Kelp Restoration Management Plan
Science Advisory Committee Meeting #4
Thursday, August 15, 2024

Meeting 4 Notes Summary

Welcome & Meeting Overview

The fourth meeting of the Kelp Restoration Management Plan (KRMP) Science Advisory Committee (SAC) was held virtually on August 15, 2024 with nine KRMP SAC members, the KRMP Project Team (i.e., California Department of Fish & Wildlife (CDFW), Ocean Protection Council (OPC), and California Sea Grant (CASG)), and three Project Team supporting notetakers. Background materials and a participant agenda were shared in advance to help prepare the SAC for a productive meeting. CASG provided context and instructions to facilitate a break-out activity and group discussion focused on indicators for the social-ecological state status of kelp in California.

Meeting Objectives & Project Timeline

CASG gave an overview of where this meeting sits in the KRMP Science Needs Assessment timeline.

- **SAC Meeting #3:** For the Science Needs Assessment, a socio-ecological system was characterized by the combination of factors that influence the sociologic and ecologic variables that affect kelp forest ecosystems. When combined, the socio-ecological state can be assessed as a metric of the health, or status, of kelp forest ecosystems in California. Goals were determined for an ideal kelp state and agreed on an adapted social-ecological framework that incorporates elements of DAPSI(W)R(M), Ostrom's Social-Ecological Systems, and unique considerations identified by the SAC. Categories for organizing indicators include:
    - External and internal pressures
    - Landscape connectivity
    - Ecological states for kelp and associated communities
    - Social states pertaining to community, management, and governance.
    - **Indicator Development**: A comprehensive list of indicators was compiled to assess the health of the kelp resource. The SAC aimed to exhaustively list indicators, allowing refinement through a prioritization activity to be completed by SAC members as homework
- **SAC Meeting #4**: Will focus on understanding the ranking of indicators through break-out discussions.

- **SAC Meeting #5**: Will aim to identify measurable parameters for key indicators discussed in Meeting #4 and to review existing monitoring programs to address gaps.
- Future meetings will explore additional indicators related to specific management efforts (e.g., harvest, restoration).
- CASG stressed the need to keep the overall project timeline in mind, which may evolve based on future discussions.

Pressures & Landscape Connectivity Indicators

- **Indicator Redundancy**: The SAC recognized some redundancy among indicators. CASG clarified that multiple mentions could signify different phenomena, emphasizing thorough prioritization to ensure vital indicators are not overlooked.
- **Relationship Among Indicators**:
    - Discussion identified direct and indirect relationships between certain indicators (e.g., turbidity influences light availability; both affect grazer activity).
    - Consideration of temporal (year-to-year changes) and spatial (regional vs. localized effects) aspects is crucial for monitoring.
- **Geographic Considerations**: Recognizing California's extensive coastline, the SAC noted the potential need for regional indicators, exploring management strategies tailored to north, central, or south coast differences.

Suggested Indicators

- Emphasis on understanding which indicators are most relevant in specific locations, with turbidity and freshwater input deemed significant for regional monitoring.
- Some indicators (e.g., salinity, grazer community structure) were debated regarding their utility in monitoring kelp health, particularly their correlations with other measures.

Ecological State of Kelp & Kelp Community Indicators

- **Long-term Dynamics**: The SAC discussed variables related to long-term kelp canopy dynamics and current gaps in monitoring (e.g., the relationship between kelp canopy biomass and density).
- **Agreed-upon Indicators**:
    - Ocean temperature
    - Kelp canopy structure and abundance
    - Recovery metrics, with a focus on temporal scaling.
- **Kelp Recovery**: Acknowledgment that some level of recovery can be assessed through fecundity metrics, although uncertainty remains regarding the necessity of this as a core indicator.

Indicators for Kelp Monitoring

- The recruitment rate was emphasized as a critical ecological indicator for understanding kelp recovery.
- The SAC noted that many variables related to kelp health might be intertwined, complicating unaided assessments of individual indicators (e.g., fitness metrics measuring thermal tolerance).

Social State of Community, Management & Governance

- **Definition of Indicators**: The SAC clarified that indicators could be categorized as:
    1. System states (reflecting whether components are headed in a desirable direction).
    2. Pressures (indicating shifts that may affect future states).
    3. Values (showing stakeholder interest in a system).
    4. Causal studies of mechanisms at play.
- **Redundancy & Feasibility Issues**: Recognition that broad indicators (e.g., kelp forest community structure) may be impractical to measure without a localized, adaptive approach.
- The SAC discussed the necessity of viewing ecological indicators to inform social indicators (e.g., connecting kelp health with cultural significance for Tribes).

Whole Group Discussion & Closing

- The SAC explored bigger-picture observations from various groups regarding indicator prioritization and the causal relationships among them.
- There was an acknowledgment that social indicators may sometimes correlate better with ecological pressures than with conditions directly (e.g., the relationship between kelp abundance and social factors like market demand).
- **Regional Variability**: The significance of indicators can vary based on region or site. Indicators for ecological state could also serve social functions, necessitating a tiered priority approach to maintain the relevance of less prioritized indicators.
- The meeting closed with a focus on next steps: addressing redundancy, evaluating existing monitoring programs, and finalizing the list of indicators based on SAC discussions. The SAC will ultimately determine which indicators are critical and may need to be adapted based on specific contexts.