

A Request to the Pacific Fishery Management Council

**To prohibit krill harvesting
in the Monterey Bay, Gulf of the
Farallones, and Cordell Bank
National Marine Sanctuaries
under Magnuson-Stevens**

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are needed to see this picture.





Krill Harvesting

Development of Strategies

- Raised as an issue during the Joint Management Plan review for MBNMS, GFNMS, and CBNMS
- Addressed by working groups and Sanctuary Advisory Councils
- Draft action plan for inclusion in Draft JMPR/EIS

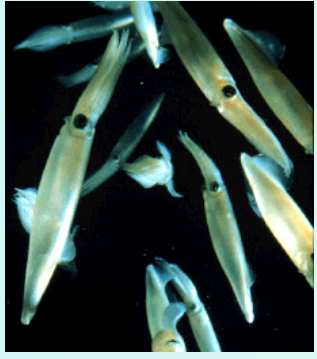
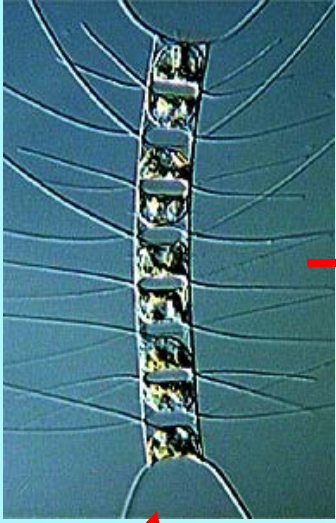
The Sanctuaries Request:

- The Council prohibits krill harvesting within the 3 sanctuaries under Magnuson-Stevens

Krill Harvesting

Why is it an Issue?

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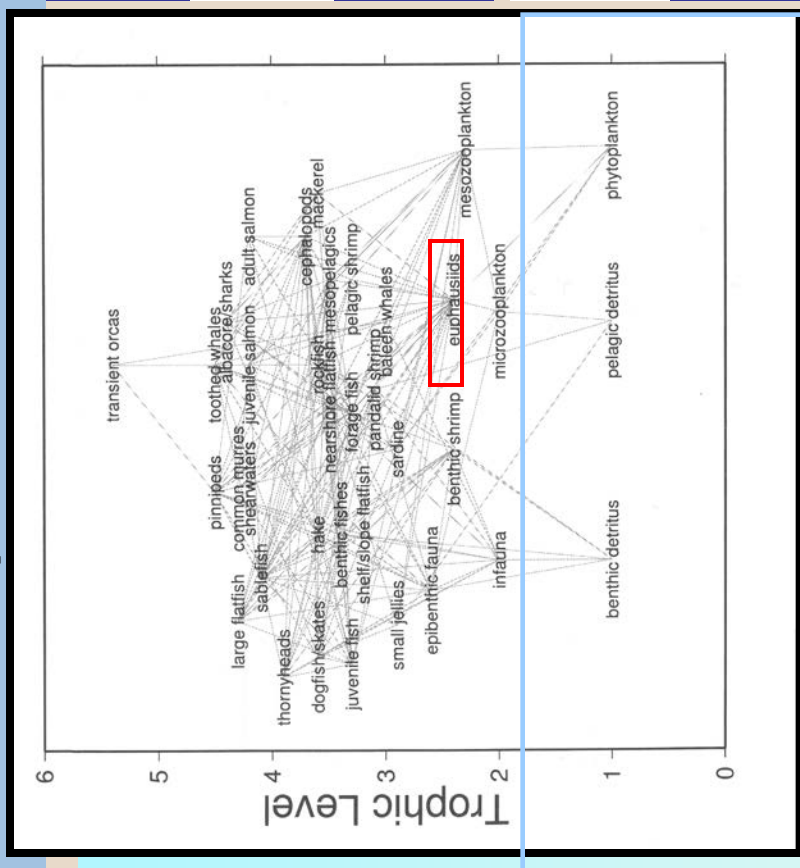


The Role of Krill in the Ecosystem

Field, J. C., R. C. Francis, and A. Strom. 2001. Toward a fisheries ecosystem plan for the northern California Current. CalCOFI Rep. 42:74-87.

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- Of the four consumers of primary production in the model, krill accounted 20.4% of all consumption.
- Krill are extremely important in passing this production on to commercially significant fisheries, including rockfish, salmon, sardine, and squid.
- Aside from mesozooplankton, the consumption of krill by predators was greater than any other component of the system, and accounted for 35% of all the secondary production passed to tertiary and higher levels.





Current Krill Harvesting Restrictions off California

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State AB 2482

State recognized the legitimacy of the threat and imposed a legislative ban on harvesting krill in state waters and landing in state port until 2011. Sponsored by PCFFA

State AB 1296

Eliminated the sunset date of 2011. Prohibits California vessels from harvesting krill to 200 miles in absence of Federal regulation. Also sponsored by PCFFA

Threat Remains

Off California, out of state vessels can still harvest krill outside of three miles where krill abundance and aggregation is highest.



Potential For a Regional Krill Fishery

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- High level of local abundance and degree of aggregation off the west coast could make for profitable fishery
- Developing land based global aquaculture markets need krill for food
- Ocean pen aquaculture needs krill for food
- According to FAO report, demand for krill products expected to increase



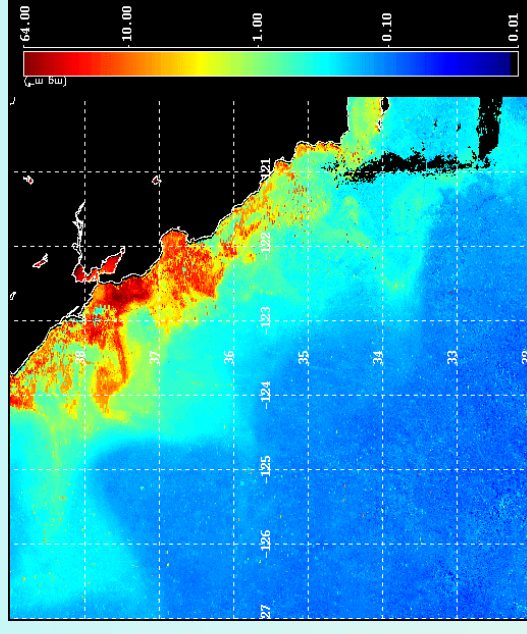
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Krill Harvesting

Supporting Document

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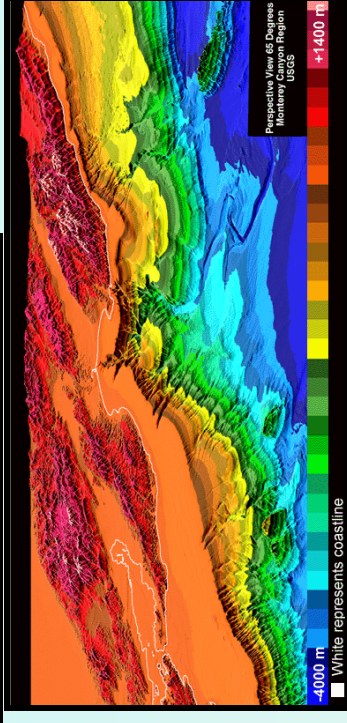
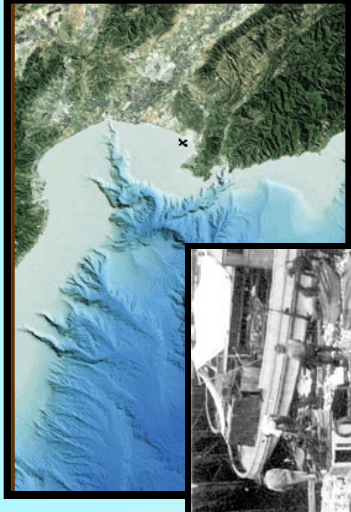
- Local researchers and NMFS representatives assisted in compiling information regarding importance to ecosystem and economy
- Much is relevant to managed stocks but also addresses the importance of krill to other species and ecosystem in general.



Productive Krill Habitat off the Central California Coast

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- Upwelling patterns
- Bathymetry
- Current patterns
- Pelagic hotspots
- Biological link





Commercial Stocks Dependent on Krill

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Stock	Krill Diet %	Average Landings in MBNMS 1981-2000 (1000lbs)
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Squid	96.6 %	13,960
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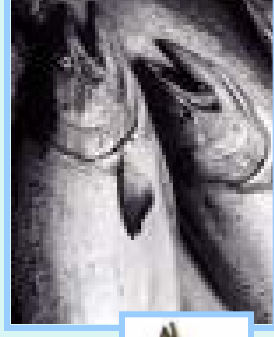
Herring	32.6%	155
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Anchovy	72%	4,297
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Salmon	25%	2,210
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Hake	31%	2(S.F.)
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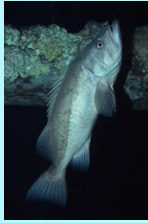



Sardine	20-50%?	8,098
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Recovering or Locally Declining Rockfish Species

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SPECIES	LENGTH in MBNMS 59-94 (Starr 02)	KRILL DIET % (Reilly 1992)
Bocaccio 	-12.3%	21-50%
Widow 	-11.4%	21-50%
Chilipepper 	-27%	21-50%
Yellowtail 	-12%	>50% (Pereyra et al 1969)



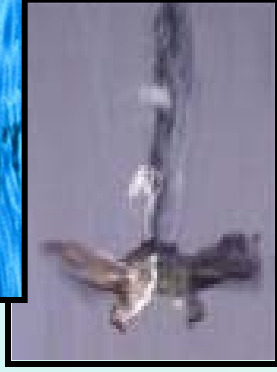
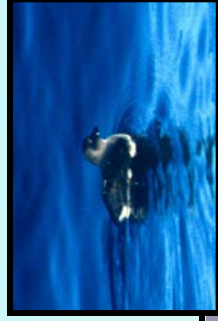
Seabirds/Cassin's Auklet Profile

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Percentage of Krill in the Diet of Cassin's Auklet (1977-2001)

Year	<i>T. spinifera</i>	<i>E. pacifica</i>
1977	85	14
1979	45	21
1980	03	43
1981	45	37
1985	22	70
1986	27	62
1987	43	53
1988	37	60
1989	37	61
1990	22	58
1991	15	42
1993	28	48
1994	35	50
1995	36	25
1996	08	82
1997	37	27
1998	69	10
1999	22	52
2000	61	18
2001	51	35

Avg 36.4 52.15



Other Seabird Krill Consumption

Krill comprise over 50% of diet:

Western Gull

Common Murre

Krill may comprise 1% to 20% of the diet:

Northern Fulmar

Pink-footed Shearwater

Short-tailed Shearwater Sooty Shearwater

Ashy Storm-petrel

Black Storm-petrel

Fork-tailed Storm-petrel

Leach's Storm-petrel

Cook's Petrel

Red Phalarope

Red-necked Phalarope

Xantus' Murrelet



Silchler '97

Whales Krill Consumption

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<u>Species</u>	<u>Daily Consumption</u>
Humpback	1.2 mt/day
Blue	3 mt/day
Sei	.8 mt/day
Fin	1.8 mt/day



Antarctic Fishery

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- Catch of 300,000 tons a year
- Products (animal feed)
- 35 tons in eight minutes
- CCAMLR sets precautionary limits
- Regional effects
 - shift in seabird/seal distribution
 - insufficient forage for predators with restricted foraging ranges
 - fishery occurs when many species are dependent on krill





Conclusion

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- We recognize and appreciate the breadth of pressing issues the Council deals with
- Given the importance of krill we encourage the Council to stop a krill fishery before it can begin
- Precedent for addressing the issue under Magnuson exists
 - NPFMC prohibition on targeting certain forage fish
- Alternatively, the Council may be given the opportunity to draft regulations under the National Marine Sanctuaries Act