

**MARINE MAMMAL COMMISSION**  
4340 EAST-WEST HIGHWAY, ROOM 905  
BETHESDA, MD 20814

7 February 2007

Mr. Kipp Frohlich  
Section Leader  
Imperiled Species Section  
Florida Fish and Wildlife Conservation Commission  
620 South Meridian Street  
Tallahassee, FL 32399-6000

Dear Mr. Frohlich:

The Marine Mammal Commission, in consultation with its Committee of Scientific Advisors on Marine Mammals, has reviewed the Florida Fish and Wildlife Conservation Commission's Draft Manatee Management Plan, *Trichechus manatus latirostris*. We apologize for missing the deadline for commenting on the draft plan, but we hope that the major points summarized here and discussed in greater detail in the attached comments will still be helpful.

The draft plan generally sets forth a solid set of primary objectives, provides a thorough description of ongoing management actions, and identifies an appropriate, well-considered list of needed actions. The Marine Mammal Commission commends you and your staff for developing what should be a useful and important guide for future efforts to recover and conserve Florida manatees. The Commission further commends the Imperiled Species Section for (1) explicitly identifying and recognizing the Okeechobee waterway as important manatee habitat, (2) recognizing the importance of collecting data on boat traffic patterns and compliance with boat speed rules, as well as data on manatee behavior and ecology, and (3) preparing a generally complete and thorough list of activities needed to recover Florida manatees.

Our primary concern is with the plan's goals. As written we believe they are inappropriate and need substantial revision. Two of the plan's three goals state that the objective is "to avoid predicted declines of more than 30% over three generations." The plain meaning of this statement suggests that the state expects, and would find acceptable, declines of up to 30 percent in manatee abundance over the next 60 years. This surely is not the state's measure of success for manatee management, and we trust it is an errant attempt to use some of the same words found in the state's adopted listing criteria.

To improve the plan, the Marine Mammal Commission recommends that the Florida Commission—

- Expand the plan and identify the source and confidence interval for the estimate of 2,181 mature animals in the population, as this is one of two reasons why Florida manatees qualify for listing as threatened under state listing criteria;

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- Delete measurable biological goal number 1 concerning annual adult survival rates or revise it to identify an adult survival rate that would be sufficient to ensure that the population increases toward its carrying-capacity level;
- Replace measurable biological goal number 2 concerning warm-water carrying capacity with a new goal specifying that, in addition to the minimum number of mature animals set by goal 3, a certain proportion of the overall population of Florida manatees (e.g., 50 percent) are using natural warm-water refuges (e.g., warm-water springs or passive thermal basins) for winter survival before Florida manatees could be removed from the state's list of imperiled species; and
- Expand the description of measurable biological goal number 3 (minimum number of mature Florida manatees) by providing both the legal and scientific basis for proposing a recovery goal (i.e., 2,500 mature animals) that is substantially lower than the state's adopted threshold for adding or removing a species or population from the state's imperiled species list.

Once again, I apologize for the late submission of our comments, but I trust they will still be useful. If you or your staff has questions, please call.

Sincerely,



Timothy J. Ragen, Ph.D.  
Executive Director

Attachment

## Marine Mammal Commission

### Specific Comments and Recommendations on the Draft Manatee Management Plan, *Trichechus manatus latirostris*

**Title:** The title would be more accurate if it were to read “Draft Management Plan for the Florida Manatee, *Trichechus manatus, latirostris*.”

**Page iii, Last Paragraph:** This paragraph notes that the goal of the management plan is to ensure a healthy, viable Florida manatee population throughout its range, including the Okeechobee waterway. Currently, few animals use the upper reaches of the Okeechobee waterway because of obstructions that block its lower portions. Fossil evidence indicates that manatees used the river historically, and its upper reaches include a number of natural warm-water springs that could significantly increase the amount of warm-water habitat available to support Florida manatees if the obstructions were removed. Allowing manatees to reoccupy that habitat could be a major step toward replacing the likely future loss of artificial warm-water habitats as existing power plants are decommissioned. The Marine Mammal Commission commends the authors of the draft plan for explicitly recognizing this waterway’s importance for the long-term conservation of Florida manatees.

**Page iv:** This page identifies six primary planning objectives aimed at protecting Florida manatees: (1) minimize impacts of watercraft, (2) implement a scientifically sound method to monitor manatee population trends, (3) install manatee protection devices on floodgates and navigation locks, (4) develop and implement a plan to prevent manatee mortality due to changes in power plant operations, (5) establish minimum flow rates for natural warm-water springs used by manatees, and (6) use measurable biological goals to evaluate progress toward recovery. The Commission believes that these objectives provide an appropriate framework for identifying and guiding conservation tasks and priorities for recovery of Florida manatees.

**Pages 1–5, Biological Background:** This section provides a concise and helpful review of information on the biology and population status of Florida manatees.

**Pages 7–11, Threat Assessment:** This section provides a concise and well-focused discussion of current and anticipated threats to Florida manatees.

**Page 13, Measurable Biological Goals:** According to the draft plan, the Florida Legislature has required measurable biological goals that define manatee recovery. As we understand it, the goals were designed to satisfy this directive and identify benchmarks that, if met, would allow Florida manatees to be removed from the state’s list of imperiled species. The goals appear to focus on appropriate and potentially useful parameters (i.e., annual adult survival rates, warm-water carrying capacity, and the number of mature individuals in the population). Nonetheless, for reasons described below, the Marine Mammal Commission recommends that the goals be revised substantially.

**Page 13–14, Rationale for Measurable Biological Goals:** The first paragraph of this section states that “...in April 2005, the FWC...adopted the International Union for Conservation of Nature (IUCN) red list criteria as the basis for its imperiled species classification system.” This statement incorrectly implies that the state classification system is in conformance with the IUCN’s

widely recognized international ranking system for species at risk. Although the state used some IUCN ranking criteria and categories, it renamed the categories it adopted and did not adopt other categories. Specifically, it changed the names of the IUCN categories from “critically endangered,” “endangered,” and “vulnerable” to “endangered,” “threatened,” and “species of special concern,” respectively, and eliminated categories for “near threatened,” “least concern,” and “data deficient.” These changes represent a major modification of the IUCN system—one that diminishes the urgency and importance that the IUCN system conveys to its classification categories for species at greater risk and disregards species at lesser or unknown risk but still requiring an extra level of protection. This paragraph should be revised to note that the state adopted a modified version of the IUCN ranking system (or its own system based in part on the IUCN system) and should identify the differences between the two ranking systems.

The section also states that “...at least 2,181 mature individuals are estimated to be in the population.” The Commission is unaware of any published, peer-reviewed estimates of this parameter for Florida manatees. Because no citation is provided to support the estimate, we are unable to determine how it was derived or whether it is accurate. Because this number is cited as one of the two reasons that Florida manatees qualify as threatened under the state’s classification system, the Marine Mammal Commission recommends that its origin be explained clearly, along with information on any assumptions made in deriving this figure and the confidence intervals surrounding the estimate.

**Page 15, Analysis of Core Biological Model:** This section describes a biological model that was used to analyze the current status of Florida manatee subpopulations and the proposed measurable biological goals. The second paragraph of the section notes the importance of “first-year growth” in measuring short-term population dynamics. It is not clear what this term means.

**Pages 17-18, Adult Survival Rate:** This section describes the first of three measurable biological goals that would be used to determine when Florida manatees might be considered to be recovered. The goal for adult survival reads as follows:

*regional adult survival rates sufficient to avoid predicted declines of greater than 30% over the next three generations (about 60 years) given available warm-water resources.*

We find this goal confusing and vague for several reasons. First, as written, this goal could be interpreted to mean avoiding a predicted decline of more than 30 percent in adult survival rate. To better reflect the meaning, as we understand it, the words “in abundance” should be inserted after the words “predicted declines.” Second, this goal identifies neither the regional adult survival rates nor a minimum overall adult survival that would satisfy this goal. Thus, it is unclear precisely what rate(s) of adult survival would satisfy this goal. Third, with regard to evaluating this goal, the reader is referred to a series of figures (Figures 2–5) that are unexplained and unclear. Those figures appear to indicate that a determination of “sufficient” adult survival rates depends on a determination of regional warm-water carrying capacity for manatees. Currently, there is no scientific consensus and very limited information on regional warm-water carrying capacity levels. Thus, until there is some

way of assessing regional warm-water carrying capacity, it is unclear whether or how it would be possible to objectively determine when this goal has been met. Fourth, there are no specified confidence levels related to determinations of sufficient adult survival rates. Presumably, the state intends to require some level of scientific confidence in estimates of this parameter when evaluating this goal. By the same token, there is no specified time span over which adult survival would have to be sufficient. Presumably, the state does not intend to wait until 60 years of data are available, nor does it intend to consider listing and delisting actions based on annual fluctuations in estimates of this parameter. Thus, some explanation of confidence intervals and time spans is needed to understand how this goal would be applied.

This criterion also appears to be inconsistent with the state's adopted listing criteria and with the other management goals in the plan. That is, this section states that, "...when considering (State listing) Criterion C, to warrant reclassification to a lower imperilment level, we would need to avoid a 10 percent population reduction." Under adopted state listing criteria, however, removal from the imperiled species list would require that a species or population have more than 10,000 mature individuals with any predicted future decline not to exceed 25 percent over three generations (i.e., about 60 years), rather than not to exceed a 10 percent decline. Thus, while the draft plan states that the measurable biological goals were designed to reflect state listing criteria, this goal identifies a threshold that is inconsistent with those criteria.

In addition, population models described earlier in the draft plan indicate that manatee population trends are strongly influenced by adult survivorship rates and that recent population trends for the two largest subpopulations, which together include perhaps 85 percent of all Florida manatees, have been relatively stable. That is, during the 1990s the Atlantic subpopulation apparently increased at an average of perhaps 1.0 percent per year, while the southwest Florida population may have decreased at about 1.1 percent per year. This goal, however, could be satisfied by adult survival rates that result in a 30 percent decline in population size over 60 years. Because measurable biological goal 3 requires a minimum of 2,500 mature animals, which is 319 animals more than the cited current estimate of 2,181 mature animals, the overall population size would have to increase in abundance over the next 60 years to satisfy goal 3, thereby exhibiting a positive growth rate. Thus, these two goals would appear to be inconsistent and the inconsistency should be resolved.

Finally, and most importantly, we find it fundamentally inappropriate to establish a management goal for any "threatened" species that would justify delisting if it declined by 30 percent over three generations. Surely such a goal is inconsistent with the intent of the state's program for conserving imperiled taxa it determines to be "threatened." Such "success" repeated over a number of generations could lead to extinction. Without doubt, such a goal would be contradictory to the intents and provisions of any listing action under the federal Endangered Species Act. It also is certainly inconsistent with the objectives of the IUCN classification system on which the state asserts its classification system is based. The Marine Mammal Commission therefore recommends that measurable biological goal number 1 be revised to identify an adult survival rate that would assure that the current population size increases toward the carrying capacity of the habitat.

**Page 18, Warm-Water Carrying Capacity:** This section describes the second of three measurable biological goals. It discusses a goal for warm-water carrying capacity that reads as follows:

*regional warm-water carrying capacity sufficient to avoid predicted declines of greater than 30% over the next three generations (about 60 years) given the prevailing rate of adult survival.*

The Marine Mammal Commission recognizes and appreciates the fundamental importance of including a goal that reflects the need to protect warm-water manatee refuges. Over the next 60 years, warm-water carrying capacity will almost certainly be one of the most important factors, if not the most important factor, in determining the long-term population size and distribution of Florida manatees. As written, however, this goal has many of the same deficiencies noted for the first measurable biological goal. For example, it would allow up to a 30 percent decline in population size over the next 60 years and involves a matter (i.e., carrying capacity) on which there is no scientific consensus and limited scientific data. Among other things, this would require information on the amount of area at all warm-water refuges in each region of Florida that retain water temperatures warm enough to support manatees through the coldest winter periods, estimates of the number of manatees that could occupy those areas for cold periods, and the availability of food to support that number of animals within nearby areas. To the best of our knowledge, such information is not available. Moreover, the basis for the minimum warm-water carrying capacity levels suggested in Table 1 for satisfying this goal is unclear. For example, it suggests a minimum warm-water carrying capacity level of 1,200 mature animals for the Atlantic subpopulation. During the state's January 2001 synoptic aerial survey, more than 85 percent of the manatees counted along the Atlantic coast were located at power plant outfalls. It is not clear if the basis for the identified minimum warm-water carrying capacity level for the Atlantic subpopulation reflects (1) an estimate of the number of animals that could be supported given the existing refuges and an assumption that those refuges will remain in existence for 60 years, (2) an assumption that equivalent alternative warm-water refuges could and would be developed over the next 60 years to replace any refuges eliminated by decommissioned power plants, (3) an analysis that indicates alternative natural warm-water habitat exists that is sufficient to support 1,200 manatees in the absence of power plant outfalls, or (4) some other set of assumptions and analyses. Similarly, the basis for identifying a minimum warm-water carrying capacity of 100 mature animals in the St. Johns region is unclear. The upper St. Johns River subpopulation already may number 100 mature animals and has been growing steadily at an annual rate of about 6.2 percent—the fastest of any Florida manatee subpopulation. This suggests that the St. Johns River subpopulation is still well below its minimum warm-water carrying capacity level and that the cited number is an inappropriately low standard for that region. To provide a better basis for determining warm-water carrying capacity levels, we suggest that the plan be expanded to include environmental and anthropogenic criteria for assessing optimal warm-water refuges similar to criteria listed in Sheri Barton's recent master's thesis<sup>1</sup>.

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<sup>1</sup> Barton, S.L. 2006. The influence of habitat features on selection and use of winter refuges by manatees (*Trichechus manatus latirostris*) in Charlotte Harbor, Florida. Masters of Science thesis, Department of Biology, College of Arts and Sciences, University of South Florida. 67 pp.

With regard to long-term warm-water carrying capacity, we believe a more appropriate management goal would be to shift dependence of Florida manatees away from human-related sources of warm water—particularly power plants—to natural sources of warm water, such as warm-water springs that are sustainable over the long term. Thus, in concert with goal number 3 that requires at least 2,500 mature animals, the Marine Mammal Commission recommends that measurable biological goal number 2 be revised to require that an explicit proportion of the overall population of Florida manatees (e.g., 50 percent) be supported by natural warm-water refuges rather than human-related warm-water discharges.

**Pages 18, Mature Population Size:** This section describes the third of three measurable biological goals. It considers the number of mature animals necessary to consider the population recovery as a *“mature population size exceeding 2,500 mature individuals statewide.”*

This goal is inconsistent with adopted state listing criteria. That is, a population of 2,500 mature animals reflects the threshold in state listing criteria separating “threatened” species from “species of special concern,” not the adopted state criteria that would trigger removal from the list of imperiled species. Rather, criterion C of the adopted state criteria sets the threshold between listing and delisting at 10,000 mature animals. With regard to this discrepancy, this section of the draft plan states, with no explanation or analysis, that “the de-listing criterion level of 10,000 mature individuals may not realistically be met for this population.” Thus, it appears that authors of the draft plan are proposing to disregard the adopted state criterion as it applies to Florida manatees and to replace it with another standard. To the best of our knowledge, there are no provisions or procedures in the state’s program for classifying species using criteria other than those that have been formally adopted by the Florida Fish and Wildlife Conservation Commission. Moreover, there is no analysis or reference provided to explain why this criterion should be set at 2,500 rather than 3,000, 4,000, or any other number. If the Florida Commission is going to allow arbitrary decisions as to when its adopted criteria do not need to be followed, it calls into question precisely what purpose those listing criteria are intended to serve and what guidance is available for determining when the adopted criteria can be disregarded.

The Marine Mammal Commission therefore recommends that this section of the draft plan be expanded to identify both the legal and scientific basis for proposing a recovery goal regarding the number of mature Florida manatees that is substantially lower than the level established in adopted state standards that defines when a species or population need not be listed as a “species of special concern.”

**Page 30, Effectiveness of Zones:** This section briefly notes that efforts are currently underway to develop methods to better evaluate the effectiveness of manatee protection zones to limit boat speeds and boat/human access in defined geographic areas. The section lists various types of analyses being considered. Tagging manatees with GPS tags is not mentioned but could be used to determine precise movement and habitat-use patterns relative to patterns of boat traffic, designated boat channels, and close approaches. We believe such tagging could be helpful for determining the effectiveness of different types of protection zones in protecting manatees and that it should be

added to the list of analyses to be considered. For example, tagging could help determine the extent to which manatees avoid marked channels where boat traffic is heavier and vessel speeds are faster, and identify precise manatee movements in response to approaching vessels.

**Pages 30-31, Review of Existing Zones:** This section notes that existing countywide boat speed zones will be reviewed based on available information concerning manatee distribution and vessel traffic patterns. It would be helpful if this section included a table that identifies a schedule for collecting relevant data in different counties similar to Table 3, which identifies a time line for revising and developing new county boat speed rules.

**Pages 42-46, Warm-Water Habitat:** This section discusses manatee dependence on warm-water discharges from power plant outfalls and related management needs. The discussion provides a good summary of the underlying issues and some of the relevant data. The two papers by Laist and Reynolds published in 2005 in *Marine Mammal Science* and *The Journal of Coastal Management*, which have been sent to you and members of your staff, would be useful references to cite in support of many of the statistics and conclusions given. Those papers also cite a number of actions that have been reflected in the draft warm-water refuge plan being developed under the Florida Manatee Recovery Plan. The measures identified in those papers and the warm-water refuge plan should be referenced and the need to pursue them without delay should be noted.

**Page 48, Springs:** This section notes the importance of natural warm-water springs for manatee recovery and notes that springs that provide potential warm-water habitat will be identified and assessed for manatee accessibility and seasonal protection. To assist you in this assessment, we will forward to you a report prepared for the Marine Mammal Commission by Cynthia Taylor assessing manatee access to warm-water springs.

**Pages 57-60, Manatee Regulatory Zone Enforcement:** This section describes various efforts to coordinate federal, state, and local manatee-related enforcement activities. Although it identifies several initiatives conducted and planned by the Florida Division of Law Enforcement and the U.S. Fish and Wildlife Service, including several joint efforts, there is no mention of efforts to integrate the U.S. Coast Guard into the manatee enforcement program. It is our understanding that, in at least some recent years, the Coast Guard has provided a greater amount of enforcement effort than the Fish and Wildlife Service. This section should discuss past and planned efforts to coordinate manatee-related enforcement activities with the Coast Guard. It may be useful to work with the Coast Guard to develop a program similar to the "Mutual Aid Agreement" between the Division and the Service, which is discussed in this section of the plan. Alternatively, the Coast Guard might be asked to become a partner in the existing Mutual Aid Agreement.

**Page 65, First Paragraph:** Satellite and radio-tracking of individual manatees should be added to the list of monitoring activities that are used to assess the status, trends, and life history of Florida manatees over time. A separate section on the techniques and purposes of this research activity (e.g., determining habitat-use patterns, identifying key warm-water and foraging habitats, assessing the fate



of rehabilitated and released animals, determining manatee movements relative to boat traffic and existing protection zones) should be added to Chapter 8.

**Page 74, Table 18:** Mortality data for 1983 should be checked. The values for mortality categories do not add up to a total of 82 deaths that year.

**Pages 76-70, Monitoring Boat Vessel Traffic:** This section describes efforts to collect data on vessel traffic patterns and boater compliance. This information is vital for management decisions regarding the establishment of boat speed zones, and the Marine Mammal Commission commends the Florida Commission for recognizing and supporting this research. Too often, marine mammal research programs are limited in focus to studies of the species or populations needing protection and neglect efforts to collect data on the human activities that affect those species or populations. Effective management requires information on both.

**Page 98, Behavioral Studies:** As noted previously, use of GPS tracking devices also would provide valuable insight with regard to vessel traffic and existing manatee protection zones. It could provide data as useful as that from D-tags and simpler to analyze. Information on animal movements in space and time in response to close approaches in shallow waters are probably more useful than precise information on pitch and roll.