



State of the Oceans & California's Marine Life Protection Act

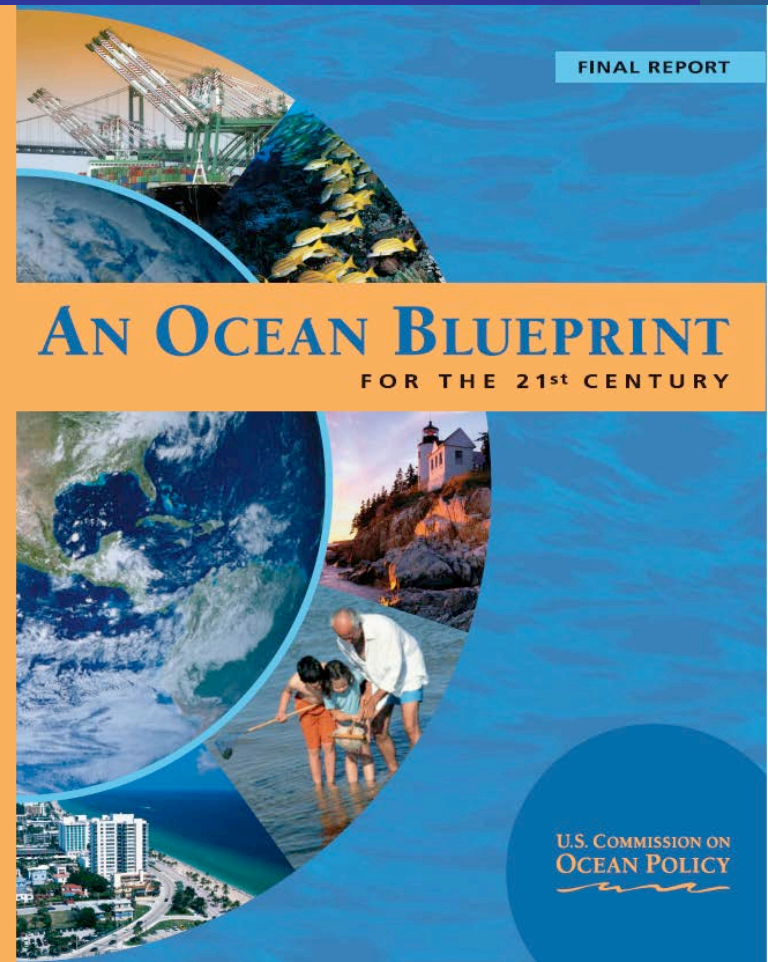
Meg Caldwell
Center for Ocean Solutions
November 1, 2008

America's Living Oceans

USE IT OR LOSE IT

U.S. Commission on Ocean Policy 2004

Pew Oceans
Commission 2003



Major Threats to Our Oceans

BOX ONE

Major Threats to Our Oceans



NONPOINT SOURCE POLLUTION

- A recent National Academy of Sciences study estimates that the oil running off our streets and driveways and ultimately flowing into the oceans is equal to an Exxon Valdez oil spill—10.9 million gallons—every eight months (NRC, 2002a).
- The amount of nitrogen released into coastal waters along the Atlantic seaboard and the Gulf of Mexico from anthropogenic sources has increased about fivefold since the preindustrial era, and may increase another 30 percent by 2030 if current practices continue (Howarth et al., 2000).
- Two-thirds of our estuaries and bays are either moderately or severely degraded by eutrophication (Butler et al., 1999).

- More than 13,000 beaches were closed or under pollution advisories in 2001, an increase of 20 percent from the previous year (NRDC, 2002).

POINT SOURCE POLLUTION

- In the U.S., animal feedlots produce about 500 million tons of manure each year, more than three times the amount of sanitary waste produced by the human population (EPA, 2002).
- Based on EPA estimates, in one week a 3000-passenger cruise ship generates about 210,000 gallons of sewage, 1,000,000 gallons of gray water (shower, sink, and dishwashing water), 37,000 gallons of oily bilge water, more than 8 tons of solid waste, millions of gallons of ballast water containing potential invasive species, and toxic wastes from dry cleaning and photo-processing laboratories (Royal Caribbean Cruises Ltd., 1998; Hey, 2000; Holland America, 2002).

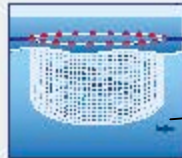


INVASIVE SPECIES

- Introduced species crowd out native species, alter habitats, and impose economic burdens on coastal communities.
- The rate of marine introductions has risen exponentially over the past 200 years and shows no sign of leveling off (Carlton, 2001).
- More than 175 species of introduced marine invertebrates, fish, algae, and higher plants live in San Francisco Bay (Cohen and Carlton, 1995, 1998; Cohen and Carlton, unpublished data).

AQUACULTURE

- A December 2000 storm resulted in the escape of 100,000 salmon from a single farm in Maine, about 1,000 times the number of documented wild adult salmon in Maine (NRC, 2002b).
- A salmon farm of 200,000 fish releases an amount of nitrogen, phosphorus, and fecal matter roughly equivalent to the nutrient waste in the untreated sewage from 20,000, 25,000, and 65,000 people, respectively (Hardy, 2000).
- Over the past decade, nearly one million non-native Atlantic salmon have escaped from fish farms and established themselves in streams in the Pacific Northwest.



Art: John Michael Toner

Nonpoint
Source
Pollution

Point Sources
Pollution

Invasive Species

Aquaculture

Major Threats cont'd



COASTAL DEVELOPMENT

- Sprawl development is consuming land at a rate of five or more times the rate of population growth in many coastal areas. Sprawl needlessly destroys wildlife habitat and degrades water quality.
- More than one-fourth of all the land converted from rural to suburban and urban uses since European settlement occurred during the 15-year period between 1952 and 1997 (the last year for which such figures are available) (NRI, 2000).
- Coastal marshes, which trap floodwaters, filter out pollutants, and serve as "nurseries" for wildlife, are disappearing at a rate of 20,000 acres per year. Louisiana alone has lost half a million acres of wetlands since the 1950s.

OVERFISHING

- As of 2001, the government could only assure us that 22 percent of fish stocks under federal management (211 of 959 stocks) were being fished sustainably (NMFS, 2002).
- Overfishing often removes top predators and can result in dramatic changes in the structure and diversity of marine ecosystems (Dayton et al., 2002).
- By 1959, populations of New England cod, haddock, and yellowtail flounder had reached historic lows. In U.S. waters, Atlantic halibut are commercially extinct—too rare to justify a directed fishing effort. Populations of some rockfish species on the West Coast have dropped to less than 10 percent of their past levels (MacCall and He, 2002).
- Rebuilding U.S. fisheries has the potential to restore and create tens of thousands of family wage jobs and add at least 1.3 billion dollars to the U.S. economy (POC, 2003).

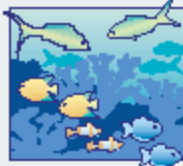


HABITAT ALTERATION

- Fishing gear that drags along or digs into the seafloor destroys habitat needed by marine wildlife, including commercially fished species.
- Typical trawl fisheries in northern California and New England trawl the same section of sea bottom more than once per year on average (Friedlander et al., 1999; Auster et al., 1996).
- Bottom-dwelling invertebrates can take up to five years or more to recover from one pass of a dredge (Peterson and Estes, 2001).

BYCATCH

- Worldwide, scientists estimate that fishermen discarded about 125 percent of what they caught during the 1990s and the early 1990s, about 60 billion pounds each year (Alverson et al., 1994; Alverson, 1996).
- Bycatch of albatrosses, petrels, and shearwaters in longline fisheries is one of the greatest threats to seabirds (Robertson and Gales, 1996; Tasker et al., 2000).
- Bycatch in the Atlantic pelagic longline fishery may be jeopardizing the continued existence of the loggerhead and leatherback sea turtles off the eastern U.S. seaboard (NMFS, 2001).



CLIMATE CHANGE

- Global air temperature is expected to warm by 2.5 to 10.4°F (1.4 to 5.8°C) in the 21st century, affecting sea-surface temperatures and raising the global sea level by 4 to 35 inches (9 to 88 cm) (IPCC, 2001).
- Recent estimates suggest an increase in mean sea-surface temperature of only 2°F (1°C) could cause the global destruction of coral reef ecosystems (Hoegh-Guldberg, 1999).
- Climate change will modify the flow of energy and cycling of materials within ecosystems—in some cases, altering their ability to provide the ecosystem services we depend upon.
- Increases in temperature may slow or shut down the Atlantic thermohaline circulation that powers the Gulf Stream, causing reductions in sea-surface and air temperatures over the North Atlantic and northern Europe, changes in the geographic distributions of fisheries, and increased risk of hypoxia in the deep ocean.

Coastal Development

Overfishing

Habitat Alteration

Bycatch

Climate Change

FROM SEA TO SHINING SEA
PRIORITIES FOR OCEAN POLICY REFORMREPORT TO THE
UNITED STATES SENATE
JULY 2009

EXECUTIVE SUMMARY

Our Ocean and Coasts Are in Trouble

In 2003 and 2004, two national Commissions—the U.S. Commission on Ocean Policy and the Pew Oceans Commission—released landmark reports on the severe threats facing our oceans and coasts. The Commissions heard from hundreds of citizens, scientists, industry groups, environmental organizations, and federal, tribal, state, and local officials across the nation and found broad consensus about many of the problems besetting our oceans and coasts:

- Fragmented laws, confusing and overlapping jurisdictions, and the absence of a coherent national ocean policy hinder our management efforts.
- A lack of federal support for emerging regional ocean and coastal governance initiatives hampers the ability of these initiatives to help solve important ocean and coastal problems.
- Overexploited fisheries bring economic hardship to fishing communities and businesses and jeopardize the living marine resources held in trust for the benefit of all U.S. citizens.
- A dearth of U.S. leadership in international ocean and coastal forums threatens our national economic and security interests.
- Dwindling U.S. investment in ocean and coastal research, science, and education compromises our ability to tackle such problems as global warming, resource depletion, harmful algal blooms, invasive species, and nonpoint source water pollution, to name just a few.
- Inadequate funding for federal agencies and for nonfederal partners at the regional, state, and local level is a severe impediment to addressing current problems and to anticipating and planning for future challenges.

Yet the Commissions also recognized that we are in a time of unprecedented opportunity. Today, as never before, we recognize the links among the land, air, oceans, and human activities. We have access to advanced technology and timely information on a wide variety of

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A Collaboration Across Disciplines and Institutions



MONTEREY BAY AQUARIUM
...inspiring conservation of the oceans



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Pacific Ocean Initiative

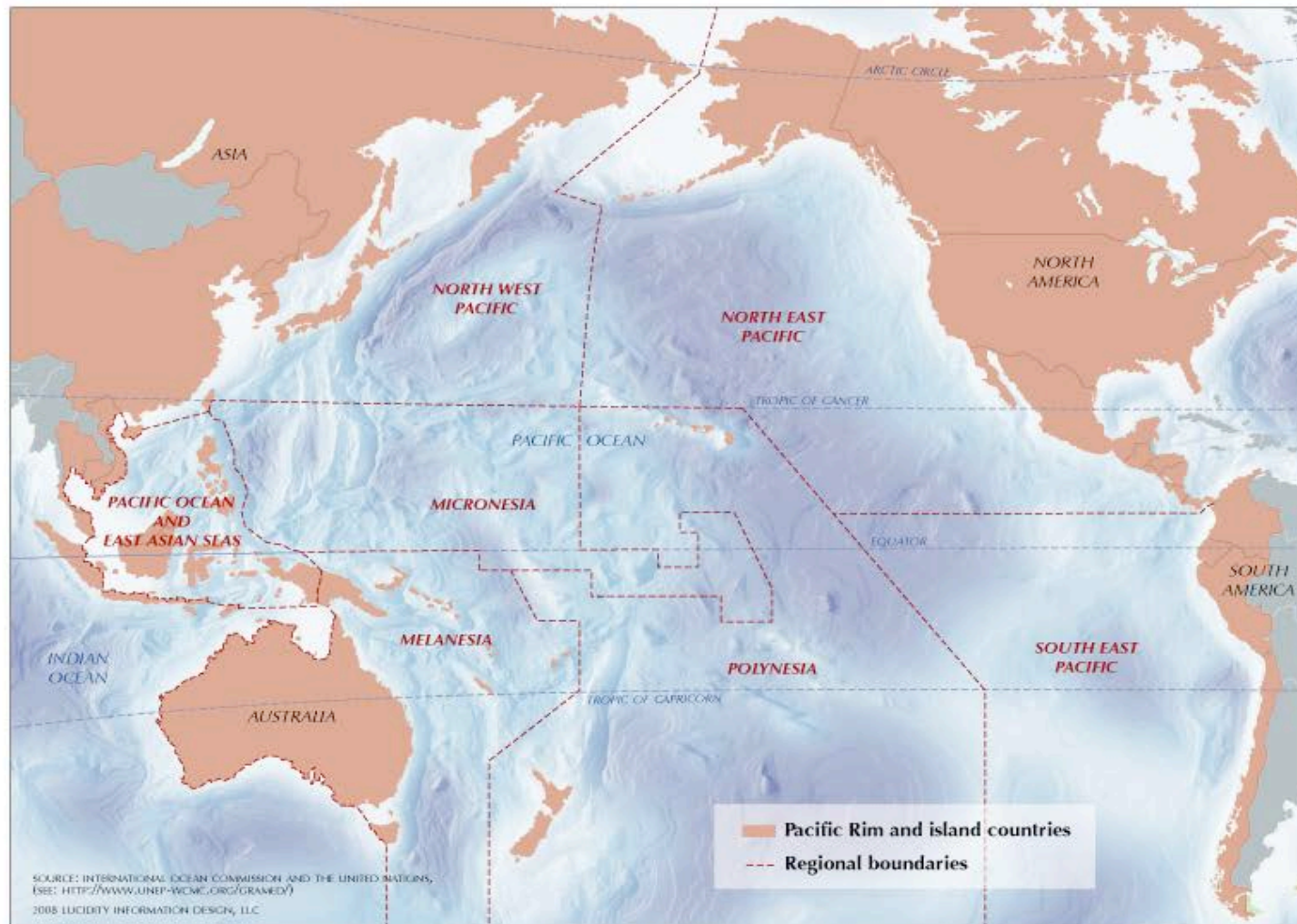
The Beginning



The Pacific Ocean 2020
Challenge

Rescuing an Ocean in Crisis

Ocean
Conservancy
Start a Sea Change



Pacific Ocean Identifying Major Threats

- **Literature review**
 - more than 3,400 papers covering more than 45 countries
- **Vetted by scientists representing 30+ countries**
- **Pacific Ocean Library**
(library.centerforoceansolutions.org)

Pacific Ocean Scientific Consensus Statement



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Ecosystems and People of the Pacific Ocean -

Threats and Opportunities for Action:

A Scientific Consensus Statement

Executive Summary:

The people from around the Pacific Ocean, from the Arctic to Antarctic, from countries populous and sparse, are witnessing a decline of the Pacific Ocean's vast resources and in the ability of people to use those resources. Pollutants, nutrient and sediment run-off from land, overfishing, habitat destruction, and climate change emerge repeatedly as the major causes. Though this wide-spread similarity of threats across the

Pacific Ocean Scientific Consensus Statement

- Identifies the *four* most serious threats to the Pacific Ocean
- The threats are persistent, widespread and increasing
- The same for all countries and people around the Pacific
- Provides the scientific foundation for major policy change

Pacific Ocean Threats



Major Threats Facing the Pacific Ocean

● POLLUTION

Organic pollutants from sewage, nutrient pollution from fertilizer run-off, plastic marine debris, toxic dumping and oil spills, urban run-off and other pollutants combine to create one of the most critical classes of ocean threats.

● HABITAT DESTRUCTION

Productive marine and coastal habitats are lost to destructive fishing practices, poor agricultural land use, inappropriate coastal development, and industrial wastewater.

● OVERFISHING & EXPLOITATION

Unsustainable resource use reduces fish stocks throughout the Pacific, limiting fish catches and often causing ecological shifts that further reduce biodiversity and productivity.

● CLIMATE CHANGE

Carbon dioxide (CO₂) discharged to the atmosphere is both altering seawater chemistry resulting in ocean acidification and causing the ocean to warm leading to sea level rise, habitat shifts, increased storm intensity, altered precipitation patterns, and coral bleaching.

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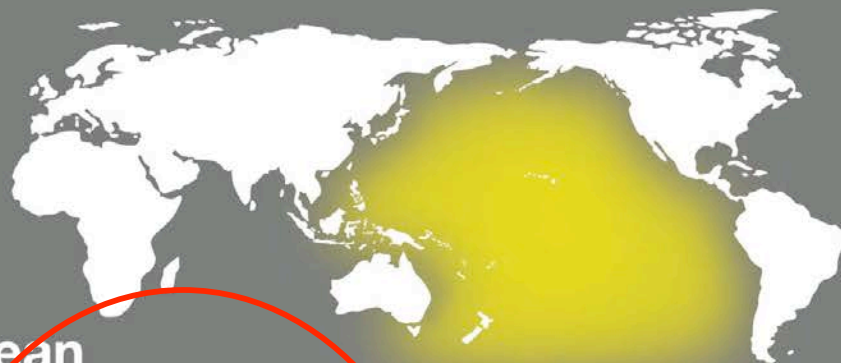
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Pacific Ocean Initiative

Looking Ahead to Solutions

- Publish Meta-Analysis
- Advise IUCN on Pacific Ocean “Stern-Like” Report
- Develop Pacific Ocean Conservation Trust Proposal
- Nurture Community of Scientists
- Advise Pacific “Heads of State” Meeting at CA World Ocean 2010

effects of marine reserves inside their borders

The Science of Marine Reserves



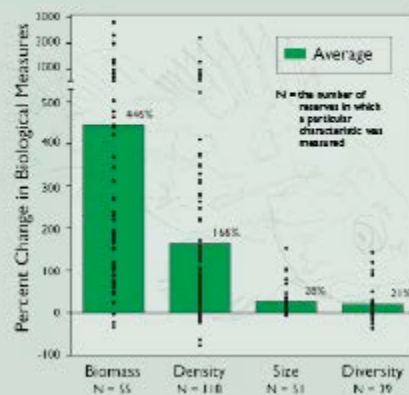
Typically when a marine reserve is established, the goal is to increase the abundance and diversity of marine life inside. Scientific research shows that marine reserves consistently accomplish this goal.

More Fishes, Shellfish, and Other Marine Life

Considerable scientific documentation—published in peer-reviewed journals—provides a clear picture of what has happened after the establishment of marine reserves.

Scientists have studied more than 124 marine reserves around the world and monitored biological changes inside the reserves.

The number of species in each study ranged from 1



effects of marine reserves beyond their borders

Fast Facts

- A network of several smaller marine reserves can be a viable alternative to one large reserve.
- A network can function to protect multiple habitats and species and to provide insurance against catastrophes.
- To form a network, reserves should be spaced closely enough that young fishes and invertebrates can move among them.

summary: marine reserves contribute to ocean health

Scientific evidence clearly shows that people are causing a decline in the ocean's health. Marine reserves have proved to be an effective way to protect habitats and biodiversity in the ocean. While marine reserves are not a cure-all, they are important for sustaining ocean life and human well-being.

People Have Created Marine Reserves Around the World

At least 45 nations—ranging from small islands to large countries—have established marine reserves in temperate and tropical regions. Scientific studies of at least 124 marine reserves in 29 nations have been published in peer-reviewed



and juvenile animals
side marine reserves to
ad waters.
nals may drift out from
serves into fished areas.



Before MLPA (& MLMA)...

- “Incoherent” array of over 88 disjointed MPAs in state waters
- Burden on petitioner to prove need for an MPA
- Traditional fisheries management collides with ESA, MMPA... and itself and utterly fails to integrate ecosystem principles



After MLPA (& MLMA) ...

- State has mandate to establish a network of MPAs in state waters by 2011 for improved ecosystem protection
- Shifts burden and places affirmative duty on the state to create MPAs
- State's fisheries managers have mandate to address ecosystem protection and now will be able to coordinate fisheries management plans with MPAs
- Places California in forefront of marine resource planning in the U.S.



MLPA's 6 Goals

- To protect the natural diversity and function of marine ecosystems.
- To help sustain and restore marine life populations.
- To improve recreational, educational, and study opportunities in areas with minimal human disturbance.
- To protect representative and unique marine life habitats.
- Clear objectives, effective management, adequate enforcement.
- To ensure that the state's MPAs are designed and managed as a network.

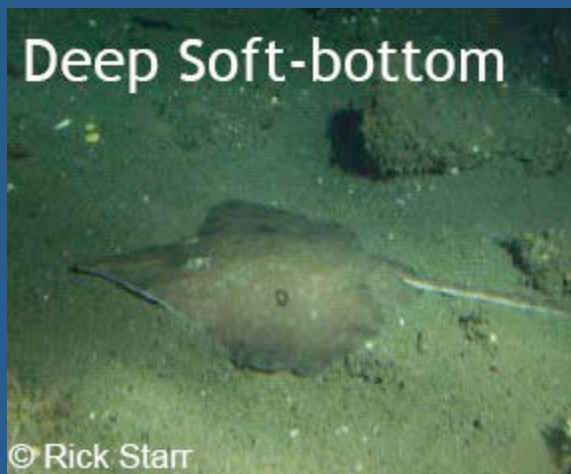
Primary Designations of MPAs in California:

- State Marine Reserve (no take)**
- State Marine Park (no commercial take, but may allow/limit recreational take)**
- State Marine Conservation Area (allows selected recreational and commercial take)**



MLPA

- Is not a Fisheries Management Law
- Requires use of “Best Readily Available Science”



MLPA Implementation

1999: MLPA becomes law

2001: \$ but bad process

2002: better process but ran out of \$

2004 to present (MLPA Initiative):

\$, staffing, deadlines, political will,
transparent public process



CA MLPA So Central Coast (2004-07)

MLPA Initiative Staff (incl. DFG)

Fish & Game
Commission

CA Marine Life
Protection Act

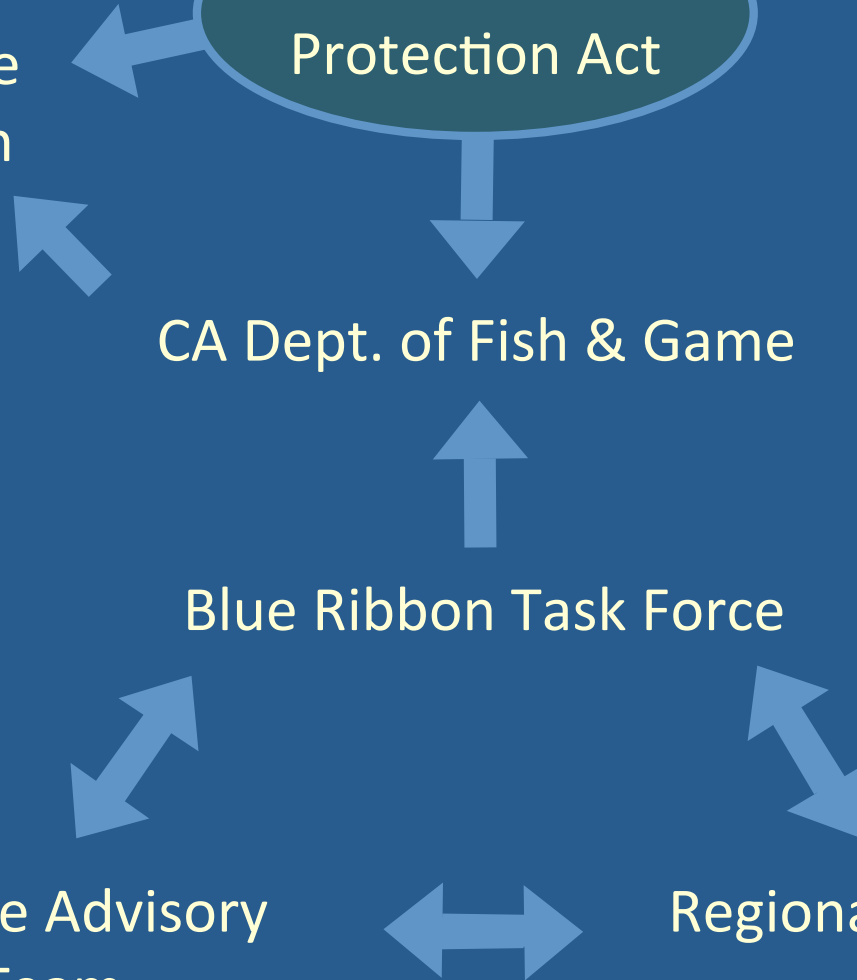
CA Dept. of Fish & Game

Blue Ribbon Task Force

Science Advisory
Team

Regional Stakeholder
Group

General Public



Providing Science Guidelines & “Rules of Thumb”

Size: minimum area of 9 sq. miles
preferred area of 18-36 sq. miles

Spacing: no more than 30-60 miles apart

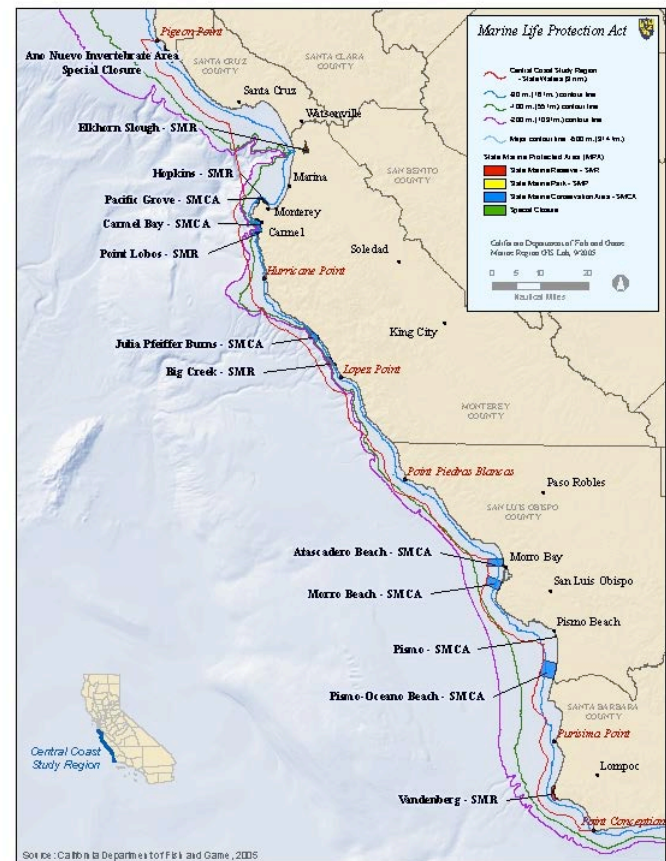
Habitat Coverage: all key habitats should
be protected

Replication: at least 3-5 replicates of
each habitat type

From This...

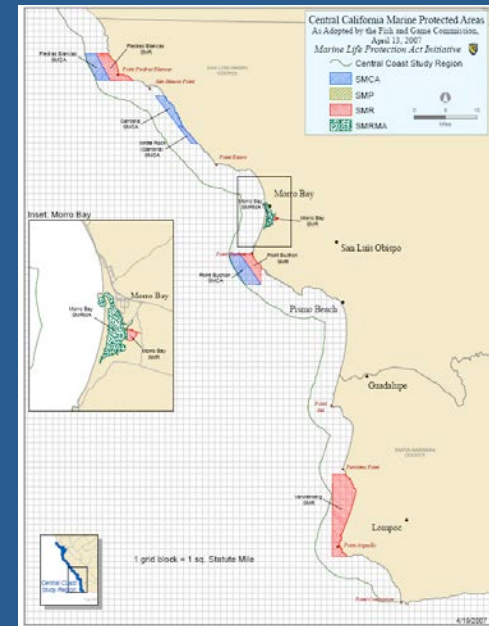
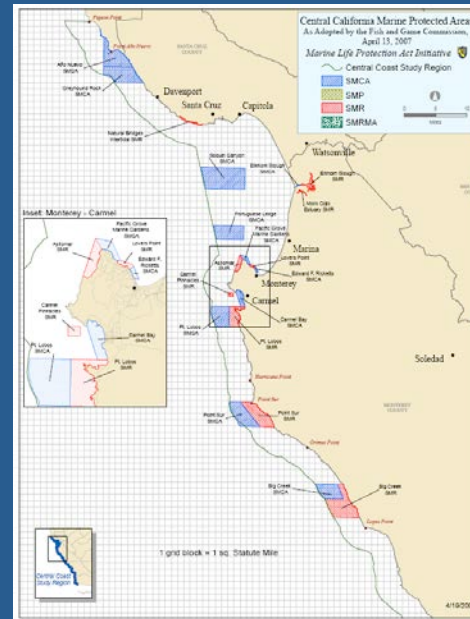
Existing MPAs in So Central Coast Region

- 12 MPAs = 3.76%
- 5 marine reserves = 0.65%



To This...

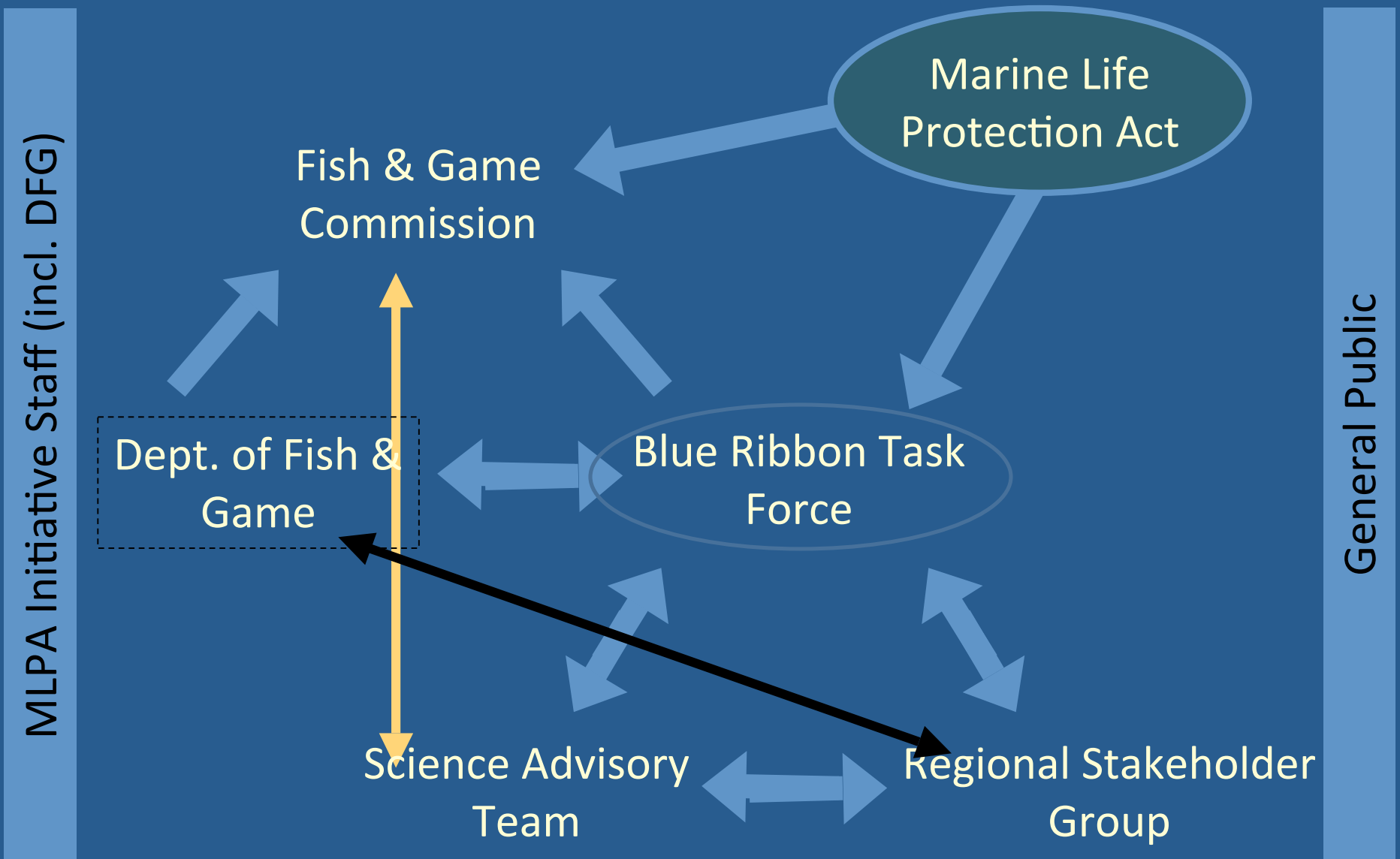
- 29 MPAS = 18% of study region (204 sq.mi or 53,000 hectares)
- 7.5% area in “no take” marine reserves, remainder mostly in moderate to high protection conservation areas



BRTF “Lessons Learned” Recommendations for North Central Coast

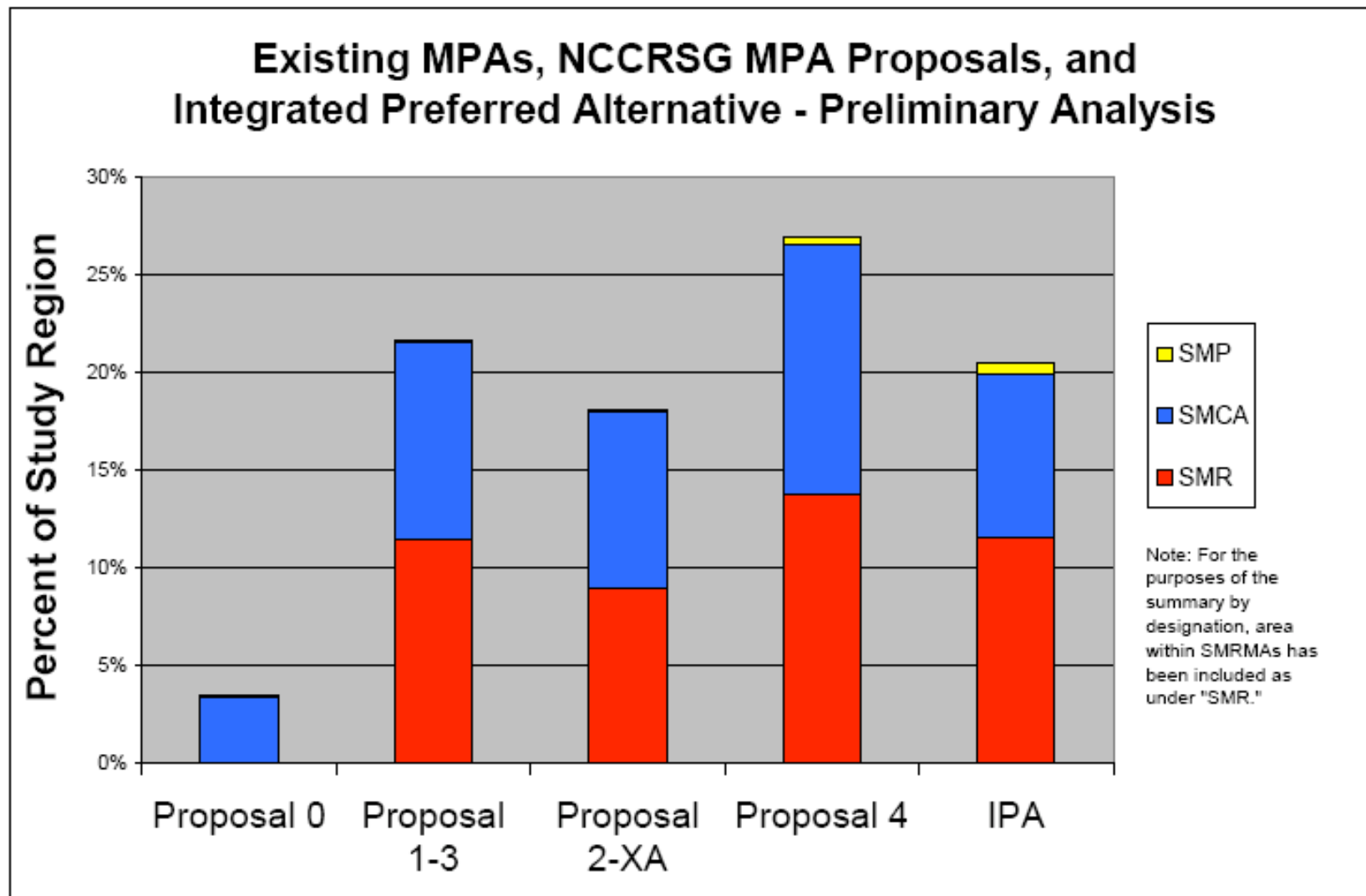
- Use a BRTF model for next region
- Clarify roles of stakeholders, BRTF, DFG
- Keep independent professional staff
- Involve FG Commission earlier and more meaningfully with SAT, BRTF, RSG
- Enhance state agency capacity: FG Commission; DFG; State Parks; SWRCB

CA MLPA North Central Coast



North Central Coast Comparison of MPA Proposals

Figure 1: Preliminary Comparison of Area Totals for MPA Proposals by Designation Type



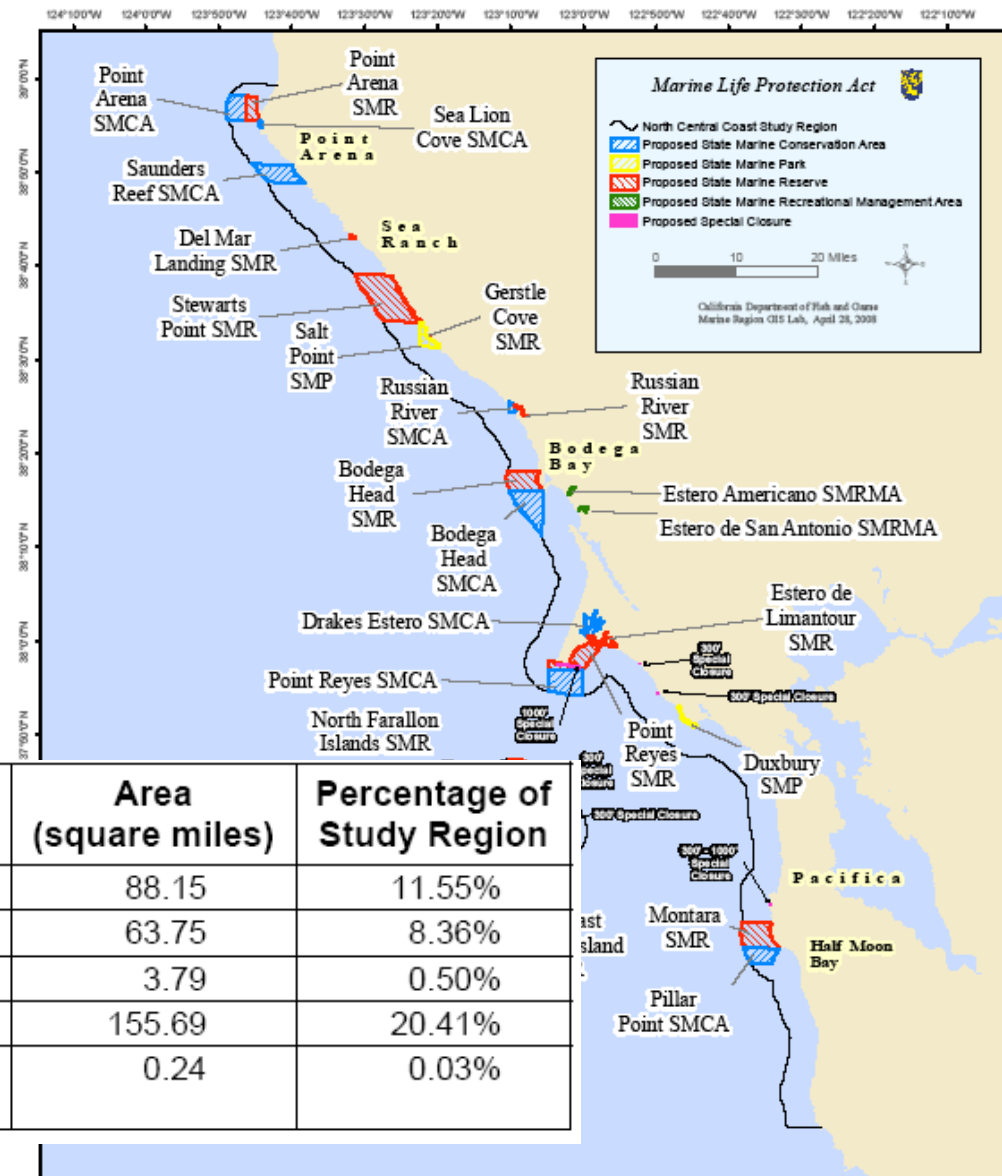
BRTF's North Central Coast Integrated Preferred Alternative

From:

13 MPAs (1 marine reserve of 0.28 sq mi)

26.9 sq mi (3.54% of study region)

To:



North Central Coast Study Region

Integrated Preferred Alternative

This marine protected area (MPA) proposal was unanimously selected on April 23, 2008 by the MLPAB Blue Ribbon Task Force (BRTF) as its preferred alternative and is being submitted to the California Fish and Game Commission (CFG) for consideration. This proposal integrates elements from three proposals developed by the North Central Coast Regional Stakeholder Group (NCCSRG) (proposals 1-3, 2-XA, and 4). These NCCSRG proposals will also be forwarded in their entirety to the CFG for consideration. Further information on each MPA proposal can be found in the associated text document with the same MPA proposal name.



	Number of MPAs	Area (square miles)	Percentage of Study Region
State marine reserve	11	88.15	11.55%
State marine conservation area	9	63.75	8.36%
State marine park	2	3.79	0.50%
MPAs Total	22	155.69	20.41%
State marine recreational management area	2	0.24	0.03%

Thank You

<http://www.dfg.ca.gov/mlpa/>

For live video of all MLPA meetings go to Cal-span.org

