

CONSERVATION INNOVATION GRANTS

Final Report

Grantee Name: World Wildlife Fund (WWF)

Project Title: “A Market-Based Program for Environmental Services on South Florida Ranchlands” (aka Florida Ranchlands Environmental Services Project (FRESP))

Period Covered by Report: October 1, 2005-Sept 30, 2009

Project End Date: September 30, 2009

Summary of the 3 year project with one year no-cost extension (taken from the CIG proposal):

“Rely on an existing collaborative process of ranchers, public agencies and public interest groups to implement and evaluate project results. Project activities include: four volunteer ranchers actively managing Water Management Alternatives (WMA) to produce environmental services of phosphorus control, water storage, and or habitat enhancement; developing practical and credible ways to measure different environmental services generated by management of the WMA; refining contract language between landowners and Florida state agencies; establishing performance documentation requirements and payment practices required for the scale –up of a market based program in the watershed.

Executive Summary

I. Key Project Accomplishments of the Florida Ranchlands Environmental Services Project (FRESP) in Designing a Payment for Environmental Services (PES) Program for Implementation in the Northern Everglades. (reporting period of October 1, 2005-Sept 30, 2009)

- 8 ranch demonstration Water Management Alternatives (WMAs) were designed, implemented and are operational:
 - 4 of the WMAs were operational in 2007, 3 were constructed in 2009 and 1 will finish construction in early 2010. All 8 will be in operational in 2010.
 - The 8 WMAs serve as demonstration projects for the production of environmental services of water and nutrient retention and provide proof of concept to both ranchers and state agency buyers and have generated data on water quality, quantity, soil

characteristics; and or vegetation and forage quality data contributing to refining cost-effective PES documentation methods.

- Achieved broad consensus by state-agency buyers and rancher-sellers on a Payment for Environmental Services (PES) program design to be implemented in the Northern Everglades as part of Everglades Restoration and protection of the St Lucie and Caloosahatchee Estuaries;
 - Established the preliminary design of key elements of a PES program contract including; RFP approach; eligibility requirements; service estimation procedures, etc.
- Received a commitment from the potential “Buyer” of these environmental services, in this case the Governing Board of the South Florida Water Management District (SFWMD), to implement (rules, budget, administer) a PES program for dispersed water management, if outstanding issues can be resolved.

II. Key project lessons and products of potential use in other regions/agricultural systems.

- **The necessary conditions for establishing an innovative PES program on working agricultural lands in another region/sector include:**
 - A commitment to pay for service as a profit opportunity and not pay for practice as a cost offset;
 - A buyer of the service(s) that is willing and able to put sustained money on the table;
 - Sufficient potential sellers of the service(s) that are willing and able to produce the service(s);
 - Where forces for change-- regulatory, economic, political -- are sufficiently compelling to motivate enough players to be willing and open to a new approach.
- **The collaborative process used by FRESP to design and field test elements of a PES program design is critical to successful implementation. Key elements of this process include:**
 - Identify a buyer of the environmental services and work with them to identify the service(s) they value and documentation requirements;
 - Build and maintain a diverse partnership of that buyer with sellers and civil society (it takes time & money but its critical) to ensure buy in to the program purpose and design;
 - Assure that the partnership includes social entrepreneurs in all constituencies (producers, private sector, state and federal agencies and civil society) committed to the PES vision;
 - Learn by doing – get real demonstration projects on the ground and use their experience to design the program;
 - A full time project manager / cat herder / neutral intermediary and a practically-oriented technical team are essential for designing a program acceptable to buyers and sellers.
- **Other transferrable FRESP tools and concepts**
 - The approach, organization and key elements in the FRESP contract design.
 - The decision support tools developed by FRESP including: the Potential Water Retention Model (PWRM) and the Ranch PES Financial Analysis Tool, and
 - The process and programmatic approaches developed to address Federal wetland jurisdictional and T & E issues.

Final Report of phase one (2005-2009) of the Florida Ranchlands Environmental Services Project (FRESP) in Designing a Payment for Environmental Services (PES) Program for Implementation in the Northern Everglades

I. Introduction

The objective of the Florida Ranchlands Environmental Services Program (FRESP) is to design a Payment for Environmental Services (PES) program to pay ranchers in the Northern Everglades who modify their water management practices to provide environmental services of water and phosphorus retention. This was to be accomplished through the implementation of on-ranch water management demonstration projects (called Water Management Alternatives (WMA)). Eight WMAs were implemented on volunteer ranches and monitoring protocols were designed to collect data on water and nutrient retention that allowed the FRESP team to learn by doing and to build a program design informed by actual experience. FRESP is being implemented through a collaborative process that includes the buyers (state agencies), sellers (ranchers), research scientists, and environmental groups. This collaborative process, grounded by ranchers experience in managing their WMAs, resulted in an evolution and refinement in shared program vision and program design. (See Appendix 1 for a list of FRESP partners).

The current FRESP vision:

Relying on *modifications to existing water management structures and strategies* on extensive *working ranch landscapes*, state agency buyers will enter into *fixed term contracts* with rancher sellers to provide publicly demanded water related environmental services and habitat, *above and beyond regulatory requirements* creating a new *profit center* for ranch enterprises.

With the completion of Phase One of the pilot project, FRESP now enters Phase Two (2009-2011) with funding from a second USDA NRCS CIG and the state of Florida to resolve outstanding issues in program design and documentation. During this time period the FRESP team will begin transferring responsibility for PES program administration and implementation to state and Federal agencies, private sector agents and the broader ranching community.

II. Key Project Accomplishments in the Design of a Payment for Environmental Services (PES) Program.

8 ranch demonstration Water Management Alternatives (WMAs) were designed, implemented and are operational. And a monitoring protocol was established for each WMA site to collect water quality/quantity, soil and vegetation data.

In our first CIG FRESP committed to building up to 4 demonstration WMAs on ranchers. The original 4 were completed in 2007 and have been in operation since then (Lykes, Buck Island, Williamson and Alderman-Deloney Ranches). Additional funding was secured from the state of Florida and new rancher volunteers were recruited resulting in 4 additional WMAs being designed. The construction of three of the new WMAs was completed in 2009 (Syfrett, Payne and Lightsey

Ranches). The fourth WMA will be completed in early 2010. All 8 will be operational in 2010 (Appendix 2 has maps of each of the 8 WMAs and a map showing the location of the WMAs).

The 8 WMAs serve as demonstration projects for the production of environmental services of water and nutrient retention and provide proof of concept to both rancher-sellers and state agency buyers. These demonstration water management projects include rehydrating drained wetlands, creating above ground minor impoundments, raising the height of the water table in the ranch soil profile and drainage network, and pumping water from a nearby canal through existing ranch wetlands and flowing back into the canal. In all cases the design of the WMAs built upon (and enhanced) existing ranch drainage or flood control infrastructure to provide the capacity to generate the desired water management services.

Two general types of WMAs were identified. Type one, where water retention is the driver service and nutrient reduction an ancillary benefit. These WMA sites typically are managing on-site water where measuring nutrient in-flow and out-flow is not cost-effective. Type two WMAs are where nutrient reduction is the driver service and water retention an ancillary benefit. These WMA sites typically by virtue of their proximity to public canals are treating off-site water allowing for cost-effective measurement of nutrient in- and out- flows and calculation of nutrient load reduction.

A water quality/quantity monitoring protocol was established for each WMA site. Hydrologic and water quality data are being collected from each WMA site, cleaned and uploaded into a project data base. Because of the prolonged drought little to no hydrologic or water quality data was obtained from the 4 original WMAs in 2007. Data was collected in 2008 from the four original WMA sites, however, there was only one significant rain event (tropical storm Fey) during that rain year. Data was obtained from only 3 of the 4 WMA sites in 2009. The Lykes WMA site was not operational in 2009 due primarily to a dispute with a neighbor over water management issues. Limited data was collected from the new WMA sites during 2009 as they came on line, but the data is spotty. In sum, there are only 2 years of data from 3 WMA sites (Williamson, Buck Island Ranch and Alderman-Deloney Ranches) and one year of data from Lykes. The limited data from the WMA sites has delayed identification of the final documentation and verification of services protocol. We anticipate completing this program design element during the next phase of the pilot project (2009-2011).

Achieved broad consensus by state-agency buyers and rancher-sellers on a Payment for Environmental Services (PES) program design to be implemented in the Northern Everglades as part of Everglades Restoration and protection of the St Lucie and Caloosahatchee Estuaries.

In the current design of the PES program, state agencies would sign fixed term contracts to pay landowners in the Northern Everglades area (mostly the Lake Okeechobee watershed) to provide documented water and Phosphorus (P) retention services. Depending on the site characteristics some ranchers will be paid for phosphorous removed from off ranch water (ex: the Lykes WMA site). However, in most places payments will be for the amount of storm water retained (ex: Buck Island, Williamson, Payne, Syfrett, Alderman, Wohl and Lightsey ranch WMA sites). Projects that retain water would be designed to assure that they will also remove phosphorous from storm water.

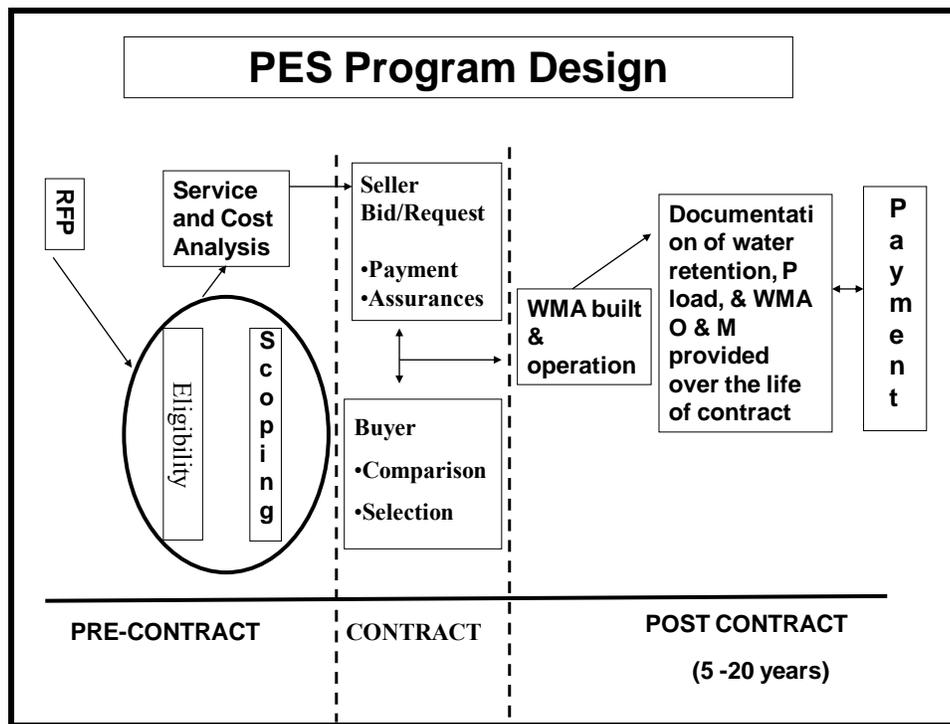
Ranchers would retrofit and expand existing flood control or drainage infrastructure common on ranchlands such as berms, pumps, culvert with riser board structures, etc., or combinations of practices to retain instead of drain water and limit flooding. The program would pay for the volume of water kept in rehydrated wetlands, ditches and the soil profile that either evaporate or seep through the groundwater system.

In a PES program ranchers choose how much water they will be willing to retain after an analysis of their own site, compatibility with other ranch operations, the need for management changes (e.g. such as planting water tolerant grasses), and the profitability of selling water retention.

Agencies of the state will choose which ranches to contract with, based on an assessment of service potential. The selected ranchers and the agency buyers enter into a fixed term contract that provides a specified payment each year for services provided over the life of the contract regardless of rainfall. The state is essentially buying the option value for water retention over the life of the contract.

The FRESP team’s current vision of how a PES program in the Northern Everglades is reflected in the program schema below and could work as follows:

The buyer, the state of Florida as represented by the South Florida Water Management District (SFWMD), announces a request for proposals (RFP) to retain water and/or phosphorous. The RFP specifies all relevant contract details (eligibility requirements, documentation requirements, method for estimating potential services, exit clauses, renegotiation clauses, price to be paid, etc.).



Before submitting a proposal the ranch parcel that includes the proposed WMA must be in compliance with existing water quality regulations. Specifically, ranch parcel owners would be keeping all required nutrient records and on schedule in implementing a USDA NRCS Conservation Plan or a Notice of Intent to implement BMPs identified through a Florida Cattlemen’s Water Quality BMP assessment protocol as currently required by state law.

Eligible ranchers would submit a pre-application packet to USDA NRCS staff, or designated technical service providers, for review prior to making a formal response to the RFP. The pre-application review will confirm the eligibility of the applicants parcel, make a general assessment of the technical feasibility of proposed projects, and assure that the proposed projects will comply with federal and state regulatory provisions associated with participation in the PES program, such as wetlands and threatened and endangered species protections and water use permitting. Currently, under development is a General Permit from the US Army Corps of Engineers for compliance with fill permitting requirements of section 404 of the Clean Water Act. In particular, a project covered by the GP would allow the landowner to return to pre-project water management conditions at the end of the contract. Related to the GP development is the development of a US Fish and Wildlife Service and NRCS FRESP Consultation Matrix, essentially a list of accepted practices that will be presumed to be consistent with the protections required for threatened and endangered species.

After screening by USDA NRCS staff or designated technical service providers, ranchers would proceed to develop a complete project proposal. The proposal would include an assessment of their sites’ potential to provide the services requested in the RFP. Low cost and easily applied tools (a Potential Water Retention Model (PWRM) and its equivalent for P reduction) are currently being developed to use in the assessment of potential water and phosphorus retention on ranches. Technical assistance to use these tools may be required, and strategies for engaging the private sector and state and federal agencies in providing that assistance are being developed. As currently conceived, ranchers would include in the response to the RFP the payment they would require for making changes in ranch water management. A financial analysis tool under development will be offered to help ranchers prepare a bid that reflects their investment, operation and maintenance, and opportunity costs and their profit expectations.

The SFWMD will make a selection among rancher applicants using criteria including, but not limited to, volume of water that can be retained and P retention potential and the cost effectiveness of each proposal based on the service generated and the payment requested by the rancher. Key contract provisions include: 1) buyers will pay for the option to retain water and phosphorous so that ranchers are paid a specified annual amount over the life of the contract regardless of rainfall; buyers may request that ranchers hold less water in any year, but may not require holding an amount that exceeds what is called for in the option; buyers and sellers agree to the documentation and record keeping requirements that will be a condition for receiving payment; the seller confirms that they have meet all the conditions required for the project to be permitted under the conditions of the General Permit.

With a signed contract in hand, the rancher implements any construction or other land and water management actions that will be needed to provide the services. At the time of construction, measurement equipment that may include stage recorders, pump flow meters and rainfall gages are

put in place. Other records, such as nutrient and pesticide applications, also will be kept for documentation as currently required by the Conservation Plan or Notice of Intent.

Payments are made over the life of the contract. In order to get paid some level of documentation will be required to document that the measured water actually retained is consistent with the rainfall and/or pumping regimes of the water year.

At the end of the contract period the site can be shut down according to rules specified in the contract, or the contract can be renegotiated if both the agency and the ranchers agree to an extension.

Commitment from the “buyer” to implement the PES program designed by the FRESP team.

A key challenge in designing a PES program is to identify a buyer of the environmental services who is committed to the program design, has sustained funding to pay for the services, and is willing to enter into agreements to purchase the services. The FRESP team received such a commitment from the potential “Buyer” of these environmental services, in this case the Governing Board of the South Florida Water Management District (SFWMD). In a resolution passed in October 2009, the Board indicated its intent to implement (rules, budget, administer) a PES program for dispersed water management, if outstanding issues can be resolved. They also instructed SFWMD staff to work with the FRESP team to resolve these outstanding issues. Key issues identified included price discovery, threatened and endangered species protection and wetland jurisdictional concerns.

Development of programmatic approaches to address threatened and endangered species and wetland jurisdictional issues.

To ensure that there are no regulatory surprises for landowners who choose to participate in a PES program to produce water management services over a fixed term contract and wish to return to pre-project conditions at the end of their contracts, the FRESP team is working with the US Fish and Wildlife Service (USFWS) and the US Army Corps of Engineers (USACOE) to design and implement programmatic approaches to facilitate a PES program implementation. USDA NRCS is facilitating the consultation with both the US FWS and the USACOE in the development of the programmatic approaches. The USFWS and the USDA NRCS are developing a FRESP specific Consultation Matrix. The FRESP Consultation Matrix identifies the subset (less than 40) NRCS guidebook practices likely to be encountered in the design of a WMA, cross references them with the threatened and endangered species of concern in the Northern Everglades and assigns a practice effects designation. Effects on threatened or endangered species of concern encountered in the design of a particular WMA can be identified during the pre-proposal screening and design changes or mitigation actions proposed.

Similarly, the US ACOE is developing a General Permit for compliance with fill permitting requirements of section 404 of the Clean Water Act. In particular, a project covered by the GP would allow the landowner to return to pre-project water management conditions at the end of the contract.

III. Key project lessons and products of potential use in other regions/agricultural systems.

Conditions necessary for establishing an innovative PES program on working agricultural farms and ranches.

While FRESP is still operating as a pilot project and not a PES program, we have identified several factors that we believe are critical to the design of a sustainable PES program. These conditions include:

- *A commitment on the part of the relevant stakeholders to pay for the environmental service(s) as a profit opportunity and not pay for practice as a cost offset.* A core concept of a PES program on working agricultural lands is that the environmental service is a commodity, like other agricultural products, to be produced and sold in order to generate a profit for the farm enterprise. This is in contrast to more common notion that the environmental service is generated through cost sharing of desired practices.
- *The existence and interest of a buyer of the service(s) that is willing and able to put sustained money on the table.* Many efforts to design and implement market-based approaches to securing environmental services have floundered due to the lack of a buyer willing and able to pay for the services. In addition, identifying a buyer before designing a program is essential to the design process as the buyer’s needs determine the services wanted, delivery specifications, price and documentation and verification requirements. The buyer needs to be an active participant in the program design process to make sure their needs are met and ensure buy-in.
- *The existence and interest of sufficient potential sellers that are willing and able to produce the service(s).* Similarly, there needs to be sufficient potential supply of the services and the preferences of the sellers need to be considered in designing a PES program. Not all agricultural enterprises will be cost-efficient producers of the service. To make the administration of a PES program worthwhile there has to be some critical amount of service generation achievable. Interest on the part of sellers is not only a function of price. Other factors -- transactions costs, hassle factor, integration of the service production with other agricultural enterprises, potential for regulatory surprises, etc., all influence the willingness of sellers to participate in a PES program.
- *Where forces for change—regulatory, economic, political – are sufficiently compelling to motivate enough players to be willing and open to a new approach.* Change is hard. To overcome inertia and get a sufficient number of individuals – agency staff, producers, private sector agents, rate or tax payers to modify their behavior requires strong motivation. A region or commodity facing strong exterior pressures to change practices can open the door to innovation.

Elements of FRESP’s process in designing a PES program are transferable to other regions.

The collaborative, learn by doing process the FRESP team used to design a PES program is the most transferable product of the pilot phase. Key elements of that process include:

- *Identify a buyer and work with them to identify the service(s) they value and their documentation requirements.* Identify regions/situations where there is a clear demand for a

particular environmental service(s) and integrate the entity interested in those services from the beginning in the design process.

- *Build and maintain a diverse partnership of the buyers with sellers and civil society (it takes time & money but it’s critical).* Creating and implementing an innovative new program will require the buy-in from diverse stakeholders and a willingness on their part to use their political, financial and or intellectual capital on behalf of the innovative program. Overcoming the many obstacles to implementing something new and different, identifying and securing funding, and getting institutional support for a PES program is facilitated by having diverse partners lobbying for change.
- *Assure that the partnership includes social entrepreneurs in all constituencies (producers, private sector, state and federal agencies and civil society) committed to the PES vision.* Identifying within each of the key stakeholder groups entrepreneurs—individuals able and willing to think outside their usual job responsibilities and the status quo—is essential to getting an innovative program off the ground.
- *Learn by doing – get real demonstration projects on the ground and use their experience to design the program.* This is self-evident.
- *A full time project manager / cat herder / neutral intermediary and a practically-oriented technical team are essential for designing a program acceptable to buyers and sellers.* Designing an innovative PES program requires a full time project manager who can focus the time and attention needed to sustain the momentum to overcome the obstacles, maintain the stakeholder process, and ensure buy in from key agents. Having a neutral intermediary managing the process, in this case World Wildlife Fund, enhanced buyer and seller confidence in the process. Also given the innovative nature of the process, it’s important that the effort be supported by a practically oriented technical team that can address the diverse issues and obstacles as they present themselves over the course of program design.

Other transferrable FRESP tools and concepts

Some of the FRESP PES program design elements—the contract, documentation methods, water retention estimation tools --- might be transferable to other regions, especially those that are over drained and where landowners have the capacity to retain water on their lands without adversely impacting current agricultural production. The tools listed below while reflecting the site specific conditions in South Florida and the specific needs of the FRESP buyers and sellers could with some modifications be used in other circumstances. Some suggestions:

- *The approach, organization and key elements in the FRESP contract design.* (see above for a detailed description of the contract process and design);
- *The decision support tools developed by FRESP including: the Potential Water Retention Model (PWRM) and the Ranch PES Financial Analysis Tool.* To facilitate the contracting process, the FRESP team developed a Potential Water Retention Model (PWRM) that will be used by buyers and sellers in the pre-contract phase to estimate the potential water retention in acre feet from a proposed WMA site. The PWRM is a non-proprietary Excel spreadsheet based model that requires a limited amount of data to run. Estimates of the PWRM for the 7 water retention WMAs is provided below.

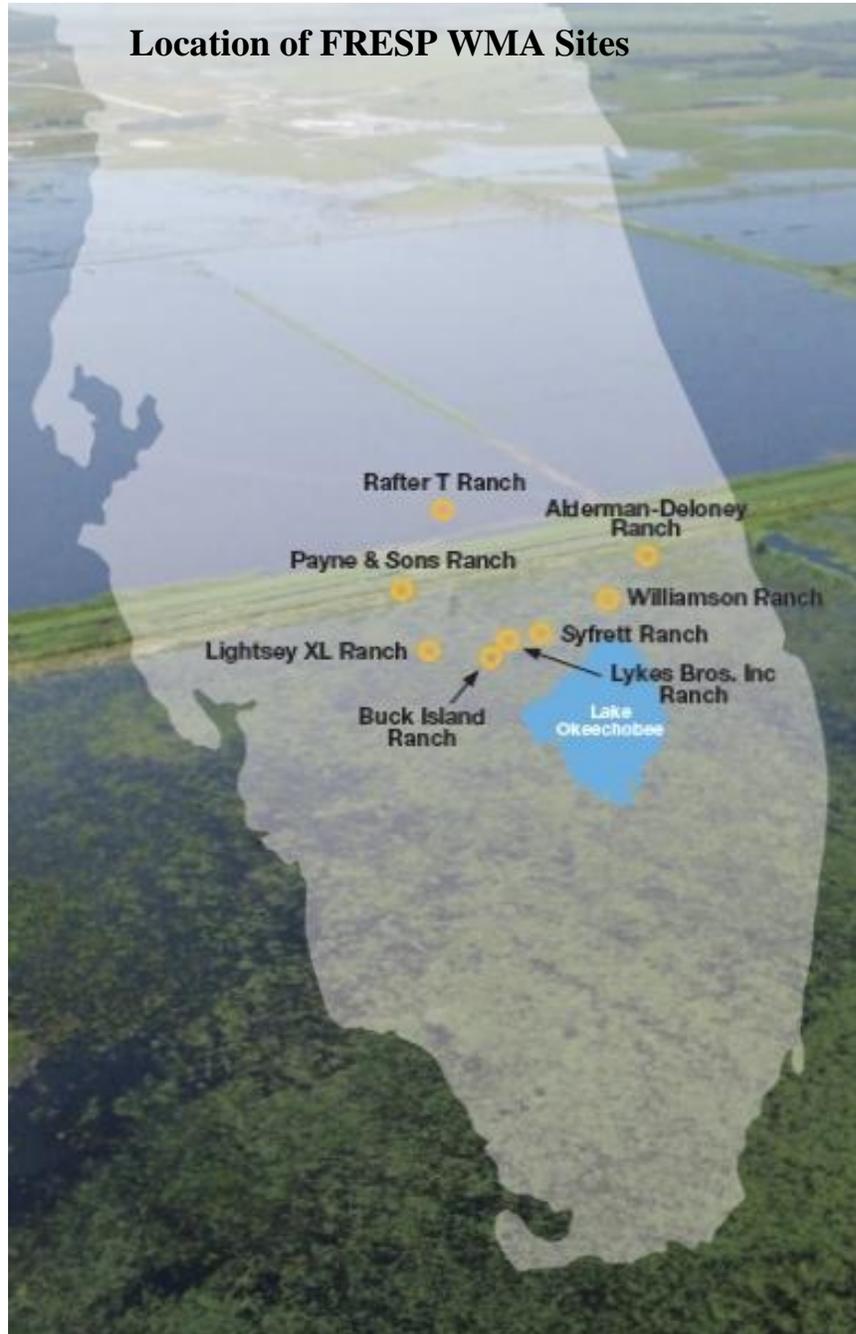
FRESP WMA Potential Water Retention as Estimated by the PWRM

	WMA Service Area	PWRM Estimate of Incremental Retention Post WMA Ac Ft
Rafter T	1624	850
XL Ranch	364	227
Payne	367	168
Syfrett	2197	933
Williamson	659	303
Alderman	322	140
BIR	3748	2479
Total All FRESP WMAs	9281	5100

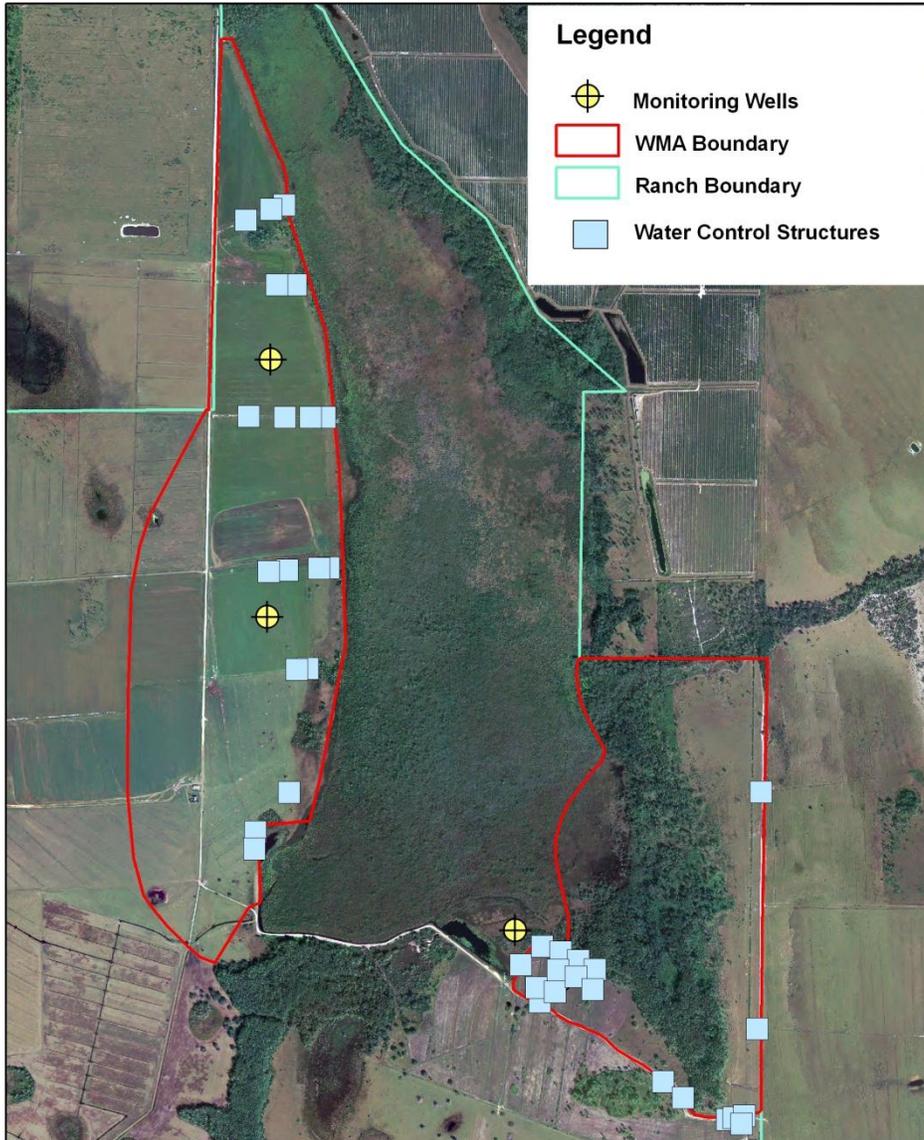
A second tool, the Ranch PES Financial Analysis Tool, is a non-proprietary, Excel spreadsheet based decision support tool to be used by ranchers in preparing their bid for providing water management services in a PES program. Ranchers aren’t used to thinking in acre feet, and there are potential tradeoffs between producing more water management services and other agricultural enterprises. This spreadsheet allows a rancher to run different scenarios imputing their assumptions on various rates (e.g. interest, marginal tax, general inflation) as well as variables related to the contract (e.g. construction costs, O & M, length, payment schedule). The decision support tool provides different approaches to estimating economic impacts (e.g. return on investment, payback period, average annual earnings).

- *The process and programmatic approaches developed to address Federal wetland jurisdictional and T & E issues.* Unanticipated regulatory surprises especially as it relates to wetlands and threatened and endangered species are a major disincentive to agricultural producers to participate in conservation programs. The programmatic approaches developed by FRESP in collaboration with the USDA NRCS, USFWS and the USACOE could be applicable in other similar PES program designs.

Appendix 2: FRESP Water Management Alternative Maps



Lightsey Cattle Company Florida Ranchlands Environmental Service Project



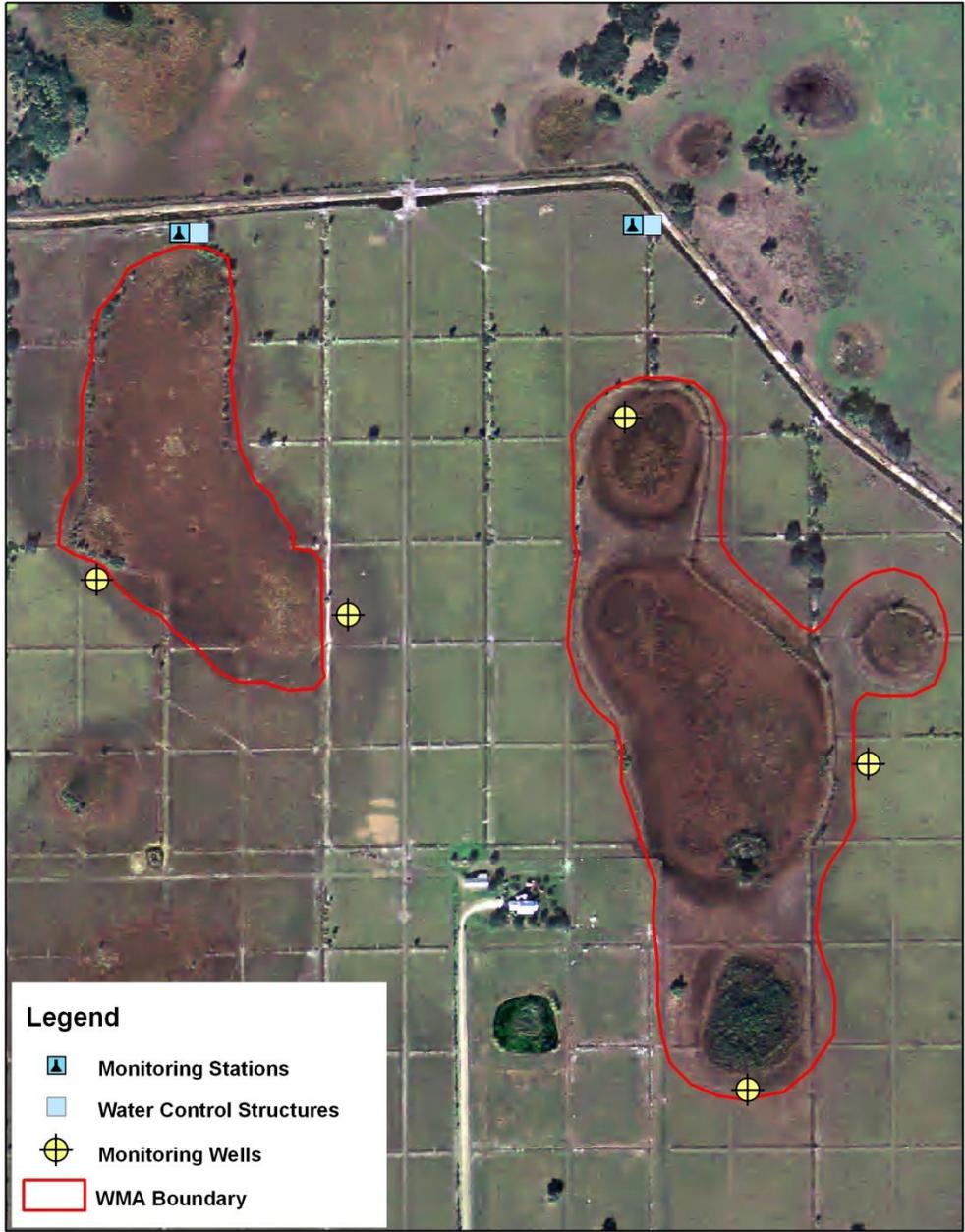
Lightsey Cattle Company's Water Management Alternative (WMA) consists of installing water control structures (culvert/risers and ditch weirs) in 14 existing ditches to retain water in a 350-acre pasture area draining into a 580-acre wetland/slough area.

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Kilometers



Prepared by Nitin Singh, FRESP Hydrologist; June 2008. DOQQ, 2004 1m resolution.

Alderman-Deloney Ranch Florida Ranchlands Environmental Service Project

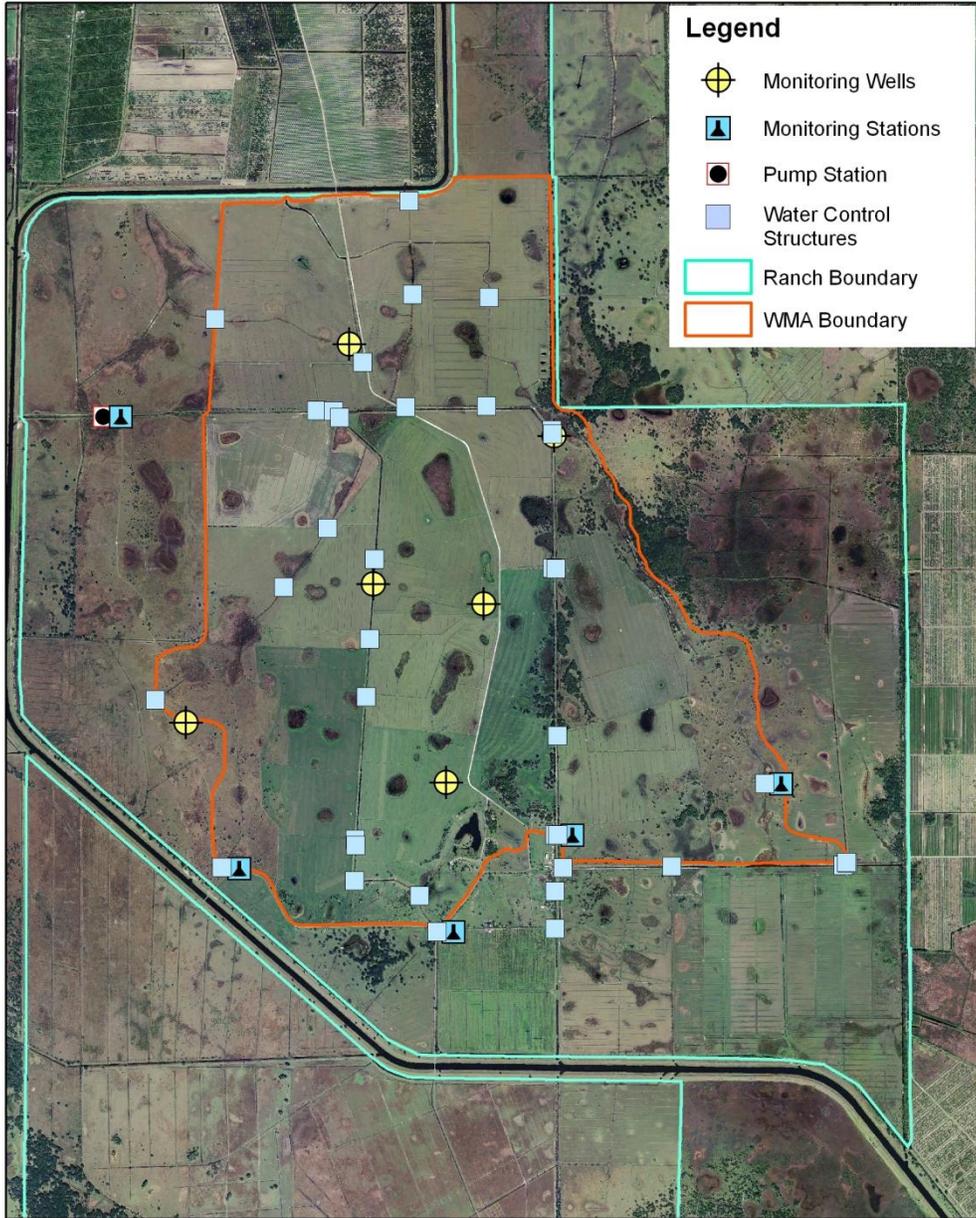


Alderman Deloney Ranch’s Water Management Alternative (WMA) consists of rehydrating two existing wetlands (18 and 30 acres) within a 340-acre improved pasture by installing a water control structures (culverts and risers) in the drainage ditches at the north end of each wetland.



Prepared by Nitin Singh, FRESP Hydrologist; June, 2008. DOQQ, 2004 1m resolution.

Buck Island Ranch Florida Ranchlands Environmental Service Project



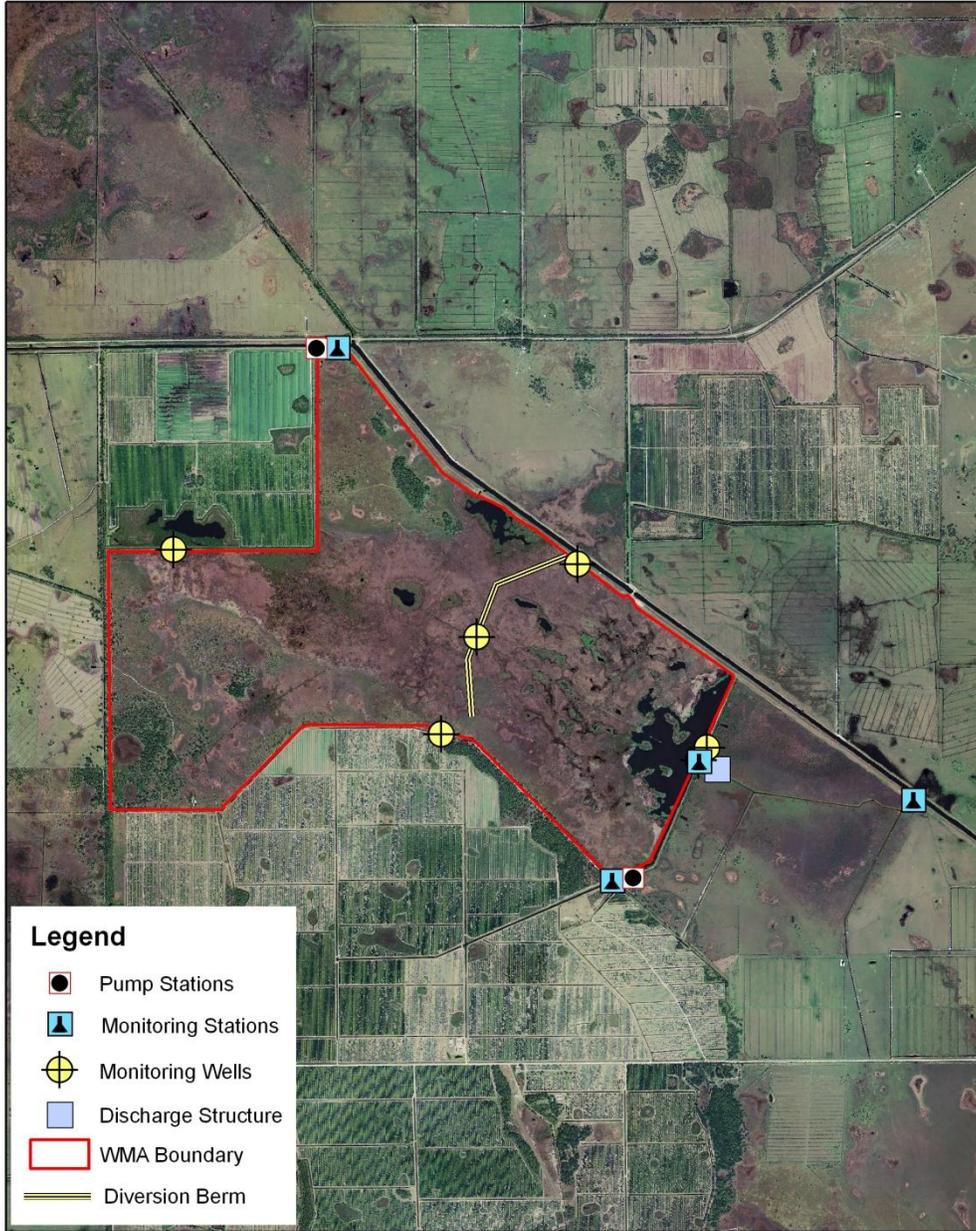
Buck Island Ranch's Water Management Alternative (WMA) consists of installing 37 water control structures (culverts and risers) over roughly 2800 acres of improved pasture and 900 acres of adjacent native pasture to create a cascading water system that uses existing canals and drainage ditches to retain ranch storm water runoff.



Prepared by Nitin Singh, FRESP Hydrologist; June, 2008. DOQQ, 2004 1m resolution.



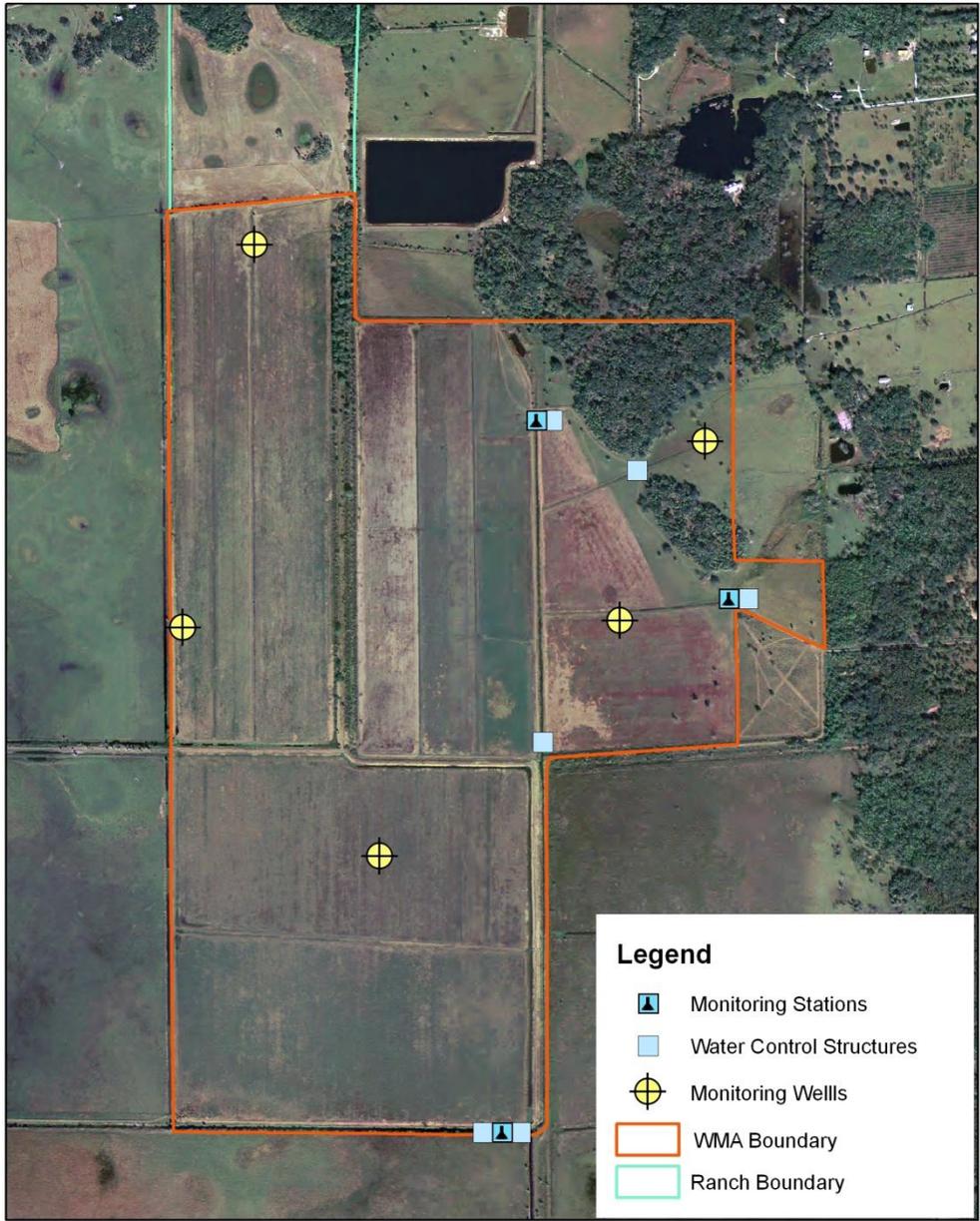
Lykes Bros. Inc. Florida Ranchlands Environmental Service Project



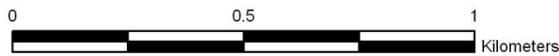
Lykes Bros. Inc. Water Management Alternative (WMA) consists of installing a pump to take off-ranch water from the Indian Prairie Canal (C-40) and run it through an existing 2500-acre marsh/wetland reservoir to filter out phosphorus before returning the water via gravity discharge back into the public canal.



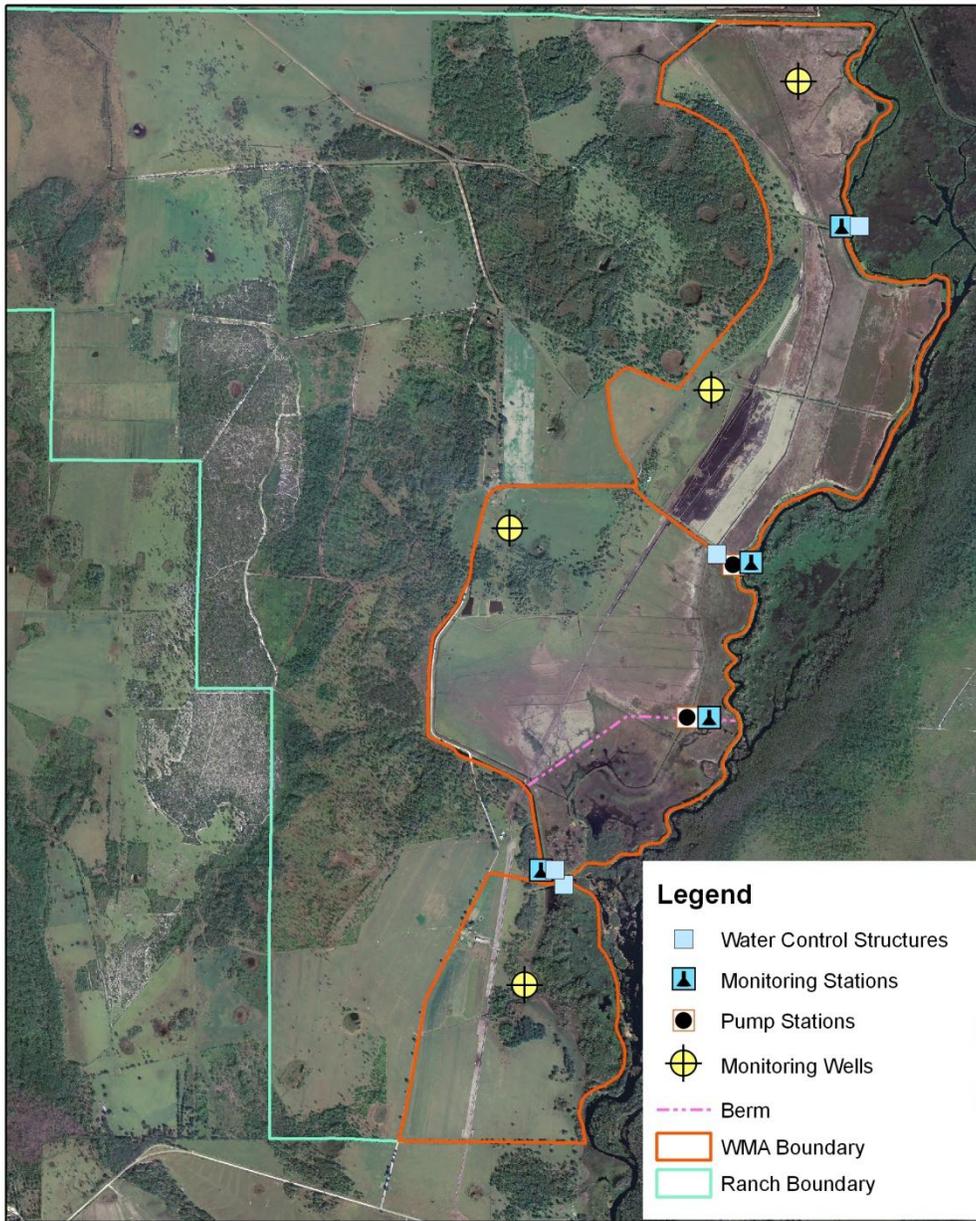
Payne - Josephine Road Ranch Florida Ranchlands Environmental Service Project



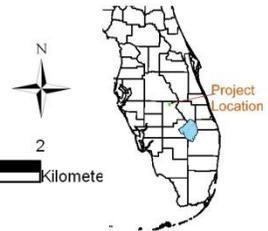
Payne's Josephine Road Ranch Water Management Alternative (WMA) will retain both on-site and off-site storm water runoff in 466 acres of improved pasture surrounded by a perimeter dike. The WMA will involve managing 3 newly installed and 3 existing water control structures to maximize retention.



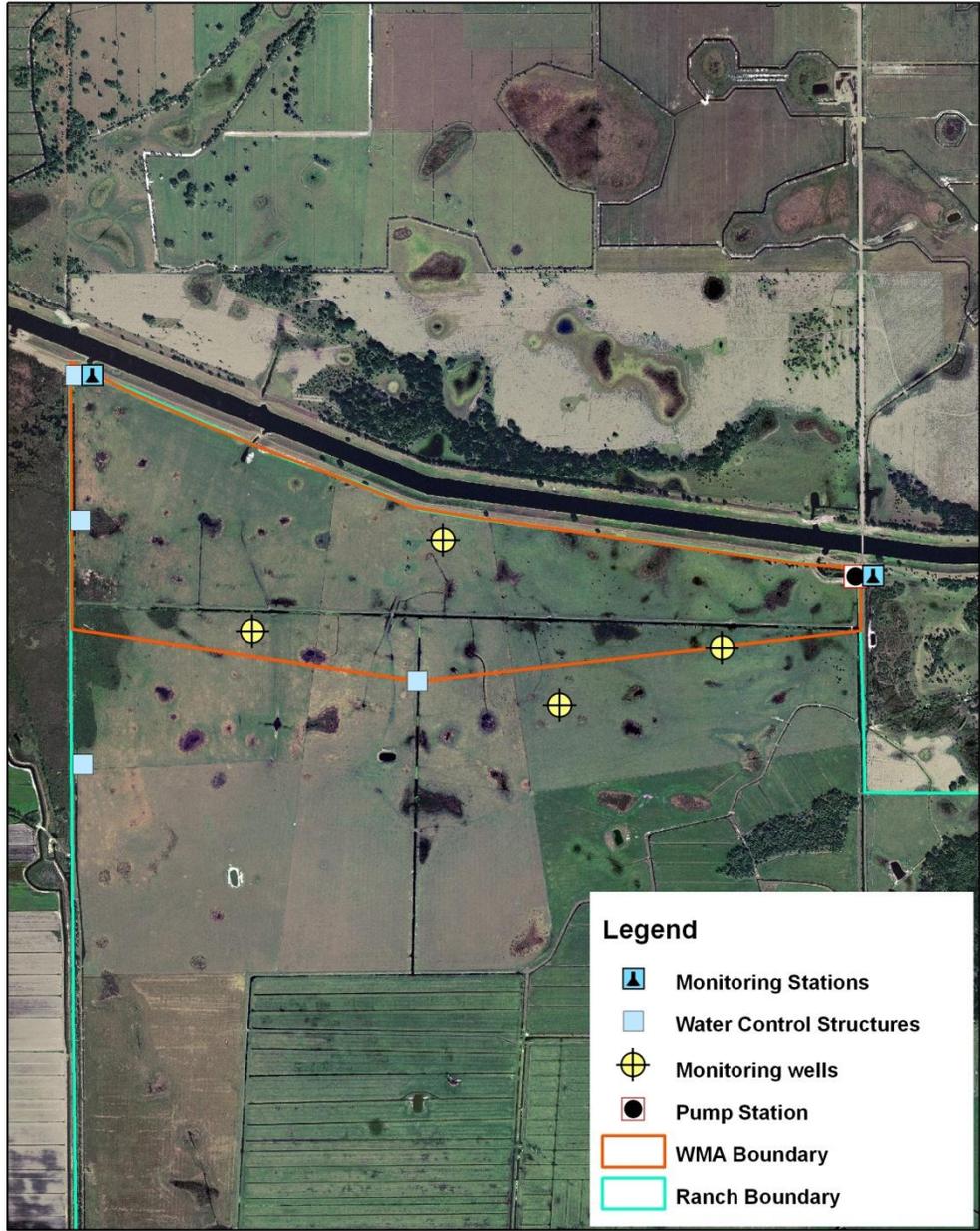
Rafter-T Ranch Florida Ranchlands Environmental Service Project



Rafter-T Ranch's Water Management Alternative (WMA) consists of 4 new water control structures (culverts and risers) and an existing pump that will be used to control the outflow from two sites (416 and 100 acres) in order to retain water in low lying pasture areas and wetlands. Construction of an earthen berm and installation of a new pump at a third site will create an above ground impoundment of about 100 acres.



Syfrett West Ranch Florida Ranchlands Environmental Service Project

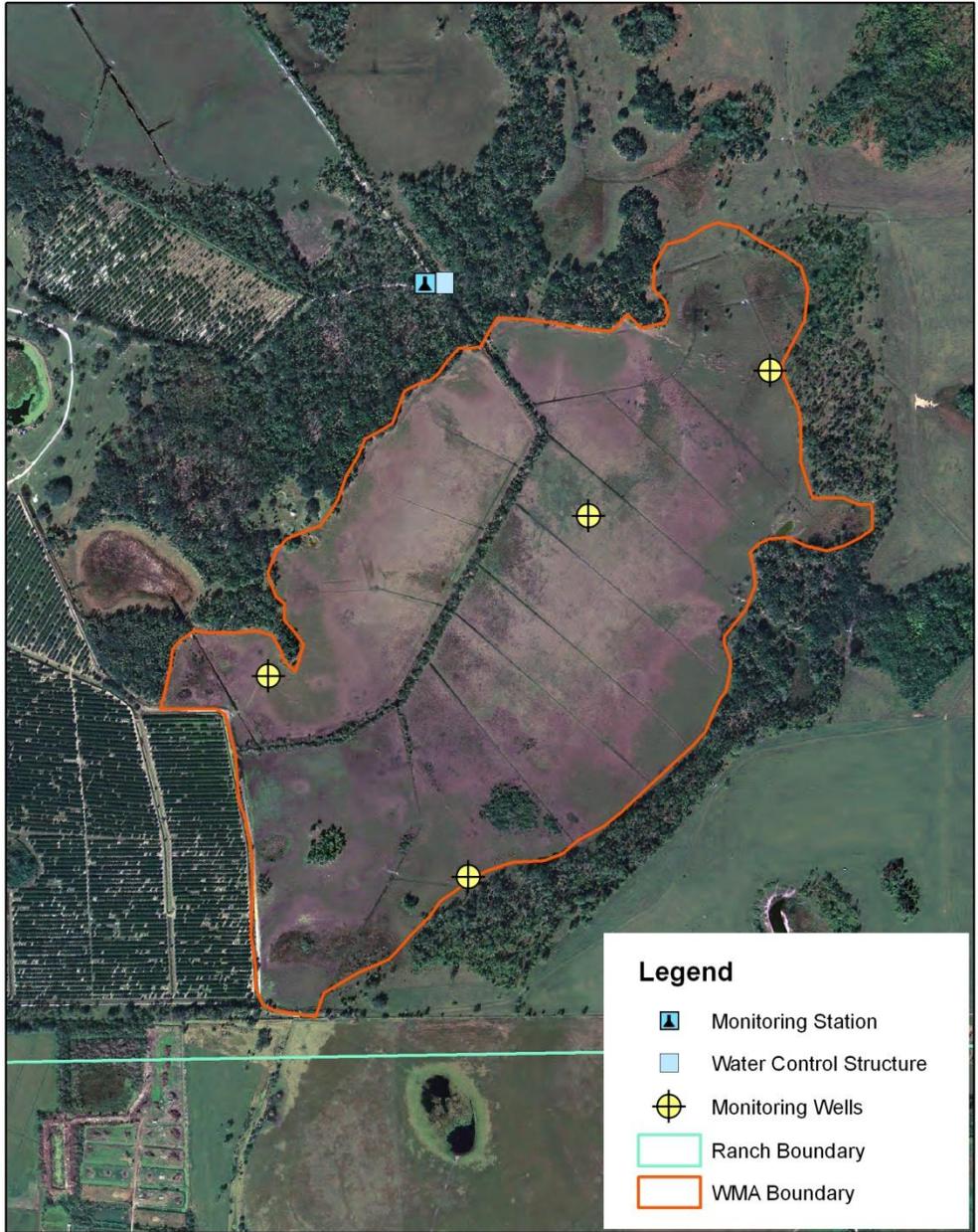


Syfrett West Ranch's Water Management Alternative (WMA) consists of installing 4 water control structures (culverts and risers) and using an existing pump to divert excess stormwater runoff (from the ranch and from the C-41A canal) to a 280-acre pasture area through an existing ditch system to retain water in ditches and low lying pastures.



Prepared by Nitin Singh, FRESP Hydrologist; June, 2008. DOQQ, 2004 1m resolution.

Williamson Cattle Company Florida Ranchlands Environmental Service Project



Williamson Cattle Company's Water Management Alternative (WMA) consists of rehydration of a 250-acre previously drained wetland within a 900-acre drainage area through installation of a water control structure (culvert and riser) in a drainage ditch at the outfall.

