THE AQUATIC PLANT MANAGEMENT SOCIETY, INC.

31st ANNUAL MEETING ABSTRACTS

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THE AQUATIC PLANT MANAGEMENT SOCIETY, INC.

The Aquatic Plant Management Society, Inc. is an international organization of scientists, educators, students, commercial pesticide applicators, administrators, and concerned individuals interested in the management and study of aquatic plants. The membership reflects a diversity of federal, state, and local agencies; universities and colleges around the world; corporations; and small businesses.

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 of Aquatic Plant Management*, members keep abreast of the latest developments in the field.

The objectives of the society shall be to:

1. Encourage scientific research and assist in promoting the control and management of aquatic plants through scientifically sound procedures.
2. Recognize and promote scientific advancement of the members and facilitate the education of aquatic plant scientists through scholarships and other assistance programs.
3. Publish the results of meritorious research and other information of value that pertains to aquatic plants and their management.
4. Extend and develop public interest in, and understanding of, aquatic plant management problems and solutions.
5. Cooperate with local chapters and other societies and organizations with similar and related interests.

NAME:
R. Michael Smart

TITLE:
The Corps' Lewisville Aquatic Ecosystem Research Facility: New Opportunities For Aquatic Plant Research

ABSTRACT:
The USAE WES has begun operation of a research facility which includes ponds, flowing water mesocosms, greenhouses, and a laboratory. The facility, located in Lewisville, Texas, is being developed under the Corps' Aquatic Plant Control Research Program for studies of the biology, ecology and control of aquatic plants. This pond research facility provides an intermediate scale environment that will help extend the results of laboratory-derived technology to the solution of aquatic plant problems in nature.

NAME:
Alfred M. Beeton

TITLE:
The Laurentian Great Lakes: Problems and Solutions

ABSTRACT:
The Laurentian Great Lakes redefine the definition of the word "lake." They contain almost 20% of the world's surface fresh water, and about 95% of the surface freshwater of the United States. An estimated one trillion gallons of water are withdrawn daily for municipal, industrial, agricultural, and power generation use. In return over 20 billion gallons of wastes are discharged into the lakes. An overview of the Great Lakes system, major problem and what is being done to mitigate and/or prevent these and future problems is presented.

NAME:
J.L. Decell

TITLE:
The Corps of Engineers Role in Aquatic Plant Management

ABSTRACT:
The Corps of Engineers Aquatic Plant Control Program (APCP) has experienced a shift from mechanical and chemical control methods, to biological/chemical methods, from in-house to a more balanced in-house/contract program. The COE has contributed approximately $100-110 million to APC since 1974.

The future will experience an increase in cost-sharing, and an increased emphasis on environmentally compatible management, including water supply.

NAME:
Lars W. J. Anderson and Joe Antognini

TITLE:
Administrative and Research Perspective of U.S. Department of Agriculture's Role in Development of Improved Methods for Aquatic Weed Management: History and Future Trends

ABSTRACT:
The USDA's primary activities in aquatic weed management have been through the Agricultural Research Service (ARS) for basic and applied research and the Animal, Plant, Health and Inspection Service (APHIS) for regulatory and "action" based programs. ARS and APHIS have historically participated in multi-agency federal and state projects and are associated closely with land-grant colleges. Successful programs include (1) exploration and introduction of biological control agents against alligatorweed, water hyacinth, and hydrilla; (2) advancement in fundamental knowledge of aquatic weed biology and physiology; (3) data-support for EPA registration packages for dalapon, 2,4-D glyphosate, fluridone, copper-based herbicides, and most recently, bensulfuron methyl; (4) potential for use of beneficial plants and; (5) methods for controlling weeds during seasonal drawdown periods. Laboratory management during the past 15 years is from several locations of one-to-two scientists to two "team" oriented groups (Ft. Lauderdale, FL and U.C. Davis, CA). Total FTE scientists has declined as have total support dollars per scientist. Research trends have been toward biological control and physiological ecology.

NAME:
A. Leon Bates, Earl R. Burns, and David H. Webb

TITLE:
The Role of TVA in Aquatic Plant Management

ABSTRACT:
The Tennessee Valley Authority is a public regional resource agency with responsibilities for managing 625,000 acres of reservoirs in seven states. Technique development for managing aquatic vegetation began in the early 1930's to deal primarily with native aquatic plants that impacted reservoir use or promoted breeding of mosquitoes. New management strategies subsequently had to be developed in the 1960's to reduce excessive non-native exotic aquatic plants such as Eurasian watermilfoil. Strategies for the future include effectively coping with new introductions such as hydrilla coupled with rapidly changing population demographics and more diverse reservoir uses. Management techniques will employ the latest technologies for integrated biological, chemical, mechanical, and environmental manipulation techniques so that best management practices can be followed. Public input and "customer" surveys will be used to guide methods and level of aquatic plant management.

NAME:
Dr. Joseph C. Joyce

TITLE:
The Past, Present, and Future of Aquatic Plant Research in Florida

ABSTRACT:
The development of aquatic plant research in Florida has been influenced by the magnitude of the aquatic weed problem and its impacts on the public's use of water resources. Funding initiatives and research directions are reviewed and related to the introduction of new species and changes in society's goals and perceptions of environmental issues and concerns. Future research directions will be greatly influenced by interagency needs and cooperation.

NAME:
Jeffrey Schardt

TITLE:
Florida's Aquatic Plant Management Program

ABSTRACT:
The aquatic plant management activities of approximately 100 federal, state and local agencies and a similar number of private companies are coordinated by the Florida Department of Natural Resources. Exotic plants pose the greatest problems in public waters as more than 95% of the management funds expended are for the control of waterhyacinth, hydrilla, and waterlettuce. Waterhyacinth has been reduced, under an aggressive management philosophy known as maintenance control, from more than 125,000 acres in the 1960's to fewer than 1200 acres in 1990. There are five phases of Florida's management program: 1) prevention, 2) survey and assessment, 3) research and development, 4) control and 5) recovery. Each phase will be discussed as well as the recent impact of inadequate funding.

NAME:
Nate Dechoretz

TITLE:
Aquatic Plant Management in California: Current Perspectives and Future Policy

ABSTRACT:
Responsibility and/or authority for aquatic plant management in California is currently distributed among various federal, state, and local agencies or organizations. Total expenditures for aquatic plant management statewide is difficult to determine. The California Department of Food and Agriculture (CDFA) spends 1.5 million dollars to detect and eradicate alligatorweed and hydrilla. The current financial crisis in California has not yet significantly impacted CDFA eradication programs. However, impacts on future programs may result from new regulatory decisions or policies as well as a decrease in available funds.

NAME:
Steven J. de Kozlowski

TITLE:
South Carolina's Aquatic Plant Management Program - The Same but Different

ABSTRACT:
The South Carolina Aquatic Plant Management Program was established in 1980 to provide coordinated statewide management of aquatic plant problems in public waters. Increases in control expenditures over the years due primarily to the spread of hydrilla, coupled with limited federal and state support, has shifted a greater financial burden to local entities and dramatically reduced available funding for research. Heightened public concern over environmental and public health impacts of pesticides has resulted in the implementation of more stringent safeguards in the use of aquatic herbicides in general, and increased herbicide residue monitoring in potable water supplies.

NAME:
Carole A. Lembi

TITLE:
The Role of Universities in Agency-Sponsored Aquatic Plant Management Research

ABSTRACT:
Universities provide personnel, facilities, expertise, lower overhead costs and other resources that can substantially enhance the research goals of a government agency. In some ways, the discipline of aquatic weed science is legitimatized by its inclusion in a university program. Unfortunately, most university researchers are not aware of either the challenging opportunities in aquatic plant management research or potential sources of funding from agencies. In addition, industry support is dwindling. There is a danger that with the exception of a few regional strongholds, university involvement in aquatic plant management research may disappear. Some suggestions for reversing this trend will be discussed.

NAME:
Peter R Newroth

TITLE:
Role of the Province of British Columbia in Aquatic Plant Management

ABSTRACT:
The Ministry of Environment, Province of British Columbia, Canada, has administered an extensive, integrated aquatic plant management program since 1972. Because of absence of experienced B.C. aquatic plant control contractors and technical experts, at a local level, and the failure of Federal Government agencies to react to nuisance aquatic weed problems, the Province took the technical lead.

The Ministry has developed, tested, implemented and documented Eurasian water milfoil control measures throughout British Columbia. Up to 1980, nearly all funding was provided by the province; since 1981 most control has been cost-shared (75% provincial - 25% local). Over $10 million has been spent since 1972, and a number of innovative control approaches (e.g.: rototilling, cultivating, diver dredging, bottom barriers) have been developed and applied. Annual treatments of high-use littoral areas now exceed 250 ha.

As local agencies develop more experience, and as suitable contractors become available, routine control operations are being delegated to local administrations. Ministry staff address broader issues including prevention of spread to uninfested areas, control technology development and documentation and evaluation of results.

NAME:
Bill Zattau

TITLE:
A Five-Year Hydrilla Management Plan for Florida

ABSTRACT:
The Jacksonville District, in cooperation with other agencies, is implementing a five-year hydrilla management plan for Florida waterbodies receiving federal funds for aquatic plant management.

This plan was initiated at a June workshop attended by local, state and federal operations and research personnel. Operations personnel provided historical data on management strategies, success and failures, and costs of operations the past five years. Standardized maps of current hydrilla infestations and listings of treatment priorities allowed comparison of the varied hydrilla management problems. Herbicide and biological control researchers provided treatment recommendations for specific waterbodies during the workshop.

Recommendations from this workshop are being considered during the development of the five-year Corps' plan. Once completed, it will serve as the foundation on which Federal funding allocations are based. This plan should assist cooperators with formulation of Annual Work Plans while increasing both the efficiency and effectiveness of hydrilla management operations in Florida.

NAME:
Melanie Moon, Mark Rattray and George Bowes

TITLE:
Acclimation of Mikania Scandens to Flooding

ABSTRACT:
Mikania scandens plants were grown under flooded and drained conditions. After 6 weeks, RGR's based on dry weight and shoot elongation were the same or greater for flooded plants. Stem and root cross sections revealed 1.7- and 2.0- fold, respectively, more aerenchyma in flooded as compared to drained plants. Higher number of stomates were recorded on the stems of flooded compared to drained plants (366 of 43). The results suggest that M. scandens acclimates to flooding anatomically and therefore is a flood tolerant species.

NAME: J.R.Cassani, H.P. Allaire, E. Laddo de la Vega

TITLE:
Seasonality in Southern Naiad in South Florida

ABSTRACT:
A population of southern naiad (Najas guadalupensis) is being monitored in Lee County, Florida for variations in a number of parameters that may affect its seasonality. The parameters studied are sediment, plant tissue, and water macro and micro-nutrients, sediment physical composition, light and temperature. Also. the reproductive biology of this species is being assessed at several sites.

NAME:
John W. Barko
Dwilette G. McFarland

TITLE:
Sediment Interactions with Submersed Macrophyte Growth

ABSTRACT:
The availability of nitrogen (N) and phosphorus (P) in sediments is affected markedly by sediment type, but can also be influenced by macrophyte growth. Results of laboratory and field studies have demonstrated conclusively that submersed macrophytes can significantly deplete sediment N and P pools. From fertilization experiments, conducted in both laboratory and field settings, macrophyte growth on nutritionally-depleted sediments has been shown to be limited by the availability of sediment N, but not P.

NAME:
Nancy J. McCreary

TITLE:
Differences in Sediment Nitrogen Supply Can Influence Growth and Interactions Between Potamogeton Americanus and Hydrilla Verticillata

ABSTRACT:
This 1989 study examined growth of Hydrilla verticillata and Potamogeton americanus on sediments differing by 10x in sediment nitrogen. Shoot production and canopy development in Hydrilla were impeded by Potamogeton, which remained unaffected by Hydrilla. Potamogeton responded more to increased nitrogen, and it dominated mixtures. Potamogeton suppression coefficients exceeded Hydrilla, but higher nitrogen reduced Potamogeton's suppressive advantage. Management practices might examine measures which reduce inherent competitive advantages of native species in response to problem species.

NAME:
Craig S. Smith

TITLE:
Ecological Changes Associated with Invasion of Lakes by Eurasian Watermilfoil

ABSTRACT:
Despite widespread concern over the invasion of lakes by Eurasian watermilfoil, invasions are not always associated with decreases in water quality, losses of invertebrate habitat, or reductions in gamefish abundance. In many cases, the influences of aquatic plants on these parameters are determined more by the total biomass of macrophytes present than by their species composition. Even invasion produces a change in macrophyte biomass, the resulting effects are not all likely to be deleterious.

NAME:
Susan Monteleone

TITLE:
Aquatic Macrophyte Interactions in Chautauqua Lake, New York

ABSTRACT:
Macrophytes were surveyed during the summers of 1988 and 1989. Relative species distributions and pair-wise species associations of six dominant macrophytes differed between lake basins. The shallow south basin, characterized by relatively minor changes in bottom topography, was more completely dominated by weedy species. Also in the south basin, Elodea canadensis may exhibit a competitive release response to Potamogeton crispus die-back. Comparisons of macrophyte growth morphologies within and among depths showed distinct patterns of distribution.

NAME:
John D. Madsen

TITLE:
Seasonal Leaf Dynamics and Seed Germination in Waterhyacinth (Eichhornia crassipes)

ABSTRACTS:
Waterhyacinth was studied in experimental ponds, one amended with nitrogen and one unamended, to determine life history characteristics for more effective implementation of control techniques. Leaf production and loss was estimated weekly using leaf tagging techniques. Pond fertility affects leaf and plant size, but not leaf production. Waterhyacinth seeds germinated in early July, with some plants reaching maturity, flowering and setting seed before the vegetative populations were eliminated by heavy frosts in December.

NAME:
W.E. Spencer, J.A. Teeri, R.G. Wetzel

TITLE:
Adaptive Significance of the Variable C_3/C_4 Photosynthetic Physiology in Hydrilla Verticillata.

ABSTRACT:
C_4 phenotypes of H. verticillata occurred within water of high plant density (mats) characterized by midday depletion of dissolved inorganic carbon (DIC), oxygen supersaturation, and p^H approaching 10. C_3 phenotypes occurred along the edge of the growing clone where neither DIC depletion, oxygen supersaturation nor elevated p^H occurred. Productivity of the C_4 phenotype was 66% greater than the C_3 under mat conditions. Laboratory experiments indicate that the induction of the C_4 phenotype is a density dependent phenomenon.

NAME:
Tara Chand, Carole A. Lembi

TITLE:
Gibberellin Synthesis Inhibitors as Potential Tools in Aquatic Plant Management

ABSTRACT:
We have shown that the gibberellin synthesis inhibitors flurprimidol, uniconazol, and paclobutrazol reduce stem elongation in hydrilla and Eurasian watermilfoil without killing the plants. This presents a potentially valuable tool in aquatic plant management because the vegetation can still provide oxygen, habitat and sediment stabilization. In small scale outdoor tests we exposed Eurasian watermilfoil to 75 and 200 ppb flurprimidol for 2 hours, 1, 3, 7, 14, and 28 days. After the exposure period, the water was removed and replaced with untreated water and the plants were allowed to recover for four weeks. Only a 2 hour exposure at 200 ppb was required to cause significant stem reduction over the four week recovery period. GC-MS analysis of water in which flurprimidol-treated water was not removed showed a half-life of 8-9 days. After four weeks in untreated water, flurprimidol was detected in milfoil tissue (fr.wt.) at concentrations 4-30 times greater than in the surrounding water, suggesting some accumulation of the compound in the plant. Analyses of flurprimidol in soil will also be reported.

NAME:
Jan D. Miller, W.T. Haller, M.S. Glenn

TITLE:
Wild Rice: Is There A Difference?

ABSTRACT:
Although the scientific community has not yet unanimously accepted the division of the genus Zizania into two species, Z. palustris (northern) and Z. aquatica (southern), several tremendous ecological differences have been noted which add to the body of evidence supporting the split. Morphological characteristics such as height, weight, leaf width, number of tillers, and number of seeds per tillers were compared. Germination, photoperiod, and habitat characteristics of both the northern and southern types were also examined.

NAME:
Dwilette G. McFarland
John W. Barko

TITLE:
Interrelationships Between Rooting Depth of Myriophyllum Spicatum L. and Sediment Nutrient Availability

ABSTRACT:
In a six-week greenhouse investigation, rooting depth of Myriophyllum spicatum L. was evaluated in relation to effects on sediment nitrogen (N) and phosphorus (P) profiles. Significant reductions in exchangeable N occurred over approximate rooting depths of 25 cm in fertile versus 40 cm in infertile sediment. Extractable P was markedly depleted down to at least 40 cm in fertile sediment, but in infertile sediment, remained relatively unchanged. Rooting depths of submersed species are suggested to be important considerations in regulating macrophyte growth and community composition in response to natural or manipulated changes in sediment nutrient availability.

NAME:
Mark R. Rattray, Julia B. Reiskind, and George Bowes

TITLE:
Hydrilla, the Photosynthetically Plastic Plant

ABSTRACT:
Hydrilla has the ability to alter its photosynthetic metabolism from C_3 to C_4-like under summer-like growth conditions. Under low, CO_2-limiting conditions, C_4-like photosynthesis was induced as demonstrated by lower CO_2 compensation points (10 vs 35 uL C02 L^{-1}), decreased O_2 inhibition of photosynthesis (0 vs 45%) relative to control plants (high CO_2 grown). PEP carboxylase activities increased 3-fold under CO_2 stress conditions. We therefore suggest that CO_2 stress is the trigger for C_4-like photosynthesis in Hydrilla.

NAME:
W.E. Spencer and R.E. Wetzel

TITLE:
The Accumulation of Phosphorus by Ceratophyllum Demersum Beneath the Ice.

ABSTRACT:
Experiments showed that the growth of summer C. demersum is limited by phosphorus concentration. Tissue phosphorus concentration in winter plants was 60% greater than in summer plants. Total phosphorus concentration in the water during the winter was 4 times that in the summer. Both net photosynthesis and dark respiration show seasonal acclimation to temperature. We propose that perennation by C. demersum in temperate lakes may enhance the acquisition of phosphorus and reduce phosphorus limitations on growth experienced during the summer.

NAME:
David Spencer and Gregory G. Ksander

TITLE:
Longevity of Sprouted Propagules for Three Species of Aquatic Plants.

ABSTRACT:
Many rooted aquatic plants grow from vegetative propagules which supply energy for early growth. Knowing how long young plants can survive from stored reserves may be useful in timing of management techniques. Sprouted propagules of Potamogeton pectinatus, P. gramineus, and Hydrilla verticillata were grown in the dark in two different experiments. Measurements of growth, tissue carbon, and regrowth potential indicated that young pondweed plants survived for about 4 weeks on stored reserves. Hydrilla appeared to survive about 8 weeks. These results imply that intensive management efforts shortly after sprouting may be more effective for some species than others.

NAME:
Brian E. Smith, D. G. Shilling, and W. T. Haller

TITLE:
The Effect of Herbicide Rate and Stage of Development of Torpedograss (Panicum repens L.) on the Efficacy of Glyphosate.

ABSTRACT:
Studies were conducted during a draw-down at East Lake Tohopekaliga near St. Cloud, FL to evaluate methods of torpedograss control. Regrowth of Panicum repens in response to the combined effects of two cultural practices, three rates of glyphosate and these stages of development was studied. Regrowth of Panicum repens in response to two cultural practices alone was evaluated. A field of torpedograss measuring approximately 250' by 10,000' was burned in late May 1991. Following the burn, the field was disked twice except for a 75' by 1,000' strip in the middle. The experimental design was a strip plot with cultural practice designating the strip. Glyphosate rates were 1.13, 2.26, and 4.48 kg/ha. These rates were applied at three physiological stages of development. Glyphosate rates and times of application were arranged factorially and the treatments replicated three times. Approximately 180 days after each of the three herbicide treatments, torpedograss regrowth was visually estimated to determine the response to the various treatments. The best control was obtained at the highest glyphosate rate on mature torpedograss.

NAME:
Lawrence A. Dyck, Timothy J. Lee, and Tracy J. Gaskin

TITLE:
Distribution of Lyngbya wollei Infestations in Lake Guntersville, a Large Southeastern Reservoir.

ABSTRACT:
Quantitative and qualitative evaluations were made of the distribution of Lyngbya within discrete physical and biotic zones of the Guntersville Reservoir (Tennessee River). Several classes of Lyngbya were identified: (1) Resident Populations (biomass to 30 kg/m^2 F.W.) reside within low energy sheltered coves; (2) Transient Populations (biomass to 40 kg/m^2 F.W.) accumulate within the lowest energy zone along high energy shorelines; (3) Macrophyte Entangled Populations; (4) Planktonic Populations; (5) Open Water Benthic Populations. Correlations between Lyngbya distribution and the physical and biotic features of the reservoir will be discussed along with implications to reservoir management.

NAME:
Stephen G. Metzer

TITLE:
Mortality of Fish and Aquatic Macroinvertebrates in Mechanical Aquatic Weed Harvesters

ABSTRACT:
Mechanical weed harvesting is a commonly applied method of controlling nuisance growths of aquatic macrophytes. The numbers of fish and macroinvertebrates which are collected along with the plant material can be substantial or negligible, depending on weed species, growth pattern, and time of the year. Studies in Florida (on hydrilla) and new York (on Eurasian watermilfoil) have yielded far different results. Preliminary data from Michigan lakes (with pondweeds) indicates that late spring harvests of curly leaf pondweed removes the most non-target organisms.

NAME:
Daniel Timothy Gerber, Donald H. Les, and Russell Cuhel

TITLE:
Radioactive Sulfate Uptake In Watermilfoils

ABSTRACT:
Two potential sources of nutrients exist for aquatic plants growing in the littoral zone of a lake: the sediment and the water column. For the seven species of Water Milfoils (Myriophyllum) found in Wisconsin (all submerged spp.), nutrients may be taken from the sediments and water column. Radiolabled sulfate (^{35}S) was used to determine the location of sulfate uptake in the shoots of these aquatics. Preliminary results suggest that sulfate uptake may occur through the entire surface area of these Milfoils, however, a large portion of the radiolabled sulfate was taken up by hydropoten (specialized for ion uptake) found on the shoots.

NAME:
Horace Johnson

TITLE:
Phenoxy "2,4-D" Herbicides - An Update

ABSTRACT:
Phenoxy "2,4-D" herbicides were introduced in 1945 for the control of broadleaf weeds. They remain one of the most widely used herbicides throughout the world. During the past several years numerous studies have been conducted which concluded that 2,4-D's can be used with minimal risk. An industry task force has been formed to develop re-registration data on the product line. This seven member group has committed over $10 million to the project which includes aquatic uses.

NAME:
K. D. Getsinger and M. D. Netherland

TITLE:
Chemical Control of Submersed Plants in High Water-Exchange Environments

ABSTRACTS:
Current submersed application techniques have been unable to provide consistent control of target plants in flowing and/or high water-exchange systems (e.g. rivers, canals, tidal areas, lakes, and reservoirs). Some inconsistent control can be related to water-exchange characteristics within plant stands resulting in off-target movement of herbicides and reduced contact time. This paper will review studies being conducted by the USAEWES and the Center for Aquatic Plants to improve control in flowing water by developing: a) specific herbicide concentration/exposure time requirements for target species; b) application techniques to take advantage of water-exchange characteristics; and c) treatment schedules designed to coincide with susceptible periods in the growth cycle of target species.

NAME:
Alison M. Fox and W. T. Haller

TITLE:
Improving Herbicide Efficacy by Appropriate Application Methods

ABSTRACT:
Extensive dye studies in tidal canals in Crystal River, Florida, indicated that water temperature was the most important factor influencing rates of herbicide dissipation and efficacy. Further experiments in these canals, and various shallow lakes, have shown that some of the temperature-induced constraints on herbicide use can be overcome by specific application methods.

NAME:
Wayne T. Jipsen

TITLE:
Getting The Bugs Out or Off the Shelf and on the Wing Biocontrol Agents Go Operational

ABSTRACT:
The Jacksonville District, in cooperation with other agencies, is implementing a new program to provide stable cost-shared resources for release, establishment, and follow-up surveillance of newly available "operational" biological control agents. As managers, we cannot allow these organisms to be orphaned. Expenses associated with maintaining nursery colonies, dispersal, establishment, and surveillance continue long after the research phase is concluded.

New guidelines have been established to allow cost-share partners to incorporate these program costs and activities into annual workplans. Training materials and seminars are being organized to facilitate the technology transfer from researchers to operations personnel.

NAME:
Stratford H. Kay

TITLE:
Perspectives on the Biological Control of Alligatorweed In North Carolina

ABSTRACT:
Flea beetles (Agasicles hygrophila) and stemboring moths (Vogtia malloi) imported from South America for alligatorweed biocontrol do not overwinter in North Carolina. Natural stemborer migrations and annual flea beetle releases often have been ineffective here, because the insects either arrive too late in the season or are adversely affected by summer weather conditions. Mild winters and favorable summertime weather resulted in successful flea beetle releases during 1989 and a significant impact of natural stemborer migrations in 1990.

NAME:
Samuel J. Chappelear, J. W. Foltz, and Kevin T. Chavis

TITLE:
Movements and Habitat Utilization of Triploid Grass Carp in Lake Marion, S.C.

ABSTRACT:
Radiotelemetry was used to determine triploid grass carp (Ctenopharyngodon idella) movement and habitat utilization in vegetated areas in upper Lake Marion, South Carolina. Grass carp exhibited a down lake movement throughout the year especially during the summer months but began moving back up the lake in September. Mean dissolved oxygen levels declined to lethal levels (0.1 mg/L) in the upper portion of the lake. Dissolved oxygen levels continually decreased from winter to spring and summer before increasing to 5.1 mg/L in the fall. Daily fish movement increased from 0.22 km/day in March to 0.65 km/day in June then steadily declined to 0.01 km/day in October. Average daily movement was 0.29 km/day compared to the longest distance moved in one day which was 3.56 km. Fish exhibited no affinity for the river channel. Fish utilized open water shallow flats (1-2 meters deep) and thick cypress swamps from February until April before shifting to open water cypress stands and open water river channel in May and June. Fish utilized open water cypress stands and open water river channel habitats exclusively from July until October. In 71.5% of the fish locations, grass carp utilized areas with aquatic vegetation present on the surface, and these areas were dominated by Hydrilla verticillata 66% of the time.

NAME:
Scott Painter

TITLE:
Establishing Habitat Goals and Response to Water Clarity Using a GIS

ABSTRACT:
An approach, using a Geographic Information System (GIS), has been developed which can determine if aquatic plants in Hamilton Harbour are limited by water clarity. Habitat targets can be established by determining aquatic plant productivity and distribution when water clarity is assumed to meet the Provincial Water Quality Objective. Remedial options to improve water clarity can be evaluated based on their effect on aquatic plant productivity and distribution.

NAME:
Stratford H. Kay and Steve T. Hoyle

TITLE:
Greenhouse Evaluation of the Sensitivity of Three Floating Plants to Imazapyr

ABSTRACT:
Greenhouse studies evaluated the sensitivity of three species of free-floating aquatic macrophytes to varying concentrations of imazapyr applied into the water column. Two-week exposure tests were conducted in small jars using static culture without renewal of nutrients or herbicide. Growth was significantly inhibited in Lemna, Azolla, and Salvinia by imazapyr concentrations as low as 0.25, 0.25, and 0.50 mg/l, respectively.

NAME:
D. G. Shilling and W. T. Haller

TITLE:
Factors Influencing the Availability of Fluridone

ABSTRACT:
Fluridone has been utilized for aquatic weed control for several years. During this period, research conducted at the University of Florida has evaluated how several biotic and abiotic factors could potentially affect fluridone and consequently efficacy. Field and laboratory studies have evaluated how water flow, water depth, water clarity, sunlight, hydrosoil, microorganisms, rate, and application method affect fluridone and control. Results from these studies have been used to not only explain variable results, but more importantly how to change controllable factors such that more consistent results could be achieved. In addition, these data have been used to determine how new application methods can be effectively utilized in the future.

NAME:
Wendy M. Andrew, D. G. Shilling, A. M. Fox, and W. T. Haller

TITLE:
Hydrilla Control Program and Herbicide Residues in the Withlachoochee River-1990

ABSTRACT:
Hydrilla has become the major aquatic weed problem in the Withlachoochee River in the last decade. Budget limitations have only allowed the use of contact herbicides, prior to 1990, to maintaining a navigation channel down the river with two treatments annually. In the spring of 1990, during low flow conditions, fluridone was applied at 10 to 12 ppb for several weeks in the upper lakes in the river and hydrilla control and herbicide residues were monitored. The total amount of fluridone used is entirely dependent upon water flow, so in years of high flow, contact herbicides will likely have to be used to maintain navigation yet remain in budget. Tailoring the currently known characteristics of aquatic herbicides to water flow regimes and budget, will hopefully provide more predictable weed management, reduce large annual variations in submersed weed biomass, increase the diversity of native submersed species, and increase recreational use of the river.

NAME:
Chuck Hanlon, A. M. Fox, and W. T. Haller

TITLE:
The Impact of Fluridone Treatments on the Plant Communities of the Withlachoochee River, Florida

ABSTRACT:
Permanent vegetation transects were mapped along the Withlachoochee River before and after hydrilla management with fluridone. The herbicide treatment, reductions in water level and a temporary deterioration in water quality reduced all types of vegetation within three months. By one year after treatment the total number of species had increased, or remained the same, in all sites. In all but the most downstream transect, the coverage of hydrilla was drastically reduced, and the proportion of native plant coverage increased.

NAME:
K.A. Langeland

TITLE:
Hydrilla Response to Rate and Timing of Bensulfuron Methyl Application

ABSTRACT:
Bensulfuron methyl applied at 25, 50, or 100 mg/l, in August or October; sequential applications of 25 mg/l in June, July, August, and October; or sequential applications of 50 mg/l in June and August had no affect on biomass of hydrilla grown in 1000 l concrete tanks. Application of 25 ppb in June stimulated growth from 7.12 g/m^2/day to 11.36 g/m^2/day. Height of hydrilla plants was reduced to one half by sequential applications of 25 mg/l in June, July, August, and October. Untreated hydrilla, as well as hydrilla treated with 100 mg/l in June, and 25 and 100 mg/l in October began producing tubers in late August through early September and continued at a rate of 9.32×10^{-5} times the cube of days after planting. As observed with biomass, 25 mg/l applied in June stimulated tuber production, as well as 50 mg/l applied in June. Fifty mg/l applied in October reduced tuber production to a rate of only 0.16 per day. Concentrations of 25, 50 or 100 mg/l applied in August; and 25 mg/l applied sequentially in June, July, or August prevented hydrilla from forming tubers.

NAME:
W. T. Haller, A. M. Fox, C. Hanlon, D. Shilling, and K. Langeland

TITLE:
Integration of Mariner into a Hydrilla Control Program

ABSTRACT:
Hydrilla regrowth from tubers and germinating root crows was treated with bensulfuron-methyl prior to initiation of vegetative reproduction in September 1990. Treatment concentration of 5, 10, 15, 20, and 25 ppb inhibited or prevented vegetative reproduction for 4 months during the Fall (September - January). Treatments scheduled for harvest May 20, 1991 will provide information on single applications (September - May) and split applications (September - January; January - May) at these concentrations. Field data from two 25 ppb applications to hydrilla under a maintenance control program on the Withlachoochee River may also be discussed time permitting.

NAME:
M. E. Kane and N. Philman

TITLE:
Comparative Studies on the In Vitro Regenerative Potential of Limnophila Species

ABSTRACT:
The in vitro shoot regeneration capacity of the prohibited aquatic Limnophila sessiliflora and putative non-weedy species Limnophila indica were compared. Shoot regeneration from pre-formed meristems on single node (whorls) stem segments and adventitious shoot formation from cultured internode segments were evaluated in liquid and agar-solidified media consisting of Murashige and Skoog medium supplemented with 30 grams/liter sucrose and various combinations of synthetic and naturally-occurring cytokinins. In all studies L. sessiliflora exhibited a significantly greater capacity for shoot regeneration from both nodal segments and production of adventitious shoots. Although more studies are needed, in vitro aquatic plant culture systems may prove useful for preliminary screening of growth potential.

APPLICATION FOR MEMBERSHIP IN:

THE AQUATIC PLANT MANAGEMENT SOCIETY, INC.

WILLIAM N. RUSHING, Secretary-Treasurer
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Signature of Applicant _____

Date _____

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