Assignment Completion

Summary of a Recommended Approach to Evaluate Existing Rapid Screening Processes and Development of a Gold Standard (if None Exists)

Submitted to the Aquatic Nuisance Species Task Force
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Background

The National Invasive Species Council's National Management Plan for Invasive Species and the Great Lakes Regional Collaboration's Strategy to Restore and Protect the Great Lakes described the need to develop assessment tools to rapidly assess risks of nonnative species (i.e., Screening Process that includes available tools to implement).

The Mississippi River Basin Panel on Aquatic Nuisance Species (Panel) developed a rapid screening process, which is one component of their risk analysis system. In addition to review by members of the Panel, this screening process was reviewed by the National Association of Aquaculture Coordinators and the Nonnative Wildlife Screening Working Group. No major changes were recommended by these groups. Although the Panel's screening process is based on science, and considered "an excellent, common-sense, rapid screening" approach, this process has not been evaluated during comparative testing with other rapid screening systems (Note: At this time, I know of no screening systems that can be implemented nearly as comprehensively and rapidly as the Panel's).

The Mississippi River Basin and Great Lakes Panels on Aquatic Nuisance Species (Panels) described, to the ANS Task Force (Task Force), the need to: 1) scientifically evaluate existing rapid screening processes, 2) report on strengths and weaknesses of those processes, and approaches to improve each of them (for various ecosystems in the U.S., and for the entire U.S., including territories), and 3) use these results to develop a "gold standard" screening process for regions/ecosystems/and entire U.S.

The Panels recommended that, if any member of the Task Force will issue a request for proposals for aquatic invasive species research, to consider the assessment recommended, in steps 1-3 above, as a high priority to be funded. The Panels also recommended Federal member staff involvement to help guide this evaluation, so that management guidance and input are optimized during screening process testing, and development of the "gold standard" screening process.

I was assigned, by the Task Force during the Autumn 2008 meeting, the task of developing a recommended approach for the scientific evaluation proposed by the Panels. Objectives and methods for, and deliverables resulting from, the proposed scientific evaluation include those listed below. Certainly, collaborators in this proposed

evaluation can enhance and expand upon this recommended approach, and provide additional deliverables.

Project Objectives

1. Assemble existing rapid screening processes
2. Scientifically evaluate existing Rapid Screening Processes
3. Determine accuracy (to species categories listed below) and precision (among expert screeners) of screening results
4. Report on strengths and weaknesses of each screening process
5. Use results to either recommend how to, or develop, gold standard screening process or processes (Note: there could be several of these--one for each of several ecosystems in U.S., and hopefully, one for the entire U.S., including territories).

Project Methods

1. Develop a database with information for species in these categories:
    a. Introduced and established in the U.S. and became invasive
    b. Introduced and established in the U.S. and failed to become invasive
    c. Were introduced into U.S., but failed to establish self-sustaining populations
    d. (and other categories, if appropriate and data exist)
2. Convene workshop of experts who will:
    a. Conduct screening on species in data base
        i. Using each screening process
        ii. For large ecosystems of U.S., and entire U.S.
    b. Tabulate screening results including
        i. Accuracy for each screening process in assigning each species to the appropriate category (Project Methods 1.a-c)
        ii. Precision among screeners for screening process species categorizations
3. After workshop develop a report that includes:
    a. Additional statistical analyses, and a synthesis based on them
        i. Includes biases of each screening process
    b. Evaluation of strengths and weaknesses of each screening process
        i. For each ecosystem of the U.S. and for the entire U.S.
        ii. For each category of species
    c. Recommendation to improve to each screening process
    d. Using synthesis of those recommendations, develop a gold standard screening process for either the entire U.S., if possible, or for large ecosystems or regions of the U.S.
        i. Conduct a test, if necessary, of the gold standard(s) using assembled data bases

Project Deliverables

1. Report:

    a. Describing materials (i.e., data bases), methods, and participants in the workshop and gold standard process development
    b. Comparison of efficiency (speed), accuracy, precision, and biases of existing rapid screening processes
    c. Detailed description of the gold standard screening process, for either regions of the U.S, and/or for the entire U.S. (including territories), and a tutorial that describes how to use that screening process
2. Presentation
    a. To the Aquatic Nuisance Species Task Force and National Invasive Species Council that summarizes deliverables 1.a-c.
3. Electronic versions of the species data bases used in the evaluations, and all reports