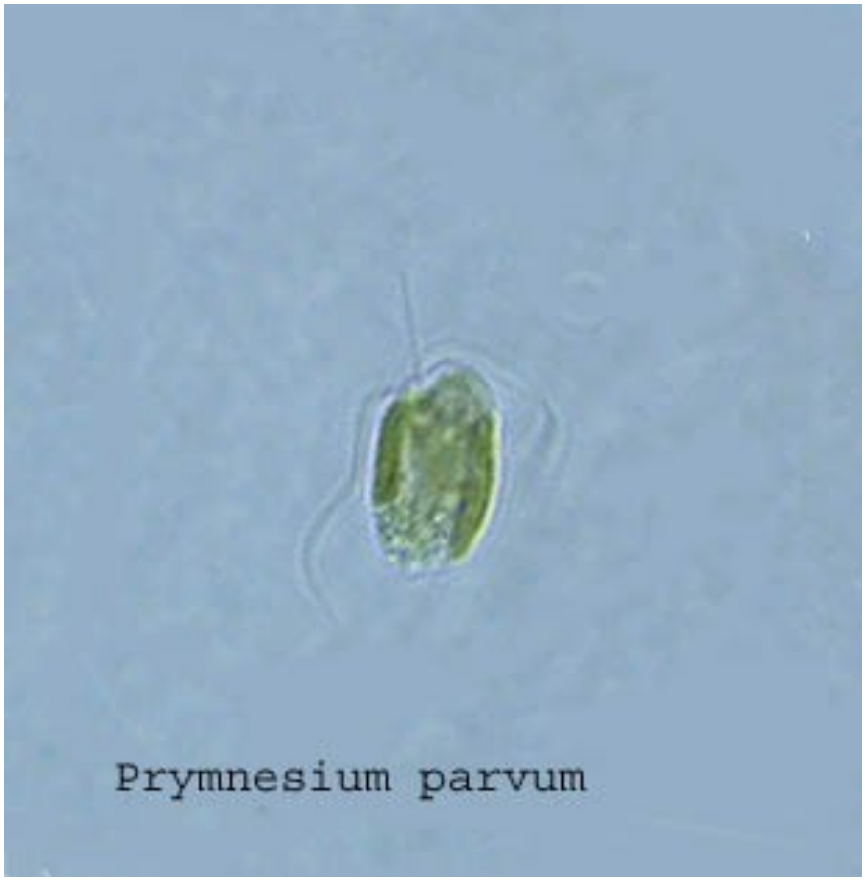
THE TOXIC GOLDEN ALGA WORKSHOP REPORT



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Texas Parks and Wildlife Department

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Preface

This report provides an overview of and the results from the Toxic Golden Alga Workshop held at Possum Kingdom, TX on August 21, 2001. Staff members of the Texas Parks and Wildlife Department coordinated the workshop. We would like to thank all those who attended and participated in the workshop. This workshop is the first step in developing research efforts to address management options concerning the toxic golden alga (*Prymnesium parvum*) and associated fish kills. Special thanks go to the Brazos River Authority for holding the day session at the Possum Kingdom Reservoir office, and the Possum Kingdom Chamber of Commerce and Dean Heffner for organizing the evening session at the Chamber of Commerce Building. The golden alga picture on the title page alga was provided by Dr. Carmelo Tomas (University of North Carolina at Wilmington). Additional support for TPWD staff involvement in this workshop was provided through the U.S. Fish and Wildlife Service Sport Fish Restoration funding program (Project F-37-TA).

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August 2001

TOXIC GOLDEN ALGA WORKSHOP
AGENDA
August 21, 2001

Time	Location	Topic
Day Session		
10:00 AM	Brazos River Authority Office Possum Kingdom, TX	Introductions
10:30 AM		Background on Golden Alga Fish Kills
11:00 AM		Issues of Concern with the Alga
11:30 AM		Research Objectives and Goals
12:00 PM		Lunch
1:30 PM		Initial Research Priorities Development and Prepare Draft Action Plan
3:30 PM		End Session
Evening Session		
7:00 PM	Possum Kingdom Chamber of Commerce Office	Present Results of Session to the Public Representatives
7:30 PM		Q and A for Input from the Public

Introduction

Texas Parks and Wildlife Department (TPW) representatives met with members of the public on July 17, 2001 at the request of Representative James Keffer. The meeting was to provide information about and discuss the fish kills caused by blooms of the toxic golden alga (*Prymnesium parvum*) earlier in the year. These kills raised concerns by the public for the recreational fishery on Possum Kingdom Reservoir and the related tourism economy of the area. At the request of the public, a promise was made to develop a committee of research scientists and agency staff members to draft research projects to address management and potential control options for this alga. The research needs and possible projects developed would be used to seek funds to accomplish the management goals identified. A workshop was organized by TPW staff for August 21, 2001, to bring together those research scientists and agencies' personnel available to initiate this process. An evening session was also held with selected members of the public to get their input on the directions suggested by the research and technical representatives.

This report is to document the results of the two sessions held on August 21, 2001. While an overview of the sessions is provided, it was not practical to capture all that was said and suggested by the participants in the sessions. This document focuses on the main points of discussion and, most importantly, on those actions to be taken as a result of this workshop. Table 1 is the attendance list for the day session of technical and research representatives who met to initiate efforts on determining the management and research needs concerning the golden alga. All participants agreed that this workshop would be the initial effort but that other researchers in this area should be involved in the process as it moves forward. Appendix A provides the extended list of researchers invited to the workshop who have agreed to participate in this effort.

Table 1.

Golden Alga Workshop
Possum Kingdom, TX
August 21, 2001
Attendance List (Day Session)

Name	Organization
David Sager	TPW/Resource Protection
Dave Buzan	TPW/Resource Protection
Joan Glass	TPW/Resource Protection
Loraine Fries	TPW/Inland Fisheries
Joe Warren	TPW/Inland Fisheries
Ken Johnson	Texas A&M University/Texas Veterinary Medical Diagnostic Lab
Weldon Newman	Brazos River Authority
Aaron Barkoh	TPW/Inland Fisheries
Gayle Haecker	Brazos River Authority-Waco
Justin Swanson	TPW/Resource Protection
Roger McCabe	TPW/Inland Fisheries
John Parit	TPW/Inland Fisheries
Tom Dorzab	TPW/Inland Fisheries
Greg Southard	TPW/Inland Fisheries
Jake Isaac	TPW/Inland Fisheries
John Grizzle	Auburn University
Brian Ostrander	TPW/Inland Fisheries
David Klein	TPW/Resource Protection
Roger Roewe	Congressman Stenholm's Office
Owen Lind	Baylor University
Laura D. Lind	Baylor University
Gary Saul	TPW/Inland Fisheries
Richard Hall	Governor's Office
Ky Ash	Representative Keffer's Office
Daniel Roelke	Texas A&M University-College Station

Background on Golden Alga Fish Kills

David Sager (TPW) gave a brief presentation on the historical knowledge of golden alga fish kills in Texas. He noted that the first fish kills confirmed to be caused by this alga took place in the Pecos River system during the mid-1980s. Since that time the range over which this alga is known to have caused fish kills has expanded to the north and east. It is presently known to have caused fish kills in the Pecos, Colorado, Brazos, and Red river systems in Texas.

Joan Glass (TPW) gave a short presentation on the numbers of fish killed and their assessed value from the documented cases of golden alga related events. She also gave a presentation on the fish kills in the Brazos River system during this year. She presented information on the timing of the fish kills and how the alga blooms and associated kills occurred on Possum Kingdom Reservoir, Lake Granbury, and Lake Whitney. One of the interesting issues was that while fish kills occurred in the reservoirs few fish kills were witnessed in the river between the three reservoirs. However, this alga has been associated with significant fish kills in rivers on other occasions. Discussions on possible explanations for this situation, helped develop ideas for potential research topics. TPW staff from the department's hatcheries also shared their experience with the alga getting into the Dundee Hatchery from its source water and killing the fish in the hatchery ponds. They discussed their efforts to control the alga using methods noted in the literature. Their success was mixed and clearly indicated the need to develop better, more reliable methods to handle this problem in the hatcheries, as well as natural water systems.

Dan Roelke (TAMU) gave a review of some of the literature of the last 10 years on the golden alga, confusing or contradictory results from research on the alga, and potential research needs to address these questions. He brought a fresh perspective to the issue as a limnological researcher and modeler, compared to the earlier presentations by field biologists. The two perspectives were complementary and helped spur discussions on the research issues and needs.

Issues of Concern

After the introductory presentations the meeting was conducted in an open format for round table discussions on research and management issues with the golden alga, potential funding options, and action items to be undertaken. Many issues were raised and ranged from the need to culture the organism to allow laboratory experimentation on the alga and its toxins to the need to assess broad scale ecological and economic impacts associated with the toxic blooms. Listed below are the main issues captured during the workshop:

- Ability to culture the alga for research projects
    - Need to establish the alga in an algal culture bank
    - Use this culture bank to establish research cultures

    - Culture alga from various watersheds to determine potential differences
- How do water quality and environmental conditions influence alga blooms and toxicity
- What are the toxins and how do they function
    - Develop analytical procedures to use toxins as fingerprint for the alga
    - Research on methods to destroy or render toxins harmless
- What is the distribution of the alga in Texas
- What are the broad scale ecological impacts of the alga blooms
- What are the economic impacts of the alga blooms
- What management options are available for controlling the algal blooms and/or toxicity

Brief discussions were held on possible funding sources but details for this effort were not discussed. It was decided that as the research proposals were developed potential funding sources would need to be identified so the proposals could be targeted for those funding sources. It was also discussed that if legislative funding sources might be available, guidance from the legislative contacts would be needed to help determine how the workgroup should proceed. The general funding sources discussed are listed below:

- U.S. Environmental Protection Agency 104 watershed/water quality funds (spring submittal)
- U.S. Army Corps of Engineers environmental project funds
- Clean Rivers Act monitoring project funds
- Agency discretionary funds
- University – long-term budget requests through the legislature

Research Priorities

The workgroup discussed the priority research efforts that were necessary to address the management issues associated with the golden alga blooms. While all priorities could not be placed in order of highest to lowest during this meeting, it was agreed that the first priority was establishing cultures of the golden alga to provide a continuous source of the organism to allow research to be conducted at any time. It was also agreed that there are two different areas of research, or actions, that needed to take place. These two areas of research dealt with management issues related to controlling the alga in hatchery situations and management issues related to the alga in watersheds (rivers and reservoirs). The two areas of research activity could be complementary in many ways but might have different timing requirements and of course the difference in scale could make a feasible option for hatchery situations, not feasible for large watershed situations. The possibility of these two research directions following parallel tracks with crossover for the complementary issues was discussed. The general list of research priorities are given below:

- Develop a culture of the golden alga for the University of Texas algal bank

- Use culture bank to develop research cultures for both watershed and culture pond research projects
- On watershed research issues:
    - Determine growth parameters
    - Conduct laboratory testing
    - Conduct numerical modeling
    - Growth and toxicity hypothesis generation
    - Conduct large-scale or field tests
    - Develop watershed data and correlation with blooms (present and historical data)
- On pond management issues:
    - Monitoring water sources for culture ponds
    - Experiments on control and mitigation strategies
- Ecological impacts of alga blooms
- Economic impacts of alga blooms

Proposed Action Plan

The workgroup all agreed the effort should go forward for developing research objectives, funding sources, and research proposals to be funded. The workgroup agreed that a broader group of researchers should be involved in this process. It was noted that the original invitee list (most of whom asked to be included in future efforts) would be a good starting place. Discussions were held about asking the Harmful Algal Bloom Committee which was originally formed to discuss red tide algal blooms and other marine toxic algae to coordinate this effort. The Harmful Algal Bloom Committee (HAB) has been accepted as a subcommittee of the legislatively formed interagency Toxic Substances Control Committee (TSCC) that gives the HAB a formal structure and brings the other state agencies in as participants. The TSCC is open to public participation and the involvement of federal agencies and universities in its efforts. This seems like a good interagency forum for proceeding with the efforts on the golden alga. Dave Buzan, TPW's representative on the HAB, and David Sager, TPW's representative on the TSCC, agreed to promote this issue with the committees. The list of action goals and plans agreed to by the workgroup is listed below:

1. Review Inland Fisheries' proposals for short-term hatchery management approaches to control alga and relate them to broader efforts
2. Work with University of Texas Algal Collection to culture alga from different locations in Texas
3. Compile meeting notes for distribution in early September
4. Start planning for follow up meetings with the Harmful Algal Bloom Committee to discuss funding sources and research proposals being developed
5. Inland Fisheries will consolidate their hatchery data into one location
6. Harmful Algal Bloom Committee to hold next workgroup meeting (potentially in October)
7. Define historical information/data that should be compiled

8. Maintain communication with public on progress, maybe coordinate through the Representative's Office and TPWD website (possibly press releases)
9. Consider future establishment of a stakeholder group to work with on these issues

Results of Evening Session with the Public

An evening session was held at the Possum Kingdom Chamber of Commerce with representatives of the public. At the meeting, workgroup members presented the results of the day session (as noted above) and a general discussion was held to address questions and suggestions. Several suggestions were made for the workgroup to develop information that could be used by the legislators in funding efforts. The need for the Texas Department of Health to become involved and provide information concerning any human health implications, or why there are none, was noted. The information could be used to defuse public concerns and bad media coverage that would have a negative effect on local tourism. Representative Keffer was very helpful in providing an overview of what was needed for legislative funding discussions. The following points were raised and resulted in clearer directions for, or revision of, the timing of some of the action objectives developed by the workgroup:

- Need to keep efforts moving quickly to provide information for legislative funding possibilities
    - Would like to have general idea of funding needed to initiate research efforts so can seek funding as soon as possible
    - Suggested a report to the governor noting research priorities and funding steps would be useful for these efforts
- A background assessment of human health issues and information by TDH would help address public concerns and bad press

TPW promised to use the HAB to involve the other agencies and move this effort forward. The scheduled HAB October meeting could provide the opportunity to develop a report to the governor with general issues and funding needs. The HAB would also bring TDH into the process to address health issues.

Appendix A

List of Researchers Agreeing to Participate in this Effort

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