

# FLORIDA PANTHER POPULATION DYNAMICS IN SOUTHWEST FLORIDA

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We have been monitoring Florida panthers since 1981 with radio telemetry. I would like to just briefly spend a few moments going over how we capture panthers, what they have done and what we have learned about them during the last fifteen years.

You just don't walk out in the woods and find panthers perched up in trees. We have to do a little bit of work to put them up there. Roy McBride has shown us how he does that throughout the world using some of the best dogs in the world. But it is basically what you have already seen before. We go out looking for panther tracks to verify sign in an area that we may want to hunt. That sign can also be in the form of panther scrapes. We will be up usually before the sun rises, looking for fresh panther sign.

When we find an area where we want to pursue panthers, we will call in the professors (hounds) to come in and help us verify the sign that we have seen. And sure enough, they know how to put panthers up a tree. After that, one of the first steps is to ensure the safety of the cat. Walt McCown and others developed a wildlife cushion that enables us to safely remove the animal from the tree and cushion its fall if it were to fall. It is essentially a bag with baffles that we fill with lung-power inflated garbage bags.

Once the wildlife cushion is in place, Roy will select his best location for darting the animal. When everything is ready, he will shoot the dart into a large meaty area of the cat, typically the hip area. A few minutes later, the cat will either tumble out of the tree and fall into the net and crash bag, or if the cat decides to hang up, somebody will go up the tree and tie off the cat and lower it to the ground.

Once the cat is safely on the ground, it is subjected to a lot of different measurements and evaluations and has a radio collar placed around its neck. The cat also receives a thorough medical evaluation. Specimens are collected for laboratory analysis. The cat is then released.

A lot of people might think that the work is over after the capture, but it is only just begun. From this point, the animal is wearing a radio collar that enables us to track the animal wherever it may go. We use an aircraft to do that. Typically the antenna is affixed to the wing strut of a Cessna 172.

Since 1981, we have collected over 20,000 locations on 56 Florida panthers (Fig.1). Radio-collared panthers have ranged from Glades and Highland Counties down throughout the entire southwest Florida area, almost to the Atlantic Ocean, down in Everglades National Park, up through Big Cypress, Fakahatchee Strand, Florida Panther Refuge and private lands in Hendry and Lee County.

Looking at a large scale map with location points identified, you can not tell a whole lot about how individual cats behave. But when you start looking at it on an individual basis, some real neat things start to fall out. Figure 2 sheds light on home ranges and how there is overlap. The two largest home ranges represent male panthers number 12 and 26. There is very little range overlap between these two males. But each male's home range encompasses several different females. That is one of their prime objectives, staking out a nice territory so that they will have the opportunity to interact with as many females as possible.

We have also learned quite a bit about panther food habits. We have collected scat from throughout the range of the radio-instrumented segment of the population. We also often find deer and hog carcasses covered with vegetation and debris, typical of panther kills.

Florida panthers are preying primarily on four or five main species: feral hog, white-tailed deer, raccoon and armadillo, and occasionally rabbit (Fig.3). About 90% of their diet is of the big four: hogs, deer, raccoon and armadillo. Where hogs are abundant, some panthers will prey almost exclusively on them. But deer are probably the most consistently eaten prey item throughout the current panther

range, because deer are the most consistently distributed animal. Feral hogs tend to thin out where you have a lot of surface water. So deer are probably the most important prey, range-wide, for the Florida panther.

Lets look at panther mortality. It seemed for a long time that panthers only died as a result of collisions with vehicles. So you just needed to pick up your daily paper, go to the road kill section and see how many died yesterday. But this kind of sampling technique is very, very biased, because you are not going to find the panthers that are not wearing radio collars that die out in the middle of nowhere. But if they are lying on the shoulder of a road where you have hundreds of people passing them every day, they are being found and reported. Which brings up another point that has been recurring here all morning about the distribution of Florida panthers. The occurrence of road-killed panthers is probably the best method for determining where panthers are. If there is another population of Florida panthers anywhere in the state, we are going to be scraping them up off the roads. The only place you will find road-killed Florida panthers is south of the Caloosahatchee river. They are just not occurring anyplace else. Chris Belden and Walt McCown, following the cats that were released up in north Florida in the reintroduction work, have had a few cats hit by vehicles. So it certainly points out to me that this is a most incontrovertible method of determining where panthers occur.

If we look at statistics on causes of mortality among radio collared panthers, we find that panthers killing panthers is the number one cause of death (Fig.4). This is primarily adult males killing juvenile males. But we have encountered males that have killed females, and then younger cats killing older males. Road kills are responsible for approximately 20% of known mortality, but all natural causes far exceed the road kill mortality of panthers.

We have also been able to document quite a bit of breeding in Florida panthers. We have cats that are very good producers, and some cats that have never been documented as reproducing, but overall, most adult females are producing kittens every other year. They are producing, on average, about two and a half kittens per litter. There is a real seasonality to when litters are produced, it is primarily in the late spring and early summer (Fig. 5). But it certainly is not uncommon to find panthers denning throughout the year.

So, how does the Florida panther and its population match up to other populations? Does it look healthy compared to cougars out west? And do we have causes for concern with the Florida panther? There was a recent article that just came out in the Journal of Wildlife Management that was looking at the population of cougars in Utah. I was very struck by the similarities between an un hunted cougar population in Utah and some of the statistics that we have been able to come up with for panthers in Florida (Fig.6). When you look at the average litter size, it's almost identical. When you look at the earliest age for documented female reproduction, it's almost identical. The average age at first reproduction is almost identical. The litter sex ratio, again, almost identical. And the loss of resident cats in both population is low. One thing that stuck out in my mind was the male dispersal distances. In Florida, male dispersal distances are approximately half of what they experienced out in Utah. What that tells me is we are working on a very limited habitat base, and the young males are not able to disperse the way they do out west. And that has a lot of ramifications, particularly in the realm of genetics of the population. Cats out in Utah are sharing genetic material across hundreds of miles, and yet in Florida, they do not have that opportunity. It's all within the same isolated population, because of the limitations to male dispersal.

So, do we need to relax and feel good about where panthers are today? No we do not. As we will be discussing later on in the conference, one of the major hurdles is going to be the habitat issue. We are taking proactive steps right now in reducing road kill mortality, as shown by a talk later on in the conference about modifying roads to be safer for people, as well as for animals. We are also trying to address the genetic question by restoring the gene flow between the Florida panther and other cougar populations that would have been occurring naturally with dispersing cats. We are hoping to get that program off this

upcoming year. So that helps us to narrow our focus, to getting back to the habitat issue, making sure that we leave enough space in Florida for Florida panthers.

## QUESTIONS:

*UNIDENTIFIED PERSON:* (Inaudible.)

*MR. LAND:* Well, they were in there. They were in there as "other" causes of mortality.

*UNIDENTIFIED PERSON:* The question is not worth all this effort, I guess. You showed us a fairly short dispersal distance. Yet Chris Belden has records on up Kissimmee and St Johns Rivers. How do those individuals get there if you have not documented that movement?

*MR. LAND:* Those are average distances that I showed.

*UNIDENTIFIED PERSON:* Have you ever had one that you tracked up into that area?

*MR. LAND:* We have never tracked one from south Florida, crossing the Caloosahatchee River yet. But we did catch a cat that was of that age north of the River in Highlands County. Whether he came from a female up in that area, we do not know. If there was a small breeding population left in that area, then those cats on the St. Johns could have very easily come from that area. I think with those young males, they are likely to continue to go until they find other panthers. If they go the wrong way, I would suspect they will just keep on going. And I think Walt McCown and Chris Belden, when they talk about their current efforts up in north Florida, they have cats apparently headed to the Carolinas that were released in Florida. This will certainly provide some evidence that cats might go as far as they can.

*UNIDENTIFIED PERSON:* (Inaudible.)

*MR. LAND:* Well, I think he's just referring to, what is always going to be inevitable, that whenever you handle a wild animal like the panther, you are always taking the risk of causing injury or death. And there has been one or two capture related losses with Florida panthers, but that is the reason a veterinarian is along for all captures now and the reason we developed things like that wildlife cushion, to help minimize those risks to the cat.

*UNIDENTIFIED PERSON:* (Inaudible.)

*MR. LAND:* Well, I think -- from what I can see on that map, we do not really suspect that there

is actually a breeding population of panthers in some of those places. A lot of what is driving that map is its potential for having panthers in the future, which is one of the goals of the recovery plan, to reestablish panthers in areas where they formerly occurred. Whereas, the information that I have provided is where we have actually tracked panthers within the last decade and a half. A lot of information on that map was based on the radio-telemetry information we have collected.

*UNIDENTIFIED PERSON:* I guess my question is, (inaudible.)

*MR. LAND:* Well, there is certainly some holes perhaps in our data, but over the last fourteen years that we have been monitoring the cats, they have showed us pretty much the important areas in south Florida. If your question is related to some, maybe areas that we have overlooked, I really don't think so, because, again, I'll go back to the road mortality data in determining where panthers occurred, and that is going to point us to places where we need to be looking. And it has never pointed to anywhere except where we have been studying.

*UNIDENTIFIED PERSON:* (Inaudible.)

*MR. LAND:* Oh, of course. And that is one area that we are hoping to get into this spring. We have documented some female and male sign up there in the CREW area this past summer. And we are really going to make a concerted effort this season to capturing those Florida panthers and accumulating those data points. I did not realize you were talking specifically of the CREW (Corkscrew Regional Ecosystem Watershed) area, but that is one area that our telemetry data is very weak, compared to what we think is there for Florida panthers.

*UNIDENTIFIED PERSON:* (Inaudible.)

*MR. LAND:* Well, I think the habitat is what restricted our panthers from exhibiting that kind of dispersal. They did not have the opportunity to go as far as those in Utah do, just simply because there is not that many places to go to. And we have seen that repeatedly. Where we captured Florida panthers, as young males, dependant males, and watched them in the dispersal process, they will end up in downtown Naples, and then they will head right back into where most of our panthers are, and most of

them will get their heads crushed in by an adult male. So we have seen those processes take place.

*MR. KEN ALVAREZ:* Tell us what affect you think the Tenth University will have on Florida panther habitat?

*MR. LAND:* Well, we are always concerned. I think we are on record as not being in favor of that site because of the panther issues. Anytime that you put a large scale development, even if it is in a fringe area of the panthers, it's not going to be good news for panthers. The CREW area is going to share a boundary with the university. But there are biological realities and there are political realities.