

**EBS Synthesis Scoping Meeting**  
**3 August 2010**  
**AFSC Traynor Room**

*Participants:* Sarah Gaichas, Phyllis Stabeno, Jeffrey Napp, Anne Hollowed, Thomas Wilderbuer, Patrick Ressler, Sue Moore, Jim Ianelli, Kerim Aydin, Nicholas Bond, Robert Foy, Edward Farley. *Unable to Attend:* Patricia Livingston, Robert Lauth. Minutes prepared by Lisa Guy.

*Why are we here?*

The Ecosystems Considerations Chapter (ECC) is currently used by the North Pacific Fishery Management Council's (NPFMC) Scientific and Statistical Committee (SSC) and Plan Teams as auxiliary information. The goal is to begin to use the ECC in the actual decision-making of setting Allowable Biological Catch (ABC) and Overfishing Limits (OFL; Figures 1 & 2).

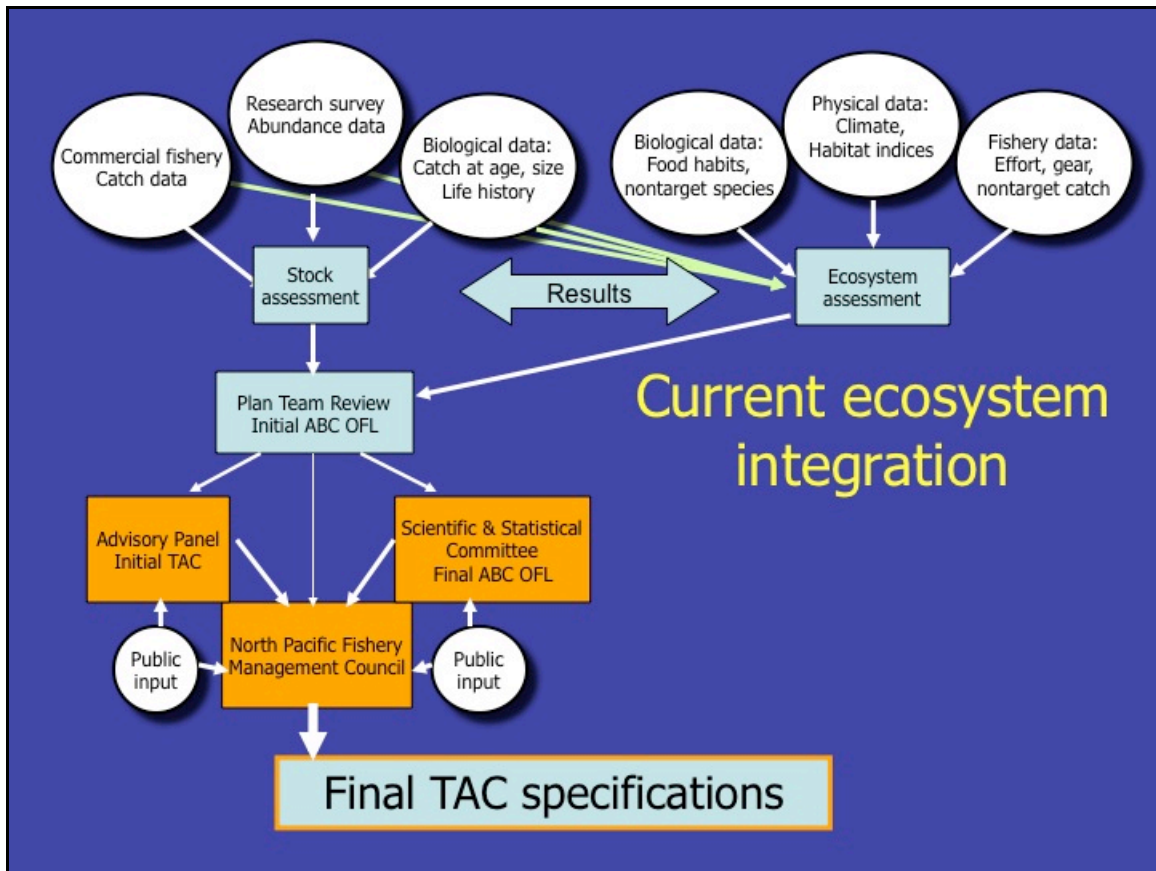


Figure 1. Current process used by fishery management to set Total Allowable Catch (TAC)

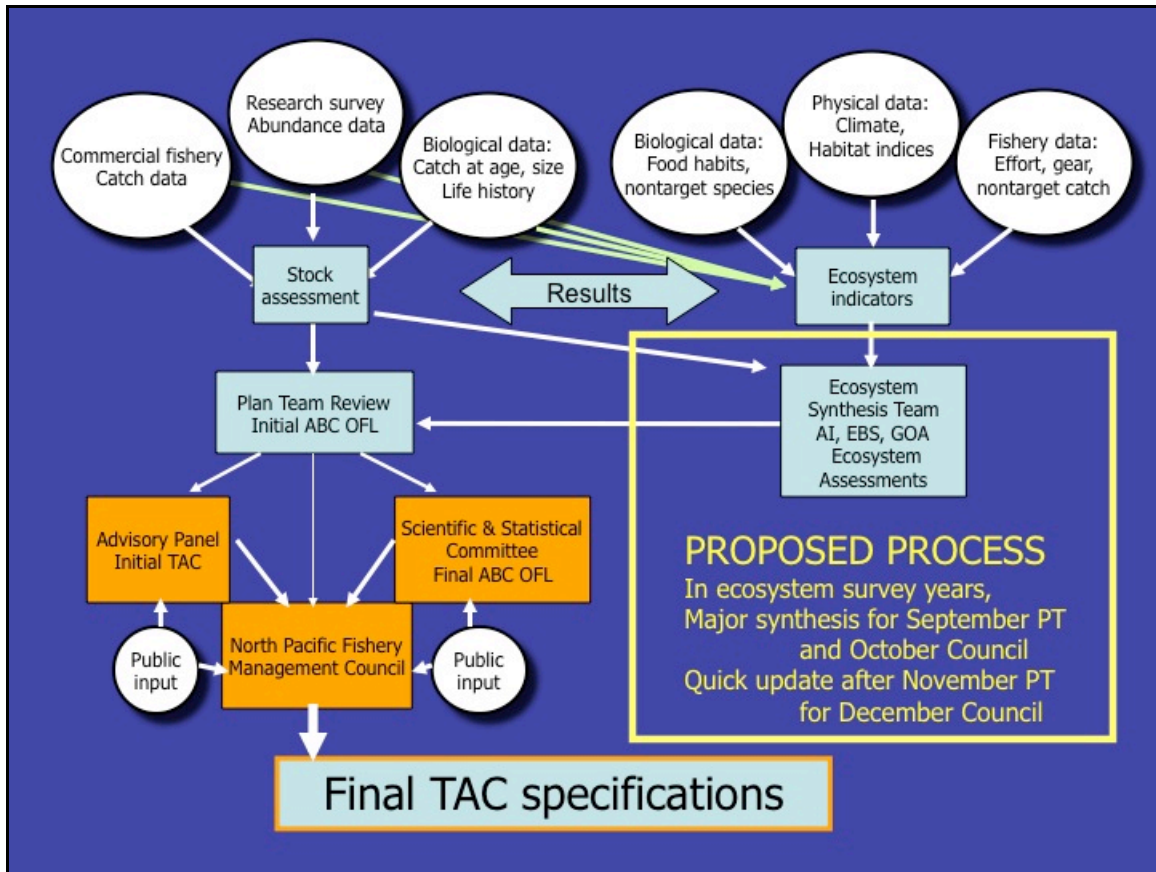


Figure 2. The proposed process for fishery management to set Total Allowable Catch. The goal for the revised process is to formally integrate synthetic ecosystem indicators into the current annual fishery management process.

In December 2009 the SSC made 3 recommendations to the authors of the ECC:

**1) Make information more directly useful in management decisions**

- Investigate lack of strong year classes in light of Ecosystem Considerations indices and data
- Promote more interaction between stock assessment and ecosystem authors to enable testing of ecosystem ideas in stock assessments

**2) Synthesize disparate fragments of data into interpretive reports**

- Reports should enhance understanding of processes that are of management importance or have predictive power
- Exclude measurable, yet unimportant time series

**3) Importance of the synthesized reports**

- Help assessment authors put their assessments in an ecosystem context
- Increase future research effort by highlighting importance of synthetic ecosystem indicators to fisheries management

NOAA's North Pacific Climate Regimes and Ecosystem Productivity program (NPCREP) has been contributing data, time series, and interpretation to the Chapter since

the beginning of the program. NPCREP, as part of its mission, plans to be involved in providing synthesis, in addition to data and interpretation.

### *What are we working towards?*

The goal this year is to assemble a Synthesis Team and conduct a workshop in October to prepare an initial synthesis for the eastern Bering Sea that will be ready for the November Plan Team meeting. Ideally, the workshop will become an annual event with the goal to provide a more synthetic statement of ecosystem status by linking individual trends. This workshop will take place during the first half of October each year after field seasons have ended and before the November Plan Team meeting. It is viewed as an iterative learning process whereby each year the Synthesis Team will strive to increase the direct inclusion of ecosystem information into the management process through the ECC. The Synthesis Team will select the top 5-10 ecosystem indicators for the eastern Bering Sea. The group has also suggested that a grand synthesis (ecosystem indicator culling) doesn't have to happen every year; the same set of indicators could be annually updated, and the whole set revisited on a 5-year rotation or as needed. We would also rotate effort/focus among the 4 large marine ecosystems for which the AFSC is responsible in alternate years.

The format of the Ecosystems Considerations Chapter could be modeled after the Northeast Fisheries Science Center's Ecosystem Status Report Card (<http://www.nefsc.noaa.gov/publications/crd/crd0911/>) and revised as outlined below. The Synthesis Team will contribute to the Executive Summary and focus primarily on the Ecosystem Assessment section.

#### **1. Executive Summary**

- Glossy report card-style format
- 3-5 page "thoughtful synthesis"

#### **2. Ecosystem Assessment**

- ~20 page synthesis
- Combined ecological/economic synthesis to meet Ecosystem-Based Fishery Management (EBFM) and SSC goals

#### **3. Ecosystem Status Indicators**

#### **4. Ecosystem-Based Management Indices**

- Keep individual contributions relatively unchanged
- Encourage standard format

The envisioned synthesis will take advantage of both in-house (NOAA) expertise as well as the expertise of other scientists working in Alaskan waters, such as members of the Bering Sea Integrated Ecosystem Research Project (BSIERP) and Bering Ecosystem Study (BEST) program. It will focus on status, trends, and interactions among important ecosystem components. The synthesis needs to consider both short-term phenomena (annual, tactical decisions) and long-term trends or regimes (quasi-decadal, strategic decisions). The charge to the group is synthesis, but also action advisories.

This first year, the Team needs to identify (i.e., cull) key time series from the multitude of available data and define key thresholds for each indicator. A two-step process will be used. The first workshop on September 29<sup>th</sup>, 2010 will select the 5 – 10 best ecosystem indicators for the eastern Bering Sea fisheries and begin to propose initial threshold levels. The second workshop in October will conduct and write the synthesis for the ECC Bering Sea Ecosystem Assessment (section 2 of the document).

*How to frame fishery management relevant questions for ecosystem synthesis*

The group discussed framing the synthesis around clear fishery management objectives to distinguish this synthesis from more general ones for the North Pacific that are already in progress or completed. The two potential levels of management questions are: the effects of fishing on individual species, and the effects of fishing at the ecosystem level. “How much catch?” is a question applied to individual species, but ecosystem synthesis could help to recommend the distribution of catch among species that sustain both fisheries and non-target apex predators. For example, is there sufficient forage for apex predators and groundfish sustainability? How much of each forage species needs to stay in the system? Other ecosystem-level questions that our synthesis could address include effects of regime shifts, system reorganization, how to manage spatially, and how to manage to maintain stock or community structure.

The Synthesis must also devote attention to protected species, identify critical factors necessary to maintain population levels, and help other species recover from depletion. Individual stock assessment decisions and systemic decisions on whether there is enough forage for the mammals, birds, etc. must be addressed. A forecast scenario is needed. For instance, forecast scenarios usually use the same parameters every year but may use different parameters if going into a regime shift.

*What are some of the critical gaps in the current Chapter?*

- Marine mammals – new results on the distribution and ecology of whales, porpoises, and ice seals have yet to be incorporated into the report
- Benthic production data including biomass and production of epibenthos and infauna -- biomass and production of commercial crabs could potentially be used as an indicator of benthic production
- Growth and physiological condition of key species -- whole body energy content could be used for early life history stages where the individual can be sacrificed (e.g., age-0 pollock, juvenile Chinook salmon)
- Indicators of commercial species from the northern Bering Sea (e.g. salmon)
- Salinity – may play a larger role than previously thought, need regional indices
- Climate variability – has more to it than we implied earlier, not just how much ice in the winter but more subtle effect of summer and early fall weather
- Fall conditions – new results on whole body content and recruitment indicate that conditions during late summer and early fall may be important to the survival of fishes. If true, we need new indicators to describe the physical and biological conditions that exist in fall

- Seabirds and disease – prevalence of disease in seabirds may indicate food stress from a change in the food production or trophic coupling of seabirds to lower trophic levels
- Seasonal distributions of commercial species -- environmental factors that change the distribution pattern of commercial species have the potential to impact the economics of fishing and bycatch (amount and species)
- Habitat suitability – definition and monitoring of suitable habitat for key species

*How will we measure our success?*

There are multiple ways to measure the success of the synthesis effort. Among them are:

- Ability to develop 5-10 indicators appropriate to the EBS
- Ability to identify important processes from the synthesis
- Number of times information is used in the Plan Team Reports
- Number of successful precautionary warnings
- Accuracy of predictions and validation

The Team will conduct a self-evaluation each year at the end of the management cycle. The Team will regularly report the strengths and weaknesses of the ecosystem input provided during the past year to the SSC, as well as ways to continually improve each successive iteration of the synthesis.

*The Proposed Process for the 2010 Ecosystems Considerations Chapter*

The timetable is set by the NPFMC process and the ECC must be completed by 25 October 2010 to be included in this year's Council deliberations. Participants at the scoping workshop recommended dividing the process into a series of three workshops, each with a specific set of goals or tasks (Table 1). The meetings will be open to all interested scientists, but the Synthesis Team is responsible for meeting the objectives and writing and reviewing the synthesis.

*Table 1. 2010 Timetable*

	Date/time	Purpose/Objectives	Participants
Workshop 1	1 day; Sept. 29, 2010	Cull indicators and agree to a small set (5 – 10)	Synthesis Team, collaborating institutions
Workshop 2	1 day; mid Oct, 2010	Interpret key times series and determine ecosystem status. Begin writing interpretation sections.	Synthesis Team, collaborating institutions
Workshop 3	½ day, immediately following	Complete writing interpretation section and draft executive summary of synthesis.	Synthesis Team
Evaluation	Feb 2011	Review successes and shortcomings of 2010 ECC, possibly at SSC meeting	Lead Authors
Further Development	Feb 2011	Meet with the assessment chapter authors to determine assessment indicators	Synthesis Team

\*Final draft report is due 25 October for internal review

The workshop conveners met the day after the scoping workshop and considered the optimal size for the Team and the many names mentioned for potential members. A short list of potential core members was created and a Doodle Poll went to those scientists to determine their availability for the two workshops. Note that the intention is for the initial workshops to be open to all interested scientists. Certain other scientists were identified as critical reviewers (the ‘validation set’) who would receive the finished product.

Although the Team will largely operate through consensus, alternative explanations and opinions will be included. Existence of alternative opinions is also a measure of the degree of uncertainty of the conclusions. Statements about relationships will be made in order of agreement and may include a scale of certainty. The report will distinguish lack of understanding from lack of information whenever necessary. In the first year, the whole document will be internally reviewed by the Team and the SSC.

The largest challenge in the first year will be to narrow the number of indicators to a short list of less than 10. This is the objective of workshop #1. This goal and how the workshop will operate will be clearly explained to the Team members before the first workshop. In addition, Team members will receive a list of potential indicators in advance. Indicators will be separated into groups for ecosystem-wide and stock assessment purposes. A strong directive of how to proceed during the workshop will be provided to keep the meeting on track. An example of a survey used successfully for this purpose (for PICES) was offered by Anne Hollowed.

*Indicator selection process*

The workshop conveners will generate a comprehensive list of possible indicators to be evaluated. This list will be given to the Synthesis Team two weeks prior to the first meeting for review. At the beginning of the first meeting the Team will be asked to rank potential indicators in order of importance. The Team will then work together to select the top 5-10 indicators by first culling those indicators determined to be least important, and progressively working toward the target number.

The indicators can be from observations, models, or combinations of multiple sources. When evaluating potential indicators, Team members will be asked to consider:

- 1) What management questions do we wish to answer?
- 2) What are the indicators telling us?
- 3) What is the mechanism behind the indicator and how does it relate to management objectives?

Once an indicator is “removed” from consideration, it will not be revisited until the following year. Depending upon time, the first workshop may also identify critical indicators we are missing and attempt to form synthetic indices from existing indicators. Combining existing indicators into synthetic indices will be encouraged at this workshop.

The second workshop will include a review of the chosen indicators and their past and present status. There will be time for a synthetic discussion and for an initial drafting of the text for the report. The writing will be done in small groups and reviewed by all participants. The ECC results will be orally presented at the December meeting of the SSC. We will request a review of the process and the product at the February SSC meeting.

The final product (ECC) will undergo internal (NOAA) review, Plan Team review in November, and SSC review at the December Council meeting.

The small group of ecosystem-wide indicators needed for the synthesis chapter will be supplemented by another list of indicators relevant to individual species stock assessments. A separate workshop for interacting with the single species assessment authors would ideally be conducted at the beginning of the next calendar year (e.g. February).