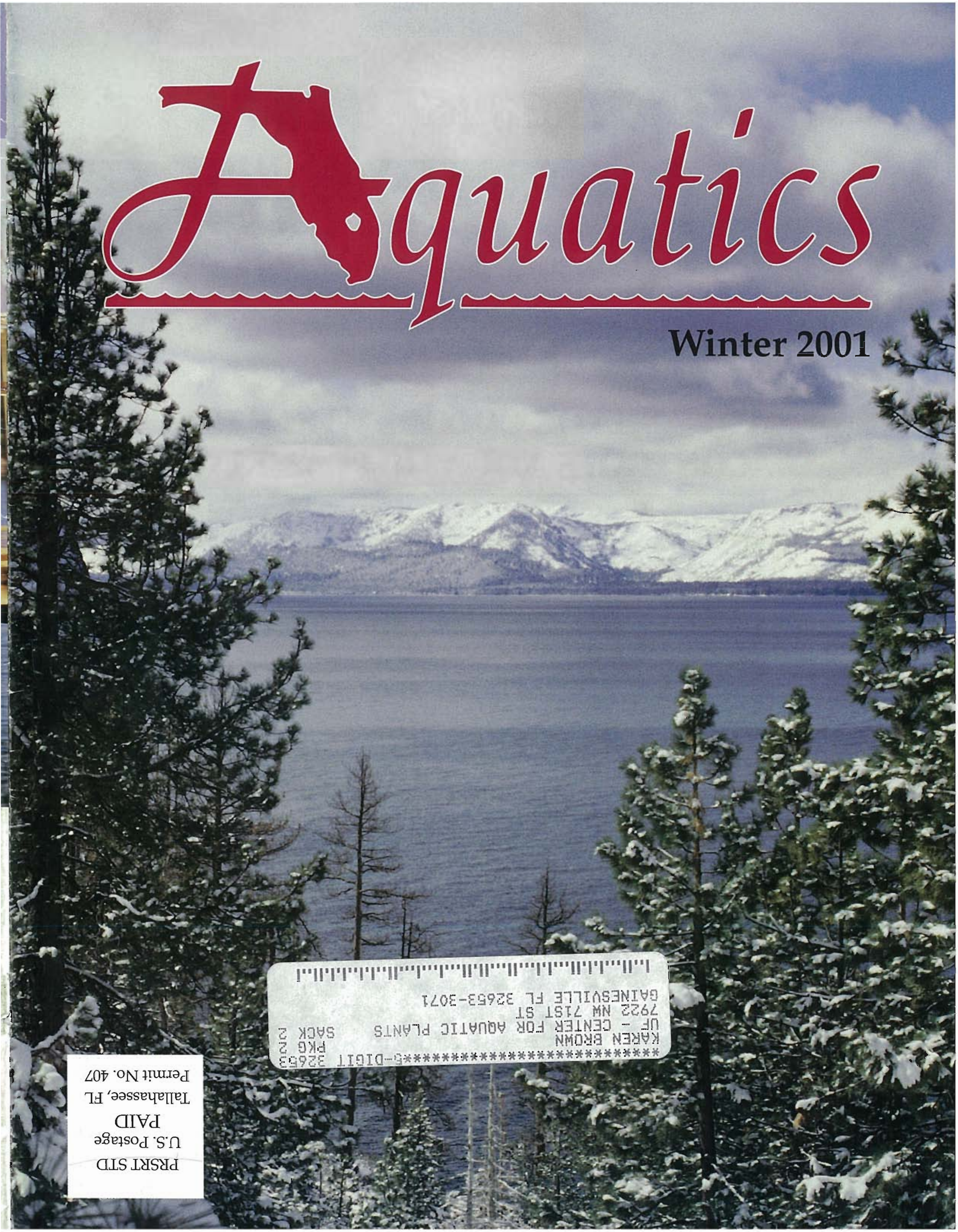
Aquatics

Winter 2001



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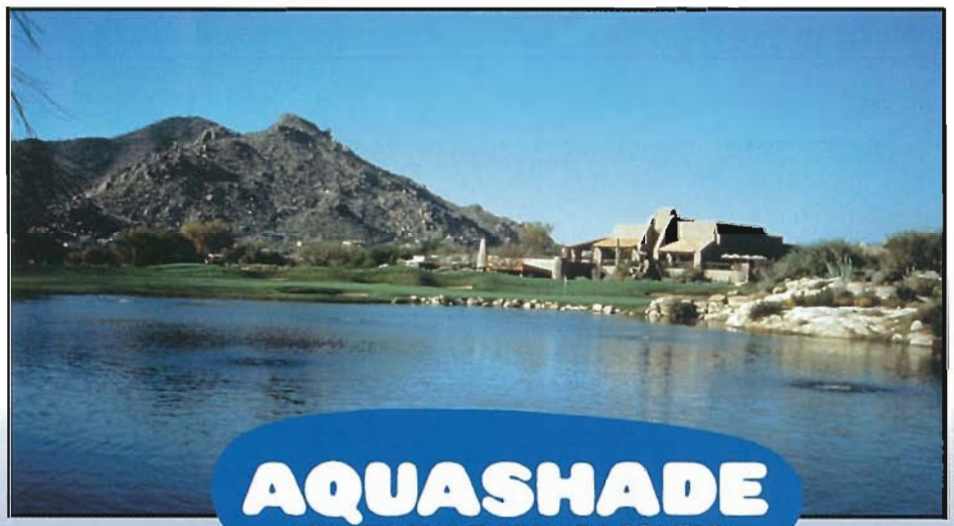

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Editorial

I look forward to serving as president of the Florida Aquatic Plant Management Society. For those who have volunteered their time to do the daily duties of running our society, I am grateful. Most members have no idea of the number of hours that our officers, directors, and committee members contribute each year. In addition, our sponsors are greatly appreciated and truly make the annual meeting an enjoyable event.

Public perception of controlling plants is a never-ending battle we face. The bass fisherman who fish around floating mats of water hyacinth or hydrilla often like these exotic plants to remain since they provide a type of structure and concentrate sport fish. But, left untreated exotic plants can eliminate large areas of bulrush and eelgrass or not allow the establishment of other native plants. I am often asked why we control exotic plants or why we don't leave some for fisheries. I believe the best one line answer is that we control exotic plants to allow our native, beneficial plants to establish, survive and thrive. I like this answer because it ends in a positive note. We aim to improve, not maintain or reduce, wildlife habitat.

The Florida Aquatic Plant Management Society has traditionally been an organization dedicated to the control of invasive aquatic plants. But the control of torpedo-grass along a shoreline only to have paragrass establish in the same area does not make for good lake management practice. There have been many private and public revegetation projects, studies published and unpublished, over the past 20 years. The IFAS Center in Ft. Lauderdale has been a leader in revegetation techniques for many years. Their publication entitled "Aquascaping" has an excellent listing of plant material. I believe our Society needs to stress the control of invasive plants, but also the establishment of native, beneficial plants. We plan to publish a special issue *Aquatics* during the summer or fall season that will list about 15 native species that can be use in shoreline plantings. Each species will include a color photograph of an actual planting, a brief description, flower color, blooming season, habitat, wildlife value, freeze tolerance, soil types, light requirement, salinity, pest problems, growth rate, recommended

Continued on page 13

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www.homestead.com/fapms/main.html

Lake Tahoe in winter—this spectacular lake is plagued by Eurasion water milfoil infesting shallow littoral areas and canals. Photo by David Tarver

Aquatics

Winter 2001/Vol. 23, No. 4

Contents

AQUATICS (ISSN 1054-1799): Published quarterly as the official publication of the Florida Aquatic Plant Management Society Registration No. 1,579,647. This publication is intended to keep all interested parties informed on matters as they relate to aquatic plant management particularly in Florida. To become a member of FAPMS and receive the Society newsletter and Aquatics magazine, send $20.00 plus your mailing address to the Treasurer.
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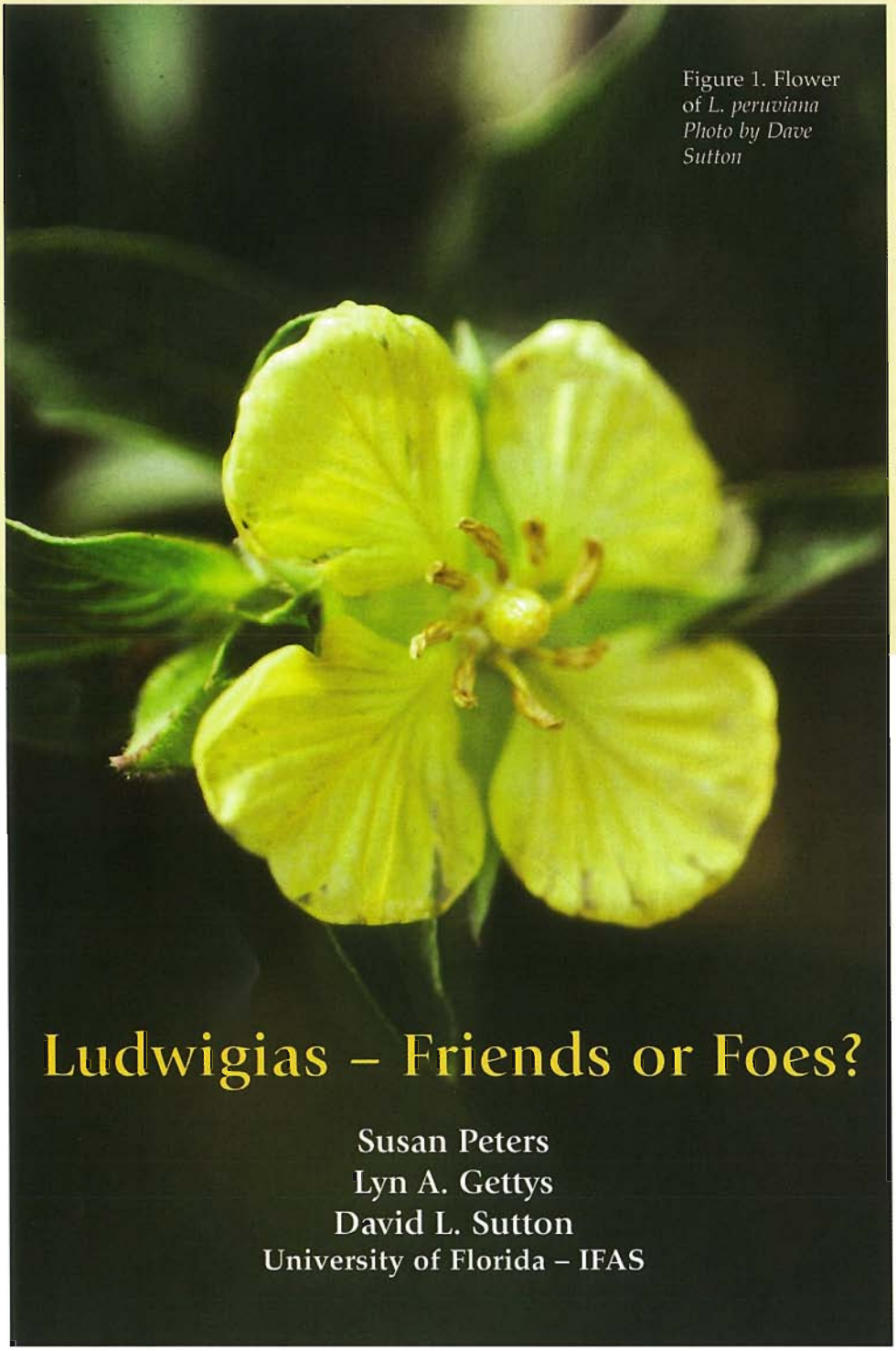


Figure 1. Flower of *L. peruviana* Photo by Dave Sutton

Ludwigias – Friends or Foes?

Susan Peters
Lyn A. Gettys
David L. Sutton
University of Florida – IFAS

Introduction

Jethro Tull used the term "weed" in 1731 in the publication "Horse-Hoeing Husbandry" to refer to aggressive, competitive plants that interfere with the production of crops. The old English word "wëod" was derived from a prehistoric Germanic plant and is a very subjective epithet.

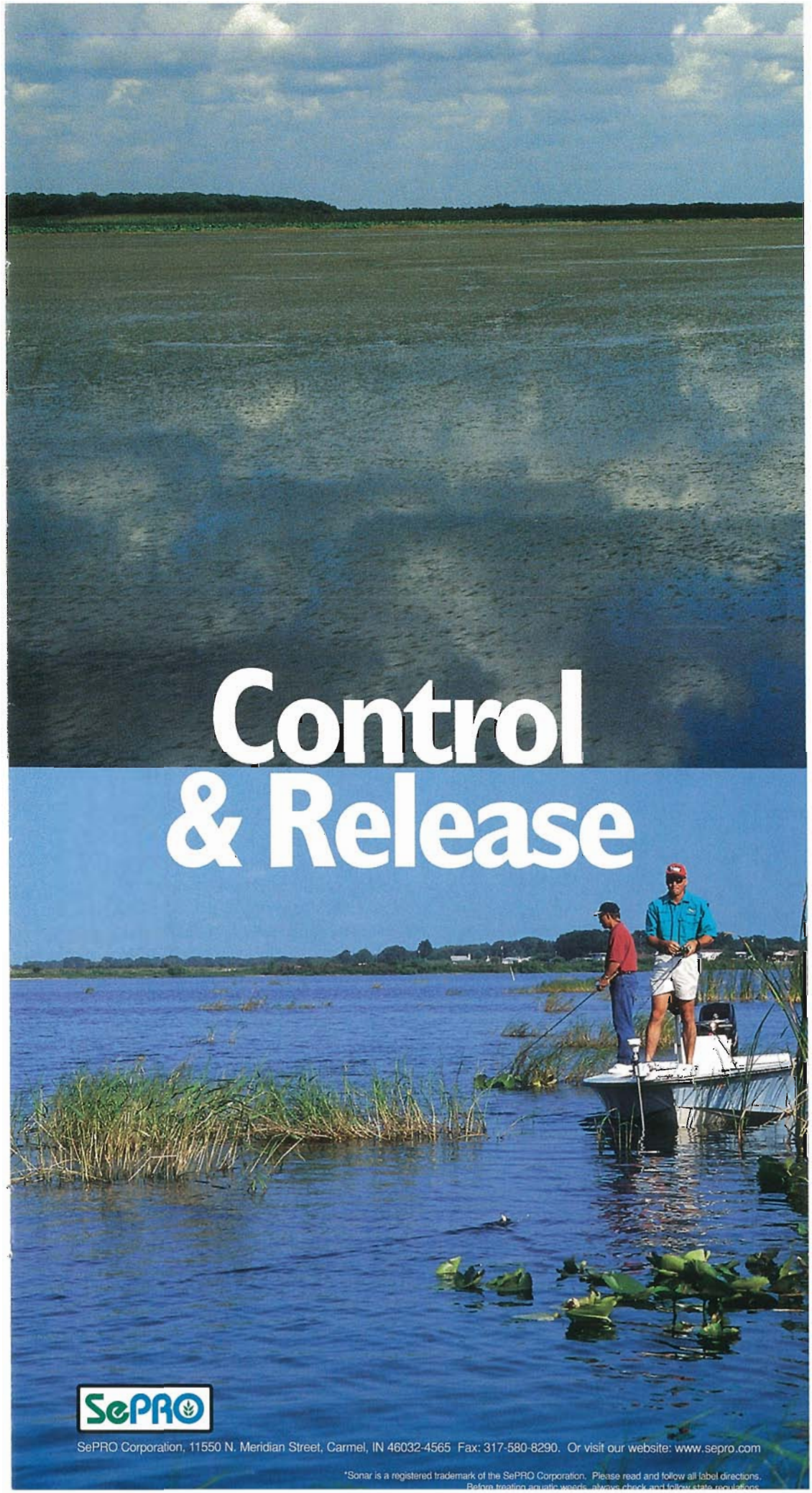
A number of different definitions have been used to describe weeds because a plant that is considered a nuisance in one situation may be desirable in another. The Terminology Committee of the Weed Science Society of America in 1956 described a weed as a plant growing where it is not wanted. Others, including Ralph Waldo Emerson, have looked at weeds in a different light; Emerson described weeds as "plants whose virtues have not yet been discovered."

The Onagraceae, or Evening-primrose family, contains the genus *Ludwigia*, a group of plants that have both desirable and undesirable characteristics. The purpose of this article is to provide information on species in the genus *Ludwigia* and to assess whether they are desirable natives or weeds.

Classification, Distribution, and Range

The genus *Ludwigia* was named in honor of C. G. Ludwig by Linnaeus in 1753. *Ludwigia* is one of 20 genera with about 650 species belonging to the Onagraceae or Evening Primrose family. Members of the family are annual or perennial herbs or shrubs. Other notable species in the family are the fuchsias and clarkias found in many landscapes.

There are about 75 species of *Ludwigia* worldwide. Members of this genus are commonly called *ludwigia*, false loosestrife, water-prim-



Every bass angler worth his salt recognizes and appreciates the value of structure. Aquatic vegetation plays an important role in providing structure for fish and wildlife. But exotic invasive plants like hydrilla and Eurasian watermilfoil crowd out the more beneficial native plants, thus disrupting a diverse habitat. This mixture or balance of plants and structure can improve both the number and quality of fish.

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rose, primrose-willow, seedbox, and a number of other less endearing terms, including "weed".

Many *ludwigia*s colonize marshes, swampy woodlands, stream banks, drainage ditches, and canals. The *ludwigia*s were originally found mostly in subtropical and temperate areas of the Americas but are now distributed throughout the world.

Florida is home to about 30 species of *Ludwigia* (Table 1). Three species, *L. bonariensis* (Micheli) Hara, *L. grandiflora* (Michx.) Greuter and Burdet, and *L. peruviana* (L.) Hara, are considered exotic or non-native, although they are not on the Federal Noxious Weed List. Distribution of the various species in Florida is widespread with about one-third of them fairly prevalent throughout the state.

Table 1. *Ludwigia*s found in Florida. Exotic species are shown in bold type.

Scientific Name	Common Name	Distribution
L. alata	Winged ludwigia	Coastal
L. alternifolia	Seed-box, Rattle-box	NW
L. arcuata	False loosestrife	W coast, N central
L. bonariensis	Carolina ludwigia	Two NW counties
L. curtissi	Curtiss' ludwigia	S, coastal counties
L. decurrens	Wingleaf ludwigia	Most of Florida
L. erecta	Yerba De Jicotea	S, central
L. glandulosa	Cylindricfruit ludwigia	NW, N central
L. grandiflora	Largeflower ludwigia	N
L. hirtella	Hairy seed-box Spindle-root	NW
L. lanceolata	Lanceleaf ludwigia	N of Lake Okeechobee
L. leptocarpa	Anglestem ludwigia	Most of Florida
L. linearis	Narrowleaf ludwigia	Most of Florida
L. linifolia	Southeastern ludwigia	Most of Florida
L. longifolia	Longleaf ludwigia	One county
L. maritime	Seaside or coastal seed-box	Most of Florida
L. microcarpa	Little seed-box	Most of Florida
L. octovalvis	Water-primrose	Most of Florida
L. peploides	Floating ludwigia	Three counties
L. peruviana	Water-primrose	Most of Florida
L. pilosa	Hairy ludwigia	N
L. ravenii	(none)	One NE county
L. repens	Red ludwigia	Most of Florida
L. spathulata	Spoon ludwigia	Four N counties
L. sphaerocarpa	Globefruit ludwigia	Fifteen N counties
L. suffruticosa	Headed seedbox	Most of Florida
L. virgata	Savannah seedbox	NW, central
L. X simulata	(none)	Three counties

Morphology

Many *ludwigia*s are quite attractive. Their leaves are usually simple with margins that are entire or minutely toothed. Leaf arrangement is alternate or opposite and small stipules subtend each leaf. Solitary flowers are borne in leaf axils and are hermaphroditic, actinomorphic, and generally showy. Each flower has 4, 5, or rarely 6 petals and the same number of sepals. Petals are bright yellow and easily detached, while the green sepals are persistent. The fruit is a many-seeded capsule that dehisces longitudinally or terminally to disperse a multitude of seeds.

Two species, *L. peruviana* and *L. octovalvis* (Jacq.) Raven, have been cultivated at the University of Florida Fort Lauderdale Research and Education Center. Both are herbaceous annual or perennial shrubs (depending on their location) and exhibit a simple to moderately branched growth habit. Both plants range in height from 1 to 3 m (3.3 to 9.8 ft) and become woody with age, starting with the growth nearest the base. Leaves are ovate to lanceolate, sometimes pubescent, and arranged in an alternate manner. *L. octovalvis* is considerably smaller in size than *L. peruviana* and produces smaller leaves and flowers. Both species bear solitary yellow flowers in leaf axils; flowers of *L. peruviana* are large, 2.5 cm (1.0 inch), and showy (Fig. 1), while the flowers of *L. octovalvis* are smaller, 1 to 1.5 cm (0.4 to 0.6 inches). The seed capsule of *L. peruviana* is broadly obconic in outline and quadrangular in shape with an overall length of 1 to 3 cm (0.4 to 1.2 inches), while *L. octovalvis* produces a linear-oblong seed capsule that ranges from 2.5 to 5 cm (1 to 2 inches) in length.

A number of *ludwigia*s possess characteristics that allow their survival in immersed, marshy environ-

ments. At times they produce white, spongy roots that grow vertically upwards to the water surface. These roots are thought to facilitate gas exchange in low oxygen environments. The U.S. Army Corp. of Engineers Wetlands Delineation Manual also refers to them as "water roots," a morphological adaptation that plants may exhibit to better tolerate anaerobic soils. The manual further comments on the ability of *ludwigias* to produce spongy tissue in their leaves, stems, and roots. This spongy tissue may provide buoyancy and support, or serve as a reservoir or passageway for oxygen needed for metabolic processes. Another competitive advantage, at least in *L. peruviana*, is the germination of seeds under low oxygen conditions while floating in water.

The perennial growth habit and tendency toward brittleness in the *ludwigias* are also assets. In some species, including *L. peruviana* and *L. octovalvis*, broken, floating bits of vegetation may readily form adventitious roots to create large dense mats of floating plant debris, thus ensuring their spread and colonization of new areas.

Control

The Florida Bureau of Invasive Plant Management indicates that *L. peruviana* is not a particular target for control efforts but may occasionally be controlled as a nuisance native in conjunction with efforts against exotic weeds. Broward County Water Management personnel will remove *L. peruviana* so that other species more desirable than *ludwigia* may proliferate in wetland areas.

Excessive growth of *L. octovalvis* can impair waterways and hinder recreation, but these plants may also provide refuge and nesting habitats to wildlife and serve as a food source for birds.

Growth of *L. peruviana* in some countries is so pervasive that government intervention is required to assist in its control. For example, approximately 30% of the Botany Wetlands (a series of urban swamps and lakes near Sydney, Australia) were covered with *L. peruviana* in 1994. Ecological studies on germination and growth experiments conducted in 1990 to 1991 as part of a management plan for the area found approximately 450,000 seeds of *L. peruviana* per m^2 (1.0^2 m = 10.8^2 ft). Fresh seed were found to be highly viable with a germination rate up to 99%, and 20% were still viable after 2 years of dormancy. Large numbers of seeds were maintained in the soil (65,000 seeds per m^2), and as many as 300,000 seeds per m^2 were retained over the winter in old fruits. Water flow, machinery, or birds dispersed floating seeds and seedlings, and best germination occurred when seeds were exposed to light.

Despite this knowledge, *L. peruviana* continues to be a problem in Australia. The species was introduced into the Sydney Botanical Gardens in 1907 and now forms dense, monospecific stands over large tracts of the Botany wetlands, displacing other wetland vegetation

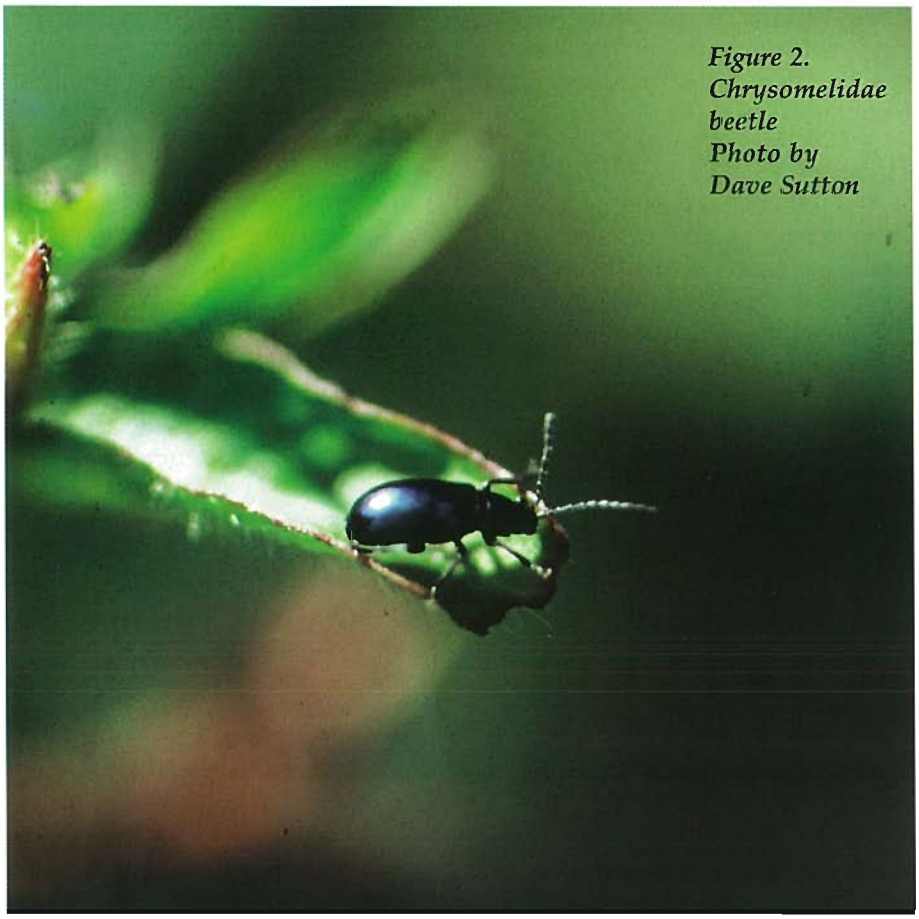

Figure 2. Chrysomelidae beetle Photo by Dave Sutton

to the extent that bird populations have been significantly reduced. Other wetlands north and south of Sydney have been affected, and *L. peruviana* has now been declared a noxious weed in the Municipality of Botany in New South Wales and in Queensland.

Ludwigias are generally found in disturbed areas. Colonization may be controlled with application of a number of different herbicides including 2,4-D, glyphosate, dicamba, and fluridone. Mechanical removal has reportedly been successful but may cause problems, as the species regularly forms plantlets from stem fragments. Natural predators in southern Florida such as a small, brightly colored Chrysomelidae beetle (Fig. 2) may help keep growth of *L. peruviana* in check.

Conclusion

Of the 30 or so species of *Ludwigia* present in Florida, about ten *ludwigias* are widely scattered throughout the state. *Ludwigias* propagate readily in disturbed habitats and are well adapted to our climate. Some of them do merit consideration for their potential to become "nuisance natives". Unlike Australia, however, extreme methods of control are not yet required in Florida, unless their removal is desired to make way for more desirable species.

There are those of us who admire the beauty of *L. peruviana*. The showy, yellow flowers and the clear, vibrant green of the new vegetation have earned the species the admiration of many. In fact, the Boca Raton Garden Club has even selected *L. peruviana* as its club logo. This just goes to show that one person's weed is another's ornamental!

Acknowledgments

This research was supported by the Florida Agricultural Experiment Station, and approved for publication as Journal Series Number N-02075. Mention of a trademark or a proprietary product does not constitute a guarantee or warranty of the product by the Florida Agricultural Experiment Station and does not imply its approval to the exclusion of other products that may be suitable. We would like to thank Drs. Fitzpatrick and Langeland for their review and comments of a draft of this manuscript.

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FAPMS 2001 Summary of Accomplishments/Events

By Nancy Allen

I hope this will be the first in a long line of similar articles to come. While putting together this year's historical program, I found out first hand, how difficult it was to pull society information together. To preserve our history, it would be very beneficial if the future outgoing presidents summarize their year in office with a list of accomplishments or events that are note worthy. Here's what happened in 2001;

1. Sponsored a coffee break at the 2001 IFAS Research and Review meeting March 7th in Palm Coast.
2. The society donated $250 to the Shelley Stocker Science Development Fund Memorial.
3. Co-sponsored a short course with the Lee County Hyacinth Control District on 17-18 January 2001. We provided free aquatic plant I.D. charts to the participants.
4. Submitted a letter to Governor Bush supporting Senator Charlie Bronson for the position of Commissioner of Agriculture.
5. Provided $1,000 to the Aquatic Ecosystem Restoration Foundation/ APMS Graduate Stipend Award.
6. Gave a $3,000 dollar contribution to U of FL/IFAS, for the production of 6 different aquatic and upland plant photomurals to be used for educational purposes in Florida schools.
7. Sent a letter to Federal representatives asking for their support for full funding of the US Army Corps of Engineers' Aquatic Plan Control (APC) Program that provides research and cost-share management funds.
8. Purchased a wireless microphone for FAPMS events.
9. Endorsed a letter to Dale Dubberly, Chief of Florida Department of Agriculture and Consumer Services concerning a request for exemption from 5E-2.033 (FAC) "Organo-Auxin herbicides; Restrictions and Prohibitions" for use in non agricultural herbicide applications.
10. Updated and revitalized the FAPMS display booth. This booth is available for use by any society member.
11. Donated $1,250 to the FAPMS Scholarship and Research Foundation.
12. New web page address set up at www.fapms.org
13. Donated $2,500 to the APMS Educational Outreach Program, for the production of grade school educational packets on invasive aquatic plants in the southeast.
14. Passed three By Law changes; one created a Library membership, and the other two were under section VI -Officers and VII-Board of Directors. These were language changes to clarify terms and eligibility to hold an office position.
15. Paid $250 for AERF Membership.
16. Aquatic Plant Manager Of The Year was awarded to William L. Smith-USACE, Palatka, FL.
17. 25th Annual Conference held at the Adams Mark Hotel Oct. 16-18, 2001 in Daytona Beach, FL.
18. Drought conditions, followed by high water levels, led to record low dissolved oxygen levels around the state.
19. On September 11, 2001, a terrorist attack occurred against the United States.

Like a nasty flu virus can put you out of commission, invasive plants such as hydrilla, Eurasian watermilfoil and egeria can invade a waterbody and upset its natural balance, all but eliminating activities like fishing, swimming and boating.

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Tumid Spider Mites Damage Water Hyacinth at the Sixmile Creek Marsh Restoration Area, Brevard County, Florida

Figure 1. Damage to water hyacinth by the spider mite ***Tetranychus tumidus.*** *Photo by Marc Minno*

By Marc C. Minno, Kenneth L. Snyder, and Kimberli J. Ponzio

The Sixmile Creek Marsh Restoration Area is a 2,800-acre property located at the junction of Sixmile Creek and the St. Johns Marsh in southwestern Brevard County, Florida. This area was once covered by extensive freshwater marsh and wet prairie habitats, but levees were constructed from 50 to 30 years ago to drain the wetlands and develop improved pastures for cattle. The St. Johns River Water Management District (District) acquired the property in the mid 1980's in order to restore the wetlands for water quality improvement and wildlife conservation. Hydrological connection to the St. Johns Marsh was accomplished in May 2001.

While on a field reconnaissance of the Sixmile CMRA on December 7, 1999, we observed a patch of dying water hyacinth (*Eichhornia crassipes*) that was covered with silk webbing (Figure 1). Closer inspection revealed water hyacinth plants that were being attacked and severely damaged by a spider mite. About 30 m^2 of water hyacinth were severely affected. Specimens of the mite and plant were collected and submitted to Dr. Cal Wellborn, Acarologist with the Florida Department of Agriculture and Consumer Services, Division of Plant Industry in Gainesville. Dr. Wellborn identified the mite as tumid spider mite (*Tetranychus tumidus* Banks) in the family Tetranychidae.

O'Hara (1961) noted *T. tumidus* damaging water hyacinth growing in canals in southern Florida and mentioned that it was the only organism that he found capable of killing the plant. Pieterse (1972) raised 12 spider mite species on water hyacinth under laboratory conditions. *Tetranychus tumidus* had one of the highest reproductive rates of the dozen mite species tested. He suggested that since spider mites were relatively inexpensive and easy to rear, they may be useful as a biological control to slow the grow of water hyacinth. Center (1987) studied the effects of arthropod herbivory on water hyacinth leaf and ramet production by tagging individual leaves and monitoring damage over time. The study was carried out in a canal in Palm Beach County. *Tetranychus tumidus* was observed to cause limited damage to water

hyacinth, especially to older leaves during the winter (December through February).

These records of tumid spider mites infesting water hyacinth appear to be valid. Unfortunately, *T. tumidus* has long been confused with a closely similar species, *Tetranychus gloveri* Banks, a common pest of cotton (Boudreaux 1979). In a 1958 publication, Boudreaux removed *T. gloveri* from synonymy with *T. tumidus*, but mistakenly applied the wrong names to these mites until corrected in 1979. Thus the literature regarding these species was in error for over twenty years. In his 1979 correction, Boudreaux mentioned that *T. tumidus* was only known from water hyacinth in the wild, but that it could be cultured on cotton in the lab. The type specimens were collected on water hyacinth in Florida around 1900. In contrast, *T. gloveri* infests many different plants in the wild but has not been collected from water hyacinth. Boudreaux (1979) had specimens of *T. tumidus* from Florida, Louisiana, and Cuba, and speculated that this mite was native to South America, the region of water hyacinth origin.

The District controls invasive weeds, like water hyacinth, using an integrated pest management approach. Managers across Florida successfully use this approach to keep water hyacinth at maintenance control levels. While herbicides are most often used, mechanical and biological controls can also be applied to manage invasive weeds when and where appropriate. Perhaps Pieterse's idea of rearing and mass-releasing spider mites, such as the naturally occurring *T. tumidus*, could be evaluated as another tool for the integrated pest management of water hyacinth.

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Editorial *Continued*

water depth, propagation, survivability, planting criteria, difficulty of collection, and cost. This publication could be updated every several years to include other species and the latest planting techniques. A brief description of our society is that it's an organization dedicated to the control of invasive plants. Perhaps, in the future we can be thought of as an organization dedicated to the control of invasive plants and the improvement of shoreline habitat with the establishment of native plants.

Please call me at 813-744-6163/6164 or email me at john.rodgers@dep.state.fl.us anytime you have a concern, suggestion, or question.

FAPMS 2002 President,

John

John A. Rodgers

FAPMS Charter Members

This list was updated by Bill Haller, Bill Moore, and David Tarver, and represents those that joined the Florida Aquatic Plant Management Society during its first year (1976/1977). Please refer to *Aquatics* Vol. 21 #2 for more FAPMS history. If you have any suggestions/ corrections for this list, please contact Catherine Johnson at 407-380-2024

NAME	MOST RECENT AFFILIATION	1976 AFFILIATION
Abrahamson, Stanley	Deceased	South. Mill Creeks, Tampa
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Anderson, Paul		
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Baird, Douglas D.	Consultant	Monsanto, Atlanta
Baker, Gordon	SFWMD, West Palm Bch.	SFWMD, WPB
Barnette, William M.	Retired	SFWMD, WPB
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Bitting, Les	Retired	Old Plantation Water Control
Blackburn, Candy	Retired	Future Horizons, Inc.
Blackburn, Robert D.	Future Horizons, Inc.	USDA/ARS, Ft Lauderdale
Blakely, Robert	Deceased	Old Plantation Water Control
Boykin, R. Ken		
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Brightwell, R.E.		
Brooks, Thomas	Retired	SFWMD, Kissimmee
Brown, Deanna	Retired	H.F. Brown Inc.
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Brown, Harold	Retired	H.F. Brown, Inc.
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Campbell, Edward	Retired	SFWMD, Kissimmee
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Clark, Roy P.	Deceased	US EPA, Atlanta
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Cool, Carl	Highlands County	Highlands County
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Cummings, Herb	Retired	SFWMD, Miami
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Drda, Thomas F.	Deceased	FGFC
Dunagan, F.J.		

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Frizell, Johnnie	Retired	Elf Atochem, Hope Hull AL
Gardner, John W.	Aquatic Systms, Inc,	3M Company
Garrard, Leon A.	Deceased	University of Florida, Gainesville
Gates, Robert J.	Deceased	SWFWMD, Brooksville
German, Louis	Deceased	SWFWMD, Brooksville
Glenn, John E., Jr.		
Grote, J.C.		
Hale, Lee		Southern Mill Products, Tampa
Hall, B. Lamar	Retired	Dade County
Haller, Bill	University of Florida, Gainesville	University of Florida, Gainesville
Hardy, Paul E.	Retired	Dade County
Hargrove, Chuck	Rhone-Poulenc	Rhodia, Inc.
Harp, Jean B.		
Harper, George L., Jr.	Retired	GFC, Pilot, Lakeland
Hestand, Rue S.	GFC, Eustis	GFC, Eustis
Hinkle, Joe C.	Florida DEP, Lake City	GFC
Hogan, William D.	Retired	Chevron Chemical Corp.
Holmes, Pennie	Retired	Old Plantation Water Control

NAME	MOST RECENT AFFILIATION	1976 AFFILIATION
Hooks, Ross	Retired	Broward County Weed Control
Hope, Donald E.		
Hopkins, Sam B., Jr.		SFWMD
Huckabee, Alvin B.	Retired	SFWMD, Ft. Lauderdale
Hudson, Clarke	Valent USA	Chevron Chemical Corp.
Jenkins, James P.		
Jenus, Joseph Jr.		
Johnston, Donald C.	Retired	E.O. Painter Printing Co.
Jones, Dan		Aventura Country Club
Joyce, Joe	University of Forida, Gainesville	U.S. Army Corps of Engineers, Jacksonville
Karby, Steven		Suncoast Specialists, Tarpon Springs
Kawaguchi, Paul	Retired	Commercial Applicator
Kelso, John T.	Retired	SWFWMD, Brooksville
King, Paul C.	Private Applicator, Tifton, GA	GFC
Lambert,Porter	Retired	SWFWMD, Brooksville
Land, Rex E.	Retired	GFC
Land, W.E.	Retired	GFC
Lawson, Carlton W.		
Lawson, Walter R.	Retired	City of Orlando
Layer, John L.	Florida Environmental	PHK Inc.
Layne, Carlton R.	US EPA, Atlanta	US EPA, Lakeland
Leasure, A.D.		
Lee, Donald V.	LA Dept. of Wildlife & Fish	Louisiana Dept. of Wildlife and Fish
Lee, Russell C.	Deceased	SWFWMD, Brooksville
Lowder, Edward C.		
Lowe, Glen L.		
Maddox, Larry L.	Retired	St. Johns RWMD, Melbourne
Madison, Edward, Jr.		
Mahler, Michael J.	Polk Cnty. Envir. Services	Florida DNR, Tallahassee
Maier, Bill	Deceased	Florida DNR, Tallahassee
McCartney, William A., Jr.	Retired	NWFWMD, Havana
McDonald,Eugene E.		
McKinney, Larry M.		Southern Mill Creek Products
McMillan, William H.		
Merritt, Ralph		
Mickler, Hampton J.	An. Mosquito Control	Anastasia Mosquito Control
Miller, Edward J.		
Minter, Tom	Agr. Consultant, Oviedo	Union Carbide
Moherek, Dr. Emil A.	Consultant	Chevron Chemical Corp
Monahan, William T.	Deceased	Polk County Env Ser, Bartow
Moore, William H.	Elf Atochem, Clermont	Pennwalt, Winter Garden
Mosier, Greg		GFC
Mullens, Thomas C.		
Murnighan, Jack		
Myers, Vernon W.	Deceased	GFC, Lakeland
Nichols, Gary D.	St. John's RWMD, Melbourne	Central and S.F. Flood Control, (SFWMD), Melbourne
Orsenigo, Dr. J.R.	Retired/Consultant	University of Florida, Belle Glade
Parham, Carl A.		
Pederson, Pete	Adapco MosquitoSupply, Apopka	Chevron Chemical Corp
Perryman, Jerry M.	Citrus Cnty. Sherrifs Dept.	GFC
Phillippy, Clayton L.	Retired	GFC Tallahassee

NAME	MOST RECENT AFFILIATION	1976 AFFILIATION
Phillips, P.W.	Retired, Hernando	GFC, Pilot
Pieroni, Alfi M.		
Price, Andy L.	City of Orlando	Asgrow Florida
Pruitt, Gary W.		Central and SF Flood Control (SFWMD), Melbourne
Raimondo, Paul		
Ranson, James H.	Retired	Lake Worth Drainage District
Rapp, James B.		Citrus County Weed Control
Raulerson, Edgar W.	Retired	SFWMD, Okeechobee
Rivelli, Thomas A.		
Rushing, William N.	Retired	US Corps of Engineers, Vicksburg
Sassic, Nicholas	Orange County Poll. Orlando	Orange Cnty Poll. Cont, Orlando
Scherer, Lester E.	Martin County	Martin County
Schweigert, Joe	SFWMD, WPB	SFWMD, WPB
Sconyers, Max C.		
Seaver, H. Ray	Retired	SFWMD, Kissimmee
Sheppardson, Terry	SFWMD, Miami	SFWMD, Miami
Shinholser, James F.	Retired	Pinellas County
Shultz, Robert I.		
Simmons, Henry M.	Retired	SFWMD, WPB
Smith, Robert W.	Retired	Colony Helicopters, Inc.
Sparkman, Perry L.	Retired	Chevron Chem Corp(Valent),Or.
Spirnock, Ray A.	Private applicator, ARC, Inc., Plant City	SFWMD

NAME	MOST RECENT AFFILIATION	1976 AFFILIATION
Stafford ,Frank S. Jr	Retired	Sarasota County
Stanley J.G.	US EPA	US Dept of Interior, DC
Steward, Frank E.	Retired	Sarasota County
Steward, Kerry K.	Retired	USDA/ARS, Ft. Lauderdale
Stewart, Charles W.		
Stokes, Glenn M.	Consultant	
Stoll, Richard H.		
Sutton, David L.	Univ. of FL, Ft. Lauderdale	Univ. of FL., Ft. Lauderdale
Sweat, Harry	SWFWMD, Bartow	GFC
Szymborski, Richard A.		
Tarver, David P.	SePro Corp, Tallahassee	Florida DNR, Tallahassee
Taylor, Thomas M.		USDA/ARS Ft. Lauderdale
Temples, Glenn C.		
Thomas, Paul A.	Retired	SFWMD, WPB
Tomasello, Rudolph		
Trent, Lowell L.	GFC, Eustis	GFC, Eustis
Tucker, Marvin R., Sr.	Deceased	Brevard County
Tye, Carl	Retired	Polk County Env. Serv., Bartow
Vance, Grady	SWFWMD, Brooksville	SWFWMD, Brooksville
Vandiver,Vernon,Jr.	Univ. of FL., Ft. Laud.	Univ. of FL., Ft. Lauderdale
Vowell, James E.		FL. Power and Light, WPB
Walker, Billy Joe		
Waters, Donald B.		GFC
Weber, Richard Lee	SWFWMD	SWFWMD Brooksville
Weedon, J. Stanley	Retired	City of West Palm Beach
Widmann, Donald C.	Nalco Chemical Co.	GFC
Williams, James L.	Lake Doctors, Inc.	3 M Company
Wilson, Frank	Retired	Polk County Env., Serv, Bartow
Woodman, Dr. William		
Worsham, W.A.		
Wright, Lewis		
Wunderlich,William E.	Retired	U.S. Army Corps of Engineers, New Orleans
Yager, Dr. J.L.		
Yoder, Philip J.	Retired	Lake County
Young, Phillip L.	Aquatic Veg. Control, Inc.	Elanco Products Inc., Boynton Beach

FAPMS Board Meeting

January 16th, 2002, at 10:00 AM, at the Double Tree Hotel in Tampa, Todd Olson 800-327-8745

National Invasive Weeds Awareness Week 2002 (NIWAW III)

"NIWAW III will be held in Washington DC the week of February 25-March 1, 2002 so that people and groups from across the country can focus national attention on the severe problems created by invasive weeds." For further information please visit the NIWAW website at www.nawma.org/niwaw.htm

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