



Meeting Summary

RLSA Restudy Group 3 Policies Meeting Protecting Natural Resources – Part 2 *Emphasis on Panther and Listed Species*

May 24, 2018, 6:00-8:00 PM, North Collier Regional Park, Exhibit Hall

I Introduction

Speaker: Mr. Kris Van Lengen, Collier County

Kris Van Lengen, Collier County Planning and Zoning, opened the meeting at 6:10. He said the program will be different tonight because the working session will be sooner in the meeting to discuss thoughts about panthers and listed species. Mr. Van Lengen gave a brief introduction and welcomed Mr. David Shindle, Florida panther coordinator with the U.S. Fish and Wildlife Service (USFWS), and Dr. Robert Frakes, formerly with USFWS. He stated that questions for presenters can be fielded either during or after the presentations.

Mr. Van Lengen displayed the timeline for the Restudy process, stating this is the beginning of the process with workshop meetings scheduled through 2018, followed by Board of County Commissioners review followed by a public hearing process to the extent there is consensus on the recommended changes.

The next workshop meeting will be at a new location, at the South County Library (the address will be posted on the RLSA website). The topic of the August workshop will be Infrastructure and Fiscal Impact. For those who can't attend there is Facebook Live and Videos on Demand for remote attendance. The next meeting will bring in Florida Department of Transportation (FDOT), impact fee staff, people from the Metropolitan Planning Organization (MPO), and the Utilities Department staff to talk about how infrastructure works, how it gets extended to new towns and villages, and fiscal impacts.

Water Resources will be discussed in September, along with water quality, water quantity and the estuary health issues. Then discussion of sustainable development and the built environment (Policy Groups 4 and 5) will happen later in the year. Future meetings will be directed by the Growth Management Oversight Committee and ultimately the Board of County Commissioners. It is anticipated that the credit system will be trued-up and discussed at every single angle at that time, and facilitation and consensus building among stakeholders will be underway in order to make recommendations.

Facebook Live and video on demand is available for those up north or on vacation. Workshop summaries are available on the website. Workshop feedback is documented in the Feedback Tracker on the website, which captures all comments so far without attribution.

Mr. Van Lengen highlighted the outcomes of the last meeting. He said the last workshop revealed many 10s (i.e., high scores) in the importance of maintaining the integrity of the restoration sending areas, and the retaining and restoration of the habitat and flowway stewardship areas. Mr. Van Lengen highlighted comments received on the restoration program including: a rebalance of the restoration (R-1 and R-2) credit system, consider credits for water retention areas as part of the restoration program, base success criteria for restoration not only on water flow or exotic removal but also on desired wildlife outcomes, seek state and federal funding or grants, and create a timetable for restoration completion.

Mr. Van Lengen said the additions to the RLSA library are appreciated. He referenced the following literature that has been added: “How much is enough?”; Landscape-scale conservation for the Florida panther, R. Kautz et.al. (2006); Landscape analysis of adult Florida panther habitat, R. Frakes et.al. (2015); and Florida panthers v. Collier County, U.S. District Court (2012).

Mr. Van Lengen gave a reminder that the Rural Lands Stewardship Receiving Area (SRA) known as Rural Lands West is scheduled for a neighborhood information meeting on June 4 at 5:30.

Dr. Amanda Evans explained that the subject of panther habitat has come up frequently in recent months, so the group discussion session allows for discussion of the main comments and concerns of attendees. This helps make the best use of the speakers’ time because they will hear what the attendees’ concerns are and can address them in their presentations. Dr. Evans thanked the audience for rearranging seating to better distribute group size and diversity.

After a group discussion, the following comments were provided by representatives of each working group:

Blue Group

A primary concern is to preserve primary panther zone habitat. The group wants to identify where the primary and secondary areas of panther habitat are located. Preservation of sufficient and viable panther corridors for north and south movement is also a concern for the group.

The Blue Group is concerned about development currently planned in primary panther habitat. The Natural Resource Index (NRI) does not take into account the best available science. NRI science is based on 2002 data and needs to incorporate 2006 and 2015 studies.

This group asked three questions including: 1) Is there a commitment to panther recovery issues; 2) Are there enough wildlife crossings now and planned for the future; and 3) Will panthers survive the development in the rural lands stewardship area?

Wildlife crossings should be an important part of the environmental permitting process. Panthers being killed on the roads is a major issue. Wildlife crossings are not the only solution, other things can be done.

The Blue Group members want to know if there are pathways panthers have traditionally followed over the years. The permitting process should ensure that wildlife crossings are established, restored, and can be scientifically viable for the panthers and their paths. How wide must the panther corridor be to be viable for the panther, especially in the Rural Lands West development?

Grey Group

The Grey Group stated concerns about preserving habitat in Southwest Florida and Collier County with an emphasis on creating preserved lands that are contiguous and reducing fragmentation. This group suggested creation of buffers around habitats and planning for compatible land uses in proximity to habitats.

Multiple corridors should link major habitats instead of one main corridor. The group members questioned the adequate width of corridors and asked if corridors should be virgin or if other buildings and structures would be allowed in corridors?

Specific questions for the speakers include: 1) What are the specific parameters for corridors and human activities nearby; 2) What will motivate USFWS and other agencies to mitigate for habitat destruction; and 3) What is the difference between primary and secondary habitat?

The Grey Group presented two topics to address during public outreach and education including: 1) how to live with panthers relating to livestock and pets; and 2) how to react when encountering a panther?

The group stated that with eighteen listed species including birds and reptiles, wetland preservation should be a major consideration in the rural lands area.

Yellow group

The Yellow Group presented four topics of importance to the group including: preserving habitat, connectivity, road mortality, and human/wildlife interaction in Southwest Florida. Because Collier County is a core area for panther habitat, there are preservation issues in light of development and growth. The same four issues above pertain to specifically to Collier County.

During the permitting process, avoidance and minimization of panther impacts should be a priority. In addition to roadway underpasses, signage, fencing and onsite mitigation efforts are needed as protection measures.

Roadway design in the RLSA should consider other and smaller listed species besides the Florida panther.

Purple Group

The Purple Group identified their top three concerns related to the panther in Southwest Florida as: 1) connectivity, maintaining corridors, and increasing genetic diversity; 2) protection of appropriate habitat to support the species; and 3) advancing science, investigating predator-prey ratios, and preventing interactions with humans such as those involving starving cougars out west.

Issues relating to the Florida panther in Collier County include that the open lands designation should be revisited in relation to appropriate areas for development. Increase the amount of panther collars to increase data sets for analysis of habitat use and population levels as habitat changes over time so it can be adaptively managed.

The environmental permitting process should consider avoiding impacts through creating less towns and more density. The best biological data should be used during the environmental review process. Also, the environmental permitting process should be enforced, specifically regarding cumulative impacts.

Management and enforcement of invasive species management will subsequently support native habitat and wildlife.

Brown Group

The Brown Group's top concerns for the Florida panther include: preserving habitat, mortality, corridors, and genetic diversity. Primary and secondary panther habitat areas need to be recalibrated over time. These areas were defined over ten years ago and should be updated.

Collier County should expand the use of panther corridor crossings. Primary panther habitat should be off limits to development. Panther habitat should connect with the stewardship areas and corridors. Set the lands aside and dedicate that land so it cannot be developed. Collier County needs improved Stewardship Sending Area (SSA) linkages. What are the optimal solutions to the interface of development and wildlife?

The Brown Group further stated that protection of panthers aids in the protection of a large number of other listed species, with the exception of the Eastern indigo snake and Florida black bear.

The Brown Group advocated for following the USFWS Department of Interior recommendations on the Habitat Conservation Plan (HCP) by determining areas for wildlife crossings first and then

using a planning approach to locate towns accordingly. This approach is supportive of panthers and might extend the panther's life.

The Brown Group members asked when should Collier County reevaluate the primary and secondary habitats, and stated that development planned in primary panther habitat is at odds with the best science available.

Black Group

The Black Group identified these three main concerns: preserving panther habitat, decreasing road mortality, and providing education for new residents.

The Black Group presented questions for the speakers including: 1) How many panthers are typically radio tracked; 2) where are the panthers most concentrated; 3) What pathways do panthers use most often; 4) How do wildfires impact panthers; 5) How do they return to the area after wildfires; 6) Are new developments required to adopt infrastructure that addresses panther safety; 7) What is the most effective infrastructure at keeping panthers safe (fences, underpasses, signage, corridors); 8) Has there been any discussion or ideas on the interface between development and the remaining natural area and what makes a good buffer between those two areas; and 9) What are the best ways to create new preserves in the RLSA whether it be federal, state or local ownership?

Mr. Van Lengen introduced the presenters, noting they will do their best to address questions. Presentations have been prepared by the experts and the areas of concern presented from each group will be emphasized. The first speaker is David Shindle, a Florida Panther Coordinator with the USFWS. Mr. Shindle has 24 years of research experience involving cat species in New Mexico and Texas. He moved to Florida in 1998 and became the lead field biologist for panther research and monitoring associated with the Florida panther. Mr. Shindle has worked for the Conservancy and is a certified wildlife biologist.

Speaker: Mr. David Shindle, U.S. Fish and Wildlife Service

Mr. Shindle said he used to capture cats, and now he herds cats. He is able to touch on most questions that were asked. Mr. Shindle gave a quick overview of past and present panther recovery because perspective is important. He will talk about challenges and threats to the panther population any time development or conservation occurs. He will give a quick overview of the USFWS processes in place and what is being worked on.

Mr. Shindle gave perspective that the Florida panther has the widest distribution of any mammal in the western hemisphere. The range formerly spanned across the United States. They need large prey, large spaces, and the minimal human intrusion possible. The primary prey for the Florida panther is deer and hogs.

The question of taxonomy is a hot topic. Panther is a listed sub-species by the USFWS under the Endangered Species Act. The sub-species classification is based on earlier classifications and a low number of specimens (approximately 17), including skull morphology, pelt color, and things like that. New genetic science supports recent recolonization of the puma in North America. It may not be a sub-species classification under that analysis incorporating genetics. There is a proposal for a single North American sub-species. More recent work by a group of experts (Cat Classification Task Force) involved systematically looking at all cats even further and a revision is proposed for a single North American/Central American/South American puma. How the USFWS will address a new classification will be reviewed later in the presentation.

Historically, many large carnivores were subject to exportation by Europeans. The panther's prey was heavily exported including 250,000 pounds of deer hide from Pensacola and Mobile in 1771. Even with only a few panthers in existence, in 1968 the Florida panther was still considered a detriment to livestock.

In the early 1970's experts didn't know if panthers were still in Florida, but 10 individuals were surveyed south of Lake Okeechobee by the World Wildlife Federation (WWF). The Florida legislature named the panther as state animal in 1982.

The future of the Florida panthers was not looking good and showing signs of inbreeding and depression with only 20-30 animals in the 1980s. In 1995, cats were brought from Texas to enhance genetic diversity and it was a successful project. The panther population has been increasing with an upward trend. The project resulted in a healthier population and healthier animals, both genetically and physically. Mr. Shindle displayed a telemetry location map differentiating locations of male and female panthers which indicates geography of the well-studied panther population.

Mr. Shindle said a lot of the habitat questions can be answered by the next presenter. A lot of information is known on preferred panther habitat. Different models are based on different parameters and cohorts of the panther populations. He displayed a map depicting the Primary, Secondary and Dispersal Zones for panther habitat. He noted that panthers are really resilient animals. They use a wide variety of habitat types, and agriculture lands are important for panthers. The USFWS is figuring out how to use the best available science. Additional sources of data are also considered. Females and kittens show up outside of the Zones and although it's not ideal habitat, it does show where connectivity areas are where transient animals are supported.

Private lands, including working ranch lands, south and north of the river, provide excellent panther habitat. Balancing ranch property rights for owners who provide the habitat and finding a way to compensate for the panther impacts is a challenge. Being smart about the growth of Florida is important, and it's the undercurrent of all these workshops.

The Habitat Conservation Plan (HCP) is a hot topic and has impacts to the RLSA overlay and eastern Collier County. Bruce Johnson with Stantec can answer questions about the HCP. The USFWS role is to draft the Environmental Impact Statement (EIS). Chuck Kelso is the lead biologist on that project. You can contact Chuck or check the website for updates on the EIS. Questions on the HCP, which is a landowner plan, can be directed to Bruce.

Mr. Shindle noted that a lot of questions were asked about how to live with panthers. The increasing panther population trend tracks accordingly with the frequency of road kills. The frequency of road kills is not the best way to count panther population, but is an indicator of an expanding population. Expansion of the breeding range is illustrated by the expanding range of female road kills over time. Mr. Shindle noted it is surprising that the Golden Gate Estates area supports breeding female cats and their kittens. Vehicular mortality threats for panthers can be ameliorated and mitigated with wildlife crossings and innovative tactics. Mr. Shindle displayed a map depicting current wildlife crossings in place, with many south of the river along I-75. For example, modifications under an existing bridge along Alligator Alley, along with fencing, helps create wildlife crossing opportunities that are useful for panthers.

Challenges of future recovery and growth management include habitat loss and population growth. The 2070 human population projections are extreme, and it shows the challenges for Floridians in the future. Moving north will be tough for panthers, so keeping the landscape permeable is important.

In reference to grizzly bears but still applicable to panthers, Chris Servheen said “...habitat is more than just space on the ground. It’s the level of human acceptance that exists for them.”

Large carnivores should be part of any planning process when people are being placed in close proximity to large carnivores. How will people and large carnivores coexist? Workshops are presented about “living with panthers” and it’s all about “living with people” in hopes that panthers will figure things out. If you build in panther habitat then expect to see panthers.

How the puma operates out west is no different, and there is a lot to learn from innovative approaches to puma management and interactions. Florida’s approach is unique because the Florida panther is a listed sub-species under the Endangered Species Act.

Mr. Shindle explained that panthers have been documented to eat wildlife and pets. Panthers have not attacked people in Florida, however these cats have killed and injured people on the west coast. A lot of agency efforts are driven to make sure humans can coexist with the animals and be proactive.

An Interagency Florida Panther Response Plan is in place as a guide for how to respond to interactions, categorization of sitings, encounters, threats, or attacks. Categorization of human-panther interactions is in the eye of the beholder based on experience, but the Florida Panther

Interagency Response Plan does define interactions as sighting, encounter, incident, threat and attack.

Mr. Shindle displayed a map showing panther depredations in the Golden Gate Estates area, indicating a clear collision course of panthers and people. Many other occurrences are reported by private ranch owners that choose to report cat depredations more than others. The map does not display all depredations, and it's becoming more important to focus in the exurban zones.

Typical or basic fencing does not detour panthers. Securing pets and animals in predator-resistant enclosures is important. Defenders of Wildlife and the Conservancy of Southwest Florida contribute time, money and effort to reduce panther-human conflict through programs such as the Pen Building Assistance Program.

Innovative approaches are working. For example, Mark Danaher uses a Shepard that responds when carnivores come outside his fence.

The big issue in eastern Collier County is impacts on cattle ranches. Young calves are often prey for panthers. How panthers hunt, catch and kill their prey is a challenge for ranchers. When panthers catch their prey they hide it from scavengers and other predators, making it difficult for ranchers to document their losses. One example in the presentation depicts the path a panther dragged a calf across a pasture, road, fence, and ditch for 350 meters under dense cover. Efforts are underway to help with this problem. The current program relies on finding the animal to verify the loss was due to a panther, and finding the lost animal is difficult. USFWS is working with the Farm Service Agency (FSA) to pay a percentage of loss, but it is not going too well. The program was designed to compensate for the loss for a listed species. In the past, ranchers would take care of the problem on their own. An incentive is needed to provide for the loss in a different way.

Mr. Shindle showed example photographs of panther sightings and encounters in Corkscrew Swamp and Port Royal. He explained that not all panthers can be relocated. If a panther exhibits threatening behavior to a human, the cat cannot remain in the wild. For example, FP243, a panther in Farmworkers Village south of Immokalee frequently came out in the middle of the day and was taking cats and dogs. The panther was not showing threatening behavior, but it was not the behaviors people want to see. FP243 was relocated south to Big Cypress. He moved far south and settled in Big Cypress Seminole Indian village. He continued exhibiting similar behavior, going to people's homes and removing cats and dogs from people's front yards. That specific panther is now part of a zoo. Physical habitat is not the only factor; people must consider how to live with these animals with less space and more people.

Mr. Shindle summarized that social intolerance is a common theme for large carnivore recovery driven by the previously mentioned threats. Some panthers are found dead with multiple gunshot wounds. The Naples Zoo does an excellent job of educating the public on coexistence and the challenges of living with panthers, as well as opportunities for large carnivore restoration.

Mr. Shindle explained that the Florida Panther Recovery Plan has the same goal as most recovery plans: to achieve long term viability so the species doesn't need to be listed as a threatened or endangered. Achieving that goal is a challenge, but several measures are used including having three viable self-sustaining populations of at least 240 individuals established for a minimum of twelve years. More populations are needed outside of south Florida. The panther issues addressed in south Florida also need to be handled in north Florida and elsewhere. South Florida needs to improve on living with panthers, management, smart growth, setting aside habitat, and compensating private landowners who provide habitat.

The Florida Panther Recovery Implementation Team includes members that represent private land owners, sportsmen, ranchers, conservation NGOs, and federal agency representatives. The team also formed sub-teams with experts in various areas such as vehicular mortality, inventory and monitoring and recovery criteria. Vehicle mortality is always a hot topic.

The transportation sub-team is a group of experts that look at better ways to design wildlife crossings, where they should go, and they put data together that provides guidance so the USFWS can make good recommendations and consultation. This sub-team has identified roadway hot spots based on the number of roadway kill locations. When a crossing or fencing is implemented, the hot spots are cooled down or resolved.

Mr. Shindle referenced questions on how to count panthers. Existing recovery criteria proves to be challenging messaging because the Florida panther is hard to count, especially with any statistical precision. How do you know when you get to the recovery goal when the panthers are hard to count? Camera grids and spatial models are better ways to count panthers. The USFWS staff hope to get to the point of not needing to collar animals because they would rather do it less invasively. One of the published statistically-defensible range-wide population estimates by Dave Onorato is based on roadkills of panthers with radio collars and looks at collective information to estimate the number of panthers. The Recovery Criteria sub-team also estimates populations by looking at adult female survival or other measures to verify there is a viable population of panthers.

Another priority of the Florida Panther Recovery Implementation Team Work is making panther recovery compatible with ranchers and sportsmen by looking at incentive programs. When setting aside land for conservation and recreational access, sportsmen are an important stakeholder group. Mr. Shindle recalled earlier issues with access in the Big Cypress Preserve. Private owners, sportsmen or advocates may disagree, but there is a shared purpose. Finding the shared purpose is key. Sportsmen prefer large contiguous areas to recreate. A healthy deer population is a common goal for sportsmen and panther recovery. Working ranchlands are supportive of the common goal of panther recovery.

A five-year status review of listed species is required as part of the Endangered Species Act. The status review looks at the present state of the population, threats, and conservation efforts. At the end of the review, the USFWS makes recommendations about the classification status of the

panther (endangered, threaten, or delist). Delisting could be due to recovery or new information on taxonomy. The assessment is underway now. The science behind the five-year review is the Species Status Assessment (SSA), which looks at the species needs, current status of the population, threats, and conservation measures in place, and then projects into the future looking for scenarios to obtain a viable population. The goal is to meet objectives of resiliency, redundancy and representation. These documents inform all USFWS decision documents. The SSA will inform the five-year review that is being worked on now, and part of the SSA will assess best available science on the topic of taxonomy with considerations for morphological analyses and more recent genetic analyses. The SSA does not provide a recommendation, but provides all information on the best available science on this topic. Mr. Shindle said a petition to delist the panther based on taxonomic error is a likely outcome.

Range expansion and panther recovery is occurring naturally. Female panthers are documented along the Caloosahatchee River. The river is not a barrier, it may be an impediment but panthers do swim. Females don't disperse far from their mothers. A wildlife crossing was put in on State Road 80 and easements were secured to help facilitate crossing. Females are north of the river for the first time since 1973. Two female panthers are at Babcock Ranch, and one female has had two litters. It's encouraging natural range expansion. Other panthers have been documented at Platt Branch. Range expansion is occurring naturally and it's very encouraging. Cats have also gone outside of Florida. The book *Heart of a Lion* by William Stolzenburg is about a cat that traveled to Connecticut. Males can disperse a significant distance. Cougars have been documented in Tennessee.

There is a lot of support for the panther, which can be seen by the support in this room, Uno Ale brewery, the Florida Panthers hockey team conservation night and Protect the Panther license plates. Mr. Shindle concluded that globally, exurban areas are where the panther needs to be.

Mr. Van Lengen thanked Mr. Shindle for the abundance of information. He said it's important to move to the next speaker and then have time for questions, and if more time is needed the meeting can extend longer. He introduced Dr. Robert Frakes who has a PhD in eco-toxology and was the Maine state taxologist for seven years. Dr. Frakes was a wildlife biologist with the USFWS for 22 years starting in 1992. He worked with several listed species including the Florida panther, keydeer, snail kite, and peregrine falcon. He helped developed the original panther habitat assessment methodology panther tool in the early 2000s and more recently developed a new panther habitat model intended to provide better scientific basis for panther conservation decisions. Like Mr. Shindle, Dr. Frakes has also participated in many peer reviewed publications.

Speaker: Dr. Robert Frakes, (formerly) U.S. Fish and Wildlife Service

Dr. Frakes stated that the questions raised from the attendees were excellent. Some will be answered by the model, David can answer some of the questions, and some questions cannot be answered because no one knows the answers.

Dr. Frakes explained that the model being presented, PLOS One, was published in 2015 and the report is available online. The model is at the PLOS website for anyone wanting more details.

The Species Distribution Model (SDM) is specifically for the Florida panther in south Florida. The model cannot be used elsewhere as it is unique to this area's characteristics. The model is a random forest model which is a powerful statistical classifier used in a lot of applications outside of the USFWS. The model uses presence/absence design based on telemetry points to identify areas where panthers are present or absent. The model then analyzes the landscape characteristics in those areas to make predictions. The landscape scale model uses a resolution of one square kilometer which is a little over 200 acres. The scale is appropriate considering the large range of panthers.

There were fifteen explanatory variables in the model including land cover types, forest edge, human population density, road density, dry season water depth and wet season water depth. The model predicts the probability of presence in each grid cell.

Dr. Frakes said the model can be used for evaluating the impacts of proposed developments. The model can be used for prioritizing areas for panther conservation when acquiring land, putting an easement on the land or evaluate the best area for conservation. Another application for the model is identifying areas for possible panther reintroductions. A statewide model is in development to quantify panther habitat throughout Florida based on model results to help identify suitable places for the panther to be relocated. The model can be used to evaluate impacts by sea level rise and changes in hydrology.

The study areas extends to a ten-mile buffer around the panther primary zone. The study area was divided into one square kilometer grid cells, so there are 16,600+ grid cells in the area. The presence and absence part of the model is based on telemetry data from 2004-2013. The date range was chosen based on the available landscape data. Only adult panther data was used; transients, juveniles or subadults were not included. There are 25,000 telemetry points representing 87 panthers comprised of 55 females and 32 males.

Dr. Frakes showed a map of the ten land cover variables showing that the study area is two-thirds wetlands, which is unusual for cougar habitat. The model gives priority to wetlands because it better helps identify where the panthers are. Each cell in the study areas has a value for each of the land cover types. This data goes into a spreadsheet for the model to analyze. Other variables include forest edge, hydrology, human population density (from the 2010 Census) and road density. Most of the study area is uninhabited, but there are some higher density areas.

Dr. Frakes showed what the model output looks like. The model predicts probability of presence in each grid cell as a number ranging from 0 to 1 broken up into five intervals. He showed a map depicting the probability of presence from low to high. Using this output and a cutoff threshold, a map is generated to depict the remaining adult panther habitat in south Florida. The model

prediction matches up fairly well with a majority the primary zone. Some of the primary zone is not good panther breeding habitat, such as water conservation areas, Shark River Slough and Everglades National Park. The secondary zone contains very little panther habitat, but is still useful for transient panthers, connectivity to other areas and potentially for restoration. However, very little breeding habitat is available in the secondary zone.

Dr. Frakes explained that the software gives an estimate of variable importance based on accuracy and Gini index. Variable importance is highest for wetland forest per the model. The second highest variable importance was human population density, which helps conclude that panthers like forests and don't like to be near people. Dr. Frakes said it was surprising to see how important human population density is for determining panther population location. Forest edge was the next variable of importance, followed by hydrology variables. All fifteen variables were maintained in the model to retain accuracy.

Sensitivity analysis of the individual variables indicates the effect of each variable on the model's output. Dr. Frakes illustrated how population density was an important variable, showing that there is a dramatic drop or 20% reduction in panther presence probability as people are added to a grid cell. An increase in wetland forest increases the probability of panther presence.

Dr. Frakes presented a graph displaying the average probability of presence in Florida panther home ranges. The graph showing home range values of 87 panthers that were in the study. No panther home range had an average P value below 0.4, and about half the panthers had a P value above 0.8. This data is important in selecting habitats for panther reintroduction or protection. Good panther habitat is any area that scores a high probability value.

Dr. Frakes presented the summary of the model results. Over 5,500 square kilometers of breeding habitat was identified in south Florida, which is significantly less than previously estimated. The USFWS panther tool called Panther Habitat Assessment Methodology is based on how much panther habitat remains in south Florida. The tool assumes much more habitat exists, which needs to be changed. Dr. Frakes' model supports the current Primary Zone except for the three previously mentioned areas (water conservation areas, Shark River Slough and "witch's finger"). The Secondary Zone contains very little adult panther habitat, only 3.8% of the total. The most important factor to determine panther presence is forest cover, human population density, amount of forest edge and water depth. Panther home ranges have a probability of presence value of 0.4 to 1.0, with a median of 0.8.

Dr. Frakes said his report lists recommendations, and the most important conservation recommendation is protecting the remaining breeding habitat. Movement corridors also need to be protected. This was recommended in 2006 by Randy Kautz. Dr. Frakes said he is making the recommendation using density figures from literature indicating there may not be enough breeding habitat in south Florida to maintain a viable healthy population of panthers in the long

term. He said we need to protect the remaining breeding habitat because all future panthers will come from the existing habitat.

Dr. Frakes said the next recommendation is to revise or replace current Panther Habitat Assessment Methodology (“panther tool”). The tool assumes more habitat is remaining than what is available. The tool assumes that the Secondary Zone is two-thirds as valuable as the Primary Zone, and assumes another zone is one-third as valuable as the Primary Zone. Dr. Frakes argued that the Secondary Zone is not nearly two-thirds as valuable as the Primary Zone. When those numbers are calculated, there is an inflation in the amount of panther habitat available and an underestimate of the compensation needed. The calculation inflation and underestimation has been going on for years and needs to be investigated.

The third recommendation directly from the Recovery Plan is to establish additional panther populations north of the Caloosahatchee River. Dr. Frakes is working on a statewide model to identify good locations to establish additional panther populations north of the river.

Dr. Frakes ran a model focused on the RLSA and surrounding areas. The model predicted habitat values showing good panther habitat is left in the RSLA boundary. Dispersal corridors are seen on the model that link to CREW, which is marginal, and another dispersal corridor toward OK Slough. GPS data from Dave Onorato shows almost a perfect match with the predicted panther habitat from the model. About 97% of the GPS points fell within the predicted panther habitat areas estimated from the model. The best way to check model accuracy is to use data from outside the model.

Dr. Frakes ended his presentation and invited the audience to ask questions. Amber Brooks with the Conservancy of Southwest Florida asked about a timeline for the SSA and HCP because those efforts would be relevant to the County’s process. Mr. Shindle said the EIS and HCP is in process. Everything in the Service is on an accelerated schedule, including the EIS. The SSA and completion of the five-year review recommendations are anticipated generally in summer of 2019, which is a general idea of the timeline and can’t be guaranteed. The SSA will go out to peer review which adds a bit of time. The SSA is the body of the background of the five-year review and recommendations.

An attendee said the model and GPS points show a clear indication of the panthers and where they are located, and asked if this data is being incorporated in the process for decision makers to consider? Mr. Van Lengen responded that the restudy is to gather information, and all information will be considered regarding new standards and incentives. The map will definitely be part of the package.

Mr. Van Lengen asked about prey-based studies, noting that there are different prey species in the east zone, and will the different prey base raise a concern in the future? Mr. Shindle responded prey density and availability is a big issue. Prey availability is a component of panther

habitat. The big decline of deer population in the southern areas of Big Cypress National Preserve south of U.S. 41 is likely due to hydrology, water releases, and the increasing native (panther) and non-native (Burmese python) large predator population. Availability of prey is a social issue because people assume the issue is caused by the panther. Habitat improvement and burning can help ameliorate prey decline. Mr. Shindle added that the University of Georgia and FWC is conducting a south Florida deer study to examine deer dynamics in south Florida across three study areas to find better ways to monitor the deer, and to look at factors affecting deer survivability including impacts of the panther.

Brad Cornell asked about the issue with compensation to ranchers for depredation. Is the problem that ranchers are not interested in the program or funding sources? Mr. Shindle replied that the Conservancy of Southwest Florida will compensate for calf losses. The issue isn't funding, but rather the roadblock is the design of the system that requires verification of loss, verification it was due to a panther, and basis of the losses on a percentage criterion. Changes are required to the farm bill and down. The rules are tough and can change. It is required to establish a beginning inventory based on pregnancy checks which is costly, the inventory at time of sale, and then calculation of loss. In the past veterinary checks was an acceptable measure of inventory. Three applications were denied this year because the veterinary pregnancy verification method is no longer acceptable. This drives frustration and the program doesn't work for ranchers. Ranchers must provide so much documentation and then the payment is only 75% of the loss. It's necessary to design a new program. A collaborative approach might work similar to the coexistence councils. For example, the Mexican wolf livestock coexistence council is a group of stakeholders including agencies, NGOs and ranchers. They use funds from the Livestock Demonstration Project Fund allocated by Congress. The council makes their own rules and pays out based on the criteria they set. The new budget has language for the wolf livestock demonstration project legislation including the option to evaluate this program for the panther. This program involves collaborating with the state, which is not a problem.

Mr. Shindle added that the FSA Livestock Indemnity Program will always be available. The issue of the panthers snatching money from the ranchers' pockets needs to be addressed. Mr. Shindle advocates for building rancher receptivity. Ranchers north of the river are watching what is happening in south Florida with the lack of compensation and incentives.

An attendee mentioned water recharge, noting the panther preserve is already in an impaired watershed. There is so much development in the priority panther habitat. The information presented by Dr. Frakes suggests there is far less priority panther habitat than originally estimated. Issues with ranchers, development pushing panthers to ranches, and development creating less food sources is a recipe for disaster. The situation looks very grim.

Mr. Van Lengen ended the meeting at 8:15. He thanked everyone for their participation and invited attendees back for the next meeting at the South Library.