



Incentivizing Panther Conservation on Working lands in the Florida Panther Focus Area

A concept paper by the Florida Panther Recovery Implementation Team

This report presents the concept of a Payment for Ecosystem Services program for landowners that provide quality habitat for the endangered Florida Panther and its prey.



Summary

The purpose of this report is to present the concept of a Payment for Ecosystem Services program for landowners that provide quality habitat for the endangered Florida panther and its prey. Many landowners and ranchers in the Florida Panther Focus Area (Figure 1) recognize that maintaining wildlife habitats on their lands that support panthers can be a liability if the panthers prey on their calves or cattle. The US Fish and Wildlife (USFWS or Service) believes that the continued management of native habitats on private lands in this landscape is essential to the recovery of the Florida panther. Therefore, incentivizing the management of native habitats is crucial and may alleviate concerns of revenue lost due to panther depredations.

The Problem

Over the past 20 years, the Florida panther population has increased significantly in southwest Florida from an estimated 30 panthers in 1995 to approximately 100 - 180 today. This success is due to many factors, including habitat protection/ management, and genetic restoration. With this success, panthers have been expanding their range on public and private lands. At the same time, conversion of agricultural lands to more intensive uses continues to contribute to the loss of Florida panther habitat that could inhibit recovery. Habitat acquisition, restoration, and management are the principal mechanisms to minimize habitat loss. Restoring suitable natural pineland flatwood forest, hardwood hammock forest, and freshwater wetland forest habitats and enhancing corridors within the Panther Focus Area contribute to the recovery of this species. Specifically, focusing on the Primary and Dispersal Zones within the Focus Area prioritizes lands essential to the long-term viability, survival and expansion of the Florida panther population.

South and central Florida ranchlands are critical to successful panther survival, with 29% of occupied panther range under private ownership within the Focus Area. Yet, the economic and environmental pressures facing ranchers is great. The unpredictable profitability of ranching operations from year to year in Florida is one of the factors that contributes to land use change and represents a threat to Florida's natural landscapes and the collective societal benefits these lands provide. Some landowners have converted native habitats and pasture into more intensive agriculture uses such as row crops, and others have sold their land because the encroachment of urban development drives up the surrounding property values, creating an incentive to sell. Though they may not want to sell the land or cancel lease agreements, many ranchers may be forced to if ranching becomes economically unviable.

As the Florida panther's range expands and population density increases on private lands, an increase in depredation events on commercial cattle operations has become a threat that could undermine previous collaborative efforts in the protection and recovery of the species. Depredation of commercial cow/calves in south Florida is a problem that the Service, the Florida Fish and Wildlife Conservation Commission (FWC), and the University of Florida Institute of Food and Agricultural Sciences (UF-IFAS) are working to address and resolve with ranchers and landowners. Recently, the Conservancy of Southwest Florida developed a small pilot

compensation program for ranchers with less than 100 head of cattle. However, the program is currently limited to smaller operations and does not apply to large landowners. The Farm Services Agency (FSA) of the U.S. Department of Agriculture recently created a Livestock Indemnity Program (LIP) in the 2014 Farm Bill. This program provides compensation to eligible livestock producers who have suffered livestock losses in excess of normal mortality due to adverse weather and attacks by animals reintroduced into the wild by the federal government or protected by federal law. The FSA's LIP program is a direct compensation tool that will require verification of the loss and cause of livestock death. Unfortunately, given the habitat conditions and tropical environment in south Florida, it can be very difficult to find a dead calf or to accurately determine its cause of death.

History

The Florida panther is the last subspecies of *Puma* still surviving in the eastern United States. Historically occurring throughout the southeastern United States, today the panther is restricted to less than 5% of its historic range in one breeding population located in south Florida. The panther population has increased from an estimated 12-20 in the early 1970s to an estimated 100-180 in 2014. The panther is listed as endangered under both the Federal Endangered Species Act (ESA) (16USC1531-1544) and Florida Administrative Code (FAC) 68A-27.

In 2008, the Florida Panther Recovery Plan (Plan) was revised with a goal "to achieve long-term viability of the Florida panther to a point where it can be reclassified from endangered to threatened, and then removed from the federal list of endangered and threatened species." It further explains that a viable population, for the purposes of recovery, is defined as one in which there is a 95% probability of the persistence for 100 years. Furthermore, the Plan states: "Public support is critical to attainment of recovery goals and reintroduction efforts. Political and social issues will be the most difficult aspects of panther recovery and must be addressed before reintroduction efforts are initiated."

In 2013, the USFWS appointed a Florida Panther Recovery Implementation Team (Team) consisting of members representing the Service, National Park Service, FWC, private landowners and nongovernmental organizations, with a mandate to facilitate those recovery activities most needed to progress toward the recovery goals identified in the Plan. The Team identified the need to develop more diverse incentives for private landowners as their highest priority action item for conserving the Florida panther.

Landowners have expressed essentially three primary concerns regarding the management of habitat for panthers: no trust in government (i.e. regulation); calf depredation; and financial burdens. In response to those concerns, the Team is working on ways to build trust and garner relationships with landowners by listening to their concerns, maintaining agency transparency and open communication, and developing landscape-level incentive programs that combine the maintenance and improvement of panther habitat with their management of working lands.

Currently, landowners manage not only their lands for agricultural uses but also leave native habitats intact for the benefit of wildlife. Many ranches within the Panther Focus Area are a mixture of native habitats, improved pasture, silviculture and agricultural crop lands. This mixture of habitat types and working lands creates habitat diversity, and maximizes the edge effect between habitat types that is beneficial for panthers and their prey.

The combination of economic loss of cattle from panther depredation and the cost of habitat management act as a disincentive to landowners to manage for wildlife habitats on their ranch. Direct compensation programs, such as FSA's LIP program and the Conservancy of Southwest Florida programs are not designed to address the issue on a large enough scale nor with big scale operations. In 2011, the Service, FWC, private landowners and Defenders of Wildlife reviewed other programs around the United States that provide direct compensation for livestock loss. Based on this informal review of other programs, it appears that direct compensation for livestock taken by panthers is not a realistic option for Florida for several reasons: the amount of forested acres intermixed with pastures in Florida would make it difficult to account for all cattle losses; south Florida's tropical climate breaks down the evidence of depredation quickly, making it difficult to identify the cause of death; and the resources needed to confirm cattle depredation would be logistically impracticable to obtain.

There are currently several incentive programs available to landowners for habitat management, such as the Natural Resources Conservation Service Environmental Quality Incentives Program (EQIP); the FWC Landowner Assistance Program (LAP); and the USFWS Partners for Fish and Wildlife Program (PFW). However, these programs present unique challenges to landowners within the Panther Focus Area, such as ineligibility for large landowners (NRCS); caps on the amount of money spent per project site, or just not meeting landowners' needs. There also exist a few easement programs for landowners, including the Agriculture Conservation Easement Program (ACEP), and the Farm and Ranchlands Protection Program (FRPP), but these programs have limited funding (FRPP) and have limited applicability to the ranches within the Panther Focus Area due to the various types of habitats and land uses.

Solution

Achieving Florida panther recovery goals may be augmented through a Payment for Ecosystem Services (PES) Program; which appeals to owners who have large acreages, diverse habitat types and varied land uses. We envision that the PES program can work in conjunction with other incentive and easement programs, where feasible, so that landowners can find the programs that best serve their diverse interests.

According to Ervin *et al.* 2014, ecosystem services are the benefits that nature provides. The biodiversity that "healthy" ecosystems provide represents the "environmental capital" on which human well-being heavily depends. Therefore, when assessing the value of ecosystem services, both intrinsic and utilitarian benefits should be considered in order to appeal to a wide range of stakeholders (Vickerman and Kelly 2013).

Ecosystem services or benefits are quite varied, but all are designed to promote the conservation of natural resources in the marketplace. Using this concept to benefit the Florida panther simply equates to an incentive, in the form of payment, offered to landowners in exchange for managing their land to provide suitable panther habitat.

Landowner interest in PES programs for the benefits of wildlife and their habitats on private ranches is growing. While compensation for cattle depredation is a seemingly separate issue from land management, they are linked to one another because providing habitat for panthers could increase the risk of depredation on commercial cow-calf operations. According to a study conducted on two private ranches within the Florida Panther Primary Zone, panther presence is positively influenced by an increased amount of forest cover and forest patch size, but negatively influenced by increasing cattle densities (Main and Jacobs, 2014). A PES system would be a holistic approach to dealing with these complex issues and would assist in panther recovery. Therefore, it becomes possible to encourage ranchers to maintain this habitat, perhaps even create more, and not change the use of their land for a specified period of time.

The use of a PES program to benefit the Florida panther would be the first time such an innovative strategy has been used for endangered species conservation in the United States. Although other similar PES programs exist in Florida, such as the NRCS Conservation Stewardship Program (CSP), the SFWMD Florida Ranchlands Environmental Services Project (FRESP), and a pilot FWC Gopher Tortoise PES (GT-PES), these programs do not offer viable options for the landowners within the Panther Focus Area; a review of these programs can be found in Appendix A.

The PES program would be based on the USFWS Partners for Fish and Wildlife program (PFW), specifically the priorities and strategies outlined in the Partners for Fish and Wildlife Act of 2006 (PL 109–294) and USFWS policy (640 FW 1). Partners biologists will provide technical and financial assistance to landowners to help meet the habitat needs of the Florida panther on private lands in the Florida Panther Focus Area. The primary objectives will include promotion and implementation of habitat improvement projects that benefit the Florida panther; and providing conservation leadership and promoting partnerships. The initial program would focus funding on private land projects that complement activities on the Florida Panther National Wildlife Refuge.

Currently the project area contains FLEPPC (Florida Exotic Pest Plant Council) Category I Invasive species such as Brazilian pepper, Old World climbing fern, and cogon grass. These species have the potential to become monocultures in both uplands and wetlands on these ranches. Removal of these invasive plants, in conjunction with prescribed fire and prescribed grazing plans, helps to restore pine flatwoods and cypress strands used by this endangered cat. Prescribed fire and prescribed grazing can also be used to develop and maintain pasture edges that can be used by panthers for cover.

Landowners who voluntarily enroll in the PES program will work with a USFWS Partners biologist to develop a Ranch Management Plan that will identify areas and acreages of habitat to be managed, planned practices and a timeline for implementation. Through historical records, the PFW biologist and landowner will review current grazing, invasive species management and burning practices. Then use that information to adjust ranch management plans, as needed, for optimal panther habitat. The PFW biologist will work with landowners, ranch managers and hired consultants to develop the best prescribed fire and invasive species management plans for both the Florida panther and cattle ranching. Landowners and Partners biologists will also develop a Landowner Agreement (LAO) that outlines the Ranch Management Plan and legal expectations for both the landowner and the USFWS for a period of 10 years. Landowners must maintain the conservation practices implemented for at least 10 years, ensuring the federal investment for the duration of the agreement. If the landowner terminates the LOA before its expiration, then costs incurred for habitat improvements placed on the land through the LOA must be reimbursed to FWS.

The Ranch Management Plan will delineate “management units” and provide funding for the beneficial effects of particular management practices within each unit. The valuation of such services is based on the average per acre cost of direct treatment and indirect treatment effects that benefit habitat for the Florida panther and its prey, including prescribed burning and treating invasive species. If prescribed burning is unfeasible in a “management unit,” due to brush overgrowth or other safety issues, then roller chopping can be an additional practice in the management plan. Roller chopping implementation will follow the minimization measures outlined in the USFWS-NRCS Interagency Consultation Matrix. Prescribed Grazing is included as a desired management practice, where feasible, so that cattle densities, calving periods and grazing rotations may be addressed for each ranch. Prescribed Grazing recommendations will follow the Florida Department of Agriculture and Consumers Services (FDACS) Best Management Practices for Florida Cow/Calf Operations, and NRCS Practice Standard 528. Many ranchers already implement these practices; this project allows us to provide both technical and financial assistance for them to continue these practices and curtail the rate of land conversion by making ranching in the primary panther habitat more economically feasible.

Table 1 shows the average cost/acre for specific practices on private lands. These “Current Average Rates” are an average from NRCS Farm Bill Programs, FWC Landowner Assistance Program, and private consultants. The “PES Payment” is 50% of these average rates. PES Payments are for both directly treated and indirectly treated acres within a “management unit”. Indirectly treated acres are those that benefit from a practice on treated acres in the same “management unit.”

Table 1. Cost of Land Management Practices

Practice	NRCS Avg Payments 2014 (per acre)	Current average rates (per acre)	PES Payment (per acre ¹)
Prescribed Burning	\$26.05	\$98.00	\$49.00
Invasive Plant Treatment	\$449.77	\$420.00	\$210.00
Roller chopping ²	\$38.60	\$94.00	\$47.00
Prescribed Grazing	\$16.93	\$17.00	\$9.00
Monitoring Access ³			\$0.50

¹ PES Payments are for both directly treated and indirectly treated acres within a “management unit”.

² Funding for Roller chopping will be available ONLY in areas that cannot be burned safely; implementation will follow USFWS-NRCS Interagency Consultation Matrix guidelines.

³ Monitoring access is a 1 time per acre payment for each ranch interested in participating in this activity (not required of PES participants)

In order to determine which lands would be eligible for this program, we analyzed the land use classifications from Florida Natural Areas Inventory within the Primary and Dispersal Zones of the Panther Focus Areas located north of I-75 in Collier, Lee, Hendry and Glades Counties. We sorted the land use classifications into three categories; Tier 1 Eligible, Tier 2 Eligible and Not Eligible.

Tier 1 eligible lands are defined as desirable panther habitat with compatible land use classifications (as outlined in Appendix B), and documented panther use via survey or photographic evidence. Tier 2 eligible lands are defined as lands that meet some of the panther’s needs; their value is not as substantial as other native habitats which contribute to successful denning but otherwise offer some benefit to the panther’s ability to hunt, such as improved pasture that provides a significant amount of edge (Onorato *et. al*, 2011). “Not eligible” lands are those land use classifications that don’t meet the habitat needs of the panther or where land management practices that would benefit the panther cannot be implemented, therefore these land use classifications are not eligible for this incentive program. We determined the eligibility of each land use classification by asking these questions.

1. Is the land parcel in private ownership, over 50 acres, located north of I-75 and within the Primary or Dispersal Panther Focus Area? (lands within the Secondary Zone will not be considered for Phase 1 of program, but would be considered in subsequent phases if the PES program becomes successful)
2. The lands are NOT part of a mitigation bank that was established for the purpose of restoring and/or managing those lands, or a conservation easement which includes funds for management practices. (WRP, etc.)
3. Do panthers use the land classification as hunting, resting, and/or denning habitat?
4. Could the land be restored to desirable habitat by removing invasive plants?

5. Are there land management practices that can be implemented to improve habitat for Florida panthers and their prey in the land use classification?

Using these parameters, we determined that there are 393,395 acres of private non-conservation lands within the Primary and Dispersal zones north of I-75. Of those lands, 190,541 acres are identified to be Tier 1 eligible and considered desirable panther habitat with compatible land use classes that would be eligible for this initial phase of the program. Improved pastures also meet most of the criteria, and although their value to panthers is not as substantial as other native habitats, they contribute greatly to the “edge effect” that makes them valuable areas for panthers to hunt, particularly at night. Landowners and biologists working together to develop prescribed grazing plans for improved pasture, has proven beneficial to wildlife and cattle ranching. Therefore, the 69,194 acres of improved pasture are considered Tier 2 eligible. The results are depicted in Figure 1. Appendix B provides a list of land use classifications from Florida Natural Areas Inventory showing how each are classified for the purposes of this program.

Next, we calculated the payments by using information from current incentive payment programs, as outlined in Table 1, for these land management practices over the life of a 10 year agreement. Most of the eligible habitats require at least two native vegetation treatments (not including invasive plant treatment) over the course of 10 years, therefore both prescribed burning and mechanical vegetation practices will be paid twice for the treated acres and the indirectly treated acres in a “management unit” during that time. The program would also pay for one treatment of invasive plants, which can be either an initial treatment or maintenance treatment, on Tier 1 eligible lands. Lastly, landowners willing to enter their tier 2 lands into the program would work with the USFWS and FWC landowners assistance programs to develop prescribed grazing plans, and if the landowner implements the plan, they would be eligible for \$9.00 per treated acre per year on those Tier2 lands.

In addition to these land management practices, land owners can also voluntarily sign up to help FWC and USFWS monitor panther populations on private lands through the use of remote cameras. In order to successfully conduct this monitoring on private lands, many logistical issues will need to be discussed and negotiated with willing property owners and agreements reached in order to proceed. Those signing up to help would be eligible for a payment of \$0.50 per acre for assisting with panther presence/absence surveys. This payment was calculated by using the average labor cost per camera assuming a camera is placed approximately every 500 acres and monitored once a month for 5 months.

For example, using the two primary practice costs:

Burning = (\$49 per Tier 1 eligible acre x 2 burns over 10 years) = \$ 98 per acre and Invasive tree/shrub treatment = \$210 per Tier 1 eligible acre

\$98+\$210= \$308 per acre over 10 years = \$30.8 per directly treated acre and per indirectly treated acre per year for Tier 1 eligible lands

Prescribed grazing plan on improved pasture (tier 2) = \$9 per acre per year

Remote camera monitoring (access) = \$0.50 per acre (for all acres)

7,000 acre ranch has 5000 acres of Tier 1 and 1,000 acres of Tier 2 lands and 1,000 acres of lands not eligible (row crop).

Tier 1 - 5,000 x \$30.8 = \$154,000

Tier 2 - 1,000 x \$9.00 = \$9,000

Monitoring - 7,000 x \$0.50 = \$3,500

\$154,000 + \$9,000 + \$3,500 = \$166,500

Total cost of the PES Program

Using the above criteria for eligibility and the formula for valuation at \$30.80 per directly treated acre and per indirectly treated acre per year for Tier 1 lands and \$9.00 an acre per year for Tier 2 lands, the amount of acres that we can potentially enroll would directly be determined by the willingness of the landowners and amount of money allocated to the project. For example,

Tier 1

Maximum 190,541 acres x \$30.80 = \$5,868,662.80 per year

Tier 2 (improved pasture)

Maximum 69,194 acres x \$9.00 per acre = \$622,746 per year

Monitoring

Maximum 300,000 acres (approximate) x \$0.50 per acre = \$150,000

TOTAL Maximum if all 259,735 acres of Tier 1 and 2 lands were enrolled

\$5,868,662.80 + \$622,746 + 150,000 = \$6,641,408.80 per year

Phases of the program

We propose a phased role out of the program in order to test the program, and provide for the programs expansion as the panther's range expands beyond southwest Florida. Phase one would be a pilot program in order to test this approach. This phase of the program would focus our efforts on lands in the Primary and Dispersal zones which meet eligibility requirements through the FNAI evaluation and on site confirmation of habitat potential . The Secondary Zone and the areas north of the Caloosahatchee River would be considered in additional phases, as funding becomes available.

The Team could coordinate this program with the Peninsular Florida Landscape Conservation Cooperative (PFLCC). The PFLCC is an applied conservation science partnerships among federal agencies, regional organizations, states, tribes, NGOs, private stakeholders, universities and other entities within Peninsula of Florida. It is designed to inform resource management decisions in an integrated fashion across landscapes at a broader scale than any individual

partner's responsibility. The PFLCC has established a landowner incentive working group that could provide expertise and guidance for this project.

While additional details would be further established to determine priorities, the concept is as follows:

The Team would ask for volunteers that are interested in to participate in phase one. We would seek both landowners and lease holders for the implementation of this pilot phase to determine effectiveness with each. After initial eligibility is established for interested landowners, a program biologist will conduct a site visit to confirm habitat potential for panther use, then further prioritization will be determined by the predation risk assessment value for each ranch, which is based on a recently completed panther hunting habitat model (Jacobs and Main 2014; Appendix C). While the amount of acres and number of landowners/leaseholders would be limited by the amount of appropriated funds for phase one of the program, our goal would be to enroll 10% of the total amount of acres identified as Tier 1 and 2 eligibility (Tier 1= 19,054 acres and Tier 2 = 6,920 acres which is a total of 25,974 acres), with 5 different participants in the 1st year. This would cost at most (depending on practices planned) approximately \$649,143 per year to implement. As more funding becomes available, we would continue to expand the program to interested land owners within this geographic scope. If landowner interest in the program exceeds the amount of funding, we will use FWC's Cooperative Conservation Blueprint to help prioritize what would be most beneficial for panther conservation.

For Example:

Tier 1: 19,054 acres*\$30.80 =\$586,863

Tier 2: 6,920 acres*\$9.00 =\$62,280

Total = \$649,143 per year for three years among five landowners

Monitoring

During the first two years, we will implement the following monitoring strategy to validate the implementation and effectiveness of the planned treatments, i.e., to ensure that treatments have achieved the purpose of maintaining habitat beneficial to the Florida panther. One measure of successful "habitat improvement" (restoration, enhancement or establishment of habitat) for this project would be the maintenance or increase in the number of panthers using the habitat.

Work with landowners to establish photo points and remote camera sites at strategic locations within ranches to evaluate pretreatment, annual treatment and post treatment conditions, cattle herd size, and average calf mortality rate (taken from information obtained by ranchers over the previous five years, if available).

Annual Evaluation of Planned Practices:

Invasive Plant Treatment

- 1) Determine baseline % cover of invasive species:
 - a. Review ranch aerial map to determine panther habitat locations.
 - b. Conduct site visit to determine invasive species present and estimate % cover at these locations.
- 2) Reduce invasive vegetation by 95% during the initial treatment.
- 3) Maintain invasive plants at $\leq 5\%$ baseline level.

Prescribed Burning Treatment

- 1) Determine baseline quality of fire dependent habitat:
 - a. History of burning/mechanical habitat treatment.
 - b. Establish photo points.
 - c. Conduct initial site evaluation.
 - i. For each habitat type, evaluate ground cover, midstory, and canopy diversity and density.
- 2) Return of historical habitat fire intervals, intensity and season (as appropriate,)

Prescribed Grazing Treatment (Grazing Plan Implementation)

- 1) Determine baseline cattle numbers,
- 2) Establish the average calf mortality rate (over the last five years of ranching, if available from ranch records)
 - a. Establish the specific percentage attributed to depredation (when possible)

Landowner Evaluation of Program:

- 1) Determine initial landowner sentiment towards panthers and this project:
 - a. Survey landowner annually about progress and success of project,
 - b. Conduct final landowner survey:
 - i. Would they be interested in continuing with the project?
 - ii. What issues need to be addressed that would benefit landowners and/or keep them interested?
 - iii. Would they recommend this program to other ranchers in the Florida Panther Focus Area? Why or why not?

Monitoring Presence of Florida Panther (when landowner signs up for this practice)

- 1) Determine presence of panthers using the habitat:
 - a. Set remote cameras.
 - b. Conduct panther captures and collaring where appropriate (with landowner approval).

After 2 years of implementing phase one of the PES program, we would evaluate its overall effectiveness and continue to expand this effort within the Panther Focus Area into a more permanent program as funding allows. Results from an ongoing human dimensions study at

the University of Florida aimed at understanding landowner attitudes toward panthers and incentive programs could be integrated with the monitoring of the program's initial phase in order to develop a more permanent and sustainable PES program. As funding and demand for the program allows, and when breeding populations of panthers expand northward, we would implement subsequent phases that would focus on the Secondary Panther Focus Area and cattle ranches north of the Caloosahatchee River.

Benefits

This program seeks to develop a system that values habitat management services which are also easy to implement and communicate to landowners. Landowner understanding is essential so that they are able to predict potential future compensation and adopt practices and actions that would maximize public benefits and net profit so that ranching and working lands remain financially viable. Working with the landowner, PFW biologists plan habitat improvement practices that restore native plant and animal communities. The term "habitat improvement" includes habitat management, restoration, enhancement, and establishment (singularly or in any combination). Practices may also include periodic manipulations to maintain intended habitat conditions on completed program projects.

Implementing the PES program in the Dispersal Zone, and restoring panther habitat through this area, would increase the possibility that a natural range expansion of the panther breeding population north of the Caloosahatchee River is successful and that proper corridors are maintained, providing for eventual Florida panther recovery. The development of PES programs or markets for ecosystem services has the potential to increase the sustainability of the ranching industry by providing financial incentives to landowners, which could stem the rate of land conversion in the Panther Focus Area and develop a sound model to achieve quantifiable conservation goals recognized in the Recovery Plan.

Providing financial incentives to landowners in recognition of the public benefits their ranches provide would counter the factors that force them to sell their land or convert it to other uses. It would help preserve the rural landscape and contribute to the recovery of the Florida panther while preserving working landscapes for future generations. In essence, landowners would provide measurable conservation benefits by restoring and maintaining suitable natural pineland flatwood forest, hardwood hammock forest, and freshwater wetland forest habitats, as well as enhancing corridors within the Panther Focus Area. Specifically, focusing this effort on the Primary and Dispersal Zones within the Focus Area prioritizes lands essential to the long-term viability, survival and expansion of the Florida panther population.

Moreover, the benefits to having private landowners managing habitat for panthers has far reaching benefits for many species of wildlife. The Florida panther is considered an "umbrella species", and restoration of this large cat's diverse habitat types contributes to the wellbeing of many other wildlife species. Specifically, listed and candidate species within this landscape, like the Florida scrub jay, Florida bonneted bat, indigo snake, gopher tortoise, Audubon's crested

caracara, and woodstorks all benefit from properly managed habitats and contribute to maintaining a biodiverse ecosystem for future generations.

Need to Act

It is obvious that South Florida ranchlands are critical to successful panther survival. These private lands provide a third of the denning and hunting habitat occupied by panthers in the Focus Area, and the entire habitat within the Dispersal Zone. This PES program provides another mechanism for conserving these highly important lands for panther survival. By showing that the FWS and our partners value the habitat that working lands provide for this endangered cat, as well as a myriad of other important wildlife species, we can strengthen our relationship with landowners. Additionally, these new partnerships can help FWS and FWC gain access to much needed monitoring information of Florida panthers on private lands, as well as provide technical and financial assistance for management practices that maintain, enhance or restore habitat on a landscape level.

The cost of this program is significantly less than purchasing the fee title or a conservation easement and assuming direct management responsibility for these lands in perpetuity. It is estimated that a conservation easement would roughly cost \$2,500 per acre, whereas the full purchase price is estimated at \$5,000 per acre. At a maximum of \$30.80 per directly treated acre AND per indirectly treated acre per year for Tier 1 eligible lands, we believe similar results in habitat management can be achieved for the short term (10 years), which will give the species time to expand its range naturally in order to meet the interim goals of the recovery plan.

In an era of limited resources and abundant threats to habitat, this PES can provide resources needed to maintain a resilient biodiverse ecosystem while working with willing landowners toward a more permanent conservation solution such as conservation easements or conservation purchases.

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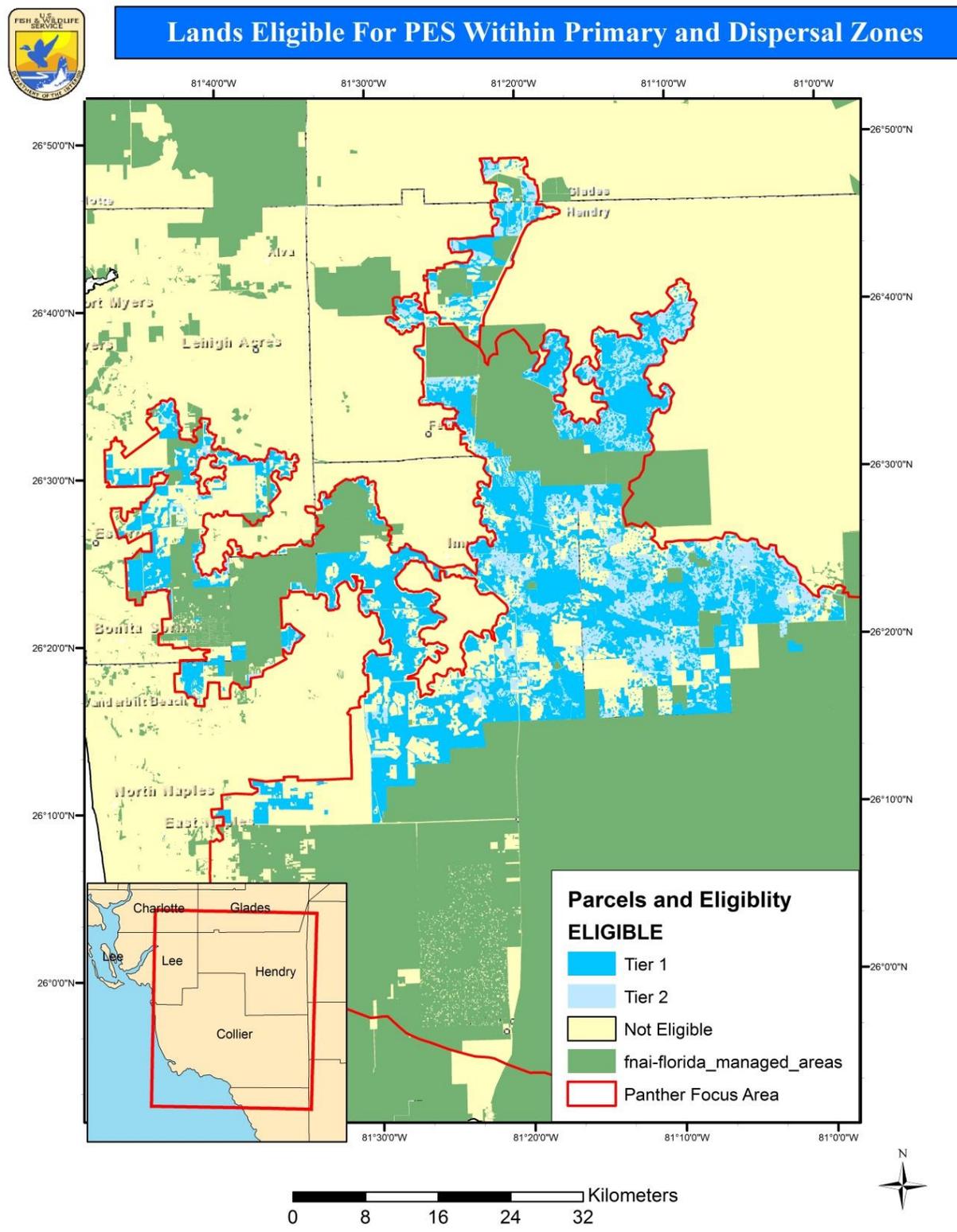


Figure 1. Phase 1: Land use eligibility for Panther Payment for Ecosystem Services

Appendix A.

A review of other PES Programs available in the state

A review of CSP: The Conservation Stewardship Program (CSP) pays for conservation performance — the higher the performance, the higher the payment. Interested landowners must read and complete a 19 page registration form, then undergo the ranking process to determine if they become a participant. Under CSP, participants receive annual land use payments for operational level environmental benefits they produce and a supplemental payment is available to participants earning an annual payment who also agree to adopt a resource-conserving crop rotation on cropland. The Annual Land Use Payment is computed by multiplying Land Use Acres X Performance Points (additional or existing) X Land Use Payment Rate. The performance points are determined from the Conservation Management Tool (CMT) which uses a point based system to measure a relative environmental benefit. The CMT evaluates both existing and proposed (i.e., additional) activities, and is designed for equity in order to score an applicant's current and planned environmental performance and to generate conservation performance points to be used for ranking and payment purposes. Supplemental payment for Conservation Crop Rotation is a flat \$12.00/acre.

Table 1 shows the value per point per land use type that would be valued in the Panther Focus Area. Determining point values is an intense process that is outlined in the Conservation Measurement Tool Conservation Performance Scoring for 2013-1. But I have inserted Table 2 to show the final product of this measurement tool for specific land uses.

Table 1. 2013 CSP Payment Rates Annual Payments

	Additional Activity	Existing Activity
Land use	Payment Rate	Payment Rate
Pasture	\$0.2376/point	\$0.0324/point
Range	\$0.1588/point	\$0.0108/point
Forest	\$0.1858/point	\$0.0173/point

Information from NRCS 2012 Conservation Stewardship Program Information Sheet, the Conservation Measurement Tool Conservation Performance Scoring for 2013-1

Table 2. Average Yearly Obligation 2011 to 2013

Land use	CSP-1	CSP-2	CSP-3	CSP-4	Average
Rangeland	\$3.86/acre	\$4.20/ acre	\$4.69/ acre	\$4.13/ acre	\$4.19/ acre
Range and Pasture	\$6.15/ acre	\$7.05/ acre	\$8.15/ acre	\$5.90/ acre	\$6.87/ acre
Forestland	\$6.42/ acre	\$8.62/ acre	\$10.47/ acre	\$5.28/ acre	\$7.94/ acre

Information from O. Armstrong, pers. comm. NRCS FL, 2014.

The CSP program is not very successful in Florida primarily for two reasons, first is the low payments provided and second, is the lengthy application process. For more information on CSP visit <http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/csp/>.

A Review of FRESP: The Florida Ranchlands Environmental Services Project designed and field tested elements of a program that would pay ranchers to improve water quality, phase, and timing by using existing water management infrastructure on ranchlands. Now, this program is named the Northern Everglades Payment for Environmental Services (**NE-PES**) Program.

The NE-PES program commits to maintaining a working landscape; allowing landowners to actively manage water based on the level of the payment received and not be limited by programs (i.e. WRP program) that direct restoration to pre-disturbance conditions at the specific site. To apply for the NE-PES program, ranchers submit their proposed Water Management Alternatives (WMA) design and a payment request to the “buyer” or SFWMD in this case. The payment request has two parts: one is the estimated costs of design, permitting, and construction of the WMA, and two is for an annual service payment. When the request is accepted by the “buyer”, a contract is developed that outlines services that are above and beyond regulatory expectations described in traditional agriculture best management practices (BMPs) and the annual service payment amount to be paid after services are complete. This payment will be paid yearly over the life of a 10-year contract based on documentation that the contracted service was provided.

The program collaborators considered other payment options, including a per-unit price for each practice. However, within this particular program, the “buyer” (SFWMD) did not feel that the “commodity” (water and nutrient storage) was comparable to those that the WMD managed on public lands. So collaborators produced definitions of these commodities that were understood and accepted by both parties and were measurable on a working ranch. Given these definitions, the SFWMD and rancher could develop the contract delineating specific services, the payment earned and documentation required to earn payment (Lynch and Shabman 2011).

The NE-PES is considered a successful program in Florida, but it has a specific target of increasing water quality in Central Florida. I think it can provide a template for a future Panther PES, but we would need data to determine “commodity” (i.e., habitat) value.

A Summary of GT-PES: FWC’s Cooperative Conservation Blueprint has contracted with Wildlands Conservation to develop a gopher tortoise payment for ecosystem services (GT-PES) program with private landowners in southwest Florida. The goal is to proactively conserve habitat for this keystone species while also preserving priority regional connectivity at the landscape scale. Under the PES framework, landowners will be compensated for providing and/or restoring high quality gopher tortoise habitat on their property as identified by FWC. Eligible landowners enter into a contract that ensures habitat will remain suitable for gopher tortoises for a period of 10 years, with an opportunity to renew subsequent to the first 10 years. Annual payments will be based on habitat metrics, currently for three tiers, and

landowners will have the opportunity to increase payments by improving habitat quality or moving up habitat tiers. A management plan will be provided as a guide to assist landowners to achieve higher habitat tiers. This effort will help to preserve habitat for multiple species, including gopher tortoise associated commensals. Currently the rate for habitat value is \$10/acre, which seems close to the amount NRCS pays for CSP and is on the low side of payment.

Appendix B. FNAI Land Use Classification Eligibility

Landcover Description	Polygon Count	Eligibility
Aquacultural Ponds	2	No
Artificial Impoundment/Reservoir	253	No
Artificial Lakes & Ponds	1	No
Australian Pine	9	Tier 1
Basin Marsh	9	Tier 1
Bay Swamp	3	Tier 1
Brazilian Pepper	119	Tier 1
Cabbage Palm	57	Tier 1
Canal	70	No
Canal/Ditch	18	No
Citrus	80	No
Commercial & Services	23	No
Communication	5	No
Coniferous Plantations	1	No
Cypress	1011	Tier 1
Cypress/Pine/Cabbage Palm	151	Tier 1
Cypress/Tupelo(incl Cy/Tu mixed)	476	Tier 1
Depression Marsh	63	Tier 1
Dome Swamp	174	Tier 1
Exotic Plants	20	Tier 1
Exotic Wetland Hardwoods	81	Tier 1
Fallow Orchards	1	No
Feeding Operations	1	No
Field Crops	35	No
Flatwoods/Prairie/Marsh Lake	4	Tier 1
Floating/Emergent Aquatic Vegetation	81	No
Freshwater Forested Wetlands	52	Tier 1
Freshwater Marshes	3090	Tier 1
Fruit Orchards	13	No
Glades Marsh	64	Tier 1
Golf courses	13	No
Hardwood Plantations	1	Tier 1
High Intensity Urban	32	No
Hydric Hammock	73	Tier 1
Hydric Pine Flatwoods	644	Tier 1
Hydric Pine Savanna	1	Tier 1
Improved Pasture	342	Tier 2
Industrial	11	No

Industrial Cooling Pond	2	No
Institutional	21	No
Isolated Freshwater Marsh	149	Tier 1
Isolated Freshwater Swamp	1412	Tier 1
Live Oak	9	Tier 1
Low Intensity Urban	1	No
Low Structure Density	90	No
Mangrove Swamp	17	No
Marl Prairie	37	Tier 1
Melaleuca	14	Tier 1
Mesic Flatwoods	570	Tier 1
Mesic Hammock	34	Tier 1
Mixed Hardwood-Coniferous	84	Tier 1
Mixed Wetland Hardwoods	611	Tier 1
Natural Lakes & Ponds	25	No
Non-vegetated Wetland	16	No
Oak - Cabbage Palm Forests	26	Tier 1
Oil & Gas Fields	3	No
Orchards/Groves	2	No
Ornamentals	20	No
Other Hardwood Wetlands	5	Tier 1
Other Wetland Forested Mixed	132	Tier 1
Parks	1	No
Pine Rockland	1	Tier 1
Prairie Mesic Hammock	3	Tier 1
Quarry Pond	45	No
Residential, High Density > 5 Dwelling Units/AC	35	No
Residential, Med. Density - 2-5 Dwelling Units/AC	36	No
River Floodplain Lake/Swamp Lake	8	No
Roads	33	No
Rock Quarries	8	No
Rockland Hammock	13	Tier 1
Row Crops	177	No
Rural Open	394	No
Rural Open Forested	1	No
Rural Open Pine	2	No
Saltwater Marsh	5	No
Sand & Gravel Pits	5	No
Sawgrass	110	Tier 1

Scrubby Flatwoods	1	Tier 1
Sewage Treatment Pond	1	No
Shrub and Brushland	220	Tier 1
Shrub Bog	1674	Tier 1
Slough	3	Tier 1
Slough Marsh	9	Tier 1
Sod Farms	1	No
South Florida Bayhead	108	Tier 1
Specialty Farms	9	No
Spoil Area	13	No
Strand Swamp	58	Tier 1
Strip Mines	2	No
Sugarcane	5	No
Transportation	3	No
Tree Nurseries	34	No
Unimproved/Woodland Pasture	946	Tier 1
Upland Coniferous	3	Tier 1
Upland Hardwood Forest	118	Tier 1
Utilities	22	No
Vineyard & Nurseries	1	No
Wet Flatwoods	63	Tier 1
Wet Prairie	826	Tier 1