JOINT MEETING OF THE BSAI AND GOA GROUNDFISH PLAN TEAMS
May 6, 2010

Members of the Plan Teams present for the meeting included those shown in bold below.

Loh-Lee Low	AFSC REFM (BSAI chair)	**Jim Ianelli**	**AFSC REFM (GOA co-chair)**
Mike Sigler	**AFSC (BSAI Vice chair)**	**Diana Stram**	**NPFMC (GOA co-chair)**
Kerim Aydin	**AFSC REFM**	**Sandra Lowe**	**AFSC REFM**
Lowell Fritz	AFSC NMML	**Jeff Fujioka**	**AFSC ABL**
David Carlile	**ADF&G**	**Jon Heifetz**	**AFSC ABL**
Alan Haynie	**AFSC REFM**	**Mike Dalton**	**AFSC REFM**
Jane DiCosimo	**NPFMC (Coordinator)**	Cleo Brylinsky	ADF&G
Henry Cheng	**WDFW**	Tom Pearson	NMFS AKRO Kodiak
Brenda Norcross	UAF	**Nick Sagalkin**	**ADF&G**
Mary Furuness	NMFS AKRO Juneau	**Paul Spencer**	**AFSC**
Grant Thompson	**AFSC REFM**	Leslie Slater	USFWS
Dave Barnard	ADF&G	**Nancy Friday**	**AFSC NMML**
Leslie Slater	USFWS	**Henry Cheng**	**WDFW**
Dana Hanselman	**AFSC ABL**	Ken Goldman	ADF&G
Bill Clark	**IPHC**	Bob Foy	AFSC Kodiak
		Sarah Gaichas	**AFSC REFM**
		Steven Hare	**IPHC**

Others in attendance: Pat Livingston, Anne Hollowed, Farron Wallace, Martin Dorn, Tom Helser, Chris Lunsford, Teresa A'Mar, Delta Anderl, Kenny Down, Mark Maunder, Julie Bonney.

Mike Sigler chaired the joint meeting of the groundfish Plan Teams. The objective of the meeting was to review proposals for GOA and BSAI Pacific cod stock assessment models. The goal was to recommend no more than six models for each area assessment for Fall 2010. The proposers deferred to Grant Thompson and the Teams for the review of their proposals, but were invited to participate in the discussion of their proposal.

Twenty one proposals were received from the GOA Groundfish Plan Team, Teresa A'mar, Mark Maunder, the Freezer Longline Coalition, the BSAI Groundfish Plan Team, and the Scientific and Statistical Committee (SSC). Grant Thompson reviewed new model proposals collectively for the GOA, the BSAI, and for both areas, as well as his own suggestions for model changes.

The Teams reviewed a draft spreadsheet that was prepared by Mike Sigler, which grouped the proposals by nineteen categories (types of recommended model changes), including the current model (Model 1) for each area assessment. Dave Carlile suggested that the teams consider combining model proposals for each category listed in the table. Jim Ianelli suggested that this could be achieved by adding columns to the draft spreadsheet. Grant Thompson revised the table as the teams reached consensus.

Exclude mean length-at-age data and exclude age composition data

Bill Clark noted that all models that would exclude length-at-age data also would exclude age composition data, so these proposals were reviewed together. Jim Ianelli endorsed the suggestion to put all the age related ideas into a single model. Grant Thompson agreed with Bill, noting that current practice is to omit survey length composition data in years for which survey age composition data are used, which implies that inclusion of length-at-age data is essential for

meaningful estimation of cohort-specific growth parameters when age composition data are used (otherwise, the only data available for estimation of cohort-specific growth parameters would be the length composition data from the fisheries, which generally do not include the young ages at which cohort-specific growth is easiest to detect). The teams agreed to recommend that one model exclude both age composition data and length-at-age data for both assessment areas.

Jon Heifetz questioned whether these assumptions lead to a realistic model, or whether the teams were simply exploring sensitivities to baseline assumptions. Jim Ianelli clarified that Model 1 would form the baseline against which other models would be compared. Dana Hanselman responded that the teams would be recommending at most five alternate model configurations to the baseline model.

Recommendation: The teams recommended adding this component to models 4, 5, and 6.

Estimate the two parameters describing variation in length-at-age

Bill Clark asked why this model configuration was proposed. Mark Maunder responded that including these parameters improves the fits to the data. He noted that the variability in length at age of year l fish is at age is fairly well determined, but is less well determined for older fish. Bill suggested that length-at-age data might be adequate for external estimation of these parameters, even if the data are biased.

Grant Thompson referred to slide 13 of his Powerpoint presentation, which depicted a good fit between standard deviation of length at age and mean length at age. Mark Maunder voiced concern about using length-at-age data if bias is showing up in only the older fish, resulting in more variability than expected; therefore he prefers to exclude the length-at-age data in one model run. He was particularly concerned if the model creates this bias inside the model. Grant agreed that using length-at-age data to estimate variability in length at age would not result in a model that is completely independent of all data relating to age; however, if the Teams wanted to include a model that was "almost" completely independent of age data, this would probably be the first compromise they would want to make. Mark continued that if you are going to exclude all age-related data, then you need to estimate the variance of age data in the model itself. Jim Ianelli replied that this assumption seems reasonable, but was concerned about estimating variability in length at age within the model when the length-at-age data themselves have been excluded. He shared Grant's concern that any improvement in the model's fit could result from misspecification(s) elsewhere in the model. Kenny Down noted that internal estimation of variability in length at age, without using length-at-age data, would be a logical extension of the Freezer Longline Coalition's previous requests to eliminate age composition data from the model. Mike Sigler noted that the proposal was worth recommending for technical reasons. Grant responded that the Teams could approve one model that estimates variability in length at age internally, and another that does so externally.

Recommendation: The Teams recommended adding this component to models 5 and 6.

Eliminate cohort-specific growth & add time-varying growth

Grant Thompson noted that use of cohort-specific growth was a new feature in the BSAI model last year; and it became the preferred model. Bill Clark said he was hesitant to accept the proposed model change unless it fits the data better. He preferred a model that has constant growth unless there is clear evidence for a cohort-specific effect. Mark Maunder recommended treating time-varying growth like a random effect. Grant offered that Rick Methot has suggested

interpreting cohort-specific growth as being roughly equivalent to cohort-specific K. Thus, cohort-specific growth adds one parameter to be estimated for each cohort, whereas time-varying growth (as implemented by Mark) adds three parameters to be estimated for each year.

Mike Sigler said that Model 6 is the same as Model 5 with cohort specific growth replaced by time-varying growth. As a new alternative, he proposed that the teams add a model with constant growth. Mark Maunder asked if the teams felt there was evidence of time varying growth, and suggested Pacific cod growth does not have a consistent trend like Pacific halibut. The trend for cod varies greatly; he referred to page 5 of his proposal for more discussion on this issue.

Dana Hanselman clarified that since the current model already uses cohort-specific growth, going to more parameters might be too much. He suggested that the proposals are general and the plan teams can modify them (e.g., vary only K, and not L1 and L2). He recommended maintaining cohort-specific growth assumptions in the model; he was concerned about making the model more complex by varying growth while there may be other model misspecifications.

The Teams deleted Mike Sigler's suggestion related to cohort growth, to not allow a growth matrix that is constant in time. The base model has cohort-specific growth. Time-varying growth will only be implemented in BSAI (Model 6) due to the quantity of age data in the GOA. Bill Clark asked why go to annual deviations of growth (or age?) data. Mark Maunder responded that cohort specific growth did not explain everything he wanted it to; incorporating time-varying growth substantially improved the likelihood. Model 6 is based on models that do not include mean length at age data. While the teams are trying to limit the number of models requested from the author this fall, the teams discussed the need for requesting this model relative to other priorities. The team ultimately agreed to request this model as it was the only request by industry different from other team or SSC requests (i.e., adds only one model beyond the models requested by the SSC or teams).

Recommendation: The teams recommended adding this component to Model 6 (BSAI only).

Age conditioned on length

Farron Wallace said that the SSC thought that this proposal might resolve the issue where mean size at age does not match the size modes in the BTS. Jim Ianelli responded that this approach is not used in any other AFSC assessment and that residuals should be carefully examined. Farron agreed and recommended that the author take another look at this approach in future assessments to see if it improves model fits. Jim concurred.

Recommendation: The Teams did not recommend adding this component to any of the models until age determination issues are resolved.

Finer length bins

After some discussion the teams felt this was a routine housekeeping change to the model. Grant Thompson noted that this might result in the loss of the pre-1982 portion of the EBS bottom trawl survey time series, because the original size composition files for those years appear to have been lost. Mark Maunder noted that Stock Synthesis allows the user to specify different bin structures for different data sets (including different years), so continued use of the pre-1982 survey time series should not be a problem after all.

Recommendation: The teams agreed that the author was free to test and implement minor changes to the model as he felt appropriate. The Teams recorded this as a change to models 2 through 6.

Maturity as a function of length rather than age and ageing bias from radiocarbon study

The Teams discussed these two proposed model changes. It was noted that basing maturity on length rather than age would be more consistent for those models that did not use age data. It was also noted that the sample size (10) used in the radiocarbon study would not be sufficient to construct an ageing bias matrix.

Recommendation: The Teams recommended adding maturity as a function of length rather than age to models 4, 5, and 6. The teams recommended no change related to the radiocarbon study.

Priors on selectivity, estimate catchability

Dana Hanselman asked about the history of estimating selectivity; e.g., had Grant "tried everything" and the priors were fixed now? Grant responded that the current models use uniform priors only, but he prefers using informative priors on any parameters where some prior information is available. Mark Maunder was concerned that, in December, the SSC could reject an entire model because of its use of informative priors, even if the other features of the model constitute significant improvements. Grant and Mike Sigler suggested that Team and SSC review of any proposed priors in September/October should minimize this possibility (i.e., priors that the Teams/SSC accept in September/October would likely be accepted in November/December).

Grant reported that while, it is difficult to estimate catchability inside the model, he is concerned that the point estimate of catchability from the 11 cod tagged by Dan Nichol might not be correct. He would like to continue his modeling attempts in this area. Dana Hanselman suggested that tightening up priors on selectivity should help with improving catchability estimates. A separate model using these components was suggested.

Recommendation: The Teams recommended adding these components as the main new features of Model 3.

Exclude IPHC data

Cod data from the IPHC halibut survey have been used in the BSAI model, but not in the GOA model. The SSC has recommended that the data no longer be used in BSAI (the BSAI Plan Team made no recommendation on its use last year), because the relative abundance data from the IPHC survey turned out to be inversely correlated with the abundance estimates from all 14 models in last year's assessment. Bill Clark noted that the survey coverage was much greater in the GOA than in the BSAI and so the GOA data could be more useful due to overlapping halibut and cod habitat there. Steven Hare noted that, except for Area 3B, there is good survey coverage in both areas. The request for length composition data from this year's IPHC survey has already been withdrawn, and it is too late to change the IPHC survey methods this year. Kenny Down recommended that cod length data collection in the IPHC halibut survey be reinitiated in 2011.

The Teams recommended leaving the IPHC data in the BSAI assessment and asked Grant to determine whether inclusion of IPHC data would be a useful addition to the GOA model.

Bill Clark asked Grant whether it would be appropriate to leave the IPHC size composition data out of the model. Sandra Lowe recommended that the GOA Groundfish PT should request IPHC

data for the GOA assessment. The summary table will reflect the teams' recommendation to incorporate IPHC data for the GOA.

Recommendation: The Teams rejected the proposal and recommended that the IPHC data be considered for use in both the BSAI and GOA model as well.

Evaluate spatial-temporal variation in fishery CPUE

Sandra Lowe noted that the analysis for evaluating the catch data is more complex than can be completed in 2010, given the new modeling requests. This requested evaluation could be planned for Sept 2011. In response to Bill Clark's question of why analysis of fishery CPUE is being requested, Farron Wallace said that the SSC was interested in spatial variation of fishery catches and recommended leaving it on the list as a research item.

Recommendation: The Teams recommended that the SSC proposal to evaluate spatial-temporal variation in fishery CPUE be included in the next set of research priorities.

Advance model one year, compare with projections

No action was taken.

Other GOA proposals

Mike Sigler suggested that Teresa A'Mar test her proposed changes to the GOA base model as an appendix. Several of them are addressed by other proposals. Ms Lowe pointed out that Teresa's assignments did not include further development of the GOA cod model. Clark and Ianelli thought many of the proposals had merit. Teresa conceded that if the assessments will already address them, then there was no need to proceed with separate examinations. Grant suggested they should be examined in both areas if they were to be addressed. The Team recommended to treat the seasonal proposal under models 2 through 6, but not to address the plus group proposal. The catchability and selectivity-at-age proposals are treated under Model 3 (see "prior" proposals). No recommendations were made on the remaining two proposals (weight, lower bound).

Other issues

Anne Hollowed and Henry Cheng asked whether the Teams intend that Grant prepare *a factorial design is required to compare model alternatives.* The Teams responded that a factorial design would not be requested. Given that 10 new alternatives are being proposed for consideration in the GOA and 11 in the BSAI, a full factorial design would require consideration of 1,024 models in the GOA and 2,048 models in the BSAI.

Jim Ianelli noted that Grant still has discretion to add or delete aspects of the model if he discovers a productive line of modeling.

Group	Feature(s)	Proposal(s)	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Current models	Keep all features of current models	CM1, CM2, BPT1	x					
Age and length	Exclude mean length-at-age data	GPT1, MM1, BPT3, FLC1				x	x	x
	Exclude all age composition data	GPT1, MM1, BPT3, FLC1				x	x	x
	Estimate variation in length-at-age internally	GPT1(?), MM2, FLC2					x	x
	Omit cohort-specific growth, add time-varying growth	FLC3						x (BSAI)
	Use age conditioned on length	SSC1						
	Use finer length bin structure	GT1		x	x	x	x	x
	Describe maturity as a function of length, not age	BPT3				x	x	x
	Estimate ageing bias from radiocarbon study	BPT2						
	Decrease emphasis on season 1 fishery sizecomps	TA5						
	Reduce "plus" age from 20 to 15	TA1						
	Exclude fishery (but not survey) age composition data	SSC3	(SSC3 was inadvertently omitted from Team discussions.)					
Selectivity and Q	Use informative priors or other constraints on selectivity	SSC2, TA3			x			
	Estimate catchability internally	GT3			x			
	Put a cap on catchability for sub-27 survey in the GOA	TA4						
	Decrease lower bound for selectivity parameters	TA6						
Other	Exclude IPHC data	SSC4						
	Examine spatial-temporal variation in fishery CPUE	SSC5						
	Advance model one year, compare with projections	GPT2						
	Re-evaluate seasonal structure	TA2, GT2		x	x	x	x	x