Identifying Priority Conservation Areas for the Baja California to Bering Sea Region

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Tri-national Initiative - CEC

The North American MPA Network aims to protect, conserve and enhance the marine environment and its biodiversity through the design and management of a system of MPAs.
Project Goal: Identify continentally unique areas important to biodiversity conservation

1. areas of high local diversity (species richness),
2. habitat diversity (beta-diversity)
3. continental endemism
4. umbrella and charismatic species (MSCCC)
5. highly productive areas
Project Plan

1. produce map of priority conservation areas
2. work with ongoing conservation initiatives
3. develop common data themes - adaptable to regional initiatives
4. establish a framework for regional efforts
What is a priority conservation area (PCA)?

Area with high:

1. ecological value
2. anthropogenenic threat
3. conservation opportunity
PCA Identification Process

1. develop GIS
2. map layers of key social, physical and biological data sets
3. perform selected analyses
4. expert workshop - Consensus Mapper software
Conservation Priority Area
planned size choices

500 km

300 km

100 km
Population Targets

Scale 10-100 sq km:
metapopulation, larval dispersal, home range, migration corridors, feeding areas, nesting areas, concentration areas

Scale 100-1000 sq km:
regional population, migration routes, species’ range, larval dispersal
Physiographic Targets

Scale 10-100 sq km:
Anoxic basins, banks, bays, calderas, canyons, escarpments, estuaries, fans, seamounts, hills, headlands, ridges, terraces, troughs

Scale 100-1000 sq km:
Island archipelagos, ridges, seamounts, trenches
Oceanographic Targets

**Scale 10-100 sq km:**
- turbulence (island wakes, headland eddies),
- estuarine circulation, tides,
- river plumes, coastal currents, internal waves,
- upwelling jets, coastal retention zones, fronts

**Scale 100-1000 sq km:**
- mesoscale circulation,
- fronts, eddies, river plumes
Threats and Opportunities

1. Threats
   exploitation, extraction, coastal land-use, pollution, coastline alteration, recreation

2. Opportunities
   previous priority setting, sustainable development and management, opportunity for local or regional engagement, funding vehicles
Available data – B2B 1.1

- Biological data
  - chlorophyll A/ cold corals/ whales/ turtles/

- Physical data
  - shoreline/ bathymetry/ currents/ temperature/ seamounts/

- Social data
  - EEZ/ population/ fishing ports/ local priorities/ mpa/
## Umbrella Species

<table>
<thead>
<tr>
<th>E. Pacific green turtle</th>
<th>Humpback whale</th>
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<tbody>
<tr>
<td>Hawksbill turtle</td>
<td>Blue whale</td>
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<tr>
<td>Kemp's Ridley turtle</td>
<td>Killer whale</td>
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<tr>
<td>Leatherback turtle</td>
<td>Gray whale</td>
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<tr>
<td>Loggerhead Turtle</td>
<td>Right whale</td>
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<tr>
<td>Pink-footed shearwater</td>
<td>Guadalupe fur seal</td>
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<tr>
<td>Short-tailed albatross</td>
<td>Sea otter</td>
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<tr>
<td>Xantus' murrelet</td>
<td>Vaquita</td>
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</tbody>
</table>
Data Analyses

- Bathymetry
- Seamounts

Benthic Features
Bathymetry: ETOPO2, regions of higher resolution

Density of Seamounts: 250 km search radius

At the B2B scale...
Complexity is along the shelf slope, various deep seamounts, and the steps into the Sea of Cortez.

Courtesy of Jeff Ardron, Living Oceans Society
Data Analyses

- Sea surface temperature
- Sea surface height (altimetry)
- Primary production

Pelagic Features
Blue Whales Tracks and SST Fronts

Etnoyer et al. 2004
Blue whale tracks courtesy of Bruce Mate, OSU

Frontal Density Persistence

Months/yr.
High : 12
Low : 3
Analyses courtesy of Chuanmin Hu and Frank Muller-Karger, University of South Florida
Biodiversity Hotspots

Courtesy of Glenn Ford, Ecological Consulting, Inc. Portland, Oregon
West Coast US MPAs

Southern California Bight
Consensus Mapper – computers networked with GIS software

Experts
Computer Network
GIS software
GIS facilitator
Workshop facilitator
Common Display

Common Visual Display
Workshop Facilitator
GIS Facilitator
Networked Computer System

Computer Terminals
Canadian, Mexican and US Experts
Consensus Mapper Process

Priority areas chosen by experts

GIS map intersection

Common area of agreement to initiate discussion

Discussion and verification
Priority Conservation Areas as identified by experts and adopted by the CEC Council
PCA 3. Western Aleutians
PCA 7. Prince William Sound
PCA 16. Central California
PCA 24. Corredor Los Cabos/ Loreto
Priority Conservation Areas: The Challenge Ahead

NAMPAN pilot will focus the cooperation of the 3 countries on achievable and necessary actions. The process to narrow the focus and determine priorities and sites will be:

1) product driven,
2) relevant to all three countries,
3) applicable beyond B2B region,
4) builds on existing efforts/ projects, and
5) will benefit from the involvement of the CEC
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Thank you - Mahalo