

# Research Priorities and Recommendations to Support Interjurisdictional Fisheries Management

## SUMMER FLOUNDER

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### Fishery-Dependent Priorities

#### *High*

- Develop a program to annually sample the length and age frequency of summer flounder discards from the recreational fishery.
- Collect and evaluate information on the reporting accuracy of recreational discard estimates in the recreational fishery.
- Conduct more comprehensive collection of otoliths, for all components of the catch-at-age matrix, on a continuing basis for fish larger than 60 cm (~7 years). The collection of otoliths and the proportion at sex for all of the catch components could provide a better indicator of stock productivity.
- Develop a reference collection of summer flounder scales and otoliths to facilitate future quality control of summer flounder production ageing. In addition, a comparison study between scales and otoliths as ageing structures for summer flounder should be completed.<sup>1</sup>
- Examine mesh selectivity patterns for a range of commonly used mesh sizes greater than the currently mandated sizes (5.5 Diamond/6 inch square).<sup>2</sup>
- Continue to collect and analyze age-length samples and CPUE data from the commercial and recreational fisheries throughout the range of summer flounder.

#### *Moderate*

- Research directed at evaluating the mesh exemption program should be continued, with increased sample sizes to allow reliable statistical testing of results.
- Use NEFSC fishery observer age-length keys for 1994 and later years (as they become available) to supplement NEFSC survey data in ageing the commercial fishery discard.
- Undertake research to determine hooking mortality on summer flounder by circle, kahle, and regular “J” hooks and make the results of work already completed available to the Management Board.

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<sup>1</sup> The SDWG reported that an exchange of aging structures between NEFSC and NCDMF was completed and a report was reviewed by the 2007 SDWG, in response to a 2005 SAW 41 high priority Research Recommendation. The SDWG noted that while the Fall 2006 ageing exchange between NC-DMF and the NEFSC indicated that the current level of ageing consistency between NC and NEFSC is acceptable, there is a need to conduct and fund these exchanges more frequently, on a schedule consistent with benchmark assessments.

<sup>2</sup> This research should only be a high priority if managers want to change the commercial minimum size. This research should wait until changes in minimum size are anticipated so outdated research does not have to be updated.

- Collect data to determine the sex ratio for all of the catch components.
- Develop fish excluder devices to reduce bycatch of immature flatfish in fisheries that target species other than flounder.

### **Fishery-Independent Priorities**

#### ***High***

- Collect information on overall fecundity for the stock, both egg condition and production, as a better indicator of stock productivity.<sup>3</sup>
- Continue fishery-independent surveys and expand existing surveys to capture all sizes and age classes in order to develop independent catch-at-age and CPUE should focus on YOY and the southern region.

### **Modeling / Quantitative Priorities**

#### ***High***

- Investigate trends in sex ratios and mean lengths and weights of summer flounder in state agency and federal survey catches.

#### ***Low***

- Examine the sensitivity of the summer flounder assessment to the various unit stock hypotheses and evaluate spatial aspects of the stock to facilitate sex and spatially explicit modeling of summer flounder.<sup>4</sup>

### **Life History, Biological, and Habitat Priorities**

#### ***Moderate***

- Develop or determine stock identification methods via meristics, morphometrics, biochemical research, and tagging (particularly off Virginia and North Carolina).

#### ***Low***

- Evaluate effects of dissolved oxygen and water current requirements for adult summer flounder and summer flounder eggs.
- Evaluate the relationship between recruitment of summer flounder to nursery areas and Ekman transport or prevailing directions of water flow.
- Examine male female ratio at age 0 and potential factors (e.g., environmental) that may influence determination of that ratio.
- Conduct the basic research necessary to develop land and pen culture techniques.

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<sup>3</sup> The SDWG noted that observed change in the sex ratio in NEFSC survey samples may result in the SSB estimates not translating as directly to egg production since there are more males proportionally in those older age categories. While these trends have not been examined in the state survey catches, these trends were examined in the NEFSC spring, autumn, and winter survey data. Additional work to examine and explain these trends in greater detail should be conducted.

<sup>4</sup> Current ASAP model lacks the capability to do sex and spatial modeling, so Stock Synthesis version of this approach (e.g., M. Maunder 2008 SAW 47 work) would be necessary. Above all, there is a lack of sufficient time series data to sex all catch and surveys, and lack of information on spatial movement and/or recruitment patterns.

- Conduct further research to examine the predator-prey interactions of summer flounder and other species, including food habitat studies, to better understand the influence of these other factors on the summer flounder population.

### **Management, Law Enforcement, and Socioeconomic Priorities**

#### *Moderate*

- Consider use of MSE techniques to address the implications of harvest policies that incorporate consideration of retrospective patterns (see ICES Journal of Marine Science issue of May 2007).
- Conduct a detailed socioeconomic study of the summer flounder fisheries.