Draft BSAI Team minutes
Nov 16-17, 2006

The Bering Sea Team reviewed the joint **sablefish** assessment and **BSAI Pacific cod** assessments jointly with the GOA Plan Team. BSAI Team comments are in the Joint Team minutes for these two species.

Pollock The Team reviewed separate assessments for Eastern Bering Sea, Aleutian Island, and Bogoslof pollock stocks. Jim Ianelli summarized three alternative models presented in this year's EBS assessment. The Team concurred with author's recommendation for Model 2, which added stations to cover pollock in strata 8 and 9 (NW of standard strata) 40 mi strongly to the east and north. Those stations should also be fished in future surveys and included in future models. The Team discussion application of tier 1 and tier 3 to the EBS pollock stock. The SSC determined Tier 1 status for this stock has been acceptable, but the Team has recommended Tier 3 and maxABC for the last 4-5 years. Tier 1 does not reduce the exploitation rate when the population is below $B_{40\%}$.. The Team accepted Tier 1 for the EBS stock.

Having accepted Tier 1 status, there was not consensus on how to set the ABC. The author's method for setting the maximum permissible ABC harvest rate was unchanged. For the last five years, ABC for this stock has been set at the maximum. Ultimately, the Team endorsed the authors' recommendation to set ABC at 1,300,000 t, rather than at the maximum permissible value. A range of ABC values from 1,200,000 – 1,512,000 t were discussed by Plan Team, with arguments offered in support of candidate values spanning the full range.

The Team recognized that the ecosystem has fundamentally changed and discussed whether to apply the new model (with additional strata) to the new ecosystem regime. Public comment suggested that the Team take a retrospective view because the EBS pollock fishery had occurred in the northwest portion of the EBS in the past. Another public comment suggested that a disproportionate amount of harvest was coming out of Catcher Vessel Operating Area. Chronological changes in sea ice cover, with indicators such as zooplankton, forage fish, and pollock recruitment, have illustrated lower EBS productivity during last several years in the EBS, in general. The Team recognized lower than expected estimated biomass in both the bottom trawl survey and echo-integration survey, the change in population distribution.

A catch of 1,300,000 t would maintain the spawning exploitation rate at the current level. In contrast, the F40% ABC recommendation of 1,390,000 t and the maximum permissible value of 1,512,000 t would increase spawning exploitation rate to the highest values since 1980. On the other hand, an ABC of 1,300,000 t does not preserve markedly more spawning biomass compared to the $F_{40\%}$ ABC recommendation of 1,394,000 t (Figure 1.45). One reason was cited for recommending an ABC equal the maximum permissible value; the 2007 female spawning biomass is near Bmsy, which is the target spawning biomass. The Team chose to accept the senior author's recommendation of 1,300,000 t for an ABC less than the maximum permissible value and to maintain the spawning exploitation rate at the current level. However there was not consensus on this recommendation, as the effect of projected fixed annual catches of 1.2, 1.3, and 1.4 million t on female spawning biomass are relatively close when projected two years forward.

Steve Barbeaux reviewed the assessment for the Aleutian Island pollock stock. The Team accepted Tier 5 status for this stock. The Team encourages the author to continue his exploration of age-structured models. The Team concurred with the SSC in that adoption of such a model was precluded until greater confidence in the stock structure and spatial distribution of pollock was expressed. The Team supports continuation of the experimental fishery survey and genetic studies to resolve pollock stock structure.

Jim Ianelli presented the Bogoslof pollock assessment of two age-structured models. The two models differed in whether a portion of Donut Hole catches were excluded (Model 1) or included (Model 2). Both models imply that age 5+ biomass peaked in 1983, and is supported largely by an enormous 1978 year class (more than 5 times larger than any subsequent year class). Following a decline from the 1983 peak, biomass appears to have been fairly stable since about 1992. The Team supported the authors' examination of these models, but felt that adoption of any of the models is premature in part, because the portion of the catch data from the "Donut Hole"

area included in the model is uncertain. It is uncertain whether Bogoslof pollock can be usefully modeled as a closed stock because the amount of interchange with pollock in the Bering Sea is unknown. The Team accepted Tier 5 status for this stock. The Team concurs with the SSC's approach for a more conservative approach than setting ABC at the maximum permissible.

Flatfish Tom Wilderbuer summarized the *yellowfin sole* assessment. The team extensively discussed Models 1 (Tier 3) and 2 (Tier 1), and accepted the authors' recommendation to use Model 1. The team has supported the base model (Model 1/Tier 3) in previous assessments. It identified two reasons to apply Tier 1 for this stock: 1) Tier 1 was not overly sensitive, it can incorporate a lot of uncertainty and calculate high biomass; and 2) ????. The Team concurred with the authors that Tier 1 was not appropriate for setting specifications because:

       1) while the stock was more productive at lower biomasses (from high Japanese fishery catches), we have only seen a single recruitment recovery occur and we don't know that we are in the same environmental regime;

       2) the time series fit in stock recruitment curve differs between Models 1 (base model using 95-01) and 2 (only uses most recent regime (78-01)) – don't assume that current regime would last and Model 2 uses stock-recruitment curve from that time, which is not as reliable.

       3) In a Management Strategy evaluation (MSE), productivity regimes were very narrow – we would need to wait 50 years to see the same down cycle again; and it may not be representative of productivity regimes in the future. Dorn et al. (2004) reported that the current harvest strategy where environmental change is not explicitly modeled is robust to underlying changes in stock productivity. The team commended the authors for evaluating Tier 1 and encourages continued exploration of the approach. A review is planned for spring 2007 for all BSAI and GOA flatfishes by the Center for Independent Experts, and a review of Tier 1 for yellowfin sole could be further examined by the panel. Tier 1 appears to be conservative and would likely underharvest the stock. The Team agreed with the authors' recommendations for OFLs and ABCs for all the flatfish assessments.

An update of last year's *arrowtooth flounder* assessment was accepted by the Team. Kerim Aydin summarized ecosystem issues for Arrowtooth flounder, and noted strong diet interactions with pollock, particularly in the BS. While this is not seen in the GOA, they are a top predator in the AI.

An update of last year's *northern rock sole* assessment was accepted by the Team. The SSC requested an MSE to explore the consequences of a non-stationary spawner-recruit relationship. An analysis of Tier 1 spawner-recruit considerations yields unrealistic and unreliable estimates. Rock sole recruitment appears to relate to environmental fluctuations of a relatively short time scale. This stock is not considered appropriate for Tier 1 management.

Buck Stockhausen examined a new model for flathead sole which disaggregated age classes. The Team recommended use of the improved model. In response to SSC comments, he examined the distribution of Bering flounder with respect to the fishery. The northerly distribution of the species did not seem to overlap the spatial distribution of the fishery, although mismatch in seasonal timing of the survey versus the fishery means that this is not conclusive.

Rockfish Paul Spencer presented a revised *Pacific ocean perch* assessment. A number of CIE comments were addressed in this assessment. The team reviewed the three proposed models. Difference between Models 1 and 2 is varying selectivities. Rebuilding of the AI POP is occurring to a greater degree than in the GOA. The Team concurred with the author's recommendation. Model 3 is similar to that used for POP in the GOA. The Teams accepted model results for the remaining rockfish stocks.

Atka mackerel Since 2001, year-class size is forecast to be below average. The Team discussed the continued decline of Steller sea lions in the western AI and its concern that fishing effort for Atka mackerel continues to be spatially distributed. Subarea ABCs and seasonal apportionments, critical habitat catch limits, rookery and haul-out trawl exclusion zones are designed to minimize the likelihood of localized depletion of SSL prey resources.

Squid and other species The Team recommended that squid, an important forage species, continue to be managed under Tier 6, and the remaining other species to be managed under the sum of ABCs for the four groups. A six-year average biomass for sculpins was used for ABC and OFL calculations. Starting in 2008, BS and AI observers will identify Hemitripteridae to species in observed catches. The fishery takes large sculpins in the AI Atka mackerel fishery, and in the BS and AI Pacific cod longline and bottom trawl fisheries. In the EBS, The survey has expanded north almost to St. Lawrence, and may result in changed abundances. The survey also does good job of assessing biomass, particularly for the more abundant species.

The authors were concerned about the high variability of octopus and shark biomass estimates based on trawl surveys and provided alternative Tier 6 approaches. There was not enough data to develop distribution maps by octopus species, although some depth gradation was noted. Liz Connors recommended not applying either Tier 5 or 6 for cephalopods. Incidental catch is predominantly taken by pot gear linked with cod allocations. Ivan Vining reported that the State is looking at developing an octopus fishery in state waters. She developed a new tier 6 calculation and recommended setting TAC < ABC to allow for an experimental fishery. Trawl gear is not accurate for octopus. Because the biomass is higher than sampled, Tier 5 would be conservative. But the ABC should be set on true biomass. The Team considers the average survey biomass as a likely minimum estimate of sharks and octopus since the majority of catch consists of smaller individuals. The Team continues to support a proposed plan amendment in 2007 to manage these at the group level.

Dean Courtney reviewed the shark assessment. An alternative tier 6 approach was investigated because of the inadequacy of using Tier 6. Last year, the Team reported that the biomass estimate is unreliable (low) because only small sharks are caught in trawl gear, so because the estimate is a conservative minimum, it is consistent with our approach.

Todd TenBrink summarized his study on skate nurseries along the slope edge. Newly hatched juveniles are found on the outer shelf. They move between the inner and outer shelves for reproduction. Adults are found in shallow waters, neonates in deep waters, and immature skates in intermediate waters. They line up 150-350 m, associated with canyon areas with high abundance and highly productive, constant current of water, and keep eggs uncovered for good oxygen through shell. Beth Matta presented the skate assessment. She intends to incorporate a number of addition to next year's assessment.

The Team adopted IPHC recommendations for 2007-2009 non-CDQ fishery halibut discard mortality rates and 2007 CDQ fishery DMRs in September 2006.