Special Session: Finding Common Ground in Fisheries Management
International Sea Turtle Symposium, San Diego, California
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Dale Squires' Opening Remark Abstract

Sea turtle bycatch reduction can make an important contribution to the conservation of sea turtles. Nonetheless, sea turtle reduction by itself, and when conducted unilaterally by individual nations, is insufficient. Sea turtle bycatch reduction instead needs to be part of a multilateral and holistic approach to conservation that addresses all sources of mortality in a least-cost approach.

This holistic approach includes (1) effective beach conservation to protect nesting females, their eggs, and critical breeding habitat to maximize hatchling production; (2) enhancement of at-sea survival of juveniles and adults at critical foraging areas and as they move into different developmental habitats by dealing with large-scale, commercial fishing fleets; and (3) reduction of subsistence, small-scale and artisanal coastal fishers' takes of turtles, perhaps the most intractable component.

Most species of sea turtles are transboundary, so that is their movements take them through a gauntlet of fisheries in the exclusive economic zones of multiple countries and on the high seas. As such, unilateral bycatch reduction by one nation that also reduces the target species catch, such as swordfish or shrimp, and where imports of these target species fill the consumption gaps, simply transfers the sea turtle mortality to another nation. Sea turtle mortality can worsen on net, consumer welfare declines due to less locally caught fresh swordfish or shrimp, local communities can suffer from fewer employment opportunities and less economic activity of fishing fleets and their suppliers and processors, and producer welfare similarly declines as profits fall for fleets, their suppliers, and processors. A recent economic study of swordfish demand and imports on the Pacific coast of the United States by Sun et al. confirms the loss in consumer and producer welfare, employment, and transfer of sea turtle mortality abroad through increased imports, rather than a reduction in sea turtle mortality, from permanent time-area closures for the California-Oregon swordfish drift gillnet fishery. The same study showed that harpoon-caught swordfish cannot substitute in consumption for swordfish from other gear types. These shortcomings demonstrate the failure of unilateral conservation, and instead clearly point the way toward sea turtle bycatch reduction taken by all nations acting cooperatively. These shortcomings further highlight the ultimate failure of time-area closures that simply shut down fleets and create consumption gaps filled by imports, and instead clearly reinforce the need for bycatch reduction measures that do not reduce the target species catches, such as the use of circle rather than J-hooks for swordfish longlining, line cutters, and other sea turtle handling techniques.

The bycatch reduction approach to sea turtle conservation ultimately achieves the maximum reduction in sea turtle mortality when part of a least-cost, holistic conservation strategy. As conservation resources are limited, programs generating the greatest turtle mortality reduction per dollar yield the largest conservation benefit, i.e. the greatest "conservation bang for the buck." A recent study by Gjertsen examined Pacific leatherback conservation costs in terms of a standard female leatherback and showed that nesting site conservation yielded the least-cost outcome. Current activities to produce hatchlings at Jamursba Medi and Wermon nesting beaches cost more than 10

times less per turtle than the Hawaii shallow-set longline regulations and more than 100 times less per turtle than the California drift gillnet time area closure. Hence, “investing” in nesting beach protection activities at these beaches currently yields a very large bang for the buck. For the same cost, 10 times as many adult female leatherbacks are generated through the nesting beach project compared to the Hawaii regulations, and 100 times as many leatherbacks compared to the gillnet closure.

Economic incentives can also contribute to effective sea turtle bycatch reduction, and in general can complement social norms that enhance conservation. Economic incentives guide fishers, consumers, and others to address all costs and benefits from consumption and production, even if not presently captured by market values, so that private pursuit of gain aligns with the public interest.

Environmental taxes and fees are one approach that make both producers and consumers bear the “external costs” of sea turtle mortality that markets otherwise ignore. These fees create incentives to reduce sea turtle mortality by raising its cost. When these fees are applied to sea turtle conservation, such as financing nesting site conservation or subsidizing improved gear for harvesters from developing countries, there is a “double dividend.” Through the efforts of the International Seafood Sustainability Foundation, the North American tuna processors, Bumble Bee, StarKist, and Chicken of the Sea, along with European MW Brands, now self-levy such a “double dividend” fee on themselves for longline caught tunas and annually apply the proceeds to nesting site conservation around the globe.

In contrast to a tax on harvest or sea turtle bycatch, and without direct control of avoidance, a limit on the number of sets per vessel cannot induce economically efficient avoidance and activity levels. A command-and-control policy such as a limit on effort allowed also induces inefficiency because it does not account for the differences among vessels in costs and ability to avoid bycatch.

Incentives can also be created that encourage fishers to innovate and to test newly invented innovations. For example, subsidies can be offered for experimentation or the new gear can be subsidized or provided free with trade-in of the old gear. Such an approach was instrumental in addressing dolphin bycatch from tuna fishing. Some form of bycatch rights, such as Dolphin Mortality Limits but for sea turtles, are seemingly attractive, but can be more difficult to apply to sea turtles because turtles are rare events plus costly comprehensive observer programs are required for monitoring, control, and surveillance.

Instead of the vessel-level policies, it is also possible to design policies that are applied to the conduct or performance of the industry as a whole rather than the individual vessels within it. For example, a bycatch limit could be imposed on the industry as a whole without specifying individual vessel limits, such as for the Hawaiian longline shallow set fishery. Industry-based policy approaches can have several advantages, particularly in the presence of uncertainty. Alternatively, analogous to the policies considered above, an aggregate bycatch quota could be coupled with fines or reward to all vessels in the industry if industry-wide bycatch exceeds or falls below the aggregate limit. Policies of this type treat the vessels within the industry as a single group, and impose limits, sanctions, or rewards on the basis of the performance of the group as a whole. Industry-based policies are also subject to disadvantages, such as the incentives for free-riding behavior and the “race to fish.”