Reply: Toward a definition of conservation principles for fisheries management

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We thank Crawford and Morito for their comments regarding our essay on conservation principles (Olver et al. 1995). We will focus our reply on the three questions that Crawford and Morito pose at the close of their commentary. The views we express are ours alone. We do not presume to speak for all fisheries biologists nor are we promulgating the policies of our respective agencies.

Question 1: How can we provide a more complete explanation of the founding biological values, and the manner in which conservation principles promote these values?

We think that our definition of conservation contains a relatively clear statement of the ecological value that underlies our definition: native ecosystems are valued; it is “wrong” to act in such a way as to impair their intrinsic ability to persist through time. Hence, conservation is “the protection, maintenance and rehabilitation of native biota, their habitats and life support systems to ensure ecosystem sustainability and biodiversity.”

We note that our definition of conservation agrees almost exactly with Mangel et al.’s (1996) second principle for the conservation of wild living resources: “The goal of conservation should be to secure present and future options by maintaining biological diversity at genetic, species, population and ecosystem levels; as a general rule neither the resource nor the other components of the ecosystem should be perturbed beyond natural boundaries of variation.”

We dispute the contention that ecosystem sustainability and biodiversity are “ill-defined values.” These terms do not refer to “values” but rather to valid ecological concepts that can be operationally defined. Useful explanations of both terms are given in Mangel et al. (1996); however, we prefer the following:

1 Grumbine’s (1994) clear prescription for maintaining ecological integrity, which we take to be synonymous with the requirements for ecological sustainability: maintain viable populations of native species in situ; maintain the representation of native ecosystems within their biogeographic range; maintain evolutionary and ecological processes, and hence maintain the evolutionary potential of species and ecosystems.

2 Noss’ (1990) account of the ways in which biodiversity is expressed across fours levels of ecological organization: the landscape, the community, the population, and the individual through its genotype.

We dispute the contention that our definition of conservation is too vague to be of any use. Our definition, much like Mangel et al.’s (1996) second principle, states the goal of conservation, and the goal is clear. In our paper, actions that we thought could operationalize this goal were outlined in our accompanying principles. This contrasts with Mangel et al. (1996), who chose to include both the “means” and the “ends” of the conservation enterprise in a single list of principles. We believe it is useful to separate ends from means, since we contend that consensus among stakeholders on goals is both possible and desirable, while consensus on means may be a much greater challenge.

Question 2: How can we distinguish between “essential biological objectives” and “social or economic objectives” for fisheries management, and is it possible to establish a conservation ethic solely on essential biological objectives?

We think that it is possible to base a conservation ethic solely on essential biological objectives. We agree with Mangel et al. (1996) that the goal of conservation is to ensure that existing ecosystems continue to persist through time. As biologists, we see this goal in terms of the purely biological requirements that ecological persistence demands. The conditions that satisfy these requirements should set the bounds within which economic and social issues are allowed to shape management decisions. Like Grumbine (1994), we argue strongly for a two-stage process: biological considerations establish constraints on overall resource use; within those constraints, legal rights and socioeconomic concerns determine the level of use and how that use is shared among stakeholders. A two-stage process is critical because (i) it reinforces the primacy of conservation requirements over resource use, and (ii) it clearly

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separates issues that are relevant in determining constraints on overall use from issues that are relevant in allocating allowable use among stakeholders.

**Question 3:** How do we propose to incorporate other stakeholders’ values in the establishment of a conservation ethic for fisheries management?

We are optimistic that other stakeholders will accept our contention that the primary goal of fisheries conservation is to ensure the continued existence of native ecosystems and their component fish populations. We recognize that there will be much disagreement regarding the best means to achieve this end. We presented our original set of supporting principles as a preliminary list of means; our hope was to generate comment and debate, the raw materials needed to develop a working consensus or modus vivendi among stakeholders.

We recognize that many of our original principles implicitly assume that resource use is intense and driven solely by the desire to maximize biomass caught, which is the traditional objective of a commercial fishery. Such principles are needed because many of the world’s large commercial fisheries are being overexploited now (e.g., Myers et al. 1997), as are many intense, consumptive recreational fisheries (Evans et al. 1991). However, for subsistence fisheries, ceremonial fisheries, and nonconsumptive recreational fisheries, very different motivations drive use, and hence, such fisheries may require quite different supporting principles. With respect to the means needed to effectively meet the goals of conservation, we strongly support Mangel et al.’s principle 6 (effective conservation requires understanding and taking account of the motives, interests, and values of all users and stakeholders but not by simply averaging their positions) and principle 7 (effective conservation requires communication that is interactive, reciprocal, and continuous). These principles are echoed in the Ecological Society of America’s report on the science of ecosystem management (Christensen et al. 1996), and in FAO’s guidelines for ethical fisheries (FAO 1995).

In fishery management and the wider arena of ecosystem management, we think increased efforts to develop and implement operable conservation principles are essential, because fisheries and ecosystems are threatened by human actions everywhere. We hope that the comments of Crawford and Morito, along with our reply, will stimulate greater attention to this issue among all stakeholders.

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**References**


