

Washington Coast Science Advisory Panel for Marine Spatial Planning

Meeting 2 Summary: Discussion with WDFW Scientists on
Identifying Ecologically Important Areas Off Washington's Coast



January 20, 2015

Meeting Summary

Science Advisory Panel for Marine Spatial Planning Attendees: Miles Logsdon (Oceanography), Si Simenstad (UW SAFS), Tim Essington (UW SAFS), Emilio Mayorga (Applied Physics), Brian Polagye (UW), Helen Barry (DNR Nearshore habitat), Charles Menza (NOAA)

Calling in from WDFW: John Pierce, Andy Duff, Theresa Tsou, Andy Weiss, Corey Niles, Jesse Doepinghaus

Attendees from other Agencies: Penny Dalton (WSG), Bridget Trosin (WSG), Libby Whiting (DNR)

Purpose:

Update the science panel on the WDFW Ecologically Important Areas (EIA) mapping project, receive feedback on their progress, and provide guidance for the next steps.

Takeaways:

1. Identify existing data gaps (i.e. life history stages) and clarify data shortcomings. Science panel will contribute ideas to improve the existing data list and identify data gaps.
2. Use estuarine structure, including outflow information, for further iterations of the project to provide gradation to the importance of estuaries. This data does exist or could be integrated.
3. Reconsider using a hexagonal system rather than a grid. A square grid can be converted into 3D space and integrated into the oceanographic mapping that uses cubes to improve the utility of the maps for future uses. There is some rationale to keep a hexagonal grid.
4. Provide information about specific stressors in the next iteration of the project.
5. Design a qualitative rubric to describe the significance and risk of each category.
6. Consider combining certainty (especially with multiple definitions of certainty including variability or data certainty) and significance into one category. The Science Panel expressed a desire to be able to apply certainty to multiple categories, such as, significance and vulnerability in phase 2 when dealing with specific stressors. Is there a way that you could either display uncertainty separately or separate the two factors out? If the data is not combined, is there a way to differentiate between two stressors (use different colored borders or 1.1, 1.2, 1.3 etc.)? That would clarify the inputs of certainty and significance as separate entities. WDFW needs to determine how the information will be best used and viewed.
7. Need to clarify and potentially differentiate the scoring rubric. It is unclear how you would get to a category 3, or score in general, because there are multiple ways to do so. 80-90% of this map is in one category and yet it is

- not known if that is because one layer's value is a 3 or all the layer's values are a 3. WDFW needs to determine the intended use and optimization of the information for the decision-making process.
8. Still need to work out how to create an aggregate measure in the groundfish species model.

Agenda:

1. Summarize Panel's questions from November meeting
2. Update on Wildlife data/mapping progress
3. Update on fish data/mapping progress
4. Next steps

1. Summarize Panel's questions from November Meeting: *The following were takeaways from the November meeting, which have been addressed individually within each bullet point.*

1. *Add value to a grid cell based off its uniqueness—WDFW is working on this.*
2. *Potentially include estuaries based on functionality/Try to differentiate between estuaries—WDFW does not have outflow information so they are limited as to what they can do on this. They are maintaining estuaries as a priority and assuming they have value. There is not enough time to get into the complexity of this data and it is beyond the scope of this project. This is something to pursue more in a secondary scale of analysis that they are not doing at this level.*
 - a. *Response from SP: There are first order estimates of outflow or projections on each estuary outflow of the coast and ways to quantify this value. For valuation of estuaries in general, internal channel structure is more important than outflow. See Takeaway 2.*
3. *Try to differentiate within estuaries-Addressed in previous bullet.*
4. *Clarifying the assumptions made in defining what is an Ecologically Important Area—WDFW is working on this continuously.*
5. *Assemble a list of criteria that you are using for establishing your data sets—WDFW is continuing to work on this.*
6. *On the issue of missing life history information—We are able to distinguish between breeding and non-breeding areas, forage fish spawning etc. but lacking information and time to really look at all life stages. This is a frequent issue within this project. For example with the groundfish model, we are not sure what life history stages are included, so we are missing a lot of near shore information and data during the winter.*
7. *Asking specific questions of the data based on specific stressors—We would look at some of the stressors and how they would overlap with those EIAs during the second stage of this project.*
8. *Temporal aspect: WDFW does have some temporal data and are bringing that into the model. For example, those areas where we have persistence of the ecological values, we are bringing that importance into the values. Ex: When*

there is help in an area for over 75% of the years, they are assigned a category 1.

9. *Can we look at relative abundance or areas that are priority to be restored? We are not preparing to address restoration needs.*
10. *Consider challenges and data quality considerations of meshing hexagon model with ocean data and public involvement that are mapped in grid cells.* WDFW asked for clarification about this from the science panel (Relates to Takeaway 4).
 - a. SP: This question relates to how you are going to use these data in the future. If you want to use them further you may face challenges or need to transform the grid. Most data that you would get from other sources is in grid format and must be resampled into a hexagon model. If you intend on interacting with the public or data users, a grid system would integrate better with other data. In oceanic and atmospheric science we need a way to represent 3-D space.
 - b. WDFW's response for why hexagons were used: Hexagons are frequently used in conservation planning. A hexagon has the highest area to edge ratio and it was used in the Western Governors Association terrestrial modeling. Hexagons tend to balance out the noise in the data. We could easily change that unit in the future for a third dimension.
11. *Add Neutral category:* Instead of going to seven categories, we are going to use five categories so there is a neutral category.

2. Update on Wildlife Data:

Draft Wildlife Scoring Criteria: Level of significance + Certainty of the data = Category 1-5, 6=neutral.

- Snowy Plover: They have several years of information plus plovers are endangered, so they are assigned category is 1.
- Tufted puffing foraging areas: They don't know the certainty of where they are foraging. There was a buffer of 3.96 miles representing modeled foraging areas. This category was assigned a 3.

Qualitative Rubric Discussion (Relates to Takeaway 5)

SP: Is there a way to qualitatively describe the rubric to write a more prescriptive scoring classification scheme? Ultimately, it would be ideal to have a scoring rubric that says something about significance and risk, calibrated by the classifications you already understand. In other words, what is the essence of being in category 1?

WDFW: The team responded that they have thought of the two factors (significance and uncertainty) and then evaluated each layer on that conceptual model. However, they are skeptical that they have a set of criteria or a set of objective measures that define those things.

Variables of Uncertainty and Significance Discussion (Relates to Takeaway Six)

SP: Usually the level of certainty is applied to every criterion, and the criteria usually include significance and vulnerability. So the degree of certainty is applied to both significance and vulnerability.

WDFW: We would talk about vulnerability in phase 2 of the project when we get to specific stressors.

WDFW on certainty discussion: On the more outer ocean/shelf zone data, our certainty levels and data are weak. We have some short tailed albatross data from eight birds, so can't be that confident around it. The seabird distribution maps are forthcoming and we have some seabird hotspot maps that are pretty coarse, but these will be incorporated. Especially in these large forage areas, there is a lot of uncertainty, so they get pretty low rankings.

Discussion about Scoring/Map Outputs (Relates to Takeaway Seven)

SP: It is not clear how you get to a three. There are three categories of significance and three of uncertainty yet only five categories. The use of this information to end up with a number that can't be dissected as to why you arrived at this number is worrisome. (See Takeaway 7)

WDFW: The team explained that they are using a draft map of combined wildlife EIA. The individual units always go to the most important category, i.e. if one layer is a 1 in that hexagon, it goes to a 1. If a hexagon is a three than nothing in that hexagon is higher than a three.

SP: The 1s are distinguished from the 6's but the 3s and 4s are not so distinguished. This relates to another science panel member's question of where are we heading and what are we asking people to participate in? What would the legend look like for the people using these maps?

SP: 80-90% of your area is a three or four. Does it have 1 or 100 threes? That information would be very important for decision makers to know. We need information to distinguish between the threes and fours.

WDFW: We are working on a tool so that when you click on a spot, you will get information on its ranking. We are still looking at different ways of combining data.

SP: It looks like the maps have data limitations that lead to odd disjunctions. For example, there is a category two area that is adjacent to a category five. Please identify where data limitations may be propagated and lead to some features that are not real. You could complete a sensitivity analysis to improve this or decide the appropriate level of detail to display if such data limitations exist. (See Takeaway 1)

3. Groundfish Models:

WDFW: We are using 9 different species distribution models. The data covers a good portion of the planning area. There is a slightly different approach than the

wildlife model in that the category assigned, is talking about the *relative* importance of the habitat to the species. The scoring system is not symmetrical since one (the most important category) is much more broad. The rationale is to be careful to not call an area unimportant rather than a false positive. Some issues that remain are whether or not to average versus aggregate when you combine data layers. If you average the 1-5 across five species models, you can only get close to a 1 if all the models are predicting 1. WDFW is trying different aggregate models for groundfish species. (Relates to Takeaway 8)

SP: What is your basis for interpolation?

WDFW: We have the NOAA model, the NWFSC uses some other kind of modeling technique. These were based on generalized linear models and used things like oxygen, benthic inverts etc. as covariates.

4. Next Steps/Discussion Questions:

1. No data vs. not habitat vs. unknown
2. Highest Value vs. Majority vs. Average
3. Policy vs. Science—What makes sense for the people who want to use the maps?

WDFW response: If we go back to the purpose of this project. We want to end up with a product of our best guess at where the important areas and how confident we are in them. It is for Marine Spatial Planning. It is not for more intensive purposes. This is supposed to be at a very high level analysis, whereby if you wanted to do a more specific project you would have to look under the hood before moving forward.

SP: We need to get to the policy applications before we will be able to know what degree of gradation is needed. Maybe the solution is to keep the flexibility on how to use the information. We don't necessarily need one way to use it.

The discussion around uncertainty continued: (Relates to Takeaway 6)

SP: We continue to struggle to combine significance and uncertainty; we keep coming back to the ambiguities that it creates. We come back to the need for a category that displays certainty. Can we step back to display the two pieces of information separately? We could display significance separate from certainty? Then decision makers can use that combined, more complex information. At least doing those two things independently would give the users the information to make decisions. The fundamental problem is that in complex systems, uncertainty gets thrown under the bus. We don't want to see it baked into the model in some unknown way.

SP: One suggestion is making more of a spread on the uncertainty category. One thought they have explored is looking at the significance level 1-5. Have a 1.1, 1.2, and 1.3 for levels of significance. Could you break them out separately when you

zoom in? That way you could highlight the borders of the cell or use different colors to denote the level of uncertainty. Ex: A blue cell with red border means high significance but high certainty.

There is a more theoretical question of whether significance and uncertainty can be equally weighted? If you are ranking something lower that is highly significant but low certainty than something that is high significance but high certainty that is an issue. Seems to bias the results. This is really a policy question of risk tolerance in terms of how that uncertainty is communicated. We must ensure that something of low significance and high certainty cannot be ranked higher than high significance and low certainty.

WDFW: We are struggling with this as well. What does certainty mean from layer to layer? In the kelp layer, certainty means consistency/variability in years. In other layers it is more certainty of kelp existing in that location. However, we can back up and look at them separately. The drive to combine it is in trying to have a simple map. We are at a high level and wanted to keep it significant but there is a cost of getting it too simple.