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Moving from Concept to Implementation: The Emergence of the Northern Everglades Payment for Environmental Services Program

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Abstract

The Northern Everglades Payment for Environmental Services (NE-PES) program was launched in 2011 by the state of Florida. The NE-PES program was developed through the Florida Ranchlands Environmental Services Project (FRESP), a six-year collaborative effort (2005–2011) that engaged ranchers, government agencies, and environmental NGOs. Through FRESP, eight pilot water management projects were implemented on cattle ranches. The projects demonstrated how ranchland owners, as service sellers, could enter into contracts with a state agency buyer to provide the buyer-desired services of water retention (acre-feet) and/or nutrient load retention (lbs. of phosphorus or nitrogen). Innovative contract elements, based on the experience of implementing the pilot projects, developed by FRESP collaboration partners made the now operating NE-PES possible.

Key Words: environmental services, payment for environmental services, environmental markets, Everglades

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I. Introduction

In January 2011, the South Florida Water Management District (SFWMD) issued the first solicitation under its new Dispersed Water Management–Northern Everglades Payment for Environmental Services (NE-PES) program. The challenge of creating a program with market-like features (see Box 1) required collaboration among a wide variety of stakeholders over many years.

That program design process began with an ad hoc collaboration, followed by the multiyear (2005–2011) Florida Ranchlands Environmental Services Project (FRESP).[1] FRESP was a collaborative process that included eight (initially four) volunteer ranchers, staff experts from World Wildlife Fund (WWF) and Resources for the Future (RFF), and representatives from the SFWMD, Florida Department of Agriculture and Consumer Services (FDACS), Florida Department of Environmental Protection (FDEP), and USDA Natural Resources Conservation Services (NRCS). A wide range of disciplinary experts from the MacArthur Agro-Ecology Research Center (MAERC) and the University of Florida Institute of Food and Agricultural Sciences made up a technical support team. Funding in excess of $7 million was secured for designing the NE-PES program.

* Resources for the Future and World Wildlife Fund, respectively.

[1] Further details on the region, on FRESP, project photos, and other background materials can be found at www.fresp.org.

Box 1. Market-like Program Fundamentals

Market-like programs combine decisionmaking flexibility with a financial incentive to reward innovative individual conservation actions, actions that in turn lead to desired environmental changes at larger scales (e.g., a watershed). Market-like programs involve the following fundamental features: First, they identify environmental services valued by buyers willing and able to pay for them. Second, because buyers want to purchase environmental results, not just land and water management practices, they define performance goals and evaluate practices in relation to those goals. Third, because they are designed to encourage innovation, they offer participants' discretion in the practices undertaken to meet a performance goal. Fourth, a market-like program envisions mechanisms whereby buyers and sellers negotiate a price and then enter into contracts governing the terms and conditions under which payments will be made; payments are made after documenting the quantity of the services produced.

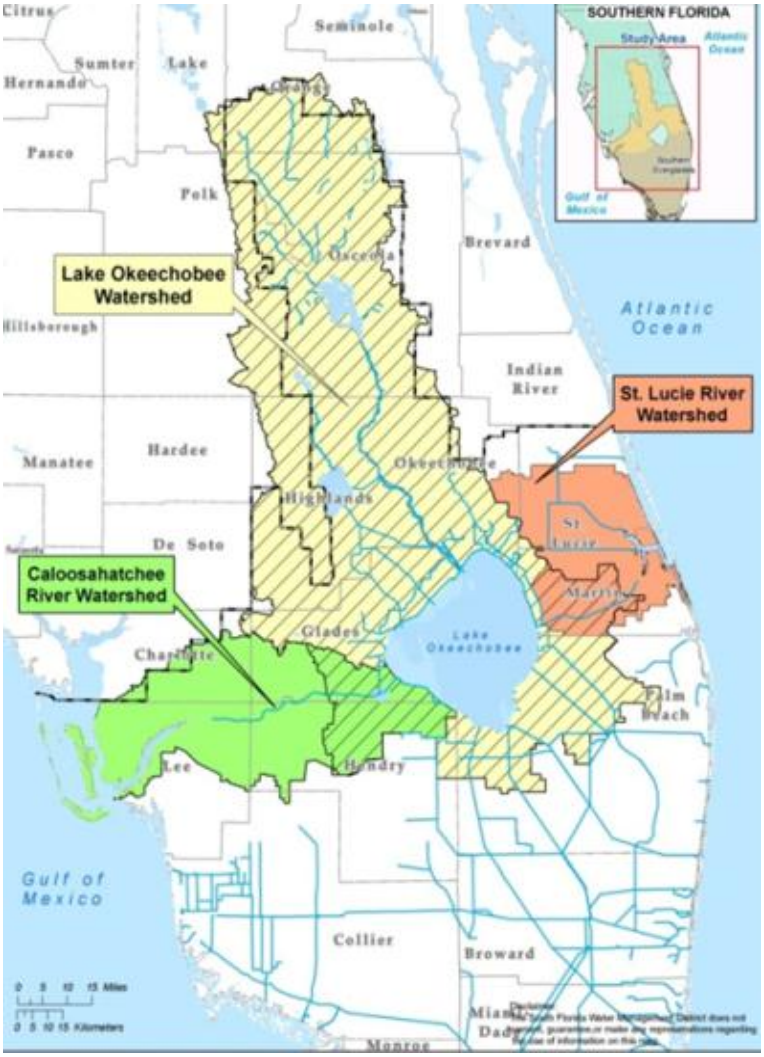
In the initial years, ad hoc collaborators and then the FRESP team agreed on broad PES program principles meant to satisfy the different stakeholders and allow for an environmentally and financially effective program. Next, the broad principles were refined and program concepts tested as projects that could produce services were designed, permitted, constructed, and monitored on portions of eight participating ranches.

This paper describes the key features of a market-like program and illustrates how collaborative processes are needed and can lead to the acceptance and implementation of such a program. The case offers lessons for others designing market-like conservation programs.

II. The Setting

The Northern Everglades begins south of Orlando and includes the Kissimmee River, Lake Okeechobee, and adjacent coastal estuaries to the east and west (Figure 1). More than 100 years ago, public agencies and private landowners began to transform the land, building a vast drainage network. Today the nearly flat northern watershed covers more than 5 million acres, with many seasonally flooded wetlands, and its hydrologic regime is governed by hundreds of publicly managed flow-control structures and thousands of miles of canal and ditch networks on private land.

Figure 1. The Northern Everglades



This massive system drained the land and provided flood control and a water supply that supported agricultural production and a significant increase in human settlement. Today about 1 million acres of the watershed is pasture, consisting of improved and unimproved land. The ranches include these pastures as well as wetland, woodlands, and other land uses such as citrus groves. The total area that can be defined as ranchland is more than 30% of the total watershed.

The hydrologic modifications and land use changes fragmented wildlife habitat and accelerated the movement of water and nutrients from working lands into marshes and lakes. The result has been an increase of nutrient loads into Lake Okeechobee and more extreme—and undesirable—lake water level fluctuations. When lake levels are high, nutrient-laden fresh water is released out of the lake through canals to the St. Lucie and Caloosahatchee estuaries, which

are being harmed by the combination of excess fresh water and high nutrient concentrations. Over recent decades, an array of regulations, best management practice (BMP) cost-share programs and public investments in regional reservoirs, aquifer storage and recovery test wells, and stormwater treatment areas (STAs) have been put in place to mitigate these adverse environmental changes.

It was against this backdrop that a disparate group of stakeholders came together, concluded that a complementary "market-like" PES approach was desired, and made the NE-PES a reality. Market-like program implementation requires thinking outside existing policy framework, as well as collaborative problem solving to find common ground among agencies, landowners, and environmental advocacy groups.

III. Converging Interests and the FRESP Process

The FRESP collaboration was a primarily virtual, but at times physical, space where participants made decisions by consensus, worked to understand the interests and constraints of others, and trusted that all involved were committed to a PES program design that addressed all concerns.

A. Different Stakeholders with a Shared Interest

In the early 2000s, a staff expert from World Wildlife Fund (WWF) recognized that large ranches north of Lake Okeechobee included extensive natural habitat for many common wildlife species, served as critical wildlife movement corridors, and supported habitat for several federally threatened and endangered species. These working ranchlands were mostly cow-calf operations that have a low per-acre discharge of phosphorus (P) relative to most other land uses. However, cow-calf production has thin financial margins and cattle prices are volatile, as are prices for sod and citrus, which are often produced on portions of these same ranches. The result was ongoing pressure to convert ranches to more intensive agriculture or to urban development; such conversion would likely result in higher P loads and further aggravate the adverse hydrologic effects of drainage. The recognition of habitat values and limited water quality impacts led WWF staff and other Florida-based environmental organizations to conclude that cattle ranching was a "preferred land use."

In 2001, WWF began approaching ranchers with this understanding and found widespread concern among them about the future of the industry. However, that same ranch community also believed that state regulatory agencies, abetted by "environmentalists," were

ignorant of the pressures on the industry and had imposed or were likely to impose regulatory requirements that would further discourage continued ranching. WFF staff identified a small number of ranchers who were leaders in their community and began one-on-one conversations with these individuals. At the same time, WWF reached out to representatives of state agencies and found receptivity to the argument that cattle ranches could play an important role in watershed restoration efforts.

Ranches in south Florida range from several hundred to hundreds of thousands of acres. A medium-size ranch is between 5,000 and 15,000 acres. Credit: P. Lynch/SFWMD.

B. Building Trust and Finding Common Ground

A formal process was initiated when WWF and a small number of ranchers, some of who later participated in FRESP, convened an ad hoc group to identify opportunities for increasing the financial returns to ranchland owners, with the goal of "keeping ranchers ranching." At that time, the PES concept was only one among several options discussed for improving the financial position of the industry. It was that ad hoc process that identified the possibility that a state or federal agency might pay cattle ranchers to change on-ranch water management as a way to complement other restoration programs being implemented by those agencies. Not only would the changed water management help reverse the adverse effects of past hydrologic changes, but water retention also was widely recognized as the most effective way to reduce P pollution from land runoff.

In fact, cattle ranching already demands active and sophisticated water management, and the ranches already had large investments in drainage infrastructure. What was needed, all agreed, was an incentive program so that ranchers would be rewarded if they chose to retain the water rather than discharge it to the regional drainage network. The group decided that a switch from "drain to retain" could be technologically accomplished with what the work group defined as water management alternatives (WMAs) (see Box 2). However, all also recognized that retaining water, especially allowing some flooding of areas of pasture, might diminish pasture productivity, cattle production, and already low cattle revenues. In fact, it was for this reason that water retention was an optional and not a required best management practice (BMP) under the state regulatory programs then in place.

Box 2. Stormwater Management Alternatives

Water management alternatives (WMAs) for stormwater are combinations of construction and management practices selected and implemented by the landowner within a defined area of a working ranch for managing water within the larger ranch parcel. The WMAs individually or in combination can include the following:

- placing flashboard riser, weirs, or both in existing uncontrolled ditches that drain by gravity from a site;
- constructing or improving earthen berms;
- constructing aboveground impoundments or enhanced utilization of existing impoundments;
- rehydrating wetlands;
- collecting surface runoff from off-site areas that typically bypass the site and diverting it to the connected onsite storage; and
- making site improvements that increase the potential for horizontal and vertical seepage from the site.

C. Engaging New Participants and the Basic Vision

The question then became, How could ranchers be motivated to retain water and hence also reduce P load, above and beyond state regulatory requirements? At this point, WWF staff approached several state agencies—the Florida Department of Environmental Protection (FDEP), Florida Department of Agriculture and Consumer Services (FDACS), and South Florida Water Management District (SFWMD)—to engage them with the ad hoc group. State agency staff at the SFWMD and FDACS had long understood that changes in the way water is managed on private ranchlands could yield hydrologic restoration and water quality benefits. However, the

changes in water management had to allow for profitable cattle, sod, and citrus production or offer compensation for lost profits.

The ranchers were not interested in selling their land so that more water could be retained. At the same time, the agencies faced limited budgets and staff for land management, so they were willing to consider alternatives to land acquisition. The ranchers also were not interested in alternatives to existing easement programs that would restrict use of the land for agricultural production, take land out of production, or prevent sale for development.

The preferred concept was to have agencies enter into time-limited contracts with ranchers who agreed to provide water services in return for payment. The agency staff expressed support for such a program, but only if changes in P load reduction and water management were *above and beyond* what was expected from the BMPs under the existing regulatory programs.

D. Building a Credible Analytical Case

As part of the ongoing dialogue, an underlying assumption was that one of the state agencies would be the buyer of services, even though no such commitment was made. However, the agencies were willing to pay for the services only if on-ranch water management was a cost-effective complement to the region's large reservoir and stormwater treatment projects. Clearly, the ranchers and the agencies needed a more certain analytical foundation for assessing the feasibility and relative costs of on-ranch water retention. For this reason, the ad hoc group used funds from the Kellogg Foundation to conduct a proof of concept study for a PES program. Staff experts from WWF and RFF managed the study, and these individuals later became project directors for FRESP.

Technical specialists who were trusted by all the stakeholders completed the analysis. A consulting engineer who had designed water management projects for the agencies as well as for ranchers worked with ranchers in the design of hypothetical WMAs for a variety of ranch circumstances. The same contractor also estimated the effectiveness of on-ranch water management in reducing P loads and changing runoff volume at the ranch scale. At the same time, a nationally recognized ranch finance economist prepared ranch-specific estimates of payments that would allow ranchers to recover costs, including compensation for production risk. Finally, the lead economist for the SFWMD worked with a well-regarded consulting firm to estimate the incremental cost and effectiveness of large regional P load reduction and water storage projects for comparison with on-ranch water management. Throughout the study, highly placed staff in the FDEP, FDACS, and SFWMD, as well as the ranchers, reviewed the work and

served as sounding boards for PES design ideas. As a result, when the final analysis concluded that on-ranch water management could be cost-effective, all of the stakeholders deemed the results credible and accepted them.[2]

E. Identifying Barriers and Challenges

The assessment also identified a daunting list of program design challenges that would need to be addressed—some typical of PES schemes in general and some specific to the Florida situation. The ranchers' principal concerns were how potential adverse effects on ranch cattle production could be recognized and compensated, and whether their land and water management practices could be returned to pre-contract conditions when their contracts were over—even if implementation of the WMA resulted in an increase in endangered species habitat or expanded wetlands footprint on the WMA site. The agencies expressed their understanding of these concerns and committed to addressing them.

The agencies were adamant that they would not make payments unless they constituted a demonstrably cost-effective use of public funds, and any payment had to be for improvements above and beyond what would be secured under existing regulatory requirements. The ranchers expressed their understanding of these agency interests.

The leaders of what would become FRESP from WWF and RFF made the argument that a market-like system was the best way to meet the interests of both the agency buyer and the rancher seller. The following specific market-like fundamentals became the foundation for the agreement to engage in FRESP and work toward what became the NE-PES:

- Environmental services were a commodity that could be produced on working ranches, but, like any commodity, they would be produced only if the rancher sellers realized an increase in ranch profitability from sale of the services. Ranchers would be the ones to choose the level of service to produce and how to produce it, in consideration of the effect on the returns from other ranch enterprises and the expected profit.
- A government agency might become a buyer of services but had the discretion to choose what ranches to buy from based on its own assessment of service potential offered by competing sellers.

[2] The final report can be found at www.fresp.org.

- The agency buyer and rancher seller would enter into a limited-term contract for the provision of a service, defined in terms of an environmental outcome, not as the construction or implementation of a conservation practice. Payments would be made only if rancher sellers provided documentation that such a service had been provided.

F. Creating FRESP

The need to address these design challenges demanded a process wherein representatives of the rancher community, agencies of the state of Florida, and the environmental community could openly discuss and come to agreement on each of the PES design elements. Further design and exploration was to be completed through a collaborative effort called the Florida Ranchlands Environmental Services Project (FRESP).

The trust engendered by the ad hoc committee process led to successful grant applications.[3] With the funds in hand, FRESP became an active collaboration among Florida agencies, the USDA, NRCS, WWF, RFF, MAERC, the University of Florida, and most significantly, ranchers. The FRESP collaboration was formally launched in 2005 after all the relevant parties signed a memorandum of understanding (MOU) agreeing to work together to design a PES program. Agreements among the district, FDACS, and eight ranchers resulted in the implementation of eight pilot projects.

Although it was not explicit in the MOU, the signatories understood that FRESP would be an iterative process of dialogue, learning, and advocacy organized around designing, implementing, and operating these eight pilot projects.[4] The pilots served as a laboratory for water management and measurement technology testing and development, as well as specific examples for reaching a shared understanding about the interests of rancher sellers and agency buyers.

[3] All partners signed on to a USDA Conservation Innovation Grant application, and the SFWMD agreed to provide cash and in-kind cost share as required by the grant.

[4] FRESP used a large portion of the funds to install WMAs on the ranches and to collect and manage hydrological and water quality data from each site.

The FRESP team included ranchers, state and federal agencies, research scientists, and an environmental NGO. Credit: G. Hendricks/USDA NRCS.

G. Developing the FRESP Vision

By 2008, the FRESP collaboration developed a concise PES vision statement that accommodated and reconciled the different interests in the collaboration:

> Owners of working ranch lands, relying on modification to existing water management structures and strategies, will enter into fixed term contracts to provide documented water related environmental services, above and beyond regulatory requirements creating a new profit center for ranch enterprises.

Representatives of FRESP used this vision statement in numerous presentations to build support in the Florida legislature and among the senior leadership in the Florida agencies. Accompanying the vision statement was an agreement on market-like design principles for the program, even though many details still needed to be resolved:

- The agency buyer requests proposals to retain water and/or phosphorus. The request specifies all relevant contract details (eligibility requirements, documentation requirements, method for estimating potential services, contract exit and renegotiation clauses, etc.).

- Ranchers who are in compliance with existing regulatory program requirements would be eligible to submit a proposal to compete for available funding. The application packet would include an assessment of their sites' potential to provide the services, and a request for an up-front site construction reimbursement payment and the annual payment.
- The agency buyers make a selection among applicants using criteria including, but not limited to, estimate of volume of water that can be retained and P retention potential using tools provided by the agency, the requested level of payments, and the proposed ways in which the service provision would be documented.
- 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, documentation equipment is put in place.
- Payments are made on an annual basis if documentation shows that the contracted services were provided.
- At the end of the contract period, the WMA 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.

IV. Addressing the Design Challenges

Participants in the FRESP collaboration were able to agree on these program fundamentals. Nonetheless, many design challenges remained to be resolved before the January 11, 2011, solicitation could be issued.

A. Defining Eligible Sellers

The collaboration had to define what ranchers, with what ranchlands, would be eligible to sell water retention and water quality improvement services. Three concerns had to be addressed. First, WMAs would be implemented on parcels within a ranch, with parcel boundaries delineated by a catchment area—an area where water drained by gravity or was pumped to an identifiable outlet. Because many ranches spread over several thousand acres, any ranch might include several catchments where WMAs could be implemented. Within the catchments, current and past land uses could vary across the ranch, with some areas being citrus land, other areas planted in sod and vegetables, and others maintained as native or improved pasture and woodlands. The partners' concern here was that retaining water on some lands where agricultural chemicals previously had been used in sod, citrus, and vegetable production could have adverse ecological

affects. Therefore, in catchments with these kinds of land use history, soil chemical analysis tests would be required before lands could be eligible for a WMA. However, such tests were expensive and often inconclusive. Thus the decision was made that until further investigations could be conducted, only pasture and wetlands areas within a ranch dedicated to cow-calf (cattle) production would be eligible to offer environmental services, limiting the number of eligible parcels.

Second, the focus of concern was on areas north of the lake, in what is now called the Northern Everglades, so collaboration participants agreed to a limitation based on geography: only ranchlands within the areas shown in Figure 1 above would be eligible for payments to provide water services.

Third, a key concern of the buyers and, by extension, taxpayers was that program applicants were already in compliance with all relevant regulatory requirements, and thus the services buyers paid for would need to be "above and beyond" those requirements.

In summary, to be eligible to respond to the solicitation for the NE-PES program, a landowner had to meet the following criteria:

- have lands classified as ranchlands and be engaged in the production of beef cattle;
- be located within the Northern Everglades;
- have enrolled or started the process of enrolling the ranchlands containing the proposed WMA in the FDACS BMP program by the date of the solicitation release;
- be in compliance with SFWMD rules and regulations and federal wetlands regulations with regard to all of the lands in his or her ownership.

B. Defining Environmental Services in Relation to the Buyer

Most lands have the potential to provide multiple environmental services, but buyers who are willing and able to pay for those services must be identified. Once a buyer is identified, the buyer's specific interests influence the definition of a particular service. In practice, defining the service requires an iterative process to balance what the buyer wants, what service providers are willing and able to provide, and how the service can be documented credibly and cost-effectively.

The FRESP collaboration was able to identify three services: habitat protection and restoration, water quality improvement for Lake Okeechobee and the estuaries, and dampening of the fluctuations in Lake Okeechobee levels and therefore releases from the lake to the

estuaries. Several federal and state agencies participated in the collaboration or were identified as possible buyers of these services. The buyer that emerged from the process was the South Florida Water Management District.[5] The US Fish and Wildlife Service programs had reliable funding, but those funds were for the purchase of easements or fee simple purchase of land to create wildlife reserves. The US Army Corps of Engineers and the US Department of Agriculture had access to significant funding, but their programs were not designed to make payments to individual ranches for documented services in a market-like program. The SFWMD, the state agency responsible for improving water quality, maintaining flood control and water supply, and restoring the Everglades, was the logical buyer because of its dual missions of water quality and quantity, combined with ad valorem taxing authority and discretionary budget authority to create a new program. However, the SFWMD agency mission did not extend to habitat restoration, even though its regulatory programs did take adverse effects on habitat into consideration when evaluating permits to make changes to land and water management on private lands.

Hence only two of the three services became the focus of PES program design. Depending on site characteristics, some ranchers would be paid for phosphorus removed from off-ranch water that was pumped onto the ranch, retained for a period to remove and sequester phosphorus, and then discharged back into the public waterways. Other ranchers would be paid based on the amount of retained stormwater—that is, water kept in rehydrated wetlands, ditches, and the soil profile to either evaporate or seep through the groundwater system—on their lands. Water can be retained on a ranch by means of berms, pumps, culverts with riser structures, or combinations thereof. Projects that retained water would be designed to ensure that they also removed phosphorus from stormwater.

C. Calculating Services above a Baseline for Contracting

Both the agency buyer and rancher sellers rejected the use of contracts where the annual payment would vary with the weather, depending on rainfall and runoff. Instead, the mutual preference was to establish contracts that set a fixed annual service payment—a preference that

[5] There was no expectation that a private buyer would pay for the water services that ranchland could provide, because those services accrued to society at large rather than being appropriable to any individual private entity. On the other hand, many of the ranches were selling exclusive hunting leases to private entities, and often those entities worked with the ranchers to improve habitat for recreational species. Early in the discussion, the creation of mitigation banks to sell habitat and wetlands offsets was explored, but banks have a small footprint and are focused on habitat conditions, and thus they would not address the watershed-scale goals for water quality improvement and hydrologic modifications in the Everglades watershed.

had a significant effect on the program's contracts. The FRESP collaborators agreed that contracts would be based on model predictions of average annual water retention or nutrient removal service expected during a 10-year rainfall period of record. While the payment would be fixed annually—and thus in any one year, a rancher might fall short of or exceed the service level commitment—over the life of the 10-year contract, the average service level should be provided.

Because of the tight relationship between the modeled estimate of the service and the payment, the collaborators agreed that model predictions would have to be based on site-specific conditions, such as size, soils, vegetation, topography, and existing and proposed water management infrastructure. The partners also agreed that every applicant would use the same model for estimating services. The collaborators then confronted the question of which models to propose for that common calculation. After deliberation and review of the available models, they concluded that all of the available models were either too complicated to run or too data demanding to be used in a market-based solicitation. As a result, they hired consultants and engaged agency staff to prepare new models designed to compute average annual water retention and average annual phosphorus removal over a 10-year period of rainfall.[6]

To address the agency buyer concern that services being paid for would be "above and beyond" existing requirements, the district, in consultation with the other participating stakeholders, developed an operational process and tool for calculating baseline environmental services. Using the tool, only above-baseline services were to be credited for payment.[7]

[6] Developing these program models resulted in an unexpected cost and delay in the development of the program that had not been anticipated at the outset.

[7] Furthermore, as a result of participation in the NE-PES program, the water retention baseline established would be permanently maintained post-contract.

Rancher Jimmy Wohl inspects a berm and culverts with riser boards installed to retain water at Rafter T. Credit: E. Boughton/MAERC.

D. Developing Documentation for Payment

Programs that pay for performance need to define "service performance" in a way that it is measurable. Also, when paying for performance, there is no tangible commodity (a pound of oranges or a steer at the market, for example), and because buyers want to know they are getting what they paid for, documentation of service level became an important topic for the collaboration. Therefore, a documentation team was created and tasked with finding cost-effective ways to measure the services provided by the rancher sellers.

The FRESP collaborators agreed that documentation should be low-cost and credible to both the buyer and seller. All agreed that the benefits of more measurements, providing greater accuracy and higher precision, needed to be evaluated in relation to the increased cost of collecting, analyzing, and managing additional data. To make this benefit–cost comparison, FRESP invested in extensive flow monitoring, automated water sampling, groundwater wells, vegetation transects, water chemical analysis, and soil analysis at the pilot sites. The documentation team was able to analyze the costs of collecting and assessing the data streams from this extensive measurement. The team could consider the loss of accuracy and precision if less data were available, relative to the heavily instrumented alternative, and find a balance between documentation costs and the benefits of additional service measurements.

In the end, the collaboration agreed on documentation requirements that focused on verification of contract compliance rather than on measuring the services provided in any year as the basis for payment. First, the rancher would provide evidence that the operation and maintenance of the WMA were as specified in the contract. In addition, for the water retention service, the daily surface water stage would be measured and related to rainfall records to determine whether the stage inside the WMA varied logically with rainfall inputs, showing that the water was being retained. For nutrient removal WMAs, the pump records would show whether the pumps were running as required under the contract operational plan, which identified canal stages that were supposed to trigger and stop pump operations.

E. Establishing the Payment

From the outset, the partners recognized that setting the payment for water management services was a critical issue. They also realized that the payment system would depend on how the services were defined and how the contracts were structured. As a result, the payment discussion remained at a conceptual level in the early years of the collaboration as other matters were resolved. A benefit to this delay was that over time, the buyers and sellers came to better understand and appreciate each other's perspectives on payment.

The buyers stressed that the payment had to be competitive with the cost of alternative ways in which they could secure the service, typically through large-scale regional projects. However, other, nonfinancial considerations affected their willingness to pay: WMAs could be put in place quickly, but the services they generated were not permanent, and WMA service levels were less certain than those of public projects. Also, monitoring a large number of dispersed water management contracts would have high administrative costs. The FRESP addressed each of these concerns in contract design so that the agency would be more willing to pay for on-ranch services.

The sellers emphasized the need to recover out-of-pocket costs and earn some margin above those costs to compensate them for increased managerial costs and risk to cattle production. It became evident that for the sellers, the minimum payment they might accept could not be established by a simple "bottom-line" cash calculation. Different ranchers had different accounting perspectives on what they defined as profit, such as competitive return on investment, payback period, or cash flow certainty. The ranchers also were concerned with nonfinancial aspects, such as how much time would be required to honor the water management contract and reporting requirements, reluctance to engage in a contractual relationship with a regulatory

agency like SFWMD, and the risks, perceived or real, of allowing government agents access to their property.

Because the buyer was not able to define its willingness to pay, and different ranchers would have different payment thresholds at which they would be willing to provide services, the collaborators settled on a bid-in proposal, or reverse auction, process. Ranchers would submit a two-part payment request in response to a solicitation. The first part would include payment for the costs of design, permitting, and construction of the WMA, and those costs would be reimbursed as justified by the submission of receipts to support actual costs incurred. The second part of the payment request would be for a lump-sum annual service payment that included project operation and maintenance. There was no expectation that the service payment request had to be justified to the buyer in the proposal beyond the cost-effectiveness evaluation as part of the proposal ranking process. However, contract compliance documentation as described above would have to be provided annually for sellers to receive the service payment.[8] It was up to the buyer to determine whether it was willing to pay the combined payment request for the level of estimated service. Furthermore, the seller applicant would make a lump-sum annual payment request and would not be paid based on a price per unit times the estimated service.

This design decision reflected the recognition, based on analysis of data secured through the FRESP pilot process, that site-specific conditions such as soils, location, existing infrastructure, proximity to public canals, and ranch management strategies would cause the cost of providing the services to vary widely. If a fixed price were set, payments may not be adequate to cover the costs of some of the more worthy projects, while vastly exceeding on-ranch costs for others.

The process whereby rancher sellers asked for a lump-sum payment had the following implications:

- The responsibility was on the rancher sellers to decide what constituted a fair annual payment that they would be satisfied with, while also taking into consideration that too high a total request might result in not receiving a contract.

[8] A two-part payment meant that the rancher seller would not have to finance the capital costs and then recover the costs through the annual service payment. This payment system was necessary because many ranchers were concerned that future annual payments would not be honored. The payment of up-front capital costs eliminated that concern.

- Projects would be offered at the lowest acceptable total cost, allowing the greatest amount of services to be obtained with a fixed budget.
- The possibility that the service could result in a single large project exhausting the budget was minimized, a possibility if payments were based on a fixed (announced or implied) price per unit times the service level.

Instruments used to document that a pasture is retaining rainwater.
Credit: R. Mesmer/MAERC.

F. Accommodating Regulatory Requirements

The decision to use contracts created two regulatory challenges. First, because the NE-PES program would be a contract between a buyer and landowners, the rancher sellers argued convincingly that they would not enter into a contract unless given assurances that doing so would not lead to unanticipated regulatory requirements. For example, they were concerned that they might be required to maintain WMA-created endangered species habitat or wetlands areas at the end of the contract. Second, from the pilot implementation experiments, it was clear that ranchers would not participate in a program requiring significant permit application time. State and federal agencies were also concerned about administration costs and staff time resulting from a scaled-up version of a PES program.

Designing and putting in place the necessary framework and tools for an integrated and streamlined permitting approach became a major activity of FRESP project directors during the

five-year pilot phase. The result of that effort was the creation of three sets of tools designed specifically for the NE-PES program: 1) a joint NRCS and US Fish and Wildlife Service Endangered Species Act Consultation Guidance Matrix designed to protect federally listed species during the construction of the WMA; 2) a regional general permit (RGP) from the US Army Corps of Engineers that would expedite the initial permitting process and provide assurances that the landowner would be allowed to remove project water management features at the end of the contract; and 3) the development of state and federal government agency memoranda of understanding (MOUs) and related guidance that identify roles and responsibilities associated with implementing and permitting the NE-PES program.[9]

V. Lessons Learned

Encouraging private landowners to take on innovative conservation practices is an emerging goal of federal and state programs.[10] And at a conceptual level, there is broad, and increasing, support for market-like programs. However, relatively few working examples exist of market-like programs that bring together private landowners and conservation interests.

The FRESP and NE-PES story illustrates what it means to bring market theory to operational PES program design. The success in creating an operating program can be traced in large part to effective collaboration processes. Collaboration was necessary for a variety of reasons, the main one being that both the buyers and sellers in a market can veto a program simply by not participating. A collaborative process and design team needs to be put in place and structured in much the same way as in any other interest-based negotiation. Several specific lessons can be drawn from the FRESP to NE-PES experience.

The first challenge is to gain trust among the key interests so they will make a commitment to working together to find acceptable program designs. However, it is likely that suspicions, perhaps even caricatures, of each other will influence the views of landowners, environmental groups, and regulatory agencies. Trust building requires a facilitator who has the dedicated time and financial resources to help the stakeholders understand the possible gains from joining a PES design collaboration. WWF staff filled that role in the FRESP to NE-PES development process.

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[9] Papers providing more detail, as well as the permit, can be found at www.fresp.org.

[10] http://govinfo.library.unt.edu/whccc/.

Second, most participants are already busy in their jobs, and the call to design a PES becomes a new work responsibility. Given the complexity of the task, the collaboration requires dedicated leadership with skills in facilitation, project management, fund-raising, and basic understanding of the interests and constraints of each of the collaborators. The process that created the NE-PES was supported by $7 million in funding and the involvement of WWF and RFF staff viewed as credible facilitators. Also, the facilitators had or were able to rapidly acquire credible technical knowledge of relevant federal and state policy, law and regulation,[11] ranch finance, hydrology, soil science, computer modeling, statistics, monitoring technology, and other technical issues. The combination of broad-based technical understanding and facilitation skills was important to both the process and the ultimate design of the program, given the need to reconcile the participants' often differing interests in the collaboration.

Third, designing a PES program demands the opportunity and willingness to learn while doing. For example, rather than design a program first and then try to implement it, FRESP partners decided to implement on-ranch demonstration projects and build the program around the experiences gained from contracting, designing, constructing, permitting, operating, and monitoring those water management projects. Through this iterative process, a more grounded, practical, and easy-to-administer program evolved because it was based on the real-world experiences of the partners. Learning while doing has implications for the process of program design. It requires pilot sites and funding to support them, as well as time for learning through conversation and experimentation in order to reach agreement among the collaborators.

Fourth, credible technical arguments must be developed to support the PES design. Credibility can be enhanced via transparent, iterative interactions around technical analysis and by engaging credible and trusted scientific experts.

Finally, acceptance among the collaborators is not enough. Reaching out beyond the collaboration and effectively advocating for a new idea requires an entrepreneurial spirit among those in the collaboration. In bringing about the NE-PES, the eight ranchers were environmental entrepreneurs willing to look for both new approaches to producing socially desirable environmental services and new profit opportunities to allow them to remain in ranching. Most important, they were willing to serve as messengers and trusted voices to the rest of the ranching

[11] For example, the PES concept is a new approach to changing conservation behavior. As such, it will have a greater chance of acceptance if it fits into and complements existing policies and programs. On the other hand, existing programs may need to be adjusted, often in significant ways, to accommodate the new PES program.

community. State agency personnel were policy entrepreneurs willing to stretch the agency mission, regulatory framework, and budgets to design a PES program. They had to have the ability to understand how a PES program could be designed, and then argue how it could fit within their agencies' bureaucracies. The researchers supporting FRESP were scientific entrepreneurs willing to make conclusive statements in the face of uncertainty and to make the success of the program a priority over peer-reviewed publications that served their immediate professional needs. The WWF and RFF facilitators acted like social entrepreneurs, arguing for adherence to market-like fundamentals but being open to ensuring that all stakeholder issues and concerns were addressed in the details of PES program design. Their facilitation and impartiality about design elements earned them the trust of both the ranchers and the agencies in the collaboration. In turn, this brought credibility to FRESP among agencies, environmental NGOs, and agricultural communities outside the collaboration, which were often at odds. The credibility of the partnership created opportunities to secure increased funding. The RFF and WWF facilitators also served as a bridge between the technical analysis needed to support the program and the ranchers whose expertise lay in the business of ranching, and they helped the agencies and the scientific community appreciate the challenges of ranching as a business.

VI. Conclusion

The NE-PES is now in its second year of operation. Under the first solicitation, 10 projects were proposed and 8 were selected. The solicitation, application, and selection process, as well as the contract design, applied all of the FRESP design elements with the exception of the payment process. The payment was established in two steps. The rancher, as proposed by FRESP, did submit a two-part payment request. However, based on that request, and in consideration of its budget and the other projects, the SFWMD entered into negotiations with each rancher to reach an accord on a final payment. A second solicitation was issued in late winter of 2013, garnering 20 applicants. The results of that solicitation will be known in the fall of 2013.