

COMMITTEE STAFF SUMMARY FOR JULY 21, 2016

7. ECOLOGICAL IMPACT ASSESSMENT TOOL IN MPAS**Today's Item**Information Direction

Update on progress and completion of new ecological impact assessment tool for scientific collecting permit applications in marine protected areas (MPAs).

Summary of Previous/Future Actions

- Most recent update on tool development Nov 5, 2014; MRC, Los Alamitos
- **Today's update on progress and pilot application Jul 21, 2016; MRC, Petaluma**

Background

Two goals within the MLPA: 1) Improvement of scientific research opportunities within MPAs, and 2) protecting populations, biodiversity, and habitat, may conflict unless science-based removal of organisms within MPAs is managed. DFW gives special consideration to scientific collecting permit applications that propose to remove organisms from MPAs to conduct their research. To assist DFW in improving the rigor of their evaluation, and consideration of multiple projects, DFW requested assistance from the OPC's Science Advisory Team. A workgroup of this team has met since June 2012 to develop a tool for this purpose. DFW has previously provided the MRC with an overview and updates on tool development (most recently in Nov 2014), and its potential applications in management of research within MPAs.

Today, Brian Owens from DFW, and Dr. Karina Nielsen, from the SAT working group, will provide an update on the tool and will detail its progress, status of completion, and pilot application (exhibits 1 and 2). DFW has also submitted an executive summary of the framework that outlines the four step approach to the decision-making process, its ecological impacts, impact thresholds, and benefits of use (Exhibit 3).

Significant Public Comments (N/A)**Recommendation (N/A)****Exhibits**

1. [DFW Transmittal Memo, dated Jul 1, 2016](#)
2. [DFW presentation for Jul 21, 2016 MRC meeting](#)
3. [Executive Summary: Scientific Research in Marine Protected Areas - Development of a Novel Ecological Impact Assessment Framework, dated Jun 20, 2016](#)

Committee Direction/Recommendation (N/A)

Memorandum

Date: July 1, 2016

To: Valerie Termini
Executive Director
California Fish and Game Commission

From: Craig Shuman 
Regional Manager, Marine Region

Subject: Agenda Item for the July 21, 2016, Marine Resources Committee Meeting Regarding Information on an Ecological Impact Assessment Developed to Better Manage Research in Marine Protected Areas.

At the July 21st Marine Resources Committee (MRC) meeting, the Department will provide an update on the status of a framework constructed to improve permitting decisions on research in Marine Protected Areas (MPAs). This will be the third time the Department has updated the MRC on this issue. This update is informational only, but provides the Department with an opportunity to get feedback from both the MRC and the public in attendance.

If you have any questions regarding this item, please contact Dr. Craig Shuman, Regional Manager, Marine Region at (805) 568-1246.

Attachments

Attachment 1: Presentation of Ecological Impact Assessment on Research in MPAs

Attachment 2: Executive Summary: Scientific Research in Marine Protected Areas- Development of a Novel Ecological Impact Assessment Framework

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Scientific Research in Marine Protected Areas: Development of a Novel Ecological Impact Assessment Framework

Marine Resource Committee Fish and Game Commission



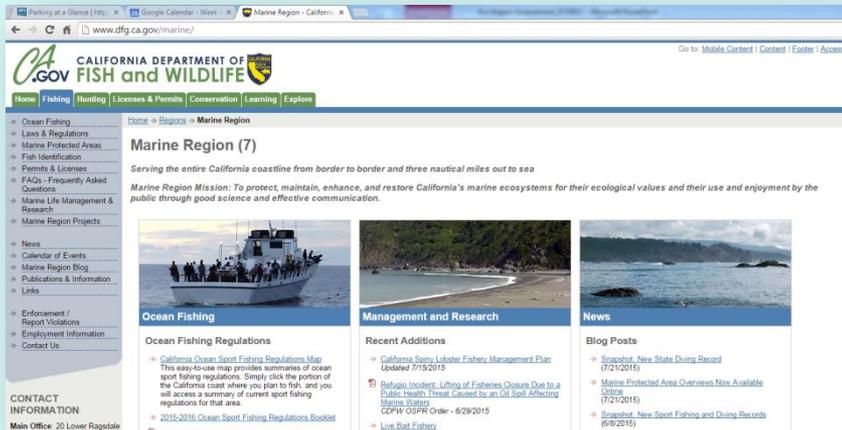
Research in Marine Protected Areas Working Group
Department of Fish and Wildlife

and

California Ocean Protection Council Science Advisory Team

July 21, 2016

CA Department of Fish and Wildlife & CA Ocean Protection Council Science Advisory Team -Working Group



- **Brian Owens, CDFW**
 - Environmental Scientist
- **Becky Ota, CDFW**
 - Habitat Conservation Program Manager
- **Emily Saarman, PISCO**
 - Project support

- **Karina Nielsen, RTC/SF State**
- **Rich Ambrose, UCLA**
- **Mark Carr, UCSC**
- **John Field, NMFS**
- **Steven Murray, CSU Fullerton**
- **Steve Weisberg, SCCWRP**

Presentation Outline

- Background on Scientific Collecting Permit (SCP) Program
- Assessment Need & Purpose
- Challenge & Approach
- Overview of Assessment
- Benefits
- Feedback & Questions



SCP Program Background

- SCPs authorized by Fish and Game Code § 1002 & 1002.5 and regulated by Title 14, 650
- Department currently undergoing a rulemaking to restructure the program
- Research is authorized via an SCP
- Process used to approve SCPs in MPAs
- SCPs issued by Marine Region since 2012:
 - Yearly average of 287 total permits, 107 in MPAs

Management Issue

- Marine protected areas (MPA) are important conservation and management tools
- Scientific research and monitoring are part of the MPA mission
- Scientific research in MPAs may impact the ecosystem and reduce MPA effectiveness



The Challenge

- MPA Managers Need to:
 - Evaluate research impacts while estimating ecological costs from cumulative impacts in MPAs to make informed permitting decisions.
- **Goal:** Develop a framework that enables MPA managers to quantify the ecological impacts of scientific research activities in an unbiased, transparent, and objective manner



Approach: Overview

A decision making tool was based on:

- Established ecological principles
- Quantitative, evidence-based process

The approach:

- Estimates potential ecological impacts of single and multiple scientific projects in an MPA
- Compares impacts against policy-set thresholds for each MPA
- Informs decision-making, doesn't prescribe

Approach: Elements

Four step assessment procedure to inform permitting decisions:

1. Filter out projects
2. Quantify ecological impacts
3. Calculate the cumulative impact of all projects
4. Compare the cumulative impacts with policy-based, acceptable impact thresholds for species, assemblages, and habitats



Estimating Ecological Impacts

- Quantitative models that capture ecological impacts to three ecosystem components
 - Populations of targeted species
 - Ecological assemblages
 - Physical habitat
- Calculations are based on proportionate loss or injury
 - Impacts are adjusted using multipliers
- Considers direct and indirect effects of each proposed study procedure
- Data tables that quantify ecological costs for a wide array of sampling activities are provided to facilitate model use

Impact Thresholds

Three impact threshold levels lead to four possible permitting decisions:

- Max of 10% of any population, assemblage, or habitat may be impacted by projects before MPA is compromised

Category	Threshold	Priority	Permit Status
De Minimis	Less than 2%	All research that passes the management review.	Approve
Negligible Impacts	Between 2% and 5%	Direct MPA related research or priority projects.	Approve
Impacts of Concern	Between 5% and 10%	Research that is critical for management.	Approve
Not Recommended	More than 10%	N/A	Deny or ask to modify or relocate.

Benefits of the Approach

- Quantitative, unbiased, and transparent
 - Enables identification of projects with highest impact
 - Allows Department to allocate resources to manage high-impact projects
- Allows for consistency in approving permits across staff changes and over time
- Enables applicants to know in advance impacts of their proposed research and to work with department to reduce them
- Should expedite the permitting process

Project Timeline

Past:

- Since June 2012, workgroup has met over 50 times

Current :

- Completed - Ecological Impact Assessment framework
- Early stages of developing data management system
- Present to Ocean Protection Council Science Advisory Meeting

Goals:

- Peer-reviewed manuscript (currently in preparation)
- Summer/Fall 2016- Implement assessment



Thank You Questions



Karina Nielsen

Romberg Tiburon Center for Environmental Studies, SF State

Brian Owens

California Department of Fish and Wildlife

**Scientific Research in Marine Protected Areas:
Development of a Novel Ecological Impact Assessment Framework
Executive Summary**

Prepared by the Research in Marine Protected Areas Work Group¹
for
The California Fish and Game Commission's Marine Resources Committee
June 20, 2016

Marine protected areas (MPAs) and MPA networks are important management tools that often have multiple goals and must balance potentially conflicting activities, one of which is scientific research. MPAs provide unique and important research opportunities because the associated ecosystems are subject to minimal human disturbance. Moreover, research is essential for evaluating MPA performance, and thus is an integral component of MPA management. However, scientific research may also impact the biota and habitats being studied. Hence, MPA managers must understand and weigh the ecological costs and benefits of proposed research activities to determine whether they can be permitted within MPA boundaries without compromising the effectiveness of the MPA or the integrity of an MPA network.

At the request of the California Department of Fish and Wildlife (Department), the Research in MPAs work group proposed a quantitative, ecologically-based decision framework to estimate the impacts of scientific research with the goal of facilitating scientific permitting decisions in California's newly established network of MPAs. The framework identifies the ecological consequences of a diversity of scientific research activities and provides an unbiased, transparent, and objective means to inform permitting decisions. This approach consists of four steps:

- 1) **Exclude projects that do not need to be conducted in MPAs** – This “MPA relevance” component considers whether or not an MPA is essential for meeting the objectives of the research project (e.g., does the project require a protected population or community or are non-MPA locations inappropriate for the study). The Department has been employing a similar criterion for reviewing permits since 2008.
- 2) **Quantify ecological impacts of the project** – This model-based element uses scientific principles to assess the proportionate impacts within an MPA to: a) the population of any targeted species, b) four major marine ecological assemblages (macrophytes, sessile invertebrates, mobile invertebrates, and fishes), and c) the physical habitat that supports MPA biota. The model quantitatively estimates the ecological impacts of scientific activities, including consideration of the vulnerability of targeted species, assemblages, and habitats, based on their recovery time and the ecological significance of affected biota.
- 3) **Quantify the cumulative impacts to species, assemblages, and habitats affected by the proposed project and all other on-going projects in the MPA** – This analysis allows each research project to be evaluated independently while also determining its contribution to the cumulative impacts of all research activities in the MPA.
- 4) **Compare the estimated cumulative impacts of all projects with policy-based acceptable impact thresholds for species, assemblages, and habitats** - This outcome will lead to decisions to accept, deny, or request modification and resubmittal of proposed projects.

¹ The Research in MPAs work group is comprised of staff from the Department of Fish and Wildlife, select members of the Ocean Protection Council's Science Advisory Team, with staff support from the Partnership for Interdisciplinary Studies of Coastal Oceans

Ecological Impacts

The core of the framework is a suite of quantitative models that estimate the ecological impacts for the many methods commonly used in scientific research projects. Ecological impact is expressed as a proportion of the population, assemblage, and habitat within an MPA that will be affected by the proposed research. The models take into account direct impacts (e.g., activities resulting in immediate mortality or habitat damage), as well as indirect impacts (e.g., activities that generate incidental or unintentional effects on other species, assemblages, or habitats). Impacts are calculated separately for individual species, ecological assemblages, and habitats. These proportionate impacts are then adjusted to account for vulnerability of the species, assemblage or habitat, based on their estimated time for recovery and the ecological significance of the affected biota.

Impact Thresholds

Determining an acceptable level of ecological impact is a policy decision that may vary among species, ecosystems and MPAs. As a starting point, we propose an overall (i.e. cumulative) impact threshold of 10% to any population, assemblage, or habitat, as a level beyond which the conservation value of an MPA may be compromised. The ecological impacts calculated in the framework are then compared with the impact threshold to determine if any individual project, or the cumulative impact of multiple projects, exceeds the acceptable threshold. The ecological impacts are compared to the acceptable impact thresholds, both individually and cumulatively for each targeted species, each of the four assemblages (macrophytes, sessile invertebrates, mobile invertebrates, and fishes), and the habitat. If any of these exceed the threshold, the approach outlined in the framework indicates that the proposed research should be revised to reduce its impact or permission to proceed should be denied.

While we propose an overall threshold of 10% impact, we also recommend that the amount of allowable impact should be linked to the anticipated benefits of the research. The Department should allow projects with small direct management value to consume only a small fraction of the available impact threshold, leaving room for future research envisioned to be of greater scientific value, or critical to informing MPA management. Moreover, we propose that no individual project should consume more than 1/5th of the available threshold for any population, assemblage, or habitat without the likelihood of generating equivalent benefits as determined by permitting staff.

Benefits of This Approach

The proposed approach identifies the ecological impacts of proposed scientific procedures and estimates their effects on species, communities, and habitats within each MPA and compares the individual and cumulative impacts of scientific projects against Department-determined threshold limits. This objective, transparent, and unbiased method for making decisions to permit scientific research in MPAs can be consistently applied across staff and over time and facilitate interactions between managers and researchers so that modifications to study designs can be made before or after permit submission. Applicants will benefit because this approach should expedite permitting decisions for most projects. It will also provide managers and researchers with information on the state of species, assemblages and habitats within an MPA targeted for study. An additional advantage of using this framework is that high-impact projects can be readily identified and staff resources can be focused on projects of greatest concern to achieving MPA conservation goals.