Scope: Scientific Review of Red Abalone Density Estimates in Northern California

Scope and Purpose

The California Department of Fish and Wildlife (DFW) is committed to incorporating the best scientific information into fisheries management decisions. DFW has requested that the California Ocean Science Trust (OST) coordinate a scientific and technical review of the survey design and the methods currently used to estimate red abalone (*Haliotis rufescens*) density in northern California.

Management Overview

The Marine Life Management Act (MLMA) mandates that California manage fisheries sustainably, at fishing levels that do not deplete the resource. Fishery independent surveys of abalone density are used as part of an adaptive management approach outlined by the Abalone Recovery and Management Plan (ARMP). The Harvest Control Rules outlined in the ARMP are structured so that a density decline greater than 25 percent prescribes a reduction in the fishery. This feature helps to ensure that reductions in the fishery are proposed only when survey results show significant declines.

Review Request

DFW's goal in asking for this review is to determine the most robust and tractable methods for estimating red abalone density, which informs management of the northern California recreational fishery. Specifically, DFW is seeking scientific and technical review of:

1) survey design, including strengths and weaknesses of current methods for estimating red abalone density;
2) the application of existing methods, including analysis of existing data, and interpretation of results; and

3) uncertainty associated with existing methods for estimating red abalone density in northern California and its adequacy for informing catch limits and other management controls of the recreational red abalone fishery in northern California, as outlined by the ARMP.

OST will work with reviewers to produce a summary of review outcomes, including 1) assessment of the current practice used to estimate red abalone density, 2) whether current methods could be improved, and 3) if so, a list of ways the methods could be improved. This summary will be made publicly available.

Roles and Responsibilities

DFW has requested that OST serve as the independent appointing agency in alignment with the Procedural Guidelines for DFW *Ad Hoc* Independent Scientific Advisory Committees. OST will convene the Science Advisory Committee (SAC), and design and implement a scientific review process that promotes objectivity, transparency and scientific rigor. The SAC will have 3 to 6 members, and one member will serve as chair.

Ocean Science Trust

1) *Implement a Review Process that Addresses Managers' Needs.* Prior to identifying and engaging reviewers, OST will work with DFW to formalize a review process that meets our collective intention of promoting full candor among reviewers, scientific rigor, and fulfills OST's and DFW's shared commitment to public accountability and transparency. The document describing the review process will be publicly available on OST's website.

2) *Implement a Transparent Reviewer Selection Process to Solicit Experts.* OST will implement a process to identify reviewers to serve on the SAC that are expert in relevant fields of social and natural sciences as applicable to the scope of this review. OST will solicit reviewer recommendations from the Ocean Protection Council Science Advisory Team (OPC-SAT), DFW and key constituent groups. OST will collect background information from all nominees willing to serve on the SAC, and work with the OPC-SAT to further vet the nominees. Final selections for the SAC will be made by the OPC Science Advisor (OST Executive Director) in consultation with the OPC-SAT executive committee. All members of the SAC, including links to background information, will be made publically available on OST's website.

3) *Promote a Rigorous, Objective Review Process that is On Task and On Time.* OST will work with DFW to inform the SAC of the scope and purpose of their task, including how the information they produce will be used. OST will compile background information relevant to the approach and methods used to estimate red abalone, undertake planning and logistics

for SAC meetings, and as appropriate engage stakeholders and draft public communications. For all formal meetings related to this review, agenda and meeting summary materials will be made publically available on OST's website.

4) *Provide Deliverables.* OST will work with the SAC to complete a summary of review outcomes that includes SAC members' comments and provides recommendations that focus on improving density survey design and methodology, and analysis as deemed necessary. OST will make the summary of review outcomes publically available on OST's website, as well as provide it to DFW.

5) *Encourage Candor among Reviewers.* OST will strive to obtain a consensus view among the SAC, however if this is not possible, dissenting views will be honored and represented in any summary of review outcomes.

California Department of Fish and Wildlife (DFW)

1) *Provide all Relevant Data and Background Materials.* DFW will assist in identifying and providing all data and other information necessary for external reviewers to conduct a constructive scientific and technical review. DFW will work to ensure all related materials are clear and accessible.

2) *Constructively Engage with Reviewers.* DFW scientists most familiar with the design, methodology and application of red abalone density surveys will engage in the process and be available to answer questions as necessary. The DFW Marine Region Program Manager, Tom Barnes, has agreed to serve as the primary management contact during the review process.

3) *Respond to Reviewer Recommendations.* DFW intends to fully consider reviewer recommendations, and respond to review outcomes as appropriate given fiscal considerations.