SUMMARY MINUTES
Scientific and Statistical Committee

Doubletree Hotel Boise – Riverside
Ponderosa Room
2900 Chinden Boulevard
Boise, Idaho 83714
208-343-1871

September 7-8, 2008

Call to Order and Scientific and Statistical Committee (SSC) Administrative Matters

The meeting was called to order at 8 a.m. on Saturday, September 7, 2008. Dr. Donald McIsaac briefed the SSC on priority agenda items.

Subcommittee assignments for 2008 are detailed in the table at the end of this document.

Members in Attendance

Mr. Tom Barnes, California Department on Fish and Game, La Jolla, CA
Mr. Robert Conrad, Northwest Indian Fisheries Commission, Olympia, WA
Dr. Martin Dorn, National Marine Fisheries Service, Seattle, WA
Dr. Owen Hamel, National Marine Fisheries Service, Seattle, WA
Dr. Selina Heppell, Oregon State University, Corvallis, OR
Dr. Peter Lawson, National Marine Fisheries Service, Newport, OR
Dr. Todd Lee, National Marine Fisheries Service, Seattle, WA
Dr. Charles Petrosky, Idaho Department of Fish and Game, Boise, Idaho
Dr. André Punt, University of Washington, Seattle, WA
Dr. Stephen Ralston, SSC Chair, National Marine Fisheries Service, Santa Cruz, CA
Dr. David Sampson, Oregon State University, Newport, OR
Ms. Cindy Thomson, National Marine Fisheries Service, Santa Cruz, CA
Dr. Theresa Tsou, Washington Department of Fish and Wildlife, Olympia, WA
Dr. Shizhen Wang, Quinault Indian Nation, Mercer Island, WA
Dr. Vidar Wespestad, Research Analysts International, Seattle, WA

Members Absent

Dr. Ramon Conser, National Marine Fisheries Service, La Jolla, CA
Dr. Tom Helser, SSC Vice-Chair, National Marine Fisheries Service, Seattle, WA

Scientific and Statistical Committee Comments to the Council

The following is a compilation of September 2008 SSC reports to the Council. (Related SSC discussion not included in written comment to the Council is provided in *italicized text*).

Pacific Halibut Management

E.1. Pacific Halibut Bycatch Estimate for International Pacific Halibut Commission Adoption

The Scientific and Statistical Committee (SSC) received a presentation by Dr. Jim Hastie and Mr. John Wallace (NWFSC), the authors of Agenda Item E.1.b, Supplemental NMFS Report, "Pacific halibut bycatch in IPHC Area 2A in the 2007 Groundfish Trawl Fishery."

The methodology for estimating annual total bycatch mortality of halibut has been reviewed on several occasions by the SSC. In this standard approach the West Coast Groundfish Observer Program (WCGOP) data on halibut bycatch rates (weight per hour of trawling) are coupled with corresponding information on hours of trawl effort to estimate to the total catch weight of halibut each year. The observer bycatch rates and logbook effort are stratified by season, depth, latitude, and arrowtooth flounder catch rate. In past years the mortality for trawl-caught halibut was estimated by applying a fixed 50 percent mortality rate. This year an additional set of catch mortality values was estimated based on WCGOP data on the "viability" of halibut using criteria developed by the International Pacific Halibut Commission. Since 2004 west coast observers have recorded three viability categories (dead, poor, excellent) for some of the individual observed halibut. The viability data are only available for a limited number of individual fish. These data were stratified by depth and year but pooled over the other factors used to stratify the halibut bycatch rate and logbook effort data (season, latitude, and arrowtooth flounder catch rates).

For 2006 the estimate of total mortality of exploitable halibut by the groundfish trawl fishery from the viability observations (345,648 lb) was very similar to the estimate from the fixed 50 percent west coast mortality rate (333,391 lb). For 2007, however, the estimate of exploitable halibut mortality from the viability observations (257,338 lb) was much greater than the estimate based on the fixed 50 percent mortality rate (175,133 lb). Although the 2007 groundfish trawl fishery generally fished in deeper waters with lower catch rates of halibut, the mortality rates for these halibut partially offset the reduced catch rates.

The SSC endorses using the observer viability data as a refinement that will produce better estimates of halibut bycatch mortality. For the estimates next year there should be further exploration of other stratification schema on the estimates of viability. For example, pooling the data across years might produce more stable estimates of the halibut mortality rate.

The SSC also recommends exploring the use of halibut viability data from observed longline fishing trips to derive estimates of halibut mortality by the west coast longline fishery. Currently the estimates for this fishery are based on a fixed 25 percent mortality rate, which appears to be high relative to mortality rates in North Pacific longline fisheries.

Pacific Halibut Management, continued

E.2. Pacific Halibut Catch Apportionment Methodology

The International Pacific Halibut Commission (IPHC) recently adopted a coast-wide assessment model for the Pacific halibut stock. Previously, assessments were conducted by regulatory area and harvest recommendations were based on results of the closed area models. A long-standing management objective of the IPHC is to equalize fishing mortality rates throughout the range of the stock. If Pacific halibut conform perfectly to a unit stock, as assumed by the current assessment model, there would be little biological basis for equalizing fishing mortality rates by regulatory area. However, similar to most stocks, Pacific halibut is unlikely to conform perfectly to a unit stock assumption, and is likely to be situated on a continuum between that extreme and the other extreme of multiple independent stocks. In these circumstances, equalizing fishing mortality rates would help maintain the spatial structure of spawning output, which would be advantageous if recruitment to an area depends on the spawning biomass in that area. It would also be appropriate if spawning in different areas contributes unequally to recruitment, i.e., there are sources and sinks, but the relative contribution of each area is unknown.

The IPHC is proposing a catch apportionment algorithm that uses a 3-year average of setline survey catch per unit of effort (CPUE) multiplied by the bottom area by regulatory area. This method is a standard approach to equalizing fishing mortality rates, and is based on the assumption that setline survey catchability is the same in all areas. Similar approaches have been used for other stocks on the west coast and the North Pacific. While the overall approach is reasonable, area apportionment using setline survey CPUE and bottom area is problematic in Area 2A for several reasons. First, hook competition appears to be higher in Area 2A than in any other area, which would depress catch rates. Second, coverage of habitat with a fixed station grid appears to be less representative in Area 2A than any other area. Finally, a greater percentage of the annual catch is removed in Area 2A before the survey occurs. All of these factors would cause a negative bias in the percent of exploitable biomass in Area 2A.

With respect to future assessments, the Scientific and Statistical Committee (SSC) recommends development of a spatially-explicit model that fully utilizes the available information. For example, a model that includes both the setline survey data and tagging data would allow evaluation of alternative model formulations by comparing model fits to both data sets. The National Marine Fisheries Service (NMFS) Gulf of Alaska bottom trawl survey provides a time series of relative abundance of Pacific halibut that has not been used for halibut assessment, nor has this data set been fully explored to address concerns about differences in setline survey catchability by area. Models that are intermediate between the coast-wide model and closed area models should be considered. Such models would be helpful in addressing issues such as the impact of migration between areas and unequal harvest rates by area.

Council Administrative Matters

C.3. Update and Communication of Research and Data Needs.

The Scientific and Statistical Committee (SSC) developed recommendations to prioritize Research

and Data Needs for Groundfish Management, and reviewed the Office of National Marine Sanctuaries (ONMS) and Salmon Technical Team (STT) comments on the Council's Update and Communication of Research and Data Needs Public Review Draft.

The SSC recommends adding a new section (3.2) to the Groundfish Management Research and Data Needs identifying the following priorities:

1. Continue to conduct annual comprehensive shelf and slope bottom trawl surveys of west coast groundfish.

2. Conduct port sampling for species composition and biological samples at levels needed to support stock assessment and management.

3. Evaluate feasibility of and develop as appropriate alternative survey methodologies for measuring abundance and distribution of groundfish. Develop a coastwide survey of rockfish populations in untrawlable areas.

4. Develop methods to assess and manage stocks for which data are not adequate to fit age-structured assessment models.

5. Develop and implement a coastwide multi-state system for electronic recording of fishticket information and fishery logbooks in consistent form.

6. Continue the evaluation of optimum yield (OY) control rules, biological reference points, spawner-recruit relationships and harvest policies used to make decisions about acceptable biological catch and harvest guideline/OY for groundfish.

7. Evaluate protocols and priorities for biological sampling (lengths and ageing structures) to ensure that sufficient data are being collected to support existing stock assessments and proposed new assessments.

8. Derive historical catch estimates which are consistent with the best available information and also consistent across species.

9. Conduct a Management Strategy Evaluation to evaluate the current 40-10 harvest control rule for Pacific whiting.

10. Establish accessible online databases for all data relevant to groundfish stock assessments.

The SSC reviewed the ONMS comments on the Council's Update and Communication of Research and Data Needs Public Review Draft and developed recommendations for how these comments should be incorporated into the Research and Data Needs. The SSC recommendations are provided as Attachment 1.

The SSC reviewed the STT comments on the Council's Update and Communication of Research and

Data Needs Public Review Draft, and concurs with the STT comments except as noted below:

- Item 4.2.2 - Genetic Stock Identification (GSI). The SSC recommends that GSI remain a high research priority in the document but also recognizes the importance of the real-time management issues raised by the STT. To address the latter, the SSC recommends the addition of the following sentence to Section 4.2.2: "There is a research need for finer stock resolution with GSI to align stock identification with management units (such as discrimination between Klamath fall Chinook and Klamath spring Chinook)."
- Item 4.3 – Mass marking. The SSC recommends that the language referring to release mark rates be retained because mass marking is an ongoing management program.
- Item 4.4 – Genetics. The SSC does not recognize that basic escapement monitoring and double index tagging (DIT) are necessarily higher priority than GSI. The DIT recommendation should be added to 4.2.1 Mark Selective Fisheries.
- The SSC supports the remaining bullets recommended by the STT.

SSC Item C.3. Attachment 1:

The SSC reviewed the ONMS comments on the Council's Update and Communication of Research and Data Needs Public Review Draft and developed recommendations for how these comments should be incorporated into the Research and Data Needs.

- 2.1 (p. 5), 3rd bullet: The SSC recommends adding *spawning habitat* to the sentence (but not *habitat models* or *active* spawning habitat).
- 2.2 (p. 6): The SSC has not reviewed the ONMS's suggested reference, and therefore concludes it would not be appropriate to recommend including the reference at this time.
- 2.2 (p. 6), 3rd bullet: The SSC recommends that the Council should consider adding the referenced 'Condition Reports'.
- 2.2 (p. 6), 5th bullet: The SSC recommends adding the following demarcation points: Pt. Reyes, San Francisco Bay, and Cape Alava.
- 2.3 (p. 7), 4th bullet: The SSC does not support adding the ONMS suggestion "ensure that adequate ground-truthing is conducted to test the models." The SSC does not consider full ground-truthing of those models currently feasible.
- 3.2.3 (p. 12), 2nd bullet: The SSC concurs with ONMS suggestion to add reference to collection of fish-association indices as well.
- 3.2.3 (p. 13), 1st bullet: The SSC notes that Section 3.4 Habitat Issues (p. 16-17) and Section 8.3 Essential Fish Habitat (p. 53) already covered this topic (gear damage to biogenic habitats), and does not recommend adding the ONMS suggested language to Section 3.2.3.
- 3.3 (p. 14), 2nd bullet: The bullet referred primarily to accessing raw data, and SSC does not agree with the ONMS recommendation to list the specific web-based programs for posting interpreted findings such as SIMoN.
- 3.4 (p. 16): In the first paragraph of 3.4 Habitat Issues, the SSC recommends adding the specific references for the "anecdotal" study (High 1998) and the "observational" study by the Monterey Bay NMS (Engel and Kvitek 1998). The SSC recommends modifying the first sentence of the 2nd paragraph as follows: "Field studies are needed on the effects of fishing on benthic habitats on the Pacific coast, where these have not yet been implemented."

- 5.1 (p. 27) 1st bullet: The SSC does not see the linkage between the ONMS references and CPS stock assessments; and does not recommend making the ONMS suggested changes.
- 5.2.1 (p. 29) 1st bullet: The ONMS suggestion to include studies of krill on various scales was already covered by 2.3 Emerging Issues for Ecosystem-Based Fisheries Management.
- 8.3 (p. 53), 1st bullet: The SSC recommends modifying the first sentence of this bullet as follows: "Conduct experiments to assess the effects of various fishing gears on specific habitats, including habitat recovery rates, on the west coast and to develop methods to minimize those impacts as appropriate."
- ONMS recommended developing a matrix for issues and needs, cross-cutting FMPs and research topics. The SSC agrees such a matrix would be ultimately useful, but is beyond the scope for this document.

References

Engel, J. and R. Kvitek. 1998. Effects of Otter Trawling on a Benthic Community in Monterey Bay National Marine Sanctuary. Conservation Biology 12:1204-1214

High, W.L. 1998. Observations of a scientist/diver on fishing technology and fisheries biology. NOAA, NMFS, AFSC Processed Report 98-01. 47 p.

Salmon Management

D.1. Salmon Methodology Review

Dr. Robert Kope indicated that reports will be available for three of the five items previously identified for possible review this fall:

1. Sensitivity analysis of Chinook and Coho Fishery Regulation Assessment Models to major assumptions including sensitivity to parameters related to mark-selective fisheries (this will be a preliminary report).

2. Development of a new stock abundance forecast for Sacramento River fall Chinook.

3. Harvest forecast model for Sacramento River fall Chinook.

Reports will not be available for the other two:

4. September 1 maturity boundary ("birth date") for Klamath River fall Chinook.

5. Lower Columbia River natural coho Endangered Species Act consultation standard.

While there is still considerable interest in these last two topics, the Scientific and Statistical Committee (SSC) understands that the emergent nature of the second and third topics placed those at a higher priority. The SSC looks forward to reviewing the reports on the first three topics at the November meeting. As always, the SSC requires good documentation and ample review time to make efficient use of the SSC Salmon Subcommittee's time. Materials to be reviewed should be

submitted at least two weeks prior to the scheduled review. Agencies should be responsible for ensuring that materials submitted to the SSC are technically sound, comprehensive, clearly documented, and identified by author.

D.2. Progress Report on Causes of the 2008 Salmon Failure

The Scientific and Statistical Committee (SSC) reviewed progress of the Scientific Working Group to Evaluate the Decline in Sacramento River Fall Chinook Salmon and Other West Coast Salmon in discussion with Dr. Robert Kope and Mr. Chuck Tracy. The SSC considered the revised list of possible causes and agreed that it was valuable to eliminate as many items as possible. However, the SSC could not evaluate the list as presented because there were no rationales provided for the deleted items. With regard to the remaining items, the SSC is concerned that data may not be available to address all of them. Even for those items with adequate data the working group will be challenged to provide rigorous analyses between now and April. The SSC recommends that the working group consider whether the recent failure was an acute event or the result of a chronic problem, as this will have bearing on the appropriate management response in the event of future failures. For example, if the resilience of the stock has been reduced, this may affect the response of the stock to climate fluctuations or other stressors.

The SSC will review the working group's draft document in April, 2009.

Council Administrative Matters, continued

C.5. Implementation of the Magnuson-Stevens Reauthorization Act

The Scientific and Statistical Committee (SSC) reviewed the proposed rule and received a presentation from Ms. Jennifer Ise in joint session with other advisory bodies. The presentation and ensuing discussion clarified several issues and highlighted other areas where more clarification is needed. The SSC has the following comments regarding the proposed rule.

The rule should more explicitly state that the SSC is a technical advisory panel and does not make policy decisions. Policy decisions are made by the Council. The rule should clarify the role of the SSC in determining acceptable biological catches (ABCs), and the procedures it should follow in recommending ABCs to the Council. It is the SSC's understanding that the SSC will determine, through the assessment process, the overfishing limit and the level of scientific uncertainty. The SSC will then apply an ABC control rule, which has been specified by the Council, to determine the ABC. This ABC will then be recommended to the Council. The Council, rather than the SSC, will determine the adjustment to fishing levels to account for uncertainty. This process will continue the important Council procedure of separating policy from science. This process should be made more explicit in the proposed rule.

The development of ABC control rules will require a collaborative process between the Council and SSC. The role of the SSC should be limited to characterizing the levels and types of uncertainty involved in stock assessments.

The proposed rule should specify in more detail what is meant by "scientific uncertainty." This

should include the types of uncertainty that should be considered. It would also be helpful for the rule to classify types of uncertainty. This would facilitate the development and implementation of control rules. Different control rules could then be used for different types and levels of scientific uncertainty. The SSC notes if a single or simple control rule is followed, stock assessments that use more data and account for more types of uncertainty may be penalized since they will typically show greater uncertainty than simpler models. It is also noted that under the rule, the SSC will be in the role of choosing a preferred model or scenario when more than one is put forward in a stock assessment. This is another type of uncertainty that will need to be resolved, that may fall outside of the ABC control rule.

The term "ecosystem components" as used in the proposed rule can be misleading since its actual use in the rule is limited to species that are included in a fishery management plan, rather than a full set of ecosystem components. The SSC suggests that a more definitive term be used in the proposed rule. The SSC also notes that the inclusion of these other species in determining fishing levels is optional under the proposed rule.

Salmon will not fit easily into the general definitions and procedures in the proposed rule. However, there is flexibility in the rule that allows the Council to propose alternative approaches (see P. 32545 – *Flexibility in application of NS1 guidelines*). Some of our most successful salmon management is based on exploitation rate control rules. The SSC would like confirmation that exploitation rate targets can serve as annual catch limits.

The proposed rule states that the SSC shall provide reports on stock status and health, bycatch, habitat status, social and economic impacts of management measures, and sustainability of fishing practices. The proposed rule should clarify this since the SSC's traditional role has been to review materials for the Council.

Groundfish management

*I.*4. Amendment 22: Open Access License Limitation

The Scientific and Statistical Committee (SSC) was briefed by Mr. L.B. Boydstun on the most recent Draft Environmental Assessment (DEA) for groundfish open access license limitation. SSC suggestions made at the March 2008 meeting have been addressed in this DEA. The SSC considers the DEA to be ready for Council action.

An issue discussed in March was whether to use a revenue- or weight-based approach to defining directed B species trips. Both approaches yield similar results with regard to estimating the number of directed B species vessels (Table B-5, p. 154). The analysis in the DEA is based on the revenue-based approach, which is reasonable and more reflective of targeting behavior than the weight-based approach.

Table 4-1-2 (p. 94) provides useful information regarding how well each alternative meets the objectives of (1) reducing the gap between capacity and resource availability, and (2) providing opportunities for less restrictive regulations and reduced discards. The column entitled "Better

match between fleet and fish?" identifies which alternatives reduce the capacity gap relative to the status quo. The column entitled "Regulation and effort shift relief" describes the percentage of total 2004-2006 B species revenue earned by non-qualifying vessels under each alternative. While this latter column suggests the extent to which loosening of regulations for qualifying vessels may be feasible under each alternative, more definitive evaluation of this issue depends on the harvest allocation between qualifying and non-qualifying vessels, which is not known at this time. The estimates in the column "Personal income economic impact" are based on the implicit assumption that the revenues earned by non-qualifying vessels would somehow be lost. Given the likelihood that all available harvest would continue to be taken by qualifying vessels (as target species) or by non-qualifying vessels (as bycatch), negative income impacts are not likely to occur in the aggregate.

Personal income impacts are more appropriately considered in terms of how such impacts are distributed among geographic areas and vessel target species categories. A number of tables in the DEA describe the distributional implications of the alternatives (in terms of income impacts and other factors) - e.g., number of qualifying vessels by port group and state (Tables E-5 to E-8, pp. 182-185), landings by port group and state (Tables E-12a to E-12b, pp. 192-193), revenue and income impacts by vessel target species category and state (Tables E-17 to E-22, pp. 203-210).

A limited entry program is a useful but not fully effective way to manage capacity and is best accompanied by additional measures to discourage capacity expansion. For instance, vessel landings limits may discourage capacity expansion by individual permit holders. Length endorsements may discourage the tendency to transfer permits from smaller to larger boats. It is not clear whether this new limited entry program is an end in itself or a prelude to a market-based system of harvest allocation. While perhaps more costly to implement, market-based systems also have more effective, built-in incentives to control capacity.

Groundfish management, continued

I.5. Stock Assessment Planning for 2011-2012 Groundfish Fishery Decision Making

The Scientific and Statistical Committee (SSC) considered whether a full assessment should be conducted for bronzespotted or greenspotted rockfish. The SSC was provided with a summary of the available data and potential analysis methods for these two species. An assessment of either species will provide information which should be useful for management. However, noting that more data, in particular survey data, are available for greenspotted rockfish and that currently available data indicate changes in fishery length-compositions between the 1980s and 2000s, the SSC recommends that a full assessment of greenspotted rockfish be conducted in 2009.

The SSC identified chairs for each of the six STAR Panels that will take place during 2009, including that for Pacific whiting. Whether a Pacific Council-sponsored Pacific whiting STAR Panel will be needed is currently unclear. The SSC recommends that the assessment of greenspotted rockfish be reviewed at the April 27-May 1 STAR Panel and that the assessment of cabezon be reviewed at the July 27-31 STAR Panel. These changes are needed to avoid conflicts of interest for STAR Panel chairs, and may lead to changes to where each STAR Panel will take place.

The SSC emphasizes that STAR Panels involve a large workload, in particular because of the need to

review complex technical analyses. Thorough review of the material presented at STAR Panels and hence compliance with the Groundfish Stock Assessment Terms of Reference requires that a sufficient number of reviewers be available. Based on its experience with previous STAR panels, the SSC recommends replacing the first two sentences of the 3rd paragraph of page 6 of the Groundfish Stock Assessment Terms of Reference with "In most circumstances a STAR Panel will include a chair appointed from the SSC's groundfish subcommittee and three other experienced stock assessment analysts. Of these three other members, at least one should be familiar with west coast groundfish stock assessment practices and at least one should be appointed from the Center for Independent Experts (CIE)." The SSC recognizes that there are costs associated with identifying reviewers and will work with the Council and NMFS Staff to identify suitably qualified reviewers for STAR Panels, while minimizing costs.

The SSC reviewed the draft text on Data Reports (Agenda Item I.5.a, Attachment 2) and endorses the draft language except for the final sentence. The SSC recommends that this sentence be replaced by "The current harvest control rule cannot be applied using the results from a Data Report. However, these results can be used for management decision making. For example, a Data Report could provide information on the trend in abundance and hence changes from *status quo* management. A key section of the Data Report is that on research needed to improve the assessment. Highlighting research priorities in a Data Report should increase the likelihood that future stocks assessments will satisfy the Groundfish Stock Assessment Terms of Reference."

The SSC was informed that Council Staff intend to modify the Groundfish Stock Assessment Terms of Reference to reflect increased involvement of Council Staff in STAR Panels. Specifically, a Council staff member will attend all STAR Panel meetings and provide guidance to assessment authors on what is needed for draft assessments to comply with the Terms of Reference for Groundfish Stock Assessments.

The SSC endorses these proposed modifications.

Revised proposed 2009 STAR Panel

Panel	Dates	Location	Spp1	Spp2	Chair
Whiting Treaty ?	*Feb. 3-6*	*Seattle*	*Pacific Whiting*	*NA*	*Sampson*
1	*April 27-May 1*	*Newport**	*Greenspotted rf*	*Spiny dogfish*	*Hamel*
2	*May 4-8*	*Seattle*	*Petrale sole*	*Splitnose rf*	*Dorn*
Updates	*June 6-13*	*WOC*	*POP, Darkblotched rf*	*Canary rf, Cowcod*	
3	*July 13-17*	*Santa Cruz*	*Bocaccio*	*Widow*	*Punt*
4	*July 27-31*	*Santa Cruz**	*Lingcod*	*Cabezon*	*Wespestad*
5	*Aug 10-14*	*Seattle*	*Yelloweye rf*	*Greenstriped rf*	*Ralston*
MopUp	*Sept 28-Oct 1*	*Seattle*	*TBD*	*TBD*	

- *may change*

Adjournment: The SSC adjourned at approximately 12:00 p.m., Monday June 9, 2008.

SSC Subcommittee Assignments, September 2008

Salmon	Groundfish	CPS	HMS	Economic	Ecosystem-Based Management
Pete Lawson	**Martin Dorn**	**Tom Helser**	**Ray Conser**	**Cindy Thomson**	**Selina Heppell**
Robert Conrad	Ray Conser	Tom Barnes	Tom Barnes	Todd Lee	Tom Barnes
Owen Hamel	Owen Hamel	Ray Conser	Robert Conrad	David Sampson	Martin Dorn
Charlie Petrosky	Tom Helser	André Punt	Selina Heppell		Pete Lawson
David Sampson	André Punt	Steve Ralston	André Punt		Todd Lee
Shizhen Wang	Steve Ralston		Vidar Wespestad		André Punt
	David Sampson				Steve Ralston
	Vidar Wespestad				Cindy Thomson

Bold denotes Subcommittee Chairperson

PFMC
10/15/08