# United States Department of the Interior

FISH AND WILDLIFE SERVICE
South Florida Ecological Services Office
1339 20th Street
Vero Beach, Florida 32960


July 29, 2005

Colonel Robert M. Carpenter
District Engineer
U.S. Army Corps of Engineers
701 San Marco Boulevard, Room 372
Jacksonville, Florida 32207-8175

RE: Correction of Statements in Biological Opinions for the Endangered Florida Panther

Dear Colonel Carpenter:

On May 4, 2004, Public Employees for Environmental Responsibility submitted a request to the Fish and Wildlife Service (Service) alleging violations of Section 515 of Public Law 106-554, commonly referred to as the Information Quality Act. After a detailed review of the allegations, the Service committed to completing a series of tasks. One of these tasks included amending our files on four biological opinions on the Florida panther, listed as endangered under the Endangered Species Act of 1973, as amended (ESA) (16 U.S.C. 1531 *et seq.*), and providing a copy of this action to your office. The four biological opinions in question include:

| Corps Permit Number | Service Log Number | Project Name | Biological Opinion Date |
|---|---|---|---|
| 199301156 | 4-1-00-F-585 | S.W. Florida Int. Airport | December 14, 2001 |
| 199402492 | 4-1-98-F-372 | Florida Rock Industries | January 30, 2002 |
| 199901251 | 4-1-00-F-178 | Southern Marsh | March 7, 2002 |
| 199901378 | 4-1-01-F-148 | Hawk's Haven | April 24, 2002 |

In each of the referenced biological opinions, the Service mischaracterized the minimum viable population and current verified population of panthers. The incorrect use of terms was included in the Status of the Species section of the opinions. The text in each of the opinions states:

> The Florida Panther Interagency Committee, based on data collected from 1981 through 1991 by the Florida Game and Fresh Water Fish Commission and NPS estimated the population at 30 to 50 adult panthers (Logan et al. 1993). Early population viability analyses projected extinction of the panther in 25 to 40 years under existing demographic and genetic conditions (Seal et al. 1989, 1992). The current population was estimated at 78 at the time these biological opinions were written (Roy T. McBride, personal communication, 2001). This number is 28 more than the 50 that the best currently available scientific information (Seal et al. 1989) indicates are needed to ensure demographic and genetic health in the extant population.

TAKE PRIDE IN AMERICA

Specifically, the Service mistakenly equated the number of total panthers in the current population at the time the biological opinions were written (78 panthers), as meeting the minimum number of breeding adults (50 panthers) needed to ensure demographic and genetic health in the current population. The Service biologist became aware of this misuse of terms in the middle of 2002 and corrected the text in subsequent biological opinions.

The Service has carefully reviewed each of the four biological opinions and determined that the misuse of terms had no impact in the evaluation of the projects or the conclusions. It is also important to note that the Service is now completing a revision of the Florida Rock Industries biological opinion, as requested by the Corps on September 15, 2004, to address deficiencies identified in National Wildlife Federation v. Norton, 332 F. Supp.2d 170 (D.D.C. 2004). These deficiencies are not related to the incorrect use of the two terms described in this letter. The Service is completing the biological opinion now and will provide it to your office in the near future.

Please add this letter into your administrative record for the four biological opinions. If you have any questions or additional information is needed, please do not hesitate to contact me at 772-562-3909.

Sincerely yours,

James J. Slack

James J. Slack
Field Supervisor
South Florida Ecological Services Office

# U.S. Fish and Wildlife Service Actions Related to the Information Quality Act and Florida Panther

On May 4, 2004, Public Employees for Environmental Responsibility submitted a request to the U.S. Fish and Wildlife Service alleging violations of Section 515 of Public Law 106-554, commonly referred to as the Information Quality Act. After review of the allegations, the Director committed to completing a series of tasks. The actions we have taken to date to address these issues are described below.

**Task 1**

**Immediately update the panther-related sections of the Multi-Species Recovery Plan to incorporate appropriate recommendations of the Scientific Review Team and publish those revisions for public comment no later than December 2005.**

**Response**

The Service recently convened a recovery team composed of multiple government and non-government partners to update the 1995 Florida Panther Recovery Plan. The team is now developing a revised recovery plan that incorporates the best available science and addresses appropriate recommendations from the Scientific Review Team (SRT), an independent group convened to comprehensively review and critically evaluate panther scientific literature and data analyses and offer recommendations to address uncertainty. The recovery plan is scheduled to be published for public review and comment by December 31, 2005. To ensure this goal is achieved, the team has scheduled meetings once each month through September 2005. When complete, this recovery plan will update the Florida Panther Recovery Plan of 1995 and will supersede the panther section of the Multi-Species Recovery Plan (MSRP), eliminating the need to update the panther portion of the outdated document.

**Task 2**

**Develop an appropriate disclaimer to accompany further dissemination of the MSRP in the interim.**

**Response**

The South Florida Ecological Services Office has posted the disclaimer below on the website linking to the MSRP http://verobeach.fws.gov/Programs/Recovery/vbms5.html.

"The MSRP, completed by the Service in 1999, contains information on the biology, ecology, status, trends, management, and recovery actions for 68 federally listed species found in south Florida, as well as the ecology and restoration needs of 23 natural communities in the region. This document was prepared to recover threatened and endangered species in south Florida and help restore and maintain biodiversity of natural communities. The MSRP was designed to assist with project planning, management actions, and environmental compliance, and it provides information for use in interagency consultations and habitat conservation plans. More than 200

representatives from agencies, academia, and private organizations worked together to assist the Service in preparing the MSRP. Public review and comment of the draft occurred over eight months before the MSRP was approved by the Service.

Because the MSRP was published approximately five years ago, the Service acknowledges that portions of it, including some sections related to the Florida panther, are now outdated. To update Florida panther science, the Service and State of Florida convened the independent SRT (Beier et al. 2003), which questioned some of the analyses and conclusions regarding Florida panther habitat in the MSRP. The description of habitat in the Florida panther section of the MSRP (p.4-120), for example, while providing a useful description of habitat needs in south Florida, does not clearly or definitively describe panther habitat in the detail available today.

In particular, the MSRP mainly discusses "preferred" and "avoided" panther habitat based upon telemetry and early work by Dave Maehr (e.g., Maehr 1990) and other researchers (e.g., Maehr et al. 1991). To address this point, the SRT suggested reanalyses of panther telemetry data. The SRT encouraged using panthers, not panther locations, as sampling units, and analyzing data on nocturnal locations of Florida panthers throughout their range to obtain a complete picture of habitat use (Beier et al. 2003). The Service recognizes the value of suggestions identified in the SRT report, and is working with researchers and other partners to describe Florida panther habitat as clearly as possible.

At this time, the Service believes the MSRP still provides a comprehensive, general overview of panther biology in south Florida. Hence, we continue to use the information within the MSRP, along with other available scientific and commercial information, in our decisions, evaluations, reviews, and analyses regarding the panther. However, we are careful not to rely on those portions of the MSRP that no longer represent the most up-to-date scientific information available, especially as they relate to the use of panther habitat descriptions.

To help address the out-dated information in the MSRP, the Service recently convened a recovery team composed of multiple government and non-government partners to revise the 1995 Florida Panther Recovery Plan. The team is now developing a revised recovery plan that incorporates the best available science and addresses appropriate recommendations from the SRT. The plan is scheduled to be published for public review and comment by December 31, 2005. To ensure this goal is achieved, the team has scheduled meetings once each month through September 2005. When complete, the Service expects the recovery plan to supersede the panther section of the MSRP, eliminating the need to update the panther portion of the outdated document."

**Task 3**

**Suspend the dissemination of the December 19, 2002, Draft Landscape Conservation Strategy (LCS). The Regional and South Florida Ecological Services Office web pages will post a notification of this suspension.**

**Response**

The South Florida Ecological Services Office has posted the notice below on its website.

Dissemination of the Landscape Conservation Strategy for the Florida Panther Suspended
The Florida Panther Subteam of the Multi-species/Ecosystem Recovery Implementation Team (MERIT) was charged with developing a landscape-level strategy for the conservation of the Florida panther. The Panther Subteam produced the "Landscape Conservation Strategy for the Florida Panther in South Florida (LCS)" in December 2002 and provided it to the Service. Upon receipt, the Service began to use the information in the LCS in its decision making processes and documents. Since then, some of the science and findings in the LCS have been challenged.

The Service will no longer disseminate the LCS because of scientific shortcomings identified by Dr. Paul Beier and others, which broadly fit into the following categories: errors associated with telemetry data and interpretation; limitations of telemetry-based analyses to inferences on daytime habitat use only; compositional analyses for determining habitat use and preference; sensitivity analyses for modeling scenarios; and methods of evaluation of potential habitats north of the Caloosahatchee River, and habitat capacity of south Florida. More specifically, Beier recommended reanalyses of forest patch size, distance from forest patches, and distance from urban areas by using the animal as the sampling unit, comparing the area used to that available to the animal, and buffering in telemetry location error. Although Beier recommended more rigorous analyses and believed that the net result of his comments would be a better refined definition of panther habitat, he suggested that this would likely have little effect on the final potential habitat map.

Many of the Panther Subteam members have worked together to refine the methodology, further analyze the data, and better define the results of the LCS as a draft article for a professional peer-reviewed journal. To date, the authors known collectively as Kautz et al. have responded to two sets of peer review edits on their draft article and are waiting to hear from the journal editor. In addition, the authors have considered the comments provided by Beier (2003) on the LCS and the recommendations offered by the SRT (Beier et al. 2003). As predicted by Beier, these reanalyses did not negate or invalidate the draft LCS for its intended purposes.

The Service is evaluating the limitations identified in the LCS further and developing recommendations for addressing the issues identified by the SRT. The Service is committed to addressing these issues comprehensively, either by incorporating appropriate information into the recovery plan now in development, or in some other demonstrable manner. In the meantime, Kautz et al. (In Review) contains the same data as the LCS, but it addresses many of the comments of Beier and the SRT, contains more rigorous analysis, and is being peer reviewed an additional time.

**Task 4**
**Take appropriate measures to address comments by Dr. Paul Beier and SRT recommendations in any future dissemination of information.**

**Response**
The Service has developed a response to these comments and other related issues, and has included the information in biological opinions for panthers completed since the Director's March 16, 2005 letter to Jeff Ruch, Executive Director of Public Employees for Environmental Responsibility. An example of this detailed information is available in Attachment 1. In

addition, the Service has developed a tracking document for SRT recommendations and our responses, and is updating it as we make progress.

**Task 5**

**By August 1, 2005, update Service files on its biological opinions to correct the portions that erroneously equated the Minimum Viable Population of panthers and the Current Verified Population. A copy of this correction will be sent to the Action Agency and posted on the Region and South Florida Ecological Services Office web pages.**

**Response**

The Service is reviewing past biological opinions, and will correct the portions that erroneously equated the Minimum Viable Population of panthers and the Current Verified Population by August 1, 2005. In addition, the Service will send a copy of the correction to the Action Agency and post the information on the Region and South Florida Ecological Services Office websites.

**Attachment A**

To help address the questions raised on some out-dated and deficient scientific sources, the U.S. Fish and Wildlife Service has added variations of the following discussion to biological opinions on the Florida panther that have been issued since the Director's March 16 letter to Mr. Jeff Ruch, Executive Director of Public Employees for Environmental Responsibility.

## Use of Best Scientific and Commercial Information by the Service

The Service uses the most current and up-to-date scientific and commercial information available. The nature of the scientific process dictates that information is constantly changing and improving as new studies are completed. The scientific method is an iterative process that builds on previous information. As the Service becomes aware of new information, we will ensure it is fully considered in our decisions, evaluations, reviews, and analyses as it relates to the base of scientific knowledge and any publications cited in our documents.

Specifically, there is one such document cited in the biological opinion the Service acknowledges has been affected in its cited form by new scientific information. The Service has taken these new sources of information into account when using this document to help guide our analysis and decisions. This document is the Multi-Species Recovery Plan (MSRP) of 1999 (Service 1999). In addition, the Service has examined Kautz et al. (In Review) for its scientific validity, specifically with regards to comments and recommendations by other reviewers as discussed below.

South Florida Multi-Species Recovery Plan

The MSRP was designed to be a living document, and it was designed to be flexible to accommodate changes identified through ongoing and planned research, and to be compatible with adaptive management strategies. These principals are set forth in both the transmittal letter from the Secretary of the Interior and in the document itself. As predicted, this is what indeed occurred in the intervening years since the MSRP was published. The Service uses the MSRP in the context it still presents useful information when taken in conjunction with all the new scientific information developed subsequent to its publication.

Kautz et al. (In Review)

The Florida Panther Subteam was charged with developing a landscape-level strategy for the conservation of the Florida panther population in south Florida. The Subteam produced the draft Landscape Conservation Strategy for the Florida Panther in South Florida in December 2002 and provided it to the Service. Upon receipt, the Service began to use the information in the draft Landscape Conservation Strategy in its decision making processes and documents since it was part of the best scientific information available to the Service at the time. Since then some portions of the science and findings in the draft Landscape Conservation Strategy have been challenged. Many, but not all, of the Subteam members have refined the methodology, further analyzed the data, and better defined the results of the Landscape Conservation Strategy into a draft article, referred to here as Kautz et al. (In Review), for submission to a professional peer-

reviewed journal, Biological Conservation. To date, the authors have responded to two sets of edits on their draft article and are awaiting response from the journal editor regarding acceptance of the manuscript for publication. In addition, the authors have considered the comments provided by Beier (2003) on the Landscape Conservation Strategy and the recommendations provided by the Scientific Review Team (SRT) (Beier et al. 2003) as discussed below. Dr. Jane Comiskey, one of the co-authors of Kautz et al. (In Review), has expressed some concerns about the manuscript and we have addressed her concerns below as well. We have also addressed issues relating to the ESA and Information Quality Act.

**Beier (2003) Comments on the Draft Landscape Conservation Strategy**

Beier provided 37 comments on the Subteam's Landscape Conservation Strategy. Kautz et al. (In Review) addressed all of Beier's comments except those discussed below.

1. Include a statement that when analyses using nighttime data are available, this picture probably will change.

*This statement is not in the manuscript, but in this and other biological opinions, the Service acknowledges that nighttime and 24-hour data are generally not readily available at this time. Data from GPS collars will be considered when found to be reliable and available. Availability of nighttime or 24-hour data may possibly change some conclusions about panther habitat in the future. In analyses of puma habitat in California, Beier (2003) found that puma show markedly broader habitat use and selection at night compared to daytime. We expect that when GPS-collar data become more available, there will likely be a better understanding of habitat use at night. However, the Service does not solely rely on daytime telemetry in making its decisions regarding panther habitat. The Service considers panther habitat to include all areas required for the panther to live out its full life-cycle, including areas providing food and shelter and supporting characteristic movement such as hunting, breeding, dispersal, and territorial behavior.*

2. Explain the witch's finger jutting eastward from the Primary Zone. No panther is going to have a home range 10 miles long and 400 meters wide. Buffer this so that it is at least 1 mile wide at its narrowest points, and 4 to 5 miles wide in most areas. I support the idea of making this primary habitat, but strongly feel that it does not make sense to make it so narrow.

*This was not addressed. This comment relates to the slender portion of the Primary Zone that protrudes eastward at the border of Palm Beach and Broward Counties and the recommendation by Beier that it be buffered to be more inclusive. While Kautz et al. (In Review) did not make this requested modification, the Service will address this omission in biological opinions, as appropriate. The Service is careful to consider Primary, Dispersal, and Secondary Zones and other panther habitat, along with additional high-quality scientific and commercial data, in our analyses and evaluations.*

3. Secondary Zone: Overall, the approach is *reasonable*, but not *rigorous*. We will probably never have data to make this a rigorous analysis, so it would be unreasonable to demand it.

However, if you ran a cursory sensitivity analysis, you can determine how the map varies under different assumptions about cutoff points and relative weights.

*According to Kautz et al. (In Review), the Secondary Zone is defined as natural and disturbed lands adjacent to the Primary Zone that may have potential to support an expanding panther population, especially if habitat restoration were possible. A preliminary boundary of a Secondary Zone was originally drawn on a hard copy map by the Multi-species Ecosystem Recovery Implementation Team (MERIT) Panther Subteam. The landscape context of the draft Secondary Zone was evaluated by combining a set of 30-meter (m) pixel grids created to measure three habitat-related variables (*i.e., *proximity to Primary Zone, proximity to a forest plus buffer patch, forest plus buffer patch size) and three land-use variables (*i.e., *proximity to urban lands, intensity of land use, and road type and density). Pixels in the six data layers were assigned scores of 1 to 10, with 10 representing the best case for panthers. Equal interval or progressively increasing or decreasing increment functions were applied to each data layer as deemed appropriate. The Secondary Zone boundary was finalized by adjusting the preliminary boundary to conform to results of the landscape context analysis and to land use changes as indicated by recent satellite imagery. To our knowledge, a cursory sensitivity analysis varying the scores assigned to the different variables within each data layer was not run. Therefore, we do not know how a map of the Secondary Zone would vary under different assumptions about cutoff points and relative weights. However, as a group, the Subteam reviewed the draft Secondary Zone boundaries in relation to the results of the context analyses and recent satellite imagery, and achieved consensus on the adjusted boundaries that best met the definition of the Secondary Zone. Therefore, the Service does not believe the lack of this cursory sensitivity analysis affects the scientific validity of a Secondary Zone nor the Service's ability to use it in biological opinions.*

4. A density of 1 panther per 11,000 hectare (ha) is a strange inference from this simple descriptive statistic. The 11,000 ha is simply total area divided by the number of panther home ranges in the area. This is not a sound approach toward estimating minimum forest area for use by panthers.

*In the Landscape Conservation Strategy, the MERIT Panther Subteam attempted to identify lands north of the Caloosahatchee River for their capacity to support one or more groups of reproducing panthers. In that process, they assumed that large forest patches, at least 11,000 ha in size, would be needed. This assumption was based on an estimate of population density in optimal habitat given by Maehr et al. (1991a).*

*In conducting a compositional analyses, Kautz et al. (In Review) determined that panther use of forest patches within fixed kernel home ranges south of the Caloosahatchee River differed significantly from random. The smallest forest patch size classes occurred within home ranges in higher proportions relative to their availability than larger forest patch sizes. With this new knowledge, Kautz et al. (In Review) did not repeat the erroneous assumption that forest patches at least 11,000 ha in size are required by panthers. Kautz et al. (In Review) did use 1 panther per 11,000 ha as a rough density estimate along with a density estimate derived from their own analysis (1 panther per 12,919 ha) to provide estimated ranges for the potential number of*

*panthers that could be accommodated by the current configuration of the Primary, Dispersal, and Secondary Zones.*

5. Habitat Capacity, "defined as areas with pixel values >3." This definition, it seems, would result in a region with Swiss-cheese holes and outlier bubbles of habitat. Was there a step that involved smoothing to create a "smooth" map? If so, describe that step. If not, acknowledge and describe the nature of the resulting map.

*For the purposes of their study, the Subteam developed an estimate of panther population density. Minimum convex polygons of panther home ranges were generated for all Florida panthers by year based on telemetry records through early in 2000 (n=49,889 telemetry locations, 1981 to 2000). Each polygon was converted to a 100 m pixel grid, and the resulting grids were summed. The region of most consistent panther occupancy for the period of record was defined as areas with pixel values ≥3. This step excluded areas used only once or twice by transient animals. To estimate population density, the total land area within the resulting region of panther occupancy was divided by 62, the estimated size of the panther population in 2000 (McBride 2000). Using this method, the region of most consistent panther occupancy from 1981 through early 2000 covered 800,951 ha. Based on the estimated panther population of 62 individuals, population density was one panther per 12,919 ha in 2000. Kautz et al. (In Review) did not address the shape or character of the resulting map, nor whether its creation involved "smoothing." However, the resulting size of area of occupancy and population density they report are consistent with other published information and are considered the most current and up-to-date scientific information available to the Service.*

6. "Region of panther occupancy was divided by 62, the estimated size of the panther population in 2000." Need to be specific about whether this refers to resident adults, resident breeding adults, adults plus independent juveniles, or total panthers, including kittens. McBride's estimate, I believe, was "adults plus independent juveniles" and is thus analogous to the estimated density provided by Maehr et al. (1991a).

*This was partially addressed. Kautz et al. (In Review) states that "…estimates place the population at 80-100 adults and subadults (Land and Lacy 2000; McBride 2001, 2002, 2003)." Later, where Kautz et al. (In Review) use the estimate of 62 panthers, McBride is cited. According to Kautz et al. (In Review), "To estimate population density, the total land area within the resulting region of panther occupancy was divided by 62, the estimated size of the panther population in 2000 (McBride 2000)." McBride (2000) clearly indicates that 62 panther number "…includes collared and uncollared, adult and subadult, part-Texas and pure Florida panthers. It does not include kittens at the den site, nor does it include extrapolations." The Service understands that the panther population of 62 in 2000 included adults plus subadults and not kittens at the den.*

7. "A population of this size would have $N_e$ of ~ 50 breeding adults." This statement needs explanation based on published data, otherwise delete it. $N_e$ is a notoriously difficult parameter to estimate.

*No similar statement is in Kautz et al. (In Review) and $N_e$ is not mentioned in the text. However, $N_e$ is in Table 5 of Kautz et al. (In Review). The presence of $N_e$ in Table 5 does not affect the scientific validity of the document nor the Service's ability to use it. The effective population size ($N_e$) is the number of adults in a population contributing to offspring in the next generation. Although we understand that $N_e$ is difficult to estimate, we believe use of it is helpful in the population guidelines given in Kautz et al. (In Review). The Service realizes that the effective population size is generally smaller than the census size and is often much smaller than the census size. Although not specifically discussed in our biological opinions, we factor this into our analyses.*

8. It is hard to believe that we cannot "rank agricultural lands as panther habitat" with data already in hand. Don't we already know that unimproved pasture > improved pasture > citrus > row crops?

*This has been addressed to some degree. Table 1 of Kautz et al. (In Review) does rank some agriculture lands but not to the level of detail in the comments. The Service has factored the relative value of cover types/habitat types into our analyses and decision-making process during project evaluations and reviews.*

9. Please change "long-term survival of the Florida panther" to "long-term survival of the existing population of the Florida panther."

*This was not addressed in Kautz et al. (In Review). However, the Service realizes that a single Florida panther population exists in south Florida. Our decisions in this biological opinion and others are based upon ensuring the survival of the panther population in south Florida while working toward what is needed for recovery throughout the panther's historic range.*

**<u>Scientific Review Team Report</u>**

1. Beier et al. (2003) states that "Telemetry data have been collected for Florida panthers over a long time period (since 1981), but in some analyses of habitat use, the vegetation maps may not have been updated and ground-truthed to stay current with analyses of telemetry data. The SRT has insufficient information to know to what degree this may be a problem, but recommends attention to this potential problem in future analyses."

*Kautz et al. (In Review) states that "While researchers have continued to collect telemetry data for radio-collared panthers through the date of this writing, we are reporting the results of the only telemetry data that were available at the time of our collaborative work, and the telemetry data we used were closer in time to the date of the land cover data sets used for habitat analysis." In relation to how this point was addressed in the Kautz et al. (In Review) manuscript, Randy Kautz (Florida Fish and Wildlife Conservation Commission [FWC], personal communication, 2004) stated that he "spent several hours at one point zooming in on panther telemetry against a backdrop of recent land cover data, and…found very few obvious examples of this being a problem. My own take was that the volume of telemetry data of over 55,000 records was so huge that any currency problems comprised a very small error factor." The Service concurs with Randy Kautz's conclusion and believes that currency errors in such a large sample size would not be significant.*

2. Beier et al. (2003) strongly recommends the use of compositional analyses (Aebischer et al. 1993) or another statistically appropriate method to compare the distributions of forest patch sizes available to panthers to those used by panthers.

*Kautz et al. (In Review) used compositional analysis to assess the effect of forest patch size on panther habitat use within the study area south of the Caloosahatchee River. This was accomplished by reclassifying upland and wetland forest types into one forest class, determining patch size, and assigning individual forest patches to size classes according to an equal area increment function. Differences in proportions of forest patches within each home range relative to the entire study area were then tested. Kautz et al. (In Review) found that forest patches of all sizes are important to panthers and that the smallest classes of forest patches are especially important.*

3. Beier et al. (2003) states "The estimate of 84% to 87% kitten survival (Maehr and Caddick 1995) is indefensible for several reasons."

*Randy Kautz (FWC, personal communication, 2004) stated that "Our Population Viability Analysis (PVA) models used more recent and realistic survival rates of 0.62." This rate was developed by the use of data collected by FWC researchers and constitutes the best available data at this time. This issue is further addressed below under Questions 2 and 6 within in the section addressing comments from Dr. Jane Comiskey.*

4. Beier et al. (2003) states "The SRT recommends that any future PVA models should be built from scratch and explicitly consider parameter uncertainty, variation (demographic, environmental) in parameters, and uncertainty in key functional relationships such as density dependence and the effects of inbreeding."

*Randy Kautz (FWC, personal communication, 2004) stated that "We used Risk Assessment, Management, and Audit Systems (RAMAS), and I believe we are happy with the results. Our use of RAMAS preceded the SRT report. I personally think that enough PVAs have been done to give us a pretty good picture of the survival potential of the population, but no doubt the next generation of PVA modelers will improve on past work." The Service concurs with this statement and believes that Kautz et al. (In Review) should be considered among the most current and up-to-date scientific and commercial information available, and we will use this analysis and other relevant information in our biological opinions until new, scientifically peer reviewed and verified data are present.*

## Dr. Jane Comiskey's February 2005 Comments on Kautz et al. (In Review)

Taken as a whole, Dr. Comiskey's concerns dealt primarily with the addition of text and explanation to Kautz et al. (In Review) if it was to be used as a substitute for the Landscape Conservation Strategy. The Service agrees that Kautz et al. (In Review) is not a stand alone document and must be used in conjunction with the body of scientific literature regarding the panther, including the work of the Panther Subteam.

1. Kautz et al. (In Review) lacks the needed ecological and environmental context to replace the full Landscape Conservation Strategy.

*This may be correct in some instances. However, where the Service has cited this document in place of the Landscape Conservation Strategy we have ensured that the information is indeed included in Kautz et al. (In Review) and not part of the larger, more detailed Landscape Conservation Strategy. We believe that Kautz et al. (In Review) captures the major findings of the Landscape Conservation Strategy. Additional ecological and environmental context that is specific to an individual proposed project and proposed project site is included in biological opinions*.

2. "The best we know given the current science at hand" indicates that some model assumptions are violated in the existing population and that parameter value estimates for reproductive rates and kitten survival are likely too optimistic. We need to acknowledge that in using model results.

*Some parameter value estimates for reproductive rates and kitten survival may be too optimistic. Some estimates of kitten survival have been too high (*e.g.*, 0.80) while others may be too low. It would have been our preference to see a range of kitten survival rates used in the model between the Conservative, Moderate, and Optimistic scenarios as was done with other reproductive parameters used in Kautz et al. (In Review). To our knowledge and that of the authors, the kitten survival rate of 0.62 is the most recent and, as far as we know, most reliable; we do not have a more reliable rate for kitten survival to use.*

*Sensitivity analyses conducted by Karen Root of the Panther Subteam showed that juvenile survival was the most important variable of those used within the PVA (K. Root, Bowling Green State University, personal communication, 2003). Therefore, we are aware that uncertainty within this parameter may have the greatest consequences on the projected population performance or trajectory. We acknowledge that uncertainties exist, and that we are aware of them, however, we consider the 0.62 kitten survival rate the best available at this time. The Service and the FWC along with our partners will continue to monitor the panther population and the south Florida landscape and incorporate any new information and changes into our decision-making process.*

*We recognize that model parameters such as this can have effects on model outcomes. The Service is mindful of the limitations that exist, and when making decisions, we focus on the well being of the species.*

3. Kautz et al. (In Review) does not include a definition of habitat.

*We agree that specifically stating what constitutes panther habitat would be beneficial, however, we do not agree that lack of a definition should prevent use of Kautz et al. (In Review). Most biologists have an understanding of what habitat means. We believe that the Service and our counterparts understand what constitutes panther habitat. However, the Service considers panther habitat to be all areas required for the panther to live out its full life-cycle, including areas providing food and shelter and supporting characteristic movement such as hunting, breeding, dispersal, and territorial behavior.*

4. We agreed on the Florida Panther Subteam on the importance of ranking land use categories on a scale of adverse to beneficial effects on panthers and evaluating proposed land use changes in the context of this scale. Randy Kautz felt that it would be redundant to include an explicit statement about this approach toward evaluating the impact to panthers of intensification of disturbance within zones.

*The Service believes that ranking land use categories on a scale of adverse to beneficial effects on panthers and evaluating proposed land use changes in the context of this scale would be helpful, but is not necessarily needed to be part of Kautz et al. (In Review).*

5. RAMAS PVA Assumptions: we need more discussion of the assumptions associated with the PVA and the degree to which we know these assumptions to be violated in the existing landscape and population.

*We are aware of the assumptions used in the PVA analyses and consider these in our decisions. We will acknowledge the degree to which we believe any assumptions are being violated in our documents.*

*According to Kautz et al. (In Review), "All models assumed a 1:1 sex ratio, a stable age distribution, 50 percent of females breeding in any year, and an initial population of 41 females (82 individuals including males), the approximate population size in 2001-2002 (McBride 2001, 2002). The basic version of each model incorporated no catastrophes or epidemics, no change in habitat quality or amount, and a ceiling type of density dependence. The basic versions of the models incorporated a carrying capacity of 45 females (90 individuals) based on estimated population sizes likely to be supported by the Primary and Secondary Zones (see Sections 4.1 and 4.3)."*

*The Service acknowledges that some of these assumptions are violated and tries to factor the degrees to which assumptions may be violated into our decisions. For example, the Service is aware that the Panther Subteam had attempted to address the effects of habitat loss by assuming a 25 percent loss of panther habitat over the first 25 years (*i.e., *one percent per year) of the 100-year model simulation during their analyses. Although the probability of extinction only increases approximately one percent under this scenario, the mean final abundance of panthers was reduced by 26 percent to 31 to 38 females. The actual likelihood of population declines and extinction can be much higher than the guidelines suggest, depending upon the number of and severity of assumptions violated. The Service realizes that habitat loss is occurring at an estimated 0.8 percent loss of habitat per year (R. Kautz, personal communication, 2003). The Service has tried to account for habitat loss and changes in habitat quality within its regulatory program and specifically through its habitat assessment methodology. For example, we have increased the base ratio used within this methodology to account for unexpected increases in habitat loss. Similarly, we consider changes in habitat quality and encourage habitat restoration wherever appropriate.*

*With regard to the assumption of no catastrophes, the Service has considered the recent outbreak of feline leukemia in the panther population at Okaloacoochee Slough as a potential catastrophe. However, the FWC is carefully monitoring the situation and it appears to be under*

*control at this time due to a successful vaccination program. However, if the outbreak spreads into the population, the Service will consider this as a catastrophe and factor this into our decisions.*

6. All three of the RAMAS PVA model scenarios (conservative, moderate, and optimistic) estimate the first year kitten survival rate at 62 percent, based on the Land/Linda kitten survival analysis from FWC annual panther reports (FWC 2001, repeated in 2002, 2003, 2004). However, the selective Land/Linda analysis omits without explanation many failed litters documented in denning tables in these same annual reports, resulting in estimates of survival rates that are too optimistic, especially for the purebred Florida component of the population where most failed litters occurred. Even when reliable rates are computed, PVA scenarios should incorporate a range of survival rates, since the high survival rate among introgressed litters in part reflects expansion into unoccupied areas of the range where there is less competition for space and prey. As such, rates could decrease as the range becomes saturated and as inbreeding effects may reappear in the population.

*Per Tim O'Meara (FWC, personal communication, 2005), this does include litters that failed. The FWC annual report does include all litters for which FWC was able to get into the den and determine outcome of litters 6 months later; if litters were not included it was because they did not meet those criteria (T. O'Meara, personal communication, 2005). We agree that incorporating a range of kitten survivals into various PVA models would be beneficial in the future. To our knowledge, the kitten survival rate of 0.62 is the most recent and most reliable estimate to use at this time. We will continue to use this estimate until a more reliable estimate is available.*

7. We should include a statement acknowledging that the SRT has found serious errors in panther science and has recommended reanalysis of baseline data for the population. We should acknowledge that, as a result of errors, PVA parameter values may have been overestimated, leading to PVA results that may be too optimistic. In the meantime, decisions should err on the side of the panther.

*The Service agrees that the SRT has found serious errors in the scientific literature related to the panther and that reanalysis of baseline demographic data for the population should be done. The SRT has made numerous recommendations and the FWC and the Service are in the process of prioritizing these based upon need and importance to panther recovery. We realize that PVAs, like any model or analyses, are only as good as the assumptions, parameters, and data used. We believe that Kautz et al. (In Review) used the best available estimates for the parameters within the PVA. We realize that there is a possibility that the PVA results may be too optimistic. We agree that our decisions should err on the side of the panther.*

## Endangered Species Act/Information Quality Act

1. The ESA states that the Service "shall use the best scientific and commercial data available." However, the vegetation data and land use/land cover maps, as well as the panther telemetry points are several years old.

*Most information must be analyzed before it is of use to us. Due to the time for analysis and the extensive and lengthy peer review and publication process, it is not possible for an article to be published in a professional journal before the data becomes several months to a few years old as is the case in this instance. We believe that Kautz et al. (In Review) is an appropriate and valid addition to the body of science and it adds to the "best scientific and commercial data available," however, part of the base data and maps are not necessarily the most current.*

2. The Information Quality Act Challenge states "The estimate of an 80% pre-introgression kitten survival rate in Maehr et al. (1999, 2002) was based on an indefensible estimate Maehr and Caddick (1995) that was unsupported by data (Beier et al. 2003:47, 49, 143-144)."

*Kautz et al. (In Review) used the more current and realistic survival rate of 0.62. This issue is also addressed above in Question 3 within the Scientific Review Team section, and in Questions 2 and 6 within the Dr. Jane Comiskey section.*

# United States Department of the Interior

FISH AND WILDLIFE SERVICE
South Florida Ecological Services Office
1339 20th Street
Vero Beach, Florida 32960


September 7, 2005

Colonel Robert M. Carpenter
District Engineer
U.S. Army Corps of Engineers
701 San Marco Boulevard, Room 372
Jacksonville, Florida 32207-8175

Dear Colonel Carpenter:

As you are aware, the National Wildlife Federation (NWF) has sent our agencies a number of letters over the past several months identifying questions related to biological opinions completed under Section 7 of the Endangered Species Act of 1973, as amended (ESA) (16 U.S.C. 1531 *et seq.*). In particular, NWF sent our agencies letters dated March 7, 2005, March 24, 2005, May 10, 2005, May 23, 2004, May 24, 2005, July 28, 2005, and September 2, 2005. In some cases, these letters provided scientific information for our consideration, and in other cases they expressed concerns about statements in a number of biological opinions related to the endangered Florida panther (*Puma concolor coryi*) and wood stork (*Mycteria americana*). The Florida Panther Society, Inc. was a co-author of the March 7, 2005, May 10, 2005, and July 28, 2005, letters, and the Florida Wildlife Federation was a co-author of the May 23, 2005, letter. The biological opinions addressed in some way include:

| **Corps Permit No.** | **Project Name** |
|---|---|
| 199603501 | GL Homes, Collier County (Terafina) |
| 199402492 | Florida Rock Industries, Lee County |
| 200001926 | J.D. Nicewonder, Jr., Collier County (Mirasol) |
| 198990960 | Old Cypress Golf Club, Collier County |
| 200106580 | Ronto Development Parklands, Inc., Collier County |
| 199702228 | Bonita Springs Utilities, Inc., Lee County |
| 20036759 | Gateway Shoppes II, LLC, Collier County |
| 20035331 | Worthington Holdings Southwest, LLC, Lee County (Arborwood) |
| 20036965 | Worthington Holdings Southwest, LLC, Lee County (Treeline Avenue) |
| 199806220 | V.K Development Corporation, Collier County (Wentworth Estates) |
| 199507483 | Miromar Lakes Addition, Lee County |
| 200445312 | Seminole Rock Mine |
| 199130802 | Daniels Parkway, Lee County |
| 199301156 | Southwest Florida Airport, Lee County |
| 199901251 | Southern Marsh Golf, Collier County |
| 19901378 | Hawk's Haven, Lee County |
| 200001574 | Verandah, Lee County |
| 199602945 | Winding Cypress, Collier County |
| 200003795 | Walnut Lakes, Collier County |
| 200200970 | Apex Center, Lee County |

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| **Corps Permit No.** | **Project Name** |
|---|---|
| 199701947 | Twin Eagles Phase II, Collier County |
| 199905571 | Airport Technology, Lee County |
| 200206725 | SR 80, Lee County |
| 200202926 | The Forum, Lee County |
| 199607574 | Cypress Creek Farms, Collier County |
| 200102043 | Bonita Beach Road, Lee County |

The Service carefully reviewed the letters upon receipt and determined the information provided and questions raised did not warrant reinitiation under Section 7 of the ESA. It is important, however, to underscore our commitment above and beyond the reinitiation threshold to maximizing the quality, objectivity, utility, and integrity of the information we disseminate to the public. To this end, we have taken steps to more clearly describe the science and analysis in recent biological opinions. In the spirit of providing complete transparency, we would like to take this opportunity to directly respond to the questions posed in the letters (Enclosure). In addition, we would like to amend opinions issued this year to address a few minor points for the record as described in the enclosure. Through this letter and enclosure, we have addressed all the issues in need of further clarification and believe the concerns are now resolved in full.

Please add this letter to your administrative record for the aforementioned biological opinions. If you have any questions or additional information is needed, please do not hesitate to contact me at 772-562-3909.

Sincerely yours,

James J. Slack
Field Supervisor
South Florida Ecological Services Office

## Enclosure

The Fish and Wildlife Service (Service) has received a number of letters from the National Wildlife Federation (NWF) over the past several months identifying questions related to biological opinions completed under Section 7 of the Endangered Species Act of 1973, as amended (ESA) (87 Stat. 884; 16 U.S.C. 1531 *et seq.*). In particular, NWF sent our agencies letters dated March 7, 2005, March 24, 2005, May 10, 2005, May 23, 2005, May 24, 2005, July 28, 2005, and September 2, 2005. In some cases, these letters provided scientific information for our consideration, and in other cases they expressed concerns about statements in a number of biological opinions related to the endangered Florida panther (*Felis concolor coryi*) and wood stork (*Mycteria americana*). The Florida Panther Society, Inc. (FPS) was a co-author of the March 7, 2005, May 10, 2005, and July 28, 2005, letters, and the Florida Wildlife Federation was a co-author of the May 23, 2005, letter.

The March 7, 2005, May 10, 2005, and July 28, 2005, letters raise virtually the same concerns about the Service's statements and analyses. The March 7, 2005, letter focuses largely on the Bonita Springs Utilities, Inc. biological opinion finalized on January 18, 2005. The May 10, 2005, letter primarily addresses the J.D. Nicewonder, Jr., (Mirasol) biological opinion published on March 9, 2005. The July 28, 2005, letter focuses primarily on the Terafina biological opinion issued on March 21, 2005. Below, we address the points raised in the letters and use the July 28, 2005, letter as the guiding framework. This most recent letter includes all the issues in need of further clarification.

**National Wildlife Federation and The Florida Panther Society, Inc. July 28, 2005 Letter**

- On page five, NWF and FPS suggest we incompletely quoted Paul Beier (2003). In particular, NWF and FPS suggest we omitted the following italicized text: "the Landscape Conservation Strategy makes a strange inference from this simple descriptive statistic. The 11,000 ha is simply total area divided by the number of panther home ranges in the area – *it is not the size of a panther home range, nor is it the amount of forest in a panther home range, nor is there any logical reason that 11,000 ha should be the 'minimum size of a forest patch to have potential use by panthers.' This is a complete non-sequitur.* This is not a sound approach toward estimating minimum forest area for use by panthers." We believe the wording in the Terafina biological opinion captures the intent of the Beier's point, and the response to the point in the opinion is also appropriate. For the sake of providing full clarity, however, we will include the italicized text in future biological opinions.

- On pages six through nine of the letter, NWF and FPS raise questions about the population viability analysis (PVA) completed in the draft paper by Kautz et al. (In Review) entitled *How Much is Enough? Landscape-scale Conservation for the Florida Panther.* In an email dated August 23, 2005, from NWF to the Service, we learned the most recent draft of Kautz et al. (In Review), which was recently submitted to a journal for final review, omitted the PVA. As a result, the Service will no longer reference this PVA in biological opinions. Furthermore, we have carefully considered this issue and determined it does not warrant reinitiation of consultation for any previously published biological opinions.

- NWF and FPS raise other questions about Kautz et al. (In Review), such as using the 2000 population estimate of 62 panthers to calculate population density. Since that time, the published verified panther population has increased to 87 in 2003 (McBride, 2000-2003). In addition, some land uses have changed since 2000. The Service would welcome future studies that use updated population estimates, along with updated land use information. This future science, along with other science that fully addresses the questions raised by NWF and FPS about Kautz et al. (In Review), would further advance our understanding of panther density and conservation needs. It is important to state the Service believes Kautz et al. (In Review) is a positive addition to the body of panther science; however, our analyses and conclusions are derived by a careful consideration of the full body of science, and not merely one paper. We believe Kautz et al. (In Review) is one part of the best available science today.

- On page seven, NWF and FPS notes the Service used "kitten survival" and "juvenile survival" interchangeably. In future biological opinions, we will use "kitten survival" exclusively in the section in question. Furthermore, we hereby amend the following published opinions to reflect this revision: Ave Maria (CPN 20030946); Mirasol (CPN 200001926); Terafina (CPN 199603501); Gateway Shoppes II (CPN 200306759); Seminole Mine (CPN 20045312); Arborwood and Treeline Avenue (CPN 20035331, 20036965); Collier Regional Medical (CPN 200311156); Wentworth Estates (CPN 199806220); and Land's End (CPN 199405829).

- On page nine, NWF and FPS question the rationale behind selecting an action area of 25 miles. The Service's Section 7 handbook defines an action area as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate action." Maehr et al. (2002) estimated a panther subadult male mean dispersal distance of 37.3 km, or 23.2 miles, and Comiskey et al. (2002) documented a mean dispersal distance of 40.1 km, or 24.9 miles. Given this range of data and the Service's best professional judgment regarding the direct and indirect effects of the Terafina project, we believe it is reasonable to define the action area as 25 miles, or an area slightly greater than the mean dispersal distance of subadult males as defined by the best available science.

- On page nine, NWF and FPS request a citation to support the statement that "densities of Florida panthers have increased in the last decade." From 2000-2003, the verified population estimates showed a clear increase (McBride, 2000-2003). To our knowledge; however, no studies have been completed that estimated the density of panthers after 2000. Nonetheless, given the population increase and changes in land use during the same period, it is reasonable to believe population density has increased. To be more transparent and precise in future biological opinions, the Service will rephrase the statement identified by NWF and FPS to "increases in published verified population numbers from 2000-2003 and changes in land use during the same period suggest the density of panthers may have increased to some degree."

- Also on page nine, NWF and FPS question a statement made in reference to a recent paper by Maehr et al. (2004) about daytime versus nighttime movements. This paper was published in a peer reviewed journal, and we reviewed it and believe the science warrants

consideration in the "Life History" section of the panther. If future science proves the statement to be incorrect, the Service will modify the text in future biological opinions, as appropriate.

- On page 10, NWF and FPS question the following statement: "Maehr (1990a) believes there is a lack of unoccupied suitable habitat for dispersing subadult Florida panthers, which may increase fighting among males, and successful male recruitment appears to depend on the death or home range shift of a resident adult male (Maehr et al. 1991a)." In particular, NWF and FPS ask how this point can be resolved with panther population increases in recent years. To clarify this point, we will add the following statement to future biological opinions: "However, more recent population data (FWC 2004) show an increase in population numbers, home ranges, and subadult males, which is in conflict with Maehr's (1990a) data. The increase in panthers is believed to be associated in part with the genetic restoration benefits from the introduction of Texas cougars into the Florida panther population (FWC 2004)."

- On page 11, NWF and FPS request a citation for the statement that "[d]en sites are used for up to 2 months and may be used in subsequent years." Although we are confident the statement comes from a credible scientific source, our efforts to identify this source have been unsuccessful. As a result, we will not include this statement in future biological opinions until we locate the original source material and cite it appropriately.

- At the bottom of page 11, NWF and FPS identify the following incorrect statement: "thirty-four incidents of trauma (47 percent) have occurred in the past 5 years (average 6.8 panthers per year during 2001 to 2005)." NWF and FPS correctly note the time span is really 4 years and the average is 8.5 panthers per year. We will ensure this point is accurately made in future biological opinions and amend the following previously published opinions to correct this error: Bonita Springs Utilities (Corps Permit Number (CPN) 199702288); Ave Maria (CPN 20030946); Mirasol (CPN 200001926); Terafina (CPN 199603501); Gateway Shoppes II (CPN 200306759); Seminole Mine (CPN 20045312); Arborwood and Treeline Avenue (CPN 20035331, 20036965); Collier Regional Medical (CPN 200311156); and Wentworth Estates (CPN 199806220). Furthermore, we have fully considered this issue and determined it does not warrant reinitiation of consultation for any of the aforementioned opinions.

- On page 12, NWF and FPS request a citation for the statement that "the goal of 95 percent probability of persistence for 100 years is the standard recommended by population biologists." The 95 percent threshold has been commonly used in PVAs (Sarkar 2004; Shaffer 1978, 1981, 1987). We will include these citations in future biological opinions. In addition, we have already taken steps to better describe the PVAs completed to date related to panther conservation. In particular, our most recent biological opinion for Ave Maria, published on June 29, 2005, describes the PVA completed by Root (2004) in greater detail. We believe Root's PVA is one important part of the best available science related to panther conservation. A couple of excerpts from the more detailed description of Root (2004) follow:

The Service, in February 2000, in order to develop an updated landscape-level strategy for the conservation of the Florida panther population in south Florida, appointed the Florida Panther Subteam. This Subteam is part of the overarching MERIT [Multi-species Ecosystem Recovery and Implementation Team]. MERIT includes more than 30 members representing Federal, State, and local governmental agencies, the Seminole Tribe of Florida, the Miccosukee Tribe of Indians of Florida, academia, industry, and the private sector, and was created with the purpose of overseeing the implementation of the recovery and restoration tasks identified in the MSRP [Multi-species Recovery Plan, 1999]. One of the actions the Subteam evaluated was the current status of the Florida panther and the various PVA models developed. Based on this assessment, members of the Subteam requested the development of an updated set of PVA models for the Florida panther. These models, developed and presented by Root (2004), were based on RAMAS GIS software (Akçakaya 2002). These models were used to perform a set of spatially explicit PVAs.

The results of these model runs predicted a probability of extinction for the conservative model of 78.5 percent in 100 years with a mean final total abundance of 3.48 females. Also, the probability of a large decline in abundance (50 percent) was 94.1 percent. The moderate model resulted in a 5 percent probability of extinction and mean final abundance of 42.3 females in 100 years. The probability of panther abundance declining by half the initial amount was 19.9 percent in 100 years under the moderate model. The optimistic model resulted in a 2 percent probability of extinction and mean final abundance of 51.15 females in 100 years. The probability of panther abundance declining by half the initial amount was only 9.1 percent in 100 years under the optimistic model. These models also provide a probability of persistence (100 percent minus probability of extension) over a 100-year period of 95 percent for the moderate model and 98 percent for the optimistic model.

- On page 12, NWF and FPS question the population ranges identified in Kautz et al. (In Review). In particular, NWF and FPS question what "Barely Viable" fundamentally describes, and how this term relates to 60-70 individuals as listed in Table 5 of Kautz et al. (In Review). We understand these ranges represent the authors' broad characterization of the likelihood of the Florida panther's persistence over a 100 year period based on a review of PVAs that have been published to date. Table 5 also includes a description for <50 individuals ("Extinction highly probable in less than 100 years"). By discussing the viability of a range of 50-60 individuals, the Service was merely connecting the two aforementioned ranges identified in Kautz et al. (In Review) for illustrative purposes.

  It is important to state that while Table 5 provides broad and relatively useful guidelines, the Service relies on the best available primary sources to develop conservation strategies. As previously noted, we believe Root (2004) is a key primary source that provides more detailed information than Table 5. For example, Root (2004) estimated an initial abundance of 41 females is 95 percent likely to persist for 100 years, albeit with a variety of assumptions and subject to genetic problems. If we were to assume a 50:50 male to female ratio, a population of 82 panthers is 95 percent likely to persist for 100 years. This would fall into the 80-100 range in Table 5 defined as "Stable population

likely for 100 years." Again, this is merely a range that broadly characterizes Kautz et al.'s (In Review) review of previously completed PVAs, and not the primary source provided by Root (2004).

- On page 14, NWF and FPS request the Service provide a definition for fragmentation. Mac et al. (1998) defines habitat fragmentation as "The breaking up of a habitat into unconnected patches interspersed with other habitat which may not be inhabitable by species occupying the habitat that was broken up. The breaking up is usually by human action, as, for example, the clearing of forest or grassland for agriculture, residential development, or overland electrical lines." The reference to "unconnected patches" is a central underpinning of the definition. For panther conservation, this definition underscores the need to maintain corridors connecting habitat in key locations of south Florida. The Service will include this definition in future biological opinions on the Florida panther.

- Also on page 14, NWF and FPS question whether the Service has accepted compensation north of the Caloosahatchee River for impacts on panther habitat south of the river. The Service has never requested nor accepted compensation north of the river for impacts south of the river, and has no plans at this time to accept this type of compensation in the future.

- On page 16, NWF and FPS request the Service provide scientific support for the assertion agricultural lands are less desirable than other preserves. Table 1 of Kautz et al. (In Review) examined panther habitat use:

> as determined by compositional analyses (CA) between fixed kernel home ranges and the CA study area (Figure 2) and the Euclidean distance analysis (EDA) of panther telemetry records by individual animal. Fixed kernel polygon home ranges were determined using 46,684 telemetry locations for 81 panthers that were >2 years old and for which >50 telemetry records were available. Land cover source data was derived from a composite of 1995 water management district land use/land cover data. Results from the CA and EDA were used to assign values to cost surface grids used in determining a landscape linkage across the Caloosahatchee River, Florida, USA.

In this analysis, Kautz et al. (In Review) compared land use types and panther telemetry data through two different methods and found a significant difference in the habitats where panthers were most commonly located. The compositional analysis method used in the paper measured the relative importance of various land cover types within home ranges. The Euclidean distance method ranked land cover types by how often they were selected by panthers to serve as daytime rest sites. In both methods, "Crop Land" and "Orchards/citrus groves" were found to be less preferable than "Cypress Swamp," "Pineland," "Hardwood Swamp," and "Upland Forest" habitats. We clearly recognize the value of a mosaic of habitat types in panther home ranges, but the data suggest panthers find forest habitats more desirable. The paper concludes "Thus, not only are panther home ranges composed to a large extent of forest cover types, but forest cover types are also near to sites selected by panthers as daytime rest sites."

- In the last paragraph on page 16, NWF and FPS identify a data gap in Table 4. Specifically, NWF and FPS note that during 2004 "at least five more panthers died within the action area." We will ensure this point is accurately made in future biological opinions and amend the following previously published opinions to include Figure 1, which shows all vehicle collisions in this part of southwest Florida through December 2004: Bonita Springs Utilities (CPN 199702288); Ave Maria (CPN 20030946); Mirasol (CPN 200001926); Terafina (CPN 199603501); Gateway Shoppes II (CPN 200306759); Seminole Mine (CPN 20045312); Arborwood and Treeline Avenue (CPN 20035331, 20036965); Collier Regional Medical (CPN 200311156); Wentworth Estates (CPN 199806220); and Land's End (CPN 199405829). Furthermore, we have fully considered this issue and determined it does not warrant reinitiation of consultation for any of the aforementioned opinions.

- On page 18, NWF and FPS identify a misuse of terms in the biological opinion. On page 48 the opinion states "The Service, based on the average panther home range size of 31,923 acres (Kautz et al. In Review) determined that 2,871,894 acres of Primary Zone equivalent lands need to be protected and managed." In future biological opinions, the statement will be revised to state "The Service, based on Kautz et al.'s (In Review) average population density of 31,923 acres determined that 2,871,894 acres of Primary Zone equivalent lands need to be protected and managed." We hereby amend the following published opinions to reflect this revision: Bonita Springs Utilities (CPN 199702288); Ave Maria (CPN 20030946); Mirasol (CPN 200001926); Terafina (CPN 199603501); Gateway Shoppes II (CPN 200306759); Seminole Mine (CPN 20045312); Arborwood and Treeline Avenue (CPN 20035331, 20036965); Collier Regional Medical (CPN 200311156); Wentworth Estates (CPN 199806220); and Land's End (CPN 199405829). Furthermore, we have fully considered this issue and determined it does not warrant reinitiation of consultation for any of the aforementioned opinions.

- On page 19, NWF and FPS question how we define "Core Area" and calculate "estimated" and "actual" acres. The "Core Area" is portrayed in Figure 10, and it includes the Primary, Secondary, Dispersal, and Other Zones. As described on page 49, the acreage in these zones is translated into "Primary Equivalents" by applying a landscape multiplier that recognizes the functional importance of the Primary and Dispersal Zones to panthers, and the generally lower functional quality of the Secondary and Other Zones today. To make this description more transparent, we have added a more detailed description to recent biological opinions. For example, the following excerpts are taken from our recent opinion on Land's End (July 15, 2005).

> Our process to determine compensation is based on the amount of habitat that we believe is necessary to support a population of 90 panthers in south Florida, which is the mid-point in Kautz et al.'s (In Review) management guidelines that a population of 80 to 100 panthers is likely to be stable, although subject to genetic problems and assumptions previously stated, through 100 years. The Service, based on Kautz et al.'s (In Review) average panther population density of 31,923 acres per panther, determined 2,873,070 acres of Primary Zone equivalent lands (see discussion of Primary Zone equivalent lands below) need to be protected and managed. Currently,

2,094,988 acres of Primary Zone equivalent lands are preserved, so 778,082 additional acres need to be preserved to support a population of 90 panthers in south Florida (2,873,070 minus 2,094,988 equals 778,082).

Primary Zone Equivalent Lands: Kautz et al. (In Review), through their habitat evaluation of lands important to the Florida panther, identified three sets of lands, i.e., Primary Zone, Secondary Zone, and Dispersal Zone, and documented the relative importance of these lands to the Florida panther. These lands, generally referred to as the core area, include the majority of the home ranges of the current population of the Florida panther. The Service, in our evaluation of habitat needs for the Florida panther expanded the boundaries of the Kautz et al. (In Review) core area to include those lands south of the Calooshatchee River where additional telemetry points historically were recorded. These additional lands, referred to as the "Other" Zone, added to the lands in Kautz et al.'s (In Review) core lands are referred to by the Service as the Core Area (Figure 12). The "Other" Zone lands, as well as the lands within the Secondary Zone, provide less landscape benefit to the Florida panther than the Primary and Dispersal Zones, but are important as a component of our goal to preserve sufficient lands to support a population of 90 panthers in South Florida.

To account for the lower landscape importance of these lands in our preservation goals and in our habitat assessment methodology, we assigned lands in the Other Zone a value of 1/3 and lands in the Secondary Zone a value of 2/3 to convert these lands to Primary Zone value, i.e., Primary Zone equivalents (Table 6). Dispersal Zone lands are considered equivalent to Primary Zones lands with a 1/1 value. For example, non-urban at-risk lands in the Other Zone total 819,995 acres, multiply these by 1/3 to determine the acres of Primary Zone equivalent lands the Other Zone can provide (819,995 times 1/3 equals 273,332 acres of Primary Zone equivalent lands). Using this assessment, the 471,466 acres of Secondary Zone lands equate to 314,297 acres of Primary Zone equivalent lands. These equivalent values, 1/3 and 2/3, for Other and Secondary Zones, respectively, and 1/1 for Dispersal Zone, are important components in our assessment of compensation needs for a project in the panther consultation area and are components of our habitat assessment methodology as discussed below.

Base Ratio: To develop a base ratio that will provide for the protection of sufficient acreage of Primary Zone equivalent lands for a population of 90 panthers from the acreage of Primary Zone equivalent non-urban lands at risk, we developed the following approach.

The available non-urban Primary Zone equivalent lands in the core area (Figure 12) are estimated at 3,272,493 acres (actual acreage is 4,486,364 acres [the "actual acreage" value includes acres of lands in each category in the Secondary and Other Zones as well as the lands in the Primary Zone]) (see Table 6). Currently 2,094,988 acres of Primary Zone equivalent lands (actual acreage is 2,605,046 acres) of non-urban lands are preserved. The remaining non-urban at-risk private lands are estimated at 1,177,506 acres of Primary Zone equivalent lands (actual acreage is 1,881,318 acres). To meet the protected and managed lands goal for a population of 90 panthers, an additional 778,082 acres of Primary Zone equivalent lands are needed. The base ratio is determined by dividing the acres of at-risk habitat to be secured (778,082 acres) by the result of the acres of at-risk habitat in the Primary Zone (568,549 acres) times the value of the Primary Zone (1); plus the at-risk acres

in the Dispersal Zone (21,328 acres) times the value of the Dispersal Zone (1); plus the at-risk acres in the Secondary Zone (471,446 acres) times the value of the Secondary Zone (2/3); plus the at-risk acres in the Other Zone (819,995 acres) times the value of the Other Zone (1/3); minus the at-risk acres of habitat to be protected (778,082 acres). The results of this formula provide a base value of 1.95.

778,082 / ((568,549 x 1.0) + (21,328 x 1) + (471,446 x 0.667) + (819,995 x 0.333)) – 778,082 = 1.95

To summarize, we calculate the "estimated" acreage by reducing the "actual" acreage in the Secondary and Other Zones to reflect their lower value to the panther as compared to the Primary and Dispersal Zones. This approach encourages compensation in the Primary and Dispersal Zones, and recognizes the need to restore the Secondary and Other Zones to maximize their value to the panther.

- On page 20, NWF and FPS offer concerns about the "Florida Panther Habitat Conservation Tool" and the fact the Service has not placed the tool in the Federal Register. In an effort to promote full transparency, the Service has taken steps to describe its habitat methodology in even greater detail in recent biological opinions, as evidenced by the explanation found in opinions published from June 29, 2005, (Ave Maria) to the present. All the data and assumptions used to develop habitat impacts and compensation information are in the opinions, allowing our methods and results to be replicated by any interested party.

- On page 20, NWF and FPS question the origin of the "habitat values" associated with land cover types. The Service developed these values after obtaining information from the Panther Subteam, reviewing the aforementioned Table 1 of Kautz et al. (In Review), and making additional changes based on best professional judgment to reflect land uses of interest in south Florida (e.g., Storm Treatment Areas).

- On page 20, NWF and FPS suggest adding 0.5 to the base ratio and having landscape multipliers are arbitrary decisions. In an effort to further increase transparency, we have added a more detailed description of this addition to the base ratio in our recent biological opinions. In our opinion for Land's End (July 15, 2005), for example, we included the following discussion.

  In evaluating habitat losses in the consultation area, we used an estimate of 0.8 percent loss of habitat per year (Kautz, Florida Fish and Wildlife Conservation Commission, personal communication, 2004) to predict the amount of habitat loss anticipated in South Florida during the next 5 years (i.e., 6,000 ha / year; 14,820 acres / year). We conservatively assumed we would be aware of half of these projects. We assumed that half of the projects would occur in the Primary Zone and half would occur in the Secondary Zone. We then adjusted the base ratio slightly higher than the 1.95 to 2.25 to account for unexpected increases in habitat loss.

  We also realize that collectively habitat losses from individual single-family residential developments will compromise the Service's goal to secure sufficient lands for a population of 90 panthers. We believe that, on an individual basis, single-

family residential developments by individual lot owners on lots no larger than 2.0 ha (5.0 acres) will not result in take of panthers on a lot-by-lot basis; however, collectively these losses may impact the panther. Compensation for such small-scale losses on a lot-by-lot basis is unlikely to result in meaningful conservation benefits for the panther versus the more holistic landscape level conservation strategy used in our habitat assessment methodology. To account for these losses, we adjusted the base value from 2.25 to 2.5, which is our base ratio.

The Service intends to re-evaluate this base ratio periodically and adjust as needed to achieve the Service's conservation goal for the Florida panther.

Furthermore, the landscape multipliers were purposely designed to direct compensation to the Primary and Dispersal Zones, which are identified as the highest conservation priorities in Kautz et al. (In Review). Since we have adopted this approach (September 2003), we have helped preserve over 12,000 acres in the Primary and Dispersal Zones. Over time, we plan to update the multipliers, as appropriate, to reflect the best available science and guide compensation and restoration to other important parts of panther habitat.

- On page 21, NWF and FPS express concern about our panther habitat conservation methodology, stating "because it cannot address habitat spatial configuration or fragmentation, habitat loss caused by indirect and cumulative effects goes uncompensated." It is critically important to state the habitat compensation strategy we employ is merely one part of our analysis for projects related to panthers. The habitat strategy primarily addresses direct effects from the footprint of the project. Indirect effects, interrelated and inter-dependent effects, and cumulative effects, however, are equally important, and are analyzed to the best of our ability with the best available science. It is also important to state many of these effects are more difficult to measure than direct effects.

  The indirect effects we analyze, for example, include an increased risk of roadway mortality from increased vehicular traffic; habitat fragmentation; potential impacts in the prey base; and a possible increase of intraspecific aggression between panthers due to reduction of geographic range. For example, we work with project applicants to steer new traffic volume away from panther corridors. In addition, we request road expansion projects to include panther crossings when appropriate, as evidenced in our latest revision to the Ave Maria biological opinion (June 29, 2005).

- On page 22, NWF and FPS question the scientific basis for our statement that "[p]rey surveys documented limited usage of the site by white-tailed deer, a primary prey species." We should have followed this statement with a reference to the *White-Tailed Deer Census Report. Terafina Development*, completed in 2004 by Passarella and Associates. This reference was included in the "Literature Cited" section at the end of the document, but was omitted in the "Direct Effects" section.

- On page 27, NWF and FPS discuss the Service's conclusion that some of the project site constitutes "marginal" wood stork foraging habitat. The Service acknowledges receiving

a letter from NWF and the Florida Wildlife Federation dated May 23, 2005, which transmitted two scientific sources. NWF and the Florida Wildlife Federation state the sources "highlight the importance of shallow surface waters for wood stork prey distribution and abundance (Ceilley and Bartone (2000)) and suggest that moderate infestations of melaleuca may have little effect on species composition and productivity as long as critical abiotic factors, including hydrology, remain in operation (O'Hare and Dalrymple (1997))." As stated in our biological opinion, the Service agrees prey is a key consideration, and maintains the position that significant infestations of melaleuca such as those found on a portion of the Terafina project site can negatively impact the prey base from the perspective of wood storks. We will be careful to consider the information provided by NWF and the Florida Wildlife Federation in future biological opinions, as appropriate.

- On page 28, the authors raise concerns about the following statement on page 64 of the biological opinion "[f]ragmentation is not as big an issue with aerial species as it is with land based species due to the aerial species ability to fly over intervening development to reach distant foraging areas." After considering this point, we believe it is an overgeneralization and will delete the statement from future biological opinions.

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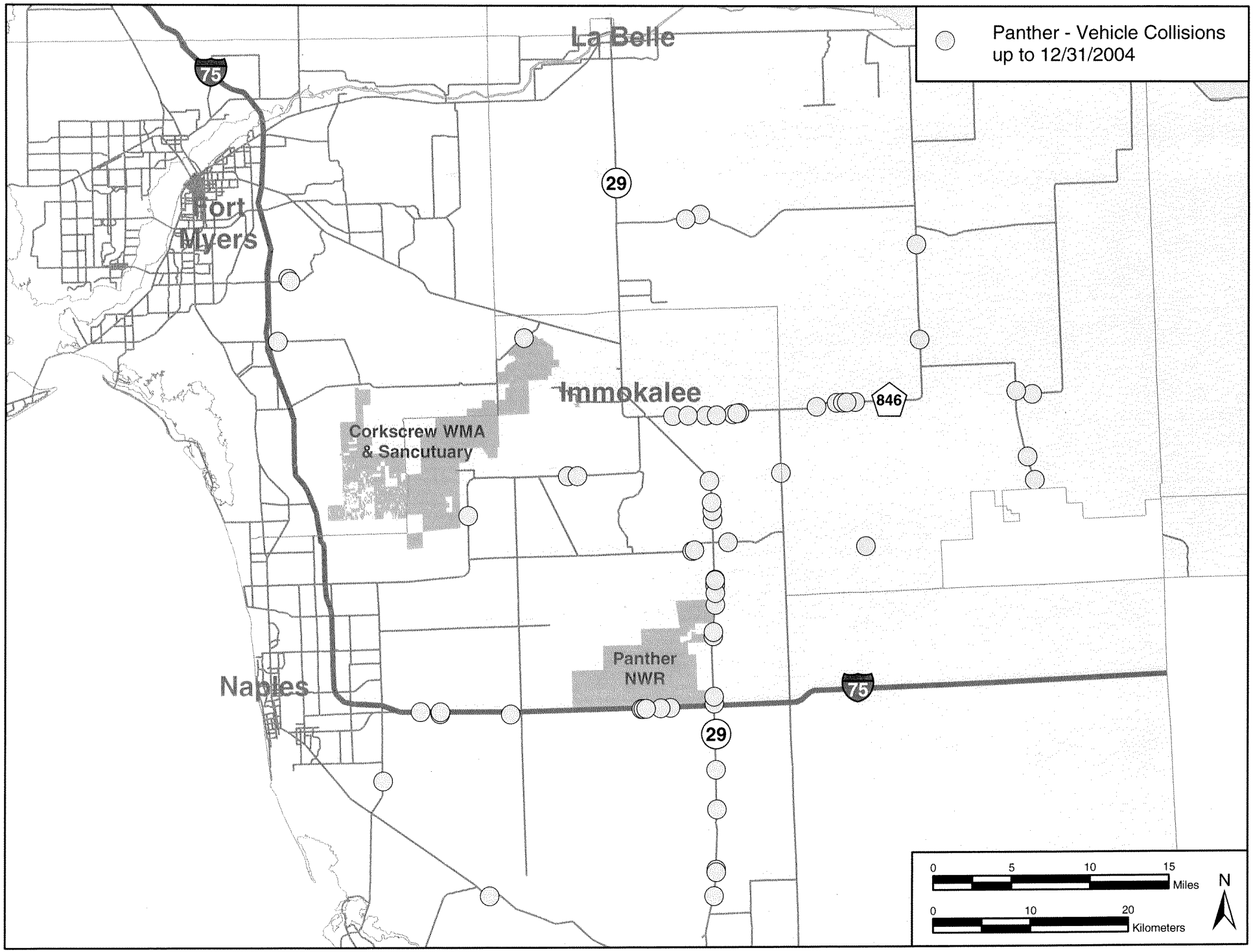
Panther - Vehicle Collisions
up to 12/31/2004
La Belle
Fort
Myers
Immokalee
Corkscrew WMA
& Sancutuary
Panther
NWR
Naples
75
29
846
0
5
10
15
Miles
0
10
20
Kilometers
N

**Figure 1**