

# **PROGRESS REPORT**

**Project Title:** Snail Management/Grub Control<sup>1</sup>

**Key Word(s):** Other

**Total Funds Committed:** \$20,500

**Initial Project Schedule:** September 1, 2007 to August 31, 2009

**Current Project Year:** September 1, 2013 to August 21, 2014

**Participants:**

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**Extension Liaison:** Joseph E. Morris, Iowa State University, Iowa

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**Project Objectives**

2. Assemble an updatable snail management guide which includes a literature review of known control options, a method of determining snail infestation levels in any water system, and a set of standard operating procedures to reduce snail populations and trematode infestations based on the research cited in Objective 1.

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<sup>1</sup> This Progress Report is for the second objective of this project. A Project Component Termination Report for the first objective is contained in the 2009-10 Annual Progress Report. This is a project that had two years of funding and is chaired by Gregory W. Whitley. It began September 1, 2007.

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## **Project Summary**

With the long history of trying to control snails in fish ponds and types of control mechanism being used (mechanical/chemical/predatory), a literature review was undertaken to compile the information to date. This list of references is from journal articles only. The references are sub-divided by the type of control that the researcher's evaluated or commented on: mechanical, chemical, or biological control. This information was then combined with information garnered from this project to produce a detailed presentation that is now available to North Central Region (NCR) aquaculture community.

## **Anticipated Benefits**

Grub infections in fish culture ponds are extremely relevant to the aquaculture industry in the North Central Region (NCR) as the industry has experienced a loss of income in both commercially important food fish species and baitfish. These economic losses result both directly from fish mortality due to trematode infection, and indirectly because of unappealing visual presentation of food fish fillets containing grubs. Outcomes of this project should help culturists in dealing effectively and economically with these infestations.

## **Project Progress**

*Objective 2.* — A search has been completed by Iowa State University staff to review literature to date concerning the three main control methods for snails: biological, chemical, and mechanical. This information was combined with information garnered from this research project to develop detailed on-line presentation for fish producers to access and obtain information potentially relevant to their snail problems. Among the various options, information

regarding effectiveness, legal implications, and potential for impact on pond general ecology, e.g., zooplankton dynamics in fish fingerling ponds, will be listed. The detailed presentation 'Snail Management in Culture Ponds' is hosted on the revised North Central Regional Aquaculture Center (NCRAC) Web site – Aquatic Biological Management

<http://www.ncrac.org/node/627> . The literature review 'Review of Snail Control in Fish Ponds' is also available on the same web site. Additional information on grubs in freshwater fish is available in the NCRAC Technical Bulletin #115 'Biology, Prevention, and Effects of Common Grubs (Digenetic trematodes) in Freshwater Fish', <http://www.ncrac.org/node/354> .

Since the initiation of this project, an updated factsheet on snails and associated grubs has been developed at Texas A&M University and is available at <http://fisheries.tamu.edu/files/2013/09/My-fish-have-grubs-final.pdf> .

## **Target Audiences**

NCR pond culturists.

## **Outreach Overview**

To achieve the goal of this objective, information on snail control methods has been provided by presentations (2014 North Central Regional Aquaculture Conference, Toledo, Ohio) and materials available on the NCRAC web site.

## **Deliverables (Outputs)**

- Literature review of past and current literature on snail control methods
- PowerPoint presentation on snail management
- Web-based information portal on snail identification and control methods

## Outcomes/Impacts

Results from this project have been used to provide an updated review of snail control methods available to the aquaculture community. Although to date there is no one ideal management solution to controlling the snail population in aquaculture ponds, aquaculturists should consider the following:

- Prevention of snail infestation when possible.
  - Use of approved aquatic herbicides or grass carp (consult state-specific regulations to decrease the amount of submerged vegetation including filamentous algae.
  - Drying pond bottoms between crops.
  - Use of flow in side tanks to limit infestations.
- Use care in the use of chemical controls as many will affect the cultured fish directly.
  - Chemical treatments often effective along pond margins but small fish may be susceptible.
  - Use of lime to modify water pH can affect both adult fish and their offspring through direct and indirect effects as well as low oxygen levels associated with decaying vegetation.
  - Applications copper sulfate (combined with citric acid) are effective control measures but can direct or indirect effects on cultured fishes; previous research notes the effect of 0.25 mg/L of copper sulfate can kill

desired zooplankton prey for larval fishes.

- Prior to chemical control use, culturists need to check total alkalinity of the culture ponds to help decrease deleterious effects from lime or copper sulfate applications.
- Consider use of biological controls for long-term controls.
  - Redear Sunfish are effective in controlling Physa but not rams-horn snails until they are fully matured.
  - Use of hybrid Redear Sunfish can help to reduce snail populations over the culture period.
  - Other possible predators include crawfish, blue catfish, freshwater drum and freshwater prawns.

## Impacts Summary

*Issue*— There is a need for current information for controlling snails in culture ponds given their role in grub infestation in fish.

*Response*— A literature review of snail control methods was conducted. Information from this review was combined with information garnered from this project was combined into a summary report.

*Results*— Information is now available on the NCRAC web site for public information.

*Recap*—In response to a need to inform the aquaculture community, a literature review combined with a detail presentation was developed on snail management.

## Publications, Manuscripts, Workshops, and Conferences

See the Appendix for a cumulative output  
for all NCRAC-Funded Other activities.