

## ***Informal Meeting of Oregon Marine Reserve Community Team Scientists***

February 19, 2010

USFWS office at Hatfield Marine Science Center, Newport, Oregon

summary by Jim Golden and Mark Hixon

The **goals** of this unofficial meeting of scientists serving on the three marine reserved community teams (Cape Falcon, Cascade Head, and Cape Perpetua) were:

- to learn about each other's expertise,
- to discuss the role of scientists on the community teams,
- to review the 2008 Ocean Policy Advisory Council (OPAC) Scientific and Technical Advisory Committee (STAC) "Size and Spacing of Marine Reserves Workshop Report" (hereafter, "STAC recommendations"),
- to develop lists of scientific needs for the marine reserve process and what information is already available, and to prioritize those needs,
- to create a list of peer-reviewed scientific publications relevant to the marine reserve process, and
- to hear from the attending audience (who spoke only during the public comment period at the end of the meeting).

***This being an informal discussion, no conclusions are official or binding.***

### **Participant List (including affiliation, expertise, and community team):**

Jim Golden (facilitator), ex-ODFW, fisheries, Cape Perpetua (alternate)

Neal Coenen, ex-ODFW, fisheries, Cascade Head (alternate)

Sarah Henkel, OSU, benthos, Cascade Head (representative)

Mark Hixon, OSU, fishes, Cape Perpetua (representative)

Roy Lowe, US Fish and Wildlife Service, seabirds, Cape Perpetua (alternate)

Bill Peterson, NOAA, oceanography, Cascade Head (representative)

Rob Suryan, OSU, seabirds, Cape Perpetua (representative)

Dick Vander Schaaf, Nature Conservancy, reserve design, Cape Falcon (representative)

### **Discussion of Role of Scientists:**

The **goal** was to explore the unique role of scientists in the present marine reserve process:

- There was recognition that imbedding scientists within community teams is a new and different strategy for Oregon's marine reserve process. This is compared to the STAC as a body advising OPAC as an external body. Scientists now join individual regional committees in designing and proposing marine reserve sites. STAC will remain as a review body for the overall process.
- Should the scientists have some cohesiveness of view, act as individuals, or both? The facilitator suggested that scientists bring different perspectives owing to their unique backgrounds and specialties, but have been given instructions to use the STAC recommendations as guidelines.

- Consensus was that scientists would work as individuals, yet stay in touch with each other as desired and consult with each other as needed.
- It was noted that we are all natural scientists, rather than social scientists, and acknowledged that social and economic analyses are outside our expertise.
- A scientist's key role is to communicate what makes a viable reserve and to give the best possible recommendations regarding design based on peer-reviewed scientific information.

### **Discussion of STAC Recommendations:**

The **goal** was to determine whether there was consensus to endorse the STAC recommendations:

- Participants endorsed the OPAC STAC recommendations:
  - Minimum reserve size is 5-10 km (2.7-5.4 nmi) of coastline, then offshore to the limit of territorial sea (3 nmi offshore). Anything less than this size and shape is unlikely to be effective in terms of meeting conservation objectives.
  - Reserve spacing is moot because OPAC and the legislature have already determined spacing (not using the STAC recommendations). Therefore, science may influence only reserve size and shape in the present process.
- Rationale for minimum size and appropriate shape is to ensure conservation objectives:
  - Size should include many species and the home ranges of mobile species.
  - Size should include many seafloor habitats because there is a correlation between habitat complexity and species diversity (i.e., more habitats = more species).
  - Shape should allow species to move offshore after their larvae settle nearshore, typical of many fishes (rockfishes, lingcod, etc.). Protection from shore to the territorial sea boundary protects young fish as they slowly move offshore and eventually join fished populations (nursery benefit).
- The question was raised: Why do STAC recommendations indicate a minimum of 5-10 km (2.7-5.4 nmi) alongshore distance for a marine reserve when a figure in the STAC document indicates that 90% of biodiversity can be captured in a mile or less for most seafloor types? Proposed answer – It takes more than a linear mile to capture a sufficient amount of all habitat types within a region, as the individual habitat types may make up less than a mile.
- The question was raised: Given that the scientists endorse the STAC size recommendations, what is the role of scientists if a proposed reserve is too small? Proposed answer - Scientists should remind the community teams of the STAC recommendations and their rationale. If necessary, scientists may write minority reports.
- The question was raised: How close or far should comparison areas be from the marine reserves? Proposed answer - At least two home range diameters away based on fully-protected home ranges of key species within the reserve.

- Participants agreed with Oregon State Police that reserve boundaries should be simple to foster compliance and simplify enforcement.
- Participants suggested that bioregion definitions be revisited, given that there is evidence for three bioregions along Oregon's coast, rather than the two adopted by OPAC. The boundary between the two OPAC bioregions is Cape Blanco. There is evidence that another boundary exists at Cape Lookout.
- Replication within bioregions is problematic because there is only one small reserve south of Cape Blanco, yet any new reserves in northern California (north of Cape Mendocino) would be in the same bioregion.
- Comparison areas (unprotected reference sites) will allow evaluation of marine reserves. Comparison areas should be similar to the marine reserves in size, shape, seafloor, and other factors, yet far enough away from the reserves so that the two sites do not affect each other strongly.
- The key question in evaluating each proposed reserve: Is this proposed reserve likely to provide a measurable ecological benefit?

#### **General Discussion:**

- It was suggested that community team scientists need a summary of the rationale OPAC used for recommendations and guidelines for the present process, including a graphic representation of the process. There is need to clarify expectations, especially of the scientists.
- It was acknowledged that marine reserves will not be a substitute for fisheries regulations outside of reserves, and will not solve fisheries resource problems, especially given the small number and sizes of reserves being considered. Nonetheless, the proposed marine reserves may provide some seafloor habitat protection, some diversity protection, some protection of groundfish species with small home range, and some level of resilience as the ocean climate changes.
- Marine reserves that are adaptive will provide the most benefits, with long-term monitoring indicating whether boundaries should be modified and reserves moved or abandoned.
- Given the slow growth and long generation times of many of marine species off Oregon (e.g., many rockfish do not mature until about a decade old), it is going to take a long time to detect any effects of reserves.

#### **List of Possible Scientific Needs for Marine Reserve Process:**

The **goal** was to list the needs scientists had heard from their respective community teams, as well as what scientific needs the scientists might anticipate. Here is the list, in no particular order:

- The current status of stocks and species that the PFMFC has been working to re-build, including their distribution and abundance in the three reserve regions.

- Vertical and horizontal current patterns and patterns of larval dispersal (connectivity and self-recruitment). This information would be very useful but there are few data available. Dr. Hal Batchelder's (OSU) larval dispersal models in STAC recommendations are relevant.
- A user-friendly "sliding-window" GIS that gives instant summaries of seafloor habitat areas and percentages of different reserve designs. Such tools will be especially needed for matching comparison areas with marine reserves. Andy Lanier (DLCD) reported that such tools may be ready in 3-4 months. (The on-line PacOOS tool presently does not work.)
- What trends are emerging from California's marine reserves? Relevant information will be provided at the ODFW reserve monitoring workshop to be held 2 March 2010 at OSU. There are also some publications available.
- Indicator species for monitoring marine reserves. Sources may be the ODFW Nearshore Strategy species list and fleet lists from workshops. Which are the best core monitoring species? What are the site specific needs vs. cross-cutting indicator species for system wide comparisons and studies? EcoTrust has chosen indicator species with objectives for each species.
- Seafloor habitat maps. New multibeam-sonar maps provide both detailed depth contours (not yet approved for release by NOAA) and seafloor type (backscatter). Maps should be available within the next couple months. There are new grab-sample data that ground-truth sonar data. Video sampling will provide further ground truth.
- At-sea surveys of seabird and marine mammal distribution, abundance, and feeding patterns, combined with colony data.
- Gap analysis of species space/time, presence/absence, and abundance data.
- Data used in original marine reserve proposals. What data sources were used? ODFW said there would be some updates of proposal information at the March 2<sup>nd</sup> meeting.
- Land-sea connection and ecological effects of reserves on the coast.
- Physical oceanography along entire Oregon coast, especially south of Newport. Suggestion was to evaluate several phases of PDO and ENSO events, a sufficient span to characterize natural climate regime variation. Dr. Bill Peterson can provide meta-data for this characterization. Cape Perpetua requires separate data, perhaps provided by gliders (OSU COAS) and PISCO data from Strawberry Hill (OSU Zoology) (hypoxia is a threat there). Cascade Head may be able to use some Newport Line data (no hypoxic threat there because the shelf is narrow and there is good circulation).
- Information that reveals whether a proposed site is "representative" of that region.
- From a social science perspective, history of fishing effort in each region, including fleet movements, distances from and use by different ports, etc.

### **List of Available Data Sources:**

- <http://www.coastalatlus.net/> is the source for the Oregon Coastal Atlas. Type "ocean" in the search box to see what is available. Site includes access to metadata, geodata, thematic charts, seafloor and depth contour maps.
- ODFW fish data are confidential. Logbook data are sketchy in the nearshore, and there are confidentiality issues. Summary information and reports on marine habitat are available at <http://www.dfw.state.or.us/MRP/publications/>.
- A presentation will be made to community teams by ODFW on marine reserve/marine protected area proposals presented to OPAC, including background information.
- PISCO data sets are available – see website at <http://www.piscoweb.org/>.

- Oceanographic metadata, temperature and primary productivity data and GLOBEC data may be available: contact Bill Peterson at HMSC/NMFS.
- ORCOOS and PACOOS data sets including satellite data are available: <http://agate.coas.oregonstate.edu/> and <http://www.pacoos.org/>. Also, Jack Barth at OSU COAS has additional coastal data sets: <http://www.coas.oregonstate.edu/>. For more information on COAS, including the Goldfinger lab: <http://www.activetectonics.coas.oregonstate.edu/>.
- In the future, the new west coast observatory system will provide real-time access to oceanographic data: <http://nanoos.org/>.
- USFWS marine bird and mammal inventory. Also, Rob Suryan indicated that at-sea bird inventory data will be offered with nesting data in the near future. Jen Zamon (NOAA) also has bird survey data along the coast.
- ODFW used to have abundance estimates of marine mammals in coastal areas, but these surveys were discontinued in recent years due to funding cuts.
- Data on land-sea connections may be available, including river data, use and management on terrestrial side, and areas of significance.
- Historical data on reserve sites may be available, including local knowledge from elders in local communities. It was suggested that the past 30+ years should be explored.
- Oregon Climate Assessment will be conducted this year. Mark Hixon is the organizer of the marine section, which will include many authors: <http://oregonstate.edu/research/multi/occri.html>. More information at a UO website: <https://scholarsbank.uoregon.edu/xmlui/handle/1794/2299>.
- Territorial Sea Plan data collected by Ecotrust – accessible by community teams?
- Landing statistics – available but only by port – may not be good enough for spatial analysis.
- Other data sets:
  - "Technical Workshop on Economic Data and Analysis of Marine Reserves" by STAC.
  - ODFW Cape Perpetua ROV pre-during-post hypoxia events.
  - NMFS Shelf Survey – mostly >3 nmi offshore, but some hauls inside.
  - ODFW Marine Resource Program website (see above).
  - Doug Markle (ex-OSU Fisheries & Wildlife)– shallow water survey information for cable crossing studies, may be available for Otter Rock and Cascade Head, and Neakanie.
  - EPA – Michelle Wood – harmful algal bloom survey.

### **Priority Scientific Needs:**

- Seafloor habitat maps: First generation is variable in terms of content and quality – need to be aware of amount of error in data sets. Second generation data products will be available in a couple of months – probability much improved, error reduced. Maps are digital and can be queried.
- Qualitative fisheries data: To track shifts in effort and changes in fishing behavior, use fishermen interviews, use quantitative information if available. To evaluate impacts of fishing, need spatially specific information from fishermen – look at edge effects, effort changes, effort distribution.
- Home ranges of adult fish and other mobile species and dispersal distances of larvae: Include summaries of existing studies, identify future studies. See Alan Shanks recent review.

- Current and past ocean conditions with respect to climate and fishing effort.
- Federally protected species within each area (e.g., hotspots for marbled murrelets).
- Overall: Comprehensive information about each site, including how representative the site is for a given bioregion, species and habitats present, fishing history, disturbance record, etc..

### **Marine Reserve Science Bibliography:**

The facilitator asked science advisors to list the most important scientific references that might be specifically helpful for the community team marine reserve process. These references will be compiled at a later date. The following is an ad hoc list compiled quickly by the participants:

- Heather Reiff, MRM program at OSU, is synthesizing a bibliography of papers relevant to marine reserves in Oregon.
- NOAA (2006) on best practices for making MPA boundaries.
- IUCN (2007) on best practices for establishing MPA networks.
- Lester and Halpern (2008) on a review comparing no-take vs partially protected areas.
- Levin (2009) on a framework for assessing biodiversity.
- Malloy (2009) on the effects of marine reserves on age structure.
- Tetreault (2007) on temperate marine reserves, take and no-take, targeted and non-targeted species.

### **Public Comments and Questions:**

- Need to understand impact of sea lions, which appear to be increasing in numbers adjacent to some of proposed sites. No ODFW surveys for 5 years. Information needed on abundance and behavior of top predators and higher trophic levels.
- Stick with the science.
- Don't underestimate uncertainty in information and outcomes– communicate uncertainty to the community teams.
- Marine reserves will serve as reference areas that should improve management overall in the long run.
- Be aware that effort will be displaced from marine reserves, and may affect comparison sites.
- Should see a big effect at Redfish Rocks in terms of improved fish abundance and size – as this area was heavily fished.
- Concern about using Newport Line oceanographic data as a proxy for Cascade Head. More information is needed based on fleet experiences and observations.
- The timeline is crazy for accomplishing the work!
- Do it right. Establish good goals and objectives. Find-out what kinds of practices are harmful to species. Determine what is to be gained. Need specificity and ability to do assessments. Where will we get the funding?
- Scientists welcomed – understand the concerns.
- Lots of work being done. A team of experts is being assembled by Dr. Stephen Brandt (Oregon Sea Grant). Oregon is developing a framework for nearshore resource (Nearshore Research Task Force).
- Assess both consumptive and non-consumptive uses. Get the best bang for buck in support of Goal 19.

There were also written questions – the facilitator has made an attempt to answer these (in parentheses):

- Isn't the proposed Cape Perpetua site going to be the largest MR in nautical miles? (I believe this is true, but final boundaries will be proposed by the community team)
- Can community science teams request added individuals for the team, and what technical support is backing this science team? (There are supposed to be representatives and alternates. ODFW is asking outside advisors to help with process.)
- Are data available on ocean acidity, and what effect will ocean acidity have on marine reserves? (See the website <http://oregonstate.edu/dept/ncs/newsarch/2008/May08/acid.html>. There may be effects on invertebrates and other species with calcium carbonate shells. A lot of research is being conducted and there are several recent review papers, which we will add to our bibliography.)
- Could a program be set up to collect historical data from elder public? (Perhaps, but this would have to be implemented by ODFW or another body.)
- What happens if a scientific team determines that a MR or MPA is not in the best interest of Oregon? Can they recommend a location or other site? Are all 20 sites a given outcome or do the community teams choose? (Scientists are members of each community team, sites for evaluation have been located already and are far fewer than 20: only 3 for evaluation, plus ongoing discussions at Coos Bay/Cape Arago and the two small pilot marine reserves. I believe that ODFW has the statutory requirement to make final recommendations based on input from the community teams.)
- Does the offshore volcanic heated water columns effect hypoxia? (Not to anyone's knowledge.)
- Are invertebrates indicator species? (I presume there might be important ones, such as Dungeness crab, sea urchins, sea stars, etc.).
- What food source species are going to be in monitoring programs? (Most surveys include species in different trophic levels, and all are food at some time in their life history.)
- Can scientists remove an area as a marine reserve or marine protected area as unimportant or insignificant? (Scientists may make recommendations as to the potential effectiveness of a proposed site, or, after retrospective monitoring studies evaluate how well a site performed. Removal is a task for the agencies with authority for changing regulations. OPAC recommended use of adaptive management – e.g. room for change based on new information as available – in creating a system of marine reserves.)