
Appendix IV

ATLANTIC SHARKS: EXECUTIVE SUMMARY OF THE 1998 SHARK EVALUATION WORKSHOP

This report was prepared in support of the Atlantic Shark Fishery Management Plan to provide an update on the status of shark resources in waters off the U.S. Atlantic and Gulf of Mexico coasts. To that end a Shark Evaluation Workshop (SEW) was held at the Southeast Fisheries Science Center, Panama City Facility, June 22 to 26, 1998. The 1998 Workshop focused on the large coastal shark grouping. The Workshop format was a mechanism for the National Marine Fisheries Service (NMFS) to obtain input into the process of scientific evaluation of shark status. This Report represents a summary and conclusions derived from analyses, which were largely the basis of discussions at the Workshop. However, this Report is a product of the scientific evaluation process of NMFS; and while every effort was made to consider the scientific viewpoints that were discussed at the Workshop, ultimately the Report represents the balancing of scientific views by NMFS and is not necessarily a consensus of those participating in the Workshop.

The 1996 SEW report had concluded that catch rates of many of the species and species groups declined by about 50 to 75 percent from the early 1970s to the mid-1980s, but that the rapid rate of decline that characterized the stocks in the early 1980's had slowed significantly in the 1990s. Partially based on results from the 1996 SEW report, a target of a 50-percent reduction in large coastal catch (relative to 1995) was selected. This was to be achieved through a 50-percent reduction in the commercial quota and through a reduction to a two fish bag limit in the recreational sector. The 1997 data indicated that commercial catches were, indeed, reduced relative to 1995 by more than 50 percent in numbers. However, recreational catches were reduced by only 12 percent. The recreational catch in numbers in 1997 was estimated to be greater than the commercial catches.

The most recent catch rate data corresponding to 1996 and 1997 continue to show inconsistent trends either upward or downward, and many of these trends are statistically insignificant. However, this is expected: although the fishery has now been regulated for five years, given that the expected rates of change in shark abundance are low and that the measures of stock abundance used are uncertain, a longer time series of catch rate estimates will be required to detect significant changes in stock size since implementation of the most recent management measures.

For large coastal catch rate indices covering the recent period (1993 to 1997, since the advent of the FMP), three of seven indices exhibit negative slopes (two statistically significant) and four indicate positive slopes (one significant). The largest annual rate of increase from these indices during this period was 17 percent, while the largest decrease was 29 percent. For sandbar during the period 1993 to 1997, four of five indices exhibit positive slopes (one significant) and only one showed a negative slope (not significant). The largest annual rate of increase from these

sandbar indices during this period was 37 percent, while the only one exhibiting a negative slope, decreased at one percent annually. For blacktip during the period 1993 to 1997, two of the five indices exhibit positive slopes and three indicate negative slopes. One of the positive slope indices and one of the negative slope indices were significant. The annual rate of change from these blacktip indices ranged from 34 percent to 19 percent.

Production model analyses utilizing catch, catch rate and demographic data were integrated using Bayesian statistical techniques. For the large coastal aggregation: current (1998) stock size was estimated to be between 30 and 36 percent of maximum sustainable yields (MSY) levels, and 1997 catch was estimated to be 218 to 233 percent of MSY (the ranges are defined by the mean values from two alternative catch scenarios). When analyses were disaggregated into sandbar and blacktip sharks, then for sandbar current stock size was estimated to be between 58 and 70 percent of MSY levels, and 1997 catch was estimated to be 85 to 134 percent of MSY. For blacktip, current stock size was estimated to be between 44 and 50 percent of MSY levels, and 1997 catch was estimated to be 163 to 184 percent of MSY. Thus, projections indicated that the large coastal aggregate complex might still require additional reductions in effective fishing mortality rate in order to ensure increases of this resource toward MSY. For the blacktip shark, projections also indicated a need for additional reductions, but it is unclear whether reductions in the U.S. alone would achieve the intended goals. Projections for sandbar were more optimistic, suggesting that current catches are closer to replacement levels.

On the basis of recent life history analyses of the sandbar shark showing that large juvenile and subadult individuals are likely to be the most sensitive stages in this species, it was concluded that management approaches should be aimed at reducing fishing mortality in these stages. A minimum size limit of about 140 cm fork length on the “sandbar-like” ridgeback sharks was identified as a possible strategy to reduce mortality in juvenile and subadult stages of sandbar sharks. Additionally, using similar life history arguments, a minimum size was also suggested for the “blacktip-like” non-ridgeback sharks as a strategy for reducing fishing mortality. However, in the case of blacktip, it is expected that a commercial minimum size might not achieve desired results due to mortality of undersized blacktips during normal fishing operations.

Although the lack of data do not allow modeling analyses for dusky sharks, this species has exhibited a low frequency of occurrence in recent periods and has a life history that is especially susceptible to overfishing. Therefore, dusky sharks may warrant special concern.

To continue improving shark stock assessments, the need for continued collection of species- and size-specific catch (landed and discarded, U.S. and non-U.S.) and effort data and fishery-independent measures of shark abundance and productivity was recognized. While notable improvements in species-specific catch information have been made for a portion of the recent catches through observer data collections and several fishery-independent measures of abundance, improved assessment advice will only result if these efforts are maintained and increased.

Every effort should be made to manage species separately. New analyses indicate that individual species are responding differently to exploitation (as was suspected in previous SEW Reports). Management of large coastal aggregates can result in excessive regulation on some

species and excessive risk of overfishing on others.