Closing the Loop in Fishery Management: the Importance of Instituting Regular Independent Management Review*

Herein we argue that lack of a regular independent review process in U.S. federal fishery management is a serious shortcoming in policy and that such a system should be implemented. Although our arguments specifically refer to federal fishery management in the United States, we believe they may be applicable to other areas of ecological management here and in other countries.

Fish-stock assessments are among the most influential scientific contributions to marine resource management. In the United States, where, for legal reasons, assessment results may trigger unavoidable fishing restrictions, assessments of federally managed resource stocks are subject to extensive peer review, making these assessments among the most highly reviewed examples of applied science worldwide. Within the National Marine Fisheries Service (NMFS), each of the 6 science centers, working with local Fishery Management Councils, has established a peer-review process. Typically, an expert panel spends 3–6 days reviewing 1–3 stock assessments and several days writing reports. Panel members are scientists not connected with the assessment or the fishery who have international standing in the field of fish population dynamics. The assessment review provides quality control for management advice and a feedback process through which fisheries science is improved over time.

Intensive review of stock assessments has had several noteworthy effects. On the negative side, the reviews are time-consuming, costly, and can be highly contentious. Although meetings are open to the public, the subject matter is technical, and discussion is largely among specialists. Nevertheless, the positive effects outweigh the negative. Strong review processes have increased the success of the NMFS in arguing that assessments constitute the best available science, the standard established by the controlling legislation (Magnuson–Stevens Fishery Conservation and Management Act). As a result, it has become more feasible to implement fishing restrictions when needed, despite challenges from fishing interests. In addition, intensive reviews have spurred innovation and improvement in the science and technology of the assessment of fish stocks, and the experienced reviewers from abroad bring fresh perspectives and new ideas to assessment science and facilitate an independent review.

In contrast, management policy does not undergo an equivalent independent technical review. Development and implementation of management policy are debated in public fora, reviewed by staff of the fishery management councils and NMFS, and increasingly are decided by courts, but those processes have neither the same goals, nor provide the same perspective, as technical reviews by outside experts. Public comments on fishery management plans almost invariably reflect interest-group perspectives. Reviews by technical staff attempt to ensure that management measures reflect council decisions and meet NMFS guidelines. When courts review management plans, they do so only to judge compliance with applicable legal standards. Broad reviews of fishery management do occur occasionally (e.g., Eagle et al. 2003). Such reviews contribute to identifying problems, but are neither frequent enough nor in sufficient detail to foster incremental improvement in management effectiveness in specific cases. In summary, nowhere does the management process include regular review, by specialists, of the efficiency and efficacy of management policy and its implementation. For that reason, the fishery management process lacks the feedback that is key to quality improvement in any process (Besterfield 2004).

What would management review look like? We envision a process different from the peer review of stock assessments in several respects. The first of these is timing and frequency. Major stock assessments in the United States undergo review

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before being received by managers as technical advice. To follow this pattern for management would add additional delay, hardly what is needed (Shertzer & Prager 2007). Furthermore, the tests of science and management differ. Science is reviewed to ascertain whether data, methods, and results are suitable and reflect objective reality. In contrast, the main test of management is its results, which are best judged after several years, as was done, for example, in the ad hoc review of Rosenberg et al. (2006). We suggest, then, that management reviews take place less frequently than scientific reviews and cover management over longer time scales, possibly considering a broader range of species at once. For example, a review might cover management actions for all species covered under a single fishery management plan (or set of related plans) over a 5-year span.

Valid topics of management review include (1) whether scientific advice was heeded, (2) whether methods chosen for management were appropriate and well considered, (3) whether management was implemented so as to have a reasonable chance of success, (4) whether the management process was sufficiently timely, and (5) whether the stated goals of the management plan were met. Members of the review panel should be disinterested parties with knowledge of the various facets of fishery management policy, science, and economics. It might also be useful to include experts in operations research and public administration. The findings in review reports would serve to inform future fishery management. Reviews would not be for the purpose of credit or blame; rather, they would serve to build a new body of knowledge on effective and ineffective management techniques and to identify areas of strength and weakness in current management procedures.

A process of management review would afford continuous, incremental improvement in fishery management and benefit managers, the public, and the resource. Laws governing fishery management in the United States and elsewhere call for ensuring sustainability of marine resources over the long term. Thus, regular reviews of each management plan should be conducted to determine how well the plan has met the goal in practice, not merely in principle.

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