National Marine Sanctuaries and Marine Spatial Planning: The Importance of Apex Predators in Planning for the Future

Sara Maxwell, Barry Nickle, Scott Shaffer, Bruce Mate, Steven Bograd, William Henry, Michelle Kappes, Greg Breed, Helen Bailey, Michael Weise, Carey Kuhn, Patrick Robinson, Barbara Block, Daniel Costa

1 University of California Santa Cruz, Santa Cruz CA, 2 Department of Biological Sciences, San Jose State University, San Jose CA, 3 Hatfield Marine Science Center, Oregon State University, Newport OR, 4 Environmental Research Division, NOAA, Pacific Grove CA, 5 Université de la Réunion, Saint-Denis, Réunion, 6 Office of Naval Research, Washington DC, 7 National Marine Mammal Lab, NOAA, Seattle WA, 8 Hopkins Marine Station, Stanford University, Pacific Grove CA

Introduction & Methods:
Understanding how apex predators use marine protected areas is crucial to implementing marine spatial management (MSP) (Hooker & Gerber 2004). We used satellite tracking to determine habitat utilization with the California Current System and US National Marine Sanctuaries between 2003 and 2008. Species include:

4. Sooty shearwaters; *Puffinus griseus*; n=26, 2005 – 2006
5. Black-footed albatrosses, *Diomedea nigripes*; n=38; 2003 – 2006

Tracks were gridded (0.25°) and high density areas calculated for individual species and all species over a number of time periods.

Conclusions & Recommendations:
The Sanctuaries incorporate high density species areas though gaps occur in northern California and southern Oregon (Figure 1). Shifts in distribution patterns occurred between years, particularly anomalously warm oceanographic years (Figure 2) (Schwing et al 2006) and use varied by species (Figure 3). We recommend:

1. Extending Sanctuary boundaries offshore to protect during variable years
2. Apply MSP to reduce interactions between whales and potential offshore oil and gas development.
3. Use MSP to prevent against direct (i.e. bird bycatch) and indirect (i.e. competition with sea lions) fishery interactions within Sanctuary boundaries.
4. Increase protections in northern California and southern Oregon.

These changes will result in more comprehensive protections on along the US West Coast.


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