1. **Sub-dividing single model into two sub-models**

**[5/28 5:00 PM] Bentley, Kale T (DFW)**

Thomas/Dan - I have two general suggestions/ideas/questions for modifying the creel model:

* Would it be worth having two different creel models - one where indirect angler counts (i.e., trailers/vehicles) and associated interview questions (i.e,. # of trailers & cars per group) were collected and going to be used in the analysis and another for when only direct counts were collected/used?  It's fine as is but one advantage of breaking apart the models is right now, angler types/counts have to be aggregated down to boat and bank.  However, when only direct counts are used, the angler groups could be defined into a larger number of groupings.
* Break apart effort and CPUE portions of the model and combination posterior draws to calculate catch outside of stan.  One advantage of doing this is that a user could define multiple catch groups (e.g., steelhead and chinook wild/release) in the user inputs section.  The data could be summarized.  Then only need to calculate effort once and then CPUE for each catch grouping.  If we went this route, it would obviously impact the standat and model summarizations.

**[6/1 9:39 AM] Buehrens, Thomas W (DFW)**

* the more I think about it, the less inclined I am to support multiple versions of the model (if avoidable)...it makes it twice as hard to ensure updates to one version are propagated to the other version. in the scenario above, the need to consolidate angler groups to two types (boat, bank) really only occurs when the only index effort count type is trailer/car counts with no index angler counts.  There are 4 parameters that are unique to specific likelihood contributions: R\_V, R\_T, b, p\_I. The first three are for studies that have trailer/car counts and ask anglers how many cars/trailers they have brought. The last, p\_I is specific to studies with index angler counts. As currently configured, these get estimated regardless of which likelihood contributions exist. Therefore, if one is NOT using car/trailer counts, one can simply summarize the data preserving as many angler groups as desired (fewer the better unless heterogeneous interview rates within a group). On the other hand, if car/trailer counts will be used, then you have to pool the data. I suggest we do this via a user input that controls how the data gets summarized. No need for separate models. RE: separating CPUE and Effort and Catch estimation so catch estimation is post-hoc. This would have worked with the older version of the model. As currently constructed, we are using the interviews to inform our estimates of total effort and catch (allowing the interview and effort likelihoods to interact), so the model is no longer separable.

**[6/1 9:49 AM] Bentley, Kale T (DFW)**

One point of clarification regarding your statement "in the scenario above, the need to consolidate angler groups to two types (boat, bank) really only occurs when the only index effort count type is trailer/car counts with no index angler counts."...If "indirect" angler counts (vehicles and/or trailers) are conducted AND used in the analysis, wouldn't the angler groups pretty much always have to be distilled down to two groups - bank, boat - even if direct angler counts were also conducted?

**[6/1 9:51 AM] Buehrens, Thomas W (DFW)**

right now, yes, because the "angler type groups" have to the the same across likelihoods. ​So if you want to use vehicle/trailer counts, you have to pool. ​My sense is this is OK from a catch estimation standpoint but may not meet needs if specifically interested in evaluating CPUE by fine-scale angler type strata. That is probably best done via post-hoc analysis anyway (fit some Generalized Additive Mixed Models to the catch data while ignoring the effort data).

**[6/1 10:00 AM] Bentley, Kale T (DFW)**

ok - that makes sense.  would be good to make this clear to people - this analysis is strictly for estimating effort, CPUE, and catch; generally just for two groups (bank, boat).  Any additional questions of interest (e.g., gear usage, hooking locations, angler demographic, etc) would be need to be completed in a separate analysis. perhaps a next step for script development would be identifying all of the "user inputs".  based on today's conversation....

**[6/1 10:47 AM] Auerbach, Dan A (DFW)**

Assuming I'm following this conversation correctly, and understanding the regional comanager priorities correctly, then I believe the estimation of effort, CPUE and "catch", potentially stratified by bank & boat should definitely suffice. (AFAIK at least, the conversation has not gotten anywhere close to something like differential release mortality rates apportioned by estimates of total gear differences.)  That said, I guess it's also important to clarify that "catch" actually corresponds to "encounters", with the scope to estimate kept, released, or "all" depending on exactly what data are fed in? We've been talking about catch/CPUE, but I don't think I see the model caring about whether fish are kept or released? (e.g., the Skagit formulation for "SH\_W\_R") If things follow the PS marine pattern, I presume there will be interest in both [K]ept and [R]eleased...

**[6/1 11:10 AM] Bentley, Kale T (DFW)**

Right now, the model generates estimates of catch for a single "grouping".  A grouping is defined by the user (and also how the data were collected). Right now, the default grouping is defined by the combination of species, it's origin, and fate (e.g., "SH\_W\_R" = Steelhead, wild, released).  Obviously, this could be modified.  For instance, we could be more explicit about defining life stage/age (in some fisheries resident rainbows are caught, sometimes smolts, jacks, etc.)  Depending on the data collection fields, we would want to filter and stratify appropriately.

**[6/1 11:40 AM] Auerbach, Dan A (DFW)**

So, I think I read that as "yes, it's conceptually applicable to 'encounters' - regardless of fate - as-is." I've looked through your edits/comments Kale - thanks for diving into that! We're in decent shape, albeit with work still to do. I like how you've pseudocoded objects for the raw-to-stan translation, and I started to flesh that out a little, but I'm thinking it may be easiest to work together "live" to reduce the confusion/overhead of writing messages back and forth. I've pushed up one more commit illustrating a possible pattern/mode of constructing an intermediary "summary" object where your comments described "summ\_effort\_counts", but we'll need to talk about some of your questions and my own....

**[6/1 11:48 AM] Bentley, Kale T (DFW)**

I define catch as "fish in hand" - the fate of the fish is either kept (harvested) or released.  what do you mean by encounter? is that synonymous with catch?

**[6/1 11:48 AM] Auerbach, Dan A (DFW)**

sorry, that's the prevailing term in PS. yes, it effectively means your definition