



AQUATIC PLANT NEWS

A newsletter of the Aquatic Plant Management Society, Inc. No. 36 February 1991
K.A. Langeland, Editor, University of Florida, Center for Aquatic Plants, 7922 NW 71st St., Gainesville, FL 32606

The Purple Plague

by Sharon Sorby

Photos by Catherine Hovanic

After 150 years of insidious spread from the eastern seaboard, across the continental northern tier, the purple plague has culminated its westward expansion by establishing serious infestations in the Pacific Northwest. Purple plague sounds ominous, aptly describing *Lythrum salicaria*, an exotic and invasive species of North American wetlands.

Lythrum salicaria, a.k.a. purple loosestrife, was first introduced into the northeastern harbours in the early 1800s. It was introduced accidentally as a contaminant of ship ballast, livestock coats, feed and bedding, and packing materials. As an ornamental and a medicinal (it is listed in early botanical journals as a blood stauncher), it was introduced intentionally. Over time, it became established in the coastal wetlands and estuaries, with human and water fowl activities providing the means for inland spread.

Viewed up close in a flower garden, the last description to come to mind would be "purple plague." Instead, a breath-taking presentation is offered by the long spikes of magenta flowers on this multi-stemmed, erect perennial. Yet, if one views the impenetrable wall of purple loosestrife along a water project channel which once teemed

with the noise of all forms of wildlife, and is now unearthly silent, the essence of what is meant by the "purple plague" is realized.

Primarily a plant of wetlands, purple loosestrife will grow invasively anywhere it can keep its feet wet. Cattails, rushes, sedges, and reeds are associated species and indicate the habitat type that is vulnerable to invasion by purple loosestrife. Although more rapidly established in a disturbed site, as light is not a limiting factor for seed germination and seedlings can tolerate up to 50% shading, healthy wetland sites of native vegetation can be invaded.

Temperature seems to be the limiting condition for seed germination, needing to be between 15 and 20 degrees Centigrade (soil or water). It has been speculated this could be a factor in the limited southward expansion of the purple loosestrife invasion. The southernmost population was collected in the area of Beaumont, Texas. Two more southern sites are at Knoxville, Tennessee and Huntsville, Alabama on the Tennessee River. These pose a threat to the extensive new wetlands created by the TVA Project of the 1960's through early '80s.

Supported by a dense, woody, fibrous root system, this tall, robust plant has developed several survival mechanisms to ensure its continued existence. The roots spread out from a crown and are covered with adventitious buds that will sprout when the parent plant is damaged. Adult plants can survive being submerged in water up to

18" in depth due to the roots' ability to develop chambered, air-filled, fleshy structures (derived from parenchyma tissue) which maintain root aeration. Any vegetative fragment with at least one node can send out roots and establish a new plant. Seed production is prolific.

The woody stems are 4-8 sided, 2-12 feet in height, and remain for 2 seasons without decomposing following winter die-back. Leaves are sessile, lance-shaped, hairy to smooth, and are arranged opposite, alternate, or whorled. The spike-like inflorescence can be 2 inches to 3 feet in height, with flowers blooming and setting seed progressively from the bottom up. In the Pacific Northwest, bloom occurs from late June through early September, and color varies from whites through pinks to deep purple, and even red; however, magenta is the most common shade.

Seeds are believed to be long lived, up to 12 years in favorable conditions. Germination rates are high, 95% the first year, and remain high, 80% at three years. About the size of finely ground pepper, there are on the average 120 seeds per capsule. A mature plant may produce as many as 2.7 million seeds.

The phenotypic plasticity of purple loosestrife has given rise to much speculation regarding its tristylous flower and cross breeding with the introduced horticultural varieties of *Lythrum salicaria* and *L. virgatum*, and the native, *L. alatum*. The resulting hybrids are fertile, and the possibility of their crossing back to a parent and further changing is a topic of debate. It also seems that the variable environmental conditions of specific sites can affect morphological differences. As the above description implies, a great deal of variation occurs in wild populations of *Lythrum salicaria*, there is ample research opportunity to discover why.

Purple loosestrife was first documented in Washington state in 1929, although it may have been introduced earlier. The initial collection was taken from the shores of Lake Washington, the largest freshwater lake in the state which includes Seattle on its western shore. In eastern Washington, the earliest collections come from Spokane County (bordering the Idaho panhandle) in the 1940s. Interviews with long-time residents along the Little Spokane River indicate it

Continued on page 7



Left: Drainage infested with purple loosestrife extends to the Columbia River, Grant County, WA.
Above: Spokane County Noxious Weed Control Board Coordinator, R. Scott Neilson stands next to mature clump of purple loosestrife in Washington.

CALENDAR OF EVENTS

August 22-23, 1991	South Carolina APMS Annual Meeting, Samee Cooper's Somerset Point Facility on Lake Moultrie, Moncks Corner, Southern Carolina.
October, 15-17, 1991	Florida APMS Annual Meeting, Holiday Inn Surfside, Daytona Beach, Florida
November 8, 1991	Texas APMS Annual Meeting, Windham South Park, Austin, Texas.
November 11-16, 1991	North American Lake Management Society, 11th International Symposium of Lake, Reservoir and Watershed Management in a Changing Environment, Sheraton Tech Center Hotel, Denver, Colorado.
February 17-21, 1992	International Weed Control Congress, Monash University, Melbourne, Australia.
July 12-17, 1992	International Symposium on Aquatic Plants, Daytona Beach, Florida

CALL FOR PAPERS!

Plan To Attend and Present a Paper At The APMS 1991 Annual Meeting

You are invited to submit a title and abstract for the 31st annual meeting of the Aquatic Plant Management Society to be held July 14-17, 1991 at the Hyatt Regency in Dearborn, Michigan. Meeting in Dearborn, Michigan, gives us an opportunity to learn about northern states lake management strategies, and to see how mid-west states are attacking the problem of transport and dispersal of noxious aquatic vegetation. In addition to our more general sessions on operational and research developments from all over our Society, we will also learn about major biological problems facing the Great Lakes, and New England states will tell us about grass-roots programs for aquatic plant management. On Monday, we will attempt to summarize the current federal and state funding for aquatic plant management, and do a bit of forecasting about the future. Give a talk on your activities, and let us know what is happening in all the regions our Society covers!

Tuesday evening we will jump back a few

decades and hold our traditional social event and annual awards program in the 1920's, 30's, and 40's, when the automobile barons were at the top. We'll be surrounded by people and autos recreating that classic age. This site is just one of many family-oriented museums and displays that are within walking distance of the Hyatt Regency Dearborn.

Please use the form below, and type the title, authors, organization, and address exactly the way you want them to appear on the program. Abstracts (75 words or less) are needed so they can be provided to those attending the meeting. If you require more than 15 minutes to present your paper or need specialized projection equipment, please contact the Program Chairman for consideration.

Video tape provides an opportunity to give a far better "feel" for your project than slides. You are encouraged to use video in your, or for your, presentation when appropriate. Video equipment to display standard 1/2" VHS will be available throughout the meeting.

Paper submission Form for the 1991 APMS Meeting DEADLINE FOR SUBMISSION IS APRIL 30, 1991 (Please Detach and Return)

TITLE: _____

AUTHORS: _____

ORGANIZATION: _____

ADDRESS: _____

TELEPHONE: _____

() REGULAR PAPER () STUDENT PAPER

AUDIOVISUAL EQUIPMENT NEEDED: () 35mm Projector () Overhead Projector () Video Projector

SEND TO: Randall K. Stocker, Program Chairman, Imperial Irrigation District, P.O. Box 937, Imperial, CA 92251

1991 Student Paper Contest

The Society encourages all graduate and advanced undergraduate students to participate in the 17th annual APMS student paper contest, to be held during the Society's 31st Annual meeting in Dearborn, MI, July 14-17, 1991. Contestants will receive free meeting registration (including admission to the July 16 dinner banquet) and lodging at the Hyatt Regency Dearborn, site of the 1991 meeting. In addition, cash prizes will be awarded to the winners (1st Place, \$150; 2nd Place, \$100; 3rd Place, \$75; and 4th Place, \$50). Only original research in aquatic plant science (or on topics related to the management of aquatic vegetation) will be considered. Titles and abstracts (see paper submission form in this newsletter) should be submitted by **April 30, 1991**, to:

Dr. Kurt Getsinger, Chairman
APMS Student Affairs Committee
USAE Waterways Experiment Station
3909 Halls Ferry Road
Vicksburg, MS 39180-6199

For information concerning the contest, please call Kurt at (601) 634-2498.

New Mechanical Harvester Demonstration

Mitsui Engineering & Shipbuilding Co., Ltd. (Japan) has developed a new type of harvester for submerged weeds in canals. The harvester features unique cutting equipment for speedy harvesting, a 10 foot harvesting depth and low profile construction to pass under bridges/pipelines. In conjunction with the SR Group, Inc. and the South Florida Water Management, a demonstration program is being undertaken in the Dade County canals of the SFWMD. The Demonstration is planned to run from February 11, 1991 to March 5, 1991, and will also be working in other areas of South Florida after March 5.

For information regarding specific times and locations, please contact the SR Group, Inc. (Houston) at (713) 623-4500 or Mr. Stephen Smith at the South Florida Water Management District at (407) 686-8800 or Florida Watts 1-800-432-2045.

PROPOSED CHANGES TO BYLAWS

Article XVIII of the Society's Bylaws requires that notice of proposed amendments be given to the Secretary/Treasurer and transmitted by him to the membership 30 days prior to the Annual Meeting. The following proposed amendments were approved by the Board of Directors at the mid-winter annual Board Meeting. These proposed amendments have been given to the Secretary/Treasurer and are herein presented to the membership:

1. NEWSLETTER EDITOR AS AN OFFICER OF THE BOARD OF DIRECTORS.

The first amendment would add language to Article IV which would make the Newsletter Editor an elected officer of the Board of Directors. This amendment would require changes in Article IV, Section A., creation of a new Section G. which describes the duties of the Newsletter Editor and additional wording in Article V. A change would also be required in Article XI, Section C which describes the order of succession for vacancies in the office of the President. As an officer of the Society, the Newsletter Editor should be included in the order of succession. For each proposed change, the existing version is presented first and the proposed version with the new language underlined is presented next.

ARTICLE IV OFFICERS

Existing Version:

Section A. The officers of the Society shall be the President, President Elect, Vice President, Secretary-Treasurer, Immediate Past President and Editor. The Board of Directors of this Society shall consist of not more than twelve (12) members and shall include the active officers of the Society.

Proposed Version:

Section A. The officers of the Society shall be the President, President Elect, Vice President, Secretary-Treasurer, Immediate Past President, Editor and Newsletter Editor. The Board of Directors of this Society shall consist of not more than thirteen (13) members and shall include the active officers of the Society.

Proposed Section Addition To Article IV:

Section G. Newsletter Editor. The duties of the Newsletter Editor shall be to assemble, publish and distribute the Society Newsletter.

Addition of the above section would then require that Section G in the existing version be relettered to read:

Section H. The Directors shall assist in administering the affairs of this Society.

ARTICLE V TERM OF OFFICE

Existing Version:

All officers except the President, President Elect, and Secretary-Treasurer shall be elected for one year or until their successors shall be duly elected and qualified. The President Elect shall be elected for a term of two years, to include one year as President Elect and a succeeding year as President. Beginning with the annual meeting in 1981, the Secretary-Treasurer shall be elected for a three-year term beginning at the close of the annual meeting in 1982 and extending to the close of the annual meeting in 1985. Subsequently, the Secretary-Treasurer will be elected every three years beginning in 1984, shall take office for one year after election and shall serve three-year term of office. The purpose of election one year prior to assuming office is to permit the newly elected Secretary-Treasurer that period to understudy the requirements and duties of the office under the direction of the incumbent. No officers except the Secretary-Treasurer and/or the Editor shall succeed himself/herself. Officers elected at any annual meeting shall begin their duties on the close of the meeting at which they were elected. Nominees for President Elect shall be selected from the Board of Directors. Two (2) new members of the Board of Directors shall be elected each year for a term of three(3) years or until their successors shall be duly elected and qualified. Any officer or director of the Society who fails to fulfill the duties of the office without valid reasons, may be removed from office by a two-thirds vote of the Board of Directors. The vacant office shall be filled as described in ARTICLE XI, Section C.

Proposed Version:

All officers except the President, President Elect, and Secretary-Treasurer shall be elected for one year or until their successors shall be duly elected and qualified. The President Elect shall be elected for a term of two years, to include one year as President Elect and a succeeding year as President. Beginning with the annual meeting in 1981, the Secretary-Treasurer shall be elected for a three-year term beginning at the close of the annual meeting in 1982 and extending to the close of the annual meeting in 1985. Subsequently, the Secretary-Treasurer will be elected every three years beginning in 1984, shall take office for one year after election and shall serve three-year term of office. The purpose of election one year prior to assuming office is to permit the newly elected Secretary-Treasurer that period to understudy the requirements and duties of the office under the direction of the incumbent. No officers except the Secretary-Treasurer, Editor or Newsletter Editor shall succeed himself/herself. Officers elected at any annual meeting shall begin their duties on the close of the meeting at which they were elected. Nominees for President Elect

shall be selected from the Board of Directors. Two (2) new members of the Board of Directors shall be elected each year for a term of three(3) years or until their successors shall be duly elected and qualified. Any officer or director of the Society who fails to fulfill the duties of the office without valid reasons, may be removed from office by a two-thirds vote of the Board of Directors. The vacant office shall be filled as described in ARTICLE XI, Section C.

ARTICLE XI ELECTION OF OFFICERS

Existing Version:

Section C. Vacancies in the office of President between terms shall automatically be filled through succession in the following order: President Elect, Vice President, Secretary-Treasurer, and Editor. All vacancies, other than that in the office of President, shall be filled through appointment by the Board of Directors.

Proposed Version:

Section C. Vacancies in the office of President between terms shall automatically be filled through succession in the following order: President Elect, Vice President, Secretary-Treasurer, Editor and Newsletter Editor. All vacancies, other than that in the office of President, shall be filled through appointment by the Board of Directors.

2. CREATION OF THE AQUATIC PLANT MANAGEMENT SOCIETY SCHOLASTIC ENDOWMENT

The second amendment would require a new article creating the Aquatic Plant Management Society Scholastic Endowment. Funds placed in the endowment account could only be used for scholarships and student activities in the Society. This article would be placed in the Bylaws as Article XVII. Article XVII and Article XVIII in the present Bylaws would be renumbered as XVIII and XIX, respectively. The proposed language is listed below:

ARTICLE XVII SOCIETY SCHOLASTIC ENDOWMENT

Section A. The Aquatic Plant Management Society Scholastic Endowment shall be used to encourage and enhance student participation in the Society.

Section B. The Aquatic Plant Management Society Scholastic Endowment fund shall be maintained in a separate account administered by the Board of Directors and shall only be used to support scholarships and student activities in the Society. Expenditures shall be made following recommendation by the Student Affairs Committee and approval of the Board of Directors.

For additional information contact Michael Kane, Bylaws and Resolutions Committee Chair (904/392-7937).

Plan Ahead!

**INTERNATIONAL
SYMPOSIUM**

**ON THE BIOLOGY
AND CONTROL OF
AQUATIC PLANTS**

A JOINT MEETING WITH
THE AQUATIC PLANT
MANAGEMENT SOCIETY

TO BE HELD AT
DAYTONA BEACH, FLORIDA
USA

12 - 17 JULY, 1992

U.S. Army Corps of Engineers Releases New Waterlettuce Biological Control Agent

Namangana pectinicornis, a biological control agent specific for water lettuce, was released in Fisheating Creek (Glades County, Florida) on February 12 and Lake Ocklawaha (Putnam County, Florida) on February 13, 1991. The moth cleared a vigorous quarantine protocol at a University of Florida laboratory and was approved for release by the U.S. Department of Agriculture (USDA) Technical Advisory Group. Research leading to this release was initiated in 1985 and has been funded by the U.S. Corp of Engineers Jacksonville District and the Corps Aquatic Plant Control Research Program. The USDA also provided support for the project.

Water lettuce is a floating aquatic plant widely distributed throughout tropical and subtropical areas of the world. Severe infestations in the southeastern U.S. interfere with recreation, navigation, irrigation, impede water flow, interfere with water control structures, and act as a detriment to the public health by providing harborage to certain mosquito larvae.

Representatives from Corps of Engineers Jacksonville District, the Corps of Engineers Waterways Experiment Station (Vicksburg, Mississippi) the University of Florida Institute of Food and Agricultural Sciences, and the USDA Agricultural Research Service (Ft. Lauderdale) participated in the release. *Namangana* joins the growing arsenal of biocontrol agents for aquatic plants which includes the alligatorweed flea beetle, thrips, and stem borer; the waterhyacinth moth, and two waterhyacinth weevils; the water lettuce weevil; and the *Hydrellia* fly

and hydrilla tuber weevil.

Namangana, native to southeast Asia, has been successfully used for management of water lettuce in Thailand. The larvae devour the leaves of the plant resulting in plant death. A new generation of the moth can be produced in approximately 35 days allowing populations to rapidly build up. The effects of the two releases are being closely monitored.

The Corps Jacksonville District's Aquatic Plant Control Operations Support Center coordinated these releases. For further information please contact Wayne Jipsen at (904) 791-2219.



ATTENTION: Aquatic Shutterbugs

Plan to enter the 1991 APMS Photo Contest. Get out your cameras and let others see your artistic impressions of aquatic plants and aquatic weed management. Cash prizes and ribbons will be awarded.

Wendy needs some competition, so dust off your old prints and start taking pictures for new ones.

Rules for Entry of Photographs in the 1991 APMS Photo Contest

1. Contest is open only to members of the Aquatic Plant Management Society (APMS).
2. Photographs containing subject matter related to aquatic plants will be considered for entry into the contest.
3. Each contestant may enter up to any number of prints, but can win only one prize.
4. Cash prizes and ribbons will be awarded for 1st, 2nd, and 3rd places.
5. Photographs can be either color or black and white prints. There is no size restriction on the prints to be entered; however, prints of 8 by 10 inches appear to be

a good size for viewing. Prints should be mounted. Vertical or horizontal formats will be considered. No 35 mm slides will be accepted.

6. Information to be included on the back of each print shall be the following:

- a. Title of print (can be included on front of mounted prints).
- b. Name and address, or business card of contestant.
- c. Negative or slide from which the photograph was made.
- d. Optional information may include camera used, film, and camera settings.
- e. If the photograph contains recognizable people, then a model release form must accompany the print.

7. APMS retains the right to keep any or all photographs. Any photographs retained by APMS become the property of APMS for their exclusive uses. Photographs not retained by APMS will be returned to contestant.

8. Entries must be submitted in person to the registration table prior to noon of the first full day of the meeting.

9. Contestants must attend the meeting to win.

10. Entries will be judged on: Subject matter, Composition, and Technical merit.

The winners for the 1990 APMS Photo Contest were:

1st Place:

Wendy Andrew
Aquatic Plant Manager
Operations Department
S.W. FL Water Management District
2379 Broad Street (U.S. 41 South)
Brooksville, FL 34609-6899

2nd Place:

Fred Katz
Graduate Student
Rutgers University
Dept. of Crop Science
Cook College, Lipman Hall
P.O. Box 231, New Brunswick, NJ

3rd Place:

Wendy Andrew

Accidental Deaths From Pesticides

Despite reports to the contrary, lethal pesticide-related accidents in the U.S. are declining. Occasionally we see quotes in the media from advocacy groups or other sources that there are 200 pesticide related accidental deaths in the U.S. each year; however, no reference is given to the source of this information. Perhaps it goes back to an estimate made many years ago by someone, maybe at that time there were that many accidental deaths, but statistics available today indicate quite different figures. In 1986 there were 20 deaths, the lowest since the current record-keeping and reporting began. The National Center for Health Statistics records figures based on actual death certificates. These are the most meaningful data on deaths from different classes of potential poisons.

The data assembled and presented in the current manner go back only to 1969; however, there are meaningful numbers for representative years prior to that data based on a review of death certificates by Dr. Wayland J. Hayes, Jr. and colleagues at Vanderbilt Medical School. In 1965 there were 111. When those numbers are compared with the 1980's, tremendous progress has been made in lowering the number of accidental deaths from pesticide exposure. The credit for this reduction

goes to education, regulation, and new technology — including the availability of less toxic products.

Accidental deaths from medicines or pharmaceutical drugs leads all other classes of substances and has increased significantly, averaging 3,428 for 1984 to 1986. Substances other than medicines and pesticides (including solids, liquids, and gases) account for more than 1500 fatal accidents, although there has been a small decline in this group during the past 10 years.

Accidental deaths due to pesticides result from poor storage practices and careless handling. Accidental deaths and poisonings from pesticides and other materials can be prevented by using common sense. Everyone should read the label and follow precautionary statements. The fact that some children are among those who die from pesticide accidents indicates the need to keep such products as well as other dangerous materials and medicines out of their reach. These statistics indicate much improvement has occurred to reduce the number of accidental deaths from pesticides, however, we can continue to do better. (Source: Farm Chemicals, November 1989)

CAST Installs New Officers

The Council for Agricultural Science and Technology (CAST) has elected new officers for 1991-1992, effective February 27. Lowell S. Jordan of the Department of Botany and Plant Sciences at the University of California, Riverside is president of CAST for 1991-1992. Dr. Jordan recently served as chair of a CAST review of the 1989 National Research Council report, *Alternative Agriculture*.

Gale A. Buchanan, resident director of the University of Georgia Coastal Plain Experiment Station at Tifton, is the new president-elect of CAST. Before joining the CAST Executive Committee in 1990, he represented the Weed Science Society of America on the Board of Directors and served as chair of the Budget and Finance Committee.

James L. Oblinger is past president. Dr. Oblinger is associate dean and director of academic affairs of the College of Agriculture at North Carolina State University, Raleigh.

David R. Lineback and Deon D. Stuthman have been elected members-at-large of the CAST Executive Committee. Dr. Lineback, head of the Department of Food Science at North Carolina State University in Raleigh, has been chair of the CAST National Concerns Committee, and represented the Institute of Food Technologists on the CAST board.

Dr. Stuthman is professor in the Department of Agronomy and Plant Genetics at the University of Minnesota. He has been involved in releasing new oat cultivars in Minnesota and

Mexico. Dr. Stuthman, a fellow in the American society of Agronomy and the Crop Science Society of America (CSSA), has represented CSSA on the CAST Board of Directors.

David B. Anderson is a new representative of individual members. Dr. Anderson is a senior research scientist in Animal Science Discovery Research at Lilly Research Laboratories in Greenfield, Indiana, and an adjunct professor in the Department of Animal Science at Purdue University.

Terms for officers and board members begin after the Board of Directors meeting in February. Individual members of CAST elect three representatives to the CAST board; the board elects officers and the Executive Committee. All other board members are named by scientific societies.

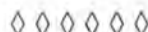
CAST is a nonprofit organization of 29 professional societies in food and agricultural science and many individual, company, nonprofit, and associate society members.

The Aquatic Plant Management Society is represented on the CAST board by Dr. Joseph C. Joyce of the University of Florida.

Recent CAST publications include: *Alternative Agriculture: Scientists' Review*, *Ecological Impacts of Federal Conservation and Cropland Reduction Programs*, and *Pesticides and Safety of Fruits and Vegetables*.

Individual members of CAST may order one free copy of each report within one year of publication. Individual membership for 1991 is \$30.

Book Reviews



Wetland ecology and management: case studies. Editor by D.F. Whigham, R.E. Good and J. Kvet, published by Kluwer Academic Publishers. 180 pages.

This is a collection of 19 papers, most of which were presented at the 2nd International Wetlands Conference in Treborn, Czechoslovakia in June 1984, and represent aspects of wetland management. The editors' objectives for this book are to demonstrate that wetlands provide a variety of uses for man, and that a range of approaches will be required to protect their valuable functions.

The papers are divided into three sections on: wetland management; landscape issues related to wetland management; wetland ecology and utilization. The first section, which was dominated by examples from North America, contained papers ranging from a conceptual approach to wetlands protection strategies in New Jersey, through a series of ecological observations from wetland reclamation projects in the USSR, to experimental data relating to the effects of fire and nutrients on marshes.

The other two sections included papers from Europe, Africa, Asia and Australia covering coastal, lacustrine and riverine wetlands and peatlands. A wide variety of experimental methods and analyses have been included in this diverse assemblage of study sites and projects. Several papers contain provocative discussions that emphasize the need for the start, or improvements to, future planning and regulation of wetland use and surrounding development.

Although the scope of this book is perhaps a little too diverse for those seeking information on a specific type of wetland and management, it would be ideal for those requiring a broader appraisal of the variety of wetland research in progress throughout the world. As such it would provide a particularly good introduction to wetlands studies for those entering the field.

— Alison Fox



Proceedings, 8th International Symposium on Aquatic Weeds, 13-17 August 1990, Uppsala, Sweden, edited by P.R.F. Barrett, M.P. Greaves, K.J. Murphy, A.H. Pieterse, P.M. Wade and M. Wallsten. European Weed Research Society. 1990. 255 pages.

(Order from E.W.R.S. Symposia Proceedings, Post Box 14, NL-6700 AA Wageningen, THE NETHERLANDS.)

This is a collection of 50 papers presented at the EWRS 8th Symposium, including papers on aquatic weed ecology, biology, and management.

Lake Getting An Overdose Of Grass Carp

Triploid grass carp number 331 weighed 5.25 pounds. Number 332 was a 7-pounder, and inspired the same expressions of glee that have greeted all its predecessors. When John Clark has caught 2,338 more of the triploid grass carp known to be in Lake McMeekin, he will have eliminated all of them.

And then once again he may see maiden cane, pond lilies, and other native plants growing in Lake McMeekin's spring-fed water. The way things are, an overdose of grass carp has virtually eliminated vegetation of any kind in the lake. The moment a green shoot rises out of the bottom, slurp! and it's in the stomach of a hungry carp. The lake's excess nutrient, once absorbed by the elodea, is now producing green algae, making the water resemble green pea soup.

Clark has the permission (actually, the blessing) of the Game and Fish Commission to catch them all, with hooks, nets, gigs, and bare hands. The commission recommends a density of two fish per acre of water to act as a control device in lakes infested with an excess of vegetation. The 135 acres of Lake McMeekin should have received 270 carp; it got 2,670.

The lake's problems started in the late 1970s with a severe infestation of Brazilian elodea, which looks a lot like hydrilla. Nobody knows where it came from, but since the weed is a popular aquarium plant, it may have gotten its start when some unthinking cottager tired of taking care of his home aquarium, and dumped its contents into the lake.

The cottagers asked for help from the Game and Fish Commission, and were given three choices: mechanical removal, with expensive weed-cutting machines; treatment with herbicides, and resultant build-up of muck; and biological control with the exotic grass carp.

Grass carp are finned mowing machines that eat half their weight in vegetation every day.

When the cottagers learned of the availability of triploid grass carp, which cannot spawn, they chose the biological control.

With \$6,000 of state funds obtained through the assistance of an area legislator, FGC personnel stocked 1,250 of the carp in April of 1983, fish that were six to eight inches long. Nearly a year passed, and cottagers could see no sign of reduction in the elodea. Grass carp have no "flee" mechanism when confronted by a hungry bass, and many through the predator fish had swallowed most of the weed-eaters.

The cottagers raised \$8,000, and in May of 1984 they re-stocked the lake with 1,420 more, larger fish 10 to 14 inches long. That made a total of 2,670 grass carp in a 135-acre lake loaded with the vegetation they love to eat.

Early the following summer elodea began floating to the surface. The carp didn't start with the extremities of the plants, but with the roots. They attacked from the bottom up, and when they cut the elodea above the roots the plants floated to the surface, and drifted to the windward side of the lake in rotting masses. The clinging and odorous tendrils covered the shorelines to a depth of three feet and more.

Pitchforks, rakes, garden hoes, trucks, wagons, pick-ups, all hauled decaying elodea. And now they were seeing the fish, growing as if the weeds were laced with steroids and hormones, suddenly two to three feet long.

They called in the GFC experts. They had three choices: poison them out, along with the bass, bluegills, and the other desirable fishes; seine the lake, and probably kill many of the gamefish; or wait for the carp to die of old age, meanwhile catching as many of them as possible by various sporting and unsporting means.

Clark built a fenced-in area that enclosed 300 square feet of shoreline, running out into the lake about 20 feet. He installed a gate that could prevent or permit fish to swim into the en-

closure. He put soybean cakes in the enclosure overnight, with the gate open, then slammed the gate shut. On one halcyon night he got 38 carp. He kept careful track of the number of exotics he eliminated and got up to 200.

Then he learned to catch them on hook and line. Start with the soybean chum tossed out in front of the dock, bait a small hook with balls of Hungry Jack biscuit mix, fresh from the package, and put it on the bottom in the area where the chum was distributed. When the line moves, haul back and reel in a carp.

His biggest grass carp so far weight 13 pounds. The 5-pounder we caught was as small as any of them. Our 7-pounder was about average.

Their fight is like that of a foul-hooked tennis shoe, but any finned creature 30 inches or so in length can charge up your batteries so your face lights up. Most of the fish are used to fertilize tomato plants or young trees. None are returned to the water.

As a specialty fish, the Clarks fillet them and lay them on the outside grill, skin side down, seasoned, and broiled with plenty of butter. The flesh is firm and white, but the bone structure of a carp is like that of the pickerel, and there is no way to eliminate the little Y-shaped bones prior to cooking.

The flavor is excellent, and those who can forget they're eating carp find them highly acceptable.

Clark is getting more and more help with his carp elimination project, as other cottagers learn to have fun while catching fish of impressive size. From neighborly reports, in addition to his 332, he can account for about 600. Meanwhile, the carp are growing, growing...

Reprinted from The Gainesville Sun, November 18, 1990.

Virginia Seeking Funds to Cut Hydrilla

Closed Harbors Seen If State Ends Effort

By Brooke A. Masters, Washington Post Staff Writer.

Underwater weeds may choke off several Northern Virginia harbors this summer, unless state legislators succeed in their efforts to protect the region's fishermen and boating enthusiasts from becoming the latest victims of the state's budget deficit.

The state recently announced that budget concerns had prompted them to withdraw from a regional coalition to mow down hydrilla, an escaped aquarium plant that first began clogging the Potomac in 1983. The leafy green weed helps improve water quality, but it also tangles around boat propellers and fishing nets, and makes it difficult to get in and out of infested areas.

"In my district, I will have 14 families on welfare if they don't cut that hydrilla," said Prince William Supervisor Hilda M. Barg (D-Woodbridge). "They can't make a living fishing if they can't get their boats to the fish."

Without Virginia's \$78,000, hydrilla will not be harvested from about 44 acres in 10 locations from Alexandria to Wide Water, in Stafford county, said Giselle Bernstein, who coordinates the harvesting for the metropolitan Washington Council of Governments. Maryland is still participating in the program and has agreed to put up \$130,000 to cut boating channels at 14 places on the river.

Although the federal government matches state contributions dollar for dollar, Prince William Supervisor Edwin C. King (D-Dumfries) told the counties would have to pay the entire bill if they take over the cutting.

Northern Virginia's legislators are trying to fight the cutback. State Sen. Joseph V. Garlan Jr. (D-Mount Vernon) has sponsored a budget amendment to appropriate about \$57,000 for the hydrilla cutting.

"Harvesting this is vital to access to marinas and docking areas."

If Garlan's bill fails, it means bad news for the fisheries, marinas and swimming areas along the Virginia shoreline, particularly in Prince William and Stafford counties.

Two rainy summers in a row have reduced hydrilla's growth nearer the District, but the weed has been spreading steadily south, Bernstein said.

Hydrilla cannot grow if the water is too salty, but rain has increased the Potomac's fresh water content, allowing hydrilla to thrive there, she said.

Submerged aquatic grasses, which include hydrilla and a host of other plants, have spread from 400 acres in 1983 to more than 5,000 in 1989, Bernstein said.

"If it's a boom year [for hydrilla], we could have a real problem on the Virginia side," Bernstein said.

Staff writer Donald P. Baker contributed to this report. Reprinted from Washington Post, February 2, 1991.

The Purple Plague (continued from page 1)

escaped from the grounds of the Country Club's garden into the river (along with the Iris, yellow flag) in the 1930s.

Populations at the two sites have expanded slowly, but steadily. Both sites are lush with minimally disturbed native vegetation which seems to offer a degree of competition for the invading purple loosestrife.

More recently, and in contrast to the west-side and easternmost populations of the state, the Columbia Basin of central Washington has seen a phenomenal rate of expansion in its purple loosestrife population. Here a cold desert of sagebrush and wheatgrass was converted into some of the richest agricultural land in the western U.S. by the Columbia Basin Reclamation Project.

The Project began with the building of Grand Coulee Dam in the 1940s, and continued with the progressive damming of the Columbia River (from both ends). In order to provide irrigation water from the Columbia River to nearly half-a-million acres of desert, a network of canals, irrigation and surface/groundwater return systems were developed. Some of the natural, pre-existing water courses were used and enhanced, some were constructed.

Two major return flows developed naturally as used and overflow waters were released in the 1940s and allowed to find their own course. These are the Winchester and Frenchman Hills wasteways which traverse some 50 miles of the Project. It took until 1965 for the water to make it from the point of origin at Banks Lake, to Dodson Road (about 30 miles) which is the believed site of initial introduction of purple loosestrife into the area in the early 1970s. These wasteways are now the primary sites of the most extensive purple loosestrife infestation in Washington, estimated at 23,000 desert wetland acres.

This reclamation project created an enormous site disturbance through the introduction of large quantities of water into the Columbia Basin desert flora. There was less than 10 years for more desirable aquatic vegetation to become established before purple loosestrife was introduced. Finding it-

self without real competition, after 10 years of modest expansion and seedbank development, it virtually exploded throughout the wet areas of the desert. Now, 20 short years after the initial introduction, each summer, lythrum blooms a purple carpet over half the area of 55,000 acres of desert wetlands.

The Columbia Basin Project was authorized and built as a multiple use project. Power production and irrigation were primary features of the project, with recreation and fish and wildlife activities as also part of the original authorized purposes. Purple loosestrife interferes with ditchbank integrity and channel capacity, creating additional operating and maintenance expenses for irrigation districts. Due to its rank vegetative growth and rapid establishment as a monoculture, it offers no habitat value to wildlife while displacing vegetation that does. It also creates an impenetrable wall precluding access by people for recreational activities.

Although the project remains primarily under federal (Bureau of Reclamation) jurisdiction, habitat management for wildlife and recreation opportunities was given to the state Department of Wildlife. A small contingency of concerned people tried from the mid 70s to alert the Department of Wildlife and the local weed control authority as to the potential negative impacts of this exotic species to habitat, wildlife, recreation opportunities, and irrigation water delivery systems.

Ten years later, in the fall of 1988, *Lythrum salicaria* was added to the State Noxious Weed List. This status allows local weed control agencies to enforce compliance with the State Integrated Noxious Weed Management Law upon landowners/managers. Also, a meeting was called to bring those with concerns about this weed together to figure out what course of action could/should be taken to address the exploding problem.

It became clear that a wait for direction (funding) from the top could be a long one, which provided the incentive to collect a groundswell of support from grassroots activities. Several projects/goals were devel-

oped and set.

Three educational projects were developed for 1989. One was the design, printing, and sale of T-shirts with a message indicating the negative aspect of purple loosestrife. Besides being a lot of fun, these T-shirts have elicited a lot of response from people, even those unfamiliar with weeds or wetlands ("Oh wow, man. Is that a new heavy metal rock band?"). I have found these people willing to listen to harangues as to the potential damage if this weed is left to spread unchecked.

A second project was the gathering of law makers, their advisers and land managers in decision making positions for an informal barbeque in the field to listen to those concerned with the problem and view from a boat, the impact along the Winchester wasteway. It was relatively well attended, and an impression was made.


The next project was a seminar specific to the historical spread and control efforts to date (including both chemical and biological research activities) of purple loosestrife. Offered to public land managers and other interested people, it was well attended, including personnel from the Department of Wildlife; and, resulted in the sale of a lot of T-shirts.

As the decade turned, the State Department of Agriculture (WSDA) ruled to outlaw the transport and sale of any plant parts of *Lythrum salicaria*, *L. virgatum*, their hybrids and cultivars, within and into the state under nursery codes. It is hoped this will prevent further introductions of purple loosestrife from home and park gardens into nearby wet areas.

A push was made to legislate the recognition of the negative impact of purple loosestrife on the habitat of our state wetlands, and mandate funding for a specific control program. The legislation did not survive the 1990 session, but the funding did, and \$250,000 was appropriated to the Department of Wildlife to conduct control efforts on their infested lands, and those for which they have management responsibility. The Department established and headed an Oversight Committee with broad based representation, to provide advice on the expenditure of funds.

The Committee was broken down into four Task Groups providing expertise and advisement on inventory data and needs, monitoring and research data and needs, educational programs and materials development, and specific control projects. There were a few shortcomings through the chosen avenues of process in this first major effort to develop a statewide program. They can be corrected so long as funding remains intact. The one thing made clear from the successes and failures of the committees is the need for a full-time coordinator to maximize effectiveness and efficiency of this statewide campaign to bring purple loosestrife to a tolerable level of control.

What 1991 brings to Washington State's battle with the "plague" remains as yet unfolded. Till then, we carry on the good fight.



Purple
Loosestrife
is capable of
out-competing
even cattails,
Grant County,
Washington.

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Originally called the Hyacinth Control Society, Inc., when founded in 1961, The Aquatic Plant Management Society, Inc. is a respected source of expertise in the field of biological, mechanical, chemical and other methods of aquatic plant management and aquatic plant sciences. The Society has grown to include several regional and state chapters; and through these affiliates, annual meetings, newsletters, and the *Journal*

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