The Honorable George Plescia  
California State Assembly  
California State Capitol Room 3141  
Sacramento, CA 94249  

Dear Mr. Plescia,

On behalf of California's historic wetfish industry, I appreciate this opportunity to introduce myself and the California Wetfish Producers Association (CWPA), a nonprofit 501(c) organization representing the majority of fishermen and processors who harvest and market 'wetfish' in California: including Pacific sardine, Pacific and jack mackerel, anchovy and market squid. The wetfish industry has produced the lion's share of California's commercial fishery harvest since before the turn of the 20th century, contributing substantially to California's economy as well as California culture for nearly 150 years.

Wetfish industry leadership established CWPA in 2004 with a primary goal to cooperate with state and federal fishery managers to assure the continued sustainability of coastal pelagic 'wetfish' resources as well as this storied industry. California's wetfish industry was founded by immigrant fishermen more than a century ago, and the enterprise of these fishing families helped to build the ports of Monterey and San Pedro, as well as San Diego and San Francisco. Today's wetfish industry is a traditional industry with a contemporary outlook: streamlined and more efficient but still peopled by fourth and fifth-generation fishing families. Now as then, this industry has heavily invested in research — from the beginnings of the California Cooperative Fishery Investigations (CalCOFI) to today, with CWPA’s cooperative research program expanding knowledge of market squid and sardine, in coordination with the state Department of Fish and Game and federal Southwest Fishery Science Center.

In light of today's precautionary wetfish fishery management and current research programs, we are assured that our wetfish resources and fishery are sustainable. So it was with alarm and extreme dismay that we learned of AB 2712, which you authored and introduced February 22.

However well-meaning the intent of this bill to protect marine resources, this legislation as drafted would — intentionally or not — result in the unnecessary curtailment of California's historic wetfish industry. Therefore we must oppose AB 2712 as written.

This bill appears not to have considered nor coordinated with any other regulations now in place to protect, manage and sustain coastal pelagic resources. It duplicates and overrides existing fishery management — both the federal Coastal Pelagic Species Fishery Management Plan (CPS FMP) and state Market Squid Fishery Management Plan. Moreover it lays yet another extreme and unneeded
regulatory burden, in fact a prohibition on fishing, on top of the current network of marine reserves and marine protected areas now being implemented under the Marine Life Protection Act (MLPA) and those already implemented by the Channel Islands Marine Reserve process, a pilot project and precursor to MLPA, not to mention the numerous areas now closed to fishing through existing fishery regulations. It further mandates the Department to conduct extensive research but provides neither the funding nor scientific personnel to accomplish these tasks: AB 2712 thus appears as another unfunded mandate.

Board members of CWPA and I, along with our scientific research consultant, would very much appreciate an opportunity to sit down with you to discuss this bill and present data supporting the length and breadth of resource management regulations currently in effect to protect and sustain coastal pelagic resources, including the wetfish species enumerated in AB 2712.

I look forward to meeting and working with you in support of strengthening California’s emphasis on best available science, as mandated in existing California ocean protection policies including the Marine Life Management Act, Marine Life Protection Act and California Ocean Protection Act, and assuring the coordination and integration of these mandates.

Thank you very much for your consideration.

Best regards,

Diane Pleschner-Steele
Executive Director
INTRODUCTION

- Overview
- A Brief History of CA's Wetfish Industry
- Highlights of existing fishery management
  - Coastal Pelagic Species FMP
  - Market Squid FMP

MARINE LIFE TRENDS & FORAGE FISHING

- Central CA Trends
- Southern CA Trends
- Information on forage habits of marine birds

MAPS OF SOME AREAS CLOSED TO FISHING

- Channel Islands Marine Reserves
- MPAs implemented through Marine Life Protection Act.

CONCERNS REGARDING AB 2712

- Analysis of the Bill by Dr. Richard Parrish, former member of the Coastal Pelagic Species Fishery Management Team (retired)
OVERVIEW

“Wetfish”, coastal pelagic species including sardines, anchovy, market squid and mackerels, have contributed the lion’s share of California’s commercial seafood harvest since before the turn of the 20th century, producing more than 80 percent of the total statewide catch, on average, and representing thousands of jobs in the ports of Monterey and San Pedro as well as San Diego and San Francisco, and harbors in-between.

AB 2712 places unnecessary restrictions on this historic fishery, jeopardizing its sustainability.

- AB 2712 duplicates existing protections without recognizing nor integrating the ecosystem-based conservation benefits of:
  - Magnuson-Stevens Conservation and Management Act (PFMC)
  - California Current System Fishery Management Plan (in development, PFMC)
  - Coastal Pelagic Species Fishery Management Plan (PFMC)
  - Marine Life Management Act (DFG)
  - Market Squid Fishery Fishery Management Plan (DFG)
  - Statewide network of Marine Protected Areas implemented under the Marine Life Protection Act
  - Additional closures and restrictions implemented through fishery regulations

- AB 2712 (Sec. 7095) specifies environmental risks, none of which are caused by fisheries in CA, yet proposes only to restrict fishing – where’s the link?
  - “Industrial fishing” [d] is not defined; moreover it does not occur in CA.
  - Virtually NO whole fish are converted to fish meal in CA.

- The plan outlined in AB 2712 does nothing to enhance ecosystem management, the goal of current state and federal fishery management policy; the solutions proposed are simply a series of single species management plans.
  - As written, the bill is a strange mixture of goals and specific management options, none of which are necessary or even well thought out. For example, the specific management options would go into law before, and with priority over, the management recommendations developed by the proposed fishery management plan. Clearly this is not the way to manage the ecosystem, or the fisheries.
  - Ecosystem management cannot be carried out with attention only given to a single trophic level in a small portion of a single habitat (in this case forage fishes in the epi-pelagic habitat) (Parrish comments, page 1)

- AB 2712 is another unfunded mandate and duplication of existing efforts – seemingly a misguided attempt to curtail CA’s historic wetfish fishery complex in the guise of marine resource protection
  - There is no way that a forage species management plan can be adequately addressed without significant dedicated funding for both the planning team and a permanent monitoring plan to track the ecosystem health of the lower trophic level fishes and pelagic invertebrates as well as oceanic regime shifts. (Parrish comments, page 1)
  - The research required by this bill is already being investigated by NOAA and independent scientists.
- CA Ocean Protection Council set global warming/ocean acidification as a high priority for CA Sea Grant research in 2008.
- Marine mammal populations have increased in California during the past several decades, after passage of the Marine Mammal Protection Act of 1972, when fisheries were significantly larger than they are at present, suggesting that the ecosystem was healthy even at the higher exploitation rates that occurred during the 1980s and early 1990s. (Parrish comments, page 2)

- Section 7099 is a prescription for certain failure of an ecosystem management plan. Simplistic and artificial policies such as only allowing fishing where fishing occurred from 2002-07 and setting maximum landings based on the 2007 landings cannot be considered to be even a first guess proxy for ecosystem management. [The 2007 landings were not even available when AB 2712 was written.]

- This section completely negates the role of science in the development of the plan, and it is an insult to the hundreds of scientists who have spent their lives studying, describing and analyzing the complex ecology of the California Current System. (Parrish comments, page 7)
  - Pelagic species by definition are carried by the currents; their distribution varies wildly from year to year due to their population size, wind and density driven local circulation processes, El Nino events, decadal and regime scale environmental process in the entire Pacific Basin.

- The evidence gathered over the last century demonstrates that ecosystem management will necessarily be an adaptive process that utilizes monitoring of both environmental and biological processes to determine the current environmental state, and then applies an ecosystem model to determine optimum harvest policies for that state.
  - CWPA has developed a collaborative research program for market squid that links environmental indices (i.e. sea surface temperature, chlorophyll A, ocean currents etc.) to scientific capture of squid paralarvae and local concentrations by area, and is cooperating with state and fishery squid scientists to relate trends to harvest levels over time.

- In summary, knowledge-based ecosystem management in which the importance of forage species is included in the determination of their optimum yield is an important goal.
  - The existing definition of "Optimum yield" in Sec. 97 of the CA Fish & Game Code already includes ecological factors.

- Unfortunately, this legislation offers simplistic, belief-based measures affecting only a portion of a single trophic level in a small portion of the California Current Ecosystem. Measures such as capping landings at an as yet unknown value determined by the landings in 2007, and restriction of the future fishery to the state water areas that were fished in the years 2002-2007, are not likely to produce a management system that is sufficiently accurate or adaptive enough to result in successful ecosystem management. (Parrish comments, page 9)
HIGHLIGHTS: CONSERVATION AND MANAGEMENT OF 'FORAGE' SPECIES
Specific References:
[Federal] PFMC – Coastal Pelagic Species FMP and
[State] DFG – Market Squid Fishery Management Plan

Introduction:
For more than a decade, both federal and California state fishery management programs have adopted an ecosystem-based management (EBM) focus: federally managed fisheries must comply with the Magnuson-Stevens Fishery Conservation and Management Act (MSA), whose amendments adopted by Congress in 2007 provide an even stronger ecosystem-based fishery management framework that mandates, among other provisions, a study on the state of science for the integration of ecosystem consideration in fishery management (MSA Section 406).

The State of California adopted an ecosystem focus for fishery management, paralleling that of the MSA, with its adoption of the Marine Life Management Act (MLMA) and Marine Life Protection Act (MLPA) in 1999.
Fluharty, D., et. al. (1999), in the paper Ecosystem-based fishery management: a report to Congress by the Ecosystem Principles Advisory Panel (U.S. Department of Commerce. NOAA/NMFS. 54 pages), acknowledged the Pacific Fisheries Management Council's Anchovy Fishery Management Plan (precursor to the Coastal Pelagic Species FMP) for setting aside a portion of the population as forage for other marine life. This FMP was a pioneer in adopting an ecosystem approach to fisheries management, and the ecosystem focus was carried over into the CPS FMP, with the Cutoff portion deducted 'off the top' of the spawning stock biomass estimate when computing harvest guidelines to provide a forage reserve.

In response to Assembly Bill No. 2712

- Fisheries governed by the Pacific Fishery Management Council and State of California are currently managed based on precautionary principles. Monitoring fisheries stocks and determining estimates of population abundance are an essential and ongoing component of management. That is, fisheries are currently managed in an inherently flexible manner in which annual catch limits, restricted access, and time/area closures [both seasonal and permanent] play a key role.

- Stock assessment science incorporates estimates of abundance and productivity of a given stock first to sustain and protect the resource as well as to optimize the potential yield. Adaptive fishery management is an ongoing process and requires estimates of current biomass, historical biomass, productivity, and uncertainty.

- Shifts in the biomass of different species in many fished ecosystems have often been driven by environmental change rather than the direct or indirect effects of fishing. In fact, in most pelagic systems, species replacements would have occurred even in the absence of fishing pressure.

NOTE: AN INDEPENDENT SCIENTIFIC AND STATISTICAL COMMITTEE (SSC) PLAYS AN IMPORTANT ROLE IN PEER REVIEWING PROPOSED FEDERAL MANAGEMENT GUIDELINES. COASTAL PELAGIC SPECIES FISHERIES ARE CLOSELY GOVERNED AND REGULATED BASED ON ESTABLISHED "BEST AVAILABLE SCIENCE" PRINCIPLES.
Highlights of the CPS FMP and Market Squid FMP

Summary:

- Pioneering EBM fishery management plan, CPS FMP established a "Cutoff", subtracting 150,000 mt off the top of estimated sardine biomass, to conserve biomass as forage.
- Established Sea Surface Temperature control for sardine, recognizing that warm-water oceanic cycles favor sardine population abundance and cold-water regimes reduce productivity.
  Precautionary Harvest Guideline (HG) Fraction set at 15% of sardine spawning biomass minus Cutoff when SST exceeds 17.2° C, and is reduced to 5% when SST drops to 16.7° C
- CPS FMP authorized limited entry fishery in CA; reduced CPS finfish fleet to 65 permits, established capacity goal at 5,650.9 mt, to maintain a diverse fleet with normal harvesting capacity equal to long-term expected aggregate total finfish target harvest level of approx. 110,000 mt
- Even though no krill fishery currently exists on the west coast, CPS FMP added krill to FMP as a 'prohibited species'.
- [Note: all west coast states prohibit harvesting and landing krill in state waters, but the CPS FMP prohibition prevents future offshore harvest/processing of krill in US EEZ]
- CPS FMP established proxy MSY for market squid at 30% egg escapement. Squid is monitored species under CPS FMP, and actively managed by CA under state Market Squid FMP.

In addition to 30% egg escapement, state MSFMP mandates:

- fishery closures statewide on weekends;
- limited entry, transferable permits [reduced purse seine fleet from 164 to 77 permits]
- Numerous areas closed to fishing, including approx. 20% squid harvest grounds in Channel Islands Marine Sanctuary, with additional marine reserves implemented or pending under Marine Life Protection Act

Detail:

1) Amendment 8 Established CPS FMP, expanded from the Anchovy FMP; included four finfish species (Pacific sardine, Pacific mackerel, northern anchovy, jack mackerel) and one invertebrate (market squid)

- MSY (maximum sustainable yield) control rules for harvest of "actively managed species": \[ \text{Harvest Guideline} = (\text{Biomass-Cutoff}) \times \text{Fraction} \times \text{Distribution} \]
- Sardine: Cutoff = 150,000 metric tons and Fraction = 0.248649805 T₂ - 8.190043975 T + 67.4558326 (where T₂ is 3-year temperature average). Distribution accounts for percentage of northern sardine biomass in US waters (87%). This precautionary formula reduces the US harvest guideline to account for sardine harvested in Mexico.
• Pacific mackerel: Cutoff = 18,200 metric tons; Fraction = 30% [environment-based percentage of biomass above Cutoff allowed to be harvested by fisheries]; Distribution 70% [percentage of total biomass in US waters]
• Anchovy, jack mackerel, and market squid included as monitored species; anchovy and jack mackerel monitored due to low landings, with active management if landings increased (squid is actively managed by California)
• Allocation of sardine HG: apportioned 33% of HG to subarea A (35° 40' N. latitude, Point Piedras Blancas, California to 39° N. latitude, Point Arena, California) and 66% to subarea B (Point Piedras Blancas to US Mexico border).
• Sardine season January 1 to December 31 and P mackerel July 1 to June 30
• Required annual Stock Assessment and Fishery Evaluation (SAFE) report for CPS

2) Amendment 9 Addressed Bycatch and Indian fishing rights
• Recommended that agencies and tribes develop dockside bycatch monitoring program, observer programs for all new fisheries, and that grates over ships holds be evaluated for separating out and live release of bycaught species
• Recognized that treaty rights apply to CPS FMP and allocations of HG

3) Amendment 10 Fleet capacity and market squid MSY control rule
• Set CPS finfish fleet capacity goal of 5,650.9 mt, to maintain a diverse fleet with normal harvesting capacity equal to long-term expected aggregate finfish target harvest level of approx. 110,000 mt
• Allowed permit transfers with restrictions while maintaining fleet capacity goal
• Set market squid MSY: established proxy MSY for squid at 30% egg escapement

4) Regulatory Amendment Revised allocation framework
• (1) moved geographic boundary between Subarea A (northern subarea) and Subarea B (southern subarea) from 35° 40' N. latitude (Point Piedras Blancas, California) to 39° N. latitude (Point Arena, California), (2) moved the reallocation date for unharvested sardine from October 1 to September 1, (3) changed the reallocation percentage of unharvested sardine to 20% to Subarea A and 80% to Subarea B, and (4) reallocated all unharvested sardine on December 1 coastwide.

5) Amendment 11 Revised sardine allocation to allow for more efficient use of HG
Established coastwide, seasonal allocation, releasing HG in three time periods: Jan 1 – June 30, 35%; July 1 – Sept 15, 40%; Sept 16 – Dec 31 25%, with any unused HG remaining in any time period to be rolled automatically into the next period. PFMC agreed to review the allocation framework in three years: 2008.

6) Amendment 12 Measures to prohibit fishing for krill
• Added krill to the management unit species of the CPS FMP under new category of "prohibited harvest"
Highlights of Market Squid FMP

From Table 3-1. Summary of Management Measures as Identified in the Draft MSFMP Adopted by the Fish and Game Commission 27 August 2004 and 3 December 2004. (Revised by Commission 22 March 2005)

**FINAL MARKET SQUID FISHERY MANAGEMENT PLAN: 25 March 2005**

**FISHERY CONTROL RULES**

**Seasonal Statewide Catch Limitation**
Established a seasonal catch limitation based on recent average catch and the assumption that squid biomass is above average spawning biomass (currently set at 118,000 tons) to be reviewed in two years.

**Weekend Closures**
Continued closures from noon Friday to noon Sunday from the U.S.-Mexico border to the California-Oregon border

**Monitoring Program**
Continued existing squid monitoring programs (port sampling and logbooks).

**Live Bait Fishery and Incidental Catch of Market Squid**
Continued existing regulations that do not require a squid permit when fishing for live bait or incidental take two tons or less.

**Gear Restrictions**
Maintained existing gear options regarding maximum wattage (30,000 watts)
Established gear restrictions which stating each vessel fishing for squid and lighting for squid would utilize shielding that will reduce the light scatter of its fishing operations by shielding the entire filament of each light used to attract squid and orient the illumination directly downward so that the lower edge of the shield will be parallel to the deck of the vessel.

**RESTRICTED ACCESS PROGRAM**

**Market Squid Fleet Capacity Goal**
Established a capacity goal for market squid vessels that produces a moderately productive and specialized fleet (55 vessels, 18 brail vessels and 34 light boats; capacity goal for nontransferrable permits is zero)

**Requirements for Initial Issuance of Permits**
Transferable Permits: Market Squid Vessel Permit: possession of a current market squid vessel permit (2004-2005) and a minimum of 50 landings in window period January 1, 2000 through March 31, 2003; Brail Permit: Possession of a current market squid vessel permit (2004-2005) and a minimum of 10 landings made with brail gear in window period January 1, 2000 through March 31, 2003; Light Boat Permit: Possession of a current market squid permit (either vessel or light for 2004-2005) and have submitted one light boat log by December 31, 2000. Non-Transferable Permits: Market Squid Vessel Permit: Possession of a current market squid vessel permit (2004-2005), possession of a California commercial fishing license for at least 20 years and a minimum of 33 landings prior to August 27, 2004. Only receipts that demonstrate catch aboard a vessel that does not already qualify for issuance of a transferable permit of any permit class are eligible. Brail Permit: Possession of a current market squid vessel permit (2004-2005), possessed a California commercial fishing license for at least 20 years and made a minimum of 10 landings with brail gear during one fishing season in a window period from January 1, 2000 through March 31, 2003. Only receipts that demonstrate catch aboard a vessel that does not
already qualify for issuance of a transferable permit of any permit class are eligible. Light Boat Permit: There is not a non-transferable permit category.

**Permit Fees**

Annual permit fees (adjusted annually for inflation):
- Market Squid Vessel Permit – Transferable = $2,000 (2008-09 permit = $2,334.50)
- Market Squid Vessel Permit – Non-Transferable = $1,000 (2008-09 permit = $1,167.25)
- Market Squid Brail Permit – Transferable = $2,000 (2008-09 permit = $2,334.50)
- Market Squid Brail Permit – Non-Transferable = $1,000 (2008-09 permit = $1,167.25)
- Market Squid Light Boat Permit - Transferable = $600 (2008-09 permit = $700.25)
- Market Squid Light Boat Permit – Nontransferable = $45

**Market Squid Vessel Permit Transferability**

Established full transferability of market squid vessel permits based on comparable capacity (within 10%); Established transferability of market squid vessel permits to a vessel of larger capacity under a “2 for 1” permit retirement; individuals wishing to gain entry into the fishery must secure two permits.

**Market Squid Brail Permit Transferability**

Established full transferability of market squid brail permits based on comparable capacity

**Market Squid Light Boat Owner's Permit Transferability**

Established full transferability of light boat owner permits with a ‘1 for 1’ permit retirement

Upgrade 1 light boat owner permits for one brail permit

**Transferability Fees**

Established a transfer fee of $500

Established a Market Squid Brail Permit Upgrade Fee of $1,500.

Experimental Market Squid Vessel Permits

Established three non-transferable experimental fishery permits.

**ECOLOGICAL CONSIDERATIONS**

**Area and Time Closures to Address Seabird Issues**

Established areas closed to squid vessels using attracting lights in all waters of the Gulf of the Farallones National Marine Sanctuary.

[Note: Approx. 20 percent of Channel Islands Marine Sanctuary state waters was closed in marine reserves, including about 20% of squid spawning areas. These areas also coincided with known bird nesting sites on Anacapa and Santa Barbara Islands. Additional marine reserves have been implemented near Año Nuevo and are under development for Farallon Islands.]

**ADMINISTRATIVE ITEMS**

**Market Squid Advisory Committee**

Established one advisory committee for the squid fishery, which includes scientific, environmental and industry representatives

The California market squid fishery is managed based on the egg escapement method. The following definitions are used by CDFG:

**Egg Escapement** – the number or proportion of a female squid's lifetime supply of eggs that she is able to deposit, on average, before being taken in the fishery.
**Egg Escapement Method** – a management tool which may be used to determine whether the fleet is fishing above or below a predetermined sustainable level of exploitation. The method requires establishing a threshold value (30%) to ensure that an adequate number of eggs are deposited prior to harvest.

NOTE: Preliminary research conducted by the National Marine Fisheries Service, Southwest Fisheries Science Center, indicates that the guidelines (or parameters) established by this method may be considered conservative for market squid in that viability of eggs may increase with increased harvesting of adult squid. Research and modeling to date indicate that the fishery is well-managed according to precautionary principles.
Reasons why market squid, sardine and anchovy harvest in should be allowed to continue as regulated under current fishery management

Summary

• Marine mammals are increasing or stable in the presence of the squid and wetfish fisheries, suggesting that these fisheries do not harm marine populations or ecosystem function.

• Krill, a primary forage species observed in bird diet in many areas of California, is a prohibited species under CPS FMP: **no harvest allowed**

• The harvest of squid, sardine and anchovy removes very small percentage of the available forage base
  - The wetfish fishery has minimal ‘bycatch’

• Coastal pelagic ‘wetfish’ species including sardine, anchovy and squid are very important to California’s historic wetfish industry

• The squid fishery is the economic driver of the wetfish industry, the backbone of California’s fishing industry, in operation for more than 150 years.

• California’s wetfish fisheries produce as much as 80 percent of the total California commercial fishery harvest – a multiplied value exceeding one hundred million dollars and thousands of jobs.

• Monterey’s wetfish industry produces:
  • up to 95 percent of all landings and 63 percent of value of all commercial fisheries in the Monterey Bay region

• Southern California’s wetfish industry produces:
  - up to 95 percent by volume and 47 percent by value of all fisheries in LA-San Pedro area
  - 86 percent by volume and 32 percent by value of all fisheries in Ventura-Hueneme area
CENTRAL CA SQUID LANDINGS & HARBOR SEAL ABUNDANCE

Marine mammal populations are increasing in the presence of wetfish fisheries
SOUTHERN CA WETFISH LANDINGS & PINNIPED ABUNDANCE

Marine mammal populations are increasing in the presence of wetfish fisheries.
EFFECTS OF CLIMATE CHANGE, NOT FISHERIES INTERACTIONS, MAY HAVE A MAJOR IMPACT ON SEABIRDS

USFWS, 2005: Regional Seabird Conservation Plan and USGS

- Natural climatic or oceanographic fluctuations create inter-annual variability of seasonal temperature cycles and corresponding timing of zooplankton blooms that can have pronounced effects on marine fish and birds (Anderson and Piatt, 1999; Bertram et al., 2001; Abraham and Sydeman, 2004).

- Sea surface temperatures have risen by 1°C in the last 100 years.

- Recently scientists have documented that seabird adult survival, reproduction, and population abundance are strongly correlated with climate fluctuations (e.g. air temperature, Croxall et al., 2002; sea surface temperature, Gjerdrum et al., 2003).

- Declines in breeding populations and reproductive success. Notable changes in the diet and reproductive output of 11 species of seabirds in the southern California current system are the result of low-frequency climate change (Sydeman et al., 2001).

- Seabird diets can reveal such climatic influences ten to even 100 year scale (Miller and Sydeman, 2004; Montevecchi and Myers, 1997).
SEABIRDS OFF SOUTHERN CA - A 20-year comparison

UNITED STATES GEOLOGICAL SURVEY RESEARCH  
(In conjunction with Minerals Management Service, MMS)

• A newly published twenty year-long United States Geological Survey (USGS) field study cited concerns to seabird conservation off Southern California as regarding offshore oil production, oil transportation by tankers, commercial shipping, commercial fishing (set and drift gillnets, long lines), military activities, and public recreation (Mason et al., 2007).

• The study of distribution and abundance of seabirds off California from Cambria to the Mexican border, conducted aerial surveys from 1993 to 2003, a 20-year comparison. Results were compared to historical data collected twenty years prior.

• Common Murres, Sooty Shearwaters, Bonaparte’s Gulls had lower population densities than twenty years before.

• Brown Pelicans, Xantus’s Murrelets, Cassin’s Auklets, Ashy Storm Petrels, Western Gulls, and Brandt’s Cormorants all had increased population densities.

• The study concluded that declines in seabird abundance off the California coast were due to environmental degradation and larger forces such as climate change.
<table>
<thead>
<tr>
<th>SEABIRD</th>
<th>PRIMARY PREY ITEMS</th>
<th>MAJOR CONSERVATION THREATS</th>
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<tr>
<td>Ashy Storm-Petrel</td>
<td>larval fish, planktonic squid, zooplankton</td>
<td>introduced rodents, native predators, contaminants</td>
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<td>Black Storm Petrel</td>
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<td>Leach's Storm-Petrel</td>
<td>planktonic/nektonic fish, planktonic squid, crustaceans, jellies</td>
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<tr>
<td>Brandt's Cormorant</td>
<td>rockfish, anchovy, blacksmith (minor component of squid and other fish)</td>
<td>disturbance at breeding sites</td>
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<tr>
<td>Double-crested Cormorant</td>
<td>surfperch, sticklebacks, sand lance, herring, salmon</td>
<td>disturbance at breeding sites</td>
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<tr>
<td>sculpins, rockfish, sandlance, non-schooling fish</td>
<td>disturbance at breeding sites, contaminants</td>
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<tr>
<td>northern anchovy, Pacific sardine (almost exclusively small schooling fish)</td>
<td>introduced mammals, entanglement in fishing gear, contaminants</td>
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<tr>
<td>blennies, sculpin, flatfish, small benthic fish</td>
<td>oil contamination</td>
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<tr>
<td>larval anchovy, saury, and rockfish, subadult and adult anchovy, juvenile bluefin, juvenile medusa fish</td>
<td>introduced mammals, native predators, contaminants</td>
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<td>krill, larval and juvenile fishes</td>
<td>oil contamination, native predators</td>
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**SEABIRD (Continued)**

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<th>Species</th>
<th>Threats</th>
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<tr>
<td>Pelagic Cormorant</td>
<td>anchovy, rockfish, Pacific whiting, jack mackerel, Pacific saury, midshipmen, whitecroaker, euphausids, squid, barnacles, sea urchin, human refuse, scavange - eggs, chicks, birds</td>
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<tr>
<td>Brown Pelican</td>
<td>Xantus's Murrelet</td>
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<td>Pigeon Guillemot</td>
<td>Cassin's Auklet</td>
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<td>Western Gull</td>
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The following information is extracted from

Long-term Studies of Seabirds on Año Nuevo Island (ANI) and Mainland, 2003
Final Report to the Monterey Bay National Marine Sanctuary –
Sanctuary Integrated Monitoring Network
Julie A. Thayer and William J. Sydeman
415-868-1221, x317 415-868-1221, x319
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Marine Ecology Division
PRBO Conservation Science
4990 Shoreline Highway
Stinson Beach, CA 94970
ANI BIRD POPULATIONS ARE INCREASING IN THE PRESENCE OF THE SQUID FISHERY

Rhinoceros auklet, Brandt's cormorant and Western gull populations increased from 2002 to 2003 to the highest levels yet recorded for ANI
(see next slide for Brand's cormorant and western gull population trends)

POPULATIONS OF PELAGIC CORMORANTS, PIGEON GUILLEMOTS AND CASSIN'S AUKLETS ON ANI ALSO HAVE INCREASED IN THE PRESENCE OF THE SQUID FISHERY

SQUID IS A SMALL PERCENTAGE OF BIRD DIET AT ANI

Auklet diet reveals a shift from anchovy to rockfish in recent years, corresponding to a shift in ocean climate in 1998-1999.

Note: 1997-98 El Niño sharply reduced squid harvest in CA

Figure 8. Percent number of prey species in Rhinoceros Auklet chick diet on Año Nuevo Island over 11 years. 1993-2003.
FISHERIES CAN HAVE POSITIVE EFFECTS ON SEABIRD POPULATIONS

United States Fish and Wildlife Service (USFWS, 2005)

Offal, or discard, in some fisheries has been demonstrated to enhance seabird feeding opportunities (Camphuysen et al., 1995).

Scientific research has shown that fisheries targeting predator fish species result in more forage fish available to seabirds. (See Furness, 1982; Tasker et al., 2000; USFWS, 2005).
COMMENTS ON AB 2712 (Plescia)
By Richard H. Parrish, PhD

Richard Parrish was a member of the original Pacific Fisheries Management Council's Coastal Pelagics Management Team. This team developed the present ecosystem based management strategy for Pacific Sardine and originated the "active" and "monitored" management categories to allow the direction of management and research efforts where they are most needed.

The California Current does need an ecosystem-based management plan which specifies management strategies for the different trophic levels. The Pacific Fishery Management Council is now developing such a plan, encompassing the entire California Current System (CCS), extending from the Washington-Canadian border to the California-Mexico border and out to the 200-mile limit of U.S. jurisdiction. It is not clear how a separate plan for the narrow strip of California state waters would satisfy, or even assist in addressing, this need. In any case, there is no way that a forage species management plan can be adequately addressed without significant dedicated funding for both the planning team and a permanent monitoring plan to track the ecosystem health of the lower trophic level fishes and pelagic invertebrates as well as oceanic regime shifts.

In the past there has been considerable criticism of single species fishery management because it did not specifically address ecosystem management. That issue has been addressed with the increased ecosystem focus of the federal Magnuson-Stevens Fishery Conservation and Management Act, with particular reference to the 2007 amendments; with the adoption of the State of California's Marine Life Management and Marine Life Protection Acts; and notably, with the pioneering ecosystem focus of the federal Coastal Pelagic Species (CPS FMP).

The plan outlined in AB 2712 does nothing to enhance ecosystem management as the solutions proposed are simply a series of single species management plans. Moreover, AB 2712 does not recognize nor integrate with any of the above mentioned ecosystem-based protections — for example, the CPS FMP already places a total prohibition on krill harvest throughout the entire west coast EEZ, extending out 200 miles. It needs to be pointed out that ecosystem management cannot be carried out with attention only given to a single trophic level in a small portion of a single habitat (in this case forage fishes in the epi-pelagic habitat).

As written, the bill is a strange mixture of goals and specific management options, none of which are necessary or even well thought out. For example, the specific management options would go into law before, and with priority over, the management recommendations developed by the proposed fishery management plan. Clearly this is not the way to manage the ecosystem, or the fisheries, and it proves yet again, that the Department of Fish and Game and Fish and Game Commission (not the Legislature) are the proper place to develop marine resource management regulations.
Problems with the present version of AB 2712

7095

(b) Populations of forage species face many threats, including global climate change, ocean acidification, pollution, and industrial aquaculture that uses wild-caught forage fish reduced into fish meal.

There is no evidence that 'forage' species are presently threatened by overfishing in California. In addition, the uses that forage fish are put to after being caught has nothing to do with a threat. The species defined as forage fish in this legislation are used for a wide range of purposes including human consumption (fresh, canned and frozen), pet food (canned), zoo food (typically individually quick frozen), bait for other fisheries (live and dead), consumed whole or as portions in aquaculture. Elsewhere in the world, forage species, especially anchovy, whiting and to some extent krill, are used to make fish meal. In California, fish meal was once a major use of both anchovy and sardine, and fish offal from jack mackerel, Pacific mackerel, some groundfish and tunas was also used for fish meal. However, production of fish meal from whole fish is now virtually nonexistent in California.

The threat to the forage fish populations is dependent upon the exploitation rate of the fishery, not the use of the landed fish. Evaluation of present and optimum exploitation rates would be the major job of the fishery management team. For example, the CPS FMP allows for a precautionary net 11 percent exploitation rate in warm-water oceanic regimes favoring sardine abundance, after subtracting 150,000 metric tons of spawning biomass 'off the top' of the biomass estimate as a forage reserve. The biomass estimate itself and harvest guideline are based on a variety of observations in the field (i.e. egg deposition rate, fecundity, sea surface temperature etc.). In cold-water regimes the exploitation rate drops to 5 percent.

(d) There is not sufficient scientific study in place to support the conclusion that industrial fishing for forage species can take place without reducing the resilience of marine ecosystems or populations of marine predators.

The same could be said of non-industrial fishing for forage species
The same could be said of commercial fishing for marine predators.
The same could be said of recreational fishing for marine predators or forage species.

The bill does not define 'industrial fishing'. This term is typically associated with at-sea factory ship operations. This type of fishing occurred during the early 1970s when the foreign fleets fished off the California coast but it has not occurred in state or federal waters of California since the 200-mile limit went into effect in 1976 with passage of the federal Magnuson-Stevens Fishery Conservation and Management Act. Moreover, marine mammal populations have increased in California during the past several decades, after passage of the Marine Mammal Protection Act of 1972, when fisheries were significantly larger than they are at present, suggesting that the ecosystem was healthy even at the higher exploitation rates that occurred during the 1980s and early 1990s.
(a) "Actively managed forage species" means those forage species, as of January 1, 2008, managed under existing sport or commercial fishery management measures implemented by the commission or department.

According to the wording of "actively managed" species in this subsection, the only forage species actively managed by the State of California are herring and market squid. This section ignores the fact that the presently "actively managed" species (Pacific mackerel and Pacific sardine) are managed by the Pacific Fisheries Management Council under the Coastal Pelagics Species Fishery Management Plan (CPS FMP).

According to the CPS FMP:
Coastal pelagic species (CPS) include northern anchovy, market squid, Pacific bonito, Pacific saury, Pacific herring, Pacific sardine, Pacific (chub or blue) mackerel, and jack (Spanish) mackerel. "Pelagic" means these fish live in the water column as opposed to living near the sea floor. They can generally be found anywhere from the surface to 1,000 meters (547 fathoms) deep. Five of these species are managed under the Pacific Council's CPS fishery management plan. A sixth species, krill, has been added to the CPS FMP as a prohibited species. In 2007 the PFMC approved a prohibition on krill harvest throughout the entire CCS.

Assuming management authority of federally managed species has both practical and legal problems for the State of California. The CPS species move back and forth between state and federal waters and they move back and forth between California, Mexico, Oregon, Washington and Canada. It makes little sense to manage a species on one side of the line with State regulations and the other side of the line with Federal regulations. It also makes little economic sense to fund two management processes to research, monitor and manage fish that will be in state waters on one day and federal waters the next day. Presently the Pacific Fisheries Management Council has the management authority for all coastal pelagic species; California actively manages squid, in cooperation with the PFMC and National Marine Fisheries Service, and also cooperates in the management of the other coastal pelagic species by collecting research samples and conforming the fishery to and enforcing federal regulations.

(b) "Forage species" means small schooling pelagic fish and invertebrates that serve as an important source of food for other fish species, birds, and marine mammals. Forage species include herring, sardine and anchovy (Clupeiformes), Pacific sand lance (Ammodytidae), smelt (Osmeridae), krill (Euphausiacea), market squid (Loligo opalescens), pelagic juvenile salmonids (Salmonidae), pelagic juvenile rockfish (Sebastes spp.), jack mackerel (Trachurus symmetricus), Pacific mackerel (Scomber japonicus), and Pacific saury (Scomberesocidae).
The species that comprise this forage fish list are a very odd assortment of fishes that includes: valid forage species, major predators of forage species and species that are totally protected during the period of their life that they might be considered forage fishes. In addition, the list does not include many of the most important forage species of the California Current.

There is no biological basis for considering jack mackerel and Pacific mackerel to be forage species. In fact these two species are major consumers of forage species. When their populations are high (both species have extensive decadal scale population fluctuations) they probably rank second or third in total consumption of pelagic forage species in the California Current System (Pacific whiting being first). According to Love (1996. "Probably more than you wanted to know about the fishes of the Pacific Coast". 381pp.) “Jack mackerel reach 32 inches and live 35 years. They grow quickly during their first year (reaching 8 inches)”. He also notes that jack mackerel feed on “krill and copepods as well as juvenile squid and fishes”.  Love (1996) states, “Pacific mackerel eat anything they can get their teeth around, particularly small fishes, squid and large zooplankton such as copepods and krill”; and “Pacific mackerel reach 25 inches. They have been aged to over 11 years. Like other tunas, these are fast growing fish, a two year old is 12 inches long”. Of course some adult mackerel are consumed by high level predators; the same can be said of sea lions that are forage for white sharks and killer whales.

The rest of the list of forage species is a strange mix of species. It includes osmerid smelts but not antherinid smelts. It includes pelagic juvenile rockfish, but not benthic juvenile rockfish or pelagic juvenile flatfish. It includes krill but not mysids or pelagic crabs. It includes pelagic juvenile salmonids, but does not define the size at which a salmonid is not considered to be a juvenile. Note that juveniles are generally considered to be animals that have not yet reached sexual maturity; salmon do not reach sexual maturity until they return to freshwater. So the only adult salmonids in the ocean are steelhead trout that have previously spawned. In addition, salmon are federally managed species and Chinook, the only species that can be taken by marine fishermen in California, have a minimum size of 20 inches (or 24 inches North of Horse Mountain). In other words, for the brief period when marine salmonids are small enough to be considered forage fish, they are already totally protected from fishing.

The list entirely ignores the most abundant forage fishes in the California Current system (i.e. meso-pelagic fishes, bathy-pelagic fishes and shortbelly rockfish).

7098

(a) (3) Explicitly analyze and consider the role of forage species in the ecosystem by identifying all species in the marine ecosystem that directly or indirectly consume each forage species, and compare ecosystem effects to a baseline in which no forage species were harvested.
This is simply a large and very expensive exercise in futility.

A much simplified version of what appears to be the intent of this section was recently published. See the figure below from “Top-down modeling and bottom-up dynamics: Linking a fisheries-based ecosystem model with climate hypotheses in the Northern California Current” by J.C. Field a,*, R.C. Francis b, K. Aydin : Progress in Oceanography 68 (2006) 238–270.

Note that the “state of the art” analysis carried out by Field, Francis and Aydin does not attempt to separate forage fishes into individual species boxes as is the intent of this section of AB 2712. They also do not consider mackerel to be forage fish.

Fig. 2. The significant food web of the Northern California Current. Key taxa for functional groups are provided in Table 3. Common names and scientific names of species and stocks are given in Table 4. The estimated trophic level is along the y axis, the height of the boxes is scaled to the log of the standing biomass, the width of the bars represents biomass flux of prey to predators, and the colors represent the alternative energy pathways such that pelagic (primary production) energy pathways are shown in blue and the benthic (detrital loop) energy pathways are shaded in red.
(b) In calculating optimum yield for actively managed forage species, the protection of marine ecosystems shall be prioritized, and optimum yield shall be reduced for ecological factors that shall include ensuring sufficient quantities of forage species to maintain predators and other ecosystem needs, such as community stability and resilience.

This is inconsistent with California’s definition of optimum yield in the California Fish and Game Code. See below:

97. Optimum Yield
"Optimum yield." with regard to a marine fishery, means the amount of fish taken in a fishery that does all of the following:
• Provides the greatest overall benefit to the people of California, particularly with respect to food production and recreational opportunities, and takes into account the protection of marine ecosystems.
• Is the maximum sustainable yield of the fishery, as reduced by relevant economic, social, or ecological factors.
In the case of an overfished fishery, provides for rebuilding to a level consistent with producing maximum sustainable yield in the fishery.

In fisheries, optimum yield (OY) is generally described as a departure from maximum sustainable yield (MSY) and it is determined with a subjective evaluation made by the agency or council that regulates the fishery. Clearly based on the above California definition, optimum yield already includes ecological factors.

The wording of AB 2712 appears not to acknowledge the present definition of optimum yield, which already includes ecological factors: if the bill wants to alter this definition then it should do this rather than misusing the definition. It seems that the intent of AB 2712 is to give additional, but not specified, priority to forage fishes. This is certainly a desirable goal and I agree that forage species should not be fished at their MSY rate. I note that the members of the original PMFC Coastal Pelagics Management Team successfully convinced the Pacific Council that the Pacific sardine stock should not be fished at its MSY rate. The precautionary policy the team recommended, that was approved by the PFMC and enacted by the Secretary of Commerce, will result in a sardine population that will average well more than half a million tons larger than the MSY policy.
There shall be no state fishery for an actively managed forage species that does either of the following:
(a) Allows for a geographic expansion of an existing fishery beyond those areas fished between the years 2002 and 2007, inclusive, unless and until scientific information, with peer review by independent experts, indicates fishery activities are not directly or indirectly adversely affecting marine life dependant on forage species in those areas.
(b) Allows catch levels for an actively managed forage species to exceed levels caught in 2007 until the department, with peer review by independent experts, determines that increased harvest will not jeopardize ecosystem protection goals and provides optimum yield calculations that explicitly account for the role of targeted forage species in the marine ecosystem and the need to provide a sufficient abundance of forage species for predators and other ecosystem needs.

Section 7099 is a prescription for certain failure of an ecosystem management plan. Simplistic and artificial policies such as only allowing fishing where fishing occurred from 2002-07 and setting maximum landings based on the 2007 landings cannot be considered to be even a first guess proxy for ecosystem management. This section completely negates the role of science in the development of the plan, and it is an insult to the hundreds of scientists who have spent their lives studying, describing and analyzing the complex ecology of the California Current System.

Pelagic species by definition are carried by the currents; their distribution varies wildly from year to year due to their population size, wind and density driven local circulation processes, El Nino events, decadal and regime scale environmental process in the entire Pacific Basin. They will also be greatly affected by global climate change, which would be expected to move their populations poleward as ocean temperatures increase.

Norton and Mason (2004) used the California fish landings and two environmental indices (sea surface temperature and upwelling favorable winds) to show the multi-dimensional trends in different components of the fish and shellfish community that is harvested in California. Their figure, shown below, describes the time trends of the species exploited in California and it clearly demonstrates that basing ecosystem management policy on information gathered over any limited time period (i.e. 2002-2007) will automatically be wrong in just a few years as the living components of the California Current System adjust to the complex, regime scale environmental fluctuations of the California Current.

In the Norton and Mason analysis the first principal component (EOF1) was significantly correlated with sea surface temperature and the second principal component was significantly correlated with upwelling favorable winds. Their study validates numerous other studies showing that the populations of individual species and species groups are largely heavily impacted by large-scale environmental fluctuations in the California Current.
The Norton and Mason study shows that using the distribution of species during any short period of years (i.e. 2002 to 2007) to develop a management plan will produce an extremely inaccurate view of both the species population size distribution in other time periods.

The combination of the Field, Francis and Aydin ecosystem model of the California Current and the decadal patterns of landings of fishes and invertebrates in California described by Norton and Mason clearly points out that the California Current System is not stationary and that there will not be a single ecosystem management strategy that will
optimize management for periods longer than about 10-15 years. Very likely the optimum harvest strategy for a given environmental state (say the 1970s) would be a disastrous strategy for the 1990s.

The evidence gathered over the last century demonstrates that ecosystem management will necessarily be an adaptive process that utilizes monitoring of both environmental and biological processes to determine the current environmental state, and then applies an ecosystem model to determine optimum harvest policies for that state.

Freezing fishing to the geographical base which occurred during the years of 2002 to 2007 and setting a cap at the landings that occurred in 2007 cannot be considered to be based on any scientific data, analysis or logic. The 2007 landings were not even available when AB 2712 was written.

7099.1
7099.2

These sections are similar to section 7099 addressed above and the comments on section 7099 apply to sections 7099.1 and 7099.2.

In summary, knowledge-based ecosystem management in which the importance of forage species is included in the determination of their optimum yield is an important goal. Unfortunately, this legislation offers simplistic, belief-based measures affecting only a portion of a single trophic level in a small portion of the California Current Ecosystem. Measures such as capping landings at an as yet unknown value determined by the landings in 2007, and restriction of the future fishery to the state water areas that were fished in the years 2002-2007, are not likely to produce a management system that is sufficiently accurate or adaptive enough to result in successful ecosystem management.

This is a poor start to achieve ecosystem management.

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