

TOOLS FOR COMPREHENSIVE APPROACH TO MANAGING HUMAN BEHAVIOR IMPACTING AQUATIC RESOURCES

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I want to address three very important challenges that need to be faced by those supporting the implementation of an ecosystem-based approach to aquatic resource management. These are:

- Goals and Objectives for the species, watershed, eco-reach, or ecosystem;
- Evaluate the current ecological health of the geographic area to be managed; and
- Improve inter-agency cooperation on management issues.

Most of our fishery management is based on measuring mortalities. This allows us to continue to feel comfortable with our management even though the fish population of our focus is now in a greatly restricted geographic area, harvest levels have significantly decreased from historic levels, and the average age/size of the harvested fish is much younger and smaller than historically. This assumes that the currently desired species has not been replaced by a species that had been considered a trash fish in the historic fishery which is often the case. Therefore, goals and quantifiable objectives, based as much as possible on historic conditions, are urgently needed to guide management and restoration.

Quantifiable objectives, performance criteria, reference point, etc. are required in education, business, and terrestrial resource management. They are generally not available for aquatic resources except for harvest and other mortality limits.

If we consider an MBA perspective on the importance of having goals and detailed objectives for a potential project, it is easy to understand that one would have a difficult time getting money to support advancing your plans/ideas without a good business plan with goals and objectives.

It seems that society and the responsible management agencies have had little success in getting usable goals and objectives for aquatic resources. Reasons usually provided include:

- The ecosystem has been greatly altered;
- The ecosystem is in transition; and
- The major anthropogenic stresses impacting the ecosystem are the responsibility of other agencies.

However, while assisting New York in preparing five watershed fisheries management plans for Lake Ontario tributaries, we learned that we were facing another challenge. By urging the regional fisheries managers to prepare "new" goals and objectives to guide the restoration of their watershed, we were indirectly criticizing their past management results and direction.

A suggestion to get past the difficulty of having agencies develop goals and objectives is to encourage NGOs to tackle the initial effort. NGOs can start the process by researching the historical information and descriptions and preparing a first draft. Once a draft is on the table, especially if it receives some

media coverage, the responsible Living Resource Management (LRM) agencies will give it attention if for no other reason than to redirect the focus. However, with a draft available, the discussion can focus on correcting/updating the information in the document. This is often much easier than starting the process. And, with draft goals and objectives in hand, society is in a much better position to address the problems with the current health of the ecosystem and the specifics of the desired conditions.

We had a chance to assess the current ecological health of Lake Ontario. After reviewing the historical published and unpublished information, we identified trends in key biological, chemical and physical indicators. Comparing the current results to more pristine historic conditions for 72 habitat types, we concluded that the energy transfer in the system was functioning at only 42 percent of its historical or restored potential. The impairments were caused by loss of indigenous species and the introduction of exotics (21%), physical changes to the basing (20%), and persistent toxic chemicals (17%). The results came as a surprise since we had expected toxins to be the major problem.

We know that Congress and the State governments have split natural resource management between agencies. Some have been given direct regulatory responsibilities for some parts while also sharing responsibilities through their advisory activities. However, effective and meaningful advice requires that the responding agency has current information and inventories, trends in abundance and distribution of key resources, and a good understanding of the potential project impact on the resources in the eco-reach. And, the receiving agency has to give adequate consideration to the advice. This is often not the case for both sides. Agencies usually focus strictly on their regulatory responsibilities and not necessarily on the recommendations from other agencies.

In summary:

Clear goals and quantifiable objectives, supported and understood by the public, can help resolve many of the challenges facing the LMR management agencies in implementing an ecosystem-based approach. If goals and objectives descriptive of the desired direction and outcome of natural resource management are not available, it is more difficult to convince the regulatory agencies to modify their actions to be in support of your agencies mission.