Bringing you HOPE -
Helping Our Peninsula's Environment
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California Marine Life Protected Area
Central Coast Regional Stakeholder Group October 14, 2005

Two Marine Protected Area Proposals:

1. **Central Coast Marine Reserve to encompass all Sea Otter Habitat**

2. **Monterey Peninsula Marine Reserve from Monterey's Shale Beds around Pebble Beach to Carmel**

Good morning,

Helping Our Peninsula's Environment, Carmel Valley Women's Network, Save Our Waterfront Committee (of Monterey), Responsible Consumers of Our Monterey Peninsula, and Pacific Grove Neighbors agree that our nearshore habitats are imperiled by excessive extraction of natural biological features.

These groups respectfully request this body support --

1. **a Marine Reserve to encompass all occupied Sea Otter Habitat with conservative buffers extending out one mile from mean high tide or 150 meters depth whichever is greater.**

2. **a Marine Reserve surrounding our Monterey Peninsula from Pacific Grove around Pebble Beach to Carmel extending to the 3 mile state boundary, and**

We respectfully request these because --

- ***The California State Legislature has found that the marine habitat and biological diversity in the state's ocean waters are threatened by coastal development, water pollution, and other human activities.***

- ***The U.S. Commission on Ocean Policy and the Pew Oceans Commission recently declared that our oceans across the nation are in crisis.***

- Over the last two decades, improvements in technology and greater participation have increased access to previously inaccessible areas and contributed to overfishing of some fish populations.

- The 1999 Marine Life Protection Act ***mandated that the state design and manage*** an improved network of **marine protected areas to**, among other things, **protect marine life and habitats,**

marine ecosystems, and marine natural heritage. Marine protected areas include marine reserves, marine parks and marine conservation areas.

- The state has a responsibility to ***act now*** to protect the health of our oceans for future generations.

And because the Reserve areas requested will --

- **Help protect and restore rare, threatened, and endangered native species or habitats including Gray Whales (eschrichtius robustus), Southern Sea Otter, California Sea Lion (Zalophus californiaus), Harbor Seals, Stellar Sea Lion (Eumetopias jubata) and Elephant Seals.**

- protect outstanding, imperiled marine species, communities, habitats, and ecosystems for the above mentioned species.

- **protect habitat, biological communities, populations, species and gene pools** of the above mentioned imperiled species which **do not exist anywhere else in the world.**

- protect connections between habitat types, including deep and shallow water.

- The proposed areas are biologically highly productive.

- The proposed areas contain multiple habitat types including surface, mid water and sea floor.

- The proposed site has historically received relatively heavy extraction, it is likely that some populations of removed species are locally depleted, and populations of removed species and **size of species** are expected to rebound if protected.

Kelp Harvesting Prohibition

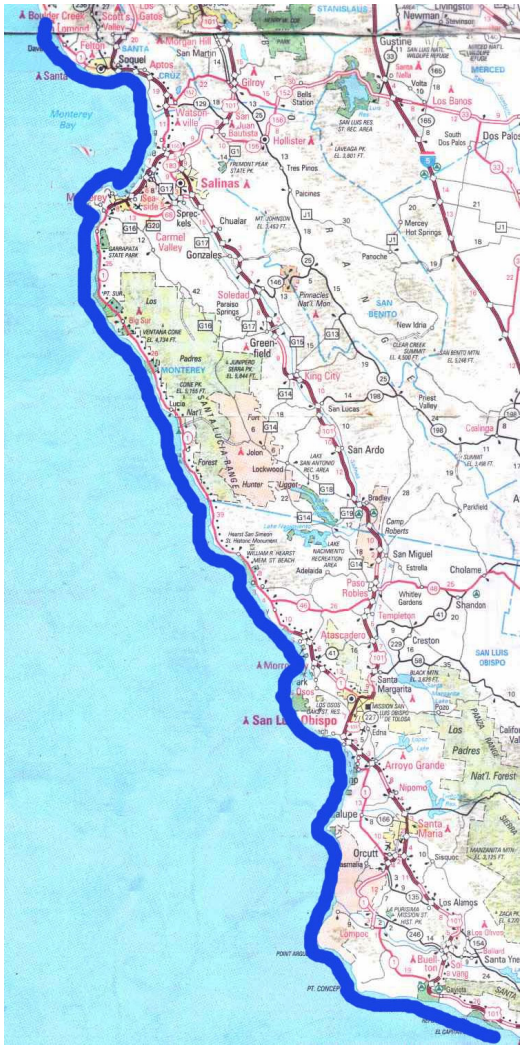
We also oppose any exemption for kelp harvesting since ***reasonable and feasible alternatives*** to kelp harvesting exist including --

- using processed feed,
- trucking kelp from areas outside endangered Southern Sea Otter habitat, and
- growing one's own kelp as is mandated in New Zealand.

With our best wishes,
David Dilworth, Executive Director

Reserve # 1 Description:

A Marine Reserve to encompass **all occupied Sea Otter Habitat** with conservative buffers extending out one mile from shore or to 150 meters depth whichever is greater.



Rationale:

- **Southern Sea Otter Ecosystem Decline**
- **Kelp Forest Decline**
- **Rockfish Declines**
- **Decline causes not fully clear, but extraction of fish, and kelp are unarguably significant causes.**

Southern Sea Otter Ecosystem Decline

This reserve is needed because the Southern Sea Otter (enhydra lutris nereis) is officially protected by several laws as imperiled, their mortality is increasing, its kelp forest habitat is decreasing in area, many species which are interdependent upon the otter and the kelp are in crisis and whether or not we think we understand what is causing these crises, we have not been able to reverse these trends. This ecosystem is headed for an ecological train wreck if we do not protect all of its facets.

Range

The otter now occupies kelp forests from Ano Nuevo in Santa Cruz County on the north, down around Pt Arguello almost to Santa Barbara harbor to the south.

Conditions:

Southern Sea Otter (enhydra lutris nereis)

This species was federally protected under the Endangered Species Act as a Federally listed Threatened species in 1977. Only about 2,700 otters remain. Its population numbers dropped for at least 5 of the years since 1996 including as recently as 2002.

While births are slightly increasing, mortality is also increasing as of 2005 leaving the populations steady but at risk of another decline, perhaps precipitous. In May 1999 the sea otter population dropped from 2377 to only 1937.

Otter Genetic Bottleneck

The 2,700 otter individuals are all extremely closely related since they recently went through a genetic bottleneck less than 100 years ago when less that 50 individuals existed in Big Sur. All living Southern Sea Otters are descendants of the Big Sur population. This means that a single disease could

easily decimate the entire population. **This means every individual is vital to the restoration of the species, not just some representative sample.**

The otters are also protected under the Marine Mammal Protection Act. The Marine Mammal Protection Act 1972, USC 16 establishes a moratorium on the taking ("harass, hunt, capture or kill") and importation of marine mammals and marine mammal products, with exceptions for scientific research (16 U.S.C. 1371). It requires all private or public actions that intentionally take marine mammals to get a permit. MMPA is administered by US-FWS.

In spite of these stringent federal laws and strict enforcement, otters are still seriously threatened with extinction, they are still directly killed by humans - regularly, their kelp forest habitat is removed by humans in the winter when it grows slowest, if it grows then at all; and their fish diet is overfished.

Otter Habitat

"As one of the few marine representatives of the order Carnivora, the sea otter evolved to inhabit a narrow ecological zone adapting to the near shore community and preferring a rocky shoreline with kelp beds." FWS, Draft Southern Sea Otter Recovery Plan June 1996

"Otters feed in both rocky and soft sediment nearshore areas, as well as in the kelp understory and canopy." US-Fish & Wildlife Service, "The Southern Sea Otter. Its Biology, Life Habits and History"

Monterey County coastal waters contain the largest concentration of the Southern Sea Otter. It lives in nearshore kelp beds out to the 100 meter depth contour and occurs from Ano Nuevo in Santa Cruz County to the north Ano Nuevo in Santa Cruz County on the north, down around Pt Arguello almost to Santa Barbara harbor to the south. There is a small population (17 - 25 individuals) relocated to San Nicholas Island. "Otters live in waters with temperatures between 35 and 60 degrees F." Ibid

Ecological Interdependence

The life of every animal and plant depends upon other biota. When one species is removed for human use, other biota, not directly touched and perhaps even unnoticed by humans, can suffer because they depend on that species. Even worse, such damage can cause a second species' irreversible decline into extinction.

When an ecosystem service (e.g. habitat for resident and transient populations, food, fuel and fodder production) is lost or weakened it can harm many species.

Sea Otters, Kelp And Sea Urchins

Lets take a look at a simple system involving Sea Otters, Kelp and Sea Urchins. They all depend upon each other. The otter is a keystone species (Miller 98) that keeps sea urchins from

depleting kelp beds. Sea urchins eat kelp, sea otters eat sea urchins, and kelp provides predator protection for sea otters.

Kelp Loss

When industry extracts kelp, Sea Otters must leave that immediate area or decline in population because they have lost their homes and the home of their fish food, their sleeping areas, cannot hide as well from predators such as sharks and orcas.[1] They must move to find other protected foraging areas. When Sea Otters leave or decline sea urchins thrive and eat too much kelp and the remaining kelp forest dies.

Lost Kelp Forest Unrestorable

In southern California, 40 years of efforts to restore lost kelp beds (since the 1960s) has been an almost complete failure. There are so many sea urchins, the kelp cannot even get started.[2] "Over the past half-century, nearly 75 percent of Southern California's once-flourishing kelp beds has vanished."

"'If you go into a kelp forest, the place is swarming with fish,' said Paul Dayton, a marine ecology professor at Scripps Institution of Oceanography. 'Take out that kelp and the fish won't go extinct, but they'll be much rarer because they don't have the habitat. ... We should protect it just on the grounds that it's for our grandchildren.'"

Sea Urchin Loss

If we let industry harvest too many sea urchins, Sea Otters have to find other food and may leave. When Sea Otters leave or decline sea urchins can rebound and destroy a kelp forest preventing sea otters' return.

Sea Otter Loss

If we let sea otters decline sea urchins thrive and can destroy a kelp forest.

Kelp Forest Cutting and Removal Impacts

Kelp (Giant Kelp - Macrocystis pyrifera & Bull kelp - Nereocystis leutkeana) forests provide habitat for a large variety of invertebrates, fishes, birds, and mammals which are distributed among the three different regions of the forests; the surface canopies, the midwater and the substrate (Foster and Schiel, 1985).

The California kelp forest was decimated by sea urchins after Southern Sea Otters were hunted to near extinction by 1900.

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[1] Southern Sea Otters use Kelp beds (Giant Kelp - Macrocystis pyrifera & Bull kelp - Nereocystis leutkeana) as refuge from predators including white sharks and winter storms, to define territory and as nursery areas for females with pups. Sea otters feed on various invertebrates that exist in kelp forests (Foster and Schiel, 1985).

[2] Cry for Kelp: Vanishing acres worry researchers. LA Times, October 14, 2005 http://seattletimes.nwsource.com/html/nationworld/2002560023_kelp14.html

Kelp grows from the ocean bottom. When cut at or near the surface it does not grow from the top. It must grow from the bottom up. The cut kelp might as well have been cut from the bottom.

Since kelp harvesting methods require new stypes to grow from the holdfast, harvested plants become more bushy and are more likely to get ripped out in early winter storms.

Kelp along Pacific Grove and Monterey is the last to get ripped out by winter storms. As such it is the final habitat for the season.... and also a primary winter target for harvesters from Central and Northern California.

"Fish diversity and abundance decrease in areas where the kelp canopies have been removed (Bodkin, J. of Exp. Mar. Bio. Ecology 1988).

The **kelp canopy at the surface is critical habitat for juvenile fish** as it creates safe, shadowed areas to hide and also traps small food.

Many marine organisms including sea urchins depend on kelp slough sinking to the sea bottom similar to leaf litter in a forest. Loss of the kelp canopy removes dead kelp fronds slough littering the sea floor and starves bottom creatures dependent upon it. When the dead kelp slough is reduced sea urchins turn to eating the living kelp plants. [3]

Unlike terrestrial plants which get most nutrients from soils, kelp gets nutrients from its entire surface.

Variations in fish abundance may have significant impacts on other communities. For example juvenile rockfishes associated with kelp forests in Monterey bay can reduce the amount of barnacle larvae reaching the intertidal to 2% of the level found in the absence of fish(?) (Gaines and Roughgarden, 1998)." - Monterey Bay National Marine Sanctuary Kelp Management Plan Jan 14 2000

"The floating canopy is thick enough to provide footing for birds as large as the great blue heron. The [kelp] forests provide a nursery, feeding grounds, and shelter, so it is not surprising that large numbers and a great diversity of invertebrates and fish are found in association with the forests." A number of mammals (California Sea Lion, gray whale, harbor seal, and sea otter frequent the forests. At least 13 birds species use the Giant Kelp as feeding ground (pigeon, guillemot, brown pelican, pelagic cormorant, snowy egret, great blue heron, western grebe, western gull, eared grebe, Brandt's cormorant, surf scooter, common loon, common murre, elegant tern). - California an Environmental Atlas and Guide, Bern Kreissman, 1991 p 68

Kelp & Sea Otters

Southern Sea Otters use Kelp beds (Giant Kelp - Macrocystis pyrifera & Bull kelp - Nereocystis leutkeana) as refuge from predators including white sharks and winter storms, to define territory and as nursery areas for females with pups. Sea otters feed on various invertebrates that exist in kelp forests (Foster and Schiel, 1985).

Kelp cutting boats admittedly disturb Sea Otters. The noise from boats disturbs Sea Otters, as does the removal of kelp as their protection from predators including sharks. Any harassment of an ESA listed species is "take", a violation of Section 9 of the U.S. Endangered Species Act.

[3] California Reefs, Chuck Davis 1991

Young fish, such as rockfish and surf perch, graze on plankton found in the top several feet of a kelp canopy. The Monterey Bay rockfish populations experienced a significant decline in the 1990's.

Whales Use Kelp Forests

Migrating gray whales, especially the young, stick close to kelp forests for protection. Gray Whales have been observed entering kelp forests to escape predation from killer whales (Orcinus orca, Baldridge, 1972) and also to feed on invertebrates such as midwater crustacean swarms (Nerini, 1984)."

Cutting Kelp at the surface can result in kelp tips no closer than four to eight feet below the surface. Kelp is typically commercially cut at low tide and stretched to the surface. When not stretched it leans over due to currents. When adding the currents and high tide the top of the cut kelp can easily be 4 to 8 feet below the surface.

Brown Alga Increase

"One common phenomena occurring in areas where surface canopies have been removed is the recruitment of the brown alga Desmarestia ligulata (Foster, 1982a; Reed and Foster, 1984). This species forms a dense subsurface canopy which can inhibit recruitment of other algal species including giant kelp (Dayton et all, 1992)." - Monterey Bay National Marine Sanctuary Kelp Management Plan Jan 14 2000[4]

Ecosystem Services from Kelp (Macrocystis) Beds

Seagrass algae beds provide approx $19,000 in Ecosystem services per hectare per year. -"The value of the worlds ecosystem services and natural capital" by Costanza et all, Nature 15 may 1997 pg 256

Those services include: Species protection (**think of what it costs to keep an endangered animal alive in an aquarium, compared to a native habitat**), storm protection, and other aspects of habitat response to environmental variability mainly controlled by vegetation structure, prevention of loss by wind, or other removal processes, nutrient cycling, waste treatment, pollution control, detoxification, atmospheric gas regulation, climate regulation, pollination, dynamic regulation of populations, habitat for resident and transient populations, food, fuel and fodder production; medicine products, genes for disease resistance, eco-tourism, sport fishing, and other outdoor activities, and don't forget **aesthetic, artistic, educational, spiritual and scientific values.**

Mysid Shrimp

The **Mysid Shrimp** species is required by state law for toxicology tests for cities throughout California. It lives almost exclusively in Giant Kelp and Bull Kelp canopies. The kelp canopy has been removed to such a degree that there is no longer enough Mysid Shrimp to fulfill testing purposes.

Kelp Alternatives

Reasonable and feasible alternatives to wholesale kelp removal exist including --

- using processed feed,
- trucking kelp from areas outside endangered Southern Sea Otter habitat, and
- growing one's own kelp as is mandated in New Zealand.

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[4] See also: Fisher, Michael S. and Scheil, David R. "The Ecology of Giant Kelp Forests in California: A Community Profile. Slidell, Lousiana: US-Fish & Wildlife Service, 1985

Rockfish Declines

Monterey Bay rockfish populations experienced a significant decline in the 1990's.

Reserve # 2 Description:

A Marine Reserve surrounding our Monterey Peninsula from Monterey's Shale Beds around Pacific Grove and Pebble Beach to Carmel extending to the 3 mile state boundary extending out to the state limit of three miles.

Rationale:

1. **Important Ecotone between Northern and Southern California species**
2. **Imperiled Marine Mammal Hotspot**
3. **Southern Sea Otter Ecosystem Decline**
4. **Kelp Forest Decline**
5. **Rockfish Declines**
6. **Decline causes not fully clear, but extraction of fish, and kelp are unarguably significant causes.**
7. **Easier to enforce as it is near a populated area.**

For the following four points, please refer to the comments for the Sea Otter Reserve above.

- Southern Sea Otter Ecosystem Decline, Kelp Forest Decline, Rockfish Declines, Decline causes not fully clear, but extraction of fish, and kelp are unarguably significant causes.

Additional reasons for this Reserve include --

- **Important Ecotone between Northern and Southern California species**
- **Imperiled Marine Mammal Hotspot**
- **Easier to enforce as it is near a populated area.**

Important Ecotone between Northern and Southern California species

The Monterey Peninsula is considered a boundary between northern and southern coastal species making it an ecotone. It marks the northern limit of many keystone southern species and the southern and the southern limit of many northern keystone species.

The Peninsula is a highly populated area with a highly educated and vigilant citizenry making enforcement of the reserve both a high societal value and with hundreds of eyes to help.
