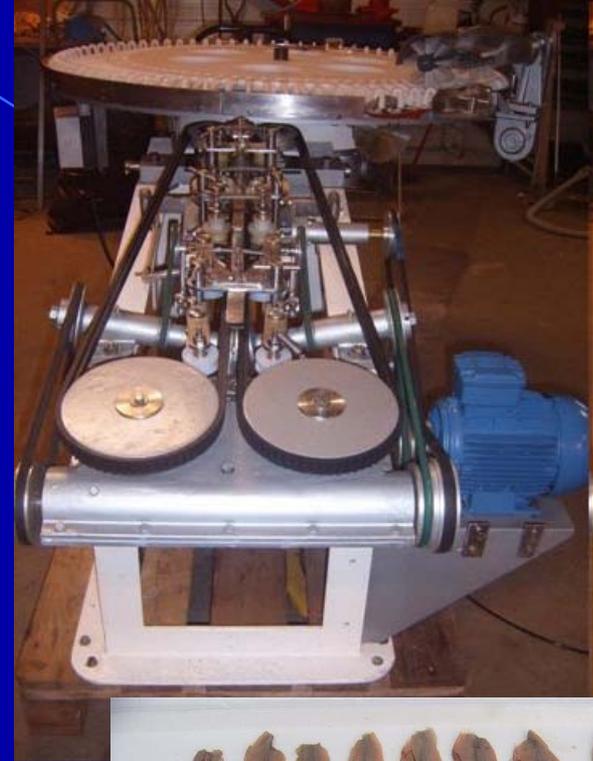
Sardines 1.00 each: 92.00 grams, 191.36 calories

World's Healthiest Foods Rating

vitamin B12 (cobalamin)	8.22 mcg	excellent
Tryptophan	0.25 g	excellent
Selenium	48.48 mcg	very good
vitamin D	250.24 IU	very good
omega 3 fatty acids	1.36 g	very good
Protein	22.65 g	very good
Phosphorus	450.80 mg	very good
Calcium	351.44 mg	good
vitamin B3 (niacin)	4.83 mg	good

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Innovations in Fish Fillet Processing

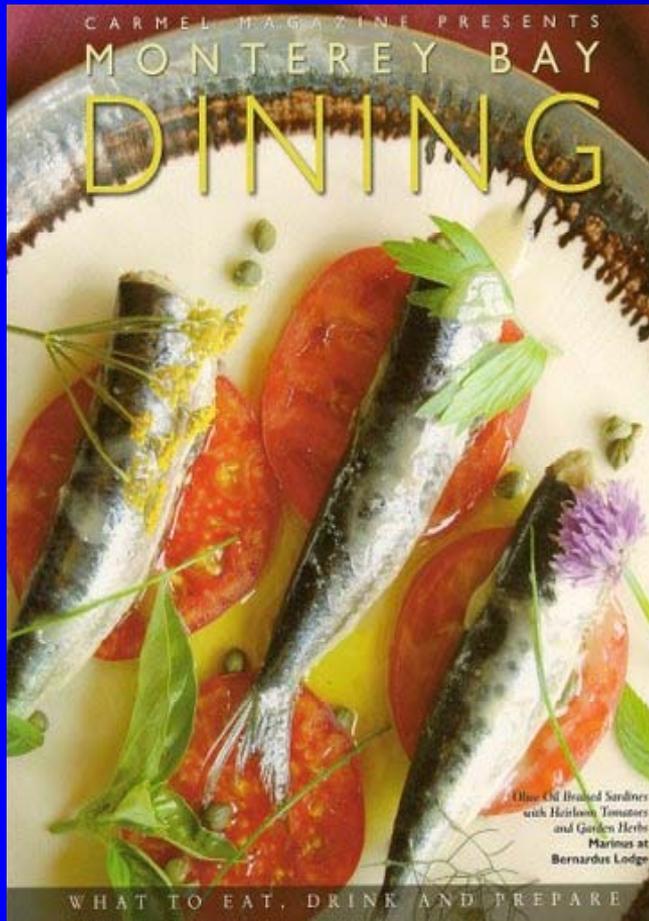


Conclusion

- The California Bulk Sardine Industry is in Trouble
- Sardines are Sustainably Caught
- Sardines have health benefits
- Innovation is needed

The 2010 Sardine Season opens in July

Eat Fresh Sardines!!



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