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April 6, 2011

Mr. Rick Robins, Chairman
Executive Committee
Mid-Atlantic Fishery Management Council
Suite 201
800 N. State St
Dover, DE 19901

Re: Ecological Considerations in 2012 Specifications

Dear Mr. Robins and Members of the Executive Committee,

The National Coalition for Marine Conservation (NCMC) is encouraged to see the topic of ecosystem-based fisheries management goals and objectives on the Executive Committee's agenda for its meeting on April 14th. So far, discussions regarding 2012 specifications for squid, mackerel, and butterfish have centered on the Industry Performance Report and a process for soliciting input from the Social and Economic Subcommittee of the SSC. We agree that input of this nature is important to the specifications process, but the Council must also address *ecological considerations* in specifications, as it committed to doing in the ACL/AM Omnibus Amendment.[1] Ecological factors should be considered with input from the SSC Ecosystems Subcommittee (ESC). **We ask the Executive Committee to provide clear guidance to the Council on the inclusion of ecosystem information and ecological considerations in the 2012 specifications package. This guidance should also describe a process for this information to be developed and considered. We offer the following recommendations for 2012 specifications:**

1. **Develop an Ecosystem Chapter for the Specifications Document/s.**

   The Council is required to annually prepare a Stock Assessment and Fishery Evaluation (SAFE) Report, which can be a single document or series of documents that provide a summary of the best scientific information available for use in determining harvest levels from each stock.[2] In other words, a SAFE report is the primary tool for informing quota-setting and should be prepared and distributed before ABC, ACL and ACT deliberations. The SAFE report must include a summary of information regarding the current and future condition of marine ecosystems in the fishery management unit (FMU).[3] For example, the Pacific Fishery Management Council's SAFE report for its Coastal Pelagic Species Plan[4] (Pacific and jack mackerel, Pacific sardine, market squid, and northern anchovy) features an "Ecosystems Considerations" chapter which provides a detailed description of the large marine ecosystem in which the fisheries operate, current climate and

[1] The ACL/AM Omnibus Amendment specifies that ecological factors will be reviewed and addressed in the determination of annual catch targets (ACTs) for mackerel and butterfish.

[2] 50 CFR § 600.315(e)(1)(ii)

[3] 50 CFR § 600.315(e)(1)

[4] See, http://www.pcouncil.org/wp-content/uploads/2010_CPS_SAFE_Text_Final.pdf

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oceanographic conditions, and trends in ecosystem indicators. For forage fish, recommended[5] ecosystem indicators include:

- Physical environment
- Habitat
- Nutrients, plankton and productivity
- Major fish, bird, and marine mammal predators
- Biological community and species indicators (e.g., other key forage fish not otherwise included in the FMP)

The Pacific Council's recent discussions about its emerging Ecosystem Fishery Management Plan include developing an ecosystem status indicator using forage fish abundance because they are a key component of the ecosystem as well as essential fish habitat (EFH).[6]

2. **Describe the role of the ESC in providing ecological advice to be considered in the determination of ABC.**

The ESC's second term of reference (TOR) is to "identify and describe scientific advice that the Council could use to address and incorporate ecosystem structure and function in its fishery management plans (FMPs) and *quota specification process* (emphasis added) to ensure that the Council's management practices effectively account for ecological sustainability." To satisfy this important TOR, we recommend that the ESC convene, prior to the meeting of the full SSC, to develop ecological advice on ABCs for mackerel, squid, and butterfish. In providing ecological input, the ESC should:

- **Review the ecosystem and ABC considerations provided by the stock assessment teams and suggest how to incorporate this information in ABCs.** For example, in the recent *Loligo* assessment (SAW 51), ecosystem and ABC considerations are concisely summarized. The summaries include a discussion of the very high natural mortality of *Loligo*, especially for spawners. The assessment team recommends considering the ecological importance of *Loligo* as prey for a wide range of species, using knowledge about predator consumption as a basis for allocating squid production between humans and other predators.
- **Characterize uncertainty relating to natural mortality estimates used in the assessment models.** Recently published scientific papers, produced by scientists from the Northeast Fisheries Science Center, have explored stock assessment models for a number of forage fish, including Atlantic mackerel and *Loligo* squid, that separate out predation mortality (i.e., M2) from other sources of natural mortality.[7] Scientists found that biological reference points that underestimate natural mortality of forage fish and assume it to be constant through time result in management advice that is overly optimistic and could lead to biomass declines in both target species and dependent predators.[8]
- **Evaluate the stock assessment models used to provide management advice in terms of their ability to fully capture ecosystem information and predator needs. This evaluation should be available to the Council to inform ACT recommendations.** Variables typically not captured in traditional assessment models include trends in the physical environment that

[5] Koepcke, Jennifer M. Ecosystem-based Management of West Coast Forage Species: Recommendations on how to improve the management and conservation of forage species in the California Current ecosystem. PRBO Conservation Science. January 2009.

[6] See Pacific Fishery Management Council March 2011 meeting minutes; discussion under agenda item J, Ecosystem Based Management.

[7] See, Moustahfid, H., Overholtz, W.J., Link, J.S., Tyrrell, M.C. 2009. The advantage of explicitly incorporating predation mortality into age-structured stock assessment models: an application for Northwest Atlantic mackerel. ICES J. Mar. Sci. 66 (3), 445–454; and also, Moustahfid, H., Tyrrell, M.C., Link, J.S., 2009. Accounting explicitly for predation mortality in surplus production models: an application to longfin squid (*Loligo pealeii*). N. Am. J. Fish. Manage. 29, 1555–1566.

[8] Tyrrell, M.C., Link, J.S., Moustahfid, H. 2011. The importance of including predation in fish population models: Implications for biological reference points. Fisheries Research 108 (2011) 1–8.

greatly impact forage fish productivity and trends in other prey and predator populations that influence consumption. It is important that these trends be captured in the SAFE report's ecosystem information. (See recommendation above.) Additional predator-need variables not captured in assessment models include prey density for optimal foraging efficiency, energetic needs, and temporal and spatial foraging requirements (i.e., availability to predators).

3. **In support of implementation of the ACL/AM Omnibus Amendment, develop ACT guidance that clarifies how ecological factors will be addressed and incorporated into management advice.**

   In specifying optimum yield (OY) for forage fish, according to the National Standard 1 Guidelines, councils are to provide adequate forage for all components of the ecosystem.[9] To achieve OY, ecological factors that should be taken into account include impacts on the forage stocks and on predator-prey interactions. These factors are to be "quantified and reviewed in historical, short-term and long-term contexts. Even where quantification of…ecological factors is not possible, the FMP still must address them in its OY specification."[10] To effectively incorporate ecological factors not addressed in the specification of ABC, NCMC recommends that the Council (in conjunction with its Monitoring Committee):

   - **Work with the ESC to:**
     - **Establish a clear ecosystem level goal for squid, mackerel, and butterfish abundance;[11] and,**
     - **Determine to what degree ecological information not captured by the stock assessments was accounted for in the final ABC recommendation, with emphasis on predator needs.**
   - **Review the ecosystem status indicators contained in the Ecosystems Chapter of the specifications document. Determine how current trends may impact squid, mackerel, or butterfish populations; and,**
   - **If necessary, include an appropriate buffer that addresses management uncertainty in providing adequate forage and that achieves ecosystem level goals for abundance.**

Thank you for considering our recommendations. We are appreciative of the Council's efforts to advance ecosystem-based principles and practices and look forward to our continued work together to develop and implement short and long term goals.

Sincerely,

Pam Lyons Gromen
Executive Director

cc: Dr. Chris Moore, MAFMC Executive Director
Jason Didden, Fishery Management Specialist

[9] 50 CFR § 600.310(e)(3)(iii)(c)

[10] 50 CFR § 600.310(3)(iv)

[11] NS1 Guidelines recommend that "consideration should be given to managing forage stocks for higher biomass than B_{MSY} to enhance and protect the marine ecosystem." [50 CFR § 600.310(e)(3)(iv)(C)]