A Review of Recreational Shark Fisheries in Southern California

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**Introduction**
Globally, fisheries have a profound impact on both population and community dynamics in marine systems. Traditionally, research and management have focused on understanding and minimizing the effects of commercial fishing. Though often overlooked, recreational fisheries can also have large impacts on natural systems. These impacts include direct affects (i.e. reductions of targeted stocks, bycatch, and pollution) as well as indirect effects (i.e. trophic cascades and ghost fishing).

There are a number of reasons that the effects of recreational fisheries have been overlooked:

- It’s an open access and dispersed fishery
- Because recreational fishers are dispersed, cumulative effects are less apparent
- It has a strong community voice and political lobby
- Many researchers and policy makers are a part of the recreational fishing community, so there may be conflicts of interest

**Why is it important to monitor, study, and manage recreational fisheries?**
- For some species and in some areas, recreational fisheries may be having a larger impact than commercial fisheries
- Sometimes recreational fisheries target a different age or sex class than commercial fisheries. Therefore, data and samples can be obtained that would be unlikely through commercial surveys
- These programs provide unequalled access to fisher knowledge and provide the opportunity to engage anglers in research efforts

**How are elasmobranchs affected by recreational fisheries?**
- They are caught by leisure, tournament, and big game fishermen
- Recreational fishermen can access coastal nursery areas untouched by commercial operations
- Recreational fishers have the technology to target adult pelagic sharks that are generally excluded by commercial gear
- Preliminary analysis (Box 1 and 2) suggests that recreational fishermen in Southern California are landing adult female thresher and mako sharks, which are not taken in commercial fisheries or scientific surveys in the region. This difference in size class of individuals landed may have an effect on population stock status that would be overlooked by considering only commercial catch.

**Box 1: Preliminary findings of mako sharks in Southern California fisheries**

*Lessons to guide a Southern California Recreational Shark Fishery Monitoring program*

Monitoring programs from other regions (East Coast of U.S., Canada, Australia, and New Zealand) provide important examples of the components of a successful recreational fishery monitoring program:

- Use multiple surveys (telephone, questionnaire, tournament, diaries, stockings surveys) because recreational fisheries are diverse and the data available from each survey type are limited
- Design data collection based on potential analyses (i.e. stock assessments) in order to account for variability in fishing and survey effort
- Catch data is a function of fisherman distribution as well as fish density and distribution so fisher behavior must be accounted for in any fisheries models. These models must also be appropriate for data with zero biased distributions

**Box 2: Preliminary findings of thresher sharks in Southern California fisheries**

*Key research questions*

Once a comprehensive monitoring and sampling program is established for the recreational shark fishery in Southern California, there are 6 primary questions we intend to answer:

- What is the CPUE of mako and thresher sharks in this fishing sector? How does that relate to other fishing sectors?
- What is the fishing pressure on local elasmobranchs?
- Using fin clips and population genetic analysis, if population structure exists, are different sub-populations experiencing higher or lower fishing pressure?
- What can samples of stomach contents and stable isotope analyses tell us about the trophic role of recreationally-caught sharks?
- Are changes needed in this fishery sector to promote sustainable fishing practices?