

Development of a Bering Sea Fishery Ecosystem Plan (FEP)

Public input at the Anchorage public hearing
October 9, 2014

Initial questions of clarification:

FEP Boundaries. The Ecosystem Committee had a preliminary discussion about boundaries in February, but will probably revisit the discussion as development continues. The Committee considered biogeographical regions identified in the BEST (Bering Ecosystem Study)-BSIERP (Bering Sea Integrated Ecosystem Research Program), but as with the Aleutian Islands FEP, the FEP would need to take fishery management boundaries into account as well. Doug Demaster noted that large marine ecosystem areas (LMEs) have now been identified specifically for the Aleutian Islands, the eastern Bering Sea, the western Bering Sea, and the Chukchi. But there is a lot of connectivity that we need to think about between the eastern and western Bering Sea, and we will need to think about how we want to deal with this.

BEST-BSIERP. A question was asked about the state of progress with taking the project information, and turning it into management advice. Doug Demaster noted that the BEST-BSIERP project was a \$60 million program funded jointly by the National Science Foundation, the North Pacific Research Board, NOAA, and the Bureau of Ocean Energy Management. It has resulted in a much better understanding of bottom-up forcing, and a forecast through climate change filters, through 2035. They are using global models and scaled down regional models to develop these longer term forecasts, which are resulting in at least a qualitative discussion of winners and losers, if not a quantitative discussion, for the next 25 years. This information is being used in some of our Bering Sea stock assessments. For pollock, Jim Ianelli uses a model of pollock recruitment that includes temperature signals, and forecasts forward. There are also flatfish models that link temperature and recruitment. He noted that the AFSC would like to work in other factors as well. For example, the Bering Sea (BS) has an annual monitoring tool (the surveys), and they get a reasonable understanding of physics and chemistry through moorings in place. But they don't have a monitoring of whether pH changes, or when. No idea of the mechanisms that could result from that, and how to incorporate within a forecast. This is an example of a blind spot.

AFSC's FEAST model. There was a question about Forage and Euphausiid Abundance in Space and Time (FEAST) model. It is understood that although the model includes a food web element, it is akin to an end-to-end ecosystem model, driven by ROMS input, and spatially and temporally specific. The model could be parametrized with shipping, energy development activities. Doug Demaster noted that the FEAST is one of the models that links lower trophic to upper trophic levels. The trouble with most recent models has been that they didn't include the middle trophic level functional response; they had lower trophic models up to zooplankton, but there was no way to link with lots of single species models for commercial species. Once FEAST provides that link, the model can test different drivers, and support management strategy evaluations to see likely impacts of different climate scenarios, and what things are robust to those types of changes. Steve Marx noted that the Pacific Council dovetailed their FEP with the Atlantis model, which has a similar function to FEAST for the Bering Sea. It was also noted that FEAST may not yet be completely operational.

Donna Parker, Arctic Storm

- I find this issue, the development of a Bering Sea FEP, both fascinating and frightening.
- I am concerned that the development of the FEP may unfold in a frightening way. To me, this would mean the development of an FEP that is action-forcing, and would overshadow the Council's FMPs; and also that developing the FEP would take up a great deal of resources.
- The discussion of developing the FEP seems to me very reminiscent of what the Council did with developing the PSEIS years ago. For example, when the PSEIS was done, the Council used the ecosystem-based management recommendations given by National Academy of Sciences as guidance, as has been discussed in this process.
- A more comforting view is to envision the FEP as becoming part of the Council library, along with documents such as the Groundfish PSEIS, and the Ecosystem SAFE report. The Ecosystem Committee, or other Council body could be in charge, and utilize the FEP process to engage on non-fishery factors (shipping, oil, pollution, etc).
- So my question is, do I need to be frightened here? Is my vision of how the FEP might materialize far flung, or close to what is unfolding?

Doug Demaster, Director, Alaska Fisheries Science Center

- I agree that development of a Bering Sea FEP is both fascinating and scary. It opens up lots of research opportunities. And in this fiscal environment, we have to be careful about what we do.
- Most of what we learned about the BS has come from long-term monitoring, cruises, surveys. We get lots of information every year from the bottom trawl survey. Then we do process studies to complement that, 30-90 day studies. We look at ways to figure out certain things – e.g., how zooplankton overwintering affects pollock (a FOCI project).
- Also we have access to lots of information on commercial species through observer catch data, and stomach contents. When we get to non-commercial species, we are not doing as well with information. For example, seabirds and marine mammals. Fur seals are easy and cheap to count. North Pacific right whales - there are probably only 30-50 left, and we don't know where they are. There are no surveys for fin whales, sei whales. We know nothing about beaked whales. For seabirds, we have pretty good data because they go to a rookery where we can count them. For most of the non-target species that are not amenable to trawl surveys, we know very little. Forage fish are especially difficult. These are the shortcomings in research that we are likely to have over the next decade.
- Ship time issues are going to be difficult, we will need to look for partnerships. If we really want to do EBFM, we will need more days-at-sea to cover the eastern BS. And then, we will need to work with climate partners.
- One of my primary concerns is that the environment will change, due to ocean acidification or climate, and our efforts to understand recruitment will be changed and we won't know recruitment relationships for our managed species.
- But in terms of many of the products that you are used to talking about, I would expect that we will continue to have those over the next decade. For example, the bottom trawl surveys, slope surveys, acoustic surveys, etc. will likely continue.
- So while there are some big holes, we have a pretty good start. We understand the BS as well as probably any marine ecosystem in the world is understood. Even with those shortcomings.
- Regarding the availability of AFSC scientists to work on this. We have lost 60 people over the last 3 years, and we likely won't get them back – we had to lose staff in order to do continue to do research. So we need to look at partner opportunities. Unless we can partner with the universities, with ADFG, other fed agencies, other state agencies, there will be gaps. We aren't in a position to add much more in terms of staff, unless we can partner with others. So I am hoping that if people ask for more research, they will come up with a boat, with staff, and will work with us in analyzing data.

Discussion:

- Stefanie Moreland: Of the knowledge gaps that you mentioned, how many are relevant to the way we do business in fisheries? to fishery assessment? Given that this is a fishery ecosystem plan.
- Doug: ocean acidification will probably become relevant, and forage fish. Not sure the upper trophic level gaps will, but the middle trophic level ones will. We need to be able to figure out the winners and losers from climate change and acidification. For example, from acidification, we think that pollock will be a winner, blue and red king crab will be losers. But we need studies to be able to get those data.
- Stefanie: as relates to fishery management, we are on a shorter timeline for determining catch levels. So the 30 year projection not going to affect us?
- Doug: true, but they could affect us in a decade.
- John Henderschedt: where are those thresholds? Where does that knowledge become a trigger for direct consideration in the stock assessment?

John Henderschedt, Council member

- One of primary questions for me, regarding deciding on a path forward, is whether the FEP is more a noun or a verb. The “library” model is much known. But an FEP could also be that process that provides structure to all the research that is going on, and which starts to identify new sources of uncertainty, reduces some and identifies others, and breaks a pathway from broad research efforts to our fishery management. It could be a way to go beyond, for example, treatment of uncertainty, and attempts to achieve resilience on single species level, to a much broader scale. That is more of a process, thinking of the FEP as a verb.

Julie Raymond-Yakoubian, social science director for Kawerak

- Kawerak supports development of FEP, hope the Council will continue to move forward
- FEP should be developed in close collaboration with Bering Sea communities, subsistence users and other stakeholders
- Rose Fosdick provided comments in Nome, and was asked several questions by Council members. Responses are provided here.
- Mr Cross and Mr Henderschedt were interested in new species in the region, and observed changes. Kawerak has documented such changes through our Social Science Program, and while we don't maintain a catalogue per se, this information is included in various reports and other products at our website (www.kawerak.org/socialsci.html). There are also various environmental observation programs in the Bering Strait region, one example is the LEO network (<http://www.anthc.org/chs/ces/climate/lew/about.cfm>) which collects community observations about climate change.
- Mr Tweit asked how an FEP could benefit Kawerak. We think could be of definite benefit to us and to tribes in several ways.
 - For example, others have mentioned that the Council's processes for management decisions aren't always clear to public. The FEP is an opportunity to lay out the broad view of Council responsibilities, abilities and actions to help clarify exactly what the Council does, where, why, and how.
 - FEP is also an opportunity to synthesize the existing literature and research on the BS region, value to decisionmakers, public and researchers. Will also help identify and prioritize gaps in knowledge and help refine research questions for the future. Synthesis most effective with the inclusion of traditional knowledge. Kawerak would be interested in being part of that process, and could provide recommendations, based on a synthesis that includes traditional knowledge, about gaps and needs.

- Another benefit. Indigenous communities are impacted by BS fisheries, sometimes negatively. FEP is an opportunity to address impacts, and find ways to mitigate or avoid them. This will be accomplished through direct collaboration with communities. We believe it should be a goal of the FEP to ensure that Council-managed fisheries do not negatively impact subsistence harvests or subsistence communities.
- Mr Tweit also asked who the Council should seek input from about the FEP. Kawerak hopes to continue to be involved, along with other Alaska Native organizations such as AVCP and ICC. But while Kawerak is a tribal consortium, we shouldn't be the sole source of information – we also suggest Council outreach to BS communities to see which have an interest in participating.
- Mr Tweit also mentioned the potential inclusion of “values” in FEP. We believe an important goal of the FEP could be to illuminate and discuss the different values that different groups of people place on the BS ecosystem and all its various components. Values between different groups can vary greatly and can often be in conflict. Kawerak has done work that highlights may ways the BS is valued by the tribal members in our communities. We hope that the FEP would discuss the various values and value systems of the different groups of people that utilize the BS, and make explicit how the Council will balance those different values.
- Other comments regarding traditional knowledge. Our region is full of expert traditional knowledge holders, those who have spent their lives monitoring and observing the marine environment, the relationships between species, between humans and the marine environment, humans and other animals, and the connections among these components. Their knowledge extends beyond their lifetimes, and includes generations of accumulated observations, experimentation, and operations in the marine environment.
- Kawerak strongly believes that traditional knowledge from indigenous communities of BS should be incorporated in the FEP, along with information about subsistence harvests and the needs of communities. The FEP should also include explicit mechanisms and procedures for incorporation of traditional knowledge into Council decisionmaking, to guide the Council and also hold them accountable. A primary objective/tangible action of the FEP should be to develop these process for including traditional knowledge and Council accountability.
- The Council has a big challenge as it moves forward, including incorporating traditional knowledge into the FEP and Council decisionmaking processes. But also great opportunity for Council to be a leader. To be successful, it will require extensive input and participation from tribes and tribal organizations. If you take on this challenge, Kawerak is willing to work with you.

Steve Marx, Pew Charitable Trusts

- I'd like to change tracks a little from a discussion of the science that needs to go into what we are researching, and what climate change will mean for fisheries.
- I think the FEP should be about the concept of tradeoffs. These are inherent in ecosystem-based management, embodied in the concept of optimum yield, which is the ultimate goal of MSA. I think about an FEP through the lens of identifying and assessing ecological, social, and economic tradeoffs.
- Whether I'm a bird enthusiast, or a subsistence user in western Alaska, or a Seldovia once-in-a-while crab pot guy, I have a role in Council process, and I should know how my input is going to be considered by the Council. A benefit that the FEP can provide is to make it explicit and transparent how my concern is going to be weighed and assessed in the Council process. It is a requirement of MSA to think about ecological, social, and economic factors; the FEP is a tool and a forum to meet that mandate, that social contract element.

Discussion:

- Glenn Merrill: How do you weigh all those different tradeoff factors? The idea of trying to turn the FEP into a verb, which requires an action, that we then have to try to do within constraints –

authorities, resources, time, the existing Council process that is trying to satisfy disparate interests. All this has to be done in a way that can be transparent and reproducible, so people can understand what the Council is doing. I don't know how we are able to do all of that. At the moment, we muddle along with current process and within our constraints. How do we struggle with all of the information we have so people can reasonably make those tradeoffs? One can make the argument that we do ecosystem-based management right now, as imperfect as it is.

- Steve Marx: I think it's clear that we are doing EBM now. But there still may be efficiencies to be had through an FEP.

Merrick Burden, Marine Conservation Alliance

- When we are thinking about FEP development, I don't think we are thinking about reinventing the wheel. So agree that we are doing aspects of ecosystem-based management right now. But how do we do it better.
- Tradeoffs have been discussed here already. Another important concept is resiliency in the system. In one definition, resiliency is created through functional redundancy. So if we are looking at the BS ecosystem, we should focus our attention on points where there is no or little redundancy. We need to go through steps to identify those important points.
- Another concept is adaptive management. Change is a constant in fisheries, and we are especially interested in how to adapt to climate change. Are there other things we should do to prepare ourselves to respond change as it happens? These are things the FEP can help us think through.

Discussion:

- Doug Demaster: Another fact people should have. Of the 54 stock assessments a year that are done for the Council, none of those are anything but single species management. Of the other 44 assessments that are done in the US, only one includes something other than single species. It is amazing to me that all of our fishery management in Federal waters is dependent on single species biomass estimates, catch, and in some cases, estimates of productivity and recruitment.
- John Henderschedt: worth considering that it may not be good management to do single species stock assessments of all of those species every year. Those assessments cost a lot of money. So to the extent that an FEP lends itself towards management strategy evaluations, and other ways of evaluating the impacts of management, it may be an aid to better allocation of resources.
- Stefanie Moreland: I appreciate the discussion on single species management. Being familiar with some of the approaches in other areas or regions, we do have a lot of aspects in our single species assessments that are cross cutting across species. So our single species is much more responsive to ecosystem change than in other regions. This region has always valued that, because people recognize the value that a healthy fish future is based on a healthy ecosystem. My initial comment was about how this FEP ties back to fisheries. But we also need to consider relationships to other non-fishing activities. For example, a new waterways fisheries arctic committee has been created to look at the relationships between subsistence fisheries and shipping impacts. Perhaps there is not really capacity to add those issues to this FEP initiative.
- John: Appreciate Stefanie Moreland's comment regarding regional differences. Having area-based FMPs is already a huge step towards an FEP construct, relative to most regions that have species-specific FMPs, and consequently different plan teams dealing with species individually. So there are certain aspects of the cross cutting way that we manage that are ecosystem-based management.
- Glenn: also the 2 million mt limit.
- Doug: We have the 2 million mt cap, a ban on forage fish, bycatch mitigation, stopping rules for catch of target and nontarget species. In terms of world fisheries, those measures are remarkable. From my perspective, things are working, and we have a large fishery that has been sustainable for 30 years. But my concern is with climate change, and what might happen in the future. We

know some relationships with temperature right now, but can't predict winners and losers. We may predict some declines, but at some point we may have to back off fishing, and change gear types, in order to respond to population changes. Things we may need to think of.

Jim Ayers, Ecosystem Committee member

- Listening to the conversation today, and the discussion of fears, I am also thinking back to Seattle comments.
- First, thinking about what we are doing right now, we are on a continuum, moving towards ecosystem-based management, and bringing the technology of today to bear.
- Second, we are not at point zero on that continuum, as we have made a lot of progress in the last 10 years in this discussion. Understand that is part of the fear factor. I believe we should start with what we have, which is an ecological approach to think about what we are doing with single species. But also think we could broaden our ecological thinking as well.
- So third aspect. I am not advocating for the FEP to be a decision-making thing. No one is suggesting the FEP becomes the dominant thing for decisions, or that the FMP process be circumvented.
- Hopefully, people with fear can support that we are not at point zero, and that we are on a continuum.
- Another big discussion item in Seattle was that we need more resources for the AFSC. We also need to think about doing a better job with what we have. Start to collaborate better in order to access more resources. There are opportunities for private funds, ways to gather resources; we need to explore those.

Bill Tweit, Council member

- I am speaking here for myself, not for the Council. Here are the things that worry me. Like Doug Demaster, I am amazed at what we have been able to pull together in terms of sustainable fishery management. But there are big challenges out there, which we are not equipped to handle. For example, climate change, our ability to recognize when it is happening, and to create a plan ahead of time.
- I am also struggling with the clash between subsistence/coastal cultures, and industrial fisheries cultures. The FEP could be a tool that puts the value systems out there, and gives us a place to talk about that. We need to examine tradeoffs between different management strategies, and from perspectives of those two disparate cultures, and I am interested in seeing if an FEP can help with that. In building that examination, I think it will be important to include the role of collecting traditional knowledge, which I think will be fundamental to understanding climate change, and understanding long term ecosystem change. We need to start on that task (the AFSC might have done so, but Council needs to).
- Then, there are rapidly changing dynamics in our top predators – Steller sea lions, fur seals, return of the great whales. The FEP could be a tool for the Council to understand what other changes may accompany these, and a tool to look at management strategies and effects on those populations. At best, we have different scientific beliefs and value systems that are coexisting uneasily. If there is a tool to look at those issues and keep them out of ESA arena, it is worth thinking about.
- Our present tool box isn't adequate to deal with these kinds of challenges. An FEP might allow us to make progress on some of those issues. I look forward to how much progress we might make on some of those with an FEP.

Persons in attendance included:

Jim Ayers, Ecosystem Committee member
Kris Balliet, Sustainable Fisheries Partnership
Merrick Burden, Marine Conservation Alliance
Dorothy Childers, Alaska Marine Conservation Council
Marina Cucuzza, student at Alaska Pacific University
Raychelle Daniel, Pew Charitable Trusts
Doug Demaster, AFSC/Ecosystem Committee member
Anne Marie Eich, NMFS Alaska Region
Austin Estabrooks At-sea Processors Association
Diana Evans, Council staff
Brandee Gerke, NMFS Alaska Region
John Henderschedt, Council member
Dan Hull, Council member
Ellie Humphries, Pew Charitable Trusts
Jan Jacobs, American Seafoods
Jon Kurland, NMFS Alaska Region
David Long, Council member
Stephanie Madsen, At-sea Processors Association/Ecosystem Committee member
Chris Maio, Coastal Geography professor at UAF
Steve Marx, Pew Charitable Trusts
Glenn Merrill, NMFS Alaska Region
Stefanie Moreland, ADFG
Susan Murray, Oceana
Freddie Olin, Tanana Tribal Council
Chris Oliver, Council staff
Donna Parker, Arctic Storm
Megan Peterson, ADFG
Julie Raymond-Yakoubian, Kawerak
Becca Robbins-Gisclair, Alaska Marine Conservation Council
Julie Speegle, NMFS Alaska Region
Bill Tweit, Council member
Jon Warrenchuk, Oceana