



 **Florida Panthers: Research, Management and Recovery Update**
June 18, 2014
Florida Fish and Wildlife Conservation Commission

Version 2

At the September 2011 Commission meeting an overview of the panthers and the FWC panther program was presented and staff followed up with an update at the September 2012 Commission meeting.

Version 2 – Edited on June 12th to update information on slides 15, 25 and 40

FWC Florida Panther Research

- 1981: Research commences
- 1980s-90s: Documentation of natural history
- 1990-94: Identification of inbreeding depression
- 1995: Genetic restoration
- 1995-2012: Population increase
- Moving forward: conflict management and expanding panther population and range



1981- Research on Florida panther by FWC commences

1980s-90s- Research focuses on learning more about the natural history and demographics of panthers.

1990-1994- Inbreeding depression documented, population thought to range between 20-30 panthers.

1995- Genetic restoration is implemented via the release of 8 female pumas from west Texas.

1995-2012- Population begins to increase to a range of 100-180 panthers by 2014. Correlates of inbreeding were reduced via genetic restoration.

Moving forward: Research and management will focus on improving our ability to assess population size and recovery benchmarks, human dimensions research, research in expanded range and research on conflict management.

Results: Impact of Genetic Restoration

- Genetic variability increased
- Reduced frequency of inbreeding defects (un-descended testicles, abnormal sperm, heart defects, kinked tails, cowlicks)
- More than 10% increase in kitten survival
- Population growth rate ~4%/year
- Probability of quasi-extinction (<10 panthers) over the next hundred years approximately 7%



The panther genetic restoration program initiated in 1995 has substantially contributed to the health and population growth of the species. While currently some degree of inbreeding still occurs, it is not at the levels observed prior to 1995. The frequency of physical defects caused by inbreeding (un-descended testicles, abnormal sperm, heart defects, kinked tails, cowlicks) have declined post genetic restoration. Kitten survival post genetic restoration is approximately 10 percent higher than before 1995 which has contributed substantially to a post 1995 population growth rate of about 4% per year. Prior to 1995, it is estimated that the panther population was declining at a rate of about 3% per year.

Post genetic restoration, the probability of quasi-extinction (population dropping to <10 panthers) over the next hundred years is estimated at 7%. This estimate assumed no change in habitat quantity or quality over the 100 year period.

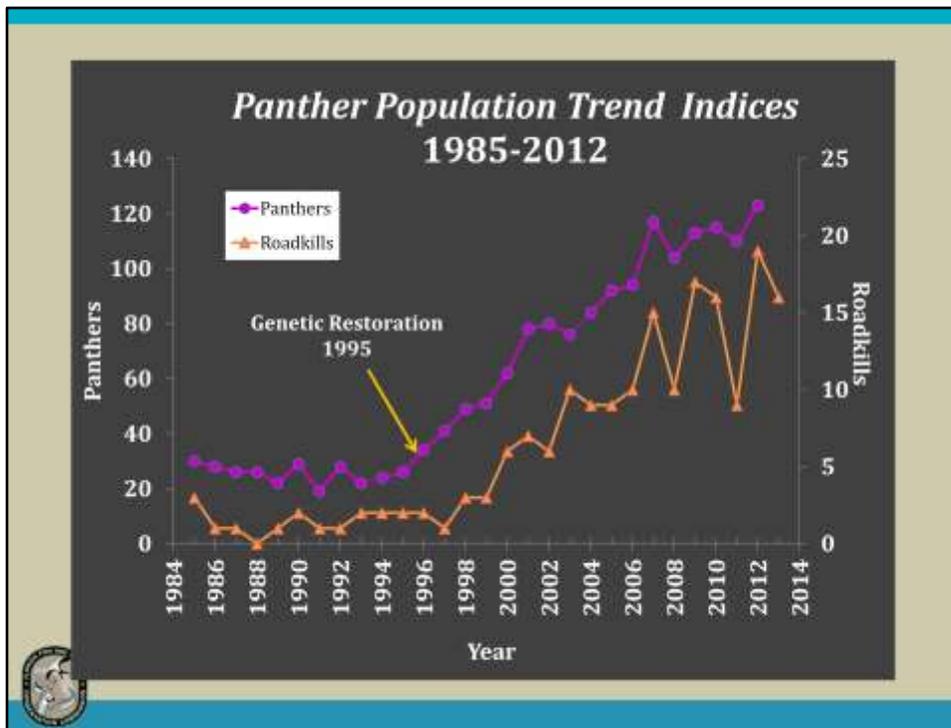
Population size and trend

- Determining panther population size and trend is important to recovery
- Most of the work on public lands
- Historically two main techniques to estimate minimum population size
 - Track surveys combined with camera trap data (in recent years) – Roy McBride
 - Back-calculated abundance based on ages from captures or roadkills
- Recently implemented approaches
 - Modeling of road mortality data
 - Use of cameras to estimate panther density



Historically two main techniques have been used to estimate population size, minimum counts from track surveys (combined with camera data in the last 2-3 years) and a retrospective look at minimum number of panthers known alive. Camera sites are motion-activated cameras deployed in the field that store digital photos. It is important to note that the bulk of the survey work providing this information has been on public lands.

New methods combining telemetry data, roadkill information, and data from camera traps will ultimately provide a statistically robust population estimate with a known confidence interval.



Two indicators, track counts (primarily on public lands), and number of road kills indicate a population increase since genetic restoration in 1995.

FWC develops the baseline or low end estimate using data from track surveys and motion activated cameras. Because most of the survey work is on public land, it does not take into account panthers that live exclusively on private lands. For this reason these counts should not be used for a population estimate, but rather an indicator of population trend.

The number of confirmed panther deaths from vehicle collisions (roadkills) also represented on the slide provides another indicator of population trend. The number of confirmed deaths due to vehicle collisions has followed the same general trend as the track count data over the period of record.

Defining a Population Range

- Upper end of the range is determined by extrapolating density from track counts over the full extent of the panther primary range
- Lower end range is determined by numbers of panthers actually observed (mortalities or captures)
- Updated range using 2012 data is 100-180 panthers
- Estimates currently in development will provide statistically sound estimates with a confidence interval.



Currently, a range for panther population size is determined based on extrapolated track surveys conducted on public land and minimum reconstructed population sizes. These methods are based on extrapolated count data and panthers observed (mortalities or captures). The upper end of the range is determined by extrapolating panther densities from track surveys on a portion of public lands. These densities are then extrapolated across the entire primary zone. The track surveys are conducted on public lands of relatively high quality habitat. Extrapolating these densities across the primary zone (which contains public lands of lesser quality habitat) may result in a over estimate of total population size. Conversely, there may be areas on private lands where panther density is higher than the areas sampled. In that case applying the sample density across the primary zone may result in an underestimate of the total population.

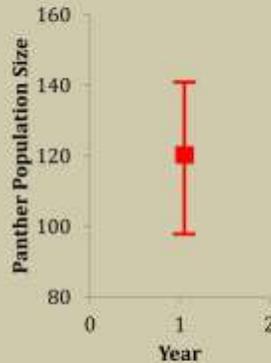
The lower end of the range (100) is derived from panthers actually observed (mortalities or captures) and is equivalent to a minimum number known alive.

In 2010, using the minimum counts at that time, FWC provided a statement that the number of panthers likely ranged from 100-160. Using the same methodology, but updating the data to 2012, the range is now 100-180.

Estimates currently in development will provide statistically sound estimates of population size with associated confidence intervals.

Population Range vs. Statistical Estimate

- To date, status of the panther population has been communicated by defining an upper and lower range
- The establishment of a range is driven by the data available,
- Moving toward a statistical estimate of population size which is more scientifically sound.



Hypothetical Example:
Estimate of population size = 120
95% Confidence Range 100-140

There are a number of shortcomings associated with using count-based information that is not collected under a statistical sampling design as estimates of population size. Count data are often more subjective and highly dependent on the expertise of the individuals doing the counting. Also, because conditions are not static year-to-year, it is often difficult to compare count data across years.

Statistical estimates of population size are preferred because the conditions under which the data are collected are tightly controlled and repeated each year and bias associated with things like varying individual expertise are controlled for or eliminated in the sampling design. Statistical population estimates will consist of an estimate of the number of panthers and an associated confidence interval (most commonly a 95% confidence interval). In the Hypothetical example presented, the statistical estimate of population size is 120 and the 95% confidence interval ranges from 100-140. In this example, we are stating that we are 95% confident that the “true” population size falls within the range 100-140.

State of the Science: Population Estimation

- Two complementary tracks under development to generate a statewide abundance estimate.

Mark/Recapture Modeling

- Use data from roadkills and citizen reports
- Require more panthers to be "marked" with radio collars

Camera Surveys

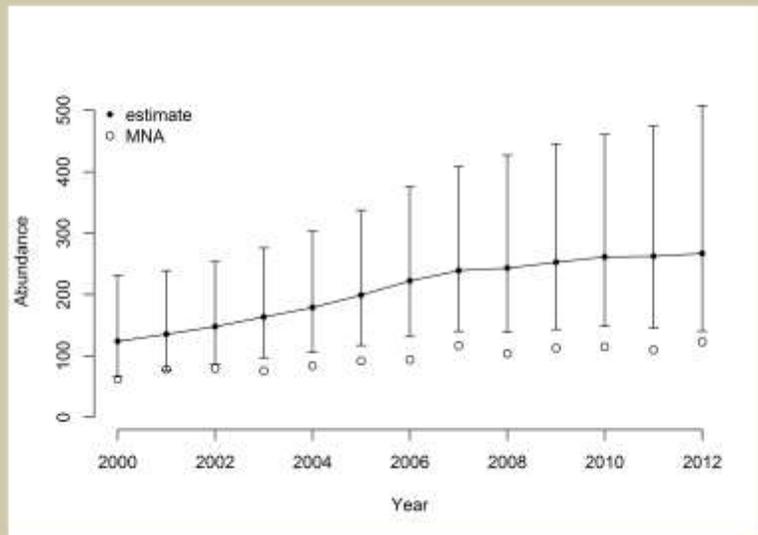
- Use cameras arrayed in a grid to provide density estimates for a given area
- Population estimates require extrapolation beyond the camera grid area



Efforts to develop a statistically sound statewide estimate of panther abundance are progressing along two parallel, but complementary tracks. Initial work modeling marked (with radio collars) roadkill panthers has shown promise in abundance estimation. However the number of radio collared panthers is still too low to generate precise abundance estimates. More panthers need to be marked to improve this method. Note that citizen reports (for example photos submitted through the FWC website) of marked panthers could also contribute to this effort.

Secondly, camera grids hold promise for generating statistically sound estimates of panther densities (number of panther/km²) in a given area. The analytical techniques used for camera grid data also require telemetry data from radio collared panthers. Camera grids are used to calculate a density of panthers in a given area. Population estimates are then generated by applying density estimates over larger areas (extrapolation). Accurate statewide numbers will require an array of camera grids deployed over a range of habitats on both public and private land.

Mark/Recapture Modeling with Roadkill Panthers



This figure presents estimates from a recent mark/recapture modeling study that used information from roadkill panthers to estimate abundance. This work was a collaboration between FWC and NOAA and is currently under review for publication. MNA in the figure refers to the minimum number of panthers known to be alive and is derived from panthers actually observed (mortalities or captures). The estimates from this modeling work demonstrate that information from roadkill panthers is potentially useful in estimating population abundance. However, currently this analysis is hampered by the relatively low number of radio collared panthers in the population. Marking a higher number of panthers (with radio collars) will improve these estimates in the future.

Using Camera Grids to Estimate Panther Density

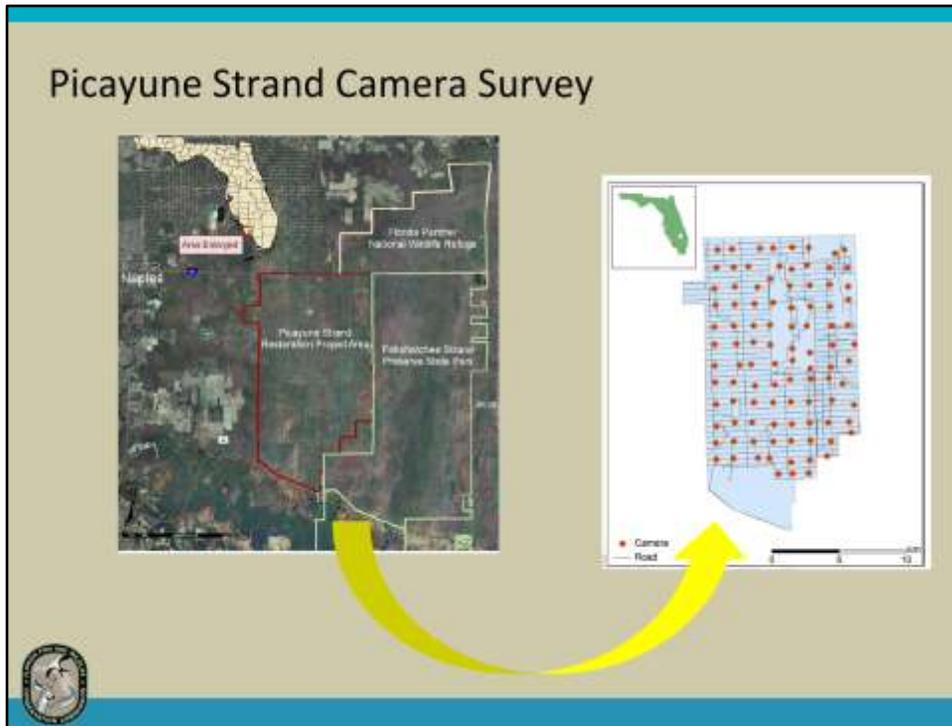
- Use a combination of telemetry data and a grid of camera traps to estimate density of panthers in a given area.
- Requires some uniquely marked individuals (usually with radio collars)
- Density data can be used to extrapolate population estimates over a wider area of similar habitats
- Camera sites also useful for density estimates of deer, turkey, bobcat and bears



Grids of cameras that are motion activated are being used successfully to generate estimates of panther density in a given area. Note that this technique also relies upon telemetry data and a certain number of radio collared panthers present in the area. This technique is advantageous in that it could also generate density estimates for other species such as deer, turkey, bobcat and bears.

Density data from the camera grids can be used to extrapolate population estimates over a wider area of similar habitats

Picayune Strand Camera Survey



Collaboration between David Shindle of the Conservancy of Southwest Florida, FWC, North Carolina State University, and US Geological Survey.

Shindle, D., and B. Kelly. 2007. Short term analysis service on scientific and technical support for completion of a two year pre-construction panther prey baseline monitoring survey in the Picayune Strand Restoration Project Area. Environmental Science Division, Conservancy of Southwest Florida; Naples, Florida; for U.S. Army Corps of Engineers, Jacksonville District; Jacksonville, Florida.

Picayune Strand Camera Survey

- 98 cameras deployed over 241 km²
- Total of 43,890 camera days (2005-2007)
 - 445 photos of Florida panthers
 - 137 photos discarded (could not tell if panther was collared or not)
 - 17 photos of collared panthers; 290 photos of uncollared panthers
- Density estimates of 1.5 individuals per 100 km² with good statistical precision



98 cameras deployed in approximately 241 km² area for 21 months (2005-2007)

Total of 43,890 camera days

445 photos of Florida panthers

137 photos discarded (could not tell if panther was collared or not)

17 photos of collared panthers; 290 photos of uncollared panthers

Density estimates of 1.5 individuals per 100 km² with good statistical precision

Sollmann, R., Gardner, B., Chandler, R. B., Shindle, D. B., Onorato, D. P., Royle, J. A., O'Connell, A. F. (2013), Using multiple data sources provides density estimates for endangered Florida panther. *Journal of Applied Ecology*, 50: 961–968. doi: 10.1111/1365-2664.12098

FWC Panther Camera Study

- Phased approach
- Addition Lands of BCNP
- 162 km² study area
- 4 month sampling period
- Collect data on
 - Panthers
 - Deer
 - Other wildlife





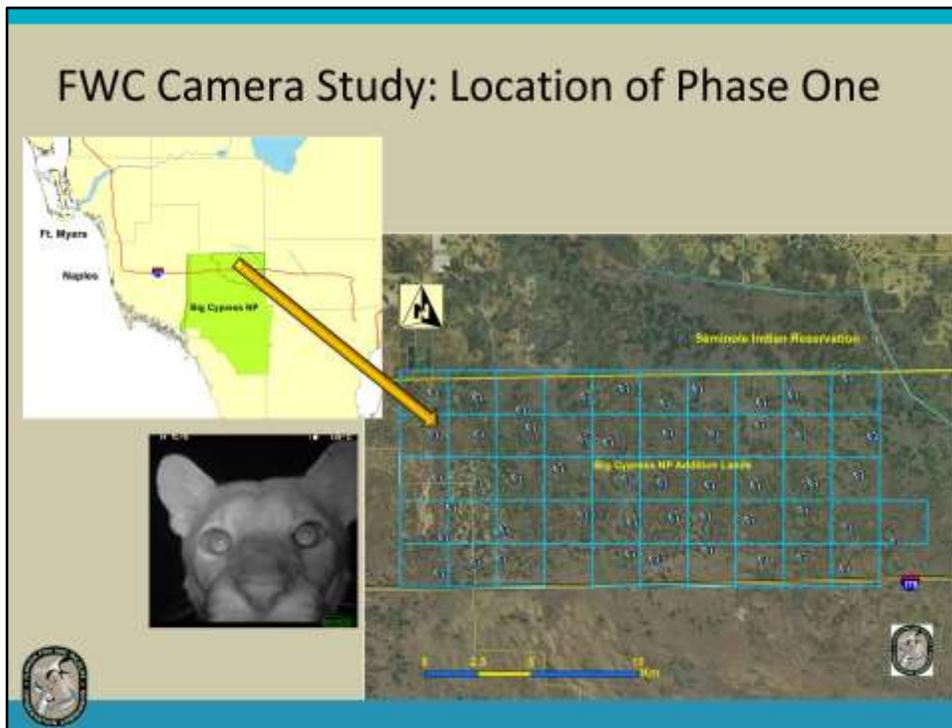

Objective is to determine whether deployment of a camera array can provide a statistically robust estimate of population density with associated measures of variance.

Phase one: thorough scientific review of camera data collected by David Shindle at the Conservancy of Southwest Florida. That review identified a statistical technique that can estimate the density of panthers in a study area using camera traps. This work was done in conjunction with FWC, the Conservancy and the U.S. Geological Survey. Subsequently, an additional analysis by NC State University funded by FWC identified an appropriate study design to answer long standing questions regarding:

1. Size of the study area
2. Number of cameras needed to sample the study area
3. Length of deployment of cameras within the study area
4. Number of radiocollared panthers needed within the study area to improve precision estimates

Addition Lands were chosen because of implications regarding future management initiatives in that area as they relate to panthers, deer, possible increase in hunter and ORV access. It is also a large area of public land that can incorporate a 162km² study area.

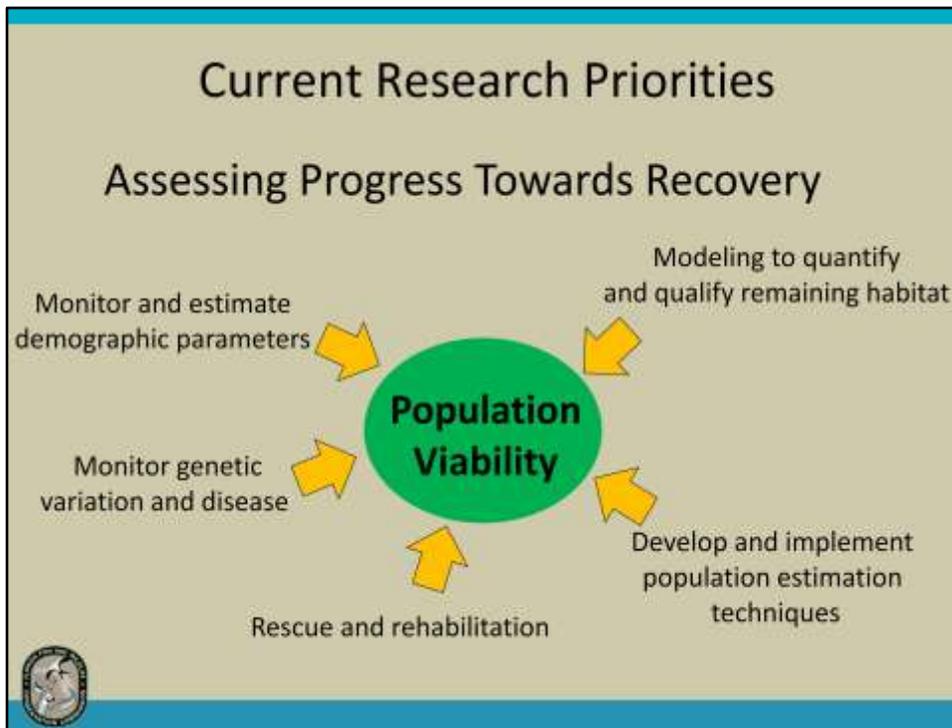
The FWC study is being done in conjunction with another camera grid for panthers that is located on the FPNWR and coordinated by David Shindle at the Conservancy. In addition, Elina Garrison (head FWC Deer Researcher) will be initiating a camera grid for a deer survey on the Bear Island Unit of BCNP. The combination of these studies demonstrates the high level of collaboration between and within agencies or other organizations. Photographic data collected on panthers, deer, and other wildlife could prove useful for a variety of purposes besides just getting density estimates for panthers or deer.



Once perfected, this methodology could be used on a variety of habitats (including private lands) to get a better estimate of density across the panther range. That information could then be used to provide total population estimate with statistical confidence.

Panther Camera Grid in the Addition Lands of Big Cypress National Preserve.

1. Encompasses a total of 162km²
2. 50 cells, each cell contains 1 camera.
3. Cameras were installed over a period of 8 days.
4. Cameras will be deployed for 4 months
5. Photos will be downloaded and organized.
6. Movement data (from flight locations and panther GPS radiocollars) will be compiled.
7. Data will be analyzed to arrive at an estimate of the density (hence population estimate) of panthers within the study area.



1. Monitor demographics of adult and subadult survival as they are important parameters to monitor and to assess population viability. The same is true for kitten survival.
2. Continue to monitor genetic restoration and be vigilant as to any observed changes that may indicate a return to a situation where inbreeding may become problematic again. FWC panther staff continues to be vigilant about monitoring the health of panthers and any emerging diseases that may impact recovery. Issues such as FeLV, FIV and pseudorabies are a few of the priority issues that have the potential to impact the small population of panthers.
3. Rescue and rehabilitation of injured panthers can have a positive impact on panther viability as well as public perception of panther research and management.
4. Research underway to develop, refine and implement techniques that will provide a true estimate of the population size. The current range of 100-180 is not a statistical estimate. This is important to monitoring recovery progress and assessing when current recovery criteria have been met.
5. Habitat modeling in progress that will help assess the quality and quantity of remaining panther habitat in south and potentially south central Florida. Large scale issue for recovery.

All of these research initiatives can produce information that feeds into assessing the longer term viability of the population. Data from several of these projects can be fed into a PVA, probability of extinction etc. A subsequent PVA (individually based) is currently being undertaken in collaboration with UF.

Research to Management





Conflict wildlife is one of several Commission focal areas and is an FWC Strategic Initiative as identified in our recent Agency Strategic Planning efforts.

As part of the conversation on conflict wildlife, the "leaning J" was introduced at the April 2014 Commission meeting as a way we can visualize or think about the past, present and future in relation to native wildlife populations and our interactions with them. Panthers and panther conservation fit well into this conceptualization.

For the next few slides, we focus on the area within the red dashed oval, which corresponds to no management and open persecution of panthers.

Prior to 1950 Florida panthers were unprotected



Ernest Lee and Dave Newell skinning a panther in the Big Cypress Swamp, Florida, 1935.



Historically panthers mostly were treated as a threat and many were shot on sight. In Florida, bounties for panthers were paid in the 1800s . The former Game and Freshwater Fish Commission designated them as game species in 1950. By 1958, the Commission made it illegal to take any panthers in Florida.

Caption for the picture to the left reads “ Ernest Lee and Dave Newell skin the fifth of eight panthers taken on a 1935 hunt in the Big Cypress Swamp in Florida.”

The picture to the right was taken in 1947.

Puma Distribution History

Former distribution of *Puma* subspecies in North America



Figure 1. Distribution of subspecies of *Puma concolor* in North and Middle America

- | | |
|---------------------------|---------------------------|
| 1. <i>P. c. annectans</i> | 10. <i>P. c. arizonae</i> |
| 2. <i>P. c. amabilis</i> | 11. <i>P. c. arizonae</i> |
| 3. <i>P. c. alpinus</i> | 12. <i>P. c. arizonae</i> |
| 4. <i>P. c. caninus</i> | 13. <i>P. c. arizonae</i> |
| 5. <i>P. c. coloratus</i> | 14. <i>P. c. arizonae</i> |
| 6. <i>P. c. catalinae</i> | 15. <i>P. c. arizonae</i> |
| 7. <i>P. c. catalinae</i> | 16. <i>P. c. arizonae</i> |
| 8. <i>P. c. catalinae</i> | 17. <i>P. c. arizonae</i> |
| 9. <i>P. c. catalinae</i> | 18. <i>P. c. arizonae</i> |



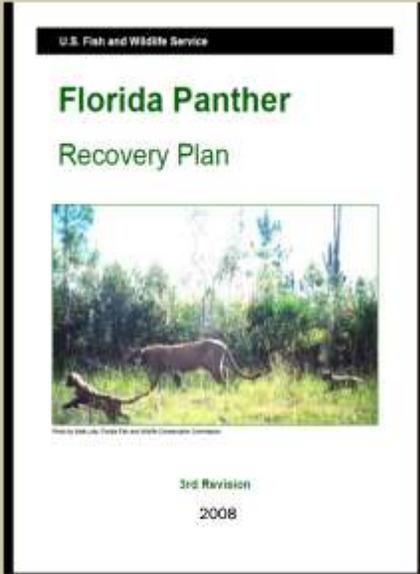
Former and current range of FL panthers



Historically panthers occurred across 7 southeastern states and their range shared borders with other puma sub-species. In addition to unregulated killing, habitat loss also contributed to reduction in the panther's range, resulting in their isolation in southern Florida. The neighboring sub-species were also either significantly decreased in number, or in the case of the eastern cougar driven to extinction.



Now we focus on the area within the dashed oval, which corresponds to protective efforts for panthers. Panthers reached a low point in population abundance, with perhaps less than 30 in Florida, and various protection efforts began. These efforts have resulted in increasing panther numbers. The next several slides will focus on this time period.



Recovery Criteria

Endangered to Threatened
Two populations of 240

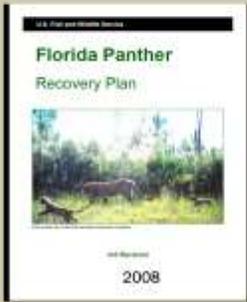
Delisting
Three populations of 240

A viable population, for purposes of Florida panther recovery, has been defined as one in which there is a 95% probability of persistence for 100 years



The goal for panther conservation is to recover the panther to a point where it no longer merits listing under the federal Endangered Species Act. The current Recovery Plan stipulates that based on the best available science panther populations must have a 95% probability of persistence. The plan also provides a measure that specifies multiple populations of at least 240 panthers each is needed. Many individuals including FWC staff question if this goal is attainable given potential social carrying capacity, the amount of available habitat, and the panther's large home range size. Therefore, the new Panther Recovery Implementation Team will be working with other experts to address if the recovery criteria are the best measure of success.

The Endangered Species Act and its provisions as administered by the U.S. Fish and Wildlife Service (USFWS) determine panther protection and resource decisions.



First Recovery Plan completed in 1981

- Three revisions: 1987, 1995, 2008
- The Recovery Team created in 2001 and had **42** members
- State and Federal Agencies, Business groups, Environmental NGO's, Indian Tribes, Universities, Zoos Disbanded in 2013

New Recovery Implementation Team

- Established 2013
- 7 members
- FWS, NPS, FWC, Barron Collier Co. Defenders of Wildlife
- To help prioritize and coordinate agency efforts on implementing recovery
- Focus on eight areas



Because it is a federally listed species, the management and conservation of Florida panthers is part of a federal recovery plan. FWC has participated in the development of the recovery plans, but ultimately they are federal documents approved by the Director of the U.S. Fish and Wildlife Service. The Recovery Plan's goal is 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. The last plan was developed by a team of 42 individuals representing a wide variety of perspectives.

The Florida Panther Recovery Team's task was completed when the 2008 Recovery Plan was finalized. The team was formally disbanded in 2013. At that time, a Florida Panther Recovery Implementation Team was created to prioritize recovery tasks and to move forward on those tasks. The team is comprised of staff from FWC, USFWS, NPS, Defenders of Wildlife and the Barron Collier Company.

Implementation Team Focus Areas

- 1) Programs for Private Landowners
- 2) Inventory and Monitoring
- 3) Panther Recovery Criteria
- 4) Range Expansion and Reintroduction Potential
- 5) Guidance for Habitat Restoration and Management
- 6) Panther Taxonomic Status
- 7) Genetic Management Plan
- 8) Vehicular Mortality

(in order of priority)



The first meeting was held on 20-21 August 2013. At that meeting the team discussed organization and procedures, and eight possible priority areas. The highest priority areas included programs for private landowners, inventory and monitoring, and recovery criteria. Landowner acceptance of and participation in panther recovery will be critical. Therefore, innovative efforts like payment for ecosystem services, or PES, are being developed to provide landowners with monetary incentives to conserve panthers. PES works by providing annual payments per acre for habitat maintained in ways that are beneficial to panthers. Dawn Jennings, the USFWS lead for panther recovery, will discuss this topic in more detail after this presentation.

Panther Conservation Partnerships

- FWC
- Big Cypress National Preserve
- Everglades National Park
- USFWS Vero Beach Field Office
- Panther National Wildlife Refuge
- State agencies
- Non-Governmental Organizations
- Private Land owners



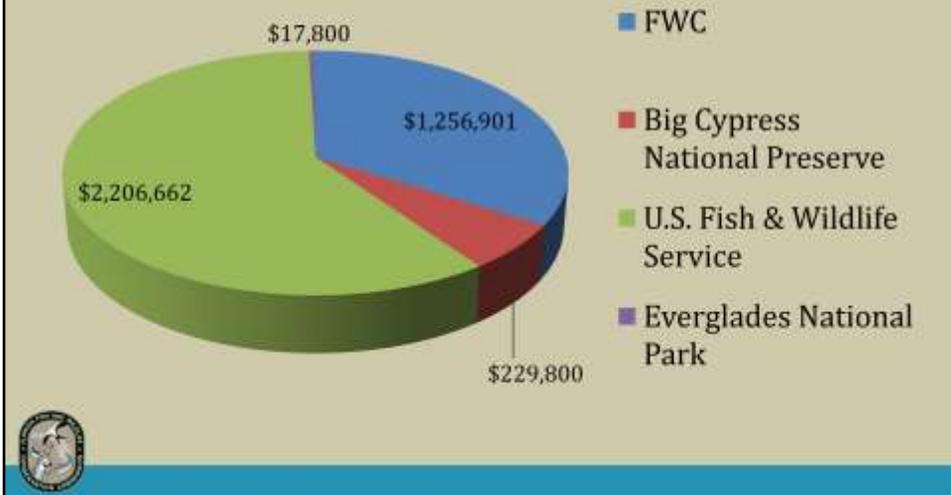
Conservation of this federally listed species requires close cooperative work among many partners. However, key decisions rest ultimately with the U.S. Fish and Wildlife Service.

Decisions that are the USFWS responsibility include:

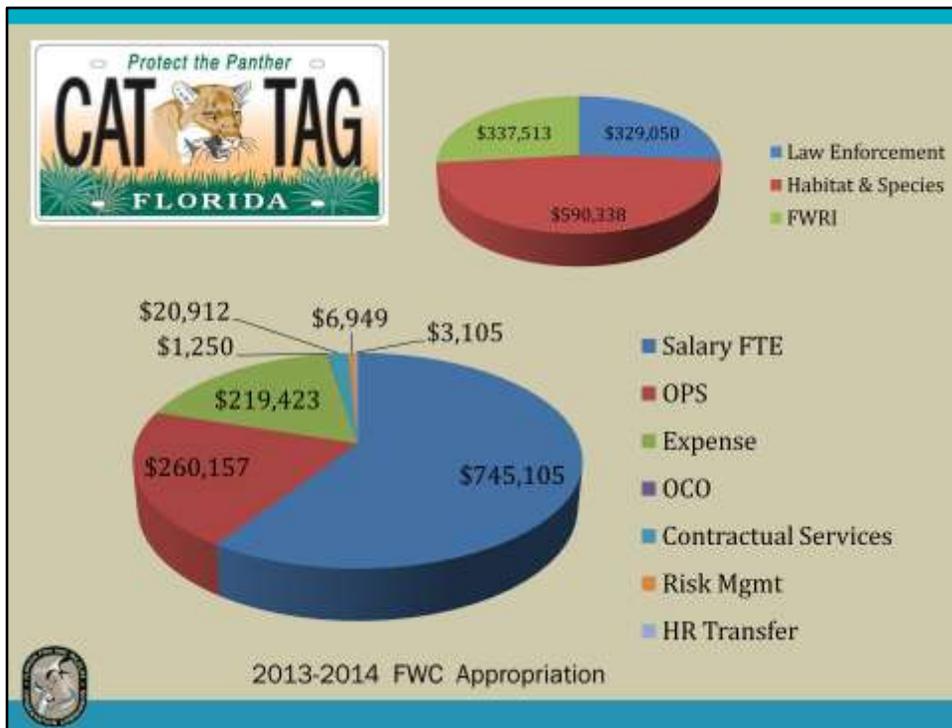
- Relocation of panthers
- Initiation of a reintroduction program
- Lethal or permanent removal of problem panthers
- Reclassification of the panther from Endangered to Threatened, or removal from the list

Florida Panther Budgets 2013-2014

Most recent year budget



Federal budgets were provided by U.S. Fish and Wildlife Service staff and National Park Service Staff. Annually, budgets for federal agencies have varied considerably. FWC's budget shown here only depicts money appropriated from the Florida Panther Research and Management Trust Fund. This slide was updated on June 12 to reflect new data.



The “Panther Tag” is the primary funding mechanism for the FWC panther program. Money from the sales of these plates is deposited into the Florida Panther Research and Management Trust Fund. The Legislature appropriates money from that trust fund to the Division of Law Enforcement, the Division of Habitat and Species Conservation and the Fish and Wildlife Research Institute. Other staff and funding sources play into panther conservation, but the large majority of funding comes from this trust fund specified for panther conservation.

Expanding Scope of Panther Program

- Developed a “Panther Road Show” to improve the Agency’s response to potential panther issues statewide
- Hired a panther specialist within the Landowner Assistance Program
- Developed a Report Panther Sightings website to collect data from citizen scientists
- Placing trail cameras on public and private lands in central and south-central Florida



FWC now trains biologists each year across the state as well as all our law enforcement academy graduates on methods of identifying panther sign, panther depredations and basics of panther conservation.

We hired a new land owner assistance biologist, Dr. Jennifer Korn, and based her in Venus FL. Jennifer has experience with large cat impacts. Most recently she has been coordinating our efforts to place trail cameras on both public and private lands north of the Caloosahatchee River so that we can better document panthers in these areas.

At our last update in 2012 we told you about a web site we were launching to promote citizen science of recording panther sightings. This provides a simple way for the public to report and upload photographs of panthers. We have received over 1250 reports of panther sightings and 203 of the reports included uploaded photographs. Of the photographs submitted 43% were verified to be panthers. The second most common photograph submitted were pictures of bobcats.



Lastly, on the "Florida Leaning J" we enter into the period of population growth, which is the area within the dashed oval. Some species actually recover to a point where the population is larger than the historical population, for example whitetail deer. That scenario is unlikely for panthers because they require such a large home range, there has been significant habitat loss, and they are not accepted well in suburban environments.

Elements of Panther Conservation

- Reduce human-caused deaths
- Monitor and improve panther health, including genetic health
- Maintain and manage habitat
- **Address human-panther conflicts**
- Monitor population to assess progress towards recovery



These are the five general elements of our conservation; as panther numbers are increasing, time and effort on addressing human-panther conflicts increases. Private landowners figure prominently in all of these aspects and are an increasing focus for conservation and recovery efforts.

Human Dimensions of Wildlife Management: Social Acceptance Issues

Interagency Florida Panther Response Plan

Florida Fish and Wildlife Conservation Commission
625 South Meridian Street
Tallahassee, FL 32399-1699

U.S. Fish and Wildlife Service
1875 Century Blvd.
Atlanta, GA 30345

National Park Service
100 Alabama St. SW
1924 Building
Atlanta, GA 30305



➤ Depredations on pets,
hobby livestock

➤ Depredations on
commercial cow/calf
ranching operations

➤ Concern that panthers
are reducing deer
numbers

➤ Fear of attacks

The FWC has worked with the USFWS, NPS and our stakeholders to develop and implement an Interagency Florida Panther Response Plan. Staff from all agencies follow the policies and procedures outlined in the Response Plan when negative human/panther interactions occur.

Ranching and Panthers

- Two year study by UF, funded by USFWS
- Looked at calf survival on two ranches
- Results varied between years and between ranches
- Average predation rate was 3%



University of Florida Master Candidate Caitlin Jacobs, under the direction of Dr. Martin Main, conducted a calf survival study on two ranches in Collier County from 2011-2013. Approximately 100 calves were tagged with radio transmitters each year on each ranch. The survival of the calves was monitored until they were shipped to market. Cause of death was investigated for those calves that died. The study was repeated a second year. This initial research confirmed that panther predation on calves is occurring and that impacts on cow/calf operations can be variable between individual ranches and between years.

Private Landowner Initiatives and Conflict Management

- Economic incentives for habitat preservation on private lands
 - Payment for Ecosystem Services
 - Safe Harbor
 - Habitat Conservation Plans
- FWC Human Dimensions Research
- Conflict management
 - Payment for livestock loss
 - Landowner and homeowner technical assistance



Landowner interest in Payment of Ecosystem Services programs is growing, both around specific compensation for Florida panther-related livestock losses and more broadly for the benefits of wildlife habitat that private ranches provide. The Panther Recovery Implementation Team has drafted a proposed Payment for Ecosystem Service Program aimed at landowners that manage lands that benefit panthers. This idea is being vetted widely with stakeholders. A representative of the U.S. Fish and Wildlife Service will provide a more detailed update following this presentation.

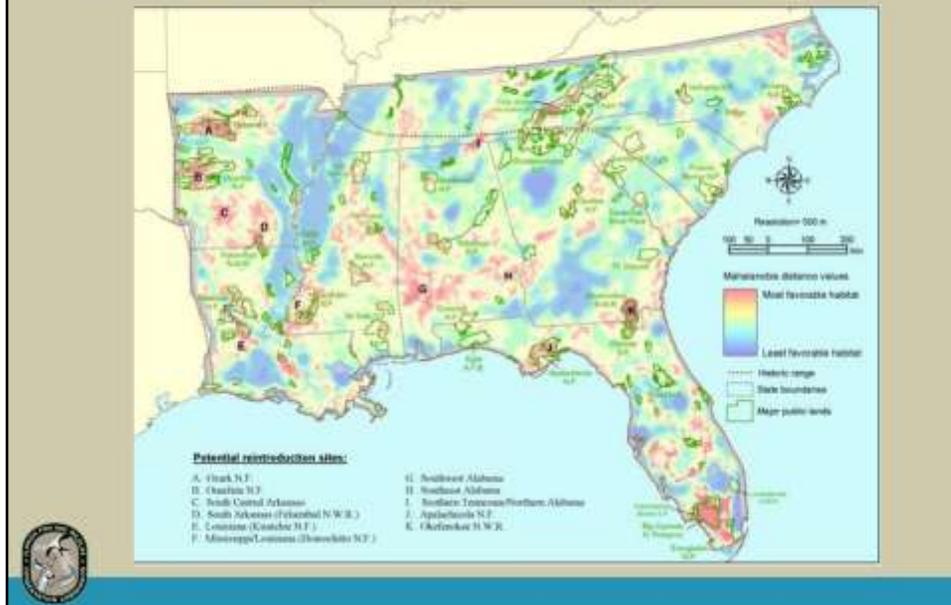
FWC has contracted with economist Dr. Elizabeth Pienaar (University of Florida) to investigate how and why different types of landowners respond to different panther habitat conservation incentives. The research is intended to provide insights into which incentives (financial incentives, regulatory relief and/or technical assistance) landowners prefer, and the potential costs of implementing these incentives. We are also in the process of exploring additional contracts with Dr. Pienaar to investigate other aspects on panther/human conflicts in the suburban and exurban environment.

FWC is investigating additional work with nationally recognized human dimensions experts to evaluate our communication strategies and determine how well we are reaching those who are experiencing conflicts with panthers.

This year the Farm Service Agency (FSA) is developing a livestock indemnity payment program that could apply to losses from panthers. This is a part of the new Farm Bill under the Department of Agriculture. This is a work in progress and FWC is coordinating with FSA in development of this program.

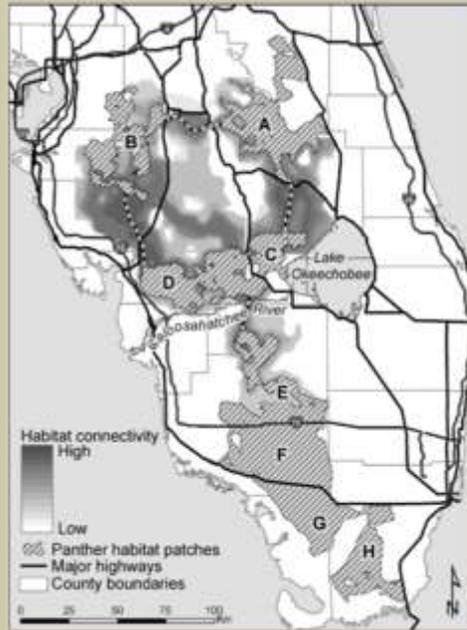
Non-governmental organizations also have programs aimed at addressing panther conflict impacts. The Conservancy of Southwest Florida has a program that provides partial reimbursement for verified panther-caused loss of calves occurring on small, family-owned and operated farms. The Conservancy and Defenders of Wildlife have also provided funds to cost share the building of protective panther-proof pens for hobby

Potential Panther Habitat in the Southeast



Individuals and teams have been looking for some time at possible panther habitat that would accommodate range expansion. Thatcher et. al published the accompanying map. The red areas have the highest likelihood of success of panther breeding populations according to his model. However, most work that focuses on potential panther range expansion has been through modeling; there is very little actual data.

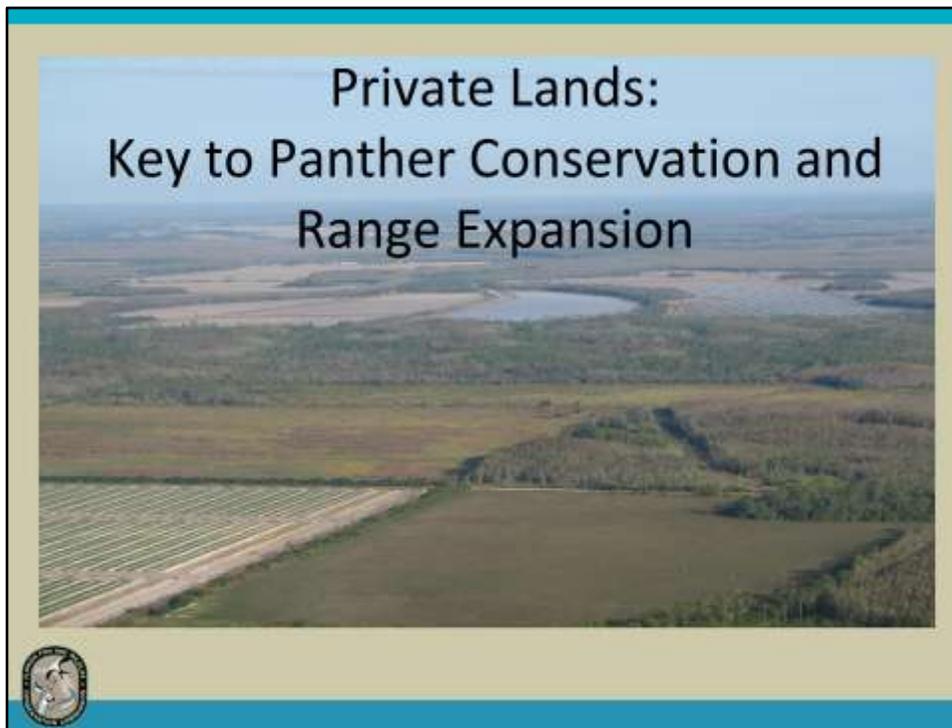
Potential panther habitat and areas of connectivity



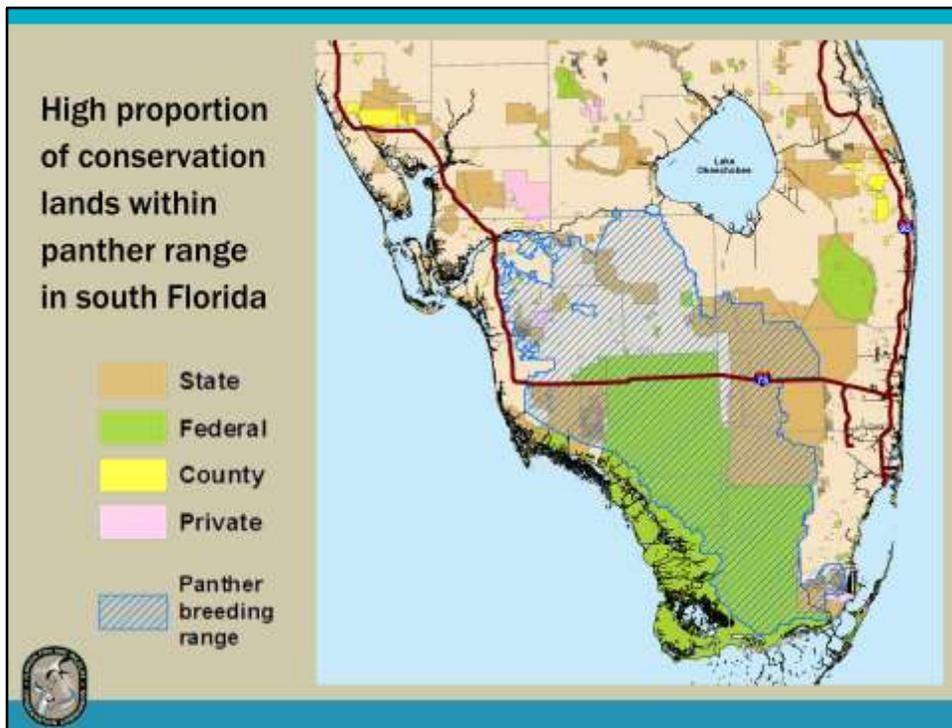
In Florida, areas have been identified that may provide suitable habitat, and potential corridors that provide connectivity between areas.



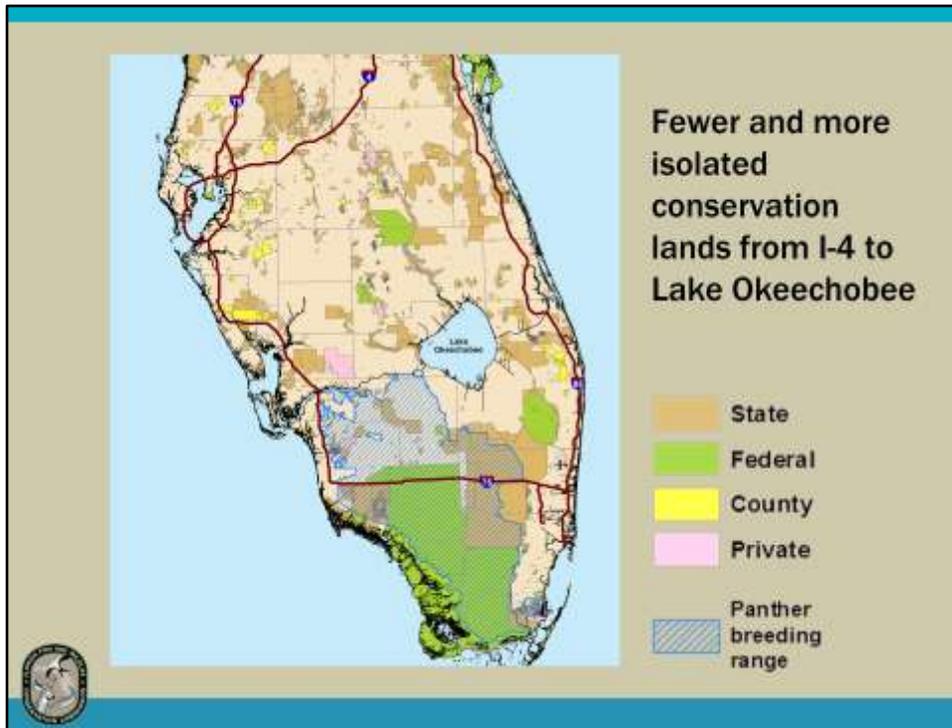
Currently panthers are found in 3 FWC regions and one individual even ventured into Georgia. However, there has been no verified cases of breeding (or presence of females) north of the Caloosahatchee River since 1973. Nevertheless, FWC biologists believe it is likely that panthers will expand their range into south-central Florida on their own. FWC is taking steps to prepare for that natural range expansion.



A single, viable panther population needs millions of acres of quality habitat and achieving the goal of three populations will take a combination of public and private lands, with a large majority of the need falling to private landowners. Therefore, private landowners will be crucial to panther range expansion and we must critically consider and address the challenges that private landowners face in accepting panthers onto their lands.



South of the Caloosahatchee River, there are significant acreages of conservation lands, shown in green, brown, pink and yellow. These conservation lands which are in State, Federal, County and private ownership form a large, contiguous block of quality panther habitat. Private conservation lands include conservation banks, or lands with permanent easements.



North of the Caloosahatchee River there is a much smaller footprint of conservation lands. The success of a panther population expansion northward will depend upon private landowners.

Human Assisted Range Expansion: Translocation or Reintroduction

- The decision to move panthers into other areas of Florida or other states rests with FWS
- FWS has no current plans to move panthers
- If moving panthers is considered in the future, a thorough public engagement process, including an Environmental Assessment would be conducted



The Recovery Plan calls for establishment of three separate populations of panthers and contemplates moving panthers into areas that were previously occupied by panthers. However any steps to relocate or reintroduce panthers must first be approved by the U.S. Fish and Wildlife Service. Larry Williams, USFWS Florida Field Supervisor, and Recovery Team Leader has indicated that there are no current plans to move panthers as a part of range expansion. Further, if plans are developed it would be a lengthy and completely public process. It is anticipated that as the population increases panthers will expand their range into central Florida without assistance, and perhaps beyond.



To summarize, FWC's research efforts are all intended to help inform management actions that lead towards the recovery of the species. Many times, specific activities serve multiple goals. For example, catching, examining and radio collaring female panthers contributes to the following:

- monitoring population health by checking for feline leukemia
- determining important habitat use and road crossings
- allows for future monitoring of kitten production and kitten health checks
- contributes towards population assessment methodology

Historically the majority of research on panthers has occurred on publically owned lands. FWC recognizes the importance of also studying and monitoring panthers on private lands and seeks willing landowners to provide limited research access to these vital private lands.

Panther Conservation Score Card

Successes

- ✓ Genetic restoration
- ✓ Improved panther health
- ✓ Population increase
- ✓ Wildlife Crossings
- ✓ Increased public awareness
- ✓ Increased scientific knowledge
- ✓ Land purchase & conservation banks

Challenges

- Panthers in towns and neighborhoods
- Depredations pets & livestock
- Decreasing habitat in S. FL
- Carrying capacity in S. FL
- Unrealistic population goals
- Sound population estimate
- Range expansion



Over the past thirty plus years we have had a number of successes, most important being that the population has grown and is not as precarious as when it was listed in the 1970s. Nevertheless, in some areas we have not been as successful, for example in developing a statistical panther population estimate. In addition, with our success has come new challenges in how to management potential conflicts with panthers.

FWC Priorities

- Statistically sound population estimate
- Conflict management and abatement
- Partnerships with private landowners
- Preparing for range expansion
- Maintaining panther population health



In conclusion, the history of the Florida panther has a trajectory common to many species; once abundant, it was persecuted almost to extinction and would have been lost but for an extensive and collaborative conservation effort by many parties. As panther numbers increase in South Florida, more effort is being directed towards reducing human conflict, developing landowner acceptance, and facilitating range expansion northward.

Much of what is known about panthers today, and much of our conservation success is a result of decades of research and management conducted by the Commission. However, as a federally listed species, ultimate authority for many decisions rests with the USFWS. This is true not only for biological issues but also in the area of conflict management and range expansion. To update the Commission on the recent activities of the USFWS and the Panther Recovery Implementation Team, Dawn Jennings, USFWS Panther Recovery Lead, will speak to the Commission following this presentation.