Bering Sea Ecosystem Indicators Workshop

Anchorage, Alaska

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Overview of Workshop

What? We seek advice from ***you*** (the scientific community and public) on priority marine ecosystem objectives, including stressors affecting both ecological and human environments.

How? Following some brief introductory presentations, a short panel session will be used to stimulate your suggestions on priorities, key indicators, and specific operational objectives to be considered by future management of the Bering Sea.

Outline of this Workshop

1. Description of Ecological Indicators project – Gordon
2. Overview of goals and definitions of an Ecosystem Approach to Management (EAM) – Gordon
3. Specific objectives for Ecosystem Approach to Fisheries Management (EAF) in the eastern Bering Sea – Diana
4. Panel discussion highlighting key eastern Bering Sea Influences
    a) Climate Stressors – Jim
    b) Ecological Processes – Pat
    c) Social/Economics – Gunnar
5. Feedback and questions from audience – *you!*

1. Description of Ecological Indicators Project

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Ecosystem Indicators Project

- **Submitted by:** North Pacific Marine Science Organization, PICES (Alex Bychkov and Skip McKinnell)
- **PIs:** Gordon Kruse (UAF), Glen Jamieson (DFO), Pat Livingston (AFSC), and Jim Overland (PMEL)
- **Collaborator:** Ian Perry (DFO)
- **Funded by:** NPRB ($100 K)
- **Title:** *Integration of Ecological Indicators for the North Pacific with emphasis on the Bering Sea: A Workshop Approach*
- **Response to NPRB 2005 RFP:** *Host a workshop to evaluate the utility of ecosystem indicators*

Project Components

1. **Involve the Bering Sea and international communities in development of a set of operational objectives for the southeast Bering Sea ecosystem**

   a) pre-Workshop – Marine Science in Alaska Symposium (January 2006)

   b) pre-Workshop – North Pacific Fishery Management Council Meeting (February 2006)

   c) Workshop – Seattle (June 1-3, 2006) – 40 invited participants

Project Components (continued)

2. Evaluate two ecosystem status reports with a goal to integrate the results and streamline the presentations:

   a) Ecosystem Considerations Chapter of SAFE

   b) PICES North Pacific Ecosystem Status Report

3. Investigate whole-system methodologies for indicators that monitor structural changes in the marine ecosystem

4. Identify next steps in validating indicator performance, improving the monitoring system to measure key missing indicators, and integration into predictive models

Project Products

1. Pre-workshop activities include drafting three working papers:
   a) development of operational objectives (Gordon)
   b) evaluate two ecosystem status reports (Pat)
   c) investigate whole-ecosystem approaches (Jim)
2. Workshop synthesis report by PIs plus PICES staff to be published in the *PICES Scientific Report Series*
3. Journal article based on our experience with this project

2. Overview of an Ecosystem Approach to Management (EAM)

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Terminology

Similar Terms:

- **Ecosystem Approach to Management (EAM)**
- **Ecosystem Approach to Fisheries Management (EAF)**
- **Ecosystem-based Fisheries Management (EBFM)**

But not:

- **Ecosystem management (EM) – *direct manipulation of habitat and populations* in space, structure and time with a view of optimizing long-term returns to humans**

EAF Definition

Ecosystem approach to fisheries (EAF) – strives to balance diverse societal objectives, by taking into account the knowledge and uncertainties of biotic, abiotic, and human components of ecosystems and their interactions and applying an integrated approach to fisheries within ecologically meaningful boundaries.

Adopted by FAO Technical Consultation on Ecosystem-based Fisheries Management.

IM Definition

Integrated management (IM) – comprehensive planning/regulation of human activities towards a complex set of interacting objectives

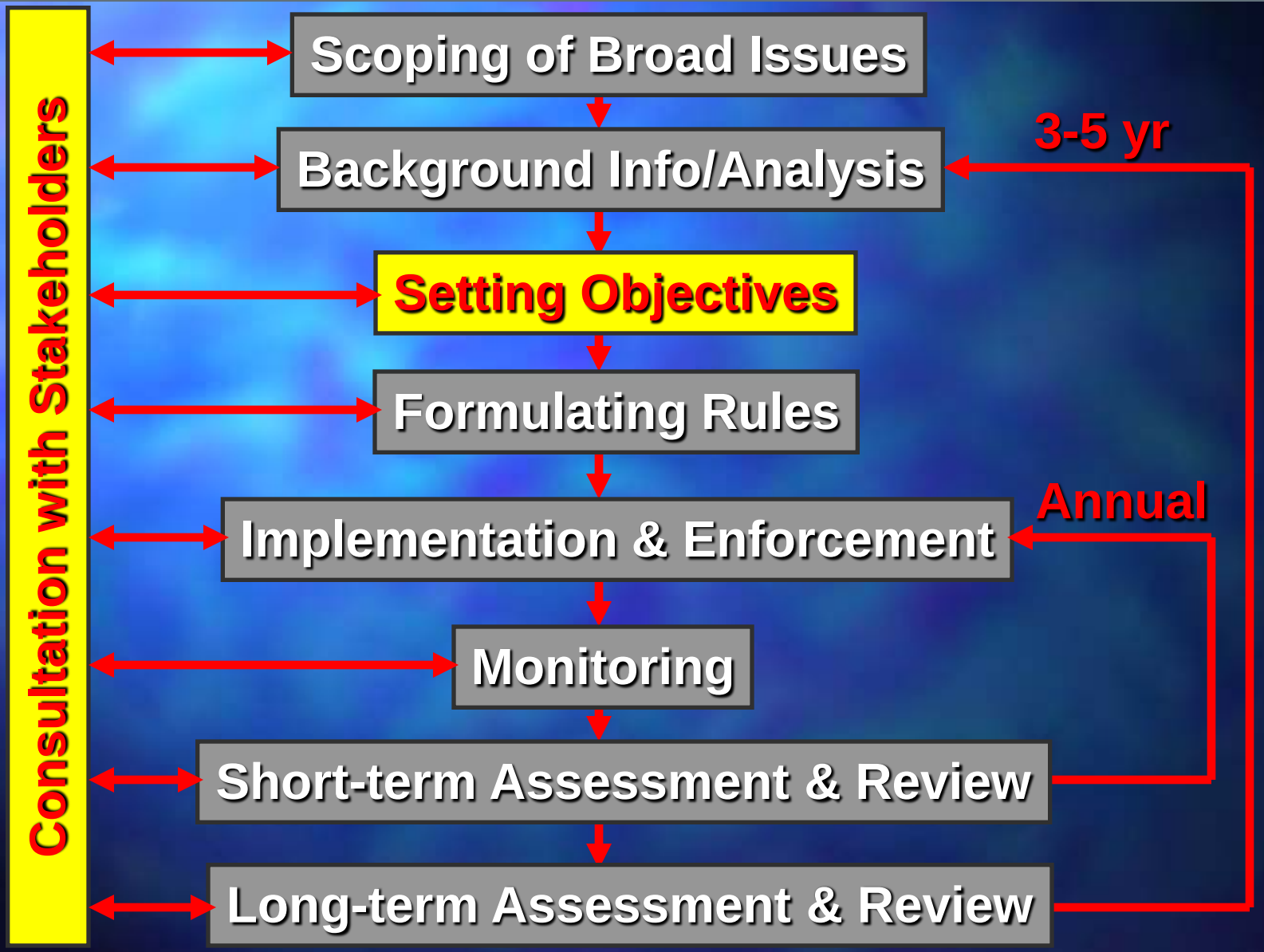
- **Aims at minimizing user conflicts while assuring long-term stability**
- **Uses a collaborative approach involving stakeholders**
- **Considers cumulative effects of human activities**

More Definitions

Ecosystem services – benefits that people receive from ecosystems

- **Provisioning Services – products obtained**: food, water, fuel, fiber, biochemicals, genetic resources
- **Regulating Services – benefits from regulation**: climate, disease, water purification
- **Cultural Services – non-material benefits**: spiritual, recreational, ecotourism, aesthetic, educational
- **Supporting Services – necessary for production of all other ecosystem services**: primary production, nutrient cycling, ecological value, sustaining conditions for life on earth

Developing an EBFM Plan (from ICES)



Setting Objectives

An Example

High-level Policy Goal:

- Maintain ecosystem structure and function

Broad Objective for Fishery:

- Maintain populations of predators and prey within ecologically viable levels

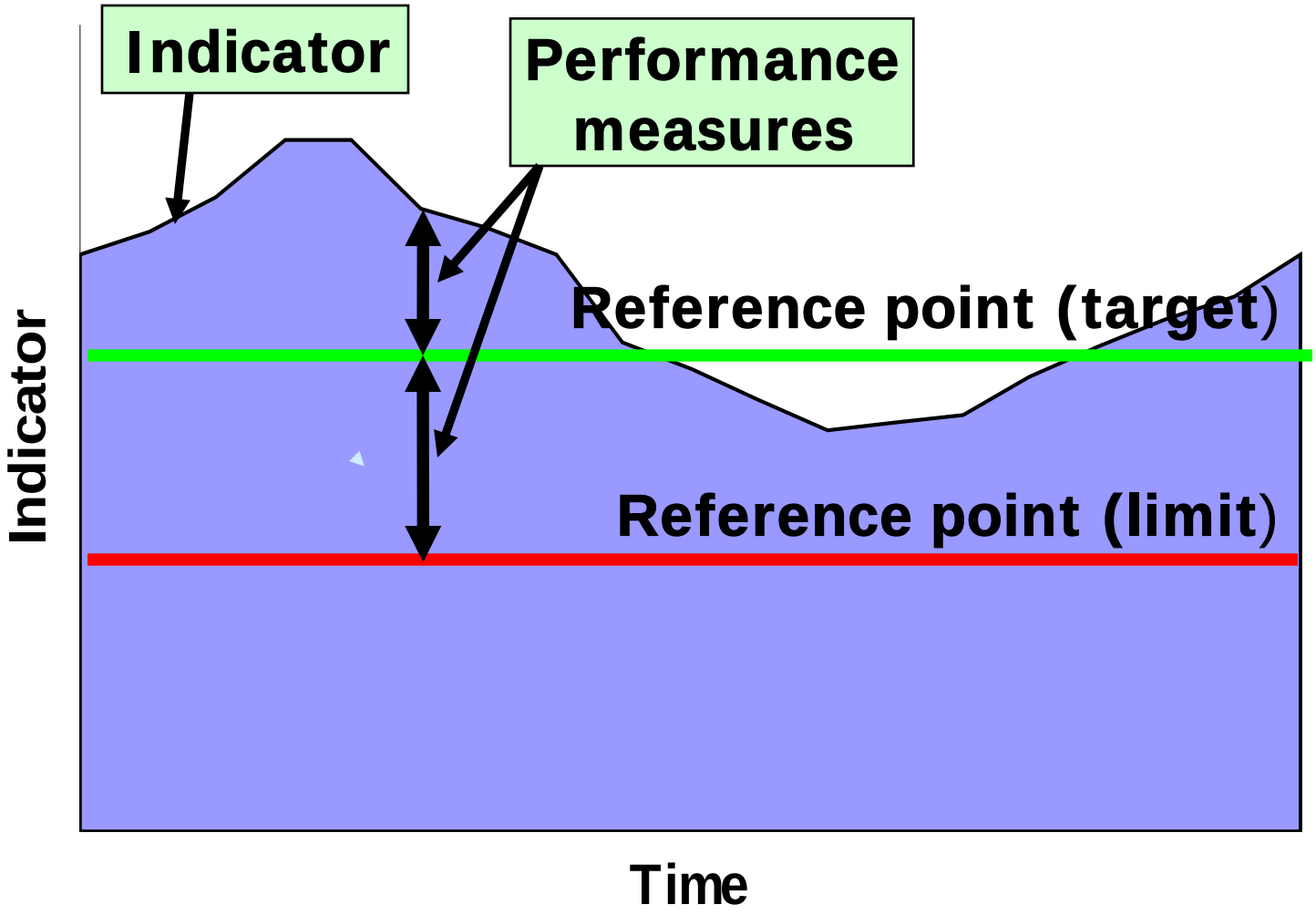
Operational Objectives:

- Reduce harvest rate of large predators by 25%
- Reduce harvest rate of forage fishes by 25%

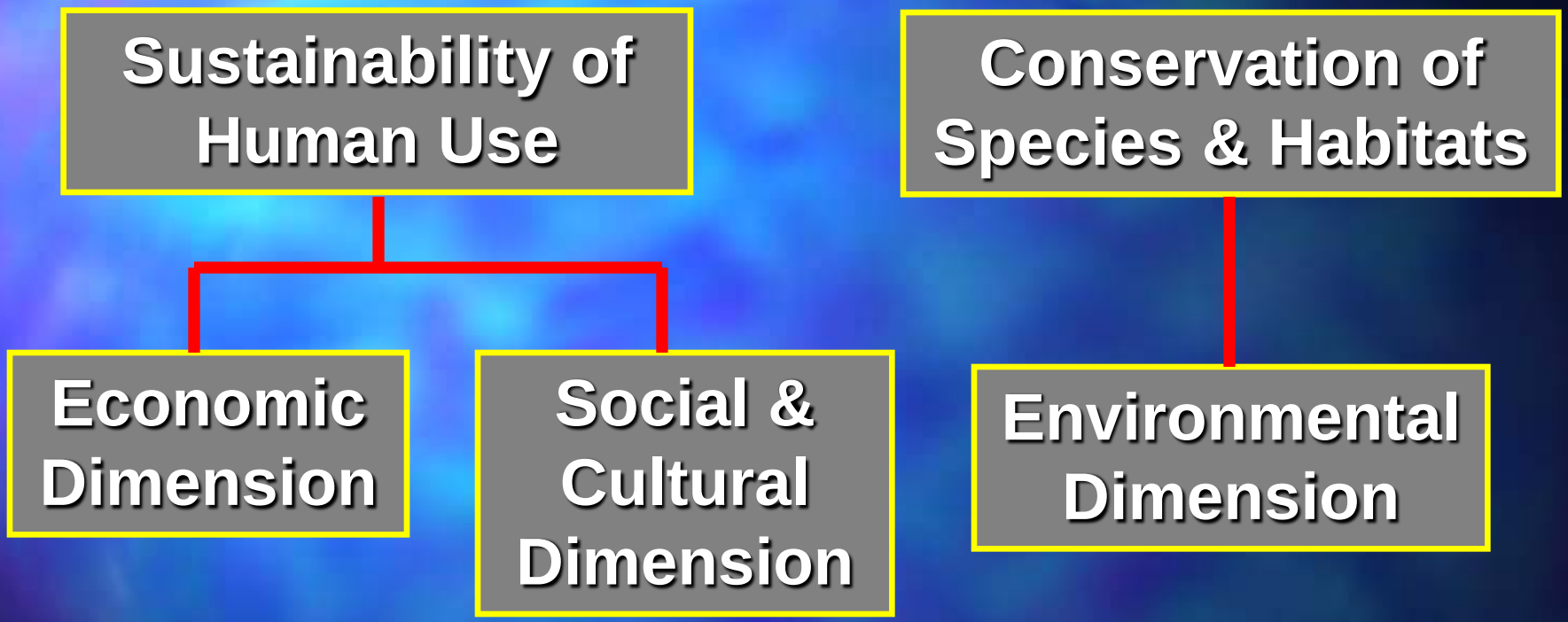
Indicators and Performance Measures:

- Trophic level of the catch
- Size spectrum of the catch

Indicators and Reference Points



Two Broad Overarching Goals (Canada)



Objectives for Conservation (Canada)

- Conserve Ecosystem Components (Biodiversity)
  - Maintain Communities
  - Maintain Species
  - Maintain Populations
- Conserve Component's Role (Productivity)
  - Maintain Primary Productivity
  - Maintain Trophic Structure
  - Maintain Population Generation Time
- Conserve Physical & Chemical Properties
  - Conserve Critical Landscape
  - Conserve Water Quality
  - Conserve Biota Quality

Potential NOAA High-level Goals Under Discussion for the U.S.

- Ensure sustainability of resources
- Conserve biodiversity
- Maintain opportunities for economic, social and cultural access to resources

“Unpacking” of Operational Objectives

- High-level policy goal
- Broad objectives for each fishery
- Operational objectives
- Indicators and performance measures

Lessons learned by Canada:

- Unpacking of conceptual objectives needs to occur as part of IM process
- Tendency to use available data to define objectives. Instead it is better to use objectives to guide data collection
- Tendency to focus on one set of objectives as it is difficult to get all relevant expertise together at once

Conclusions

- We seek your input into priorities, specific operational objectives, and key indicators
- We are ***not*** designing an EAF management plan
- Rather we refer to the selected management alternative from the Alaska Groundfish Fisheries Final Programmatic Supplemental Environmental Impacts Statement (PSEIS) to guide the discussions
- A short panel session will be used to stimulate suggestions on priorities, specific operational objectives, and key indicators to be considered by future management of the Bering Sea using the selected management alternative.