**Robby Fonner  
Comments on “Spatial separation of catches in highly mixed fisheries”**

1. Big picture … aka story, contribution, soundness/appropriateness of methods

* As someone who is not highly involved in spatio-temporal modeling with dynamic factor analysis, I thought the paper did a great job of clearly communicating the methods, objectives, and results clearly and in a meaningful way.
* Consider revising opening paragraphs with the objective to “hook” the reader right away. Why is this paper important methodologically and with regard to fisheries management? Why should I care?
* Page 3, paragraph two. – in framing the story, you may want to acknowledge that it is the objective of fisheries managers to utilize stocks to their MSY. Fishers, on the other hand, maximize their utility, which usually involves maximizing expected profit, managing risk, maintaining their cultural identity etc. They respond to economic incentives along internal (e.g. gear, effort) and external (e.g. switching fisheries) margins. So the trick, as I see it at least, is to understand what catch compositions are available to fishers, and then implementing policies that create incentives for them to harvest those compositions that promote utilization. This might not be critical to discuss in the current manuscript, but I think it makes for a more believable policy story.

1. Missing references or context

* Pascoe et al 2007 (attached) compare targeting ability for beam and otter trawlers in the North Sea demersal fishery. Findings include differences in targeting ability across gears and vessel sizes. These findings might enrich, verify or provide a comparison for the findings in this paper based on fishery-independent data.
  + For example, “differences in catches between locations” is supported by Pascoe at al … but they also find, as I recall, heterogeneous targeting ability among fleets. Considering the results of the current study, it is possible that the targeting heterogeneity found by Pascoe could be due to differences in “tactics” across fleets”.
* Page 14, paragraph One: *“… our framework could be used to simulate different fishing effort scenarios to identify lower bounds for optimum spatial avoidance* (Reimer 2017) *to support management decisions. Identifying the limits of spatial targeting and avoidance could support scientific contribution to meeting the goal of maximizing catches in mixed fisheries within single stock quota constraints*.”  
  + I think I am missing exactly what is meant by this. Clarify with additional detail. I am also not fully clear what is being cited from the Reimer paper.

1. Future directions

* Consider expanding the discussion (pages 13-14) to add specifics about how the modeling techniques, and results yielded by the modeling could potentially be used for informing policy (e.g. time-area closures, spatially heterogeneous catch regulations, move on regulations). The methods and results are clear and very well written. The biggest thing that jumped out at me is that the discussion about where this goes next is fairly limited and less detailed compared to the rest of the paper.
* Another thought I had is that the type of modeling in this paper could potentially serve as an input to behavioral models (e.g. location choice, production models) of fishermen where environmental conditions (e.g. species density) are unobservable or partially observable.
* This framework could likely also inform bycatch avoidance. It might be worth developing a paragraph in the discussion around future directions related to the bycatch, or protected species context.