

DISCREDITING A DECADE OF PANTHER SCIENCE



IMPLICATIONS OF THE SCIENTIFIC REVIEW TEAM REPORT

January 2004



The Florida Panther Society, Inc.



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About the National Wildlife Federation

The nation's largest member-supported conservation education and advocacy group, the National Wildlife Federation unites people from all walks of life to protect nature, wildlife and the world we all share. The Federation has educated and inspired families to uphold America's conservation tradition since 1936. www.nwf.org

About the Florida Wildlife Federation

The Florida Wildlife Federation is a statewide, non profit, citizens' organization, which promotes the conservation, restoration and sound management of Florida's fish and wildlife and their habitats. The Federation also encourages the public's appreciation of Florida's environment through sustainable, resource-based outdoor recreation. www.flawildlife.org

About the Florida Panther Society

The Florida Panther Society, Inc. is a volunteer run and member supported environmental education and support organization for *Puma concolor coryi*. www.panthersociety.org

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INTRODUCTION

The Florida panther is one of the most endangered mammals in the U.S., with less than 100 individuals living in the wild in south Florida. Population numbers have increased somewhat in recent years, thanks to the successful translocation of a related subspecies, the Texas cougar, into Florida to restore genetic diversity. But the primary threat to the survival of the panther is habitat loss and fragmentation, and this threat appears to be growing as development in southwest Florida sprawls eastward from the Gulf Coast.

The Florida panther has the good fortune of being protected by the Endangered Species Act, one of the crown jewels of U.S. environmental law. The ESA provides a host of strong measures to help protect the habitat of the panther and to promote panther recovery. It mandates the use of the best available science, and it provides citizens' groups with the tools to enforce the law when agencies ignore the science.

This paper discusses the federal government's use of unsound science in its decisions concerning the Florida panther, which has now been conclusively shown in the December 2003 report by the government-commissioned Scientific Review Team. This paper also documents the extensive habitat loss that has resulted from the U.S. Fish and Wildlife Service's (FWS) failure to use sound science - science that could be found in its own recovery planning documents - for nearly a decade. It asks some tough questions, such as: how could an agency charged with protecting endangered wildlife go so far astray?

Role of Developers

A significant part of the story of the Florida panther is the role of developers, who have exerted substantial political influence on agency decision making concerning development projects in rural southwest Florida. But this does not completely answer the question of how FWS's judgments about saving the panther have become so unhinged from good science.

Time and again, FWS has approved development projects in panther habitat that it had previously deemed "essential" to panther survival, and it has typically done so without imposing any substantial requirements on developers to avoid, minimize or compensate for the harm caused.

Intense Scientific Controversy

The key to understanding what has gone wrong with panther management is to delve into the scientific controversies of the past decade. This part of the story begins with Dr. David Maehr, at one time considered to be the top scientific expert on Florida panther issues. Dr. Maehr worked on panthers for Florida's wildlife agency for roughly nine years until the mid-1990s, when he left and then wrote a well-received book on panther conservation, *The Florida Panther: Life and Death of a Vanishing Carnivore* (Island Press (1997)). Since then, he has worked



partly as an assistant professor and partly as a consultant for developers.

Over the past decade or so, Dr. Maehr has written a series of papers on panther ecology which have been peer-reviewed and published in reputable journals. In recent years, the conclusions in these papers have drawn an enormous amount of controversy. Independent scientists, both in the wildlife agencies and in academia, have questioned the fundamental assumptions of virtually all his recent work--for

example, that the Florida panther is a forest obligate species (i.e., only able to survive in forests) and that it rarely travels more than 90 meters from large patches of contiguous forest. They have offered evidence showing that the panther uses a wide variety of habitat types, including agricultural lands, and is not dependent solely on large forests.

Under PHEM, the habitat destroyed was treated as virtually worthless to the panther due to the fact that it was comprised primarily of agricultural lands and lacked a large contiguous forest.

FWS's adoption of PHEM and similar habitat evaluation methodologies that treat the panther

Key Findings

- ✓ In the past decade, the U.S. Fish and Wildlife Service (FWS) and the U.S. Army Corps of Engineers have consented to the destruction of thousands of acres of Florida panther habitat in southwest Florida, much of which FWS has deemed "essential" to the panther's survival in its own scientific documents. The agencies typically require minimal efforts by developers to offset the harm with habitat acquisition or restoration.
- ✓ FWS has rationalized its approvals of this extensive habitat loss by characterizing the panther as a forest obligate (i.e., unable to use non-forested habitats) and by dismissing habitats without large blocks of forest as unimportant to the panther. Yet in recent years the body of scientific work on which FWS has relied has been disputed by *all* of the panther scientists on the agency's own recovery team *except* the author of that work. FWS has not responded to these criticisms.
- ✓ In 2002, FWS commissioned a new team of independent scientists known as the Scientific Review Team to address the scientific controversy. In December 2003, the SRT issued a scathing report finding that roughly ten years of scientific studies treating the panther as a forest obligate are unsound. FWS has not yet responded to this major report.
- ✓ The fact that the federal government is using discredited science to justify approvals of projects that destroy important panther habitat is now beyond legitimate dispute.

This challenge to Maehr's work is no academic dispute. Using the conclusions in his scientific papers, Dr. Maehr has developed methodologies that developers have used to persuade FWS to reduce their mitigation obligations under the Endangered Species Act. For example, his best-known methodology, the Panther Habitat Evaluation Model, enabled Lee County to win approval of the Daniels Parkway Extension, destroying or fragmenting roughly 2,000 acres of panther habitat. Lee County was required to provide nothing more than 69 acres of land acquisition as compensation for the loss, and the 69 acres of habitat acquired was considered as having somehow replaced the 2,000-plus acres of habitat lost to development.

as a forest obligate species unwilling to travel from large forest patches (hereinafter, as shorthand, referred to simply as PHEM) has led to extensive losses of habitat. Apparently not willing to oppose a development proposal if there is a remotely plausible scientific argument to support it, FWS has approved dozens of projects in the past several years that destroy extensive panther habitat while providing little or no compensation. Independent scientists (including some within FWS itself) and conservation organizations have provided scathing critiques of these methodologies to FWS officials. These critiques have not convinced FWS officials to reverse course.

Ultimately, FWS was forced by the controversy to appoint a team of four independent, highly qualified scientists, called the Scientific Review Team (SRT), to review the scientific literature, interview the key players, and sort out the issues. The result of the SRT's efforts, delivered in a December 2003 report, may finally force FWS to abandon the PHEM methodology and to adopt a method of addressing development in panther habitat that is based on sound science.

In a lucid summary of the panther literature, the SRT report thoroughly discredits PHEM. For example, the report shows that Dr. Maehr reached his conclusions by leaving out key data without acknowledging doing so – data that would have undermined his conclusions. It also shows how Dr. Maehr has characterized panther habitat use without acknowledging that the data on which he relies consists entirely of daytime resting points and does not account for nighttime movements. In summary, the SRT report shows that PHEM rests on the shakiest of foundations, raising serious questions about how FWS could have relied upon it so heavily as the basis for its panther management decisions.

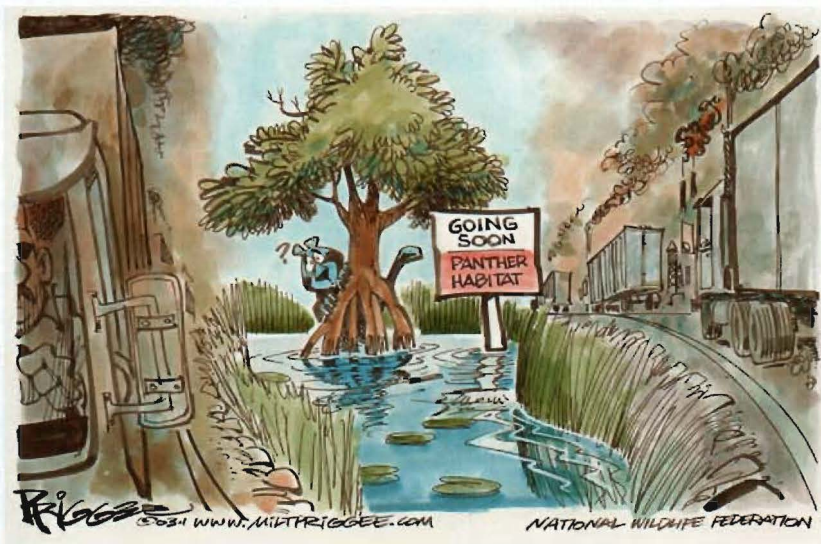
The report also raises tough questions about FWS's failures to act with respect to panther reintroduction. As the panther recovery plans since the early 1980s have made clear, reintroduction of two additional populations is needed to ensure the cat's long-term viability. Yet, as the SRT team points out, progress on this front is dismayingly slow.

The story of the Florida panther is not all bad news. This paper documents a number of the successes, such as the genetic

restoration program and highway crossing tunnels that prevent panthers from getting killed by automobiles. Many of these successes should be attributed to dedicated professionals at FWS, the Florida Fish and Wildlife Conservation Commission, and other federal and state agencies.

Although the story of the SRT report is not over, the appointment of the SRT must already be counted as a success. If FWS had not appointed this team, it might still be able to dismiss controversies on panther science as simply disputes among "opposing camps." The SRT report, coming from esteemed scientists appointed by FWS itself, removes this excuse. It places the burden squarely on FWS's shoulders to stand up for good science and to begin addressing the imminent threats to the panther's last remaining habitat.

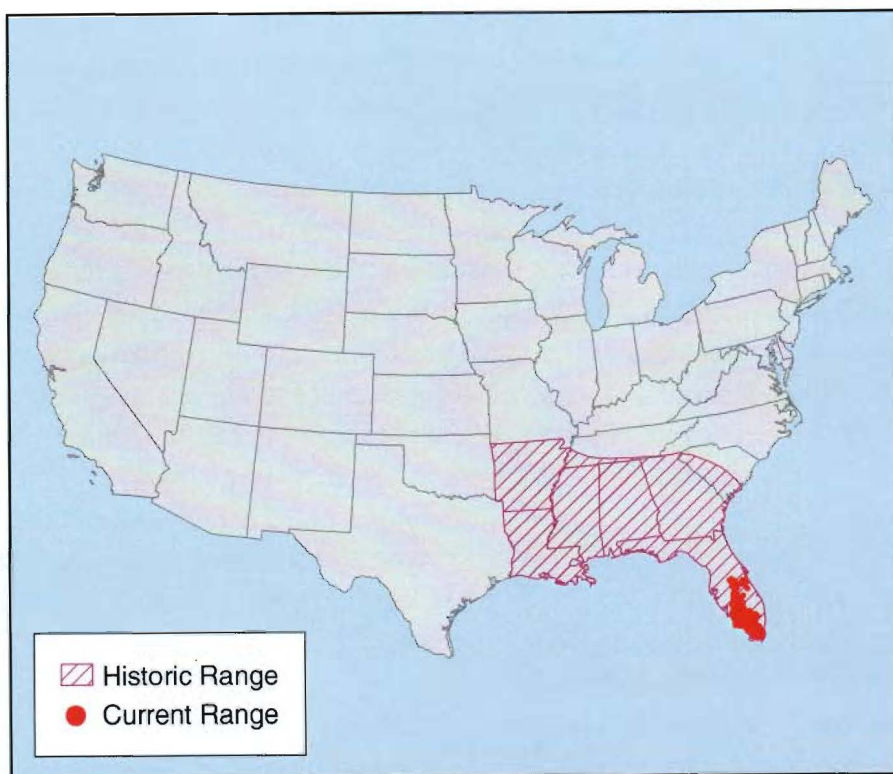
We live in an era where the Bush administration and its allies in Congress often claim that they want to insert "sound science" into ESA decision making. This paper calls upon the FWS leadership and other Bush administration officials to adopt sound science in the case of the Florida panther, even if the effect of doing so means that stronger protections must be put in place to counter sprawling development in panther habitat.



AUTHORIZING EXTENSIVE HABITAT DESTRUCTION

The Florida panther (*Puma concolor coryi*), a sub-species of the American mountain lion, once ranged across a broad swath of the southeastern U.S., from eastern Texas and Arkansas to South Carolina and down to Florida. (See Map 1). Past eradication efforts and continuing habitat loss and degradation have isolated the remaining population in south Florida, primarily in the Western Everglades. As a result of this severe decline and continued threats to its survival, the panther was federally listed as endangered in 1967 and included on the first Endangered Species Act (ESA) list upon the law's passage in 1973. Less than 100 panthers currently survive in the wild. (McBride (2002)).

Continued loss and degradation of habitat are the most significant threats to the panther's survival. Roughly 50 percent of occupied panther habitat now consist of private lands (FWS 1993), and a substantial portion of these lands are under threat of development. Although radio-collared panthers have been documented in 12 counties in south Florida (FWS 1999), roughly half of the occupied range lies in three counties south of the Caloosahatchee River – Lee, Collier, and Hendry. According to U.S. Housing Markets, a market research publication, Lee and Collier counties are currently the first and fourth hottest housing markets in the country. Thus, the future of this magnificent species hinges in part on land use decisions that must be made in the



Threats to the Panther's Survival

Habitat loss and fragmentation of its current range in south Florida is the most significant threat facing the panther today. Continued loss of habitat to misguided development threatens the panther's survival, reducing the carrying capacity of the land by reducing prey species and the size and quality of feeding and denning areas. These factors in turn exacerbate competition between cats over territory and mates, causing intraspecific aggression, which is the leading known cause of panther mortality (NWF 2000).

Vehicle mortality is also among the highest known causes of panther mortality (FWC 2003). Construction of highways in wildlife habitat may result in habitat fragmentation, direct mortality, direct habitat loss, displacement and avoidance, and associated human development (Ruediger 1998, cited in USFWS 1999).

In addition to habitat loss, intraspecific aggression, and vehicle mortality, the panther faces other threats including: genetic depression, environmental contaminants (e.g., mercury), and disease (Roelke 1991, Roelke and Glass 1992, Dunbar 1993, Dunbar 1994, cited on Panther Net, FPRT 2001, FWC 2003).

very near term. Unless protection measures are undertaken soon, the very habitat upon which the panther depends for its survival will be lost to highways, subdivisions, strip malls and golf courses.

Fortunately, the panther enjoys the legal protections of the ESA. The ESA expresses the nation's commitment to ensure that human activity does not drive other species to extinction. In a remarkable display of wisdom, Congress recognized when it enacted the ESA in 1973 that taking care of other species responds to the ecological, educational, historical, recreational, scientific, economic, moral and aesthetic interests of people. (ESA § 2(a)(3).)

Unlike many other environmental laws (including Florida's endangered species law), the ESA contains a set of clear mandates and prohibitions and it provides citizens with tools to enforce them. For example, ESA § 7 prohibits the Corps from issuing a permit for development in panther habitat unless the U.S. Fish and

Wildlife Service (FWS) finds that the project is unlikely to appreciably reduce the likelihood of panther survival and recovery. This is known as the ESA's "jeopardy" prohibition.

ESA § 9 forbids any actions, federal or non-federal, that "kill," "harm," "harass," or otherwise "take" the panther. Under ESA § 10, an exception to this "taking" prohibition is made for non-federal actions if FWS finds that the developer has prepared a habitat conservation plan (HCP) that minimizes and mitigates the harmful effects of the taking "to the maximum extent practicable," provides adequate funding to implement the HCP, and avoids jeopardizing the existence of the species. In undertaking ESA § 7 and § 10 reviews of development projects and making these crucial findings, FWS is required to employ the best available science. ESA § 7(a)(2).

This is the way that the ESA intends for endangered species to be protected. Unfortunately, FWS and the Corps have not faithfully implemented their ESA responsibilities

Importance of the Florida Panther

Protecting the panther is good for people. By protecting the panther's habitat, land managers help ensure that many other Florida species survive in the face of intense development pressures. Protecting the panther's habitat also enhances our quality of life by providing rich soil, fresh air, clean drinking water and flood protection (Terborgh 1988).

The Florida panther also plays an important role in Florida's tourism- and recreation-based economy. A recent economic study commissioned by NWF and FWF (*Bell 2002*) estimates that 78 percent of tourist days are occupied in part by activity supported by the abundant natural resources in Collier and Lee Counties. The study concludes that the annual "flow use" value of panthers and other wildlife for the residents of Collier and Lee Counties is nearly \$8.3 million, with a capitalized value of near \$277 million in 2000. When extended to everyone living in Florida, the asset value of the Florida panther is \$3.2 billion.

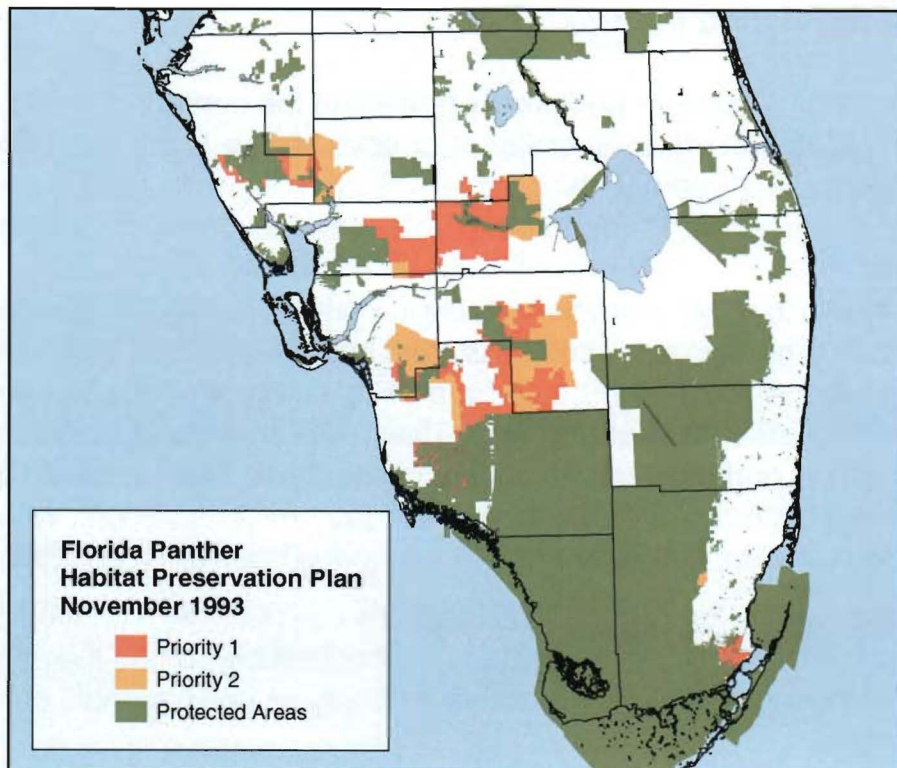
The people of Florida have long recognized the animal's importance on moral and aesthetic grounds. As far back as 1982, Florida's schoolchildren chose the panther as the State Mammal. The loss of the Florida panther is simply an unacceptable outcome for Florida and the nation.

for the Florida panther. In the past decade, FWS and the Corps have reviewed dozens of large-scale development projects pursuant to ESA § 7 – projects that together would destroy tens of thousands of acres of panther habitat. Despite the fact that FWS itself had previously deemed many of the project locations to be "priority" habitat that is "essential" to panther survival, the agencies have never found that any project would appreciably reduce the likelihood of panther survival and recovery. In fact, in at least four instances, draft "jeopardy" opinions written by FWS biologists were overturned by FWS officials. Ex. 68-70, 106, 180, 182-84, 285,289 (*The Habitat, Florida Gulf Coast University, Timberland & Tiburon Subdivision, Treeline Boulevard, Airport Access Road, Daniels Parkway Extension*).¹ During the same time period, in reviewing projects not

involving Corps permits, FWS never found that any project in panther habitat would "kill," "harm," or "harass" a panther, and never required a developer to submit an HCP before going forward.

The following are a few examples of the projects that FWS and the Corps have allowed to go forward in Florida panther habitat, in dereliction of their ESA duties. Through these examples, a pattern emerges – the repeated failure by these agencies to ensure the use of sound science to protect the endangered Florida panther.

¹ Exhibits ("Ex.") referred to in this paper are government agency documents, on file with the lead author, that were submitted by the NWF team in support of its motion for summary judgment in *NWF v. Caldera*, Case No. 1:00CV01031(JR) (D.D.C.).



Map 2

Florida Gulf Coast University: The Camel's Nose Under the Tent

In the early 1990s, a group of prominent developers in Florida decided to build a new state university on rural lands to the east of Fort Myers in southwest Florida. A problem arose: the preferred site, on land owned by a prominent developer, served as habitat for the Florida panther. FWS biologists issued a draft biological opinion stating that the project would jeopardize the existence of the panther. *Ex. 98, 106-108, 110, 112-13.* However, after extensive lobbying of top agency officials, in 1994 the developers ultimately secured a no-jeopardy opinion from FWS. *Ex. 11, 92, 96, 114, 118, 124, 131, 135-6, 142-43, and 146.* Although FWS admitted that the project "raises serious concerns regarding the future status of the Florida panther in south Florida, and specifically, in Lee County," it allowed the project to go forward without requiring any

measures to compensate for the extensive loss of panther habitat. *Ex. 11.* A key to the developers' success was having obtained a letter of support from Dr. David Maehr, the noted panther biologist. *Ex. 332 (letter of support); see also Def. Ex. 23 (Maehr resume claiming credit for "creative and successful permitting" on projects that include The Habitat, Florida Gulf Coast University, and most recently the Daniel's Road extension").*

During the battle over what is now known as Florida Gulf Coast University, federal and state officials recognized that they had a problem: no one had ever clearly stated what habitat was needed by the panther for its survival. Anticipating a wave of development into the rural lands of southwest Florida, in 1993 four agencies jointly released a Habitat Preservation Plan (HPP) finding that the panther's habitat had already dropped to the "minimum threshold levels necessary to prevent extinction," and

identifying “priority” habitats they deemed “essential” for panther survival and in need of land acquisition or other conservation attention (*Logan. T., Florida Panther Habitat Preservation Plan (FWS 1993)*) at 33). (See Map 2). In its 1999 recovery plan, FWS stated that protection of priority habitat is “essential to maintaining a minimum viable population of 50 breeding adult panthers in South Florida.” (*Multi-Species Recovery Plan for South Florida (FWS 1999)* at 4-147).

***Daniels Parkway Extension:
Rationalizing the Destruction of
“Essential” Habitat***

In the late 1990s, Lee County sought FWS and Corps approval of a new four-lane highway, called Daniels Parkway Extension, that would slice through rural lands that had been described in the HPP as priority habitat for the panther. According to FWS, the highway would destroy roughly 700 acres of priority habitat, and fragment another 840 acres from the CREW Ecological Study Area, an important breeding area for the panther. Ex. 60 at 4, 18. Additional acres of habitat, not quantified, would

also be destroyed because they were now ripe for development as a result of the highway. *Id.* at 18; Ex. 309 at 4.

In December 1998, FWS issued a biological opinion stating that the project would avoid jeopardy if Lee County would commit to acquiring 265 acres of off-site habitat to compensate for the highway’s harmful impacts. Lee County refused, stating that it would provide no compensation beyond the 69 acres that was already being required by the water management district to offset wetlands losses. The county hired lobbyists in Washington, D.C., to pressure top officials to agree to this approach. Ex. 288, 299, and 300. A key part of the county’s lobby message was that Dr. Maehr had concluded, using his new Panther Habitat Evaluation Model (PHEM) methodology for panther conservation, that a 69-acre habitat acquisition would fully offset the loss of habitat caused by the highway. Ex. 288. Under PHEM, there would allegedly be no net loss of panther habitat value or functionality because the 69 acres of land allegedly had habitat value equal to the roughly 2,000 acres of land to be developed. *Id.*



In May 1999, FWS biologists expressed concern to FWS officials that important habitats would be destroyed or fragmented under Maehr's methodology, and called for a jeopardy determination unless major compensation measures were agreed to by Lee County. Ex. 289. In August 1999, NWF and its state affiliate the Florida Wildlife Federation (FWF) sent a letter to FWS expressing alarm about a report that FWS officials would soon be approving the project, with virtually no mitigation, in reliance on the methodologies of Lee County's consultant, Dr. Maehr. Ex. 306. The letter identified several flawed assumptions with Maehr's methodology, including that it improperly assumed that agricultural lands had no value to the panther, even though such lands were known to support the panther's prey base.

A Corps biologist also criticized the PHEM methodology, noting that, among other things, it ignored the highway's effects on "naturally vegetated areas," including agricultural lands that contain prey for the panther. Ex. 309 at 4, 14. *See also* Ex. 59 at 40 (noting the agricultural habitats destroyed by the road were assigned no value, while agricultural lands to be acquired as mitigation were assigned a habitat value of 0.3).

Despite these criticisms, FWS and the Corps approved the Daniels Parkway Extension project, relying on the PHEM methodology to conclude that jeopardy to the panther would be avoided with an off-site acquisition of 69 acres of land.

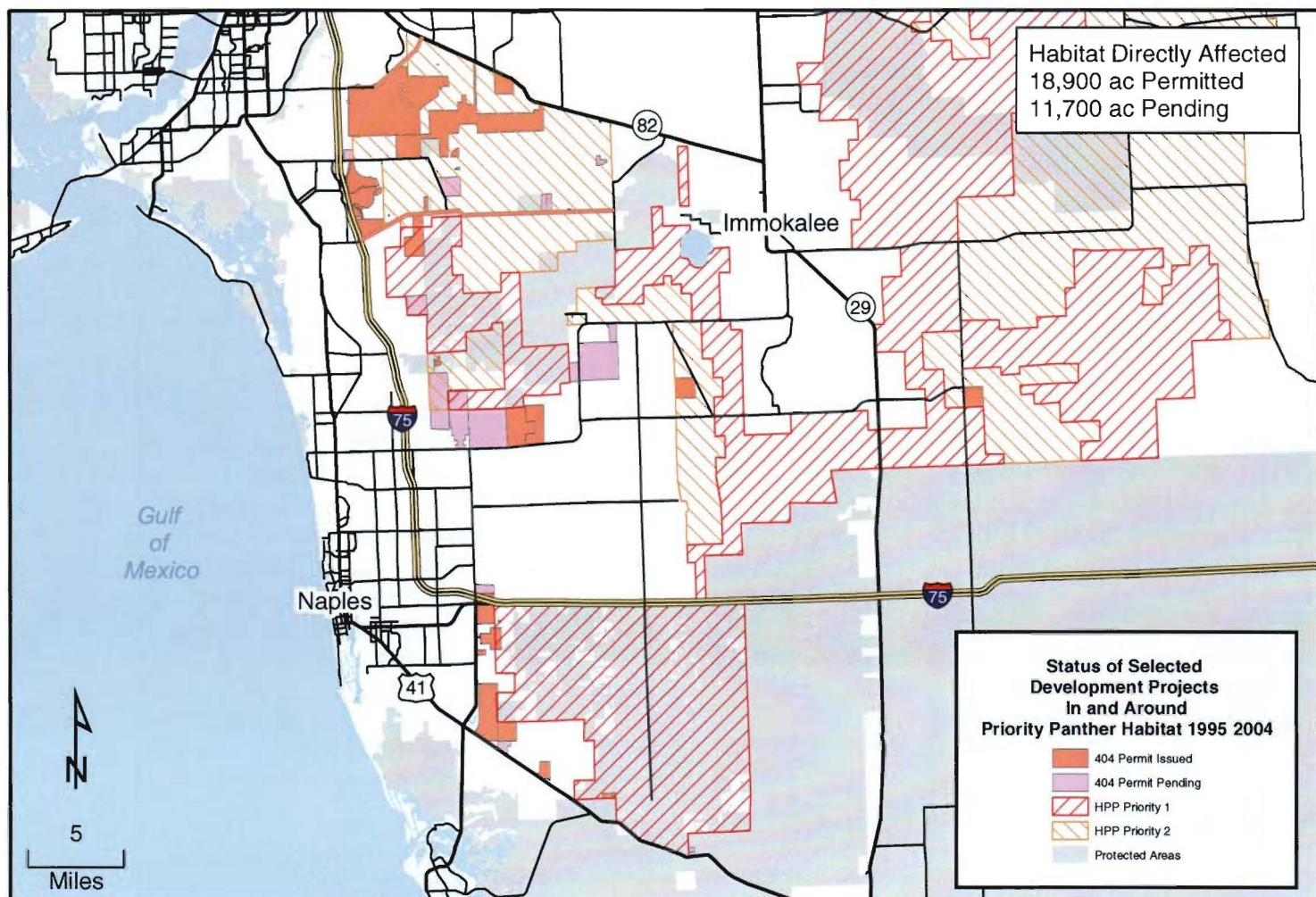
Multiple Development Projects in and Around Priority Panther Habitat

In 2000, NWF, FWF and other conservation groups sued FWS and the Corps, challenging the approval of the University, Daniels Parkway

Extension and 21 other development projects in and around priority panther habitat. The NWF



team argued that the two agencies were violating the ESA by ignoring the best available science, including the HPP and FWS's own 1999 recovery plan update, both of which characterized priority habitats as essential to the panther's survival. (*Logan. T., Florida Panther Habitat Preservation Plan (FWS 1993) at 33; Multi-Species Recovery Plan for South Florida (FWS 1999) at 4-147*). It also alleged that the agencies were disregarding the cumulative effects of piecemeal development in panther habitat, and that the 23 projects alone had resulted in over 5,000 acres of habitat destruction. (*See Map 3*).



Map 3

PARTIAL LIST OF SELECTED DEVELOPMENT PROJECTS IN AND AROUND PRIORITY PANTHER HABITAT

With FWS Estimates of Direct Habitat Destruction*

<u>Project Name</u>	<u>Acres Directly Destroyed**</u>
FL Gulf Coast Univ., Timberland & Tiburon Subdiv., and Treeline Rd	1,183
The Habitat Subdivision	1,000
Bonita Bay Golf Club	129
Corkscrew Ranch Subdivision	75
Miromar Lakes Subdivision	1,323
Daniels Parkway Extension	40
Naples Reserve Golf Club	692
Naples Golf Estates Subdivision	290
Airport Terminal Expansion	4,800
Florida Rock Ft. Myers Mine #2	3,677

* FWS Biological Opinions typically do not estimate the total amount of *indirect* destruction of panther habitat (e.g., degradation and fragmentation of adjacent habitat caused by a highway or mine). However, partial estimates by FWS suggest that indirect losses are quite substantial. See, e.g., *Daniels Parkway Bi. Op.* (indirect loss of 1,511 acres); *Florida Rock Bi. Op.* (indirect loss of 1,592 acres).

** Because this is a partial list, the total acres on chart do not equate with the total acres on the map.

Unfortunately, in 2002 the court dismissed the case on procedural grounds, finding, in essence, that the case was framed too broadly. The fundamental scientific issues raised by the case - whether FWS and the Corps had failed to use the best available science by continuously allowing destruction of priority habitats that FWS previously had deemed to be essential (as alleged by the NWF group), or whether the lands in question could be dismissed as having little habitat value under the PHEM methodology (as alleged by the government and the developers) - were never addressed by the court.

Since July 2000, FWS has issued 19 additional biological opinions allowing development projects to go forward in panther habitat. According to FWS's own calculations, 11 of these projects destroyed or degraded over 16,000 acres of panther habitat; habitat loss from the remaining projects was not calculated. (Nov. 11, 2003, *Letter from FWS to Sen. Joseph Lieberman*, Attachment at 1, 4.)

5,000 Acre Rock Mine in Essential Panther Habitat

In 2003, NWF and its partners filed two new panther cases in federal court, raising the same substantive concerns raised by the case filed in 2000 while avoiding the procedural problem encountered in that case. The first case, filed by NWF along with FWF and the Florida Panther Society, challenges FWS's and the Corps' approval of a permit that would allow Florida Rock Industries, Inc. to destroy more

than 5,000 acres of priority panther habitat while leaving a small area of 800 acres off to the side for panthers. FWS acknowledged that at least 8 panthers have been found on or near the project site, *Biol. Op.*, Jan. 30, 2002, at 21, representing approximately 10 percent of the entire south Florida panther population.

To overcome FWS biologists' resistance to the mine, known as Fort Myers Mine #2, Florida Rock Industries lobbied FWS officials in Washington, D.C. and Atlanta (see, e.g., *Letters from Florida Rock Industries to Members of Congress*, and from *Members of Congress to FWS's Washington, D.C. and Atlanta Offices*, on file with the author). In addition, Florida Rock sent FWS an analysis of the project prepared by Dr. Maehr. Maehr acknowledged that the project site "overlaps extensively" with mapped areas characterized as important to the panther by the Florida Fish and Wildlife Conservation Commission (Cox et al., *Closing the Gaps*, 1994), and he conceded that these maps represented the best available scientific information. Nonetheless, he concluded that it



Nationwide Permits: Unfettered Development in Panther Habitat

NWF and the Florida Panther Society also have challenged the Corps' refusal to undertake an ESA consultation with FWS regarding the impacts of "nationwide" permits on the panther. Nationwide permits are permits that are issued by the Corps at the national level allowing dredging and filling of wetlands for certain categories of development (e.g., utility lines), with virtually no site-specific environmental review. Under the Clean Water Act, the Corps is authorized to issue such permits if it finds that the category of activities permitted will have a minimal impact on the environment. Unfortunately, the Corps has unlawfully used this authority to allow development in panther habitat without requiring any measures to avoid harmful impacts.

was “unlikely” that the mine would “negatively affect the property’s long-term ability to support the panther.” According to Maehr, the land where the mine would be built is largely agricultural and “panthers avoid such herbaceous habitats.” (*Sept. 7, 2000, Letter from D. Maehr to K. Passarella.*)

In January 2002, FWS approved the project. (*Bio. Op., Jan. 30, 2002, at*). NWF and FWF wrote to FWS, complaining that FWS had failed to address the science showing the diverse array of habitats used by the panther, and that it had failed even to discuss the project site’s priority status under the FWS’s recovery plan. The NWF group called for FWS to reinitiate its consultation with the Corps and to reevaluate its approach. This request was denied. On February 6, 2003, in reliance on FWS’s biological opinion, the Corps issued its permit for Fort Myers Mine #2. (*Feb. 6, 2003, Corps Permit and Environmental Assessment.*)

Bowing to Political Pressure, Rationalizing with “Science”

As these examples show, time and again, when FWS has been called upon to protect panther habitat from proposed development projects, it

has allowed the projects to go forward with little or no mitigation. FWS has faced enormous pressure from politically-connected developers to approve their projects, and it has repeatedly bowed to that pressure.

The ESA provides important checks and balances to prevent powerful developers from using their clout to secure projects that undermine species conservation. As noted above, it requires that federal agencies conserve endangered species using the best available science (*ESA § 7*) and, in tandem with the Administrative Procedure Act, it allows citizens to overturn arbitrary decisions in court. (*ESA § 11.*) However, this system of checks and balances has broken down in the case of the Florida panther, largely due to the agencies’ ability to rationalize its decisions with Dr. Maehr’s PHEM methodology. Fortunately, a new report by a government-commissioned team of scientists puts to rest any lingering arguments for the validity of the PHEM methodology, and it identifies some of the key steps needed to ensure that unsound science does not continue to infect panther conservation policy in the future.



EXPOSING THE UNSOUND SCIENCE

The beginning of the end for the PHEM habitat evaluation methodologies was in 1999, around the time that the NWF team announced its litigation plans. Apparently in response to the NWF 60-day letter of intent to sue, FWS formed a new "panther subteam" of the Multispecies Ecosystem Recovery Implementation Team (MERIT) for south Florida's listed species, and charged the team with developing a landscape-level strategy for the conservation of the Florida panther population that could be applied in the regulatory context. *See Int. Def. Ex. 6 at 2 (FWS meeting minutes stating that subteam was formed by FWS to address need for "discrete maps that will have application as regulatory tools").*



Appointed to the team were four individuals with panther-related expertise: veteran panther houndsman and field biologist Roy McBride; Big Cypress National Preserve field biologist

Deborah Jansen; a panther modeler from the University of Tennessee, Jane Comiskey; and biologist/consultant Dr. Maehr. The Subteam also included individuals with other areas of expertise, such as Population Viability Analysis and Geographic Information Systems modeling. However, they relied upon the panther experts for information about panther behavior, habitat use, and interpretation of telemetry data.

The debates within the MERIT panther subteam revealed a serious fault line within the scientific community. On one side was Dr. Maehr, with nearly a decade's worth of peer-reviewed, published papers on panther biology, who argued that the Florida panther is a forest-centric animal that rarely wanders more than 90 meters from large forest patches. His PHEM model effectively rules out the need for developers to protect or fully compensate for the loss of any habitats other than forest patches larger than 500 km².

On the other side was McBride, Comiskey and Jansen as well as FWS biologists. McBride provided the Subteam with three field reports that brought years of first-hand experience to bear on the question of panther demographics and habitat use (McBride 2001, 2002, 2003), challenging the PHEM concept of panther habitat suitability. In 2002 Comiskey, McBride, and Everglades National Park biologist Oron Bass, Jr. collaborated on a seminal paper critiquing the assumptions underlying PHEM (Comiskey *et al.* 2002). The group argued that the panther is a habitat generalist, using and benefiting from the mosaic of habitats within extensive home ranges, countering Maehr's contention that the panther is a forest obligate, dependent for survival on large patches of forest. They found that the forest obligate theory was based on a biased sample of the available panther data, failure to identify location error, and incorrect use of daytime telemetry to make inferences about panthers' nighttime movements.

FWS Chooses the Side of Discredited Science

Ignoring even their own staff biologists' concerns, FWS officials have elected to continue using the PHEM methodology. In one biological opinion after another, FWS has approved development projects in panther habitat and required little or no mitigation for the resulting habitat destruction and fragmentation. It has rationalized its failure to protect panther habitat by suggesting that, as argued by Maehr, habitat is of little value to the panther without large contiguous forests. See, e.g., *FWS Biological Opinion for Florida Rock Industries Fort Myers Mine #2* (January 30, 2002).

Senator Lieberman Weighs In

In 2002, NWF, FWF and the Council of Civic Associations issued a report entitled *Road to Ruin*, detailing the damage to panther habitat and other public resources being caused by FWS's and the Corps' refusals to address the cumulative effects of development in southwest Florida (<http://www.nwf.org/nwfwebadmin/binaryVault/roadtoruin.pdf>).

Citing the evidence in this report, on August 7, 2003, Senator Lieberman (D-CT) sent letters to the agencies with detailed questions about the agencies' failures.

In October and November, 2003, respectively, the Corps and FWS responded, in essence, that Senator Lieberman's concerns were unwarranted. FWS acknowledged that it used Dr. Maehr's methodologies in determining the responsibilities of permit applicants. However, it did not acknowledge that these methodologies were in any way controversial. (Nov. 11, 2003, *Letter from FWS to Sen. Lieberman* at 4-5.)

Findings of the Scientific Review Team

In response to the burgeoning scientific controversy, FWS and the Florida Fish and Wildlife Conservation Commission agreed to convene an independent team of scientists. In April 2002, the agencies assembled a Scientific Review Team (SRT) consisting of four

individuals (Dr. Paul Beier, Dr. Michael Vaughan, Dr. Michael Conroy, and Dr. Howard Quigley) with diverse expertise in panther ecology and related fields, to examine the scientific literature and its conclusions. After extensive study, written questions, and interviews with many of the key players, the SRT issued its report in draft form in July 2003 and in final form in December 2003 (Beier *et al.* 2003) (<http://www.wildflorida.org/critters/panther/Beier-Panther-SRT.pdf>).



The SRT's report is a powerful indictment of the science underlying the PHEM methodology. By inference, it also raises serious questions about (1) the system of checks and balances that should have prevented or corrected serious errors in such a visible, well-funded and well-staffed recovery effort and (2) the scientific integrity of officials at FWS and the Corps, the two agencies that elected to use the PHEM methodology to justify extensive destruction of panther habitat, and refused even to respond to painstaking critiques of that methodology from reputable scientists (including agency staff) and

conservation organizations. Now that a comprehensive critique has come from a panel of independent, highly qualified scientists that FWS itself convened, the agencies will find their past approaches increasingly difficult to maintain.

The SRT analysis of panther literature is quite detailed and cannot be fully summarized in this brief report. The Team explores the methodologies of virtually every prominent scientist that has published work on Florida panther habitat, prey, genetics and biomedical issues in recent times. Because Dr. Maehr is the most frequently-published scientist and the most controversial, the SRT comments extensively on his work. Among other things, it finds:

- ✓ “[T]he most influential paper on panther habitat use (Maehr and Cox 1995)” excluded data from roughly 6,000 radio telemetry locations without acknowledging doing so. This was “the most serious case of selective use of data,” creating “serious bias” in the paper’s conclusions (Page 4).
- ✓ The PHEM model for deciding panther mitigation relies on several conclusions from this 1995 study that are “unsound.” “Particularly unsound conclusions” are that panthers are reluctant to use areas farther than 90 meters from forest cover, panthers require forest blocks greater than 500 km², and panthers are forest obligates (Page 8).
- ✓ Dr. Maehr’s assertion that panthers avoid traveling more than 90 meters from forest is based on telemetry data collected only during daytime hours, even though the panther is most active at night. Dr. Maehr has repeatedly failed to acknowledge this crucial limitation in his data (Page 4) – a fact that the SRT referred to as “disturbing” in its draft report (Page 7).
- ✓ Based on these and other methodological flaws, panther managers should “cease” using the PHEM model and Dr. Maehr’s

recommendations regarding panther travel distance from the forest and minimum forest patch size (Page 11).

- ✓ Maehr’s population viability analysis, which concludes that the panther has a virtually 100 percent probability of persistence for 100 years, lacks the necessary sensitivity analysis. For example, no such analysis was done concerning Maehr’s projection of high (80 percent) kitten survival. The data suggest that if kitten survival were less than 60 percent, the panther population would experience negative growth rates and rapid extinction (Page 29).

The SRT report is significant not only because it exposes the flawed science that has been used by the federal agencies in deciding mitigation requirements and other crucial panther management issues. It also provides useful guidance on how to ensure that sound science is adopted in the future. In addition to calling for the abandonment of



PHEM and its underlying assumptions, the SRT offers a host of solid recommendations for future data collection, research, planning and management. Some of these recommendations are featured in the concluding section of this report.

ROAD NOT YET TAKEN: PANTHER REINTRODUCTION

Since the approval of the first Florida Panther recovery plan in 1981, FWS has recognized that the ultimate recovery of the Florida panther depends not only on protecting the south Florida population, but also on reintroducing two populations to supplement the existing population. Yet, despite the fact that reintroduction is listed as a priority in FWS's current panther recovery plan, FWS has taken few actions to make it a reality. The SRT points to this lack of progress in its report: it states that it was "dismayed" that "little substantive work has been done on identifying reintroduction sites and preparing for the social and political challenges involved in such an effort." Based on its interviews, the SRT concludes that "FWS has not been strongly

committed to the reintroduction effort."

Although a 1994 FWS report (Jordan 1994) provided "a start" in identifying reintroduction sites, none of the tasks targeted in the report for completion by February 1996 have been completed, and some may not even have been started (SRT Page 9).

In the mid-1990s, Florida's wildlife agency, the Fish and Wildlife Conservation Commission (FWCC), was designated as having the lead role on panther reintroduction. The agency's Reintroduction Feasibility Study (Belden and McCown 1996) concluded that reintroduction is biologically feasible. However, social and political issues that arose during the study were dealt with only once, at community workshops in 1998. FWCC was not equipped with the public relations training or communications strategy to handle the small but vocal group of opposition.

In 1999, FWS re-asserted the lead role in panther reintroduction. Planning did not start until 2001 with the formation of a new recovery team that is currently completing a full revision of recovery plan. In 2002, FWS again initiated a Habitat Evaluation of Potential Reintroduction Areas. The project, headed by Joe Clark, Frank van Manen and Cindy Thatcher (USGS Southern Appalachian Field Lab, University of Tennessee), identifies and ranks potential reintroduction sites in the southeastern United States based on biological criteria. The final report was completed in 2003, but has not been released by the FWS.

While the reintroduction site assessment addresses biological issues, stakeholder input and a solid communications plan are necessary to address the social and political issues of restoring panthers to the southeastern U.S.

In 2002, FWS's Jacksonville Field Office submitted two proposals for panther recovery efforts: the first was for a series of 4 stakeholder



working group meetings to be held in the southeastern U.S.; the second was for developing a communications plan for reintroduction. Neither proposal received funding from the USFWS Regional Office. As a result, in 2003 FWS's field staff revised their plans, proposing a combined project that focuses primarily on building a communications plan. It remains to be seen whether this project will be funded.

Panthers are running out of time. Habitat destruction in south Florida continues to diminish this endangered big cat's chances for long-term recovery. Steps need to be taken now to effectively plan reintroduction components of the recovery process, which will likely take 3 to 5 years to complete before reintroduction can begin.

According to a 1995 statewide survey regarding Florida panthers, 91 percent of respondents supported efforts to recover Florida panthers and 83 percent supported reintroduction efforts (Duda and Young 1995, cited in Belden and McCown 1996). A similar survey targeting counties near a proposed panther-reintroduction area in north Florida found 75 percent of residents in favor of reintroduction (Cramer 1995, cited in Belden and McCown 1996). Despite broad support for panther recovery, top management at FWS and FWC appear unwilling to commit to the reintroduction measures that the agencies acknowledge are needed to ensure the species' long-term survival.



SUCCESSES TO BUILD UPON

So far, this report has emphasized the severe difficulties that conservationists have faced in attempting to secure protection and recovery of the panther and its habitat. If no additional background on the Florida panther was provided, readers might conclude that the challenges are just too great, that it is impossible to make progress in the face of powerful political forces hostile to endangered species protection. However, as the following examples demonstrate, progress for the panther is indeed possible.

Success #1: Genetic Restoration

By the early 1990s, panther managers were deeply worried about inbreeding depression among the isolated small population of panthers, estimated to be between 30 to 50 individuals. The problems arising from this genetic problem were many, including heart deformities, low sperm count, malformed sperm, and cryptorchidism (a condition in which one or both testicles fails to descend) (Roelke et al 1993, cited in Beier et al 2003).

In 1994, the four federal and state agencies primarily responsible for panther management adopted a genetic restoration plan for translocating individuals of the nearest puma subspecies (*P.c. stanleyana*) to south Florida. In early 1995, eight female Texas cougars were released into south Florida and 5 of these successfully mated with Florida panthers (Land et al 2003, Appendix III p 61-62). As a result of this effort, the Florida panther population has shown increased fitness (Beier et al 2003 p 18) and some 80 to 100 individuals now live in the wild (McBride 2003, Appendix IV in Land et al 2003 p 63-65).

According to the SRT report, "The genetic restoration program seems to have been a success. It has been an undeniably helpful

step, and probably a necessary condition, for panther recovery" (SRT Page 22).

The leading opponent of the genetic restoration

program from its outset has been Dr. Maehr. (SRT Page 15-18.) The SRT report rejects each of the arguments that Maehr has lodged against the program. For example, Maehr has argued that the panther was already demographically fit prior to the translocation of Texas cougars. According to the SRT, Maehr's estimates of high kitten survival rates among the purebred



panthers are "indefensible" (Page 18, 26). Likewise, Maehr's analysis of population dynamics misinterprets the relevant data. This is significant because the "entire body of evidence" to support Maehr's argument that Florida panthers were already demographically fit prior to translocation "hinges on this misinterpretation" (Page 25).

Although continued monitoring is needed to determine whether panthers are demonstrating traits indicating the return of inbreeding depression, the genetic restoration program has so far shown itself to be an unqualified success.

Success #2: Wildlife Crossings

According to the Florida Department of Transportation, for the past 50 years, the state has built an average of 4.5 miles of high-speed paved road per day (White and Ernst 2003).

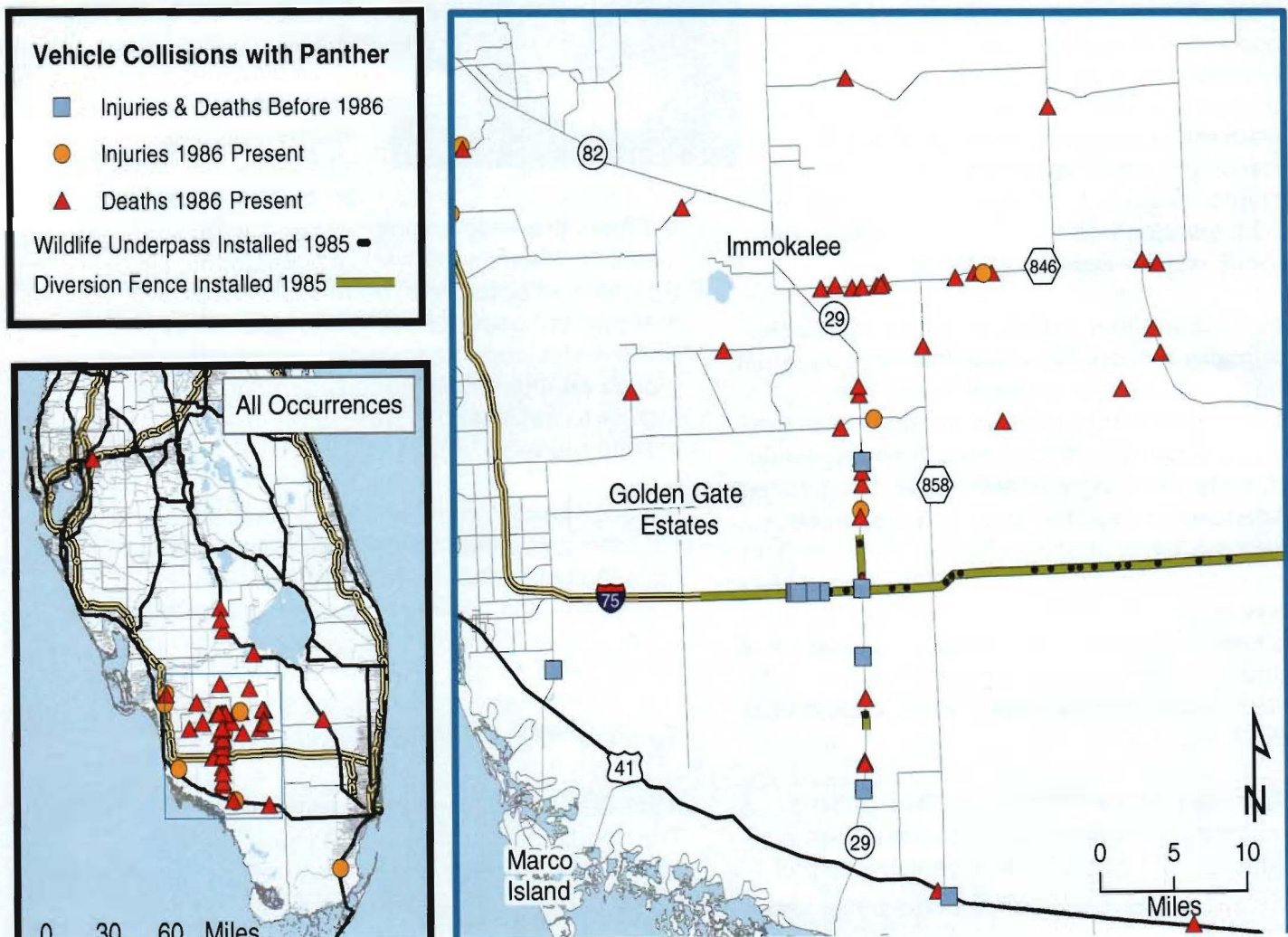


This expanding network of highways has a severe impact on wildlife (Schaefer et al 2003), especially animals such as the panther that travel great distances. Vehicle collisions are one of the leading known causes of panther mortality. (FWS 1999). Wildlife crossings are

essential for providing safe passage for the panther and other animals.

Florida was one of the first states to construct wildlife crossings. In the 1980s, as part of a settlement of an ESA enforcement action filed by NWF, FWF, Florida Audubon Society and other conservation groups to protect the Florida panther from the proposed conversion of a small state road known as Alligator Alley to a four-lane interstate highway (I-75), the Federal Highway Administration and the Florida Department of Transportation designed and began construction of twenty-four underpasses for panthers and other wildlife. Senator Bob Graham (D-FL) secured an amendment to the federal highway bill in 1987 that allowed tolls to be collected on I-75 to pay for the crossings (States News Service, April 2, 1987). To channel the animals to the underpasses, the

Map 4



agencies built an 11-foot-high chain link fence topped with three strands of barbed wire. Today, there are 20 underpasses along Alligator Alley (I-75) and four on State Road 29. See *Map 4*.

As a result of a legal action by Florida Wildlife Federation and others, Collier County is now evaluating rural road segments for panther crossings. The first road to be addressed is Route 846 east of Immokalee, a lethal transportation corridor owned and maintained



by the County where seven panthers have been killed by vehicles.

Although vehicle mortality remains one of the highest known causes of panther death, no panthers have been killed where underpasses and fencing have been installed. The wildlife crossing project for panthers has become an international model, studied by engineers and ecologists in Canada, Mexico, Australia and countries throughout Europe (Richey 1999).

Success #3: Florida Panther National Wildlife Refuge / Friends of the Refuge

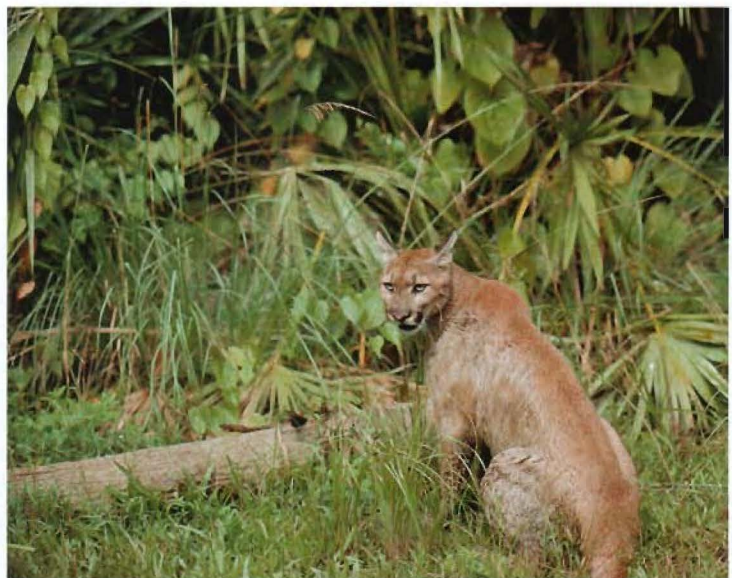
Established in 1989, the Florida Panther National Wildlife Refuge protects 26,400 acres of panther habitat. In any given month, five to eleven panthers use the refuge for hunting, daybedding, denning,

or traveling to other areas. See <http://floridapanther.fws.gov>.

In addition to protecting panther habitat, the refuge now has its own support organization. The Friends of the Florida Panther Refuge has initiated several projects to increase understanding and appreciation of the panther. Their recent accomplishments include the Panther Posse program, which educates students, teachers, and the community about the panther, its habitat and the other plants and animals; and the Refuge Remote Video project, which documents panther activity, providing the first natural video footage of panthers in the wild.

Success #4: PantherNet

In 1999, the Florida Fish and Wildlife Conservation Commission (FWCC) launched PantherNet, a multidisciplinary interactive website funded by proceeds of the Florida panther license plate. Developed by Florida State University in conjunction with FWCC's Advisory Council, this website provides valuable information and activities on the natural history of the Florida panther, its habitat, threats to its survival, and



history and conservation efforts. See www.panther.state.fl.us

Success #5: MERIT Conservation Strategy and Panther Habitat Map

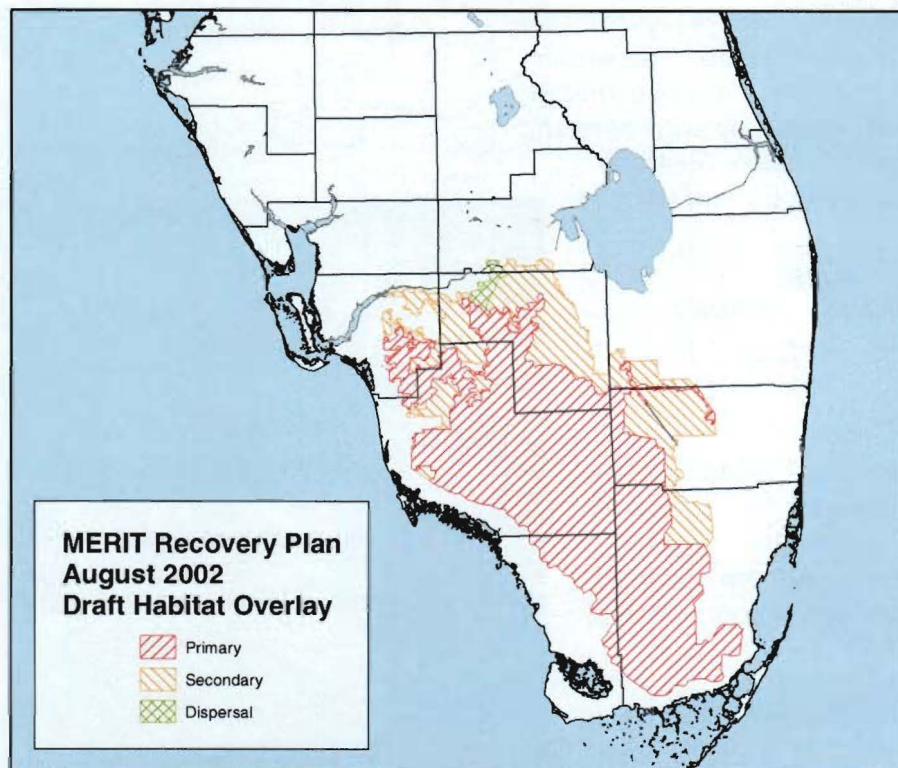
As noted above, FWS's formation of the MERIT Panther Subteam provided a forum for concerns about panther science to be raised and debated. These debates helped to elevate the serious deficiencies with Maehr's methodologies (and FWS's and the Corps' use of those methodologies) in the larger scientific community. As a result, there is an emerging consensus within the scientific community that corrective action must now be taken.

Of course, the mission of the MERIT Subteam is not simply to debate panther science, but to develop a model with which panther science could be applied in everyday situations involving FWS reviews of proposed development permits and habitat acquisitions. The MERIT Subteam

rose to this challenge, producing a Conservation Strategy and Panther Habitat Map in August 2002 that provides clear direction to FWS about the habitat needs of the panther. (See Map 5).

Unfortunately, this conservation strategy and map have since been bottled up by FWS in internal review, without any move by FWS to either adopt the document or identify any inadequacies. A year and a half after it was drafted, FWS has not released it for public review or comment. Although the document was submitted for peer review and included in the SRT review, FWS has never incorporated peer reviewers' or the SRT reviewers' comments. This 18-month delay, coming at a time when habitat continues to be destroyed as a result of unwise permitting decisions, represents a tragic state of paralysis at FWS. However, this failure to act should not detract from the efforts of the MERIT Subteam, which rose to the challenge of defining the panther's habitat needs amidst a swirl of controversy.

Map 5



Success #6: Scientific Review Team Report

As discussed above, the SRT has greatly advanced the cause of panther conservation by issuing its comprehensive report on panther science in December 2003. Although it remains to be seen whether FWS and other agencies will adopt the SRT's recommendations, the SRT's contribution to scientific understanding must alone be considered a success story.

mandated the county develop a plan that protects the habitat of panthers and other listed species.

Collier County's recently adopted habitat plan protects over 100,000 acres through transfer of development rights and a stewardship program that rewards landowners for protecting and enhancing panther habitat. Camp Keais Strand and Okaloacoochee Slough, two important panther travel corridors, are protected through



Success #7: Local Government Actions

In 1999 as the result of legal action by the Florida Wildlife Federation, Florida Department of Community Affairs, and Collier County Audubon Society, Governor Jeb Bush and the Florida Cabinet imposed a building moratorium across Collier County's rural lands and

the county's plan. Although in their infancy, these incentive-based programs show great promise and similar stewardship programs are under consideration by other Florida counties.

LESSONS LEARNED, RECOMMENDATIONS FOR THE FUTURE

Thanks to the ESA and the many individuals who work to implement it on the ground, the panther has been brought back from the brink of extinction. The genetic restoration and wildlife crossing initiatives, carried out pursuant to the ESA recovery plan, are just two examples of how much progress can be made if people of good faith come together to implement a conservation measure that rests on sound science. These actions have been taken with the prodding of citizens groups and independent scientists, using their full array of enforcement, advocacy and education tools. They also have taken place due to the commitment of the staff of FWS, FWCC and other agencies who are able to overcome resistance within their own agencies and other obstacles and make decisions beneficial to panther conservation. Without these individuals, and without the strength of the ESA, there would be little hope for this unique and treasured wildlife species.

Yet the panther remains at serious risk of extinction due to the refusal of FWS and the Corps to abide by their ESA mandate to protect and conserve the panther using the best available science. Much damage has been done, with many thousands of acres of habitat lost, while these agencies have relied on unsound science and approved one development permit after another. Likewise, many potential opportunities for reintroducing the panther outside of south Florida have been lost as FWS and FWCC dithered.

Fortunately, the scientists on the SRT have made a series of sound recommendations that point the way forward, at least from a scientific perspective. The most urgent recommendations are those that restore sound science and give FWS the tools it needs to protect important panther habitat that is under imminent threat of development. These include:

- ✓ Cease using Maehr's concepts and methods for characterizing habitat, and any other method that is based upon the discredited notion that the Florida panther is a forest obligate species or that it is reluctant to move from large forest patches.
- ✓ Adopt a new methodology for habitat evaluation that incorporates long-range recovery goals and that is based upon the best available science concerning the panther's habitat needs. Establish a process to ensure scientific rigor in the future for the panther research and monitoring programs.

Other essential steps we recommend are:

- ✓ Hold a series of stakeholder meetings, and use other communications outreach tools, to achieve broad public support for protection of the south Florida population's remaining habitat. Based upon stakeholder input, develop a regional conservation plan that addresses the cumulative effects of development on panther habitat, and integrates protection of the panther's habitat into local growth management plans and transportation decision making.
- ✓ Develop regulatory guidance setting forth the procedures through which core habitats will be protected, and development in secondary habitats will be minimized and mitigated, pending preparation of a regional conservation plan. The foundation for this outreach should be the MERIT Subteam's Conservation Strategy and Panther

Habitat Map dated August 2002, subject to any improvements that have been identified in the peer review process.

- ✓ Hold a series of stakeholder meetings and use other communications outreach tools to achieve broad public support for reintroduction of the Florida panther into suitable regions outside of south Florida. Based upon stakeholder input and scientific habitat assessments, develop a series of recommendations and alternatives for reintroduction sites, and initiate an Environmental Impact Statement process to reach a decision with the broadest possible public input.
- ✓ Develop a strategy for securing funding for private landowners and for implementing other incentives tools to restore and manage private land habitats.

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