



# MARINE MAMMAL COMMISSION

8 April 2016

Mr. Jay Herrington  
Field Supervisor, Florida Ecological Services Office  
Attn: Docket No. FWS-R4-ES-0214-0178  
U.S. Fish and Wildlife Service Headquarters MS:BPHC  
Leesburg Pike  
Falls Church, VA 22014-3803

Dear Mr. Herrington:

The Marine Mammal Commission (the Commission), in consultation with its Committee of Scientific Advisors on Marine Mammals, has reviewed and offers the following comments on the U.S. Fish and Wildlife Service's (FWS) 8 January 2016 *Federal Register* notice (81 Fed. Reg. 1000) proposing to reclassify the West Indian manatee (*Trichechus manatus*) from endangered to threatened under the Endangered Species Act (ESA).

## Background

Section 3(16) of the ESA defines the term "species" to include "any subspecies of fish or wildlife...and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature." When the FWS listed the West Indian manatee (*Trichechus manatus*) as endangered, the two subspecies now recognized—the Antillean manatee, *T. manatus manatus* and Florida manatee, *T. manatus latirostris* (Domning and Hayek 1986)—had not yet been identified and provisions for designating DPSs had not yet been established. Therefore, the West Indian manatee was listed at the species level. That is, all subspecies and DPSs, whatever they might be, were included in the listing.

In December 2012, the Pacific Legal Foundation submitted a petition on behalf of Save Crystal River, Inc., seeking reclassification of the West Indian manatee, as a species, from endangered to threatened. As noted in its 2 September 2014 letter commenting on the petition (see attached letter), the Commission believes that reclassifying the species as a single entity is inappropriate given the substructure of the species and the different population trends of, and threats faced by, West Indian manatees in different parts of their range.

As FWS recognized in its *Federal Register* notice, Florida and Antillean manatees constitute genetically and morphologically distinct subspecies of West Indian manatees with almost no movement of individuals between their ranges (Domning and Hayek 1986). As such, these two subspecies merit independent consideration for purposes of listing decisions under the ESA. In particular, improvement in the status of the Florida subspecies and reduction in the threats it faces, should have no bearing on a listing decision for the Antillean subspecies unless it too is showing similar increases in abundance and reduction in threats.

Mr. Jay Herrington

8 April 2014

Page 2

Moreover, each subspecies may consist of multiple distinct population segments (DPSs) that merit independent assessment under the ESA listing criteria if they face different threats. As recommended by the Commission in its September 2014 comments on the petition and discussed further below, FWS needs to analyze the available genetic, photo-identification, tagging, and other data to identify possible DPSs and determine whether any such DPS qualifies for different listing status under the ESA.

In order to support the proposed action to reclassify the species (or any subspecies or DPS) from endangered to threatened, FWS needs to show one of three things (or some combination of the three)—that the taxon’s status at the time of the original listing was in error given new information, that the taxon’s abundance has increased to the point where it no longer is in danger of extinction, or that, even if the taxon’s population size has not grown appreciably, the threats to its existence have been abated to the point where they no longer present a risk of extinction. In its proposed action, FWS does not contend that the original listing was erroneous. Therefore, the analyses need to focus on why the status of the species as a whole, and each of its constituent subspecies and DPSs, has improved to the point, and/or that threats have been reduced to the point, where it no longer is in danger of extinction throughout all or a significant portion of its range. Below, we discuss separately how the applicable listing factors apply differently to the two recognized subspecies of West Indian manatees.

The Commission’s September 2014 letter on the listing petition noted the need to consider the status of Florida manatees and Antillean manatees separately. The Commission also made three recommendations specific to Florida manatees—that FWS (1) complete a review of the unprecedented manatee cold stress and red tide-related die-offs in recent years (i.e., 2009-2013), (2) estimate past trends in the frequency of such die-offs and project those estimates into the future, and (3) assess the effects of anticipated power plant closures on the long-term viability of Florida manatees and the likelihood that natural warm-water refuges will be sufficient to support existing levels of manatees as refuges currently provided by power plants are lost. Despite the Commission’s recommendations, FWS has not provided separate analyses of the ESA listing factors for Antillean manatees and Florida manatees or conducted any analyses of their possible constituent DPSs. The Commission recommends that FWS (1) suspend further consideration of the proposed action until these finer scale analyses have been completed and (2) retain the current listing status for the West Indian manatee throughout its range until independent threats analyses in accordance with the comments below have been completed for the two subspecies and those analyses have been made available for public review and comment.

#### **Status of Antillean Manatees (*Trichechus manatus manatus*)**

As part of its proposed action, FWS would change the status of the Antillean manatee from endangered to threatened. The Commission does not believe that the information and analyses presented in the proposed rule adequately support the proposed change for this subspecies.

#### Status and Trends

The FWS analysis cites two assessments of the status and trends of West Indian manatees that specifically consider the status of the Antillean manatee. The first is an assessment completed in 2010 as part of a West Indian manatee regional management plan prepared by the Caribbean

Environment Programme of the United Nations Environment Programme (UNEP 2010). The UNEP assessment concluded that the Antillean manatee was declining throughout most of its range.

The second is the summary status assessment of West Indian manatees prepared by the Sirenia Specialist Group of the International Union for the Conservation of Nature (IUCN) in 2008 (Deutsch et al. 2008). Although the IUCN classified the West Indian manatee as “Vulnerable” with an expectation that its overall numbers will decline by 10 percent over the course of three generations (60 years), FWS does not take into account that the IUCN also conducted an independent assessment of the Antillean subspecies and classified it as “Endangered” (Self-Sullivan and Mignucci-Giannoni 2008). This assessment reflected the IUCN’s conclusion that there were fewer than 2,500 mature individuals and its projection that the subspecies would decline by 20 percent over the next two generations (40 years) in the absence of effective responses to current and projected anthropogenic threats, including habitat degradation and loss, hunting, fishing-related mortality, pollution, and human disturbance. The FWS analysis does not reference or consider the IUCN’s reasons for finding that Antillean manatees should be classified as endangered, a major omission that undercuts the proposed change in listing status for this subspecies.

The Commission also is concerned about the population data FWS selected to use in its analysis. Table 1 in the *Federal Register* notice includes abundance estimates for 19 areas within the range of the Antillean manatee. As explained by FWS, these estimates and the trend data provided for these “populations” are based in large part on “the personal opinions of local experts and are not based on quantified analyses of trends in country population counts or demographics. Such data from these countries are limited or absent, making most of these assessments conjectural.” A single point estimate is given for each of the 19 areas, which are then summed to obtain an overall abundance estimate of 6,700 Antillean manatees. This contrasts markedly with the conclusions reached by UNEP and IUCN. Based on similar expert data, the UNEP regional management plan (Table 3 on page 11, UNEP 2010) estimated total Antillean manatee abundance (including all ages) at between 3,000 and 5,600 animals. The 2008 IUCN assessment estimated their total abundance at between 2,600 and 5,600 manatees (Deutsch et al. 2008). The Commission believes FWS should follow a more precautionary approach that recognizes the range of, and uncertainties associated with, the available abundance estimates. As with stock assessments under the Marine Mammal Protection Act, FWS should include the range of plausible abundance estimates and specify minimum abundance estimates. Having more information on the uncertainty surrounding abundance estimates is particularly important when they are based largely on opinion rather than quantitative data.

Table 1 of the notice also provides expert opinion on population trends in each of the 19 range states of Antillean manatees. In all but three of those areas (i.e., Puerto Rico with 532 manatees, Honduras with 100, and French Guiana with 100, where numbers are believed to be stable), the populations are believed to be declining or possibly declining (11 range states), or trends are unknown (5 range states). FWS concludes from this information that the subspecies’ abundance is believed to be declining or unknown in 84 percent of its range. In Guyana, for example, FWS notes that some experts believe manatee numbers have declined from “several thousand” in the 1970s to perhaps 100 today (81 Fed. Reg. at 1005). Based on the information presented in the proposed rule, it seems fair to characterize the population trend for the Antillean manatee as declining or believed to be declining through most of its range, sometimes precipitously, or that we

lack sufficient information to detect a trend, other than in small pockets (comprising only about 10 percent of the estimated abundance), where numbers appear to be stable, but not increasing.

The only evidence cited by FWS that suggests a possible positive growth trend for Antillean manatees is a model by Castelblanco-Martinez et al. (2012). The authors of that study, however, caution that their model is limited by uncertain population data and does not account for declining trends in local populations. In addition, the model assumes that manatees will be exposed to low human pressure and relatively low frequency of stochastic events, neither of which appear to be reliable assumptions given the threats in some parts of the range and the patchy distribution of relatively small groups of animals. The model also assumes a range-wide population of 6,700 animals which, as discussed above, is not well supported and may be overly optimistic. Thus, the model does not adequately account for uncertainty and does not provide a sufficiently reliable projection of Antillean manatee population trends to warrant changing the subspecies' listing under the ESA.

#### Analysis of Listing Factors

The analyses of the ESA listing factors are insufficient to support a conclusion that the Antillean manatee should no longer be considered endangered under the ESA. Most of the discussion of threats in the *Federal Register* notice is specific to manatees in Puerto Rico, which may not be representative of the threats faced by the vast majority of Antillean manatees elsewhere in their range. The assessment of threats faced by this subspecies elsewhere is superficial and weak. For example, although the assessment of present or threatened destruction and modification of habitat or range recognizes that loss of habitat, such as foraging areas, fresh water sources, travel corridors, and sheltering areas, is occurring throughout the Antillean manatee's range, FWS seems to conclude that habitat loss is not a significant threat to Antillean manatees. In contrast, both the UNEP and IUCN analyses indicate that habitat loss is a factor contributing to population declines in many parts of the Antillean manatee's range.

The only actions designed to alleviate the threats of habitat loss to Antillean manatees outside of Puerto Rico identified in the notice are the establishment of protected areas by some range states. However, FWS does not identify those areas, supply specific information on what protections are provided, or indicate whether those areas have been effective. Moreover, most, if not all, protected areas containing Antillean manatee habitat apparently were in place in 2008 and 2010 when the IUCN and UNEP reports both predicted a continuing decline in Antillean manatee abundance notwithstanding such protections. The notice provides no information on whether additional protected areas or protective measures have been established more recently that might somehow alter the conclusion that habitat loss continues to be a significant threat, or reasons why FWS might disagree with the IUCN and UNEP conclusions that habitat loss is and likely will continue to be a cause of widespread decline in the subspecies.

The Commission does not believe the information in the notice sufficiently supports a conclusion that habitat loss is not likely to contribute to a continued decline in Antillean manatee abundance that threatens their existence throughout a significant portion of its range. The Commission therefore recommends that FWS either (1) provide a more complete review of available information on habitat loss, the effectiveness of actions being taken to prevent such loss in range states outside of Puerto Rico, and possible risks posed by habitat loss throughout the subspecies' range, or (2) modify its discussion of this listing factor to clarify that available

information is inadequate to conclude that ongoing and threatened habitat loss no longer presents a risk of extinction to the Antillean manatee throughout a significant portion of its range.

Analyses of the listing factor pertaining to overutilization for commercial, recreational, scientific, and educational purposes also are insufficient to justify changing the listing of Antillean manatees from endangered to threatened. FWS recognizes that hunting has been a major cause of population declines in the greater Caribbean region and that, although most range states have laws that prohibit hunting manatees, “poaching remains a major threat to manatees” in areas outside U.S. jurisdiction. FWS cites Marsh et al. (2011), who identified poaching as a threat to Antillean manatees in 12 of the 19 range states. FWS notes that poaching has been reduced in “some” areas and remains “common in others,” but provides no information on where hunting has decreased or by how much, where it remains common, or why the conclusion by Marsh et al. is no longer valid. Despite some contrary information and very little analysis, the proposed rule concludes that the effects of hunting and other direct utilization are likely to be moderate and no longer a threat the continued existence of Antillean manatees. The Commission believes FWS’s analysis of this factor is insufficient to conclude that hunting no longer is a major threat, at least within some, perhaps significant parts of the subspecies range. The Commission therefore recommends that FWS either modify its conclusion that hunting is not a significant threat to the Antillean manatee as a whole or to any constituent DPSs or provide additional support for the conclusion that poaching is no longer a threat to their continued existence.

#### Distinct Population Segments

As discussed above, any DPS of a vertebrate species that interbreeds when mature is considered to be a “species” under the ESA and is eligible for separate listing status. However, nowhere in the proposed rule does FWS consider that West Indian manatees or either of the two recognized subspecies may consist of multiple DPSs that face different threats and that may merit different listing determinations. Just as the analyses for Florida manatees should have little bearing on a listing determination for the Antillean manatee, the analyses for one DPS should have little bearing on a listing decision for another. For example, evidence suggesting that the manatee population in Puerto Rico is stable and the belief that applicable laws there are being enforced there would be largely irrelevant to assessing the status of populations in other areas that are declining and where hunting, habitat destruction, or some other threat remains a significant problem. Thus, it is crucial that FWS consider whether the two subspecies consist of multiple DPSs (under the applicable policies<sup>1</sup>) that face different types and levels of threats. This is particularly true for the Antillean manatee, whose disjunct distribution suggests that there may be multiple DPSs.

FWS has not adequately considered the implications of the Antillean manatee’s fragmented distribution and limited movements, both of which are noted in the IUCN and UNEP assessments, before making a wholesale listing decision at either the species or subspecies level. For example, based on telemetry and genetic studies, FWS concluded that, for management purposes under the MMPA, the Puerto Rico manatee should be treated “as a separate stock of Antillean manatees” (USFWS 2009). The Commission believes that this stock also may constitute a separate DPS under

---

<sup>1</sup> Specifically, the Policy Regarding the Recognition of District Vertebrate Population (61 Fed. Reg. 4722 and the Final Policy on Interpretation of the Phrase “Significant Portion of Its Range” in the Endangered Species Act’s Definitions of “Endangered Species” and “Threatened Species” (79 Fed. Reg. 37578).

the ESA, but that further analysis is needed before drawing such a conclusion. Other groups of Antillean manatees may also warrant recognition as DPSs. Isolated populations elsewhere (e.g., Cuba and Dominica) may constitute DPSs. In addition, the gap in manatee distribution and movements between Nicaragua and Colombia may prevent genetic exchange between northern and southern portions of the subspecies' range (Gonzalez-Socoloske et al. 2015) sufficient to warrant recognition of separate DPSs for manatees in South America and the Yucatan-Mexico region.

Given the likelihood that Antillean manatees consist of multiple DPSs and that some of those DPSs likely are subject to different threats and face different risks of extinction, the Commission recommends that FWS list the Antillean manatee as endangered throughout its range until the agency has (1) reviewed available genetic, photo-identification, telemetry, and other data to determine whether there are DPSs that warrant separate listing, (2) conducted a more rigorous analysis of threats to the subspecies and any identified DPSs, and (3) provided the public the opportunity to review and comment on the results of those analyses. The Commission believes it highly likely that, if FWS changes the listing status of the West Indian manatee as a whole or considers the status of the two subspecies separately and changes the listing status of the Antillean manatee and all of its component DPSs to threatened, it will promptly be petitioned to reinstate the endangered status of Antillean manatees, or at least some DPSs.

#### **Status of Florida Manatee (*Trichechus manatus latirostris*)**

The *Federal Register* notice recognizes that Florida manatees constitute a genetically and morphologically distinct subspecies of West Indian manatee with almost no movement of individuals between its range and the Antillean manatee's range. As such, they meet the definition of "species" under the ESA and should be assessed independently for listing purposes. There is relatively good information indicating that Florida manatee numbers have increased since the 1980s. The current population estimate is 6,350 (95% confidence interval of 5,310-7,390) with at least 6,063 manatees counted during a statewide synoptic survey in February 2015. Although the observed population growth seems large enough to consider reclassifying Florida manatees as threatened, such a decision must also consider foreseeable threats and their anticipated impacts on future population trends.

As noted above, the *Federal Register* notice cites the IUCN Sirenia Specialist Group's summary assessment for the West Indian manatee (Deutsch et al. 2008), which concluded that the species as a whole should be classified as "Vulnerable" under the IUCN classification system. However, FWS's failure to cite the separate IUCN evaluation for the Florida manatee creates an incomplete and somewhat misleading picture. That evaluation (Deutsch 2008) concluded that the Florida subspecies should be listed as "Endangered" under the IUCN classification system due to a population of less than 2,500 mature individuals and the conclusion that it would "decline by 20% over the next two generations (estimated at 40 years) due to anticipated future changes in warm-water habitat and threats from increasing watercraft traffic over the next several decades." The IUCN analysis concluded that the greatest threats to Florida manatees come from a combination of die-offs related to cold stress and red-tides and strikes by watercraft. The Commission does not believe that FWS has adequately analyzed these factors and their possible effects on future population trends of Florida manatees.

Cold-Stress and Red-Tide Die-Offs: The frequency and severity of Florida manatee die-offs due to cold-stress and brevetoxin poisoning from red-tides have increased significantly over the past 20 years. In 2010 alone, more than 450 manatees are known or suspected to have died due to cold-stress associated with exceptionally cold weather (Barlas et al. 2011). This is more than eight times higher than for any previous year and exceeds the total manatee deaths from all sources reported for any prior year. In 2011, more than 100 Florida manatees died from cold-stress. Red-tide-related die-offs also have been increasing in frequency and severity. Between 2002 and 2009, five separate red-tide events each killed from 40 to 100 manatees, a stark contrast to the preceding 20 years, when only two such events occurred. Another red-tide event in 2013 killed at least 277 manatees, nearly twice the previous record high for such deaths, and contributed to a record-high 840 deaths that year. Total reported manatee mortality due to all causes between 2009 and 2013 exceeded 2,900, roughly 1,100 more deaths than for any previous five-year period.

If trends in cold-stress and red-tide die-offs are a product of broader climate change, which seems possible, both their frequency and severity could continue at recent levels or increase even further. Although average Florida temperatures increased between 1985 and 2008, this appears to be due to increases in temperatures in non-winter months. For the majority of Florida counties with significant changes in average monthly winter and spring temperatures (December through May), the temperatures actually *decreased* (Von Holle et al. 2010). This is consistent with well documented changes in weather patterns over North America that have caused Arctic air masses to move further south for longer periods in winter coincident with variability in the North Atlantic Oscillation and other large scale ocean-atmosphere interactions (Easterling et al. 2000, Walsh et al. 2001, Vavrus et al. 2006 and Edwards 2013).

In light of the increasing trend in these die-offs, the Commission is concerned that the positive growth rate of the Florida manatee population may have begun to decline or may soon do so. This concern prompted the Commission to recommend in its comments on the manatee petition that FWS review the unprecedented number of manatee deaths between 2009 and 2013 and, using the core biological model (Runge et al. 2004), assess their effect on abundance and vital rates over that 5-year period. The Commission further recommended that FWS examine past die-offs of Florida manatees to estimate trends in their frequency and severity, and factor those trends into the model used to project abundance and growth rates into the future. The proposed rule provides no indication that such analyses have been conducted.

Instead of these types of forward-looking analyses, FWS supports the proposed action with a new population analysis that evaluated threats and population trends for Florida manatees only through 2009 (Runge et al. 2015). This analysis predicts that there is only a 2.5 percent chance that the statewide abundance of Florida manatees will decline below 4,000 animals in the next 100 years and less than a 1 percent chance that the effective population size on either the East Coast or West Coast of Florida will fall below 500 animals over that period. However, the analysis states that “Florida manatee populations have experienced a number of unusual [recent mortality] events...that *are not yet reflected* in the analysis” (emphasis added). The analysis also assumes that “current threats (will) remain constant indefinitely.” This assumption is inconsistent with recent trends in the frequency and severity of manatee die-offs and fails to account for the expectation (as discussed below) that warm-water refuges will be lost as power plants are retired over the coming decades, further increasing risks of cold-stress-related mortality. FWS needs to factor such changes into its population assessments. The Commission therefore reiterates its recommendation that FWS (1)

revise its assessment of population trends to take into account the die-offs of manatees between 2009 and 2013, (2) use all available data to project trends in the frequency and severity of die-off events into the future, and (3) using those trends and the revised (see below) core biological model, project population sizes and growth rates of Florida manatees over time.

Updating the Core Biological Model: The Commission is concerned that the core biological model used to assess Florida manatee population trends (i.e., Runge et al. 2004) does not adequately account for uncertainties in key population parameters. Model projections do not reflect the full range and distribution of plausible population trends. For example, the assumption that “current threats [will] remain constant indefinitely,” as noted above, is inconsistent with the increasing frequency and severity of red-tide and cold-stress-related die-offs.

The *Federal Register* notice states that “[d]ata from the Manatee Carcass Salvage Program...were used [in the model] to estimate fractions of mortality due to each of six known threats: watercraft, water control structures, marine debris, cold [stress], red tide, and others.” That approach, however, may underestimate the total deaths attributed to certain categories because not all deaths are necessarily assigned to the correct category. This is particularly true for red-tide and cold-stress-related deaths. For example, in 2010, when 282 deaths were attributed to cold stress based on necropsy examination, an additional 172 carcasses were identified as suspected cold stress deaths given the timing and location of carcass retrieval. Similarly, during large-scale red-tide die-offs, many manatee deaths suspected of being caused by red-tide are attributed to unidentified causes because not all carcasses can be examined. It is unclear to the Commission whether the model uses only deaths that can be attributed definitively to a particular cause or includes deaths that are either confirmed or suspected of having been caused by cold-stress or red-tide. This should be clarified and any required adjustments made to ensure that the model is properly accounting for those deaths in its long-term population projections, or at least reflecting the uncertainty associated with those projections.

The model relies on expert opinion panels to estimate warm-water carrying capacity and certain other parameters. However, no thorough description of the advice from the various panels is provided by FWS. The Commission is concerned that, unless the range and distribution of expressed opinions are fully captured, the model will not adequately reflect those views. Also, it is unclear whether expert panels provided or were asked to provide advice on how parameters such as cold-stress and red-tide-related deaths may change in the future and how such changes should be incorporated into the model.

In light of concerns regarding whether and how uncertainty is captured and reflected in the current version of the core biological model, the Commission believes that both the model and the data should again be independently peer-reviewed *before* model results are used to inform a listing decision for Florida manatees. Therefore, the Commission recommends that FWS (1) convene an independent panel of manatee biologists and population modelers to reexamine both the data and modeling methods used in the current core biological model, (2) revise the model as appropriate to incorporate peer-review findings, (3) use the revised model to assess the effects of observed mortality between 2009 and 2013 on projected population trends; and (4) incorporate the range of opinions expressed by expert panel members and account for uncertainties in model parameters, including the future frequency and severity of red-tide and cold-stress-related die-offs, into its projections of population trends.



Recovery Plan Reclassification Criteria: As noted in the proposed rule, FWS must consider the recovery criteria set forth in the Florida Manatee Recovery Plan (FWS 2001) when considering a change in listing status. The notice devotes considerable discussion to actions addressing each of those criteria and related recovery plan objectives, but does not identify the criteria themselves. From our review of the plan, at least some of those criteria have not been met.

For example, the criteria for recovery factor A (threats to habitat) specify, in part, a need to establish minimum flow levels at certain warm-water springs, including the Crystal River Springs Complex, Homosassa Springs, Blue Spring, and Warm Mineral Springs. As a related matter, recovery factor D (adequacy of existing regulatory measures) specifies that “additional specific actions..., such as those listed pursuant to Factor A...*must* be accomplished...*before* the FWS will consider the species for reclassification” (emphasis added). These actions have not been fully accomplished. Although the *Federal Register* notice identifies springs for which minimum flows have been established, minimum flows have yet to be established for two springs specifically identified under recovery factor A, namely the Crystal River Springs Complex and Warm Mineral Springs. Because far more manatees depend on the Crystal River Springs Complex than on any other spring in Florida, establishing a minimum flow level for that location is arguably the single most important action needed to meet the requirements under recovery factor A, yet this has not been accomplished.

It is one thing to establish minimum flow levels, but more important is ensuring that, once established, those levels are being met and will continue to be met in the future. FWS’s analysis does not discuss the extent to which management actions in Florida have successfully reversed or prevented spring flows from declining below established minimums and does not recognize the challenges in doing so. In fact, FWS acknowledges in the notice that the flow at many Florida springs has been reduced or eliminated. As we read recovery factors A and D, Florida manatees should not be considered for reclassification as threatened until minimum flow levels have been established for all important warm-water springs, and sufficient management measures are in place to ensure that those levels will be met and maintained. FWS should abide by the guidance in the recovery plan and defer further consideration of the reclassification of Florida manatees until such measures are in place.

Recovery factor A also specifies that a network of level 1 and 2 warm-water sites needs to be protected as refuges, manatee sanctuaries, or manatee safe havens. This network is depicted in Figure 7 of the recovery plan, which identifies 23 level 1 and 2 sites. More than half of those sites, however, are power plants that could be decommissioned at any time at the discretion of electric utilities for reasons independent of the needs of manatees and FWS control. Indeed, two of the power plants identified in Figure 7 have already been closed or are no longer providing warm-water habitat for manatees. Given the uncertainty regarding whether the identified power plants will continue to provide warm-water refuges and for how long, these sites cannot be counted on to contribute reliably to manatee survival over the long term. The network of sites necessary to provide warm-water habitat for Florida manatees identifies only five springs. The Commission does not believe that the network, absent the power plants, is adequate to sustain the current population of manatees. FWS officials attending the Commission’s 2011 annual meeting acknowledged the need for further work to strengthen the envisioned regional network and advised that a series of structured decision-making meetings had been planned. To date, none of these meetings have been

held and it remains unclear how the recovery plan's criteria for identifying and protecting regional networks of warm-water sites will be met. This is something that FWS needs to address before proceeding with the proposed change in listing status.

The discussion in the *Federal Register* notice suggests that FWS believes the existing recovery plan criteria, now more than 15 years old, to be outdated and that it no longer needs to follow them. If there is a need to update the criteria, that should be done before taking action to change the listing status of Florida manatees. Until the criteria are revised, however, FWS should follow the existing criteria. Therefore, the Commission recommends that FWS either (1) apply the existing recovery plan provisions and not change the Florida manatee's listing status until all applicable criteria have been met, or (2) update the recovery plan criteria and provide the public a chance to review the new criteria before it applies them to a listing decision.

Power Plant Closures: Perhaps the greatest long-term threat to Florida manatees is cold-stress-related mortality, which likely will increase over time due to power plant retirements and the limited availability of alternative warm-water habitat. All power plants now used by manatees as warm-water sites are expected to reach the end of their operational lives within 40 years (Laist and Reynolds 2005a). When those power plants close, manatees will have lost approximately half of the winter warm-water refuges now available to them. The only alternative warm-water habitats to sustain Florida manatees through the winter will be a small number of warm-water springs that discharge ground water at relatively constant temperatures (72°F) and passive thermal basins<sup>2</sup> (Laist and Reynolds 2005b) The proposed rule does not adequately assess the threat associated with power plant closures. To correct this, the Commission recommends that FWS assess (1) the proportion of Florida manatees likely to be affected by power plant retirements in each of the four management regions identified in the recovery plan, (2) the availability and adequacy of alternative warm-water habitats, (3) the likelihood that manatees will be able to find alternative sites, and (4) any additional actions needed to ensure that an adequate number and distribution of alternative warm-water sites will be available.

In assessing the proportion of animals potentially affected by power plant closures, FWS should consider Laist et al. (2013), who found that approximately half of all Florida manatees rely on power plant outfalls in most winters, but that two-thirds did so during the extreme cold-weather event in 2010. In Florida's East Coast waters, inhabited by nearly half of all Florida manatees, reliance on power plant outfalls is even more important—two-thirds depend on power plant outflows in most years, but in 2010, more than 80 percent did so. In most years, only 17.5 percent of all Florida manatees rely on warm-water springs and 30 to 35 percent use passive thermal basins.

Laist et al. (2013) assessed the adequacy of warm-water springs and passive thermal basins to support manatees during cold periods by examining the distribution of cold-stress-related deaths during an exceptional cold period in winter 2010 relative to the location of warm-water springs, passive thermal basins, and power plants. They found that cold-stress deaths were concentrated primarily in Florida's southwest and east central coasts where the only known warm-water habitats were passive thermal basins and power plants. Cold-stress deaths were far less likely to occur in areas where manatees had access to warm-water springs. When normalized to account for

---

<sup>2</sup> Passive thermal basins are small embayments that cool more slowly than surrounding waters and are able to retain heat for relatively short periods during severe or extended cold weather.

differences in manatee abundance, cold-stress deaths were roughly three times more likely to occur in areas where passive thermal basins and power plants provide the only or the principal warm-water habitats. Without power plant outfalls, cold-stress deaths in areas without warm water springs undoubtedly would have been substantially greater. Based on these findings, it is likely that, if all power plants now used by Florida manatees are retired before or at the end of their planned operational lives and no actions are taken to provide substitute warm-water sources, a majority of Florida manatees (i.e., those without access to warm-water springs) will face an increased risk of death from cold stress.

The availability of alternative warm-water habitats to manatees will depend on the ability of manatees to find them, which, in part, will depend on how far those habitats are from power plants. Experience with shut-downs of industrial warm-water sites indicates that most manatees tend to use nearby alternative warm-water sites even if those sites provide inadequate protection from cold stress (Laist and Reynolds 2005a). Therefore, most manatees now using power plants for thermoregulation are likely to be exposed to potentially lethal cold temperatures when plants are retired.

The problem is particularly acute along the East Coast of Florida, where 80 percent of manatees depend on power plants in the coldest weather and where the nearest warm-water springs are on the St. Johns River, with access as far as 400 miles away. In addition, manatee access to most of the springs along the St. Johns River is limited due to dams, conversion of spring boils for use as human spas, and intensive recreational use. Similarly, in southwest Florida, the only spring likely capable of supporting more than a few manatees is Warm Mineral Springs, where manatee access is limited by shallow depth and competing human uses. Given the large proportion of manatees now dependent on power plant outfalls, the Commission believes it is possible that 50 percent or more of Florida manatees could be exposed to lethally cold temperatures if all power plants now used by manatees are retired.

FWS also needs to review the measures in place to ensure that warm-water habitat other than power plant outfalls will be available in the future and consider whether additional measures are needed to provide sufficient assurance. For example, a Warm Water Task Force developed a draft plan for this purpose in 2005, but FWS disbanded the team before it completed its work. Despite pledges by FWS to finalize the plan, it has not done so. Based on tasks identified in the draft plan, however, extensive work, costing tens of millions of dollars, likely will be needed over the next three to four decades to ensure that adequate warm-water sources will be available to manatees in Florida as power plants are retired (Laist et al. 2013).

Until FWS has adopted a strategy for ensuring that sufficient warm-water habitat will be available to manatees in the future and has provided a reasonable basis for concluding that the identified actions will be carried out, it is premature to discount the threat that power plant closings presents to the continued existence of Florida manatees. The Commission recommends that FWS refrain from changing the listing status of the Florida manatee until it has identified the actions needed to ensure that alternative warm-water habitat will be available and has a reasonable basis for concluding that those actions will be carried out.

Watercraft-related Mortality: The proposed rule notes that collisions by watercraft with Florida manatees constitute the largest source of human-caused mortality. Watercraft have been responsible for about 20-25 percent all manatee deaths in most years. The principal management measure to reduce such deaths has been the establishment of boat speed zones by the State of Florida in high-use manatee areas in 26 Florida counties. FWS contends that the numbers of Federal and State officers enforcing these zones are adequate, but recognizes that the effectiveness of established zones is unclear given the results of boater compliance studies. Those studies suggest compliance rates with posted speeds vary from 85 to 14 percent on different waterways. Despite questions about the effectiveness of speed zones, FWS concludes that, in light of the past growth and stability of the Florida manatee population, management measures to address watercraft-related deaths are adequate to ensure continued growth of the population.

The Commission agrees that current regulatory and enforcement measures have played a vital role in minimizing watercraft-caused manatee deaths. However, FWS's analysis assumes, without any discussion, that the existing measures will remain in place in the foreseeable future. Reviewing, assessing, and adjusting boat speed zones, maintaining signs, and enforcing those laws are expensive and the costs have been borne largely by the State. While we are unaware of anything specific to suggest that the State plans to reduce its efforts, there has been persistent and increasing pressure by the boating community to eliminate or minimize boat speed regulations. Indeed, many proponents of relaxing boat-speed measures have long urged reclassifying or delisting Florida manatees under the ESA to bolster their arguments. Moreover, the increasing trend in the number of boats in Florida's waters is expected to continue as the State's population grows, requiring continued vigilance to ensure that watercraft-caused manatee deaths do not also increase. Therefore, to assess whether existing and future measures are likely to be adequate to ensure that watercraft-related mortality of Florida manatees does not increase, FWS needs to consider the impacts from the growing number of vessels using Florida's waters and evaluate the potential for changes in regulatory protections and enforcement efforts. Therefore, the Commission recommends that FWS defer consideration of any action to list manatees as threatened until it has undertaken an assessment that considers (1) the possibility that changing the listing status of manatees could contribute to a relaxation of boat speed restrictions and enforcement efforts, (2) whether sufficient safeguards are in place to ensure that the effectiveness of watercraft-related measures will continue to be evaluated and maintained.

---

In conclusion, the Commission finds that that FWS has not conducted all the analyses necessary to justify the proposed action to reclassify West Indian manatees as threatened throughout their range. The Commission recommends that FWS suspend further consideration of the proposed action and retain the current endangered listing for the West Indian manatee until it has taken the necessary steps to assess separately the status of Antillean and Florida manatees and any DPSs that may warrant a separate listing under the applicable ESA criteria.

Mr. Jay Herrington

8 April 2014

Page 13

I hope these comments are helpful. The Commission would be glad to help FWS address any of these recommendations. If you or your staff have questions, please call.

Sincerely,



Rebecca J. Lent, Ph.D.  
Executive Director

#### Attachments

2 September 2014 letter to FWS on the petition to reclassify West Indian manatees

21 September 2011 letter to FWS on managing warm-water refuges

#### References

Castelblanco-Martínez, D.N., A.L. Bermúdez-Romero, I.V. Gómez-Camelo, F.C. Weber Rosas, F. Trujillo, and E. Zerda-Ordoñez. 2009. Seasonality of habitat use, mortality, and reproduction of the vulnerable Antillean manatee, *Trichechus manatus manatus* in the Orinoco River, Colombia: implications for conservation. *Oryx* 43(2): 235-242

Barlas M.E., C.J. Deutsch, M. de Wit, and L.I. Ward-Geiger (Eds.) 2011. Florida manatee cold-stress related unusual mortality event, January-April 2010. Final Report. FWC/FWRI file F-2852-10-11-F. Florida Fish and Wildlife Research Institute. St. Petersburg, FL. 125p.

Deutsch, C. 2008. *Trichechus manatus* ssp *latirostris*. Version 2015-3.1. The IUCN Red List of Threatened Species. Version 2014.3. <http://www.iucnredlist.org/details/22106/0>.

Deutsch, C.J., C. Self-Sullivan, and A.A. Mignucci-Giannoni. 2008. *Trichechus manatus*. The IUCN Red List of Threatened Species. Version 2014.3. <http://www.iucnredlist.org/details/22103/0>.

Domning, D.P. and L.C. Hayek. 1986. Interspecific and intraspecific morphological variation in manatees (Sirenia: *Trichechus*). *Marine Mammal Sci.* 2:87-144.

Easterling D.R., J.L. Evans, P.Y. Groisman, T.R. Karl, K.E. Kunkle, and P. Anbanje. 2000. Observed variability and trends in extreme climate events: a brief review. *Bulletin of the American Meteorological Society* 81:417-425

Edwards, H. 2013. Potential impacts of climate change on warm-water megafauna: the Florida manatee example (*Trichechus manatus latirostris*). *Climate Change* 121:727-738.

Fish and Wildlife Service (FWS). 2001. Florida Manatee Recovery Plan (*Trichechus manatus latirostris*) Third Edition. Southeast Region, U.S. Fish and Wildlife Service. 144p + Appendices

Mr. Jay Herrington

8 April 2014

Page 14

Gonzalez-Socoloske, D., L.D. Olivera-Gómez, J.P. Reid, C. Espinoza-Marin, K.E. Ruiz, and K.E. Glander. 2015. First successful capture and satellite tracking of a West Indian manatee (*Trichechus manatus*) in Panama: feasibility of capture and telemetry techniques. *Latin American Journal of Aquatic Mammals* 10(1): 52-57. <http://dx.doi.org/10.5597/lajam00194>.

Hunter, M.E., A.A. Mignucci-Giannoni, K.P. Tucker, T.L. King, R.K. Bonde, B.A. Gray, and P.M. McGuire. 2012. Puerto Rico and Florida manatee represent genetically distinct groups. *Conservation Genetics* 13: 1623-1635.

Laist, D.W. and J.E. Reynolds, III. 2005a. Florida manatees, warm water refuges, and an uncertain future. *Coastal Management* 33:279-295.

Laist, D.W. and J.E. Reynolds, III. 2005b. Influence of power plants and other warm water refuges on Florida manatees. *Marine Mammal Science* 21(4):739-764.

Laist, D.W., C. Taylor, and J.E. Reynolds, III. 2013. Winter habitat preferences for Florida manatees and vulnerability to cold. *PLOS One* 8(3): 1-11.

Marsh H., T.J. O'Shea, and J.E. Reynolds, III. 2011. Ecology and conservation of the Sirenia: dugongs and manatees. Cambridge University Press, New York, NY. 521 pp.

Runge, M.C., C.A. Langtimm, J. Martin, and C.J. Fongesbeck. 2015. Status and threats analysis for the Florida manatee (*Trichechus manatus latirostris*), 2012: U.S. Geological Survey Open-File Report 2015-1083, 23 p. <http://dx.doi.org/10.3133/ofr20151083>.

Self-Sullivan, C. and AA Mignucci-Giannoni. 2008. *Trichechus manatus* ssp *manatus*. Version 2015-3.1. The IUCN Red List of Threatened Species. Version 2015-4. <http://www.iucnredlist.org/details/22105/0>.

Von Holle B., Y. Wei, and D.Nickerson. 2010 Climatic variability leads to later seasonal flowering of Floridian plants. *PLoS ONE* 5(7):e1150

Walsh JE, A.S.Phillips, D.H. Portis, and W.L. Chapman. 2001. Extreme cold outbreaks in the United States and in Europe, 1948-99. *Journal of Climate*. 14:2642-2658

United Nations Environment Programme (UNEP). 2010. Regional management plan for the West Indian manatee (*Trichechus manatus*) compiled by E. Quintana-Rizzo and J.E. Reynolds III. CEP Technical Report No. 48. UNEP Caribbean Environment Programme, Kingston, Jamaica. 170 pp.

U.S. Fish and Wildlife Service (FWS). 2009. Stock assessment West Indian manatee (*Trichechus manatus*) Puerto Rico stock (Antillean manatee, *Trichechus manatus manatus*). Revised 30 December 2009. Jacksonville Endangered Species Field Office. Jacksonville, FL 13p.