

Lygodium Infestations in the Lake Wales Ridge

by Tabitha Biehl, The Nature Conservancy



Lygodium invades lakefront property and backyards in Highlands County, FL. During the aerial survey *Lygodium* was frequently identified along lake edges and in ditches, but even more infestations were mapped in remote swamps and isolated habitats. Photo by Tabitha Ann Biehl.

INTRODUCTION

On a recent aerial survey over the Lake Wales Ridge in Highlands and Polk counties, biologists marveled at the beauty and biodiversity of the Ridge's unique scrub habitat, dotted with wetlands and sparkling lakes, only to be shocked moments later by what looked like a green carpet smothering the landscape. The mission during these flights was to map locations of invasive species. Biologists expected to find *Lygodium*; however, they did not expect infestations larger than 10-20 acres. The "green carpet" *Lygodium* infestation encountered in Highlands County encompassed 100-200 acres of lake front property.

This green carpet, better known in the invasives world as *Lygodium microphyllum* (Old World climbing fern), is spreading north and, together with *Lygodium japonicum* (Japanese climbing fern) expanding to the south, it is tightening a noose around central Florida.

Lygodium microphyllum and *L. japonicum* are relatively new threats to the Lake Wales Ridge and may be the most threatening of the invasive non-native plant species currently known in Florida. It is *Lygodium's* ability to spread, dominate and alter natural regimes that inspired the Lake Wales Ridge Ecosystem Working Group (LWREWG) to try and halt further infestations.

The LWREWG works across public and private boundaries to ensure the long-term protection of the native plants, animals and natural communities of the Lake Wales Ridge. Representatives from 12 conservation agencies participate in LWREWG Invasive Species Committee meetings to share information, plans and solutions. The presence of *Lygodium* on the Lake Wales Ridge prompted the committee to collectively develop objectives and strategies to address this threat. The LWREWG Invasive Species Committee's objective is to detect and contain by 2006 invasive species on private and public lands that could become larger infestations. By 2013, we hope to have *Lygodium* under a maintenance control plan whereby infestations are continuously surveyed and treated.

A June 2003 brainstorming session resulted in a work plan that guides efforts to manage *Lygodium* along the Ridge and meet our stated objective. A strategy that emerged as top priority was to conduct surveys of the Lake Wales Ridge in order to map the *Lygodium* infestations

SURVEY METHODS

The LWREWG Invasive Species Committee plans to conduct systematic and repeatable ground and aerial surveys for *Lygodium*. Standardizing methods across the Ridge enables partners to compare results and measure the success of management methods across the entire ecosystem. Locations of *Lygodium* are collected from private and public landowners. Twice a year, participants submit their most recent *Lygodium* locations to Avon Park Air Force Range (APAFR). Once compiled and spatially referenced,

The committee recognizes that continued surveying and mapping of *Lygodium* are imperative in managing the fragile ecosystems of the Lake Wales Ridge.

the information is disseminated back to participants in the form of a map, data, or both.

Ground Surveys

Ground survey methods were adopted from APAFR and the Florida Division of Forestry (DOF). The protocol recommends using belt transects and multiple observers to survey areas from the ground.

Aerial Surveys

South Florida Water Management District (SFWMD) aerial survey protocols were implemented by the LWREWG. These include establishing east/west transects 1,000 meters apart across the area of concern. With two or three observers and a global positioning system (GPS) unit, we use nested points to continuously log survey transects and record data. The helicopter hovers 50-100 feet over the treetops. When an invasive plant is spotted, the helicopter exits the transect and hovers over the location. Observers then map the location as a point and record information on size, habitat and density of infestation. Once this information is collected, the helicopter returns to the transect and continues surveying.

SURVEY RESULTS

As of March 2004, there were 213 mapped locations of *Lygodium* on the Lake Wales Ridge (ground survey information last updated January 2004). By comparing locations from the helicopter survey (111) to the ground surveys (110), only eight of

these locations were duplicates, meaning 103 new infestations were mapped during the aerial survey. This information provided great insight into the immediacy of the problem on the Ridge.

The helicopter survey covered approximately 400,000 acres of the Ridge and resulted in the mapping of an estimated 400-800 acres of *Lygodium*. Observers discovered larger and more frequent infestations of *Lygodium* towards the southern end of the Ridge. Ninety locations were found in Highlands County and 21 locations in Polk County during the aerial survey.

Of the 111 locations of *Lygodium* found during the helicopter survey, only 27 were on conservation lands. Almost all of these infestations have been located and treated with herbicides. The remainder of the locations (84) are on private lands. The LWREWG Invasive Species Committee continues to develop and implement survey and treatment strategies to assist with control of both species of *Lygodium* on private and public lands.

Acknowledgements

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Important progress on the *Lygodium microphyllum* biological control program

by Robert W. Pemberton, US Department of Agriculture-Agricultural Research Service (USDA-ARS), Invasive Plants Research Laboratory

USDA-Agricultural Research Service scientists are one step closer to releasing the first biological control agent against Old World climbing fern (*Lygodium microphyllum*). Our petition requesting release of a defoliating moth, *Cataclysta camptonozale*, has been approved by the Technical Advisory Group for Biological Control of Weeds, the federal interagency group that evaluates such petitions. This approval is a recommendation for release to USDA-APHIS (Animal and Plant Health Inspection Service), the responsible regulatory agency. It is the first and most critical step in the permitting process. Approval led to the second step, the preparation of a draft Biological Assessment that judged the risk to federally protected rare species to be insignificant. USDA-APHIS is now finishing the Environmental Assessment that will be published in the Federal Register. If there are no serious challenges to the release during the 30-day public comment period, USDA-APHIS will issue a release permit. If there are legitimate objections to the release (none are expected but they can occur), written responses and more research may be needed. We've got our fingers crossed in hopes of receiving a release permit by autumn.

A release petition for another candidate for biological control of *Lygodium*, a gall forming eriophyid mite named *Floracarus perrepae*, was submitted in February. Other biological control candidates including a second defoliating moth, *Neomusotima conspurcatalis*, and a stem-boring moth, *Ambia* sp., are being studied. USDA-ARS scientists are committed to developing biological controls to limit this terrible weed.

This research effort is possible thanks to partnerships with the South Florida Water Management District and the Florida Department of Environmental Protection that provide essential funding, and our overseas cooperators, particularly Australia's Commonwealth Scientific and Industrial Research Organization (CSIRO).

For more information, contact Robert Pemberton at bobpem@saa.ars.usda.gov, 954-475-0541 ext. 106.



Adult moth, *Cataclysta camptonozale*, on Old World climbing fern, *Lygodium microphyllum*. Photo by Christine Bennett, University of Florida, Entomology and Nematology Dept.