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STRATEGIC INVESTMENTS IN LARGE PELAGIC RESEARCH

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The Southeast Fisheries Science Center (SEFSC) of the US NOAA Fisheries provides much of the US science advice for the management of Highly Migratory Species (HMS) in the Atlantic, Gulf of Mexico and US Caribbean Sea. These stocks include the tunas, sharks, billfishes and swordfish all of which are targeted either commercially or recreationally or both in US waters. These species are managed internationally through membership to the International Commission for the Conservation of Atlantic Tunas (ICCAT); however, while the US is an ICCAT member, few Caribbean nations are members. According to ICCAT (2006), both blue and white marlin are overfished and undergoing overfishing; western Atlantic sailfish are undergoing overfishing and fully exploited; western Atlantic Bluefin tuna are overfished and undergoing overfishing; north Atlantic swordfish are no longer undergoing overfishing and are rebuilding; and Atlantic yellowfin tuna are neither undergoing overfishing nor are overfished.

The commercial ex-vessel value and recreational value continue to provide sufficient incentive for exploitation. For example, the ex-vessel value for tuna and swordfish steaks in 2003 and 2004 was US\$22,000,000 and US\$16,000,000, respectively. In Puerto Rico, the estimated value of recreational billfish fishing in 1994 was estimated at US\$44,000,000 per year. A 1999 study (Sutton et al. 1999) estimated that for the US Gulf of Mexico, the charter boat industry produced 1000 jobs and total economic output of US\$45,000,000 per year. This study also identified HMS as the most sought after species by the Gulf of Mexico charter boat industry. The billfishes are highly prized recreational targets globally, yet there is a lack of understanding of much of their life history. In 2000, the SEFSC first developed an "Atlantic Billfish Research Plan" currently in version 4 and revised in 2004. The objective of the plan was to provide guidance on research priorities to reduce uncertainty in ongoing stock assessments to improve the biological basis for management and rebuild the stocks. This plan prioritized information needs as: biology and ecology, including age and growth, fecundity, species identification and stock structure; analytical methodology and tool development and implementation; and fishery research including gear solutions to minimizing bycatch. As a result of this plan, increasing investments in funding of applied research began in 2002 and with an increasing number of research partners and collaborators. One measure of increasing the

body of knowledge on which to base management is the number of publications resulting from these increases in investment. From 2004 to 2006, the number of publications specific to billfish life history, ecology, and potential impacts from fishing increased from less than 5 to 8 in 2005 and to 23 in 2006. Continued investments into research organized around a working hypothesis will progress towards improving the science advice and basis for management world wide.

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