

AGREEMENT NO. 460003179

MEMORANDUM OF UNDERSTANDING

Between

THE U.S. FISH AND WILDLIFE SERVICE

and

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

and

FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION

This Memorandum of Understanding (MOU) is entered into on APR 20 2013, 2014 between the U.S. Fish and Wildlife Service, a federal agency (USFWS) and the South Florida Water Management District (SFWMD), and the State of Florida Fish and Wildlife Conservation Commission (FWC).

WHEREAS, the USFWS, FWC, and SFWMD have a vested interest in controlling and/or eliminating invasive exotic plants; and

WHEREAS, in this mutual agreement, the USFWS, SFWMD, and FWC will work together to control and eliminate the expansion of exotic species within the Arthur R. Marshall Loxahatchee National Wildlife Refuge (Refuge); and

WHEREAS, this MOU is entered into under the authority of the Migratory Bird Conservation Act of 1929 (16 U.S.C. 715-715r), as amended; Fish and Wildlife Act of 1956 (70 Stat 1119), as amended; Federal Grant and Cooperative Agreement Act of 1977, Fish and Wildlife Coordination Act of 1934 (16 USC 664); National Wildlife Refuge Administration Act of 1966 (16 USC 668dd), as amended; and the National Wildlife Refuge System Improvement Act of 1997 (PL 105-57); and

WHEREAS, the USFWS is a federal agency with wildlife management responsibilities, to include entering into contracts with public agencies, private corporations, or other persons; and

WHEREAS, the National Wildlife Refuge System Improvement Act requires that lands administered by the USFWS be managed for 'wildlife first' and maintained in an environmentally acceptable manner, and to the extent practicable, in such a way as to restore biological integrity, diversity, and environmental health; and

WHEREAS, the FWC is an entity of the State of Florida charged with the responsibility for protecting and managing Florida's fish and wildlife resources for their long-term well-being and the benefit of people; and

WHEREAS, the SFWMD is an entity of the State of Florida charged with managing and protecting water resources of the region by balancing and improving water quality, flood control, natural systems and water supply.

WHEREAS, the USFWS, SFWMD and FWC work with partners and stakeholders to identify and manage invasive exotic species in Florida for the benefit of fish and wildlife and the environment, and

WHEREAS, the USFWS, SFWMD, and FWC wish to establish an MOU to work together to control and eliminate the expansion of exotic species within the Arthur R. Marshall Loxahatchee National Wildlife Refuge; and

WHEREAS, the USFWS has the authority to enter into this MOU with the SFWMD and FWC;

NOW THEREFORE, the USFWS, FWC, and SFWMD, in consideration of the mutual benefits flowing from each to the other, do hereby agree to enter into this MOU to facilitate cooperative invasive exotic removal or treatment in the Arthur R. Marshall Loxahatchee National Wildlife Refuge.

I. Period of Performance

The period of performance of the MOU shall commence on the date of execution of this MOU and continue for a period of five (5) years, and may be renewed for four (4) additional five (5) year periods. The parties will review and assure the terms and conditions are current and that the purpose of the agreement remains in effect before executing an amendment renewing this agreement.

II. Coordination

The USFWS, SFWMD, and FWC collectively have complementary responsibilities and shall cooperate on the management of invasive exotic species in concert with other resource objectives. It is therefore appropriate and desirable that these agencies join together in this MOU to fulfill mutual objectives for providing invasive exotic species control.

III. Responsibilities of the Parties

For a period as hereinafter set forth, the USFWS, FWC and SFWMD shall cooperate as necessary for the performance of work as set forth below:

A. Responsibilities of the SFWMD:

1. Work and contractor oversight for contracts issued by the SFWMD will be the responsibility of SFWMD staff, unless other arrangements are made in coordination with all parties.
2. SFWMD staff will coordinate and lead monthly progress meetings between SFWMD, FWC, and the USFWS. Any other issues, such as locations of listed species or conflicts with other Refuge activities, will also be addressed at these meeting.
3. All access shall be coordinated with USFWS staff within these time restrictions: Air access-48 hours, Airboat access-24 hours.
4. SFWMD will make every effort to minimize airboat impacts from employees, contractors, and subcontractors, by staying on existing trails, traveling in more open water areas, avoiding driving through dense vegetation whenever practical, and using approved entrance points from the canal to the Refuge interior.
5. Airboats must be clearly marked as an official boat.
6. Airboats must fly an orange flag that extends 10 feet from the marsh surface and is at least 10x12 inches.
7. Activities should be planned to minimize the number of trips necessary to complete outlined tasks.
8. All contractors must adhere to all federal and state guidelines and policies related to exotics treatments (safety plan, methodology, etc.) and will confirm there are valid permits for any and all chemicals applied in the Refuge. All non-selective herbicides shall be applied in a manner to minimize damage or overspray to non-target species.
9. Contractor work locations will be tracked in a manner consistent with regional monitoring in the Greater Everglades.

B. Responsibilities of the USFWS:

1. USFWS will coordinate USFWS contracted treatments with SFWMD and FWC in a mutually acceptable manner.
2. Field staff will be available to meet weekly.
3. USFWS will ensure compliance with pesticide use requirements, such as pesticide use permits (PUPS), NEPA documentation, and Section 7 consultations using information provided by SFWMD and FWC.
4. USFWS will not restrict access to the Refuge by the SFWMD. There may be times when areas are closed to prevent habitat damage or for safety reasons such as low water and prescribed burns for example.
5. A map of No Access areas will be provided before the treatment begins and will be updated throughout the treatment period. Water quality sites are marked with white PVC and should be given a 50-100 meter buffer when operating airboats. Walking in these areas should also be limited to the extent practical. Areas marked as research sites should not receive any treatment; however, on a limited basis entry can be allowed to treat exotics as long as there is limited disturbance.
6. USFWS will coordinate prescribed fire, when possible, to assist in the overall invasive treatment plan.

C. Responsibilities of all parties:

1. The USFWS, FWC, and SFWMD will work together to gather data on invasive exotic plant species and control or eliminate populations where appropriate.
2. Any deviations from agreed upon plans by any party will be discussed between USFWS, FWC, and SFWMD before any actions are taken.
3. Communication between the agencies will be timely and transparent to facilitate diligent contractor oversight.
4. The USFWS and SFWMD will work together to provide a safe working environment and protect government property and staff/contractors (state and federal).
5. It is understood and agreed that each party operates under its own legal authorities, policies, and administration as it relates to work duties.

IV. Project Managers

The parties shall direct all matters arising in connection with the performance of this MOU to the attention of the Project Managers for attempted resolution or action. The Project Managers shall be responsible for overall coordination and oversight relating to the performance of this MOU. Should any party change its address, written notice of such new address shall promptly be sent to the other parties.

LeRoy Rodgers
South Florida Water Management District
Land Resources Bureau
3301 Gun Club Road
West Palm Beach, Florida 33401
(561) 682-2773

Rolf Olson, Project Leader
U.S. Fish and Wildlife Service
Arthur R. Marshall Loxahatchee National Wildlife Refuge
10216 Lee Road
Boynton Beach, Florida 33473
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Linda King, Subsection Leader
FWC/Habitat & Species Conservation
Invasive Plant Management
3800 Commonwealth Blvd. M.S. 705
Tallahassee, Florida 323399
(850) 617-9425

V. Modification of Agreement

This Agreement constitutes the entire agreement between the parties and supersedes all prior and contemporaneous agreement, representations, and undertaking. No supplement, modification, or amendment of this agreement will be binding unless it is in writing and signed by all parties.

VI. Termination of Agreement

This MOU may be terminated by any party for convenience upon 60 days written notice of such termination to the other parties. If any party fails to fulfill its obligations under this MOU in a timely and proper manner, the other parties shall have the right to terminate this MOU by giving written notice of any deficiency. In the event a dispute arises which the project managers cannot resolve between themselves, the parties shall have the option to submit to nonbinding mediation. This MOU has no third-party beneficiaries (intended or incidental), who may enforce obligations of either party should the MOU be terminated.

VII. Other Terms and Conditions

- A. The USFWS, FWC and SFWMD, their employees, subcontractors or assigned, shall comply with all applicable federal, state, and local laws and regulations relating to the performance of this MOU.
- B. The participation of the USFWS, FWC and SFWMD in activities conducted pursuant to this MOU is not intended to place either party or its representatives in a position of incurring tort liability arising from an action of the other party. Each party is responsible for any injury or property damage to third parties caused by negligence of its own employees acting within the scope of their employment/official duty subject to such limitation as may be prescribed by applicable laws. Specifically, tort liability arising from negligent or wrongful acts or omission of USFWS employees acting within the scope of employment shall be adjudicated pursuant to the Federal Tort Claims Act (28 USC 2671 – 2689). Likewise, tort liability arising from negligent or wrongful acts or omissions of FWC employees or SFWMD employees while acting within the scope of official duty shall be governed by the provisions of state law. However, nothing herein shall constitute a waiver by any party of its sovereign immunity or statutory limitations on liability.
- C. The performance of the parties of any of their obligations under this MOU shall be subject to and contingent upon the availability of funds appropriated by the United States Congress or the Florida Legislature or otherwise lawfully expendable for the purpose of this agreement. The party shall give notice to the other party of the non-availability of such funds when the parties have knowledge.
- D. The parties hereto do not intend nor shall this MOU be construed to grant any rights, privileges or interest to any person not a party to this MOU.

- E. During the performance of this MOU, the parties agree to abide by the terms of Executive Order 11246 on nondiscrimination and will not discriminate against any person because of race, color, religion, sex, or national origin.
- F. All notices required or permitted to be given under the terms and provision of this MOU by either party to the others shall be in writing and shall be sent by registered or certified mail, return receipt requested, or by a nationally recognized overnight courier service.

IN WITNESS WHEREOF, the parties have caused this MOU to be executed by an authorized official on the date and year set forth below their signature.

U.S. DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

BY: Cynthia K. Johnson
 TITLE: Regional Director
 DATE: December 29, 2014

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

BY: Deborah Brachew
 TITLE: Procurement Bureau Chief
 DATE: 4-28-15

FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION

BY: [Signature]
 TITLE: ASSISTANT EXECUTIVE DIRECTOR
 DATE: 10 Feb 15

APPROVED AS TO FORM
 AND LEGAL SUFFICIENCY
[Signature]
 Commission Attorney

Project Title: FY15 Melaleuca and Old World Climbing Fern Treatments: A.R.M. Loxahatchee National Wildlife Refuge

Project Coordinator Contact Information:

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Land Resources Bureau
South Florida Water Management District
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Method of Control: Contractual Services

Project Goals for State Funding: The project goals will be to target initial & maintenance treatments of Old World climbing fern (*Lygodium microphyllum*), and melaleuca (*Melaleuca quinquenervia*) found in the southern region of the Arthur Marshall Loxahatchee National Wildlife Refuge (Refuge).

Project Location: The Refuge (Water Conservation Area 1) is a 143,000-acre wetland landscape characterized by a matrix of peat-based bayheads and freshwater marsh (sawgrass marsh, slough, and wet prairie) (Figure 1). The area is owned by the State of Florida and managed by the US Fish and Wildlife Service (USFWS) as the A.R.M. Loxahatchee National Wildlife Refuge (Refuge).

Project Description:

Background

Control of invasive exotic plants is a priority management objective at the Refuge, where numerous invaders proliferate. Despite many years of invasive plant management in the Refuge, melaleuca and Old World climbing fern continue to infest large portions of the ecosystem (Figures 2 & 3). Initial treatments of melaleuca and Old World climbing fern have been conducted in most portions of the Refuge and many areas have received multiple treatments. A 4,000 acre section in the north central portion of the Refuge contains moderate to high density stands of melaleuca that have yet to be initially treated. Large-scale aerial treatments of dense Old World climbing fern were carried out in 2007, 2008, and 2013. However, an abundance of suitable habitat and limited resources for control

have resulted in a significant expansion of Old World climbing fern throughout the Refuge over the last decade.

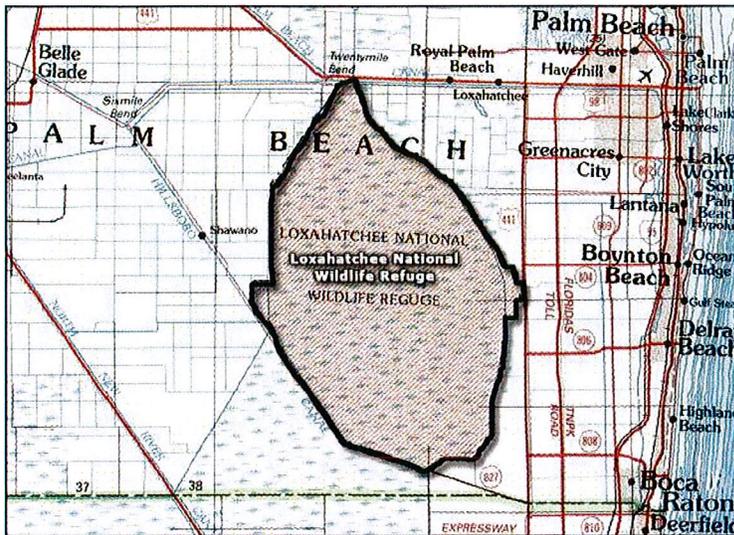


Figure 1. Location of the A.R.M. Loxahatchee National Wildlife Refuge, Palm Beach County, FL

Beginning in FY2014, the Florida Fish and Wildlife Conservation Commission (FWC) and South Florida Water Management District (SFWMD) began implementing herbicide control efforts targeting melaleuca, Old World climbing fern, and occasional Brazilian pepper at the Refuge. This work was conducted in conjunction with ongoing control efforts funded and implemented by USFWS

contractors (Figure 4). The financial support provided by FWC, combined with the high volume/flexibility of the SFWMD's contractor base, has allowed for significant escalation of the Refuge's existing work plan. Staff from FWC, SFWMD, and USFWS are working collaboratively to integrate control activities into a cohesive Refuge-wide strategy.

Overview of Preliminary Collaborative Plan

Staff from FWC, SFWMD, and the Refuge met on January 14, 2014 to develop a multi-year, collaborative control strategy in the Refuge. The consensus developed from this meeting serves as the framework of this multi-year strategy and includes several key points:

- Both melaleuca and Old World climbing fern should be managed in the immediate and long-term within the Refuge
- Follow up treatments are a critical component of the strategy.
- Flexibility in work area planning is necessary due to access constraints in the northern portions of the Refuge during the dry season. High water levels may also bring about deviations in work plans, since herbicide efficacy may be poor on excessively inundated emergent plants.
- The SFWMD/FWC control efforts will begin in the south and work systematically to the north

- The Refuge will continue to conduct initial and follow up treatments for melaleuca and Old World climbing fern in the northern sections of the Refuge.
- A primary justification for immediate control of melaleuca in the north is protection of regionally significant wading bird foraging areas.
- Retreatments for Old World climbing fern will occur for two years following an initial treatment, and retreatments for melaleuca will occur two years after initial treatment. Each subsequent year units will be evaluated for efficient retreatment rotation.
- In some cases, aerial treatment of melaleuca or Old World climbing fern is appropriate and cost effective, but should only be done when the target weed has nearly complete canopy coverage. Aerial treatments will be discussed and approved by Refuge staff prior to use.

The multi-year collaborative plan is still under development, though preliminary work areas and control strategies have been identified. Figure 4 shows the proposed initial work areas for federal and state efforts between 2014 and 2018. The planned work areas were selected based on available funding, dry season access concerns, and priority treatment areas (i.e. wading bird habitat, containment strategy). The Refuge includes possible work extension areas during 2015-2018 to ensure access to work areas and to expand work areas if additional resources become available. Figure 4 assumes all initial treatment areas will receive follow-up treatments on the following schedule:

Year 1—control of melaleuca and Old World climbing fern

Year 2—retreat Old World climbing fern

Year 3—retreat Old World climbing fern and melaleuca

Synopsis of FY14 Treatments:

Ground based applicators swept 11,808 acres for Old World climbing fern and 13,644 acres for melaleuca in the southern reaches of the Refuge (see Figures 2 and 3) between February 1–August 1 2014. Treatment acres (total area of herbicide application) for these two species totaled 806 and 765 for Old World climbing fern and melaleuca, respectively. An additional 100 acres of dense melaleuca was treated aurally. The total cost for all treatments was \$997,575 (\$100k SFWMD plus \$897,575 FWC).

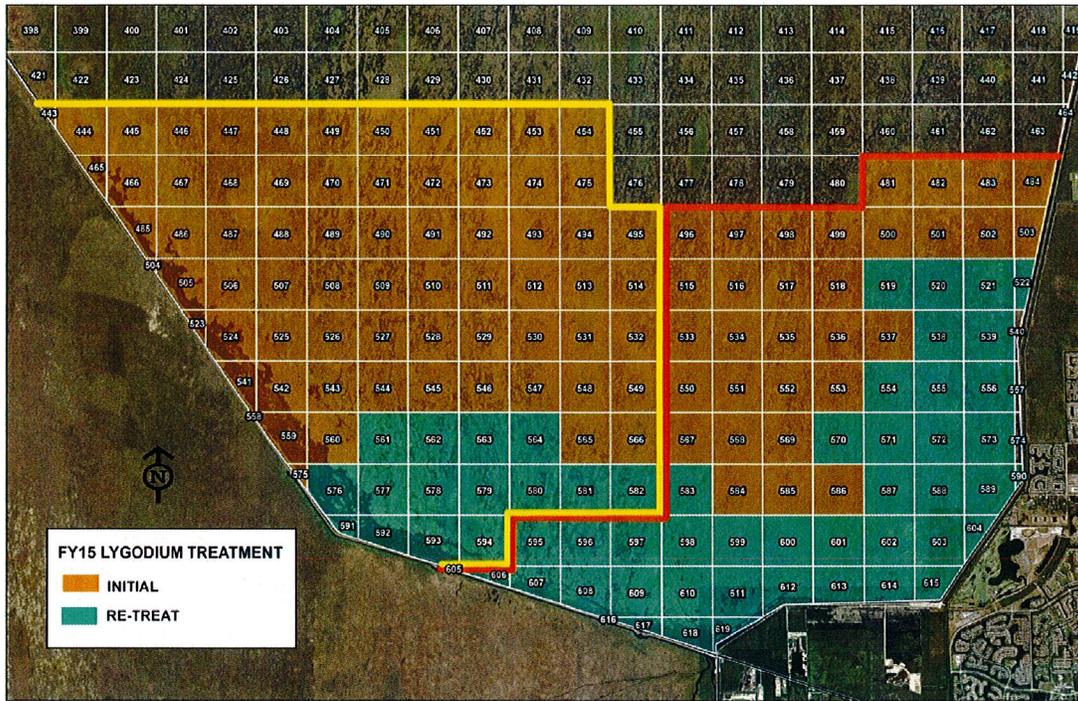


Figure 2. Completed FY14 and planned FY15 Old World climbing fern treatments by SFWMD/FWC in Loxahatchee NWR. Planned Old World climbing fern treatments for FY15. Orange cells indicate planned “initial” treatments for FY15. Green cells are areas treated in FY14 that will be swept for retreatments during FY15.

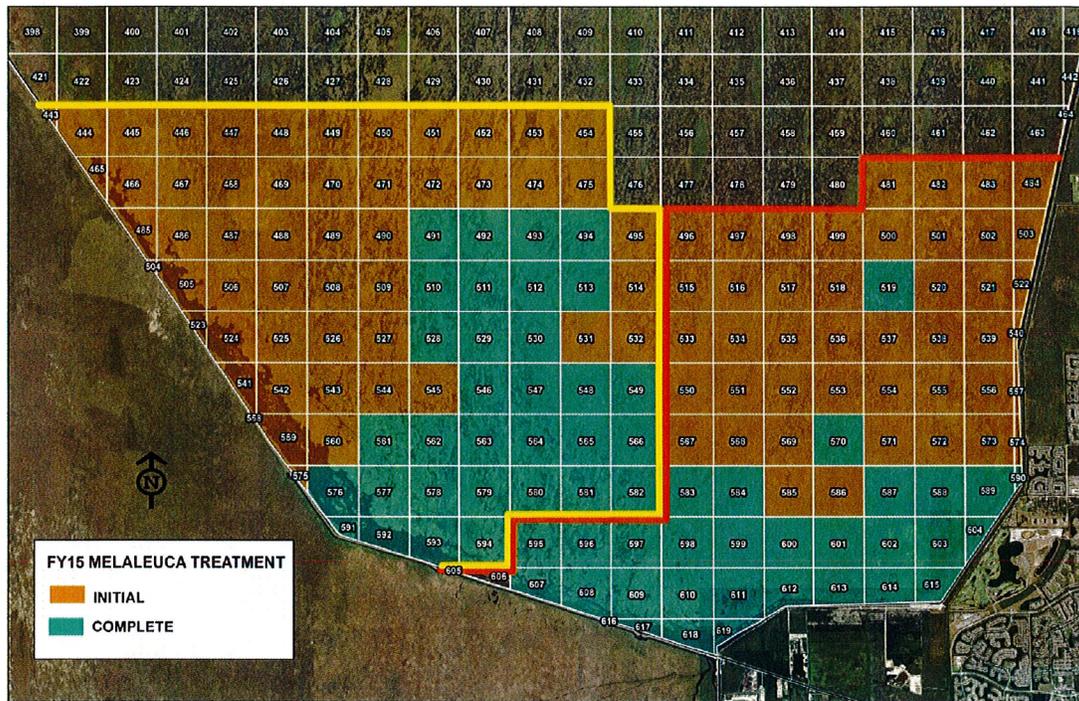


Figure 3. Completed FY14 and planned FY15 melaleuca treatments by SFWMD/FWC in Loxahatchee NWR. Green cells are areas treated in FY14. These cells will be re-treated in FY16 or FY17. Orange cells indicate planned "initial" treatments for FY15.

Some Lessons Learned During FY2014. Treatment of small OWCF patches in marsh habitat is very slow and inefficient. Ground crews were directed to bypass small patches (less than .05 m²) in marshes during the initial treatments. Prescribed fire, followed by ground based foliar applications would likely improve efficacy and efficiency of OWCF control in open marsh habitats. There is some concern that OWCF herbicide control efficacy varies. Post-treatment assessments indicate that some plants are not getting initial top kill. This could be due to rain following treatments, but this is not confirmed. In some cases, plants may have been missed entirely. Plant recovery from resprouting rhizomes as well as copious emergence of new sporophytes was observed in some cases. The SFWMD proposes close coordination with the Refuge Prescribed Fire Team to identify burn unit priorities that could improve herbicide control efforts.

FY2015 SFWMD/FWC Treatments

The primary purpose of this Statement of Work (SOW) is to describe proposed activities for SFWMD/FWC control efforts in FY2015, which are built around the

preliminary multi-year strategy outlined above. During FY2015, the SFWMD directed control efforts at the southern end of the Refuge (Figure 5). Both melaleuca and Old World climbing fern were controlled in the work area. For FY2015, FWC proposes to provide \$1,000,000 for the proposed contractual services. Completion of the proposed work will occur no later than June 15, 2015. Contractor oversight for this proposal will be the responsibility of the SFWMD, though close coordination between Refuge and FWC staff will be maintained. Monthly progress meetings between SFWMD, FWC and Refuge staff will be conducted as necessary.

As suggested by Refuge staff, the SFWMD will apply for a Special Use Permit from the Refuge for the work proposed herein. A Memorandum of Agreement between the Refuge, FWC, and SFWMD will be developed to guide control activities in future years.

Work Specifications

The methods described below are guidelines for the work specifications portion of the SOW. These guidelines are not intended to limit implementation of control activities and non-traditional methods may be considered. The final treatment method will be approved by the SFWMD Project Manager in accord with the Contractor. Only chemicals with an approved USFWS pesticide use proposal (PUPS) will be authorized for use. The list of chemicals approved will be provided at the initial site meeting. If a different chemical is requested for use, an approved PUPS must on file before that chemical will be used. All non-selective herbicides shall be applied in such a manner as to minimize damage or over spray to non-target species.

Abundance of Melaleuca in Loxahatchee NWR: 2012

1 km Grid

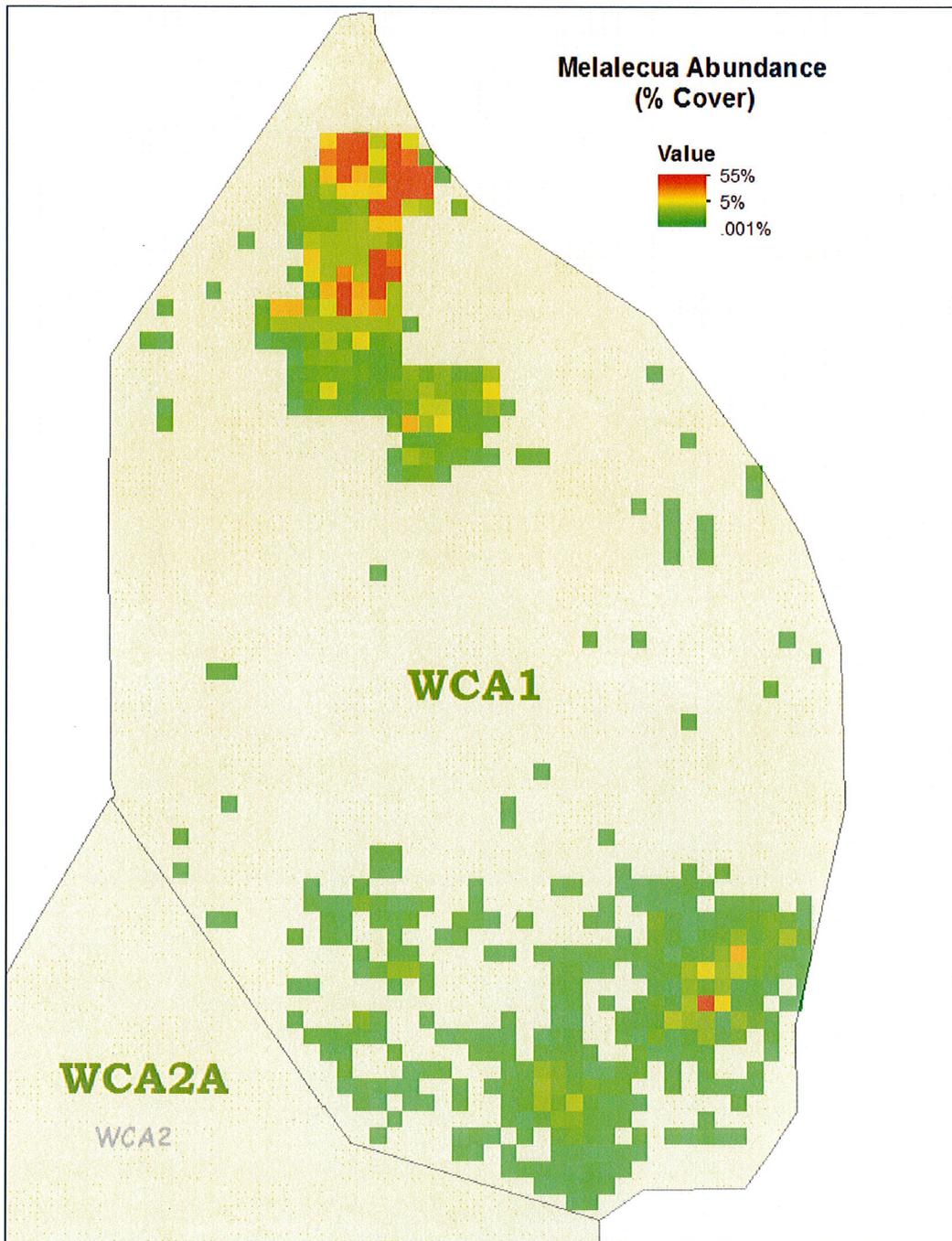


Figure 2. Distribution and abundance of melaleuca within the Loxahatchee National Wildlife Refuge. Source: SFWMD

Abundance of Old World Climbing Fern
in Loxahatchee NWR: 2012

1 km Grid

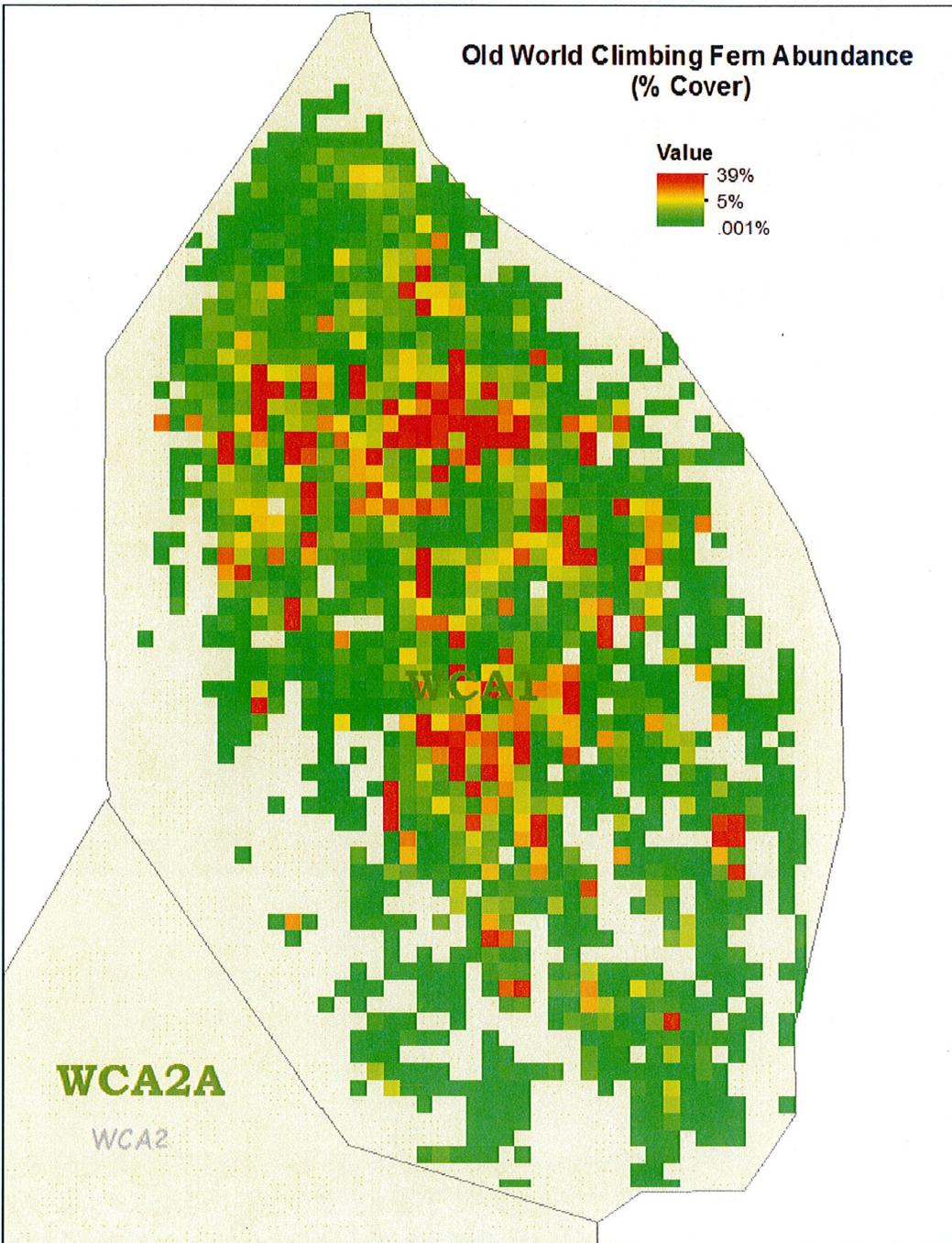


Figure 3. Distribution and abundance of Old World climbing fern within the Loxahatchee National Wildlife Refuge. Source: SFWMD

Agency Work Areas and Initial Treatment Years

1 km² Grid

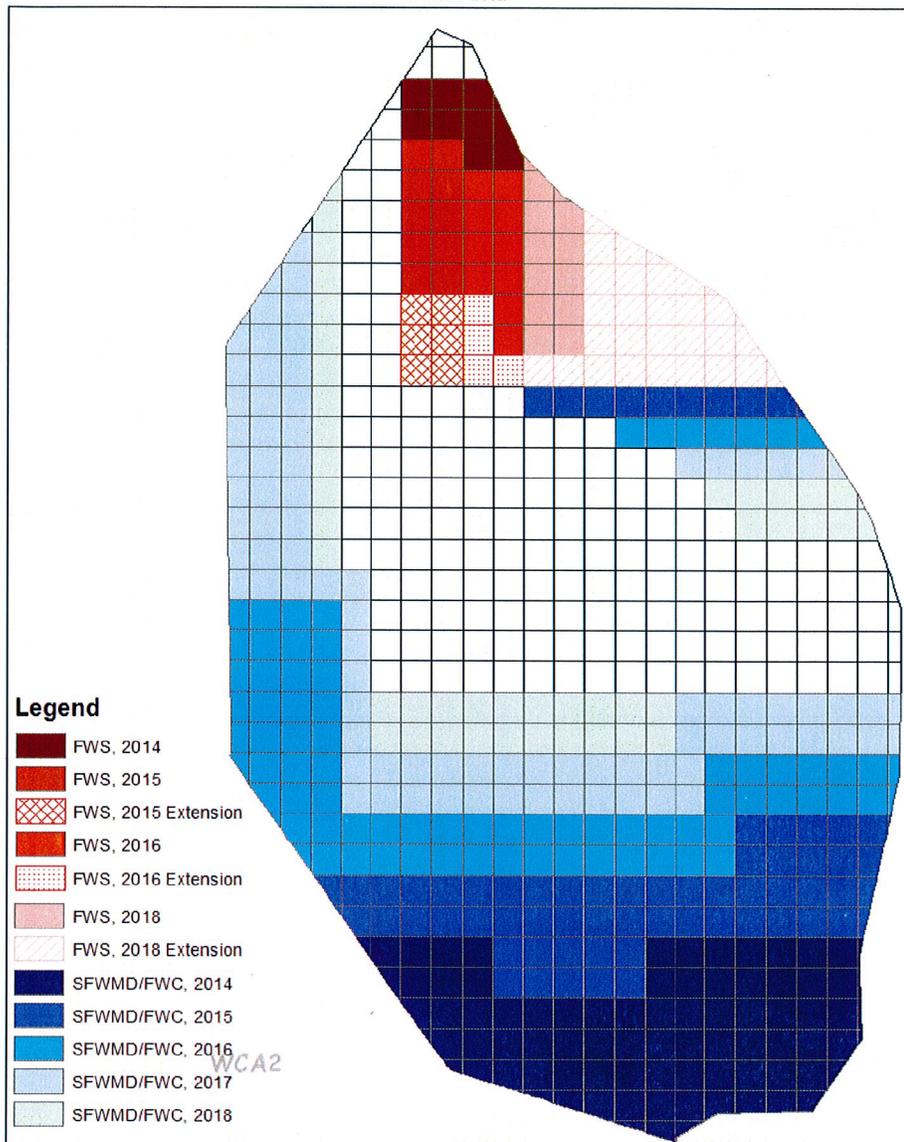


Figure 4. Planned agency work areas by year. Follow up re-treatments in years 2 and 3 are assumed for each area.

The proposed work area for 2015 currently contains widely scattered to small dense patches of melaleuca and Old World climbing fern. All work will progress following a 1 km grid system established by the Refuge. The Contractor will deploy ground crews in two configurations, depending on the estimated abundance of targeted weeds in the area. In marsh areas with very low-level infestations, airboats equipped with spray tanks or will systematically traverse each grid cell to or Old World climbing fern. Small patches of Old World climbing fern shall be foliar-sprayed using approved herbicides until entire leaf surface is sprayed to wet but not dripping. Overspray to native vegetation shall be minimized so as to limit non-target damage to desirable species. Crew(s) of one supervisor and two laborers will systematically traverse each grid cell to control low-level infestations of melaleuca. Single melaleuca trees and saplings will either be hand-pulled or herbicide treated using cut-stump, hack and squirt, or girdling techniques.

In marsh or tree island areas with moderate to high infestation levels, the contractor will deploy airboat(s) with full crews. Airboats will be manned by a supervisor and crew. These crews will systematically remove melaleuca using cut-stump hack and squirt, girdling and hand pulling techniques. Old World climbing fern will be foliar treated using either backpack sprayers or tank sprayers as appropriate. Overspray to native vegetation shall be avoided so as to limit non-target damage to desirable species. The other type of airboat will be equipped with a hand-held spray system and will be manned by one supervisor and up to two laborers. As described above, this crew will systematically traverse open marsh areas and treat widely scattered trees and small patches using hand pulling, cut-stump, hack and squirt, or girdling and foliar spray techniques.

The Contractor shall strictly adhere to all herbicide label application rates, precautionary and safety statements, and shall be familiar with, and adhere to SFWMD safety requirements. The Contractor shall also adhere to all federal, state, and local regulations governing the application, transportation, storage, use, and disposal of products utilized in the performance of this contract. These regulations include, at a minimum, Federal Insecticide, Fungicide and Rodenticide Act, 29 CFR 1910, OSHA General Industry Standards, and Chapter 487, Florida Statutes.

The Contractor(s) will stage from designated boat ramps on the southern end of the refuge. The SFWMD may consider construction of new boat ramps to reduce

travel time to work areas. The Contractor will be notified that airboat access from the perimeter canal into the interior areas is limited to Refuge-approved access points. The SFWMD will provide the Contractors with GPS waypoints and tracks for these access points and trails prior to commencement of work. Any proposed new access points/trails must first be approved by Refuge staff. Contractors will also be instructed to follow existing trails within the Refuge interior, when feasible, to limit habitat damage due to boat traffic.

Contractor Oversight

The rapid pace and large scale of this project will require that SFWMD field representatives/inspectors be present throughout project implementation. Monitoring for poor work performance, particularly with regard to herbicide mixing, equipment calibration & maintenance, application efficacy, and non-target damage, is a critical component of this project. Weekly inspection reports and photographs of completed work contractor activities will be submitted to Francois Laroche.

Diligent oversight will help contract managers to identify and address problems early. Photo-documentation of poor contractor performance is a critical part of monitoring the contractors. Communicating observations among the agencies is also very important, and needs to be timely and transparent.

Coordination:

Contract managers will coordinate on a weekly basis to assess progress and to forecast work priorities. Any interagency meetings will be coordinated by SFWMD. A progress map, developed and maintained by SFWMD staff, will be available at the meeting to facilitate discussion. SFWMD staff will provide the Refuge with information on completed grid cells in a timely manner. Other issues such as identified listed species locations, conflicts with other Refuge activities (e.g. public use, prescribed fire), and other considerations will be addressed at this meeting.

Contractor locations will be tracked using a 1-kilometer grid system for the Refuge, which is consistent with the regional monitoring grid for the Greater Everglades (e.g. sketch mapping). Contractors and agency staff will use this grid system to identify general locations of work areas and other cases where specific coordinates are not necessary.

The use of GPS will further facilitate communication and record keeping for herbicide treatments. For this reason, each crew supervisor and all agency field inspectors should have all relevant waypoints (e.g., boat ramps, established airboat trails, project boundaries, etc.) and grid coordinates loaded into their GPS unit. These coordinates will be supplied to staff and all contractors.

Outside Coordination:

Other users of the Refuge will need to coordinate through Refuge staff to ensure that there are no conflicts. Examples of potential conflicts include research activities, biological control implementation, hunting, and prescribed fires. Refuge staff will coordinate with other users to collect location information for any sensitive areas that applicators should avoid or at least be aware of. This information will be included in the GIS database managed by the Refuge. Any herbicide restriction areas (e.g., biological control release sites), must be marked in the field and included in the GIS database to minimize accidental treatments by contractors.

USFWS Planned Work:

The following maps represent planned work areas proposed by Refuge staff for fiscal years 15-18. These efforts are intended to complete the Refuge-wide strategy of working from the south using a containment strategy while addressing heavy infestations remaining in the northern reaches of the Refuge.

USFWS Loxahatchee 5 Year Treatment Progression

