

**Caribbean Fishery Management Council**  
**Scientific and Statistical Committee**  
***Caribbean Fisheries Data Improvement Project - Recommendations***  
Miami, Florida  
March 2 - 4, 2010

The following recommendations are based on a series of talks presented at the meeting, on the resulting discussion sessions and on supporting material sent to the SSC via email.

**FISHERY DEPENDENT SAMPLING**

**General Recommendations**

The SSC recognizes that the optimal management of the U.S. Caribbean fishery resources relies heavily on both fishery dependent and fishery independent data. While the type of data needed for management is important, validation of the data is also paramount. As such, the SSC recommends that the Caribbean Commercial Data Improvement Project (i.e., the MRAG project) be carried to completion and that it serve as the basis for implementing a commercial fishing monitoring program.

The SSC also recognizes that many aspects associated with commercial fishing activities in the U.S. Caribbean approximate those of the recreational fishing sector. Hence, any developed sampling framework to collect needed commercial fishing data may share common properties with that needed to collect the relevant recreational data.

In order to achieve the general goal of enhancing the quantity and quality of data used in the management process, it is the opinion of the SSC that the following specific recommendations also be considered:

**Specific Recommendations**

1. Improving the quality of trip ticket data increases the reliability of any stock assessment. Therefore we believe that for adequately determining the status and trends of US Caribbean fish stocks it is necessary that the CDRs both for Puerto Rico and the USVI be improved to include the necessary additional biological (e.g. landing by species within the USVI) and physical data as discussed earlier in this meeting (e.g., to reduce current 50% unreported catch for Puerto Rico). The SSC also recommends that priority species be based on commercial importance, ecological importance, and representation by gear.
2. The SSC recognizes that recreational data are critical for stock assessments and efforts should be made to develop an appropriate recreational data collection system. Effort should be commensurate with catch by the recreational sector.
3. In order to have uniformity and consistency in the US Caribbean commercial report process, both PR-CCRs and USVI-CCRs should consist of the same template, understanding that there will be variations in language, species composition, location and others.

4. Develop a detail aerial survey plan to validate HIGH (Wednesday-Friday) and LOW (Sunday) fishing periods. This will be important for the port sampler to know. And to determine areas of high and low fishing intensity. This aerial survey, in conjunction with port sampling, should be viewed as an alternative long-run method for collecting fishery dependent data.
5. With the GPS location data, correlate known spawning grounds with the spatial distribution of fishing vessels (clustered vs random).
6. Lay GIS layer of fishing vessels locations over NOAA's Biogeography Maps for habitat type, over Environmental Sensitivity Index Map for relation between wildlife and protected resources and fishing locations, and over NOAA's Navigation charts for information of depths.
7. Port samplers should increase the percent of the catch assessed from 3-5% in Puerto Rico and from 1-2% in the USVI. Fishers as well as pertinent fish buyers should be adequately trained in fish taxonomy and metrics to increase the accuracy and reliability of the commercial reports. Biological sampling should be enhance to obtain adequate data on maturity and length and age and length at harvest (for both the commercial and recreational harvest).
8. Consider the use of incentives to encourage (coerce) fishermen to provide the requested information on the trip tickets in the most accurate way. This incentive can complement increased education with the fishing community of the role of trip tickets in the fishery management process.
9. Photo documentation of catch, boat, gear and other relevant information by port agents should be considered.

#### **FISHERY INDEPENDENT SURVEYS**

Todd Gedamke presented a plan for an initial fishery independent survey to be conducted at St. Croix. The survey is meant to be a proof of concept, and the high sampling rate is meant to generate sufficient data to plan adequate sampling for future applications. The plan is based on using fish traps as the sampling unit and will be conducted in a cooperative manner with local fishermen.

The SSC found the initiative well justified and well planned, although some aspects such as trap design and deployment have not been finalized.

The SSC supports this effort and recommends the agency provide adequate support to field implementation of this project to completion.

The SSC also recommends that some thought be given to the technical issues of how this approach might be scaled up for practical application elsewhere, i.e., is the current plan being design in a manner that can be implemented in other areas. One particular issue is the allocation of sampling sites (wide dispersal versus clustered in sub-areas).

The SSC also recommends that the proof of concept survey allocate samples in such manner to avoid confounding spatial and lunar-cycle effects.

Once Gedamke's trap project is completed, the SSC should review the report and determine if the SEAMAP sampling protocol should be modified based in order to continue the sampling on an annual basis.

#### **USE OF MARINE RESERVES FOR ASSESSMENT**

A brief overview of Alec McCall's presentation was given by Todd Gedamke, reviewing ongoing work on how to use closed areas for assessment purposes.

The SSC saw promise in this approach, but identified several constraints to be considered. This included the effectiveness of enforcement of closed areas, the role of habitat and reserve location, the availability of spawning stock (for recruitment) for now rare species, and the duration of the closure relative to the life span of target species.

The question was raised if the CFMC should pursue designing a series of marine reserves for management purposes. The SSC is supportive of this approach, but recommends that this not be undertaken without explicit buy-in by the local agencies, since such reserves would be within their jurisdiction and involve substantial efforts to implement.

Given that there already exist several closed areas within the US Caribbean, the SSC strongly recommends that the status of these reserves relative to fish densities and size structure (relative to reserve purpose) be reviewed and presented to the Council at a 2-day meeting. Areas to be considered include, but are not restricted to, Mona and Desecheo Islands, Tres Palmas, the three Red Hind closures of western Puerto Rico, the Buck Island and Virgin Islands Coral Reef National Monuments, the Marine Conservation District, the spawning sites at Grammanik Bank, Lang Bank and St. Croix mutton snapper site, St. John National Park, the St. Croix East End Marine Park and the St. James and Mangrove Lagoon Marine Reserves on St. Thomas.

#### **OTHER RESEARCH AND MONITORING**

**Life History Studies:** The SSC recommends that more emphasis be given to basic life-history studies, especially focusing on longevity, growth and maturation. The former two will require access to sites with older individuals. Otolith work was identified as the most promising approach for these. Emphasis should be given to species for which such information is lacking. A summary table of available life-history information should be prepared to guide future research efforts.

**Socioeconomic Information:** The SSC identified a need for more socio-economic data and specifically recommends two studies: (1) Behavioral analysis to determine the factors affecting catch levels by fishermen, and (2) A study of the factors determining price structures.

**Spawning Aggregations:** Spawning aggregations of snappers and groupers were identified areas of specific interest and that studies be continued to locate and assess spawning populations.

**Capacity Building:** Develop a broader conceptual approach for capacity building (based on the 2007 NAS Ocean Studies Board Report).

**Integration of fishery monitoring programs:** The SSC noted that there are ongoing projects to improve monitoring of US Caribbean commercial fisheries, recreational fisheries, and highly migratory species fisheries. It appears that these projects are being planned and carried out separately, although they face similar challenges and there is overlap in fishery participants and the fish stocks in the three types of fisheries. In particular, small scale commercial fisheries in the Caribbean have similarities to recreational fisheries, and sampling methods being developed for both recreational fisheries might be applicable to small scale commercial fisheries.

The SSC recommends that the organizations responsible for monitoring Caribbean fisheries work together to integrate monitoring programs.

#### **OFFICE OF PROTECTED RESOURCES PRESENTATION**

**Indirect effect of fisheries on endangered coral species:** Several individual members of the SSC have extensive knowledge of the scientific literature on the indirect effects of herbivores fisheries on the health of corals. Overfishing is probably one of several factors adversely affecting corals. Its relative importance is hard to assess, and it probably varies between reefs.

Since some coral species in the jurisdiction of the CFMC are listed as endangered, the CFMC should consider the impact of fisheries on these species. This issue was brought to the attention of the CFMC by the Protected Resources Division of the SERO. Specifically, the Division representative cited literature on the importance of grazing by parrotfish. However, this is a complex matter from a scientific point of view such that it is not appropriate to react to a superficial review of a few scientific papers. In this regard, the SSC offers the following comments:

1. The indirect impact of fisheries on corals is a much broader issue than the ACL on parrotfish currently under consideration. There are many other grazers, and fisheries on all trophic levels are potentially important because of trophic cascades.
2. With coral reefs under more stress and showing signs of deterioration worldwide, the indirect impact of fisheries on today's and potentially future endangered coral species is certain to be an increasingly serious issue for fisheries management. Taking account of indirect trophic impacts of fisheries is more complex scientifically than the more common direct impacts (e.g., through bycatch) that have been addressed in other fisheries. Stellar sea lions are a notable example of the complexity of taking into account the trophic relationship between fisheries and an endangered species.

3. The SSC cannot be expected to assemble and analyze all of the relevant scientific literature on the relationship between fisheries and coral health. The Agency should be responsible for this task using its own scientists or through arrangements with non-agency experts.
4. A critical question that must be addressed is “how much fishing is ok?” The literature highlights potential problems of overfishing. The MSFCMA already forbids overfishing. If fisheries management complies with MSFCMA, is the impact on healthy corals acceptable? Is this level of fishing acceptable for endangered species of corals or is even less fishing necessary? These are complex scientific issues and it is unreasonable to expect fishery management councils to know the answers without an objective, authoritative scientific synthesis that gives practical guidance.
5. The scientific basis for decisions on how fisheries should be managed to comply with endangered coral considerations should be subject to the same type of scientific transparency, inclusiveness, and peer review as the other science that is considered in support of fisheries management. The science that supports fisheries management is usually assembled by open workshops that have direct access to data. It is also reviewed by SSCs.