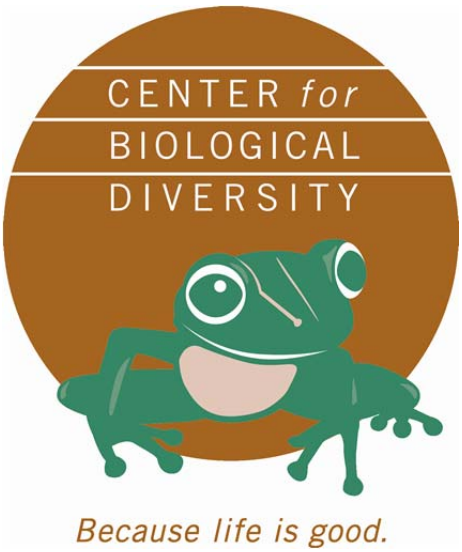

Everglades
Law Center, Inc.
Defending Florida's Ecosystems and Communities

September 2, 2014

Public Comments Processing
Attn: Docket No. FWS-R4-ES-2014-0024
U.S. Fish & Wildlife Service Headquarters
MS: BPHC, 5275
Leesburg Pike, Falls Church, VA 22041-3803

RE: FWS-R4-ES-2014-0024; 92220-1113-0000-C5, 90-Day Finding on a Petition to Reclassify the West Indian Manatee From Endangered to Threatened

The Center for Biological Diversity and Everglades Law Center submit the following comments on the U.S. Fish & Wildlife Service's ("Service's") 90-day finding on a petition to reclassify the West Indian manatee (*Trichechus manatus*) as threatened under the Endangered Species Act ("ESA" or "Act"). For the reasons explained below, reclassification is not warranted under Section 4(a) of the ESA and the best available science supports the Service's continued listing and management of the species as "endangered."

I. Introduction

The Florida manatee has enjoyed protection under the Endangered Species Act since 1973. By 1979 the Service estimated there were only 800-1,000 individuals,[1]

[1] *Endangered and Threatened Wildlife and Plants; Proposed Rulemaking to Provide for the Establishment of Manatee Protection Areas*, 44 Fed. Reg. 4745 (Jan. 23, 1979), *available at* http://ecos.fws.gov/docs/federal_register/fr262.pdf.

and by 1987, that number had risen to 1,200.[2] Through careful management of the manatee and its habitat, the Service and its Florida partner, the Florida Fish and Wildlife Conservation Commission, have helped increase the population of Florida manatees at least four fold.

Despite this positive long-term trend, the same threats against the manatee that landed it on the endangered species list persist today. Manatee mortality from all sources has increased since 1973 and these threats limit its ability to fully recover and ensure that the possibility of extinction is never far off. A review of the threats against the manatee based on the best available scientific information shows that it is threatened with extinction and warrants protection under the Act as an endangered species. Not only would it be premature and detrimental to the continued existence of the species to downlist it to threatened at this time, it would not be supported by the language or intent of the Endangered Species Act, the Service's regulations, or the best available science.

II. Florida Manatee Biology, Distribution, Abundance, Population Trends and Demographics

The Service first protected the West Indian manatee, *Trichechus manatus*, as endangered throughout its range under the Endangered Species Preservation Act of 1966. It was one of the first species to be protected under what was the precursor to the ESA.[3] In 1973, the Service listed it under the Endangered Species Act.[4] The Florida manatee is a subspecies of the West Indian manatee and is native to Florida.[5]

The Service designated critical habitat for the Florida subspecies in 1976.[6] While it was one of the first ESA designations of critical habitat for an endangered species and the first for an endangered marine mammal, the designation did not list any of the required specific physical or biological features essential to the conservation of the manatee, which may require special management considerations or protection.[7] The Service has also published several recovery plans for the manatee since 1980; the Service published the latest recovery plan in 2001.[8]

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[2] Florida Manatee Recovery Plan (*Trichechus manatus latirostris*) Third Revision, U.S. Fish and Wildlife Service Southeast Region Oct. 30, 2001, (*hereinafter "*Recovery Plan"), *available at* http://ecos.fws.gov/docs/recovery_plan/011030.pdf.

[3] *Office of the Secretary, Native Fish and Wildlife, Endangered Species*, 32 Fed. Reg. 4001 (Mar. 11, 1967), *available at* http://www.nmfs.noaa.gov/pr/pdfs/fr/fr32-4001.pdf.

[4] 16 U.S.C. § 1531 *et seq*.

[5] U.S. Fish & Wildlife Service, Endangered and Threatened Wildlife and Plants; 12-month Finding on a Petition to Revise Critical Habitat for the Florida Manatee (Trichechus manatus latirostris), 75 Fed. Reg. 1574, 1575 (January 12, 2010), *available at* http://www.gpo.gov/fdsys/pkg/FR-2010-01-12/pdf/2010-325.pdf#page=1.

[6] *See* 50 C.F.R. § 17.95(a).

[7] 16 U.S.C. § 1532(5)(A); Recovery Plan.

[8] 75 Fed. Reg. 1575

These long-lived marine mammals are dark grey, average 10 feet in length, and weigh between 800 to 1,200 pounds.[9] They have a round, flattened, paddle-shaped tail and two front flippers that are used for steering while swimming.[10] Females can reproduce as early as four years of age but most breed between the ages of 7 and 9.[11] Gestation occurs for 12-14 months and females typically have one calf every 2 to 5 years.[12] The mother and calf remain together for up to 2 years.[13]

Manatees are found in freshwater, brackish, and marine environments. Typical habitats include coastal tidal rivers and streams, mangrove swamps, salt marshes, and freshwater springs.[14] Manatees are herbivores and feed on a wide range of aquatic vegetation.[15] Preferred feeding areas include shallow seagrass beds with ready access to deep channels.[16] Manatees use springs and freshwater runoff sites for drinking water and secluded canals, creeks, embayments, and lagoons for resting, cavorting, mating, calving, and nurturing their young.[17] Travel corridors include open waterways and channels.[18]

The Florida manatee population is divided into four regional management units (formerly subpopulations): Northwest, Upper St. John's River, Atlantic and Southwest.[19] The Northwest unit occupies the Florida Panhandle south to Hernando County. The Upper St. John's River unit encompasses the St. John's River south of Palatka. The Atlantic unit occupies the east coast of Florida from the lower St, John's River south of Palatka to the Florida Keys. The Southwest unit occurs from Pasco County south to Whitewater Bay in Monroe County.[20]

The manatee's inability to adequately thermoregulate in temperatures less than 68 degrees Fahrenheit restrict it to natural and artificial sources of warm water during colder months. Natural sources include springs and artificial sources include heated water discharged from power and industrial plants.[21] Prolonged exposure to cold water temperatures can result in debilitation and death due to

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[9] *Id.*
[10] *Id.*
[11] *Id.*
[12] *Id.*
[13] *Id.*
[14] *Id.*
[15] *Id.*
[16] *Id.*
[17] *Id.*
[18] *Id.*
[19] U.S. Fish & Wildlife Service, 2012 Final Stock Assessment Report, West Indian Manatee 1-2 (January 2014), (*hereinafter* "SAR 2012"), *available at* http://www.fws.gov/northflorida/manatee/SARS/FR00001606_Final_SAR_WIM_FL_Stock.pdf.
[20] *Id.*
[21] James A. Powell, Ph.D., "Concerns regarding the US Fish & Wildlife Service's decision of "may affect but not adversely affecting" the West Indian Manatee of the proposed Lake Worth Inlet deepening and widening project," at 2 (February 27, 2014) (*hereinafter* "Powell Report").

"cold stress" syndrome.[22] The loss of warm-water habitats is one of the leading threats facing the population and is likely to contribute to the decrease of manatees in the future.[23]

The minimum number of manatees counted in Florida has generally increased since statewide aerial surveys began in 1991.[24] These surveys are performed during the winter months at warm water refuges. Yet, synoptic aerial counts have considerable biases as sightability can be related to environmental conditions such as water clarity, surface chop, and behavior of individual animals such as bottom resting compared to surface resting as examples.[25] Consequently, the Florida Fish and Wildlife Conservation Commission has specific criteria as to appropriate conditions surveys can be flown, with minimum wind speeds, fixed survey tracks, experienced observers and cold temperatures. The latter is particularly import since it is cold weather that causes manatees to aggregate at warm water sites, which are the focus of surveys.[26] Since 2010, however, those counts have not followed a similar growth trajectory as previous years.[27] In 2010, 5,077 manatees were counted, in 2011, 4,834 manatees were counted and 4,824 manatees were counted in 2014.[28]

Moreover, the additional mortality from recent cold-stress events has likely affected the population's abundance and possibly its age and sex distribution.[29] Since the 2007 demographic analysis and Service's 5-Year Review were issued, there have been record numbers of manatee deaths. An unprecedented cold weather event in 2009-2010 was largely responsible for a record annual total number of manatee deaths documented that year.[30] In 2010, 766 manatees died in Florida, including 282 deaths directly attributed to the cold.[31] In 2011, FWC reported the second highest number of cold-stress related mortality with 112 deaths directly attributed to the cold.[32] In addition to cold-related stress, hundreds of manatees have died in the past two years in Southwestern and Southeastern counties following red-tide events. Last year, 272 manatees died as a result of red-tide according to FWC.[33] More than 160 manatees died in the algae laden waters of the Indian River Lagoon alone.[34] 2013 saw a record-breaking 813

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[22] 75 Fed. Reg. 1574, 1575.
[23] *Id.*
[24] Powell Report, at 3.
[25] *Id.*
[26] *Id.*
[27] *Id.*
[28] http://myfwc.com/research/manatee/projects/population-monitoring/synoptic-surveys/.
[29] Letter from Marine Mammal Commission to USFWS, September 21, 2011, *available at* http://mmc.gov/letters/pdf/2011/annual_mtg_fws_92111.pdf.
[30] SAR 2012.
[31] *Id.* at 8
[32] *Id.*
[33] http://m.myfwc.com/news/news-releases/2013/july/09/manatees-released/.
[34] Greg Allen, "With Murky Water and Manatee Deaths, Lagoon Languishes," NPR, September 26, 2013 *at* http://www.npr.org/2013/09/26/223037646/with-murky-water-and-manatee-deaths-lagoon-languishes; http://www.myfwc.com/media/2600491/YearToDate.pdf.

deaths, approximately 16 percent of the total manatee population.[35]

III. Reclassification of the Manatee from Endangered to Threatened Is Not Warranted Under the ESA

The Endangered Species Act is "the most comprehensive legislation for the preservation of endangered species ever enacted by any nation."[36] In enacting the ESA Congress found that "various species of fish, wildlife, and plants in the United States have been rendered extinct as a consequence of economic growth and development untempered by adequate concern and conservation,"[37] and that "[o]ther species of fish, wildlife, and plants have been so depleted in numbers that they are in danger of or threatened with extinction."[38] The purpose of the ESA is "to provide a program for the conservation of . . . endangered species and threatened species" and to "provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved."[39] The overarching policy of the ESA is that "all Federal departments and agencies shall seek to conserve endangered and threatened species and shall utilize their authorities in furtherance of the purposes" of the ESA.[40] "The plain intent of Congress in enacting this statute was to halt and reverse the trend toward species extinction, whatever the cost."[41] "In short the preservation of endangered species was to be considered 'the highest of priorities.'"[42]

To achieve the ESA's purpose, Section 4 requires the Service to protect species by listing them as "endangered" or "threatened."[43] In addition to requiring the Service to list endangered or threatened animal or plants, it must also at the time of listing, to the "maximum extent prudent[44] and determinable,"[45] designate any habitat of the species, which is considered to be critical habitat.[46] Section 4 also requires the Service to "develop and implement . . . 'recovery plans' . . . for the

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[35] David Fleshler, Manatee Numbers Down in South Florida, Sun Sentinel, January 4, 2014 *at* http://articles.sun-sentinel.com/2014-01-04/news/fl-manatees-arrive-20140104_1_manatee-coordinator-florida-power-light-plant-palm-beach-county.
[36] *Tenn. Valley Auth. v. Hill*, 437 U.S. 153, 180 (1978).
[37] 16 U.S.C. § 1531 (a)(1).
[38] *Id.*
[39] 16 U.S.C. § 1531(b).
[40] *Id.* § 1531 (c)(1).
[41] *Tenn. Valley Authority*, 437 U.S. at 184.
[42] *Florida Key Deer v. Paulison*, 522 F.3d 1133 (11th Cir. 2008) (citing *Tenn. Valley Authority*, at 194).
[43] 16 U.S.C. §§ 1532(6), (20).
[44] 50 C.F.R. § 424.12(a)(1). Designation of critical habitat is not prudent when either the species is threatened by taking or other human activity, and identification of critical habitat can be expected to increase the degree of such threat to the species or such designation of critical habitat would not be beneficial to the species.
[45] Critical habitat is not determinable when either information sufficient to perform required analyses of the impacts of the designation is lacking, or the biological needs of the species are not sufficiently well known to permit identification of an area as critical habitat. 50 C.F.R. § 424.12(a)(2).
[46] 16 U.S.C. § 1533(a)(3); 50 C.F.R. § 424.12(a).

conservation and survival of endangered species and threatened species."[47] Each recovery plan should include: a description of site-specific management actions as may be necessary to achieve conservation and survival of the species; objective measurable criteria that, if met, would result in the de-listing of the species; and time and cost estimates to carry out the plan measures, and to achieve intermediate steps toward the goal of recovery.[48]

Therefore, the substantive protections listed species receive under the ESA include the designation of critical habitat,[49] the development of a recovery plan,[50] the prohibition of unlawful "take,"[51] and federal agencies' avoidance of jeopardy and adverse modification via consultation with the Service.[52]

A. Reclassifying a Species From Endangered to Threatened Under Section 4

The Secretary of Interior (through the Service) may reclassify the listed status of a species in accordance with the regulations set forth in 50 CFR 424.[53] Alternatively, an "interested person" may submit a written petition to the Secretary to reclassify a particular species.[54] Within 90 days of receiving a petition to reclassify a species, the Secretary shall make a finding as to whether the petition presents substantial scientific or commercial information indicating that the petitioned action may be warranted.[55]

On December 14, 2012 the Service received a petition from the Pacific Legal Foundation on behalf of Save Crystal River, Inc., requesting that the West Indian manatee and subspecies thereof be reclassified from "endangered" to "threatened" based primarily on the Service's 2007 5-Year review of the species.[56] Following the Service's review of the petition it issued a "90-Day Finding" that the proposed reclassification of the species "may be warranted."[57] It announced it would conduct both a status review and a five-year review of the species.[58] Based on the status review, the Service intends to issue a 12-month finding on the petition, which will address whether the petitioned action is warranted.[59]

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[47] 16 U.S.C. § 1533(f)(1).
[48] 16 U.S.C. § 1533(f)(1)(B)(i)-(iii).
[49] *Id.* at § 1532(5), 1533(a)(3)(A)(i).
[50] *Id.* at § 1533(f).
[51] *Id.* at § 1539(a).
[52] *Id.* at § 1536(a)(2).
[53] 50 C.F.R. § 424.10.
[54] 16 U.S.C. § 1533(b)(3)(A); 50 C.F.R. § 424.14(a).
[55] 50 C.F.R. § 424.14(b)(1).
[56] U.S. Fish & Wildlife Service, Endangered and Threatened Wildlife and Plants; 90-Day Finding on a Petition to Reclassify the West Indian Manatee From Endangered to Threatened, 79 Fed. Reg. 37707 (July 2, 2014), *available at* http://www.gpo.gov/fdsys/pkg/FR-2014-07-02/pdf/2014-15458.pdf.
[57] *Id.*
[58] *Id.*
[59] *Id.*

In determining whether a species' status can be reclassified from endangered to threatened the Service must base its decision on the best available scientific information evaluating the following factors:

(1) The present or threatened destruction, modification, or curtailment of its habitat or range;
(2) Over utilization for commercial, recreational, scientific, or educational purposes;
(3) Disease or predation;
(4) The inadequacy of existing regulatory mechanisms; or
(5) Other natural or manmade factors affecting its continued existence.[60]

The Service cannot deviate from these criteria in its decision-making.[61] The role of the Service is to assess the technical and scientific data in the administrative record against the relevant listing criteria set forth under Section 4(a) and then to exercise its own expert discretion in reaching its listing decision.[62]

The reason why reclassification decisions are to be based solely on the five factors set forth under Section 4(a) is rooted in the fundamental purpose of the Act, which is to conserve (i.e. recover) species so protection of the ESA is no longer necessary.[63] The Service defines recovery as "improvement in the status of listed species to the point at which listing is no longer appropriate under the criteria set out in section 4(a)(1) of the Act."[64] In other words, "recovery is not attained until the threats to the species as analyzed under section 4(a)(1) of the Act have been removed."[65] As the court in *Northern Spotted Owl v. Hodel* explained, "The Act was amended in 1982 to ensure that the decision whether to list a species as endangered or threatened was based solely on an evaluation of the biological risks faced by the species, to the exclusion of all other factors."[66] Thus, the five aforementioned factors are used to determine whether threats have been eliminated or sufficiently reduced to the point at which the species is on its way towards recovery and down-listing the species is warranted. Further, the Secretary must determine whether a species should be reclassified under the ESA, *solely* on the basis of the best available scientific and commercial information regarding a species' status.[67] As Congress explained during the

[60] 16 U.S.C. § 1533(a)(1)(A)-(E); 50 C.F.R. § 424.11(c)(1)-(5).
[61] *Biodiversity Legal Fund v. Babbitt*, 943 F. Supp. 23 (D.D.C. 1996); *Southwest Ctr. for Biological Diversity v. Babbitt*, 939 F. Supp. 49 (D.D.C. 1996).
[62] *Northern Spotted Owl v. Hodel*, 716 F. Supp. 479 (W.D. Wa. 1988).
[63] 16 U.S.C. § 1532(3).
[64] 50 C.F.R. § 402.02.
[65] *Fish and Wildlife Service & National Oceanic & Atmospheric Administrative, Interagency Cooperation – Endangered Species Act of 1973, as Amended; Final Rule*, 51 Fed. Reg. 19,935 (1986).
[66] *Hodel*, at 480 (citing Conf. Report 97-835, 97th Cong. 2d Sess. (Sept. 17, 1982) at 19, *reprinted in* 1982 U.S. Code Cong. & Admin. News 2807, 2860).
[67] 50 C.F.R. 424.11 (b) (emphasis in original).

passage of the ESA, "economic considerations have no relevance to determinations regarding the status of the species."[68]

In addition to assessing the five listing factors, the Service is required to determine whether a species in danger of extinction or threatened by possible extinction in all or a significant portion of its range. An "endangered species" is "any species which is in danger of extinction throughout all or a significant portion of its range."[69] A species is "in danger of extinction throughout…a significant portion of its range" if there are "major geographical areas in which it is no longer viable but once was."[70] A "threatened species" means "any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range."[71]

The terms "likely" and "foreseeable future" have not been defined by Congress, nor has the Service promulgated regulations or policy guidance defining the terms. However, the Service must use a definition that is reasonable, ensures protection of the species, and gives the benefit of the doubt regarding any scientific uncertainty to the species. And while these terms may be relative to the evaluation of an individual species, in the case of the Florida manatee, because the same threats persist against it and it faces new and worse threats, the Service must conclude that the species is currently in danger of extinction.

B. The ESA's Five-Factor Test Does Not Support Reclassifying the Manatee from Endangered to Threatened.

Down-listing decisions must be based solely on the five factors set forth under 4(a)(1):

(1) The present or threatened destruction, modification, or curtailment of its habitat or range;
(2) Over utilization for commercial, recreational, scientific, or educational purposes;
(3) Disease or predation;
(4) The inadequacy of existing regulatory mechanisms; or
(5) Other natural or manmade factors affecting its continued existence.

Threats from all five categories, individually and cumulatively, continue to threaten the manatee with extinction.

1. The present or threatened destruction, modification, or curtailment of its habitat or range threaten the manatee with extinction.

[68] H.R. Conf. Rep. No. 97-835, at 20*, reprinted in* 1982 U.S.C.C.A.N. 2807, 2861.
[69] 16 U.S.C. § 1522(6); 50 C.F.R. 424.02(e).
[70] *Defenders of Wildlife v. Norton*, 258 F.3d 1136, 1144 (9th Cir. 2001).
[71] 16 U.S.C. § 1532(19); 50 C.F.R. § 424.02(m).

Manatee habitat continues to experience destruction, modification, and curtailment from the reduction of warm water refuges, the continued loss of sea grass habitat, and watercraft access projects.

a. Threats to Warm-Water Refuges

Manatees are vulnerable to debilitation and death as a result of "cold stress syndrome" making the loss of Florida's warm-water habitats one of the leading threats facing the manatee population.[72] Historically, manatees relied on warm, temperate waters of South Florida and on natural warm-water springs scattered throughout the State as buffers but as a result of human disturbance at natural sites, they have relied increasingly on industrial sites and associated warm-water discharges as refuges from the cold.[73] Nearly two-thirds of the population winters at industrial warm-water sites, which are made up almost entirely of power plants.[74] Power plants in Brevard, Palm Beach, and Hillsborough counties maintain the largest winter aggregations of manatees throughout the year.[75] These artificial warm-water sites, however, are not permanent and their availability to manatees depends on the continued operation of these plants, some of which are decades old. Some of these plants could be retired soon and most could be retired over the next 30-50 years.[76] The closing and repowering of power plants will affect manatee winter distribution patterns.[77]

In addition to decommissioning of these industrial sources, there are also more immediate threats to artificial warm water sources, principally from large port projects. For example, the Riviera Power Plant near Palm Beach Inlet/Lake Worth Harbor provides refuge for nearly 25 percent of the entire east coast population-upwards of 600 manatees in any given year.[78] The U.S. Army Corps of Engineers is proposing a massive inlet dredging project to serve the Port of Palm Beach, which lies just a few hundred feet north of this critically important resource. The project is likely to have significant adverse effects on the species and its critical habitat.[79] Similar port projects are slated for Jacksonville, Miami, Port Everglades and the west coast. The Florida Wildlife Conservation Commission has identified the potential threats to manatees from port activities all across the state.[80]

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[72] 75 Fed. Reg. 1574, 1575.
[73] *Id.*
[74] *Id.*
[75] *Id.*
[76] Letter from Marine Mammal Commission to USFWS, September 21, 2011, *available at* http://mmc.gov/letters/pdf/2011/annual_mtg_fws_92111.pdf.
[77] Kimberly Pause Tucker, Margaret E. Hunter, Robert K. Bonde, James D. Austin, Ann Marie Clark, Cathy A. Beck, Peter M. McGuire, and Madan K. Oli. 2012. *Low genetic diversity and minimal population substructure in the endangered manatee: implications for conservation*. Journal of Mammalogy, 93(6):1504-1511.
[78] Powell Report, at 8.
[79] *See generally*, *id.*
[80] *See* http://myfwc.com/wildlifehabitats/managed/manatee/habitat/port-facts/.

While the Service purports to be developing an "action plan" for sustaining manatees in the long term without their reliance on industrial warm water sources,[81] planning for alternatives appears to remain in its infancy. The plan envisions working with the State, industry, and other agencies to enhance access to specific natural springs and establishing MFLs under state law. Yet, providing greater access to specific springs is of limited help when our state's springs are suffering from the effects of pollution and excessive groundwater withdrawals. Since the 2007 Status Review was published, Florida's springs have experienced significant increased degradation from pollution and excessive groundwater withdrawals.[82] The situation has reached a crisis level as a *Tampa Bay Times* investigation revealed in 2012.[83]

Further, MFLs alone are unlikely to address the habitat needs of manatees. MFLs are intended to prevent water bodies from "significant harm" not what is necessarily needed for listed species such as the manatee to recover.[84] This is accomplished by establishing the minimum flow for a particular water body that is "the limit at which further withdrawals would be significantly harmful to the water resource or ecology of the area" and the minimum water level which is "the level of groundwater in an aquifer and the level of surface water at which further withdrawals would be significantly harmful to the water resource of the area."[85] Just what constitutes "significant harm" remains undefined by statute.[86] The statute makes no special allowance for areas that have protected classifications such as wildlife refuges, aquatic preserves or other areas where a lesser degree of harm could be considered "significant."[87] In short, MFLs are in place to guard against a level of harm that may occur well after whatever harm is inflicted to a particular species.

The Service contends that a minimum spring discharge rate that considered the

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[81] U.S. Fish & Wildlife Service. 2007. West Indian Manatee 5-Year Review: Summary and Evaluation. U.S. Fish & Wildlife Service, Southeast Region, Jacksonville Ecological Services Office, Jacksonville, Florida, Caribbean Field Office, Boqueron, Puerto Rico. 86 pp. at 17, (*hereinafter* "5-Year Review"), *available at* http://www.fws.gov/northflorida/Manatee/2007%205-yr%20Review/2007-Manatee-5-Year-Review-Final-color-signed.pdf.

[82] Lizette Alvarez, "Florida Lawmakers Proposing a Salve for Ailing Springs, New York Times, April 14, 2014 *at* http://www.nytimes.com/2014/04/15/us/florida-lawmakers-proposing-a-salve-for-ailing-springs.html?_r=0; Lizette Alvarez, "Florida Struggles to Overcome Threats to Freshwater Springs, New York Times, June 22, 2012 *at* http://www.nytimes.com/2012/06/23/us/florida-worries-as-growth-threatens-its-freshwater-springs.html?pagewanted=all.

[83] "Florida's Vanishing Springs," Tampa Bay Times, *at* http://www.tampabay.com/specials/2012/reports/florida-springs/.

[84] *See* § 373.0421(2), Fla. Stat.

[85] *Id.*

[86] Klein, Christine A., Mary Jane Angelo, and Richard Hamann, *Modernizing Water Law: The Example of Florida*, 61 Fla. L. Rev. 403, 447 (July 2009), *available at* http://scholarship.law.ufl.edu/cgi/viewcontent.cgi?article=1007&context=facultypub.

[87] *See id.*

estimated flow rates necessary to support overwintering manatees has been identified for Blue Spring, and that the Districts are in the process of establishing other MFLs. But the MFL program in Florida is failing in many respects. Many MFLs have yet to be established by the water management districts[88] and once a district adopts a priority list of waters for the adoption of MFLs citizens are precluded from forcing the adoption of MFLs for a particular water body.[89] For those that have been established, many are in violation including those for the Caloosahatchee Estuary, Loxahatchee River, and the Everglades, which are frequently in violation.[90] For the Caloosahatchee this often means altered water flows and salinities, which have been identified as particularly significant threats to submerged aquatic vegetation,[91] which manatees depend upon for food. Further, while manatees can tolerate a wide range of salinities they prefer habitats where osmotic stress is minimal or where fresh water is periodically available.[92] The lack of freshwater flows in some areas or availability of freshwater for extended periods of time can result in dehydration.[93]

Further, "recovery and prevention" strategies are not being implemented expeditiously and with any real results, despite the statutory directive.[94] In some cases the sole recovery strategy for an MFL violation is a Comprehensive Everglades Restoration Plan (CERP) project, which may be many years away from being constructed. This is the case for the Caloosahatchee, where the recovery strategy is the C-43 West Basin Reservoir-a project that has not yet been constructed.[95] Moreover, the Service's plans for warm-water refuge alternatives is inherently subject to state legislative and rulemaking processes beyond the

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[88] *See* John R. Thomas, "Rules Based on Bad Science," Gainesville Sun, June 30, 2014, *at* http://www.gainesville.com/article/20140630/OPINION03/140629700; Kenneth H. "Buddy" Mackay Jr., "Give Priority to Florida's Springs, Reduce Pumping," Ocala Star Banner, April 6, 2014 *at* http://www.ocala.com/article/20140406/OPINION/140409832; http://www.nwfwater.com/system/assets/661/original/DEP_Approval_Letter_(2014-2-19).pdf; http://www.swfwmd.state.fl.us/projects/mfl/reports/Approved_FY2014-MFL_Priority_List_and_Schedule.pdf; http://www.sfwmd.gov/portal/page/portal/xrepository/sfwmd_repository_pdf/2014_priority_water_body_list_schedule.pdf; http://fl-suwanneeriver.civicplus.com/DocumentCenter/Home/View/87; http://floridaswater.com/minimumflowsandlevels/prioritylist.html.

[89] Klein, et. al. at 445.

[90] South Florida Water Management District, Ecological Conditions Update, slide 2 (May 12, 2011).

[91] RECOVER. 2014. System Status Report, U.S. Army Corps of Engineers, Jacksonville District, Jacksonville, FL and South Florida Water Management District, West Palm Beach, FL, 4-27 *at* http://www.evergladesplan.org/pm/ssr_2014/docs/cre_sav_2014.pdf.

[92] Recovery Plan at 20.

[93] 5-Year Review at 30.

[94] *See* § 373.0421(2), Fla. Stat. (requiring recovery strategies to be "expeditiously implement[ed]").

[95] 40E-8.421, FAC. *See generally*, Jane Graham and Julie Hill Gabriel, "Jump-Starting Everglades Restoration via Tools for Interim Progress," Natural Resources and Environment, Vol. 27, Number 4, Spring 2013, *available at* http://www.americanbar.org/publications/natural_resources_environment/2012_13/spring_2013/jumpstarting_everglades_restoration_via_tools_for_interim_progress.html.

Service's control and if the state legislature's failure to pass the "Florida Springs and Aquifer Protection Act" this year is any indication, years away from becoming a reality.[96]

Given these failures and the ESA's requirement that the Service cannot rely on future action or on unenforceable state efforts to address threats to the species,[97] the Service should not look towards unproven conceptual plans that rely mostly on future state actions such as the establishment of MFLs as long-term protections for warm water refuges and other habitat needs for the manatee.

b. Threats to Manatee Habitat from Loss of Seagrass

Since 1950, Florida has experienced a 50 percent decline of seagrass, which the manatee depends on for food.[98] The Florida Fish & Wildlife Conservation Commission ("FWC") reports that the status of submerged aquatic vegetation is "poor and declining," and that the statewide threat rank for seagrass habitat is "very high."[99] In addition to deteriorating water quality, development, dredging, and rising temperatures,[100] seagrass faces numerous threats from boating related activities including propeller scarring, boat groundings, and boat wakes. A 2012 biological opinion prepared by the National Marine Fisheries Service found that with respect to U.S. Army Corps of Engineers Nationwide Permit 36 authorizing activities required for the construction of boat ramps:

> The indirect impacts of the activities authorized by this Nationwide Permit have had more severe consequences for endangered and threatened species under NMFS' jurisdiction. For example,

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[96] The legislation would have delineated a spring protection and management zone for each Outstanding Florida Spring and required the establishment of MFLs for these springs failed to pass this year, *available at* http://www.flsenate.gov/Session/Bill/2014/1576.

[97] "Courts addressing what regulatory mechanism should be considered under Section 1533 have concluded that the ESA does not permit agencies to rely on plans for future action or on unenforceable efforts." *Greater Yellowstone Coalition, Inc. v. Servheen*, 665 F.3d 1015 (9th Cir. 2011) (citing *Oregon Natural Resources Council v. Daley*, 6 F.Supp. 2d 1139, 1155 (D. Or. 1998)); *See also Fedn. of Fly Fishers v. Daley*, 131 F.Supp. 2d 1158, 1165, 1169 (N.D. Cal. 2000) (MOU with states to undertake future conservation efforts did not constitute an existing regulatory mechanism). State management plans that are not enforceable and do not require monitoring are not adequate regulatory mechanisms. *Id.*

[98] U.S. Fish & Wildlife Service. 2010. Comprehensive conservation plan and environmental assessment: Pine Island, Matlacha Pass, Island Bay, and Caloosahatchee National Wildlife Refuges, Charlotte and Lee Counties, Florida. U.S. Dept. of the Interior, Atlanta, Georgia. 299 pp., at 70, *available at* http://www.fws.gov/southeast/planning/PDFdocuments/JNDingDarlingNWRComplexDraft/Ding%20Darling%20Satellite%20Refuges%20Draft%20CCP.pdf.

[99] FWC. 2005. Florida's State Wildlife Action Plan. Wildlife Habitats: Submerged Aquatic Vegetation. 332, *available a*t http://myfwc.com/media/134715/legacy_strategy.pdf.

[100] Hughes, A.R., S.L. Williams, C.M. Duarte, K.L. Heck Jr., and M. Waycott. 2009. Associations of concern: declining seagrasses and threatened dependent species. Front Ecol. Environ. 7(5): 242-46, 242; Masonjones, H.D., E. Rose, L.B. McRae, and D.L. Dixon. 2010. An examination of the population dynamics of syngnathid fishes within Tampa Bay, Florida, U.S.A. Current Zoology 56(1): 118-33, 118.

> Haddad and Sargent (1994) estimated that over 64,200 acres of seagrasses, which provide important forage for the endangered West Indian manatee and which contain populations of threatened Johnson's seagrass, were moderately or severely damaged by boat propellers in Florida, partially as an indirect effect of boat ramps authorized by this Nationwide Permit.

c. Threats to Manatee Habitat from Watercraft Access Projects

In addition to continued threats to warm water refuges, manatee habitat continues to be degraded by dock, marina, and other watercraft access projects.[101] These impacts range from the direct loss of manatee habitat (e.g., obstructions to travel corridors and loss of foraging opportunities) to providing additional watercraft access, which increases the risk of vessel collision. The impacts of watercraft collisions are described below.

2. The overutilization of manatees for commercial, recreational, scientific, or educational purposes threatens it with extinction.

Commercial, recreational, and/or educational activities are resulting in manatee harassment, particularly at Crystal River National Wildlife Refuge. This National Wildlife Refuge contains freshwater springs which provide manatees a warm water refuge. Springs offer manatees the best protection against cold stress.[102] In 2007, the *St. Petersburg Times* featured an article about swimmers grabbing, walking on, and riding manatees at Three Sisters Springs in Crystal River.[103] The incident was documented on video and state and federal authorities fielded "hundreds of complaints" in connection with the incident.[104] The article also highlighted the inadequacy of water-based law enforcement and the current inability of state wildlife officials to make a case without actually observing a violation.[105] Since then, some environmental groups have called for the closure of Three Sisters Springs during the winter and others have called for major changes to the Service's "swim with" program.[106] Proposed changes include additional no-

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[101] *See generally*, Center for Biological Diversity, *Collision Course: The Government's Failing System for Protecting Florida Manatees from Deadly Boat Strikes*, Sept. 2014.
[102] Laist DW, Taylor C, Reynolds JE (2013) Winter Habitat Preferences for Florida Manatees and Vulnerability to Cold. PLoS ONE 8(3), *available at* http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0058978.
[103] Barbara Behrendt, "Manatee Abuse Caught on Tape, Tampa Bay Times, February 11, 2007, *at* http://www.sptimes.com/2007/02/11/Citrus/Manatee_abuse_caught_.shtml.
[104] http://www.fws.gov/northflorida/Releases-07/001-07-Joint-FWS-FWC-manattee-harassment-031207.htm.
[105] Behrendt 2007.
[106] Annie Snider, "Things are out of control as manatee-loving tourists overwhelm refuge," Greenwire, January 29, 2014 *at* http://www.eenews.net/stories/1059993658.

entry sanctuaries, prohibitions on diving, and limiting the number of swimmers near manatees at one time.[107]

The second largest threat to the continued existence of the Florida manatee is "the stability and longevity of warm-water refuges."[108] Florida manatees are vulnerable to cold-stress related injuries and death in waters below 68 degrees Fahrenheit. Manatees suffer from hypothermia and metabolic changes due to exposure from cold waters in the winter months.[109] The warm water wintering habitat vital to the survival of the Florida manatee is susceptible to seasonal and climate changes. Florida manatees traditionally depended upon natural warm-water springs along the Florida coast in the cold winter months for food and as "buffers to the lethal effects of cold winter temperatures."[110] However, the Florida manatee has experienced loss and damage to this vital warm-water habitat since the original designation of critical habitat in 1977. Since that time, Florida's human population has more than doubled.[111] With this increased human population have come an increased number of coastal developments which result in alterations to manatee habitats.[112] Human disturbances and destruction of the natural warm water springs in coastal Florida have forced the manatees to use industrial warm-water discharge areas as wintering sites.[113] In fact, the Service has estimated that more than two-thirds of the Florida manatee population now winter in power plant discharge areas,[114] and that while these artificial sites have benefitted the species, "they also pose a significant risk."[115] The Service predicts that the deregulation of the power industry in Florida as well as damage to natural warm water springs "*will* significantly affect the manatee's ability to tolerate and withstand the cold…G*iven the magnitude of the problem,* the outright loss of these numbers of animals could significantly affect recovery efforts."[116]

Therefore, incidents with humans can have significant adverse impacts to manatees, particularly for adults with calves who are already experiencing cold related stress and need warm water refuges to survive the winter months. Studies have shown that manatees avoid human noise and activity in warm water refuges, making them more susceptible to cold related death and injury as they move towards colder waters. Swim-with activities coupled with boating activities in

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[107] Barbara Behrendt, "Group Seeks More Protection for Crystal River Manatees," February 21, 2011, *at* http://www.tampabay.com/news/environment/wildlife/group-seeks-more-protection-for-crystal-river-manatees/1153030.
[108] FWS 2001 at 28.
[109] *Id.* at 75.
[110] *Id.*
[111] *Id.*
[112] *Id.*
[113] *Id.* at 28.
[114] *Id.*
[115] *Id.*
[116] *Id.* (emphasis added).

these sensitive areas, can subject the species to significant cumulative effects.[117]

Although the Service recognized the "imminent danger" facing manatees and passed an emergency rule in the winter of 2010-2011 declaring Kings Bay a manatee sanctuary,[118] more can be done. One study notes that "[l]ong-term survival of Florida manatees will require improved efforts to enhance and protect manatee access to and use of warm-water springs as power plant outfalls are shut down."[119] In the Service's 2001 manatee recovery plan, the Service expressed concern for the future survival of the species,[120] identifying the loss of warm water habitat during winter months as one of the primary threats to the manatee.[121] The 2001 plan discussed the need for further protections in areas where human development has pushed out the manatee.[122] The plan states that the manatee's "survival will depend on maintaining the integrity of ecosystems and habitat sufficient to support a viable manatee population;"[123] that "[o]ne of the *greatest threats* to the continued existence of the Florida manatee is the stability and longevity of warm-water habitat…. Protection, enhancement and/or replacement, identification, and characterization of these sites are *essential* to the continued recovery of the manatee population;"[124] and that "[o]ther important unprotected areas should be identified and afforded necessary protections."[125] The designation of Kings Bay as a manatee refuge will help the Service achieve recovery goals for the manatee.

3. Disease or predation threatens the manatee with extinction.

Threats against the manatee, including impacts from red tide and the unknown pathogen affecting the manatee in the Indian River Lagoon, are described in other sections of these comments. While not widely regarded as a present threat to manatees, papilloma virus has been found in captive Florida manatees and there is some evidence that it may also be present in the wild population in

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[117] King, J.M. and J.T. Heinan. 2004. An assessment of the behaviors of overwintering manatees as influenced by interactions with tourists at two sites in central Florida. Biological Conservation 117:227-34; *Endangered and Threatened Wildlife and Plants; Manatee Protection Areas in Florida*, 67 Fed. Reg. 680, 681 (Jan. 7, 2002) (citing Jay Gonzalez, Mote Marine Laboratory, personal communication 2001).
[118] Craig Pittman, "New Rules Will Tighten Manatee Regulations in Kings Bay," November 5, 2010 *at* http://www.tampabay.com/news/environment/wildlife/new-rules-will-tighten-manatee-regulations-in-kings-bay/1132461
[119] Laist DW, Taylor C, Reynolds JE (2013) Winter Habitat Preferences for Florida Manatees and Vulnerability to Cold. PLoS ONE 8(3).
[120] Recovery Plan at 23.
[121] *Id.* at iv.
[122] *Id.* at 86.
[123] *Id.* at iv.
[124] *Id.* at 86.
[125] *Id.* at 83.

northwestern Florida.[126] Manatees weakened by other threats may be at increased risk of disease or predation.

4. The inadequacy of existing regulatory mechanisms threatens the manatee.

Several state and federal regulatory mechanisms fail to adequately protect the manatee.

a. Florida Manatee Sanctuary Act

The Florida Manatee Sanctuary Act (§ 379.2431(2), Fla. Stat.) falls short in several important respects of fully protecting the species. First, in determining whether boating restrictions (such as manatee slow signs) are necessary to protect manatees or manatee habitats, the regulations require there be frequent manatee sightings and scientific information supporting the conclusion that manatees inhabit the area on a regular or periodic basis.[127] It also requires an analysis of known boating activities in the area and a balancing of "the rights of fishers, boaters, and water skiers to use waters for recreational and commercial purposes."[128] As a result, FWC may be precluded from putting up signs in a particular area where manatee use has not been well studied or where boat access has not previously been provided.[129] The perverse consequence of this rule for areas where boating access has been recently introduced is that manatee slow signs may not be erected until after there are impacts to manatees. This goes against the very purpose of the Florida Manatee Sanctuary Act, which considers the State of Florida as a refuge and sanctuary for the manatee.[130]

Further, there is a chronic failure by FWC to enforce existing speed zones. Although information on patrol hours, ratio of officers to boats or slips, or numbers of citations issued is limited, the information that is available does not suggest enforcement is stringent or is working to reduce manatee mortalities. Indeed, compliance is only about 50%, with 10-15% of boats blatantly disregarding speed zones.[131] Additionally, speed restrictions may not be enough

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[126] Bossart, G.D., R.A. Meisner, S.A. Rommel, Shin-je Ghim, and A. Bennett Jenson. 2002. Pathological features of the Florida manatee cold stress syndrome. Aquatic Mammals 29:9-17; Woodruff, R.A., R.K. Bonde, J.A. Bonilla, and C.H. Romero. 2005. Molecular identification of a papilloma virus from cutaneous lesions of captive and free-ranging Florida manatees. Journal of Wildlife Diseases, 41: 437-41, *available at* http://www.jwildlifedis.org/doi/pdf/10.7589/0090-3558-41.2.437.

[127] Rule 68C-22.001, Fla. Admin. Code.

[128] *Id.* at (2).

[129] This occurred in the case of the proposed Sunwest development. *See* Letter from Hankla to Pantano (Feb. 15, 2011); Email from Moreau to Peabody (Aug. 18, 2010); and Email from Valade to Scheetz (Aug. 5, 2010).

[130] § 379.2431(2)(b), Fla. Stat.

[131] Calleson, C.S. and R.K. Frohlich. 2007. Slower boat speeds reduce risks to manatees. Endangered Species Research. 3:295-304, *available at* http://www.int-res.com/articles/esr2007/3/n003p295.pdf.

at 25 mph, as reports show that strikes occur at reported speeds between 15-40 mph.[132]

Furthermore, as Craig Pittman reported in his book *Manatee Insanity*, enforcement officers are often reluctant to issue tickets.[133] One Florida Fish and Wildlife Conservation Commission officer explained that despite observing several county deputies speeding in manatee speed zones, "state wildlife officers never give their county counterparts a ticket because '[we] don't want to start a war with them.'"[134] Meanwhile federal enforcement officers report that they are unable to take enforcement action on many speeders who violate manatee zones,[135] and that some boaters don't even know what a channel marker is much less a slow speed zone sign.[136]

Laist and Shaw suggest speed zones may not work for the following reasons: (1) the fact that the speeds are still too fast for manatees to avoid collision; (2) boater compliance rates are too low to reduce the collision risk; (3) the type or extent of the speed zones is insufficient to protect manatees; or (4) the zones are somewhat effective, but the increase in manatees and boats has outpaced the speed zones' ability to reduce collisions.[137]

In addition, a 1989 Governor and Cabinet Policy Directive (and later the Florida Manatee Sanctuary Act) required 13 counties to develop and implement manatee protection plans.[138]

County	MPP Approved	Yearly Average Mortality Attributable to Watercraft Since MPP Approval	Cumulative Total Mortality Attributable to Watercraft Since MPP Approval
Brevard	2003	10	93
Broward	2007	3	17
Citrus	1991	2	59
Collier	1995	5	97
Miami-Dade	1995	2	38
Duval	1999	5	73
Lee	2004	15	139
Indian River	2000	2	27
Martin	2002	2	24
Palm Beach	2007	3	20

[132] Calleson 2007.
[133] Pittman, C. 2010. *Manatee Insanity*. University Press of Florida.
[134] *Id.* at 154.
[135] *Id.*
[136] *Id.* at 155.
[137] Laist, D.W. and C. Shaw, Preliminary Evidence that Boat Speed Restrictions Reduce Deaths of Florida Manatees, Marine Mammal Science 22(2):472-79 April 2006.
[138] § 379.2431(2)(t), Fla. Stat.

Sarasota	2011	1	1
St. Lucie	2002	1	11
Volusia	2005	6	47
TOTAL			646

In many instances, MPPs have not reduced manatee mortality attributable to watercraft collisions. In all instances, MPPs have not eliminated manatee mortality due to watercraft collisions.

b. Marine Mammal Protection Act

In enacting the MMPA in 1972, Congress found "certain species and population stocks of marine mammals are, or may be, in danger of extinction or depletion as a result of man's activities."[139] "Such species and population stocks should not be permitted to diminished beyond the point at which they cease to be a significant functioning element in the ecosystem of which they are a part, and consistent with this major objective, they should not be permitted to diminish below their optimum sustainable population."[140] In passing the MMPA, one of Congress' concerns was the "[t]he problem of manatee mortality caused by people and their activity," and it provided "the Secretary of the Interior with adequate authority to regulate or even to forbid the use of power boats where manatees are found."[141]

To this end, the MMPA imposes a moratorium on taking marine mammals.[142] "Take" includes harassing, hunting, capturing, collecting killing, or attempting to harass, hunt, capture, collect, or kill any marine mammal.[143] Species listed under the ESA are considered "depleted" under the MMPA. The manatee is listed under the Marine Mammal Protection Act as a "depleted" stock. Section 115(b) of the MMPA requires the Service to develop "conservation plans" for marine mammals considered depleted.[144] These plans are modeled after recovery plans under the ESA and identify actions needed to restore species or stocks to optimum sustainable population levels defined under the MMPA.[145] Section 101(a)(5)(A) of the MMPA allows the Service to authorize the incidental take of marine mammals by regulation if the agency determines such taking would have a negligible impact on the species or stock.[146] The MMPA defines "negligible impact" as "an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival."[147]

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[139] 16 U.S.C. § 1361 (1).
[140] *Id.* § 1361(2).
[141] *Endangered and Threatened Wildlife and Plants; Proposed Rulemaking to Provide for the Establishment of Manatee Protection Areas*, 44 Fed. Reg. 4745 (Jan. 23, 1979), *available at* http://ecos.fws.gov/docs/federal_register/fr262.pdf.
[142] 16 U.S.C. § 1371.
[143] 50 C.F.R. § 18.3.
[144] 16 U.S.C. § 1383b.
[145] Recovery Plan at 2.
[146] 16 U.S.C. § 1371(a)(5)(A).
[147] 50 C.F.R. § 18.27(c).

In 2000, several conservation organizations and individuals field suit against the U.S. Fish & Wildlife Service and U.S. Army Corps of Engineers alleging violations of the MMPA, the ESA and other laws, by failing to adequately protect the manatee throughout the state of Florida.[148] The parties later settled and the Service agreed to take several actions, including pursuing a rulemaking proceeding to adopt incidental take regulations under the MMPA.[149] In 2002, the Service published a proposed rule but the rule was eventually withdrawn in May 2003. In so doing, the Service cited questions regarding standards and assumptions, new information, and analytic methodologies precluding a finding that incidental take resulting from governmental activities related to the authorization, regulation, or funding of watercraft and watercraft access facilities within certain regions of Florida would have a negligible impact on any of the four stocks of Florida manatee.[150]

In promulgating an incidental take rule the Service must calculate potential biological removal level ("PBR"). The PBR is the maximum number of animals, not including natural mortalities that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population. [151] The PBR is the product of three elements: the minimum population estimate, half of the maximum net productivity rate, and a recovery factor.[152] Citing the NMFS' 2005 Revisions to Guidelines for Assessing Marine Mammal Stocks, the manatee stock assessment explains, the default value of 0.1 should be used for endangered (depleted) stocks and a default value of 0.5 should be used for threatened stocks or stocks of unknown status.[153] The 2014 stock assessment calculates a PBR of 14 for the manatee.[154] If, however, the manatee was reclassified as a threatened species, its PBR could increase more than fivefold to 74 individuals using the latest stock assessment numbers.[155] As a result, an incidental take rule developed for the endangered manatee would permit far less "take," and likely be far more protective, than one that could be developed for a species the Service considers "threatened." Taking such action only after the species is reclassified would likely have a profound negative impact to the species and threatened its existence.

c. Critical Habitat under the Endangered Species Act

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[148] *Marine Mammals; Incidental Take During Specified Activities*, 68 Fed. Reg. 24700, 24701 (May 8, 2003), *available at* http://ecos.fws.gov/docs/federal_register/fr4346.pdf.
[149] *Id.*
[150] *Id.* at 24703.
[151] 16 U.S.C. § 1362(20).
[152] *Id.*
[153] 2012 SAR.
[154] *Id.*
[155] PBR=(4,834) (0.031) (0.5) =74.927 (or 74).

The Florida manatee, listed as an endangered species in 1967,[156] has continued to suffer from habitat loss and unnatural mortalities.[157] In 1978, Congress amended the ESA,[158] requiring that critical habitat designations contain the description of the "physical and biological features essential to the conservation of the species." [159] Because the Service designated critical habitat for the Florida manatee in 1976, the designation does not describe the physical and biological features essential to the manatee, [160] and instead simply lists geographic boundaries and names water boundaries.[161]

To address the deficiencies in the manatee's habitat, the Service enumerated its plans to "evaluate desirability of modifying 'critical habitat' designations, and make changes as necessary" and "protect and monitor areas of special significance to manatees" through designating "additional areas as 'critical habitat.'"[162] In response to these articulated goals and priorities, the Service has established additional manatee protection areas to safeguard individual manatees and some habitats. However, despite these additional protections, the Service notes the manatee's habitat as designated is inadequate for its survival:[163]

> Even if mortality and injury are minimized or eliminated, the continued existence and recovery of manatee populations will be dependent upon the identification and protection of suitable habitats and other areas of special biological importance. Habitat loss and degradation may prove to be the major impacts jeopardizing the continued existence of manatees in the future.[164]

The 1996 recovery plan also points to inadequate essential habitat as a limiting factor for full recovery of the Florida manatee.[165] In particular, "[i]ntensive coastal development throughout Florida, driven by increases in the human population, is degrading important manatee habitat and poses perhaps the greatest long-term threat to the Florida manatee."[166] Human-related mortalities "particularly the increasing number of watercraft-related deaths, should be viewed in the context of Florida's growing human population, which increased by almost 86% from 1970 to 1990. The rise in manatee mortality during this period

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[156] The manatee was originally listed under the Endangered Species Prevention Act of 1966 in 1967. It was later listed as endangered species in 1973 under the Endangered Species Act. 75 Fed. Reg. 1574.
[157] *Id.* at 1575-1576.
[158] Endangered Species Act of 1978, Pub. L. 95-632 § 4(a)(1)-(5).
[159] *Id.* at § 2(1).
[160] 75 Fed. Reg. 1574, 1574.
[161] 32 Fed. Reg. 4001; 50 CFR § 17.95 (1977).
[162] Recovery Plan at 45, 52.
[163] *Id.* at 14-15, 21, 43, 45, 46, 52.
[164] *Id.* at 43.
[165] U.S. Fish and Wildlife Service. 1996. Second revised Florida Manatee Recovery Plan, at 25, *available at* http://www.fws.gov/northflorida/Manatee/Recovery%20Plan/1996_FWS_Florida_Manatee_Recovery_Plan.pdf.
[166] *Id.* at 28.

is at least in part the result of the increasing numbers of people and boats sharing the manatee's habitat."[167]

Notably, it identified distinctive physical and biological habitat characteristics which it deemed "manatee habitat requirements."[168] These included: "adequate sources of aquatic vegetation for food; sources of fresh water; secluded areas in which to mate; to bear and nurture their young, and to rest; warm-water refugia during cold winter periods; and safe travel corridors connecting such areas."[169]

The Florida manatee 2001 recovery plan describes a multitude of activities and events on or in the manatee habitat which continually threaten the survival of the manatee population.[170] Many, if not all, of these activities can be traced to inadequate protections for manatee habitat. In describing the magnitude of the harms the Service states:

> The most significant problem presently faced by manatees in Florida is death or serious injury from boat strikes. The availability of warm-water refuges for manatees is uncertain if minimum flows and levels are not established for the natural springs on which many manatees depend, and as deregulation of the power industry in Florida occurs. Consequences of an increasing human population and intensive coastal development are long-term threats to the Florida manatee. Their survival will depend on maintaining the integrity of ecosystems and habitat sufficient to support a viable manatee population.[171]

In the last thirty-one years since that first designation, nineteen additional refuges and sanctuaries have been established by the Service, the state of Florida, and local agencies to "reduce the incidence of manatee injuries and death."[172] All of these sanctuaries have concentrated their efforts to protect the manatees from direct harm and harassment by prohibiting "certain waterborne activities" which "result in the taking or one or more manatees."[173] However, they do not protect the habitat of the manatees from destruction or disturbance, only the individual animals themselves.[174] These sanctuaries, although valuable protections for the manatee populations, fail to offer the manatee the same protections the proper designation of critical habitat would offer.

In 2008, the Center for Biological Diversity and other organizations petitioned

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[167] *Id.* at 25.
[168] *Id.* at 75.
[169] *Id.*
[170] Recovery Plan at 23-30.
[171] *Id.* at 23.
[172] *Id.*; Emergency Rule to Establish a Manatee Refuge in Kings Bay, Citrus County, Florida. 75 Fed. Reg. 68719-68725 (Nov. 9, 2010), *available at* http://www.gpo.gov/fdsys/pkg/FR-2010-11-09/pdf/2010-28196.pdf#page=1.
[173] *Id.* at 68720.
[174] *Id.*

the U.S. Fish & Wildlife Service to revise the critical habitat designation for the Florida manatee.[175] The petition argued that the critical habitat revision was required due to the lack of constituent elements in the designation, changes in use patterns by manatees since the designation, and new information from scientific studies carried out since the designation.[176] Patterns of use have also changed, largely in response to coastal development, industrial growth, and increased recreational use of the manatee's nearshore habitats.[177] Thus, new habitat has become essential to the species. The science has also advanced and thanks to better surveys, information gathering, and tracking efforts, it is possible to better identify which habitat are essential at specific times of year for specific biological functions enabling critical habitat to be defined with far greater precision.[178]

In January 2010, the Service determined that the revisions to the manatee's critical habitat were warranted but sufficient funds are not available due to higher priority actions such as court-ordered listing-related actions and judicially approved settlement agreements.[179] The Service indicated that it intends to initiate rulemaking when it completes its higher priority projects and has the necessary resources to do so.[180]

In making its finding the Service acknowledged the need to identify the physical and biological features essential to conservation of the species, in order to address the ecological and conservation needs of the species.[181] Since the original designation, there is more information on the specific habitat needs of the manatee including its use of warm-water sites and power plant discharges that will allow the Service to identify the physical or biological features essential to manatee conservation.[182] "Given the significance of warm water to the survival of the manatee in Florida, the most essential feature will be the availability and adequacy of warm-water refugia."[183] Additional features may include adequate forage within dispersal distance of a warm-water refuge, areas needed for calving and nursing, and important travel corridors for movements throughout Florida and beyond.[184]

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[175] Wildlife Advocacy Project, Save the Manatee Club, Center for Biological Diversity, and Defenders of Wildlife, "Petition for a Rule to Revise Critical Habitat for the Florida Manatee, Trichechus manatus latirostris, pursuant to the Endangered Species Act." (Dec. 19. 2008) (*hereinafter* "2008 Petition"), *available at* http://www.biologicaldiversity.org/species/mammals/Florida_manatee/pdfs/ManateeCHPetition.pdf.
[176] *Id.*
[177] *Id.*
[178] *Id.*
[179] 75 Fed. Reg. 1574, 1574.
[180] *Id.*
[181] *Id.* at 1577.
[182] *Id.*
[183] *Id.*
[184] *Id.* at 1578.

Designated critical habitat provides unique protections to endangered species, which other conservation and protection cannot. Critical habitat is defined by the ESA to include habitat which is "essential to the conservation of the species and which may require special management considerations or protection."[185] The ESA further defines conservation as "the use of all method and procedures which are necessary to bring any endangered species" to recovery, where "measures provided [by the ESA] are no longer necessary."[186] Proper critical habitat designation improves an endangered species' chance of survival and full recovery. The 1978 amendments to the ESA require designations of critical habitat to include those "those physical and biological features essential" for the recovery of the species.[187] These "features" provide the Service with tangible elements in the critical habitat to protect and manage the designated areas without jeopardizing the survival of the species.

Critical habitat promotes species survival and recovery.[188] It helps outline the habitat needs of the species and inform the decision-making processes regarding incidental take permits, habitat conservation plans, land acquisition by the federal government and conservation groups, and the development of recovery plans.[189] It is also a particularly useful enforcement tool.[190] The Service's failure to adequately protect the species' essential physical and biological features through a revised critical habitat designation leaves the species vulnerable to continued habitat degradation. This is particularly true for warm water refugia the manatee depends upon during the winter months for survival.

Additionally, the ESA requires federal agencies to engage in consultation with the Service prior to "any action authorized, funded, or carried out by such agency" to insure that action "is not likely to…result in the destruction or adverse modification" this critical habitat.[191] The Service regulations define "adverse modification" as a "direct or indirect alteration that appreciably diminishes the value of critical habitat for both the survival and recovery of a listed species."[192] This definition assumes that the "designated critical habitat" includes "those physical and biological features essential to the conservation of the species"

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[185] 16 U.S.C. § 1532(5)(A)(i).
[186] *Id.* at § 1532(3).
[187] 16 U.S.C. § 1532 (5)(A)(i).
[188] Marin F.J. Taylor et. al., The Effectiveness of the Endangered Species Act: A Quantitative Analysis, 55 BioScience 360, 361 (2005), *available at* http://www.biologicaldiversity.org/campaigns/esa/pdfs/bioscience2005.pdf.
[189] 2008 Petition, *citing* Pamela Baldwin, The Role of the Designation of Critical Habitat Under the Endangered Species Act, in Paul Foreman, Endangered Species: Issues and Analysis 165 (2002).
[190] James Salzman, *Evolution and Application of Critical Habitat Under the Endangered Species Act,* 14 Harv. Envtl. L. Rev. 311 (1990), *available at* http://scholarship.law.duke.edu/cgi/viewcontent.cgi?article=1887&context=faculty_scholarship; *See also,* Oliver Houck, *The Endangered Species Act and Its Implementation by the U.S. Departments of Interior and Commerce*, 64 U. Colo. L. Rev. 277, 310 (1993) ("[T]he ESA's prohibition on modification of critical habitat is interpreted by courts as strong and unyielding.")
[191] 16 U.S.C. § 1536(a)(2) (1982).
[192] 50 C.F.R. § 402.02.

identified in the designation for critical habitat.[193] The habitat designated for the Florida manatee fails to identify any of these "features," which are necessary to carryout the protections intended by congress under such critical habitat designations.

In 1998 the Service and the National Marine Fisheries Service ("NMFS") produced "the final Section 7 Handbook," addressing "the major consultation processes."[194] This handbook is an aid for Service and NMFS biologists and analysts to insure an acting agency's proposed action "is not likely to…result in the destruction or adverse modification of habitat."[195] Under the guidance in this handbook to reach this level of insurance, "in evaluating project effects on critical habitat, the Services must be satisfied that the *constituent elements* of the critical habitat likely will not be altered or destroyed by proposed activities to the extent that the survival and recovery of affected species would be appreciably reduced."[196] The handbook provides no direction for the analyst to determine the "project effects on critical habitat" when the constituent elements are not defined in the designated critical habitat. The only guidance provided states, "if the nature of the [potential direct and indirect] effects cannot be determined, benefit of the doubt is given to the species."[197]

Critical habitat is not only designated for areas necessary for the survival of individuals of the endangered species, but also for the recovery of that species. This means the designations can reach beyond the habitat currently occupied by the species to include areas to support population expansion and food resources. These designations also provide state and local governments, private landowners, and the public with information necessary to further protect and conserve the species.

5. Other natural or manmade factors affect the manatee's continued existence.

Natural and manmade factors including boat strikes, red tide, and climate change remain a significant threat to the manatee.

a. Boat Strikes

Manatees that are hit by watercraft may suffer injuries from propeller wounds, impact, or crushing from the hull. A leading author on manatees concluded "[w]atercraft-related mortality is having the greatest impact on manatee

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[193] 16 U.S.C. § 1532(A)(5)(i).
[194] USFWS and NMFS, *Endangered Species Consultation Handbook, Procedures for Conducting Consultation and Conference Activities Under Section 7 of the Endangered Species Act,* Forward (Mar. 1998), (*hereinafter* "Handbook"), *available at* http://www.nmfs.noaa.gov/pr/pdfs/laws/esa_section7_handbook.pdf.
[195] 16 U.S.C. § 1536(a)(2).
[196] Handbook, at 4-35.
[197] *Id.* at 3-12.

population growth and resilience…elimination of this threat alone would greatly reduce the probability of quasi-extinction."[198] However, the situation does not appear to be improving despite efforts to raise awareness and enact speed zones. Modern boats are designed to be able to go faster in shallower waters, potentially increasing threats to manatees and their seagrass habitats. Manatees may not hear an oncoming boat, or have time to move, or may move from shallow water to the channel. Manatees suffering from cold stress or red tide may be slower to respond to oncoming watercraft.

Historically, the greatest source of manatee mortality has been collisions with watercraft. From 1974-2013, 21 percent of manatee mortality was attributed to watercraft. However, the Service notes "[n]o estimate of the true number of manatee deaths exists because the number of carcasses not found or unreported is unknown."[199] Indeed, in that same timeframe, the cause of death could not be determined for 31 percent of salvaged manatees; watercraft mortality likely makes up some unknown percentage of that category. Boat strikes continue to be the primary source of human-caused injury and death for manatees.[200] From 1978 to 2012, 84% of manatees that died from human causes were killed by watercraft. [201] Between 2008 and 2012 the percentage killed by watercraft increased to 89%.[202] Researchers noted in a 2007 quantitative threats analysis that "watercraft-related mortality is having the greatest impact on manatee population growth and resilience" and "elimination of this threat alone would greatly reduce the probability of quasi-extinction."[203] Yet, it is unlikely that the number of boat strikes will significantly decrease anytime soon. The number of registered vessels in Florida increases about 3% annually and has more than doubled since 1980.[204] Florida continues to lead the nation in boat sales[205] and registered vessels with nearly 900,000.[206] Almost one million non-registered vessels are thought to be using Florida's waters.[207]

In 2011, the Marine Mammal Commission-an independent U.S. agency established to provide independent oversight of marine mammal conservation policies and programs carried out by federal agencies-found that "[o]ver the past ten years, boat strikes have killed between 75 and 100 manatees per year. The

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[198] Runge, M.C., C.A. Sanders-Reed, C.A. Langtimm, and C.J. Fonnesbeck. 2007. A quantitative threats analysis for the Florida manatee (*Trichechus manatus latirostris*). Final report to U.S. Fish and Wildlife Service, Jacksonville, FL. Intergovernmental Contract no. 40181-5-N012 (Mar. 2007). U.S. Geological Survey Open-File Report 2007-1086. 34 pp.
[199] 2012 SAR at 4.
[200] *Id.*
[201] *Id.*
[202] *Id.*
[203] *Id.* (citing Runge et. al. 2007).
[204] FWC 2008 Watercraft Mortality Database Query-Boating Accident Statistics, *available at http://myfwc.com/boating/safety-education/accidents/*.
[205] *See* http://www.miasf.org/florida-leads-nation-in-boat-sales-for-2013/.
[206] FWC 2013. Boating Accidents Statistical Report, *available at* http://myfwc.com/boating/safety-education/accidents/.
[207] *Id.*

principal means of minimizing such deaths are boat speed regulations and limitations on new docks and marinas near manatee habitats."[208] Yet, the Corps and other agencies continue to permit the construction of new docks and marinas near manatee habitats without adequate safeguards and conditions. As NMFS explained in 2011, NWP 36 has "had ecologically significant indirect effects on endangered West Indian manatees in Florida: between 1986 and 1992, watercraft collisions accounted for 37.3% of manatee deaths, where the cause of death could be determined, by providing access to increased numbers of watercraft (Ackerman et. al. 1995)."[209]

The true impact of watercraft collisions goes beyond reported mortalities because manatees are not always killed. In fact, individual manatees are often identified by scars made by cuts from boat propellers.[210] Of the 88 manatees that required critical care from 2008-2012, seventy-five were injured by boats.[211] Watercraft can also harass manatees causing them to alter their natural behavior.[212] Secondary harmful effects from boating activities include stress such as the disruption of normal breeding behavior, calf rearing, migration, and feeding. An increase in the probability of unsuccessful mating, perinatal mortality, prevention of reaching freshwater resources and warm-water refugia, and decreasing the availability of food resources all contribute to the reduction of the manatee population in Florida. These effects are likely to decrease successful reproduction.

b. Eutrophication, Algae Blooms, and Red-Tide

Red-tide remains a significant threat to manatees. During these events, toxic algae settles on the seagrasses that manatees consume, affecting their nervous system and ultimately causing them to drown.[213] In 2013, a record number of manatees died in the state of Florida and many are likely attributed to red-tide events. FWC's 2013 Manatee Mortality report for 2013 indicates that 161 manatees died in Brevard County from "undetermined" causes.[214]

While the deaths in Brevard County remain "undetermined" researchers believe these deaths could be attributed to a change in environmental conditions in the Indian River Lagoon relating to the loss of 47,000 acres of seagrass because of

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[208] Letter from Marine Mammal Commission to USFWS, September 21, 2011, *available at* http://mmc.gov/letters/pdf/2011/annual_mtg_fws_92111.pdf.
[209] NMFS Biological Opinion on U.S. Army Corps of Engineers Nationwide Permit Program, 176 (Feb. 2012), *available at* http://www.nmfs.noaa.gov/pr/pdfs/consultations/biop_acoe_permits2012.pdf.
[210] http://myfwc.com/research/manatee/projects/photo-identification/program/.
[211] 2012 SAR at 6; USFWS Manatee Rescue, Rehabilitation, and Release Program Reports 2012.
[212] FWC 2006 Final Biological Status Review of Florida Manatee, *available at* http://myfwc.com/media/415109/Manatee_BSR.pdf.
[213] http://www.nbcnews.com/science/science-news/florida-sees-record-803-manatee-deaths-red-tide-blamed-f2D11785545.
[214] http://www.myfwc.com/media/2600491/YearToDate.pdf.

massive algae blooms.[215] Earlier this year, attorneys sent a sixty-day notice of intent to sue letter under the ESA alleging that the eutrophic conditions are the result of septic tank leachate.[216] These deaths highlight the continued threat red-tide poses to manatees and raise significant questions about the root causes of eutrophication.

c. Climate Change

Edwards (2013) provided a detailed review of current and projected climate change impacts to the Florida manatee, and identified significant threats from (1) the projected increase in exposure to harmful algal blooms, (2) the current and projected increase in the intensity of hurricanes and storm surge, (3) the projected increase in cold extremes like those that occurred in the winters of 2010 and 2011, exposing manatees to severe cold stress and die-offs, (4) the loss of warm water refugia due to sea level rise, saltwater intrusion, storm surge, and changes in precipitation and streamflow, and (5) degradation of habitat and food resources.[217] Martin et al. (2011) highlighted that sea level rise and saltwater intrusion are projected to increase groundwater consumption for human use, which will affect spring flow and thermal capacity at manatee winter aggregation sites. Sea level rise may also disrupt coastal power plant operations that provide artificial warm-water refuges for manatees.[218]

As discussed above, climate change threatens the manatee in numerous ways, including sea level rise, increasing storm intensity and storm surge, and projected increases in cold extremes. Each of these threats is discussed in more detail below.

1. Global sea level rise is accelerating in pace and is likely to increase by three to four feet or more within this century

Sea level rise threatens to reduce the availability of thermal refugia for the manatee, and degrade or eliminate coastal habitats and food resources.[219] Global average sea level rose by roughly eight inches over the past century, and sea level rise is accelerating in pace.[220] As summarized by the Third National Climate

[215] Tyler Treadway, "More Puzzling Than Why Indian River Lagoon Animals Died En Masse Is Why the Deaths Stopped," TC Palm, *at* http://www.tcpalm.com/franchise/indian-river-lagoon/more-puzzling-than-why-indian-river-lagoon-animals-died-en-masse-is-why-the-deaths-stopped_56484756.
[216] http://www.manateeindianriverlagoon.com.
[217] Edwards, H.H. 2013. Potential impacts of climate change on warmwater megafauna: the Florida manatee example (*Trichechus manatus latirostris*). Climatic Change 121: 727-738.
[218] Martin, J. et al. 2011. Structured decision making as a proactive approach to dealing with sea level rise in Florida. Climatic Change 107: 185-202.
[219] Edwards 2013.
[220] Melillo, Jerry M., Terese (T.C.) Richmond, and Gary W. Yohe, Eds., 2014: Climate Change Impacts in the United States: The Third National Climate Assessment. U.S. Global Change

Assessment, "Since the late 1800s, tide gauges throughout the world have shown that global sea level has risen by about 8 inches. A new data set shows that this recent rise is much greater than at any time in at least the past 2000 years. Since 1992, the rate of global sea level rise measured by satellites has been roughly twice the rate observed over the last century, providing evidence of additional acceleration."[221]

Many areas of the Southeast Atlantic and Gulf of Mexico coasts have experienced significantly higher rates of relative sea-level rise than the global average during the past 50 years.[222] The state of Florida is considered to be one of the most vulnerable to sea level rise. Large regions of Florida have elevations at or below 3 to 6 feet, making these areas particularly vulnerable to flooding.[223]

According to the Third National Climate Assessment, global sea level is projected to rise another 1 to 4 feet by 2100, with sea-level rise of 6.6 feet possible.[224] Sea level rise could increase by another 6 inches in just the next decade.[225] In its 2012 sea-level rise assessment, the National Research Council similarly estimated global sea-level rise at 8 to 23 cm by 2030, 18 to 48 cm by 2050, and 0.5 m to 1.4 m by 2100.[226] The effects of sea-level rise will be long-lived. Scientists estimate that we lock in 8 feet of sea-level rise over the long term for every degree Celsius (1.8 degrees Fahrenheit) of warming.[227]

Regional projections for Florida also indicate that sea level rise of three to four feet or more is highly likely within this century. The Southeast Florida Regional Climate Change Compact Counties—Monroe, Miami-Dade, Broward, and Palm Beach counties—released the Southeast Florida Regional Climate Change Action Plan in October 2012 which included a detailed "Unified Sea Level Rise Projection" for south Florida.[228] The sea level rise projections for south Florida are similar what has been estimated globally by the National Research Council: 8

Research Program, 841 pp. doi:10.7930/J0Z31WJ2, *available at* http://nca2014.globalchange.gov/.

[221] Melillo et al. 2014 at 44.

[222] Karl, T. R., J. M. Melillo, and T. C. Peterson. 2009. Global Climate Change Impacts in the United States at 37, *available at* www.globalchange.gov.

[223] Weiss, J.L. et al. 2011. Implications of recent sea level rise science for low-elevation areas in coastal cities of the coterminous U.S.A. Climatic Change 105:635-645; Strauss, B.H., R. Ziemlinski, J.L. Weiss, and J.T. Overpeck. 2012. Tidally adjusted estimates of topographic vulnerability to sea level rise and flooding for the contiguous United States. Environmental Research Letters 7:014033.

[224] Melillo et al. 2014.

[225] Melillo et al. 2014 at 45

[226] NRC. 2012. Sea level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future, National Research Council of the National Academies.

[227] Levermann, A. et al. 2013. The multimillennial sea-level commitment of global warming. PNAS 110:13745-13750.

[228]www.broward.org/NATURALRESOURCES/CLIMATECHANGE/Pages/SoutheastFloridaRegionalClimateCompact.aspx.

to 18 cm (3 to 7 inches) by 2030, 23 to 61 cm (9 to 24 inches) by 2060, and 48 cm to 1.45 m (19 to 57 inches) by 2100.[229]

2. Hurricanes and storm surge are increasing in intensity

Manatee survival has been shown to decrease significantly following years with intense hurricanes and winter storms.[230] Studies have found that the severity of Atlantic hurricanes is increasing,[231] and hurricane severity is projected to continue to intensify.[232] The frequency of hurricane-generated large surge events and wave heights is also increasing.[233] The risk of extreme storm surges has already doubled as the planet warms, and these events could become 10 times more frequent in the coming decades.[234] As sea levels rise, storm surge will be riding on a higher sea surface which will push water further inland and create more flooding of coastal habitats.[235] For example, one study estimated that hurricane flood elevations along the Texas coast will rise by an average of 0.3 meters by the 2030s and 0.8 meters by the 2080s, with severe flood events reaching 0.5 meters and 1.8 meters by the 2030s and 2080s, respectively.[236]

3. Cold extremes are likely to increase in frequency

Recent studies suggest that climate change is likely to increase the frequency of cold extremes like those that resulted in manatee die-offs during the winters of 2010 and 2011. Several studies have linked the cold winter conditions and cold

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[229] Southeast Florida Regional Climate Change Compact Technical Ad hoc Work Group. 2011. Unified Sea Level Rise Projection for Southeast Florida. A document prepared for the Southeast Florida Regional Climate Change Compact Steering Committee. 27 pp., *available at* http://southeastfloridaclimatecompact.org/.

[230] Edwards 2013.

[231] Elsner, J. B., J. P. Kossin, and T. H. Jagger. 2008. The increasing intensity of the strongest tropical cyclones. Nature 455:92-95; Bender, M. A., T. R. Knutson, R. E. Tuleya, J. J. Sirutis, G. A. Vecchi, S. T. Garner, and I. M. Held. 2010. Modeled impact of anthropogenic warming on the frequency of intense Atlantic hurricanes. Science 327:454-458; Kishtawal, C. M., N. Jaiswal, R. Singh, and D. Niyogi. 2012. Tropical cyclone intensification trends during satellite era (1986–2010). Geophysical Research Letters 39: L10810.

[232] Villarini, G. and G. Vecchi. 2013. Projected increases in North Atlantic tropical cyclone intensity from CMIP5 models. Journal of Climate 26: 3231-3240.

[233] Grinsted, A., J. C. Moore, and S. Jevrejeva. 2012. Homogeneous record of Atlantic hurricane surge threat since 1923. Proceedings of the National Academy of Sciences of the United States of America 109:19601-19605; Komar, P. D., and J. C. Allan. 2008. Increasing hurricane-generated wave heights along the U.S. east coast and their climate controls. Journal of Coastal Research 24:479-488.

[234] Grinsted, A. et al. 2013. Projected hurricane surge threat from rising temperatures. PNAS doi:10.1073/pnas.1209980110.

[235] Tebaldi, C., B. H. Strauss, and C. E. Zervas. 2012. Modelling sea level rise impacts on storm surges along US coasts. Environmental Research Letters 7:014032.

[236] Mousavi, M. E., J. L. Irish, A. E. Frey, F. Olivera, and B. L. Edge. 2011. Global warming and hurricanes: the potential impact of hurricane intensification and sea level rise on coastal flooding. Climatic Change 104:575-597.

extremes that have struck the Northern Hemisphere in recent years to Arctic sea ice loss due to climate change.[237]

d. Lack of Genetic Diversity

A recent study by Tucker, et. al. suggests that manatees in general, and Florida manatees in particular, are characterized by low levels of genetic diversity.[238] Low genetic diversity has been shown to reduce survival, reproduction, and population growth rate, and may increase the probability of extinction.[239] Genetic diversity is particularly important for small, isolated populations or those occupying fragmented habitats, and it may be critical for anthropogenically affected large mammals that tend to have reduced genetic diversity, such as the manatee.[240] While researchers found that demographic concerns related to low genetic diversity (e.g. inbreeding depression) are not severe at this time, further reduction in population size or disruption to gene flow within and between the west and east coasts "could alter this situation drastically."[241] Further a reduction in warm-water sites coupled with colder-than-average winters as predicted by some climate change models, could result in a significant reduction in the Florida manatee population size and can potentially intensify genetic drift and inbreeding on the population.[242]

C. Manatee Recovery Plan Criteria have not been met

As stated by the Service in its manatee recovery plan, "[t]he focus of recovery is not on how many manatees exist, but instead the focus is on implementing, monitoring and addressing the effectiveness of conservation measures to reduce or remove threats which will lead to a healthy and self-sustaining population."[243] To that end, the recovery plan states that the following criteria must be met prior to reclassification of the Florida manatee from endangered to threatened:

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[237] Cohen, J.L., J.C. Furtado, M.A. Barlow, V.A. Alexeev, and J.E. Cherry. 2012. Arctic warming, increasing snow cover and widespread boreal winter cooling. Environmental Research Letters 7 (1) (March): 014007. doi:10.1088/1748-9326/7/1/014007.
Liu, J., J.A. Curry, H. Wang, M. Song, and R.M. Horton. 2012. Impact of declining Arctic sea ice on winter snowfall. PNAS 109 (11): 4074-4079.
Overland, J.E. and M. Wang. 2010. Large-scale atmospheric circulation changes are associated with the recent loss of Arctic sea ice. Tellus A 62: 1–9.
Strauss, B.H., R. Ziemlinski, J.L. Weiss, and J.T. Overpeck. 2012. Tidally adjusted estimates of topographic vulnerability to sea level rise and flooding for the contiguous United States. Environmental Research Letters 7:014033.
[238] Kimberly Pause Tucker, Margaret E. Hunter, Robert K. Bonde, James D. Austin, Ann Marie Clark, Cathy A. Beck, Peter M. McGuire, and Madan K. Oli. 2012. *Low genetic diversity and minimal population substructure in the endangered manatee: implications for conservation*. Journal of Mammalogy, 93(6):1504-1511.
[239] *Id.* at 1507.
[240] *Id.* at 1507-1508.
[241] *Id.* at 1509.
[242] *Id.*
[243] Recovery Plan at iv.

1. Reduce threats to manatee habitat or range, as well as threats from natural and manmade factors by:
- Identifying minimum spring flows;
- Protecting selected warm-water refuge sites;
- Identifying for protection foraging habitat associated with the warm-water refuge sites;
- Identifying for protection other important manatees areas; and
- Reducing unauthorized human caused "take.

2. Achieve the following population benchmarks in each of the four regions over the most recent 10 year period of time:
- Statistical confidence that the average annual rate of adult survival is 90% or greater;
- Statistical confidence that the average annual percentage of adult female manatees accompanied by first or second year calves in winter is at least 40%; and
- Statistical confidence that the average annual rate of population growth is equal to or greater than zero.[244]

As these comments explain, these recovery criteria have not been met.

D. The 2007 Projection Model Relied Upon By the Petitioners Is Not a Proper Basis for Reclassifying the Manatee from Endangered to Threatened.

The Petition submitted by the Pacific Legal Foundation on behalf of Save Crystal River, Inc. fails to make a persuasive case that the manatee should be down-listed from "endangered" to "threatened" under the ESA. Petitioners rely primarily on the Service's 2007 5-Year Review of the species, which in turn relied on a 2007 projection model for the position that the manatee should be reclassified as "threatened" under the Act. That model projects an 8.6% probability of falling below a quasi-extinction threshold of 250 adults on either coast within 100 years. A projection model or "forecast" is not a proper basis under Section 4(a)(1) of the ESA to reclassify the manatee from endangered to threatened and is no substitute for the best available scientific information on the status and threats to the manatee. Down-listing decisions must be based solely on the five factors set forth under 4(a)(1).

Rather than evaluate threats to the species, the model functions merely as a best guess of the risk of extinction in the next 100 years. As the Service explains in its 5-Year Review, two different approaches were used in reviewing the manatee population.[245] The first approach "used the five factors from the ESA." The

[244] *Id.* at v.
[245] 5-Year Review at 16.

second approach was "essentially a comparative population viability analysis that involved forecasting the Florida manatee population under different threat scenarios."[246] "A customized population model for the Florida manatee, referred to as the Manatee Core Biological Model (CBM) (Runge et. al. 2007) was the framework for that analysis (Runge et. al. 2007)."[247]

The ESA requires the Service to base any decision to reclassify a species on the five factors set forth in the ESA-nothing less and nothing more. Therefore, the Service should not and cannot rely on this model in its 12-month finding for the manatee. Moreover, the for the reasons explained above, the manatee should not be down-listed based on the five-factors set forth under section 4(a). The conservation actions the Service identified in its 2007 5-Year Review also will not adequately address the significant threats the manatee faces now and into the future.

When the Service identified the manatee as endangered over 40 years ago it found that

> More than 50 percent of human-caused deaths investigated during the salvage program were attributed to boat or barge collisions. Furthermore, a high percentage of living manatees bear wounds and deformities caused by propellers. Additional human-related causes of manatee mortality are the tangling of manatees in nets and discarded fishing lines, and the harassment of manatees by apparently well-meaning, as well as vandalous, swimmers and divers. Such harassment will often force manatees away from warm springs and into colder water, where they become stressed and are more prone to disease. Harassment also causes disruption of the relationship between females and their nursing calves.[248]

In creating refuges for the manatees in 1979, the Service observed that "human activities, such as the operation of motor boats and swimming, in areas where manatees may congregate are a significant cause of manatee injuries and deaths."[249] Today 80-90 percent of human-caused deaths are attributed to collisions with watercraft. A high percentage of manatees bear wounds and deformities caused by propellers. Manatees still become entangled in fishing gear and still face harassment at warm water refuges. The Service in its manatee recovery plan has stated that "[t]he Florida manatee could be considered for reclassification from endangered to threatened provided that threats can be reduced or removed, and that the population trend is stable or increasing for a sufficient time period."[250] It is evident that the threats against the manatee, boat strikes, cold stress, toxins, diminishing warm water refuges, have not been

[246] *Id.*
[247] *Id.*
[248] 44 Fed. Reg. 4745.
[249] *Id.*
[250] Recovery Plan at iv.

reduced or removed. While the population has increased over the last 40 years, it has dipped over the last few synoptic surveys. Coupled with the recent die-offs attributable to cold stress and toxins, the Service cannot conclude that the population trend is stable or has increased for a sufficient period of time.

V. The Protections for "Endangered" vs. "Threatened" Species Under the ESA and MMPA

The ESA defines an "endangered species" as "any species which is in danger of extinction throughout all or a significant portion of its range."[251] It defines a "threatened species" as, "any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range."[252] Service policy and case law establish that the "significant portion of its range" provision of the ESA provides an independent basis for listing a species.[253]

One key difference in the level of protections afforded to endangered and threatened species under the ESA is that while the Act expressly prohibits the "taking" of endangered species, it does not expressly prohibit the taking of threatened species. For threatened species, section 4(d) of the Act directs the Secretary of the Interior to promulgate rules "to provide for the conservation" of threatened species. Although the Service has promulgated a rule applying all section 9 take prohibitions to threatened species,[254] the Service may still issue a special "4(d) rule" for specific species that does not provide the same level of protections afforded to endangered species.[255] Thus, a decision to reclassify a species status from endangered to threatened does not necessarily mean a species will always enjoy the same protections afforded under the Act.

Should the Service downlist the manatee to threatened and promulgate a 4(d) rule, it must still "provide for the conservation" of the species.[256] The ESA defines "conservation" as "the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which" ESA protection is no longer required.[257] Thus, the term "conservation" includes ensuring a species' survival as well as promoting its recovery.[258] In *Defenders of*

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[251] 16 U.S.C. § 1532(6).
[252] *Id.* § 1532(20).
[253] *See e.g., Defenders of Wildlife v. Salazar*, 729 F.Supp.2d 1207 (D. Mont. 2010); *Wildearth Guardians v. Salazar*, 2010 U.S. Dist. LEXIS 105253 (D. Ariz. Sept. 30, 2010).
[254] 50 C.F.R. § 17.31.
[255] 16 U.S.C. § 1533(d).
[256] *Id.* ("Whenever any species listed as a threatened species pursuant to subsection (c) of this section, the Secretary shall issue such regulations as [s]he deems necessary and advisable to provide for the conservation of such species."); *Sierra Club v. Clark*, 755 F.2d 608, 612-13 (8th Cir. 1985) (Service's discretion to issue regulations under ESA Section 4(d) "is limited by the requirement that the regulations he is to issue must provide for the *conservation* of threatened species" (emphasis in original)); *State of Louisiana, ex rel. Guste v. Verity*, 853 F.2d 322, 332-33 (5th Cir. 1988) (conservation is a "mandatory duty").
[257] 16 U.S.C. § 1532(3).
[258] *Gifford Pinchot Task Force v. U.S. Fish & Wildlife Serv.*, 378 F.3d 1059, 1070 (9th Cir. 2004)(*quoting Sierra Club v. U.S. Fish & Wildlife Serv.*, 245 F.3d 434, 441-42 (5th Cir.

Wildlife v. Andrus, the court construed the relationship between section 4(d) and the ESA's conservation definition, stating:[259]

> It is clear from the face of the statute that the Fish and Wildlife Service, as part of the Interior, must do far more than merely avoid the elimination of a protected species. It must bring these species back from the brink so they may be removed from the protected class, and it must use all methods necessary to do so. The Service cannot limit its focus to what it considers the most important management tool available to it to accomplish this end…[T]he agency has an affirmative duty to increase the population of protect species.

Therefore, the Service's authority to promulgate a 4(d) rule authorizing the take of manatees will be constrained by the requirement that the measures specified by the 4(d) rule be "necessary and advisable" to provide for the survival and recovery of the species.

Endangered and threatened species may also receive different protections under the Marine Mammal Protection Act ("MMPA").[260] The MMPA prohibits the taking of marine mammals, which includes harassing, hunting, capturing, killing, or attempting to harass, hunt, capture, or kill any marine mammal. Species listed under the ESA are considered "depleted under the MMPA. Section 115(b) of the MMPA requires the Service to develop "conservation plans" for marine mammals considered depleted. These plans are modeled after recovery plans under the ESA and identify actions needed to restore species or stocks to optimum sustainable population levels defined under the MMPA.[261] Section 101(a)(5)(A) allows the Service to authorize the incidental take of marine mammals by regulation if the agency determines such taking would have a negligible impact on the species or stock. As explained in greater detail above, whether the Service may choose to promulgate an MMPA rule could depend in some cases on the way in which the Service values endangered versus threatened species in its stock assessment reports. Therefore, a decision to reclassify a marine mammal from endangered to threatened under the ESA may also have implications under the Marine Mammal Protection Act.

VI. Conclusion

In closing, the manatee remains imperiled by threats including cold-stress, boat strikes, and red-tide, which due to factors such as a rise in the state's population, increased development, and climate-change, may only get worse in the years ahead. Population numbers do not tell the full story and no reclassification

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2001)("'Conservation' is a much broader concept than mere survival. The ESA's definition of 'conservation' speaks to the recovery of a threatened or endangered species.").

[259] 428 F.Supp. 167, 160 (D.D.C. 1977).

[260] 16 U.S.C. § 1461, *et. seq.*

[261] Recovery Plan at 2.

decision should be made based on the 2007 population projection contained in the 2007 5-Year Review. Instead, the present and threatened destruction of its habitat, overutilization for commercial and recreational purposes, disease, inadequacy of existing regulatory mechanisms, and other natural or manmade factors necessitate a finding by the Service that the manatee remains "endangered" under the Endangered Species Act.[262]

Please do not hesitate to contact us regarding these comments or the references we have relied upon.

Sincerely,

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Enclosures:

All references cited in these comments are provided by c.d., except those originally authored by the U.S. Fish and Wildlife Service, those that are published in the Federal Register, case law, statutes, regulations, and news articles.

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[262] 16 U.S.C. § 1533(a)(1)(A)-(E); 50 C.F.R. § 424.11(c)(1)-(5).

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