Brady Phillips
JMPR Management Plan Coordinator
NOAA National Marine Sanctuary Program
1305 East-West Highway, N/ORM-6,
Silver Spring,
MD 20910

December 27, 2006

Re: Marine Sanctuaries Joint Management Plan Review

Dear Mr. Phillips,

We respectfully submit the attached text for inclusion in the documents that will comprise the Joint Management Plan for the Cordell Banks, Gulf of Farallones, and Monterey Bay National Sanctuaries.

The text we are submitting focuses on mitigating for the known impacts of ocean noise pollution on marine habitats. The issue of the impacts of underwater noise pollution on marine animals has come to the attention of scientists, the public, and policy makers only recently due to the dramatic increase in marine mammal stranding events consequent to the use of military sonars. As scientists have responded by trying to determine what effects various anthropogenic noises have on marine habitat, it has become clear that what we do know about marine bio-acoustics is far overshadowed by what we do not know.

This situation has encumbered the development of coherent ocean noise policies – largely because it seems that any decision we make regarding ocean noise regulations will be only informed by the available science – which we know to be lacking.

But we believe that the facts we do have give policy makers enough evidence to at least begin the necessary work of crafting preliminary ocean noise policies – knowing that we will become more informed as additional research is completed and additional evidence arises. Our suggested text accommodates for this by including provisions for flexibility and modification as data come in.

To help better frame the acoustic impacts issue, tables ES-1 and Table 4-1 in the JMPR Draft EIS summarizing the impacts of the proposed actions should include columns on “Acoustics” to accommodate for the proposed text we are submitting. Furthermore,

acoustic impacts in these tables – as well as throughout the DEIS and the individual sanctuary's plans, should segregate the acoustic impacts into two categories: the impacts of noise on birds and pinnipeds above the water (e.g., from aircraft, boat traffic and Personal Water Craft), and the impacts of underwater noise (e.g., ship propulsion noise, active sonars, and seismic airgun exploration) on fish, turtles, marine mammals and marine invertebrates.

One of the challenges of crafting ocean noise regulations in the sanctuaries is that the sanctuaries are already beset by high levels of anthropogenic noise. All three sanctuaries lie under the path of some of the world's busiest shipping routes. Additionally, other maritime activities have saturated the sanctuary areas with navigation, mapping and fish finding sonars. Shipping and sonars have been long standing sources of noise in the sanctuaries, and at present we can only speculate about the extent of the impacts that these noises have had on sanctuary biota over time.[1] Prohibiting these noise sources within the sanctuaries by relocating shipping lanes would be impractical and would do little to ameliorate any impacts that these noises may have on animals outside of the sanctuary boundaries (animals that are not otherwise subject to the constraints of our boundary making).

Knowing that we are already starting with a noisy acoustical environment should not stop us from moving ahead with informed regulations and a policy framework. Noise sources in the oceans are increasing at a dramatic rate. The recent increase is not so much due to the increases in shipping traffic and navigation sonars as it is due to the introduction of new technologies and increased exploitation of ocean resources. New communication sonars for military operations and underwater exploration (by way of autonomous or unmanned vessels) are introducing a whole new class of noises into the sea. These noises can be exceedingly loud, but even when they are not particularly loud, they may have qualities that confound animals. Thus while there is a trend to set noise exposure levels just below the "Temporary Threshold Shift" (TTS) levels of captive marine mammals,[2] the estimated exposure levels in the Bahamas beaked whale stranding of May, 2000 were significantly lower than the suggested "safe" level of the cited document. (The USWTR DEIS suggests 190 dB re: $1uPa^2$–s as a "safe" level – from which marine mammals can recover from TTS, but the modeling of the beaked whale stranding suggests that these animals were exposed to levels no greater than 145 dB re: 1uPa. [3])

While these facts introduce a level of uncertainty to what exposure levels are safe for marine animals, precaution would dictate that lower exposure levels should serve as guidance unless the specific noise source in question can be found to be benign to marine animals at higher levels. This is particularly the case when the noise source represents a new type of sound or a new technology – such as a new acoustical communication technology – not yet proven in the marine bio-acoustic environment.

Additionally, seismic exploration for petroleum and minerals is expanding and reaching into ever deeper waters, and it is well known that these noises have negative impacts on ocean habitat.[4] Because of the very definition of a "marine sanctuary," seismic exploration for resource extraction – or even for "asset surveys" – should be prohibited in the sanctuaries. But noise from seismic surveys adjacent to the sanctuaries does not

conform to the sanctuary boundary, thus setting sanctuary limitations on "trans-boundary noise pollution" will require coordination and cooperation with other agencies responsible for adjacent jurisdictions.`

Furthermore, new and emerging in-water and underwater industrial processing technologies, such as Liquid Natural Gas processing, or ocean floor based petroleum extraction processing will introduce and increase ocean ambient noise to heretofore untold levels. If left unregulated, these noise sources may mask biological sounds critical to the survival of marine animals in the sanctuaries.

While these aforementioned challenges may seem formidable, they are not insurmountable. Knowing what we currently know about the impacts of anthropogenic noise on marine animals, we would be remiss if we did not take this opportunity to set some preliminary guidelines for the regulation of underwater noise pollution in the sanctuaries. By providing flexibility in the regulations, and accommodations to include new data as it becomes available, we can protect the sanctuaries while assuring that the sustainable use of the oceans will be available to all stakeholders.

Sincerely,

Michael Stocker
Science Advisor
Seaflow

Cc: Maria Brown, Superintendent
Gulf of the Farallones National Marine Sanctuary

Dan Howard, Superintendent
Cordell Bank National Marine Sanctuary

Superintendent
Monterey Bay National Marine Sanctuary

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[1] Shiva Polefka, Linda Krop. "Anthropogenic Noise and the Channel Islands National Marine Sanctuary." Environmental Defense Council, 2004.
[2] "Draft Overseas Environmental Impact Statement/Environmental Impact Statement Undersea Warfare Training Range" October 2005. U.S. Navy.
[3] Hildebrand, J. and Balcomb, K. 2004. *Modeling the Bahamas Beaked Whale Stranding of March 2000* (Presentation at the Third Plenary Meeting of the U.S. Marine Mammal Commission Advisory Committee on Acoustic Impacts on Marine Mammals, 27-29 July 2004, San Francisco, California).
[4] Arne Hassel et. al. "Influence of seismic shooting on the lesser sandeel (*Ammodytes marinus*)" ICES Journal of Marine Science, 61: 1165-1173.