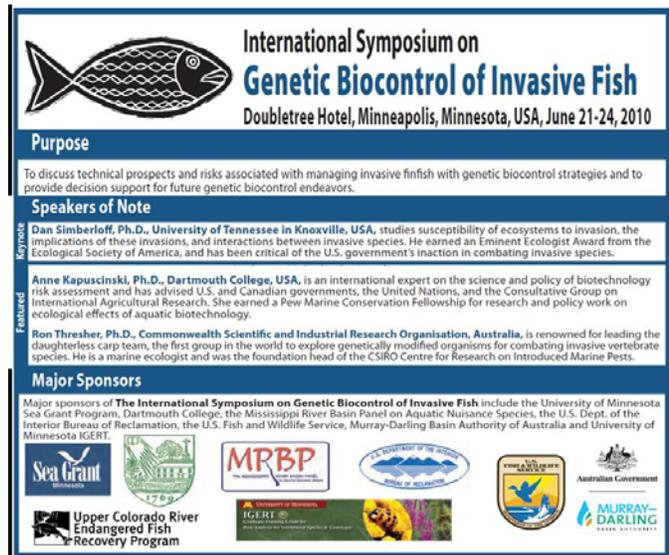


- I. Project Title: Recovery Program Participation / Contribution to a Genetic Biocontrol Symposium.
- II. Principal Investigator(s): Angela Kantola and Pat Martinez, P.O. Box 25486, DFC, Denver, CO 80225. Phone: 303/969-7322 (Angela); 970-245-9319 ext. 41 (Pat). FAX: 303/969-7327. E-Mail: angela_kantola@fws.gov, patrick_martinez@fws.gov.
- III. Project Summary: The Recovery Program contributed funds to support the development and implementation of the [International Symposium on Genetic Biocontrol of Invasive Fish](#). This international symposium addressed the potential and risk assessment of genetic biocontrol of established invasive finfish species.
- IV. Study Schedule: FY 2010.
- V. Relationship to [RIPRAP](#): General Recovery Program Support Action Plan III.A Reduce negative interactions between nonnative and endangered fishes. III.A.2.G. Evaluate other methods for controlling nonnative fishes, including manipulation of flow and temperature, use of fish attractants, pathogens, genetic modification, and chemical piscicides.
- VI. Accomplishment of FY 2010 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings: The Recovery Program helped sponsor this conference because genetic biocontrol strategies have the capability to be more effective and targeted than current nonnative fish control methods. (Thanks go to Dave Speas, who combined the fund transfer with additional Reclamation funding.) Significant obstacles and concerns must be identified and successfully addressed before biocontrol strategies can be implemented; therefore, the conference was designed to create a roadmap for risk assessment of genetic biocontrol of aquatic invasive species. Nonnative Fish Coordinator, Pat Martinez, participated in the conference, and reported at the [August 17, 2010, Biology Committee meeting](#) that the symposium was quite significant, even historic, and included presentations on a number of valuable references. Pat described methods of genetic



control, which include:

Sterile release: reproductive interference

- sterile male: chemical or radiation induced; mate with fertile females
- triploidy: thermal or pressure induced; mostly sterile (triploid females)

Chromosome set manipulations: population reduction

- sterile triploid males: aneuploid; non-viable progeny; population reduction
- Trojan-Y chromosome: sex:ratio distortion; female extinction

Gene-based recombinant DNA: GMOs; population eradication

- inherited construct: autocidal; “breed to extinction”; “daughterless carp”
- conditional lethality: inducible mortality; environmental or artificial trigger

Pat said more is known about the triploidy approaches and considerable expertise is available, but transgenic methods are further out, particularly in light of regulatory requirements. The FDA appears open to considering transgenic proposals, but it will take time. Currently there’s a bit of a patchwork of regulations, both state and Federal, to consider. Dave Speas noted that some of the techniques discussed at the symposium take a *long* time (e.g., 70 years) to wipe out a population, so their use in eliminating nonnatives to protect endangered species will be limited. Sterile male technology perhaps has the greatest potential. The Recovery Program isn’t in a position to do any field testing at this point, but Pat thinks we should encourage CDOW’s work with triploid walleye, for example. Perhaps one of our hatcheries could be dedicated to this kind of work when we no longer need to stock endangered fish (assuming all the regulatory concerns could be overcome). Both Utah and Colorado are working on triploidy. The pdf’s for the presentations from the workshop are available at:

<http://www.seagrant.umn.edu/ais/biocontrol#presos>

VII. Recommendations: Require use of triploid, or otherwise sterile, nonsalmonid predatory fishes for taxa (i.e. esocids, percids, moronids) for which any sterilizing technology (triploidy, hybrids, chemical) has been developed in nonnative fish stocking proposals.

VIII. Project Status: Complete.

IX. FY 2010 Budget Status

- A. Funds Provided: \$5,000
- B. Funds Expended: \$5,000
- C. Difference: None
- D. Percent of the FY 2010 work completed, and projected costs to complete: All work completed.
- E. Recovery Program funds spent for publication charges: None.

X. Status of Data Submission: Not applicable

XI. Signed: Angela Kantola 11/18/10
Principal Investigator Date