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CLUB**



May 12, 2021

The Honorable Deb Haaland
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TRANSMITTED VIA E-MAIL

RE: Request for Objective Reevaluation of the Scientific Integrity of the Species Status Assessment for the Florida Key Deer

Dear Secretary Haaland, Assistant Secretary Estenoz, and Deputy Director Williams:

Sierra Club and the Center for Biological Diversity write to express their concern that the scientific integrity of the Species Status Assessment for the endangered Florida Key Deer conducted by the Fish and Wildlife Service under the Trump Administration was compromised by a predetermined agenda to eliminate or reduce protections for the species, and to do so on an unreasonably expedited schedule. Even the most current May 2021 version of the Florida Key

Deer Species Status Assessment, recently released by FWS,¹ contains numerous significant errors that may be causing FWS to underestimate the probability of extinction for each portion of the population (referred to as “Tiers” I through III). These errors cast doubt on the Assessment’s conclusions regarding both the current and future condition of the species, and would render any decision made utilizing the Species Status Assessment arbitrary and capricious, and in violation of the Endangered Species Act’s requirement to base decisions on the best available scientific and commercial information. Moreover, FWS conducted its process for evaluating the status of the species without the transparency required by FWS regulations, FWS guidance, and the Freedom of Information Act. We ask that the Biden Administration put any proposed rules regarding the classification of the Florida Key deer² on hold until after it conducts a thorough evaluation of the process through which this Species Status Assessment was developed, as well as a careful review, by an objective team of scientists, of the Species Status Assessment document and all of the data and modeling utilized to calculate its probabilities of extinction.

Troubling errors and omissions in the text of the May 2021 version of the Florida Key Deer Species Status Assessment include:

- Inflating the amount of remaining Florida Key deer habitat used in the modeling by 250% by using the wrong units of acreage.
- Inverting the ratio for the amount of habitat required to support a deer, such that the density is shown as “0.22 acres per deer,” when the actual value is 0.22 deer per acre (about 4.5 acres per deer).

¹ The May 2021 version of the SSA (“version 3.3”) is substantively identical to the March 2021 version of the SSA (“version 3.2”) that FWS released on March 31, 2021 in connection with a court order obtained by the Sierra Club, which required public disclosure of the January 2018 version of the Florida Key deer Species Status Assessment pursuant to the Freedom of Information Act (FOIA). *See Sierra Club v. United States Fish & Wildlife Serv.*, No. CV 19-2315 (JEB), 2021 WL 765727, at *4–5, *9 (D.D.C. Feb. 26, 2021). FWS decided to release the March 2021 version alongside the January 2018 version. The only changes between the March 2021 and May 2021 versions of the SSA appear to be superficial cosmetic changes, such as changing font colors and relabeling the table titles in Appendix A. On May 6, 2021, FWS FOIA Officer Tiffany McClurkin notified Sierra Club that “version 3.3” of the SSA had recently been uploaded by FWS to the Service’s public “ServCat” database at <https://ecos.fws.gov/ServCat/Reference/Profile/132263>, as well as at the “SSA web-site” <https://www.fws.gov/southeast/endangered-species-act/species-status-assessments/>.

² In a declaration dated December 3, 2020, FWS indicated that a proposed rule to reclassify the listing status of the Florida Key deer was imminent. *See Sierra Club v. United States Fish & Wildlife Serv.*, No. CV 19-2315 (JEB) (D. D.C.), Supplemental Decl. Tiffany McClurkin ¶ 6 (ECF No. 23-1) (“The draft decision and rule are being routed for a final agency decision.... This decision is eminent [sic] but not complete.”).

- Modeling hurricane impacts to the species using a 2% annual probability of a category 3 or higher intensity hurricane, when the best available scientific information indicates the annual probability is at least 5.6%—almost three times the likelihood used in the Species Status Assessment model—and failing to provide any basis for the 2% hurricane likelihood used in the modeling.
- Sourcing other information about hurricane frequency from a self-published paper by the “Science and Public Policy Institute”—an organization that promotes climate change *denial*—rather than directly from the National Hurricane Center, NOAA, or any credible, peer-reviewed source.
- Failing to provide any explanation or analysis to address the fact that the population modeling discussed in the October 2017 version of the Species Status Assessment generated probabilities of extinction that were vastly higher than the probabilities of extinction generated by the “compartment” model utilized in all later versions of the Species Status Assessment.
- Failing to provide any explanation for how or why the Key deer populations projected by the “compartment” model remain in the hundreds *even when the amount of remaining habitat is very close to zero*, though this unrealistic result plainly indicates that there is something very wrong either with the model or the input, or both. This error indicates that the model is likely underestimating the probabilities of extinction and quasi-extinction by projecting unrealistically high populations until the time when the amount of habitat actually equals exactly zero.
- Omitting important information identified by FWS Florida Keys Refuge biologist Kate Watts and external scientists indicating that the current condition of the species is substantially worse than described in the SSA.

These errors and omissions show that the May 2021 Species Status Assessment (“SSA”) does not constitute a careful compilation and analysis of the best available scientific information. The errors are especially disturbing considering that more than three years have elapsed since FWS relied on the faulty January 2018 version of the SSA to initiate a proposed rule to delist the species, and continued to work on a proposed downlisting rule throughout 2020 based on a version of the SSA revised in September of 2019. But these errors are not surprising at all given the rushed and secretive process for its development, which suggests that the Trump Administration intended to provide the public with as little time as possible to scrutinize the complex modeling and other previously unpublished scientific information on which the proposed reclassification rule would rely. The haste and lack of transparency in the process is demonstrated by the following:

- FWS circumvented its own regulations requiring notice to the general public in the Federal Register when a 5-year ESA status review is underway—instead it only notified a select group of “stakeholders.”

- FWS ignored its own guidance directing that Species Status Assessments should be made public when complete, and updated as new information becomes available. Instead, it withheld the January 2018 Species Status Assessment from the public despite having deemed it sufficiently complete to proceed to the next step of utilizing it in decision-making.
- FWS violated FOIA by withholding the completed January 2018 Species Status Assessment.⁴ FWS also egregiously dragged its feet in responding to Sierra Club’s February 2018 FOIA request for information related to the status review—providing only 3 pages of records prior to Sierra Club filing suit in August 2019 to compel a response and obtain the January 2018 Species Status Assessment.
- Despite serious concerns raised by FWS Science Coordinator Steve Traxler in January of 2018 that the Species Status Assessment did not reflect the latest scientific information regarding sea level rise, FWS rushed to prepare a rule to delist the Florida Key deer based on the January 2018 Species Status Assessment, and also prepared a draft post-delisting monitoring plan; it was not until July 2019, when FWS was in the final stages of proposing the delisting, that it decided to ask USGS to review the sea level rise information. In response to the USGS review, a September 2019 analysis by FWS hydrologist/Refuge Ecologist Lori Miller confirmed that the January 2018 SSA report did not reflect the best available science, or even the best available science as of January 2018.
- Scientists preparing the complex modeling underlying the Species Status Assessment were rushed to meet artificial deadlines imposed by the agency, which appeared to serve no purpose other than expediting a rulemaking to strip the species of legal protections.
- In July and August of 2019, FWS tried to “embargo” a report written jointly by FWS, Florida Fish and Wildlife Conservation Commission, and The Nature Conservancy staff regarding the impacts of sea level rise on ESA listed species in the Florida Keys due to concern that the report would undermine or contradict its imminent proposal to delist the Florida Key deer.

The plain scientific errors in even the most current version of the Species Status Assessment, lack of transparency, and haste in rushing a rulemaking to reduce or eliminate protections for this species are red flags that should compel the Biden Administration to closely scrutinize this Species Status Assessment, and the process through which it was developed, prior to proceeding with any decision-making in reliance on it. Moreover, the Biden Administration’s review of the Species Status Assessment should be conducted by objective scientists who don’t have any personal incentives to defend or conceal its defects.

The attached report provides a detailed explanation of the errors summarized above, and is based on public records, many of which Sierra Club obtained through FOIA litigation.

⁴ See *Sierra Club v. United States Fish & Wildlife Serv.*, No. CV 19-2315 (JEB), 2021 WL 765727, at *4–5, *9 (D.D.C. Feb. 26, 2021) (ordering disclosure of the January 2018 SSA).

Thank you for your attention to this matter. We look forward to seeing the Biden Administration's actions to reevaluate this Species Status Assessment thoroughly, and to ensure that any decisions regarding the Key deer are based on a careful and considered review of the most current scientific information.

Sincerely,

/s/ Dan Ritzman

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Review of the May 2021 ESA Species Status Assessment for the Florida Key Deer⁵

The May 2021 version of the Florida Key Deer Species Status Assessment—recently released by FWS⁶—contains numerous significant plain errors that cast doubt on the accuracy of its scientific conclusions regarding the calculated probabilities of extinction for each portion of the population (referred to as “Tiers” I through III). These errors cast doubt on the Assessment’s conclusions regarding both the current and future condition of the species, and would render any decision made utilizing the Species Status Assessment arbitrary and capricious, and in violation of the Endangered Species Act requirement to base decisions on the best available scientific and commercial information. Moreover, FWS conducted its process for evaluating the status of the species without the transparency required by FWS regulations, FWS guidance, and the Freedom of Information Act. FWS also attempted to “embargo” a scientific report that would conflict with its pending decision to delist the species.

⁵ Prepared by Karimah Schoenhut (Ph.D., Earth & Environmental Science, University of Pennsylvania (2003); J.D., University of Pennsylvania Law School (2012)), Staff Attorney, Sierra Club, 50 F St. NW, 7th Floor, Washington, DC 20001; (tel) 202-548-4584; karimah.schoenhut@sierraclub.org

⁶ The May 2021 version of the SSA (“version 3.3”) is substantively identical to the March 2021 version (“version 3.2”), which FWS released in connection with a court order obtained by the Sierra Club requiring public disclosure of the January 2018 version of the Florida Key deer Species Status Assessment pursuant to the Freedom of Information Act (FOIA). *See Sierra Club v. United States Fish & Wildlife Serv.*, No. CV 19-2315 (JEB), 2021 WL 765727, at *4–5, *9 (D.D.C. Feb. 26, 2021). FWS decided to release the March 2021 version alongside the January 2018 version. Based on a side by side examination, the changes between the March 2021 and May 2021 versions involve only superficial cosmetic edits such as changing font colors and relabeling the table titles in Appendix A. “Version 3.3” of the SSA was recently uploaded by FWS to the Service’s public “ServCat” database at <https://ecos.fws.gov/ServCat/Reference/Profile/132263>, as well as at the FWS website <https://www.fws.gov/southeast/endangered-species-act/species-status-assessments/>.

The errors and omissions in the text of the May 2021 version of the Florida Key Deer Species Status Assessment (“SSA”) include:

- Inflating the amount of remaining Florida Key deer habitat used in the modeling by 250% by using the wrong units of acreage.
- Inverting the ratio for the amount of habitat required to support a deer, such that the density is shown as “0.22 acres per deer,” when the actual value is 0.22 deer per acre (about 4.5 acres per deer).
- Modeling hurricane impacts to the species using a 2% annual probability of a category 3 or higher intensity hurricane, when the best available scientific information indicates the annual probability is at least 5.6%—almost three times the likelihood used in the Species Status Assessment model—and further, failing to provide any citation, calculation, or explanation to support the 2% hurricane likelihood used in the modeling.
- Sourcing other information about hurricane frequency from a self-published paper by the “Science and Public Policy Institute”—an organization *that promotes climate change denial*—rather than directly from the National Hurricane Center, NOAA, or any credible, peer-reviewed source.
- Failing to provide any explanation or analysis to address the fact that the population viability modeling and Bayesian population modeling discussed in the October 2017 version of the Species Status Assessment generated probabilities of extinction that were vastly higher than the probabilities of extinction generated by the “compartment” model utilized in all later versions of the Species Status Assessment.
- Failing to provide any explanation for how or why the Key deer populations projected by the “compartment” model remain in the hundreds *even when the amount of remaining habitat is close to zero*, though this unrealistic result plainly indicates that there is something very wrong either with the model or the input, or both. This error indicates that the model is likely underestimating the probabilities of extinction and quasi-extinction by projecting unrealistically high populations until the time when the amount of habitat actually is zero.
- Omitting information raised by FWS Florida Keys Refuge biologist Kate Watts in the fall of 2017 indicating that the Key deer population is currently affected by malnutrition.
- Omitting information raised by FWS Florida Keys Refuge biologist Kate Watts indicating that Key Deer are already experiencing habitat loss due to sea level rise.
- Failing to address in the modeling an April 2018 FWS report evincing a reduction of at least 36% to the estimated “core” population due to the impacts of Hurricane Irma, which devastated the Keys in September 2017.

These errors and omissions show that the May 2021 Species Status Assessment does not constitute a careful compilation and analysis of the best available scientific information.

The process for developing the Florida Key deer Species Status Assessment was marked by haste, secrecy, and a disregard for transparency requirements, as demonstrated by the following:

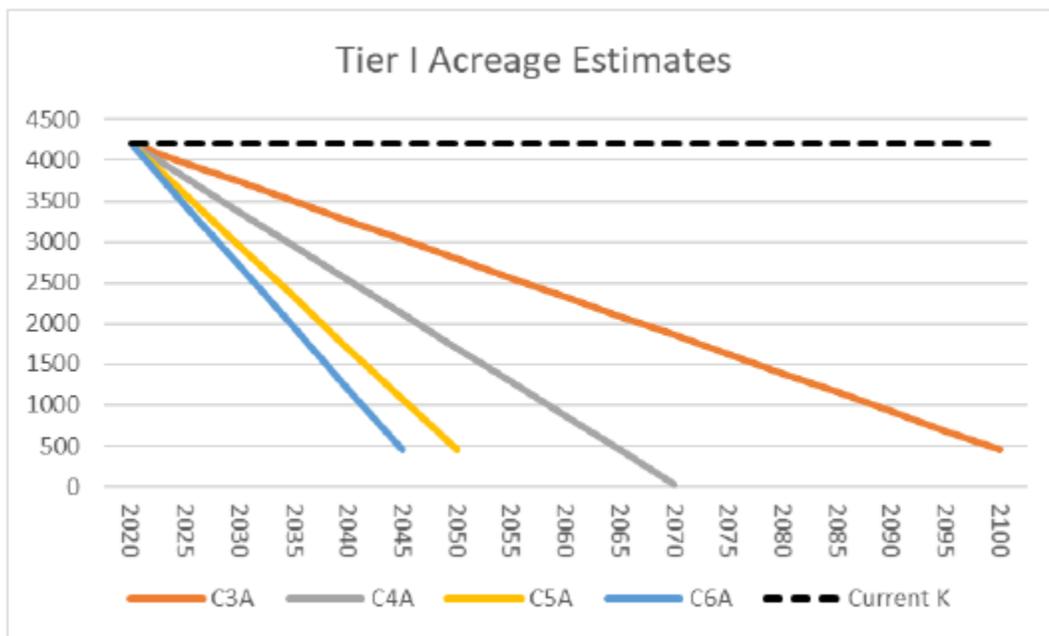
- FWS circumvented its own regulations requiring notice to the general public in the Federal Register when a 5-year ESA status review is underway—instead it only notified a select group of “stakeholders.”
- FWS ignored its own guidance directing that Species Status Assessments should be made public when complete, and updated as new information becomes available—instead, it withheld the January 2018 Species Status Assessment from the public despite having deemed it sufficiently complete to proceed to the next step of utilizing it in decision-making.
- FWS violated FOIA by withholding the completed January 2018 Species Status Assessment. *See Sierra Club v. United States Fish & Wildlife Serv.*, No. CV 19-2315 (JEB), 2021 WL 765727, at *4–5, *9 (D.D.C. Feb. 26, 2021) (ordering disclosure of the January 2018 SSA). FWS also egregiously dragged its feet in responding to Sierra Club’s February 2018 FOIA request for information related to the status review—providing only 3 pages of records prior to Sierra Club filing suit in August 2019 to compel a response via litigation, and obtain the January 2018 Species Status Assessment.
- Despite serious concerns raised by FWS Science Coordinator Steve Traxler in January of 2018 that the Species Status Assessment did not reflect the latest scientific information regarding sea level rise, FWS rushed to prepare a rule to delist the Florida Key deer based on the January 2018 Species Status Assessment, and also prepared a draft post-delisting monitoring plan; it was not until July 2019, when FWS was in the final stages of proposing the delisting, that it decided to ask USGS to review the sea level rise information. In response to the USGS review, a September 2019 analysis by FWS hydrologist/Refuge Ecologist Lori Miller confirmed that the January 2018 SSA report did not reflect the best available science, or even the best available science as of January 2018.
- Scientists preparing the complex modeling underlying the Species Status Assessment were rushed to meet artificial deadlines imposed by the agency, which appeared to serve no purpose other than expediting a rulemaking to strip the species of legal protections.
- In July and August of 2019, FWS tried to “embargo” a report written jointly by FWS, Florida Fish and Wildlife Conservation Commission, and The Nature Conservancy staff regarding the impacts of sea level rise on ESA listed species in the Florida Keys due to concern that the report would undermine or contradict an imminent proposal to delist the Florida Key deer.

These defects in the text of the May 2021 SSA, and the process for its development, are set forth in detail below. Please note that this review focuses only on the most glaring errors in the May 2021 SSA, and does not address the many other questionable assumptions and judgments throughout the SSA that result in underestimating the risk of extinction to the species, and how soon extinction will occur.

I. The May 2021 Version of the Status Assessment Contains Numerous Errors and Omissions

A. The May 2021 SSA Presents Habitat Acreages that are Inflated Due to a Plain Error in the Units of Measurement and Other Errors

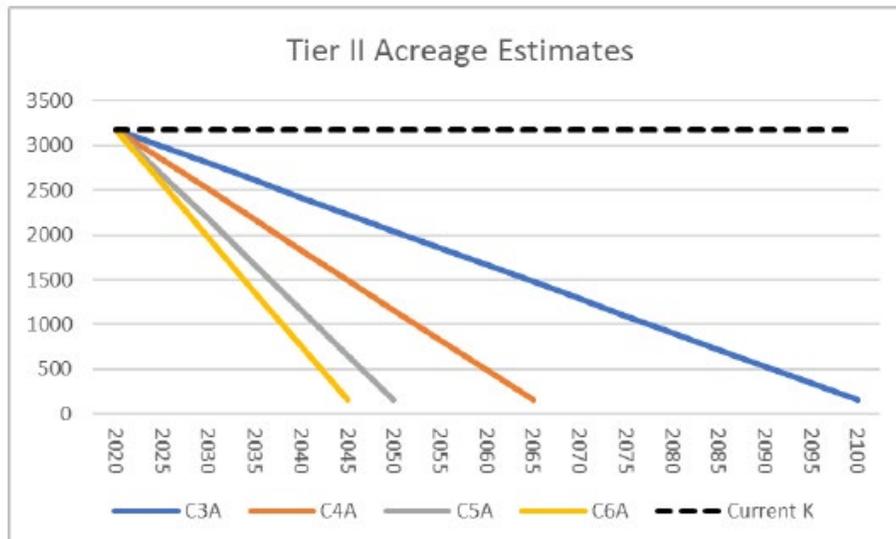
The updated sea level rise impact modeling in Appendix B, which was intended to correct the failures of the January 2018 SSA, appears to be using habitat acreages that are inflated due to errors in the unit of measurement and other errors. Figure B-14 in Appendix B of the May 2021 SSA shows the habitat acreages that were used in the modeling of sea level rise impacts under each scenario. *See* SSA version 3.3 (May 2021) at 160. The figure title states that it is showing the “Estimated upland area (ha) by tiers” for the “updated sea-level rise scenarios.” *Id.* The abbreviation “ha” stands for hectares—the unit of measurement used for the area of the habitat. For the “Tier I” portion of the Key deer population (the Key deer on Big Pine Key and No Name Key), Figure B-14 shows the current (2020) amount of upland habitat as approximately 4100 hectares:



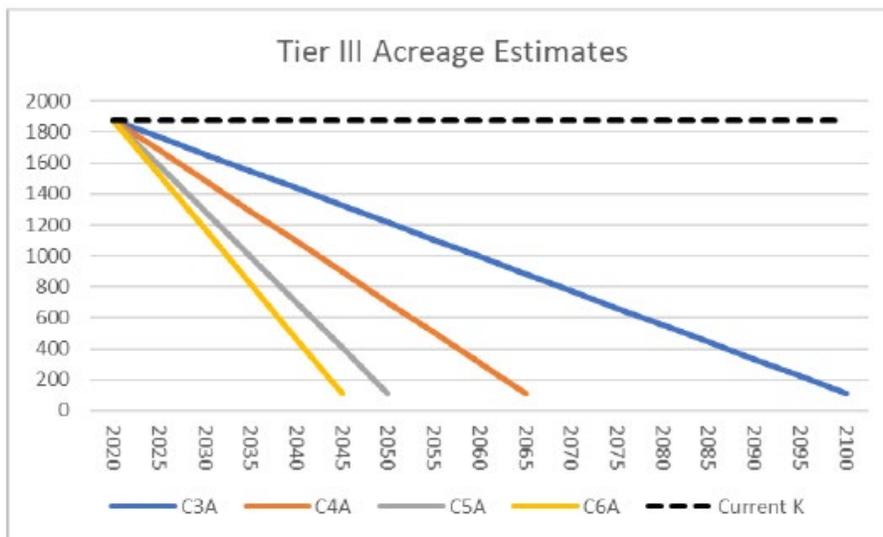
Yet both Table 4 and Table 10 in the May 2021 SSA indicate that the current upland habitat acreage for Tier I is actually only 1655 hectares—not 4100 hectares. *See* SSA version 3.3 (May 2021) at 19, Table 4; (providing total current upland habitat in hectares as

the total of pineland plus hammock plus developed upland areas); *id.* at 60 Table 10 (providing total 2015 “upland habitat” in hectares as the combined amount of pineland plus hammock plus developed upland areas utilized by Key deer). Notably, 1 hectare is equal to about 2.47 acres, and 1655 hectares is thus equal to about 4090 acres. To the extent that the modeling in Appendix B is using 4100 *hectares* as the current amount of upland habitat for Tier I, it would be inflating the available habitat by about 2.5 times the actual amount. For the same reasons, the amounts of habitat remaining under each sea level rise scenario over time would be inflated by about 2.5 times due to this error with the units of measurement. Since the carrying capacity for any given point in time in the modeling is determined by multiplying the acreage of remaining upland habitat by a fixed constant representing deer density per unit of area, inflating the acreage due to this units error would inflate the projected carrying capacity, and in turn inflate the projection of the population size that can be sustained.

For the Tier II portion of the population, Figure B-14 indicates that the current area of upland habit is approximately 3200 hectares. *See* SSA version 3.3 (May 2021) at 160. Yet both Table 4 and Table 10 in the May 2021 SSA show that the current upland habitat for Tier II is actually only 1,102 hectares. *See* SSA version 3.3 (May 2021) at 19, 60. Notably, 1102 hectares amounts to approximately 2723 acres. Thus, an error with the units of measurement alone does not explain the value of 3200 shown in Figure B-14. In any case, if the modeling in Appendix B is utilizing the acreages shown in Figure B-14, it would be relying on grossly inflated habitat amounts, and thereby overestimating the remaining carrying capacity and population under every scenario. From Figure B-14:



For the Tier III portion of the population, Figure B-14 shows a current upland habitat area of approximately 1850 hectares. *See* SSA version 3.3 (May 2021) at 160. Yet Table 4 and Table 10 in the May 2021 SSA state that the current upland habitat area is only 1004 hectares. *See* SSA version 3.3 (May 2021) at 19, 60. Again, to the extent that the modeling in Appendix B is using 1850 hectares instead of 1004 hectares as the starting amount of habitat, it would be inflating the amount of upland habitat, and the carrying capacity by approximately 84%, thereby overestimating the amount of habitat remaining over time under each scenario, and the population that could be sustained. From Figure B-14:



Notably, the sea level rise modeling discussed in the main text of the May 2021 SSA also appears to reflect errors that grossly inflate the amount of habitat that was input into the population modeling. Figure 22 in the May 2021 SSA states that it is showing the “Estimated upland area (ha) by tiers” under each sea level rise scenario. *See* SSA version 3.3 (May 2021) at 62. Figure 22 indicates that the areas shown are in hectares. Figure 22 shows a current area of upland habitat for Tier I of approximately 4100 hectares. *Id.* Again, this is inconsistent with Table 4 and Table 10, which show the acreage is only 1655 hectares. From Figure 22:

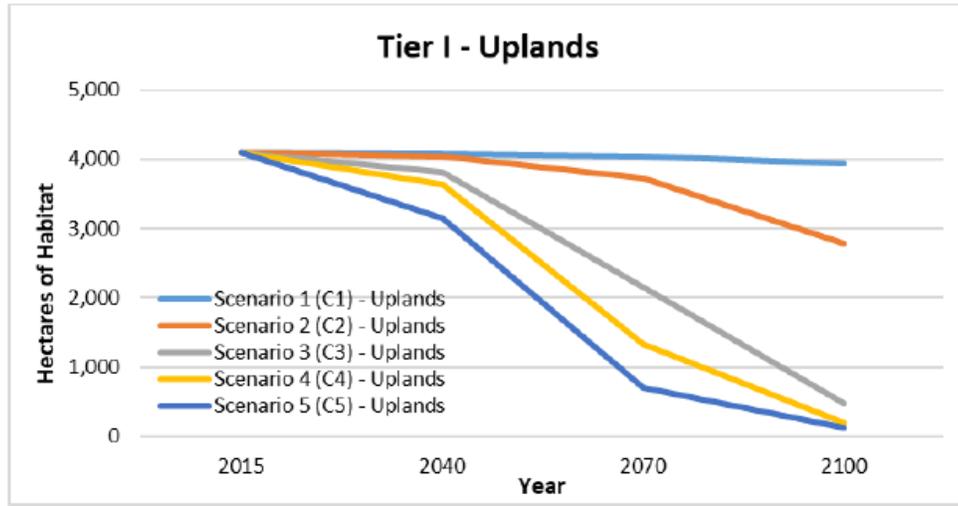


Figure 22 indicates that the that the current area of upland habitat for Tier II is approximately 2750 hectares. Again, that is inconsistent with the current acreage shown in Table 4 and Table 10, of 1102 hectares. From Figure 22:

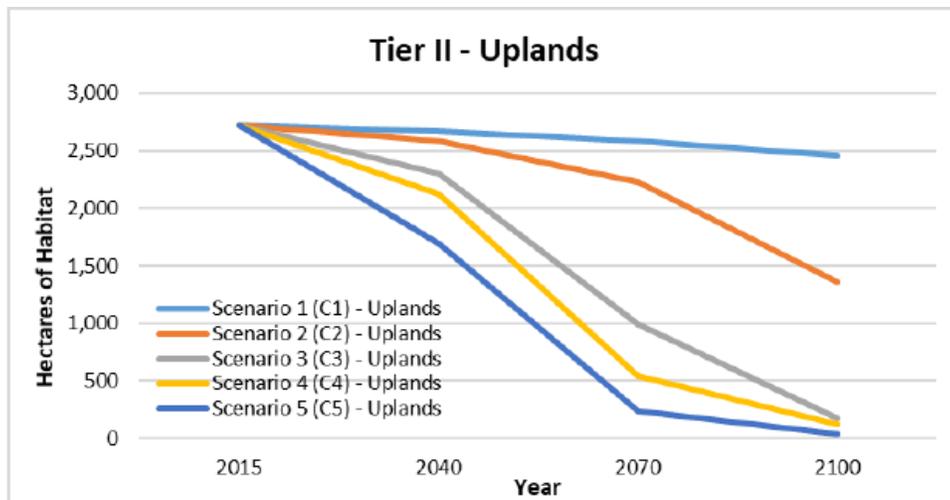
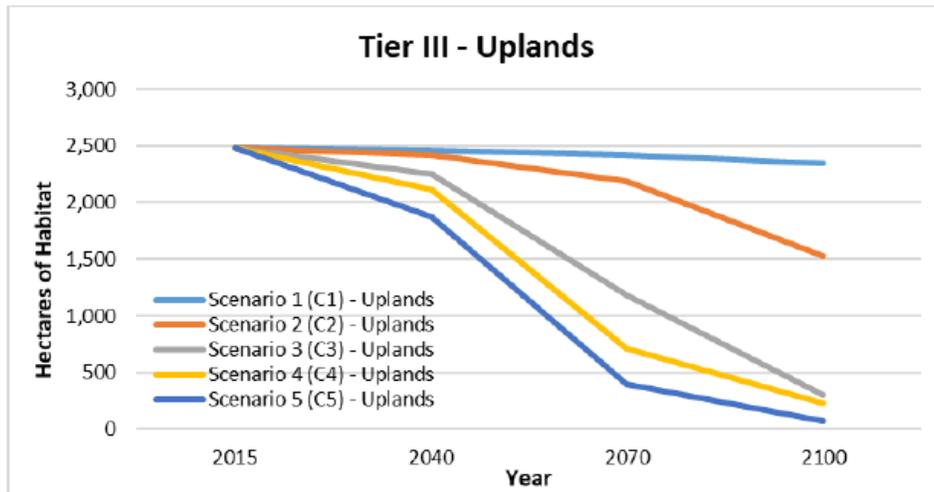


Figure 22 indicates that the current area of upland habitat for Tier III is approximately 2500 hectares. Again, that is inconsistent with the current acreage shown in both Table 4 and Table 10, of 1004 hectares. From Figure 22:



In sum, the large disparities between the current upland habitat areas for each “Tier” reported in Table 10 of the May 2021 SSA, and the areas shown in the figures reflecting the habitat areas used to calculate the remaining carrying capacity in the population modeling, suggest that the model output reflects erroneously inflated habitat amounts, which in turn would inflate the remaining carrying capacity and inflate the estimated population that can be sustained as sea level rise proceeds. The net effect would be to erroneously and grossly underestimate the probability of extinction and the timing of extinction.

B. The Deer Density Constants Shown in the May 2021 SSA Are Plainly Erroneous

Table 11 of the May 2021 version of the SSA describes the factors that were used in the population modeling used to estimate probabilities of extinction under various scenarios. Table 11 states that for Key deer density, the values used in the modeling are: “Tier I = 0.22 acres/Key deer, Tier II = 0.05 acres/Key deer, Tier III = 0.01 acres/Key deer.” *See* May 2021 SSA at 78. *These numbers are the inverse of the actual densities.* As explained below, instead of “0.22 acres/deer,” the density should be 0.22 deer/acre. To the extent that the modeling is actually using a density of 0.22 acres/deer, it would be grossly inflating the projected carrying capacity of the habitat. Instead of assuming that it requires 4.5 acres to support a deer (which is the correct ratio based on the other data in the SSA, as detailed below), Table 11 indicates that the model assumed it takes only 0.22 acres to support a deer.

Table 10 of the SSA reports the Tier upland habitat in terms not only of the undeveloped upland habitat, but the combined developed and undeveloped upland habitat. For Tier I it reports a total of 1655 hectares total upland habitat (pineland + hammock + developed) as of 2015. *See* Table 10 SSA version 3.3. (1655 hectares = 4089.6 acres). For Tier II it reports 1,102 hectares of total upland habitat (pineland + hammock + developed) as of 2015 (1102 hectares = 2723.1 acres). For Tier III it reports 1,004 hectares (2480.9 acres). The SSA reports a Tier I population of 900 Key deer, which it asserts to be the present carrying capacity of the Tier I habitat. The analogous populations stated for Tier II and Tier III are 130 and 20, respectively. If the density was calculated using the total upland habitat for Tier I (pineland + hammock + developed) it would be $900 \text{ deer} / 4089.6 \text{ acres} = 0.22 \text{ deer per acre}$. For Tier II it would be $130 \text{ deer} / 2723.1 \text{ acres} = 0.0477 \text{ deer per acre}$ (rounds to 0.05 deer per acre). For Tier III it would be $20 \text{ deer} / 2480.9 \text{ acres} = 0.008 \text{ deer/acre}$ (rounds to 0.01 deer per acre). Thus, it appears that the densities used in the compartment model erroneously use the number of deer per acre as the number of acres per deer. For Tier I, the model should be using an estimate of $4089.6 \text{ acres} / 900 \text{ deer} = 4.5 \text{ acres/deer}$, not “0.22 acres per deer.” Similarly, the densities for Tier II and Tier III would be the reciprocal of the value shown on Table 11.

Thus, to the extent that the modeling actually used the habitat area to deer ratios shown in Table 11, it would be grossly inflating the number of deer that would be sustained by the remaining habitat.

C. The Population Modeling in the May 2021 SSA Erroneously Uses a 2% Annual Probability of “Category 3+” Hurricanes

Like the January 2018 version of the SSA, the May 2021 version of the SSA continues to model hurricane impacts on the Key deer population using the assumption that “the Catastrophic hurricane probability (Category 3+) is 2 percent annually.” May 2021 SSA at 68, Table 11. The list of scientific papers that the SSA cites to support that assumption do not appear to actually contain any explanation of the assumption that the probability of a Category 3 or higher hurricane is only 2%, nor report that value. *See id.* Indeed, the available science indicates that the probability of a Category 3 or higher hurricane is 5.6% or more: For nearby Key West, the return

period for a Category 3 or higher hurricane was reported in 2007 by NOAA to be 12 years,⁷ which corresponds to an 8.3% annual probability.⁸ In 2011, NOAA reported the return period for a Category 3 or higher hurricane at Key West to be 18 years,⁹ which corresponds to an annual probability of 5.6%. Similarly, in 2007, for Key West, Keim et al. reported an average return period of 15 years (6.7% annual probability) for hurricanes greater than or equal to Category 3.¹⁰ In the absence of any more recent estimate of the return period for Category 3 and greater hurricanes for the Lower Keys, it appears that the 2% probability used in the SSA modeling would underestimate the annual likelihood of such an event by approximately three to four times the actual likelihood, thereby seriously underestimating impacts to the Key deer population from Category 3 and higher hurricanes.

The fact that the SSA provides no explanation at all for this important factor used in the model, and no actual citation to support it, casts doubt on the analysis. That the 2% value appears to be only a fraction of the actual likelihood of a Category 3+ storm further casts doubt on the

⁷ Eric S. Blake, Edward N. Rappaport, and Christopher W. Landsea, NOAA/NWS/NCEP/TPC/National Hurricane Center, “The Deadliest, Costliest, and Most Intense United States Tropical Cyclones From 1851 to 2006 (and Other Frequently Requested Hurricane Facts),” NOAA Technical Memorandum NWS TPC-5 (2007), at 21, Table 12 (return periods for major hurricanes); *see also id.* at 1 (explaining the “A major hurricane is a category 3, 4, or 5 hurricane on the Saffir/Simpson Hurricane Scale”), *available at* <https://www.nhc.noaa.gov/pdf/NWS-TPC-5.pdf>.

⁸ For an event that occurs on average every 12 years, the annual probability of occurrence is 1/12, which equals about 8.3%. *See, e.g.*, Neumann, Charles J., National Hurricane Center, “The National Hurricane Center Risk Analysis Program (HURISK),” NOAA Technical Memorandum NWS NHC 38 (1991) at 23, *available at* <https://www.nhc.noaa.gov/pdf/NWS-NHC-1987-38.pdf> (“The subject of return periods is closely tied to n-year events. These are defined as events (strong winds. Excessive rainfall.etc.) the magnitude of which are equaled or exceeded on the average once every n-years....An n-year event is often referred to as an event having a 1/n chance of occurring in a single year. Thus, a 50-year event has a 2% while a 100-year event has a 1% chance of occurring in a single year.”).

⁹ Eric S. Blake, Christopher W. Landsea, and Ethan J. Gibney “The Deadliest, Costliest, And Most Intense United States Tropical Cyclones From 1851 to 2010 (and Other Frequently Requested Hurricane Facts),” NOAA Technical Memorandum NWS NHC-6 (2011), at 24, Table 12, *available at* <https://www.nhc.noaa.gov/pdf/nws-nhc-6.pdf>.

¹⁰ Barry D. Keim, Robert A. Muller, and Gregory W. Stone, “Spatiotemporal Patterns and Return Periods of Tropical Storm and Hurricane Strikes from Texas to Maine,” *Journal of Climate*, Vol. 20, 3498-3509 (July 15, 2007) at 3504, Figure 5, *available at* https://www.researchgate.net/publication/242556284_Spatiotemporal_Patterns_and_Return_Periods_of_Tropical_Storm_and_Hurricane_Strikes_from_Texas_to_Maine.

validity of the analysis. In short, due to this questionable and unsupported assumption, the modeling in the SSA underestimates the risks posed to the Key deer by major hurricanes.

D. The May 2021 SSA Cites a Self-Published Report by an Organization Recognized as Promoting Climate Change Denial for Other Facts about Hurricane Frequency

Instead of citing a credible, primary source such as the National Hurricane Center, the May 2021 SSA cites a self-published paper from the “Science and Public Policy Institute” for facts about the frequency of Category 1 storms in the Florida Keys.¹¹ The Library of Congress archive website summary for the “Science and Public Policy Institute” states that it is “a public policy organization which *promotes climate change denial.*”¹² Indeed, it is readily apparent from the paper itself that its author promotes climate change “skepticism.” The citation to this extremely dubious source is present not only in the May 2021 version of the SSA, but also in the October 2017 and January 2018 versions of the SSA. The information being cited in the SSA appears to be taken from page 4 of the Ferguson (Science and Public Policy Institute) paper, where Ferguson reproduces a figure purportedly from the National Hurricane Center.¹³

Given the importance of hurricanes as a threat to the survival of the Key deer, it is deeply disturbing that the Texas A&M and FWS scientists authoring the SSA would source *any* information about hurricane frequency from such an obviously unreliable source, rather than

¹¹ See May 2021 SSA at 21 (citing “Ferguson 2008” for the proposition that “On average, Category 1 hurricanes make landfall in the Florida Keys every 4 to 6 years.”); *id.* at 100 (SSA Literature Cited section showing only citation to “Ferguson” as “Ferguson, R. 2007. Hurricane threat to Florida: climate change or demographics? Science and Public Policy Institute. <Accessed October 1, 2017.>”). The self-published paper is available at the “Science and Public Policy Institute” website, at <http://scienceandpublicpolicy.org/wp-content/uploads/2007/10/hurricanethreat.pdf>.

¹² See Library of Congress website at <https://www.loc.gov/item/lcwaN0018190/>, (last accessed May 9, 2021) (presenting summary retrieved from http://dbpedia.org/resource/Science_and_Public_Policy_Institute) (emphasis added). See also Press Release from U.S. Senator Sheldon Whitehouse, “Senators Call Out Web of Denial Blocking Action On Climate Change,” (July 15, 2016), available at <https://www.whitehouse.senate.gov/news/release/senators-call-out-web-of-denial-blocking-action-on-climate-change> (listing “The Science and Public Policy Institute” as one of 32 climate change denier organizations criticized by Senators for “perpetrating a sprawling web of misdirection and disinformation to block action on climate change.”).

¹³ Incidentally, the SSA authors misread the figure as indicating that the return period for a storm is 4-6 years, when the figure actually shows return periods of 4 to 5 years for the Florida Keys.

obtaining it directly from reliable sources such as the National Hurricane Center and NOAA publications. It is also disturbing that throughout multiple rounds of peer review and other reviews between October 2017 and May 2021, no one at FWS apparently noticed (or perhaps cared) that information was being obtained from this dubious source rather than a credible primary source.

The SSA's reliance on such a questionable source of information for facts about hurricane frequency is especially troubling given the lack of any actual citation or explanation for its assumption that the annual probability of a "Category 3+" hurricane is 2%, discussed above. It is also disturbing that the SSA discusses the frequency (return period) of Category 1 hurricanes, but says nothing about the frequency (return period) of more severe hurricanes. A reasonable inference is that the authors omitted any explicit discussion of the frequency or return period of Category 3 and higher storms from the text of the SSA because the available facts from the National Hurricane Center did not comport with the low probability they used in their modeling of impacts to the species.

An erroneously low assessment of the threat from Category 3 and higher hurricanes is especially problematic for the evaluation of the current condition of the species. Specifically, the SSA's conclusions regarding the current viability turn on calculations of extinction probability being <1% in the absence of sea level rise impacts. In addition to providing no explanation for the 2% annual probability for a Category 3 or greater storm, the SSA modeling also caps the impacts of a hurricane to an annual mortality of only 30%—apparently based on the mortality observed after Hurricane Irma. But Hurricane Irma had a storm surge of approximately 2.5 meters NAVD at Big Pine Key,¹⁴ and Big Pine Key has its highest upland habitat elevations at about 2.44 meters. A Category 3 hurricane with an even higher storm surge would certainly result in higher fatalities, yet the model does not allow for fatalities from a hurricane to ever exceed a 30% annual drop in the year the hurricane occurs. Notably, for nearby Key West, the probability of a Category 3 or higher hurricane with at least 4 meters of storm surge—which would put the entirety of Key deer habitat on Big Pine Key approximately 1.5 meters under

¹⁴ Florida DEP, "Hurricane Irma Post-Storm Beach Conditions and Coastal Impact in Florida," (April 2018) at 9, available at https://floridadep.gov/sites/default/files/H_IRMA_Post-Storm_Report_1.pdf.

water or more—has been estimated to have a return period of 138.8 years,¹⁵ which would correspond to an annual probability of 0.72%. Though mortalities from such an event would no doubt be far more than 30%, if not total extirpation, the modeling just ignores totally this scenario instead of accounting for it.

E. The May 2021 SSA Fails to Acknowledge that Prior Viability Modeling Using Different Modeling Approaches Yielded Drastically Higher Probabilities of Extinction

The October 2017 version of the SSA reported that the *current* resilience of the Key deer population in the Tier II portion of the range was *low* because the “[e]xtinction risk estimates based on population sizes suggest a high probability [sic] of extinction” even in the absence of habitat loss from sea level rise. *See* October 2017 SSA at 31. The October 2017 SSA stated that based on “previous PVA outputs” the probability of total extirpation of the Tier II portion was “1-1.5%” and that the probability of quasi-extinction (the population dropping below 50) for that portion of the range was greater than 30%. *See id.* at 31, 38, Table 7. Notably, even for the lowest sea level rise scenario modeled, which would have only 0.1 meter of sea level rise by 2040 and a loss of only 24 hectares of the total Tier II upland habitat (amounting to only a 2.1% loss), the Bayesian model results displayed in the October 2017 SSA showed a *66% likelihood of total extirpation* of the Tier II portion by 2040.¹⁶ This suggests that the Bayesian modeling indicates a high probability of total extirpation of the Tier II portion of the range even in the absence of sea level rise, due to the instability of the small population size for the Tier II population.

After the October 2017 version of the SSA, FWS apparently abandoned the Bayesian model in favor of a “compartment model” approach. The compartment model results reported in the May 2021 SSA show less than a 1% likelihood of extirpation for the Tier II portion under the

¹⁵ Trepanier, J. C., J. Yuan, and T. H. Jagger (March 2017), The combined risk of extreme tropical cyclone winds and storm surges along the U.S. Gulf of Mexico Coast, *J. Geophys. Res. Atmos.*, 122, 3299–3316, doi:10.1002/2016JD026180, *available at* <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1002/2016JD026180>, at Table 8 (estimating return periods for hurricane wind speed and storm surge level pairings).

¹⁶ *See* October 2017 SSA at 58 (Table 10) (showing only 24 acres of Tier II upland habitat loss by 2040 for Scenario 1); 74 (Table 12) (showing extinction probabilities for Tier II under Scenario 1).

“baseline” sea level rise scenario (C0), leading the May 2021 version to present the conclusion that the current reliance for the Tier II portion is high instead of low. *See* May 2021 SSA at 32, 39. The May 2021 SSA omits any mention of the extinction probabilities generated from “previous PVA outputs” that were shown in Table 7 of the October 2017 SSA. Instead, Table 7 in the May 2021 SSA presents the extinction probabilities calculated from the compartment modeling of the “baseline” sea level rise scenario (C0). *See* May 2021 SSA at 32, 39.

The May 2021 SSA provides no discussion to acknowledge that the choice of model had such a drastic impact on the outcome, or to even acknowledge the existence of the different results produced by other approaches to modeling. Nor does the May 2021 Species Status Assessment reflect any consideration of whether the disparity between the results produced by these different models may reflect errors in the inputs or in the formulas used to construct the models.

Having previously generated the much higher extinction probabilities through other approaches to the modeling, the SSA cannot meet the ESA’s requirement to utilize the best available scientific information without acknowledging and explaining why those other approaches to modeling the probability of extinction are inferior to the compartment modeling approach used in the May 2021 version. The ESA’s requirement that FWS base its decision-making about the legal status of species “solely on the basis of the best scientific and commercial data available to” the agency, 16 U.S.C. § 1533(b)(1)(A), means that FWS “cannot ignore available biological information.” *Kern Cty. Farm Bureau v. Allen*, 450 F.3d 1072, 1080–81 (9th Cir. 2006). FWS cannot simply ignore the existence of those other models and their outputs. Yet the May 2021 SSA attempts to do just that—it simply deletes any reference to the drastically higher near-term extinction probabilities indicated by other modeling approaches and pretends that the information simply doesn’t exist.

Notably, FWS circulated the October 2017 version of the SSA to reviewers at the Florida Fish and Wildlife Conservation Commission shortly after it was written, but refused to release it to the public in response to Sierra Club’s February 2018 FOIA request until 2021, *after* Judge Boasberg (U.S. District Court for the District of Columbia) concluded that FWS had failed to justify its withholdings of draft Key deer SSAs and records related to the Key deer SSA.

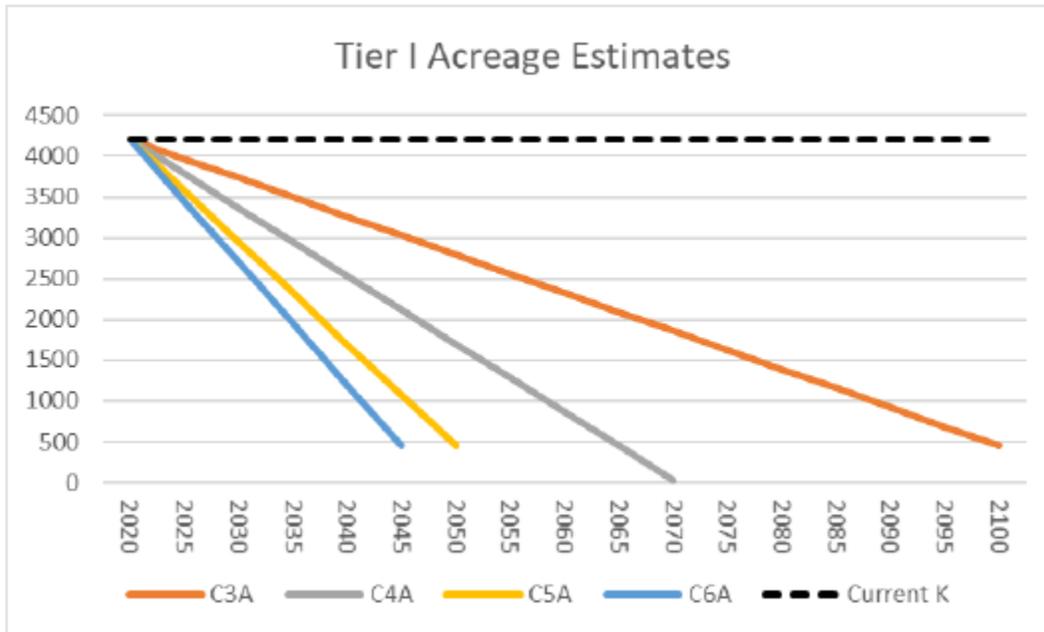
The reality that the low population numbers in the Tier II portion of the range currently place that portion at relatively high risk of extirpation even without additional sea level rise is of

obvious importance to the question of whether the Key deer are in danger in all *or a significant portion* of the range. More broadly, the unexplained and vastly different results produced by the different models cast doubt on whether the compartment model in the May 2021 SSA constitutes a realistic estimate of the extinction probabilities for any of the three Tiers.

F. The May 2021 SSA Fails to Address that the Compartment Model Projects Populations Drastically Higher than the Carrying Capacity Even After Sea Level Rise Eliminates Most of the Upland Habitat

The output presented in Appendix B indicates that as the amount of upland habitat drops to a small fraction of the current amount due to sea level rise, the population estimated by the compartment model does not drop accordingly, and instead remains at a level that is much higher than the carrying capacity up until the time when the amount of remaining upland habitat actually equals zero. The May 2021 SSA does not include any discussion of why the population remains so much higher than the carrying capacity, or whether that may demonstrate that the compartment model's projections are unrealistic, and therefore overestimate the remaining population at low habitat amounts. Such an overestimation of the population persisting at those low habitat amounts would be important because it would mean that the probabilities of dropping below the thresholds for quasi-extinction, and of total extinction, would be grossly underestimated.

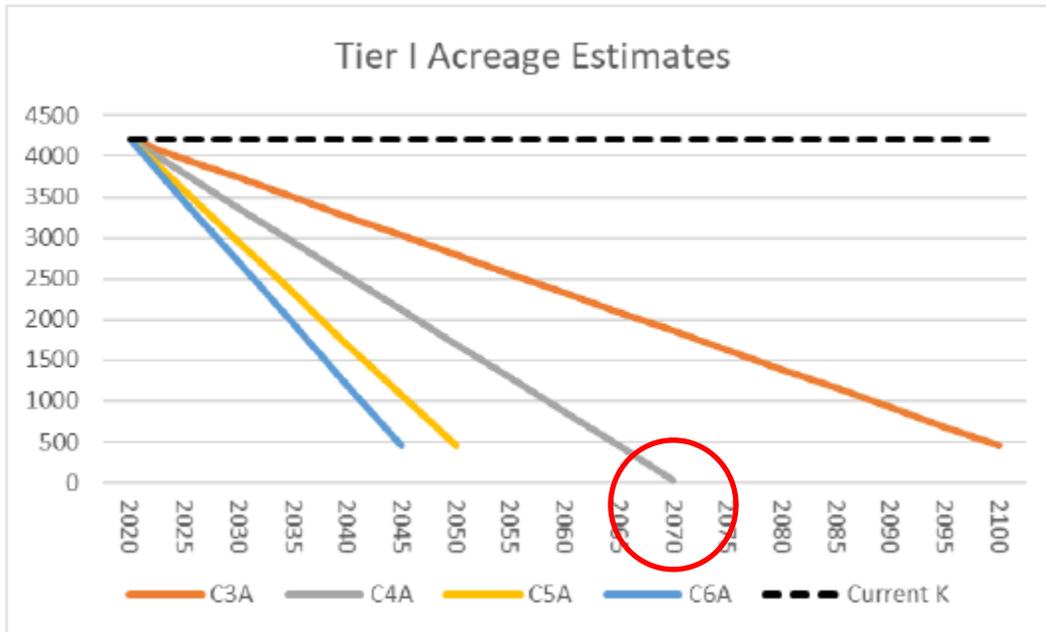
For example, for sea level rise Scenario C3-A, Figure B-14 at page 160 of Appendix B (reproduced immediately below) shows the remaining amount of upland habitat dropping from approximately 4100 in 2020 to just under 500 by the year 2100. As discussed above, the labeling on Figure B-14 indicates that the acreages shown are in hectares, but that does not comport with the current habitat amounts shown in both Table 4 and Table 10 of the SSA, which indicate that the current amount of Tier I upland habitat is about 4100 acres (1655 hectares), not 4100 hectares. If the correct unit of measurement was used in the modeling, as well as the correct deer density, then the carrying capacity at year 2100 would be less than 110 deer (500 acres x 0.22 deer per acre = 110 deer). From Figure B-14:



Yet Table B-12 in Appendix B, which models the C3-A scenario, predicts an average population of 216 deer for Tier I in 2100. *See* May 2021 SSA at 149. There is no explanation provided in the SSA as to how the average population can remain at roughly double the carrying capacity—particularly since the formula presented in SSA to explain how the population change is estimated in the compartment model appears to use the carrying capacity as a cap on the population by inducing a population reduction when the population exceeds the carrying capacity. *See* May 2021 SSA at 78 (Table 11). Further, the habitat loss appears to be modeled as a linear decrease due to sea level rise, not rapid drops. *See* Figure B-14 (showing linear drops in upland habitat acreage).

Even more extreme, for Scenario C4-A, Figure B-14 in Appendix B shows the amount of upland habitat for Tier I remaining in 2070 to be very close to zero. Yet the model output in Appendix B shows the average population for Tier I at the year 2070 under Scenario C4-A to be 284 Key deer! *See* May 2021 SSA at 152, Table B-14. **To reiterate, despite there being almost zero habitat remaining by 2070, the compartment model predicts that there will still be an average population of 284 deer.**

From Figure B-14 in Appendix B of May 2021 SSA (red circle added to show habitat is very close to zero by 2070):



Model output for Scenario C4-A from May 2021 SSA at 152, Table B-14:

Tier I							
2020							900
λ Decline = 0%							
	<=100	<=50	<=25	<=0	Resiliency	Avg	SD
2040	0.0	0.0	0.0	0.0	High	588	135
2070	0.2	0.0	0.0	0.0	High	284	73
2100	100.0	100.0	100.0	100.0	Low	0	0

Even under variations of the model run using a reduced population growth rate (“ λ Decline =15%”), the model output still shows an average 2070 population of 107 Key deer for Tier I, *despite the habitat being near zero*. See May 2021 SSA at 152, Table B-14.

Clearly the compartment model is not realistically predicting the population, either due to problems in the model itself, or errors in the input into the model. As a result, it is grossly underestimating the probabilities of extinction.

This error, and the total failure of the May 2021 SSA to discuss or acknowledge this error, is especially disturbing in light of comments of FWS Science Coordinator Steve Traxler *made in January of 2018* stating: “There needs to be some type of vetting of the models being used to determine resilience, extinction, etc. The Key Deer SSA team during the SSA decisional meeting briefly discussed *the difficulty of the model to have species numbers drop below 100 even though it appeared that most of the available habitat for the species was gone* due to sea

level rise.”¹⁷ **This remark suggests that even in January 2018, FWS was aware of a problem with the compartment model overestimating the population.** Yet, instead of addressing this problem before engaging in any decision-making based on the model output, FWS appears to have ignored this serious error and proceeded to work on proposed rules to strip the species of ESA protections through delisting or reclassification.

In fall of 2019, FWS reran the compartment models with the updated SLR scenarios shown in Appendix B of the May 2021 SSA, but it apparently did not correct this error, as clearly evinced by the model output for Scenario C4-A. It is astonishing that between fall of 2019, when FWS reran the models to prepare Appendix B, and May 2021, neither FWS staff nor any of the external scientists involved in the modeling sought to correct or address this problem.

G. The May 2021 SSA Omits Information Raised by FWS Florida Keys Refuge Biologist Kate Watts in Fall of 2017 Indicating that the Key Deer Population is Affected by Malnutrition

In comments on the October 2017 version of the SSA made in fall of 2017, FWS Florida Keys Refuge biologist Kate Watts responded to the SSA’s assertion that the “core Key deer numbers continued to increase with few concomitant issues traditionally seen in highly dense white-tailed deer populations (e.g., disease outbreaks, malnutrition)” by highlighting the terms “disease outbreaks, malnutrition” and stating: “We are seeing both of these issues in the current population.”¹⁸ Yet, subsequent versions of the SSA, including the May 2021 version of the SSA, do not provide any further discussion of the malnutrition issue flagged by Kate Watts in the section on “Carrying Capacity and Density Dependence,” and continue to indicate that the increase in the “core” Key deer population to its pre- Hurricane Irma levels was not accompanied by the problems associated with highly-dense deer populations.¹⁹

This issue is important because the SSA modeling in the May 2021 SSA bases its assumptions about carrying capacity and deer density on the idea that the pre-Hurricane Irma Tier I population of 900 is the number of deer that can be supported by the current amount of Tier I upland habitat. If the core (Tier I) population was suffering from malnutrition issues at

¹⁷ Attachment 1, Comments of FWS Science Coordinator Steve Traxler, dated January 24, 2018 (emphasis added).

¹⁸ Attachment 2, Excerpt from Kate Watts’ Marginal Comments on October 2017 SSA at 27.

¹⁹ See May 2021 SSA at 27-28.

900, it suggests that a carrying capacity derived from a density based on 900 deer would be higher than the actual carrying capacity, and would overestimate the population that can be sustained by a given amount of habitat. In other words, if the deer are already suffering from malnutrition at a density of 0.22 deer per acre, then using a carrying capacity based on a deer density of 0.22 deer per acre for the Tier I portion of the range in the modeling would overestimate the populations that can be sustained.

H. The May 2021 Omits Information Indicating that Key Deer Are Already Experiencing Habitat Loss Due to Sea Level Rise

The May 2021 SSA fails to address factual assertions raised by FWS Refuge Biologist Kate Watts indicating that sea level rise has already been destroying Key deer habitat, and limiting population numbers in the “Tier II” portion of the range. In responding to the assertion that there is potential for population growth in the Tier II portion of the range because Key deer numbers there are under the carrying capacity of the habitat, FWS Refuge Biologist Kate Watts stated in comments on a draft portion of the SSA:

Given the loss of freshwater sources on these two islands due to sea level rise and storm events over the last 15 yrs, is this still true? If the population has not grown considerably, is it appropriate to assume that it still has room to grow? For example, Cudjoe Key now has only a handful of water bodies that remain fresh throughout the year. Freshwater marsh is being replaced by saltmarsh and mangrove (current and future condition). Additionally, what was pine rockland on Upper Sugarloaf has now transitioned into a more tidally-influenced halophytic habitat after Hurr. Wilma (Ogurcak, Ross, Moyer, Hester datasets).²⁰

Rather than discuss the impacts of *currently ongoing* habitat loss for the Keys within Tier II due to sea level rise, and the impacts on the population and carrying capacity of those Keys, subsequent versions of the SSA appear to completely ignore the information raised by FWS Refuge Biologist Kate Watts. Instead, without mentioning the information raised by Kate Watts in any manner, the SSA continues to assert that the Tier II population has “population growth potential.” *See* May 2021 SSA at 32 (asserting that the Tier II islands “have population growth potential as they are under carrying capacity”); *id.* at 39 (asserting that “Tier II islands have

²⁰ Attachment 3, Excerpt from Kate Watts’ Marginal Comments on October, 4 2017 Draft of Current and Future Conditions Section of SSA (file name “10042017_Current and Future Conditions_KWEdits.docx”).

significantly fewer Key deer, although the presence of preferred vegetation and freshwater sources results in population growth potential, as they are currently under carrying capacity.”).

This omission is particularly egregious because the SSA’s estimates of population size in the Tier II Keys reflect data from surveys conducted in 2005—over 15 years ago.²¹ For two of the Tier II Keys (Cudjoe and Upper Sugarloaf), the SSA purports to provide updated numbers “obtained by Kate Watts, Key deer biologist in November 2015 (personnel [sic] communication)”—but, in comments on the October 2017 version of the SSA, Kate Watts herself questioned whether she had actually provided those numbers. She wrote:

Did I provide this? I thought that I just gave sex ratios for Cudjoe / Sugarloaf[.] Maybe this came from a post-translocation dataset?²²

The last published post-translocation monitoring of the Key deer on Cudjoe and Sugarloaf appears to have occurred in 2006.²³ Thus, it appears that the SSA’s population numbers for the Tier II portion of the range are based on information that is approximately 15 years old, and does not reflect the currently on-going sea level rise and hurricane impacts identified by Kate Watts.

Further, a March 2020 paper by Key deer SSA co-author Israel Parker indicates that the population surveys conducted for FWS in 2016 and the years thereafter to assess the impacts of a disease outbreak (screwworm) and of Hurricane Irma, only took place on the “core” area—the Tier I Keys (Big Pine Key and No Name Key)—not the Tier II or Tier III portions of the range; the 2020 study states that while “[b]oth events reduced Key Deer abundance, with Hurricane Irma also causing widespread habitat changes (e.g., vegetation windthrow and loss, flooding, salinization of water holes... The extent of Key Deer mortality outside the core area was

²¹ See May 2021 SSA at Table 5, citing “Watts et al. 2008” for population estimates of all but two of the Tier II Keys; Watts, D. E., I. D. Parker, R. R. Lopez, N. J. Silvy, and D. S. Davis. 2008. Distribution and abundance of endangered Florida Key deer on outer islands. *Journal of Wildlife Management* 72:360–366, at 361 (stating that surveys were conducted between August and December of 2005).

²² Attachment 2, Excerpt from Kate Watts’ Marginal Comments on October 2017 SSA at 25.

²³ See May 2021 SSA at 6 (citing Parker et al. 2008 for latest information regarding the status of the deer on Cudjoe and Sugarloaf Keys); Parker, I. D., D. E. Watts, R. R. Lopez, N. J. Silvy, D. S. Davis, R. A. McCleery, and P. A. Frank. 2008. Evaluation of the efficacy of Florida Key deer translocations. *Journal of Wildlife Management* 72:1069–1075, at 1071-72 (“We monitored translocated Key deer during 2003–2006.”).

unknown, though outer islands such as Little Pine Key lost much of their upland vegetation.”²⁴ And although a population survey effort was conducted in 2020, it apparently covered only the two Tier I Keys (Big Pine and No Name), not the populations for the Tier II or Tier III Keys.²⁵ Again, this indicates that the SSA’s assertions regarding the current condition of the Key deer in the Tier II portion of the range, and its potential for growth, are based on speculation and surmise, and not a fact-based assessment of whether the population is limited by significant, and ongoing, habitat degradation or alteration that has occurred in the last 15 years.

I. The Modeling in the May 2021 SSA Fails to Address an April 2018 Report to FWS Showing More Severe Population Declines Due to Hurricane Irma

The population viability modeling in the May 2021 SSA evaluates probabilities of extinction under each sea level rise scenario for two different sets of “starting” (i.e. present day) populations—the estimated population prior to Hurricane Irma, and the estimated population post-Hurricane Irma. For the “Tier I” population (the Key deer on Big Pine Key and No Name Key), the May 2021 SSA assumes a pre-Irma population of 900 Key deer, and a post-Irma population of 630 Key deer. The pre-Hurricane Irma estimate is based on road-surveys from November 2016 through February 2017 that estimated the Tier I population to be from 825 to 1017 Key deer.²⁶ The May 2021 SSA indicates that its post-Irma estimate of 630 Key deer

²⁴ Parker, Israel et al. (2020). Florida Key Deer Presence on Outer Islands Following New World Screwworm and Hurricane Irma. *Southeastern Naturalist* 19 (1), *available at* <https://doi.org/10.1656/058.019.0115>, at N20 (citing Montalvo, A.E., I.D. Parker, A.A. Lund, and R.R. Lopez. 2018. Lower Keys Marsh Rabbits post-Hurricane Irma. US Fish and Wildlife Service, Vero Beach, FL for assertion regarding habitat loss on Little Pine Key.)

²⁵ See Silvy, Nova et al. (2021), 2020 Key Deer Population Estimate, prepared by Texas A&M Natural Resources Institute for FWS, (file title dated Feb. 17, 2021), at 4, *available at* <https://ecos.fws.gov/ServCat/Reference/Profile/132263>.

²⁶ See May 2021 SSA at Table 5, citing “Parker et al. 2017a” for explanation of how pre-Irma estimates were adjusted to reflect predicted Hurricane Irma impacts; “Parker 2017a”: Parker, I. D., M. Grassi, R. R. Lopez, N. J. Silvy. 2017. Key deer Hurricane Irma report October 2017. National Key Deer Refuge, Big Pine Key, Florida, USA at 4 (“Population estimates from road survey data ranges prior to Hurricane Irma ranges from 825–1,017 deer (CI = 699–1,272) on Big Pine (BPK) and No Name (NNK) keys”); *see also* “Parker 2017b”: Parker, I. D., B. L. Pierce, J. T. Beaver, Lopez, R. R., N. J. Silvy, D.S. Davis. 2017b. Florida Key deer screwworm final report. Texas A&M Natural Resources Institute. College Station, USA at 11 (providing pre-Irma

reflects an estimated reduction of 30% from a pre-Irma population of 900.²⁷ Problematically, the May 2021 SSA entirely fails to mention that an April 2018 report to FWS authored by one of the authors of the SSA (Israel Parker) estimated the post-Irma Tier I population to be down to 573 Key deer based on road-survey estimates conducted in March 2018.²⁸ The April 2018 report explains that the March 2018 road surveys were “the most intense and consistent of the post-Hurricane Irma surveys *and we feel that population estimate is most accurate and precise.*”²⁹

The omission of this information results in underestimating the probabilities of extinction in two ways. First, the modeling starts at a current population of 630 instead of 573, which reflects approximately a 10% inflation of the starting population. Second, the modeling assumes that when a major hurricane occurs, the population will decrease by no more than 30% the year of the hurricane (and will not continue to decline in the years thereafter). The results of the April 2018 report indicate that there was at least a 36% decline from the pre-Irma estimate of 900 (since $900 - 573 = 327$ and $327/900 = 0.363 = \sim 36.3$ percent). Furthermore, a 2021 report to FWS characterizes the data from the 2018 report as showing the population decline caused by Hurricane Irma was estimated to be 40%.³⁰ Thus, the modeling in the SSA is inexplicably using

population estimates for Tier I population based on each set of road surveys from November 2016 through spring 2017).

²⁷ $900 \times 30\% = 270$; $900 - 270 = 630$; see May 2021 SSA at 32 (“Big Pine ... and No Name ... keys ... support up to 80 percent of the entire population with a population abundance ranging from 825 to 1,017 deer (pre-Hurricane Irma, Parker et al. 2017b). The post-Hurricane Irma population estimate was 630 Key deer (approximately 30% reduction due to hurricane-related mortality, Parker et al. 2017b).”).

²⁸ See Parker, I.D., M. Grassi, R. R. Lopez, N. J. Silvy, B. L. Pierce. 2018. Florida Key Deer Hurricane Post-Irma Report *Post-Hurricane Irma Salinity Abundance Analyses* April 2018, Prepared for National Key Deer Refuge, Big Pine Key, Florida, USA, *available at* <https://www.fws.gov/WorkArea/DownloadAsset.aspx?id=2147613878>, at 5 (“Although data is not presented here, windthrow and subsequent vegetation regrowth caused dramatic changes in sightability of Key deer during road surveys. As such, abundance estimates varied (October 2017: $n = 871$, $CI = 698-1086$; November 2017: $n = 478$, $CI = 347-658$; January 2018: $n = 812$, $CI = 548-01$; February 2018: $n = 714$, $CI = 420-1213$; *March 2018: $n = 573$, $CI = 441-743$; Fig. 5). The March 2018 surveys ($n = 16$ surveys) were the most intense and consistent of the post-Hurricane Irma surveys and we feel that population estimate is most accurate and precise.”) (emphasis added).*

²⁹ Parker, I.D., M. Grassi, R. R. Lopez, N. J. Silvy, B. L. Pierce. 2018. Florida Key Deer Hurricane Post-Irma Report *Post-Hurricane Irma Salinity Abundance Analyses* April 2018, at 5 (emphasis added).

³⁰ See Silvy, Nova et al. (2021), 2020 Key Deer Population Estimate, prepared by Texas A&M Natural Resources Institute for FWS, (file title dated Feb. 17, 2021), at 12 (“Hurricane Irma

a 30% population reduction instead of a 40% population reduction to model the impacts of major hurricanes.

The May 2021 SSA does not cite any population data more recent than the April 2018 report. Instead, it relies on scientific reports from the fall of 2017 for the Tier I population numbers. Although FWS conducted extensive new modeling in fall of 2019 to address its failure to use the best available science with regard to sea level rise scenarios (presented in Appendix B of the SSA), it utilized the outdated post-Irma population of 630 for the post-Irma Tier I population in that modeling, instead of the lower post-Irma population of 573 evinced by the March 2018 surveys described in the April 2018 report.³¹ Since the primary author of the April 2018 report, Israel Parker, is also an author of the SSA, and actually conducted the modeling for it, it is difficult to understand why the best available scientific information about the post-Irma population was apparently ignored when the models were revised in the fall of 2019. Similarly, it appears that the modeling assumed the impacts of hurricanes to be only a 30% population reduction for the year of the hurricane.

The effect of this omission of critical scientific information that was obviously available to the SSA authors is to inflate the projected populations and underestimate the probabilities of extinction.

Notably, although FWS very recently released a study dated February 17, 2021 that reports the results of a 2020 population survey of the Tier I Key deer population, it is not at all clear from that study whether the reported population estimates from the 2020 surveys reflect an actual increase in the Key deer population since March 2018, or are largely the result of variance. Although the authors state that “survey data suggests that Key deer numbers were impacted by stochastic weather events and disease, but given sufficient time and appropriate habitat management, they have had the opportunity to be on the rebound”—they offer that assertion *immediately after* seemingly acknowledging that the variance around the recent population estimates is sufficiently large that it precludes finding a significant difference between any of the

making landfall in 2017 ... resulted in an estimated 40% population decline (Parker et al. 2018; Table 2).”), available at <https://ecos.fws.gov/ServCat/Reference/Profile/132263>.

³¹ See May 2021 SSA at Appendix B, 136-146 (showing that modeling used post-Irma starting population of 630 deer for Tier I); *id.* at 148-158 (showing that alternative set of modeling used pre-Irma starting population of 900 deer for Tier I).

estimates discussed.³² Moreover, the authors do not engage in any evaluation of whether a population increase from 573 to 748 or more between March 2018 and 2020—approximately a 30% increase in just two years—is realistic or feasible given the population growth rates for Key deer. It is also notable that stating that the population numbers “*have had the opportunity to be on the rebound*” is distinctly different from stating that the numbers actually are on the rebound.

While the May 2021 SSA does not incorporate or address the 2020 survey results, in future evaluations and revisions to the SSA, the 2020 survey results must be interpreted with caution, and with attention to the confidence intervals around the reported means, as well as the wildly different means associated with surveys using different methods and having different intensities. In future modeling of population viability, care should be taken not to use these estimates as if they represent the actual population count.

II. The Process for Developing the Key deer Species Status Assessment Reflects a Lack of Transparency and a Rush to Strip the Species of ESA Protections

A. FWS Circumvented its Own Regulations Requiring Federal Register Notice of a Five-Year Status Review

Despite the fact that a five-year status review was already two-years overdue by July 2017, and that FWS initiated the SSA development in July 2017 *specifically to inform that 5-year review*, FWS did not comply with its own regulation requiring it to provide notice in the Federal Register when initiating a five-year review.³³ Instead, FWS only notified a list of select “stakeholders.”³⁴ In a July 24, 2017 letter, FWS told those “stakeholders” that it was developing

³² See Silvy, Nova et al. (2021), 2020 Key Deer Population Estimate, prepared by Texas A&M Natural Resources Institute for FWS, (file title dated Feb. 17, 2021), at 12 (“Current Schnabel (n = 748) and pooled distance (n = 1,087) population estimates were greater than Post-Hurricane Irma estimates in 2018 (n = 573) but still slightly below estimates calculated in 2016 after the screwworm outbreak (n = 860; Table 2). *Though none of these estimates are significantly different* (Table 2, Figure 4), survey data *suggests* that Key deer numbers were impacted by stochastic weather events and disease, but given sufficient time and appropriate habitat management, they have *had the opportunity to be on the rebound.*”) (emphasis added), available at <https://ecos.fws.gov/ServCat/Reference/Profile/132263>.

³³ See 50 C.F.R § 424.21. FWS had last completed a mandatory five-year review to evaluate the endangered status of the Florida Key deer in 2010, at which time it concluded that the Florida Key deer should remain listed as endangered.

³⁴ See Attachment 4, June 7, 2018 letter from FWS Florida State Supervisor Larry Williams.

the SSA for the Florida Key deer because: “It has come time to update the most current 5-year review which will evaluate the current status of the species. In support of evaluating the current status of this species, the Service is initiating a Species Status Assessment (SSA)... In this case, the SSA will inform a decision regarding the status of the Key deer, i.e. determination of endangered (no change in status), threatened (downlisting), or protection not warranted (delisting).”³⁵

The general public did not learn about it until February 6, 2018, when a leak to the *Miami Herald* forced FWS to concede to the *Miami Herald* that it was, in the words of FWS spokesperson Ken Warren, “finishing up an evaluation related to the status of the Key deer required under the Endangered Species Act.” The truth, which became apparent later through the FOIA litigation that Sierra Club brought against FWS, was that by January 2018, FWS had already completed the Species Status Assessment and moved on to the next step of using it to make a recommendation on the legal status of the species. In January 2018, the “Recommendation Team” reviewed the legal status of the species and recommended that the Key deer be delisted. Even as of July 10, 2017, FWS’s plans were to have the Recommendation Team make its decision in January 2018 to facilitate the proposal of a delisting rule in FY2018.

Yet FWS never provided notice in the Federal Register that it was initiating a 5-year status review. As FWS Southeast Regional Coordinator Kelly Bibb stated in a January 12, 2018 e-mail discussing whether to remove the Key deer from a pending Federal Register notice initiating 5-year reviews: “We have an internal meeting that has made a decision in the admin record and no 5-yr review was even initiated. We have an unfortunate speed problem.”³⁶ In a January 16, 2018 e-mail, Kelly Bibb stated that “Larry et al” had asked for the Key deer to be removed from the then-pending Federal Register notice announcing the initiation of 5-year reviews for various species.³⁷

In short, FWS knew as of July 2017 that it would be conducting a review of the legal status of the species in January 2018, and that a 5-year review was overdue. But instead of

³⁵ Attachment 4, July 24, 2017 letter from FWS Field Supervisor Roxana Hinzman.

³⁶ Attachment 5, January 12, 2018 E-mail from FWS Southeast Regional Coordinator Kelly Bibb.

³⁷ Attachment 5, January 16, 2018 E-mail from FWS Southeast Regional Coordinator Kelly Bibb.

publishing notice in the Federal Register at that time to notify the public that the status of the Key deer was under review, it proceeded in secret, notifying only a handful of “stakeholders.”

B. FWS Failed to Follow Its Own Guidance That Species Status Assessments Should Be Published When They Are Completed

Instead of following its own guidance indicating that SSAs should be released to the public when completed, and updated frequently thereafter when new scientific information becomes available, FWS kept the January 2018 SSA and the re-evaluation of the species’ legal status based on that SSA, secret.

As stated above, by January 2018, FWS had moved on from developing the Species Status Assessment to the next step of using that scientific report to inform decisions about the legal status of the species. Record documents refer to the Species Status Assessment as having been completed in January of 2018.³⁸ From January 2018 through July 2019, FWS devoted resources to preparing a proposed delisting rule based on the SSA, and even developed a draft post-delisting monitoring plan. FWS guidance on Species Status Assessments directs that Species Status Assessments should be published when they are completed, not delayed pending decision-making utilizing them. *See* August 2016 FWS “SSA Framework” guidance at 8.³⁹ The SSA Framework guidance explains that SSA reports should be “updateable in realtime” because ESA decisions will be “referencing the SSA” report instead of “incorporating it into each ESA” decision. *Id.* FWS clearly believed that the January 2018 SSA was sufficiently complete to rely upon it to review the legal status of the species, and to rely upon it to make a decision to devote agency resources to preparing a proposed delisting rule as well as a post-delisting monitoring plan. Yet it refused to make the January 2018 SSA public.

³⁸ *See Sierra Club v. United States Fish & Wildlife Serv.*, No. CV 19-2315 (JEB), 2021 WL 765727, at *5 (D.D.C. Feb. 26, 2021) (“[C]ontrary to Defendant’s claims, the January 2018 report appears not to be a draft at all. Plaintiff establishes a compelling factual record of the agency itself treating the document as final. In written communications, it referred to the report as “completed in January 2018” and detailed plans to release it to the public in August 2019 after a public information meeting about the status of the deer...In the Court’s view, both serve as clear indicators of finality.”).

³⁹ *See* USFWS Species Status Assessment Framework, Version 3.4,” dated August 2016, available at https://www.fws.gov/endangered/improving_esa/pdf/SSA%20Framework%20v3.4-8_10_2016.pdf.

C. FWS Violated the Freedom of Information Act by Improperly Withholding the January 2018 Species Status Assessment

In response to the February 6, 2018 *Miami Herald* report that FWS was secretly reviewing the ESA listing status of the Florida Key deer, Sierra Club filed a FOIA request in February 2018 for records related to the status review for the Florida Key deer. For the next year and half, FWS dragged its feet in responding to the request and provided only three pages of records as of August 1, 2019, when Sierra Club sued FWS for its failure to comply with FOIA. FWS continued to withhold the January 2018 SSA until March 31, 2021, when FWS released it pursuant to a court order for disclosure obtained by Sierra Club. *See Sierra Club v. United States Fish & Wildlife Serv.*, No. CV 19-2315 (JEB), 2021 WL 765727, at *4–5, *9 (D.D.C. Feb. 26, 2021). That decision also concluded that FWS had failed to meet its burden to justify its extensive withholding of scientific documents related to the Species Status Assessment.

The Service’s unlawful withholding of documents, in violation of FOIA, underlines the disturbing lack of transparency around the preparation of the Species Status Assessment, which is a purely biological report that itself makes no recommendation or decision about the legal status of the species or any policy matter. Again, it appears that FWS was intent on shielding the Species Status Assessment from public scrutiny so that the public would only see it for the first time at the start of a 60-day comment period on a proposed delisting—leaving the public with little time to evaluate the complex modeling underlying its projected probabilities of extinction.

D. FWS Rushed Forward with Developing a Proposed Delisting Rule Based on the January 2018 SSA Without Meaningfully Addressing the Concerns Raised by FWS Scientists and Peer Reviewers

In January 2018, FWS Science Coordinator Steve Traxler raised numerous serious concerns regarding the January 2018 SSA to FWS Recommendation Team member Roxana Hinzman (FWS Field Supervisor). Those concerns included identifying that the January 2018 SSA evaluated impacts under a low-end sea level rise scenario (“C2”) that was no longer sufficiently realistic based on the best available scientific information. In a January 10, 2018 e-mail, Science Coordinator Steve Traxler wrote:

The observed data from 2000-2018 depicts 6 inches of SLR. This makes C2 no longer plausible and C3-C5 highly probable. The disconnect I have is that most of the lower keys are inundated at 4 ft of SLR.... The other huge issue is that habitat

will be lost LONG before inundation, probably a full foot lower root zone issues an[d] freshwater lens issues will occur. We need to quit displaying scenarios that are no longer plausible. 8 years ago a scenario was sometimes shown where SLR would be level or decrease. No one shows that anymore. C1 and C2 need to come off the tables.⁴⁰

In another January 10, 2018 e-mail, Steve Traxler made factual assertions identifying the existence of additional, newer scientific information from the Sea Level Affecting Marshes Model (“SLAMM”) relevant to the impacts of sea level rise on the habitat of the Florida Key deer:

The reference you shown [sic] is one set of scenario that is probably 3-4 years old. The Keys adaptation state listed species project currently underway just did SLAMM modeling of the keys (refined from the Federal Keys adaptation project [sic]). 4 ft of sea level rise removes almost all habitats in the lower keys. The modeling was done by Dr Jason Evans at Stetson University. [H]e has done the previous SLAMM modeling for the federal species proejct [sic] last year.

Notably, external peer reviewer Nils Peterson also raised concerns that the two low-end sea level rise scenarios modeled in SSA were no longer realistic. In comments on the November 2017 peer review version of the SSA, Nils Peterson stated: “It might be worth removing the Scenarios 1 and 2 for sea level throughout the report since they are so unlikely barring massive geo-engineering. You could go with just 3 and 4 or 3-5. That might paint a more realistic picture.”

Instead of addressing FWS Science Coordinator Steve Traxler’s comments by updating the sea level rise scenarios used in the modeling based on the best available scientific information, FWS rushed forward with drafting a proposed rule to delist the species. Rather than correcting the January 2018 SSA’s deficiencies with regard to the sea level rise scenarios *before* proceeding with a proposed rule to delist the species, FWS Regional Director Leo Miranda apparently believed that it was appropriate to plough forward regardless and publish a proposed delisting rule, as long as FWS solicited comments on the “climate change analysis.” In a February 26, 2018 e-mail to FWS hydrologist Lori Miller, who also flagged concerns relevant to

⁴⁰ Attachment 6, FWS Science Coordinator Steve Traxler E-mail Comments, dated January 10, 2018.

the sea level rise analysis in the SSA, FWS Field Supervisor and Recommendation Team member Roxana Hinzman wrote:

Leo is receptive to getting something from us on how we think best to address climate change in our work products (especially SSA in the context of foreseeable future). The appropriate way to describe uncertainty [sic] around climate change models. Etc. He is also willing to specifically ask for public comments on the climate change analysis in the Key Deer FR notice. He wants those two things to dovetail. I'm not sure when the FR notice will go out - but when it does we won't have a lot of time. So I want to make sure we have a plan to get the white paper reviewed and up to the RO for consideration.⁴¹

Thus, rather than resolving whether or not the draft proposed delisting rule was based on the best available science regarding sea level rise *prior to* publishing the proposed delisting, Leo Miranda apparently directed staff to delay resolving that critically important question until *after* the delisting rule was officially proposed.

It was not until July of 2019, after over a year of wasting agency resources on drafting and reviewing a proposed delisting rule, and drafting a post-delisting monitoring plan, that FWS finally asked USGS to review the sea level rise information in the January 2018 SSA.⁴² As a result of FWS receiving the USGS review on August 16, 2019, FWS Refuge Ecologist Lori Miller subsequently prepared a “Sea Level Rise Science Update” for the Key deer SSA on September 30, 2019. That “update” confirmed the concerns raised by Steve Traxler regarding scenarios C1 and C2. Lori Miller’s “update” explained that, as summarized in a 2017 NOAA report, statistical analyses published between 2013 and 2016 showed that the likelihood of sea level rise *exceeding* the projection in scenario C1 was 100%, and that the likelihood of sea level rise *exceeding* the projection in scenario C2 was 96%.⁴³ The “update” explained that for those reasons, those two scenarios had been “eliminated from the current range of SLR scenarios.”⁴⁴ The update also explained that the SSA had omitted the available science regarding the exacerbating impacts of increased tides. As summarized in Appendix B of the May 2021 SSA:

⁴¹ Attachment 7, E-mail from Roxana Hinzman to Lori Miller, dated February 26, 2018.

⁴² See Attachment 8, May 21, 2020 Letter from FWS to Sierra Club at 3.

⁴³ See Attachment 9, Lori Miller September 30, 2019 E-mail and Key Deer SSA Sea Level Rise Science Update at 4; see also May 2021 SSA at 128.

⁴⁴ See Attachment 9, Lori Miller September 30, 2019 E-mail and Key Deer SSA Sea Level Rise Science Update at 4; see also May 2021 SSA at 128 (making the same assertions regarding elimination of scenarios C1 and C2 from set of sea level rise scenarios).

The United States Geological Survey (USGS) Southeast Climate Adaption Center reviewed the Key deer SSA in August 2019. *The peer review indicated that the SSA did not include the most recent and relevant 2017 science* such as rapid ice melt in Greenland and Antarctica along with other regional processes like tidal influence. The sea level rise (SLR) projections used in the SSA were based on the Intergovernmental Panel on Climate Change 2013 report (IPCC 2013). The new peer reviewed SLR projections used in this Appendix are based on the National Oceanic and Atmospheric Administration 2017 report (NOAA 2017).⁴⁵

In August of 2019, despite the fact that the USGS review was still pending, FWS had announced to the public on August 9th that it would be releasing the January 2018 SSA on August 22, 2019 along with information regarding a proposed rule to change the status of the species. After receiving the USGS review on August 16th, FWS subsequently “pulled back” the SSA and proposed delisting rule shortly before the August 22, 2019 public meeting.⁴⁶

FWS then undertook a rushed process to address the failure of the January 2018 SSA to incorporate the best available information about sea level rise. Rather than establish timelines for re-evaluating the legal status of the species based on the completion of new modeling to reflect the updated sea level rise scenarios, FWS apparently set an early October deadline for a new Recommendation Team meeting, and then rushed the scientists doing the modeling to meet that arbitrary and artificial deadline. In a September 26, 2019 e-mail Matt Dekar stated that the external scientists FWS had hired to do the modeling, Roel Lopez and Israel Parker were concerned about whether they could complete all of the modeling runs before the October 2, 2019 Recommendation Team Meeting, because FWS had not been timely in providing them with data about the updated habitat amounts to use in the modeling.⁴⁷ It appears that those scientists were only notified of the need to update the modeling around September 19-20 of 2019. Given this rush, it is perhaps not surprising that the revisions to the SSA that were made at that time are fraught with errors, and further, that they failed to correct or even evaluate many of the other problems with the SSA and the modeling.

Following the October 2, 2019 Recommendation Team Meeting, FWS immediately began working on a rule to downlist the species to threatened instead of delisting it. Due to the

⁴⁵ See May 2021 SSA at 127 (emphasis added).

⁴⁶ See Attachment 8, May 21, 2020 Letter from FWS to Sierra Club at 3-4.

⁴⁷ See Attachment 10, E-mail from Matt Dekar, dated Sept 26, 2019.

Trump Administration’s rescission of the blanket 4(d) rule in August of 2019, the impact of a downlisting would be that the Key deer would be stripped of all take protections except for those specifically provided in a species-specific 4(d) rule. Further, due to the August 2019 rescission of the blanket 4(d) rule, obtaining vacatur of an inadequate species-specific 4(d) rule through litigation would no longer result in automatic reinstatement of full take protections. In sum, FWS could strip the species of protections via a downlisting rather than delisting.

Based on the information provided in the March 2021 and May 2021 versions of the SSA, it does not appear that FWS made any effort to meaningfully re-evaluate or update the SSA between fall of 2019 and May 2021.⁴⁸ Again, having reached a hasty recommendation to change the status of the species, it proceeded to rush forward with developing a proposed rule.

E. FWS Attempted to “Embargo” the Florida Keys Terrestrial Adaptation Project Report Because It Would Undermine the Proposal to Delist the Florida Key Deer

E-mails obtained via a public records request to the Florida Fish and Wildlife Conservation Commission indicate that FWS attempted to delay public availability of a joint report on climate change impacts to ESA listed species in the Florida Keys. The Florida Keys Terrestrial Adaptation Report titled “Florida Keys Case Study on Incorporating Climate Change Considerations into Conservation Planning and Actions for Threatened and Endangered Species” was authored by staff from FWS (Steve Traxler), the Florida Fish and Wildlife Conservation Commission (Logan Benedict, Bob Glazer, and Beth Stys), The Nature Conservancy (Chris Bergh), and Stetson University (Jason Evans). This report acknowledges dire consequences for the Florida Key deer as a result of sea level rise. In June of 2019, co-author Bob Glazer notified FWS Science Applications Program Acting External Affairs Assistant Regional Director Todd Hopkins that the report was complete. Rather than make the report publicly available, subsequent emails from Todd Hopkins and Bob Glazer indicate that FWS attempted to delay the broad release of the report due to concerns about the impact on FWS’s pending proposal to delist the Key deer. In an August 23, 2019 e-mail, Bob Glazer stated to co-author Beth Stys, “Chris sent me his notes from the public Key Deer meeting. There has been a lot of misinformation from the

⁴⁸ See May 2021 SSA at iii (discussing changes between versions); March 2021 SSA at iii (same).

press as well as the FWS. *As you know, they were trying to embargo our report until the dust settles on this issue* so I am thinking that the information they provided is disingenuous to some extent.”⁴⁹

In a July 15, 2019 email, Todd Hopkins directed FWS Science Applications Program staff to hold off on uploading the KeysTAP report into an on-line catalog because: “we are waiting a bit for the FWS. It just came out and we are working on how to communicate this info - it’s climate change, it’s bad news for most keys species, and FWS is wanting to de-list Key deer this FY ... we need to be sensitive about how much noise we make on this. I’ve looped in R4 ES and Refuges and Brian Hires (HQ) already. Once we get the ‘all clear’ from the HQ and R4 comms folks, we’ll post it.”⁵⁰

In a November 18, 2019 email from FWS Todd Hopkins about delaying publication of the KeysTAP report, he stated: “We went back and forth on this with Phil Kloers in the RO and Brian Hires in HQ back in August after the final report came to me in July. *They wanted to wait (I believe) until the Key Deer SSA was revisited or at least settled.* I’ve not seen anything public about a decision, but internally I’m told that after the USGS peer-review of the SSA, they decided not to de-list but rather to down-list the key deer. FWC has sent this report out to its people and I believe that AFWA or SEAFWA was also sent it. *It isn’t posted anywhere online yet that I know of.* It was funded by Sci Apps and the work was done by FWC and TNC with significant FWS involvement (Traxler).”⁵¹

That FWS would attempt to suppress the publication and distribution of a scientific report regarding climate change impacts to the Florida Key deer, specifically because it would contradict or undermine FWS’s pending proposal to delist the species, again demonstrates that the Service’s consideration of impacts to the Key deer was tainted by a drive on the part of some FWS officials and staff to strip the species of protections as quickly as possible, and regardless of the best available scientific information.

⁴⁹ Attachment 11, E-mails from Bob Glazer and Todd Hopkins, dated June 27, 2019 through November 18, 2019 (emphasis added).

⁵⁰ Attachment 11, E-mails from Bob Glazer and Todd Hopkins, dated June 27, 2019 through November 18, 2019.

⁵¹ Attachment 11, E-mails from Bob Glazer and Todd Hopkins, dated June 27, 2019 through November 18, 2019 (emphasis added).

Attachment 1

Comments of FWS Science Coordinator Steve Traxler, dated January 24, 2018¹

¹ This record was obtained by Sierra Club from FWS in the course of litigation regarding Sierra Club's February 2018 FOIA request.

Very Draft SSA thoughts/comments

FROM: Steve Traxler

TO: Roxanna Heinzman

CC: Lori Miller, Layne Bolen, Shana DiPalma

DATE: 1/24/2018

Regional recommendations

1. **Determine foreseeable future early in the SSA process.** Having foreseeable future determined on the day of the SSA decision framework appears to be counter intuitive. Typically, in a project or scientific endeavor, the parties come together early in the process and determine what assumptions/parameters will be used in the effort. If foreseeable future was determined early in the SSA process then all of the modeling and other SSA aspects could be have that information incorporated in the results section. Less subjective discussions would occur on that information. To have 3 people who may or may not have the same amount of knowledge of the area as the SSA team, determine foreseeable future during a meeting is counterproductive to using the best available science.
2. **Vet resilience/PVA type models.** There needs to be some type of vetting of the models being used to determine resilience, extinction, etc. The Key Deer SSA team during the SSA decisional meeting briefly discussed the difficulty of the model to have species numbers drop below 100 even though it appeared that most of the available habitat for the species was gone due to sea level rise.
3. **Use root zone/freshwater lens impact level as when sea level rise causes issues.** Sea level rise inundation is one measure of impact, but many studies are now using the impact to root zone or freshwater lens zone as being the more important discussion parameter. This can often happen 1-2 feet below the sea level rise inundation impacts and greatly speeds up the timeline for species effects as well as exacerbated impacts. In the case of the key deer, long before inundation the freshwater lens could have salt water intrusion and the uplands plants could have transitioned to mangroves or the habitats could be without the primary plant community.
 - a. A study of when sea level rise impacts will affect the Florida Keys may be useful for future SSAs and 5 year status updates. This type of project is relatively easy for USGS and could be recommended for future SSA support.
4. **Standardize 1-2 scenarios across USFWS programs for Florida.** These scenarios at a minimum should include Sea level Rise, Temperature, and Precipitation. The methodology that the South Florida Ecological Service office has employed working with staff in the CERP and ES sections could be expanded statewide. The outcome of the CERP and ES office was to use the NOAA high sea level rise scenario (see document

being developed by Lori Miller). I recommend that the SFESO use those scenarios previously discussed and develop impacts to the various species and habitats. When needed additional regional scenarios can also be used in the analysis. The PFLCC has much of this information on the PFLCC Conservation Planning Atlas. There might be an opportunity for Science Applications to lead this effort in the SE.

5. **SSA leads and team members should take the NCTC climate smart conservation and scenario planning class.** NCTC offers a class on climate smart conservation and scenario planning. I think we should recommend anyone leading an SSA to have taken those classes.
 - a. The USFWS has developed a scenario planning handbook. This document should be a starting point for use in these SSAs.
<https://www.fws.gov/home/feature/2014/pdf/Final%20Scenario%20Planning%20Document.pdf>
6. **Develop stakeholder based scenarios.** Stakeholder based scenarios take more work up front but typically have better acceptance when making decisions on habitats and species.
7. **Stop using scenarios that are no longer possible.** Past IPCC assessments were 1990, 1995, 2001, 2007, and 2014. These are based on peer reviewed information and typically this process uses data that is at least 2-3 years old. In Florida we have had the ability and data over the last few years to develop local and regional sea level rise scenarios incorporating IPCC results with local data collection and future projections. What we typically see is that for each new IPCC report, the low projections or 2 quickly drop off the plausible or realistic scenario discussion and the middle projection will become the low projection. As an example, in 2010 scenarios were developed by stakeholders for south Florida that used 6 inches as one low SLR scenario and even had another scenario that depicted no SLR. Through the monitoring tidal information collected in Florida these scenarios have been determined to no longer be possible. The recent Key West tide data indicates that since the year 2000 the sea level rise is near 6 inches, which is no longer a linear curve (Dr. Jerry Lorenz, Audubon, personnel communication and working in Florida Bay). This is important because if true, this is the initial step to be able to see SLR in the accelerated portions of the SLR curves and makes 1-2 m of SLR by 2100 scenarios very plausible.

The Key deer SSA in the executive summary table discusses that the 2 low scenarios through the literature are no longer possible. Just as the 2010 low scenarios were removed from discussion we should remove the 2 low scenarios in the Key deer SSA. By showing that information we are not allowing the addition of two more plausible scenarios. Typically 3-5 scenarios creates a nice range of information to review.
8. **Use regional impact tools when available.** During the key deer SSA discussion it was mentioned that not much information was available discussing habitat impacts. Much of Florida has had Sea Level Rise affecting Marsh Model (SLAMM) modeling previously completed. All Florida USFWS coastal refuges and the gulf coast of Florida have been

SLAMM modeled. The Florida Keys have had SLAMM modeling completed multiple times over the last 5 years including twice in the last 1.5 years. The key to good SLAMM modeling results is good topography and with LIDAR the results keep getting better.

9. **Check the validity of information related to SLR.** The Key Deer SSA used figures that depicted sea level rise scenarios reaching up to 80 inches. Overall the keys may be high enough to allow that to occur, but Big Pine Key loses 96% of available land to inundation at 54 inches. The reason that the Florida Keys 21 federally listed terrestrial species project stopped the SLR scenarios at 4 ft. is because that heavily impacted all of the keys and almost completely impacted the lower keys. In fact, the local stakeholder based team determined that 1.5 - 3 feet of SLR caused damaging impacts to many of the habitats and species Florida keys wide and all of the lower Florida keys species.

Attachment 2

Excerpt from Kate Watts' Marginal Comments on October 2017 SSA²

² This record was obtained by Sierra Club from FWS in the course of litigation regarding Sierra Club's February 2018 FOIA request.

SPECIES STATUS ASSESSMENT FOR THE FLORIDA KEY DEER (*ODOCOILEUS VIRGINIANUS CLAVIUM*)

I. PARKER, M. MARSHALL, D. BECKER, B. POWELL



Prepared by:
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SSA Report – Florida Key Deer

Table 5 - Estimated abundance of Key deer throughout their range derived from various sources (numbers correspond with Figure 8, Lopez et al. 2016*). Included is the final density estimate used in the Bayesian model derived using post-Hurricane Irma data.

Tier Island complex	Area (ha)	Density Estimate	Density Estimate	Density Estimate	Source
		(low)	(high)	(final model value)	
Tier I				900	
Big Pine	2,522	749	921	850	A
No Name	459	76	96	50	A
Tier II				130	
Little Pine	381	14	17	14	B
Howe	373	12	15	12	B
Big Torch	626	14	17	14	B
Cudjoe	1,319	42	50	40	C
Sugarloaf	1,399	42	50	40	C
Newfound Harbor	76	30	36	10	B
Tier III				20	
Annette	222	<1	<1	1	B
Johnson	154	<1	<1	1	B
Knockemdown	582	4	5	4	B
Ramrod	374	<1	<1	1	B
Summerland	436	<1	<1	1	B
Little Torch	305	6	8	10	B
Middle Torch	410	2	3	2	B

Commented [WK20]: Did I provide this? I thought that I just gave sex ratios for Cudjoe / Sugarloaf Maybe this came from a post-translocation dataset?

*Some of the estimates adjusted based on predicted impacts due to Hurricane Irma (Parker et al. 2017).
A = estimates obtained in Lopez et al. 2016
B = estimates reported by Watts, D. E., I. D. Parker, R. R. Lopez, N. J. Silvy, and D. S. Davis. 2008. Distribution and abundance of endangered Florida Key deer on outer islands. *Journal of Wildlife Management* 72:360-366.
C = estimates obtained by Kate Watts, Key deer biologist in November 2015 (personnel communication) Population estimates from both B and C are pre-screwworm incident and are likely overestimated. Assuming a 15 percent population impact (percent observed on Big Pine and No Name Kkeys), a low population estimate was calculated for outer keys. Estimate for Big Pine and No Name Kkeys already adjusted.

population impacts from changes in vegetation habitat selection ratios. Further research demonstrated that the Key deer population in the core population (Tier I islands) was approaching carrying capacity under then-current conditions as early as the mid-2000s (Barrett and Stiling 2006, Barrett and Stiling 2007). Changes in vegetation structure (e.g., declines in preferred browse species) and other related impacts to invertebrate populations supported these conclusions. Although, density-dependent and capable of impacting their local environment, the core Key deer numbers continued to increase with few concomitant issues traditionally seen in highly dense white-tailed deer populations (e.g., disease outbreaks, malnutrition). The Key deer herd is seemingly healthy. It is possible that additional factors supported the increased population (e.g., supplemental feeding by people, improved habitat maintenance by government personnel). However, this requires additional study.

Commented [WK22]: We are seeing both of these issues in the current population

Freshwater Availability

Water availability is a limiting factor for deer populations on any island or island complex (USFWS 1999, Lopez 2001). While pineland and hammock habitats accounted for 34 percent of Key deer range, permanent freshwater sources in these habitat types accounted for approximately 58 percent of all freshwater sources (Lopez et al. 2003a; Figures 11–14). Freshwater marshes are also a source of freshwater for Key deer (Folk 1991) and accounted for approximately 28 percent of all freshwater sources (Lopez et al. 2003a). With limited water availability, Key deer are relatively adapted to moderate salt contamination of water sources. Some evidence indicates that they can tolerate brackish water of 5 ppt over a long period and 15 ppt over short periods; however, the evidence is still rather limited. This tolerance has been tested periodically by storm surge from hurricanes that salinized waterholes in Key deer habitat (Lopez et al. 2003a). However, little additional research has been conducted concerning Key deer-specific physiological requirements for water.

USFWS and TAMU personnel periodically have installed freshwater guzzlers to supplement available water sources and to provide additional incentive for translocated deer to remain on target islands. Freshwater was used as bait during some Key deer capture efforts in areas with limited freshwater availability. A freshwater lens rests upon salt water in the porous limestone substrate of the Lower Florida Keys. Only about 20 percent of the rainwater actually recharges this freshwater lens (USFWS 2010a). As such, droughts, sea-level rise and hurricanes can dramatically impact freshwater availability in the short- and long-term by disturbing the relatively fragile freshwater system. Sea-level rise has already caused salinization of some freshwater holes and impacted vegetation communities (Ross et al. 1994, Zhang et al. 2011, Ogurcak 2015).

Attachment 3

Excerpt from Kate Watts' Marginal Comments on October, 4 2017 Draft of
Current and Future Conditions Section of SSA

(file name "10042017_Current and Future Conditions_KWedit.docx")²

² This record ("10042017_Current and Future Conditions_KWedit.pdf") was obtained by Sierra Club from FWS in the course of litigation regarding Sierra Club's February 2018 FOIA request.

Tier II

Tier II has fewer data and therefore extrapolation is required. We must assume that sex ratios and reproduction are the same as the core population. Key deer generally maintain a population that is 61% female (Lopez et al. 2005, USFWS 2016, Figure 7, Figure 8). Extrapolation of current Tier II (154-185 deer) abundance provides female estimates (Tier II = 94-113 females). These abundance estimates are well above the minimum of 50 deer that was needed for population growth (Harveson et al. 2006).

The Tier II population has **Moderate resiliency** with a terminal extinction rate between 1-1.5% and quasi-extinction chances of 4.9%-9.1% (25-deer threshold) and 22.7%-30.4% (50-deer threshold). These populations, particularly those on Cudjoe and Sugarloaf have required concerted management efforts to increase the population. The USFWS translocated 39 deer to these islands in 2003-2005 (Parker et al. 2008). However, these islands have growth potential as they are under carrying capacity (Harveson et al. 2006) and population growth would reduce extinction and quasi-extinction risks.

Commented [k4]: The Refuge has camera survey data that provides sex ratios on these two islands if you'd like to use it.

Commented [k5]: Given the loss of freshwater sources on these two islands due to sea level rise and storm events over the last 15 yrs, is this still true? If the population has not grown considerably, is it appropriate to assume that it still has room to grow? For example, Cudjoe Key now has only a handful of water bodies that remain fresh throughout the year. Freshwater marsh is being replaced by saltmarsh and mangrove (current and future condition). Additionally, what was pine rockland on Upper Sugarloaf has now transitioned into a more tidally-influenced halophytic habitat after Hurr. Wilma (Ogurcak, Ross, Moyer, Hester datasets). You discuss vegetation association changes later on in the doc. Not sure if this matters for the PVA/risk analysis, but just checking the assumption.

Attachment 4

Letter from FWS Florida State Supervisor Larry Williams, dated June 7, 2018,³
with Enclosed Copy of a July 24, 2017 Letter from FWS Field Supervisor Roxanna Hinzman to
“Key Deer Partners”

³ Sierra Club received a hard copy of this letter from Larry Williams via mail from FWS on June 14, 2018.



United States Department of the Interior



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

June 7, 2018

Jason Totoiu
Executive Director
Everglades Law Center, Incorporated
331 West Central Avenue, Suite 213
Winter Haven, Florida 33880

Dear Mr. Totoiu;

Thank you for your May 25, 2018, letter expressing your interest in Key deer recovery. We appreciate the support all the organizations provide in conserving threatened and endangered species.

Recently the U.S. Fish and Wildlife Service (Service) implemented a Species Status Assessment (SSA) framework to ensure that we base all of our decisions on the best available science. We initiated an SSA for Key deer in July 2017, and we announced that via the enclosed letter. The letter was sent by email in early August 2017 to more than 25 stakeholders from the State, County, Tribes, congressionals, universities, and nongovernmental organizations – including Last Stand, Save Our Key Deer, and Key Deer Protection Alliance. The letter solicits information from all these partners and explains how the SSA is intended to inform regulatory and policy decisions; but will be developed independently from any such decisions. If we have a proposed decision that requires notice in the *Federal Register*, it along with the associated SSA will be posted for public review and comment.

The Service appreciates the information your organizations provided. If you have questions about the SSA framework, please contact Roxanna Hinzman, Field Supervisor for the South Florida Ecological Services Field Office, at roxanna_hinzman@fws.gov or 772-469-4309.

Sincerely,

Larry Williams
State Supervisor
Florida Ecological Services

Enclosure

cc:

Center for Biological Diversity, St. Petersburg, Florida (Jaclyn Lopez)
Key Deer Protection Alliance, Big Pine Key, Florida (Alicia Putney)
Last Stand, Key West, Florida (Mark Songer)
Sierra Club, St. Petersburg, Florida (Frank Jackalone)
Sierra Club, Washington, DC (Karimah Schoenhut)



United States Department of the Interior



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

July 24, 2017

Dear Key Deer Partner:

The Key deer is an endangered species that is endemic to the Florida Keys in Monroe County Florida. The U.S. Fish and Wildlife Service (Service) listed the Key deer as an endangered species under the Endangered Species Act of 1973, as amended (Act) (87 Stat. 884; 16 U.S.C. 1531 *et seq.*) on March 11, 1967 (32 FR 4001). Over the last 50 years, the Service has worked closely with partners to make significant progress toward recovery of the species. It has come time to update the most current 5-year review which will evaluate the current status of the species. In support of evaluating the current status of this species, the Service is initiating a Species Status Assessment (SSA).

The SSA framework is intended to generate a highly integrated, explicit, and scientifically based approach to evaluate the biological and conservation status of a species. The Key deer SSA will begin with a compilation of the best available information on the species (taxonomy, life history, and habitat) and its ecological needs at the individual, population, and/or species levels. Next, the SSA will describe the current condition of Key deer habitat and demographics, and the probable explanations for any past or ongoing changes in these parameters. Finally, the SSA forecasts the species response to probable future scenarios of environmental conditions and conservation efforts. The Service is currently soliciting scientific information that would be useful in the development of the SSA as described above.

The SSA is intended to inform regulatory and policy decisions, but be developed independently from any such decisions. In this case, the SSA will inform a decision regarding the status of Key deer, *i.e.* determination of endangered (no change in status), threatened (downlisting), or protection not warranted (delisting). Once a status determination has been fully developed, we will provide you with additional information. We will ultimately provide a public notification of our finding in the *Federal Register*. Any associated proposed rulemakings would include an opportunity for the public to review and comment.

We will accept new information throughout this process, but would be most helpful if it was provided by September 1, 2017. Information and questions should be submitted to: Drew Becker, Recovery Coordinator, Southeast Regional Office, U.S. Fish and Wildlife Service, 1875 Century Blvd., Atlanta, Georgia, 30345, (404) 679-7226, keydeerssa@fws.gov. All data and information submitted to us, including names and addresses, will become part of the administrative record.

Sincerely yours,

Roxanna Hinzman
Field Supervisor
South Florida Ecological Services Office

Attachment 5

January 2018 E-mails from FWS Southeast Regional Coordinator Kelly Bibb¹

¹ The records of these e-mails were obtained by Sierra Club as a result of its February 2018 FOIA request to FWS regarding the Key deer status review, and the litigation associated with that FOIA request.



Dekar, Matthew <matthew_dekar@fws.gov>

Key deer follow up

3 messages

Lamp, Nikki <nikki_lamp@fws.gov>

Thu, Jan 11, 2018 at 5:41 PM

To: Roxanna Hinzman <roxanna_hinzman@fws.gov>, Brian Powell <brian_powell@fws.gov>, Matthew Dekar <matthew_dekar@fws.gov>, Kelly Bibb <kelly_bibb@fws.gov>

Hi all,

I missed the final part of the discussion on SPR at yesterday's meeting, but what I think I heard is a proposed delisting rule will be recommended. If that's the case, I think we should re-think including this species in the 5-year review FR initiation notice Kelly is moving through sumame (maybe this was already discussed in the RO?).

In the past, we have indicated in proposed downlisting or delisting rules that the proposed rule also serves as the 5-year review. And since we have public comment periods with the proposed rules the public would still have opportunity to comment and provide any new info.

Thoughts?

Nikki

Nikki Lamp, Ph.D.
Endangered Species Supervisor
U.S. Fish and Wildlife Service
South Florida Ecological Services Office
1339 20th Street
Vero Beach, FL 32960
Office: 772-469-4303
Cell: 772-925-2005

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Follow us on InstaGram @usfw_south_florida
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Bibb, Kelly <kelly_bibb@fws.gov>

Fri, Jan 12, 2018 at 4:12 AM

To: "Lamp, Nikki" <nikki_lamp@fws.gov>

Cc: Roxanna Hinzman <roxanna_hinzman@fws.gov>, Brian Powell <brian_powell@fws.gov>, Matthew Dekar <matthew_dekar@fws.gov>

I wish I could have joined that meeting.

In general, Nikki (of course you know this cause we worked together) a proposed rule can be your actual 5-year review because its a five factor analysis and a recommendation. [so it is done at that point]

Matthew and I talked about the problem here. We have an internal meeting that has made a decision in the admin record and no 5-year review was even initiated. We have an unfortunate speed problem. We are late in making our 5-year commitment.

[Quoted text hidden]

Kelly A. Bibb
U.S. Fish and Wildlife Service
Southeast Regional Recovery Coordinator
Southeastern U.S., Puerto Rico and U.S. Virgin Islands
1875 Century Boulevard
Atlanta, GA 30345
404-679-7132 (phone)
404-679-7081 (fax)
kelly_bibb@fws.gov

"You don't step on enthusiasm." "Perpetual optimism is a force multiplier." - Former Secretary of State and retired four star General, Colin Powell

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4/9/2018

DEPARTMENT OF THE INTERIOR Mail - Key deer follow up

Fri, Jan 12, 2018 at 4:16 AM

Bibb, Kelly <kelly_bibb@fws.gov>

To: "Lamp, Nikki" <nikki_lamp@fws.gov>

Cc: Roxanna Hinzman <roxanna_hinzman@fws.gov>, Brian Powell <brian_powell@fws.gov>, Matthew Dekar <matthew_dekar@fws.gov>

Could the FWS with science make a proposed rule at any time? sure

But we normally have a procedure to do that and we notify the public in the Unified Agenda - open gov't forecast

Timing has made this situation odd

[Quoted text hidden]



Dekar, Matthew <matthew_dekar@fws.gov>

Re Initiation of a 5-Year Review For Gulf Sturgeon

Bibb, Kelly <kelly_bibb@fws.gov>

Tue, Jan 16, 2018 at 1:01 PM

To: Mark Cantrell <mark_a_cantrell@fws.gov>

Cc: Matthew Dekar <Matthew_Dekar@fws.gov>, Adam Kaeser <adam_kaeser@fws.gov>, "Phillips, Catherine" <catherine_phillips@fws.gov>, Sean Blomquist <sean_blomquist@fws.gov>

just for your use Mark
because Larry et al have asked us to remove key deer
so just keep this for your internal consideration as format 🙄

[Quoted text hidden]

**2018110 5 yr review draft FR Notice for 36SE.doc**

75K

Attachment 6

FWS Science Coordinator Steve Traxler E-mail Comments, dated January 10,
2018⁴

⁴ FWS released this record to Sierra Club in the course of litigation regarding Sierra Club's February 2018 FOIA request.

From: [Miller, Lori](#)
To: [Traxler, Steve](#); [Miles Meyer](#)
Cc: [Roxanna Hinzman](#); [Brian Powell](#)
Subject: Re: Key Deer SS SLR discussion
Date: Wednesday, January 10, 2018 12:52:54 PM

Rox, here are my 2 cents. I could not answer the **Ex 5 DPP** (C2-C5) of inundation question you posed to Steve and me this morning as I was not asked to consult on this SSA. I do know that the SLR scenarios presented were 3 years old and from the SE FL Compact. I have not read the Key Deer SSA, so I'm not sure if the NOAA 2017 report was cited or not. But we really need to be using the latest data (which as Israel pointed out is changing at a pretty fast pace.)

You made a comment this morning that there really isn't any urban development models for determining habitat loss (at least that is what I think I heard). The Atlas website has an urban development model used and presented in the mole skink SSA that calculates habitat loss. Shana performed that analysis. So there is some modeling available for urban development.

I have a climate change team meeting in the morning with Steve, Shana, and Layne. We are going to discuss the status of new modeling, standardizing sea level rise scenarios for the office (I have already written this summary), and using climate change in SSAs. As I mentioned in another email to you recently, I would really like for us to sit down and discuss this, especially in the light of the upcoming call with Laura Brandt.

Let me know if I can help in any way.
Lori

On Wed, Jan 10, 2018 at 10:15 AM, Traxler, Steve <steve_traxler@fws.gov> wrote:

The reference you shown is one set of scenario that is probably 3-4 years old.

The Keys adaptation state listed species project currently underway just did SLAMM modeling of the keys (refined from the Federal Keys adaptation project). 4 ft of sea level rise removes almost all habitats in the lower keys. The modeling was done by Dr Jason Evans at Stetson University. e has done the previous SLAMM modeling for the federal species project last year.

Steve Traxler

Peninsular Florida LCC Science Coordinator
US Fish & Wildlife Service
[1339 20th Street](#)
[Vero Beach, FL](#)
Phone: 772-469-4265
Cell: 772-532-6537

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On Wed, Jan 10, 2018 at 10:06 AM, Traxler, Steve <steve_traxler@fws.gov> wrote:

Rox:

FYI. The observed data from 2000-2018 depicts 6 inches of SLR. This makes C2 no longer plausible and C3-C5 highly probable. The disconnect I have is that most of the lower keys are inundated at 4 ft of SLR, (b) (5)

The other huge issue is that habitat will be lost LONG before inundation, probably a full foot lower root zone issues an freshwater lens issues will occur.

We need to quit displaying scenarios that are no longer plausible. 8 years ago a scenario was sometimes shown where SLR would be level or decrease. No one shows that anymore. C1 and C2 need to come off the tables.

I am working on a write up with recommendations discussing this email in more detail.

Sincerely,

Steve Traxler

Peninsular Florida LCC Science Coordinator
US Fish & Wildlife Service
[1339 20th Street](#)
[Vero Beach, FL](#)
Phone: 772-469-4265
Cell: 772-532-6537

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--

Lori Miller
Senior Hydrologist, CFM
Environmental Engineer
Everglades Restoration
U.S. Fish and Wildlife Service
1339 20th Street
Vero Beach, FL 32960
772.469-4231

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Attachment 7

E-mail from Roxana Hinzman to Lori Miller, dated February 26, 2018.⁵

⁵ FWS released this record to Sierra Club in the course of litigation regarding Sierra Club's February 2018 FOIA request.

From: [Hinzman, Roxanna](#)
To: [Miller, Lori](#)
Cc: [Traxler, Steve](#)
Subject: Re: Invitation: Meet for lunch to discuss climate change white paper @ Wed Feb 28, 2018 12pm - 1:30pm (EST)
(lori_miller@fws.gov)
Date: Wednesday, February 28, 2018 9:15:34 AM

No others. Just the one that you all were preparing (or had prepared in which case I need to see it so please bring it along or send it to me ;o).

Roxanna Hinzman, Field Supervisor
U.S. Fish and Wildlife Service South Florida Ecological Services Field Office
1339 20th Street
Vero Beach, FL 32960
Desk 772-469-4309
Cell 772-532-1247
Fax 772-562-4288
roxanna_hinzman@fws.gov

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On Tue, Feb 27, 2018 at 11:22 AM, Miller, Lori <lori_miller@fws.gov> wrote:

The only white paper I am aware of is the one that I prepared for Florida. Is this the white paper we are discussing or is there another one that I have not seen yet? If there is another white paper that you are referring to, could one of you send it my way please?

Thanks,
Lori

On Mon, Feb 26, 2018 at 3:15 PM, Hinzman, Roxanna <roxanna_hinzman@fws.gov> wrote:

This is about our afternoon discussion when Laura Brandt was here. Leo is receptive to getting something from us on how we think best to address climate change in our work products (especially SSA in the context of foreseeable future). The appropriate way to describe

uncertainly around climate change models. Etc. He is also willing to specifically ask for public comments on the climate change analysis in the Key Deer FR notice. He wants those two things to dovetail. I'm not sure when the FR notice will go out - but when it does we won't have a lot of time. So I want to make sure we have a plan to get the white paper reviewed and up to the RO for consideration.

Thanks,
Rox

Roxanna Hinzman, Field Supervisor
U.S. Fish and Wildlife Service South Florida Ecological Services Field Office
[1339 20th Street](#)
[Vero Beach, FL 32960](#)
Desk 772-469-4309
Cell 772-532-1247
Fax 772-562-4288
roxanna_hinzman@fws.gov

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On Mon, Feb 26, 2018 at 2:59 PM, Miller, Lori <lori_miller@fws.gov> wrote:
Sure thing Rox. I'm not sure what this is about. So, if you could give me a brief overview, that would be helpful!

Lori

On Mon, Feb 26, 2018 at 2:45 PM, Hinzman, Roxanna <roxanna_hinzman@fws.gov> wrote:

Let's say 11:45. If y'all get there before me, I'd like a BLT on wheat toasted, with Fries and a soda. I'll pay them or you (whoever orders ;o).

THANKS! Getting this up to RO is super important, so I want to make sure we hit the timeline and the mark. Appreciate y'all making time.

Rox

Roxanna Hinzman, Field Supervisor
U.S. Fish and Wildlife Service South Florida Ecological Services Field Office
[1339 20th Street](#)
[Vero Beach, FL 32960](#)
Desk 772-469-4309
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roxanna_hinzman@fws.gov

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On Mon, Feb 26, 2018 at 2:43 PM, Traxler, Steve <steve_traxler@fws.gov> wrote:
I am open, either time works

Steve Traxler

Peninsular Florida LCC Science Coordinator
US Fish & Wildlife Service
[1339 20th Street](#)
[Vero Beach, FL](#)
Phone: 772-469-4265
Cell: 772-532-6537

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On Mon, Feb 26, 2018 at 2:41 PM, Miller, Lori <lori_miller@fws.gov> wrote:
yeah 11:45 or 11:30 should be better.

On Mon, Feb 26, 2018 at 2:39 PM, Hinzman, Roxanna
<roxanna_hinzman@fws.gov> wrote:

Do we want to shoot for 11:45? Will that help at all? (I left another meeting on the calendar that has been moved to block the time until we see what works for us - so am more flexible than my calendar looks ;o)

Roxanna Hinzman, Field Supervisor
U.S. Fish and Wildlife Service South Florida Ecological Services Field Office
[1339 20th Street](#)
[Vero Beach, FL 32960](#)
Desk 772-469-4309
Cell 772-532-1247
Fax 772-562-4288
roxanna_hinzman@fws.gov

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On Mon, Feb 26, 2018 at 2:36 PM, Miller, Lori <lori_miller@fws.gov> wrote:
Yay Caseys!!!! It's gonna be crazy at noon. So bring your patience! haha
Lori

On Mon, Feb 26, 2018 at 2:33 PM, Roxanna Hinzman
<roxanna_hinzman@fws.gov> wrote:

Meet for lunch to discuss climate change white paper [more details »](#)

I'm sorta feeling like being outside and having a BLT. If one or both of you prefer somewhere else I'm totally open to wherever ;o)

When Wed Feb 28, 2018 12pm – 1:30pm Eastern Time

Where Casey's Place, [917 Azalea Ln, Vero Beach, FL 32963, USA](#) ([map](#))

Video call https://plus.google.com/hangouts/_/doi.gov/roxanna-hinzman

Calendar lori_miller@fws.gov

Who

- roxanna_hinzman@fws.gov - organizer
- lori_miller@fws.gov
- steve_traxler@fws.gov

Going? **Yes** - **Maybe** - **No** [more options »](#)

Invitation from [Google Calendar](#)

You are receiving this email at the account lori_miller@fws.gov because you are subscribed for invitations on calendar lori_miller@fws.gov.

To stop receiving these emails, please log in to <https://www.google.com/calendar/> and change your notification settings for this calendar.

Forwarding this invitation could allow any recipient to modify your RSVP response. [Learn More](#).

--

Lori Miller
Senior Hydrologist, CFM
Environmental Engineer
Everglades Restoration
U.S. Fish and Wildlife Service
[1339 20th Street](#)
[Vero Beach, FL 32960](#)
772.469-4231

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--

Lori Miller
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772.469-4231

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Attachment 8

May 21, 2020 Letter from FWS to Sierra Club



United States Department of the Interior



FISH AND WILDLIFE SERVICE

1 Wildlife Drive
Sanibel, Florida 33957

IN REPLY REFER TO:
FWS-2018-00551

May 21, 2020

Email: karimah.schoenhut@sierraclub.org

Karimah Schoenhut
50 F Street NW, 8th Floor
Washington, D.C. 20001

Re: FOIA Request Number FWS-2018-00551 and *Sierra Club v. U.S. Fish and Wildlife Service, 1:19-cv-2315 (JEB)*

Dear Ms. Schoenhut:

This is in response to your discrepancy letter dated April 21, 2020 regarding your Freedom of Information Act (FOIA), 5 U.S.C. § 552, request of February 27, 2018. Your FOIA tracking number is FWS-2018-00551. Your request is seeking records generated since November 2016 discussing the ongoing species status review for the Florida Key deer (*Odocoileus virginianus clavium*), including but not limited to:

- *Records pertaining to the impetus for the review, including but not limited to records of the reasons for, motivation behind, prompting of the review. Such records should include but are not limited to any communications within FWS and with outside agencies, parties or individuals;*
- *Records of scientific information presented to or generated by FWS;*
- *Records of scientific review from peer reviewers, State and Federal agency staff, and Department of Interior staff;*
- *Records of communications discussing the status of the species;*
- *Records of communications discussing regulatory mechanisms to address threats to the species;*
and
- *Records of communications discussing conservation measures for the species*

Response

We are writing today to partially respond to your letter dated April 21, 2020.

We have searched our records and have located the “climate change white paper” from Section I. Missing Records, referenced in a partially released record entitled “Re_ Invitation _Meet for lunch to discuss clima...(3)_Redacted.pdf.” The following record, consisting of eight (8) pages, is being released to you in its entirety:

Climate Change Section_Florida_20170127.pdf	Full Release
---	--------------

We have also searched our records and have located five (5) files from Part II. Redacted Attachments Requiring Clarification, of your letter. These files are as follows:

08032017 Key Deer Biology and Species Needs md.docx	Withheld in Full
/4. Key deer ssa ownership/1.2 Figure16 Ownership 20171116.jpg	Withheld in Full
/5. Revisions/3.2 Figure4 REVISED.jpg	Withheld in Full
/5. Revisions/3.3 Figure16 REVISED.jpg	Withheld in Full
/5. Revisions/5.2 Figure16 Ownership 20171116test.jpg	Withheld in Full

These files were sent to the Office of the Solicitor for review and it has been determined that they are being withheld in full under Exemption 5, Deliberative Process Privilege.

Exemption 5

Exemption 5 allows an agency to withhold “inter-agency or intra-agency memorandums or letters which would not be available by law to a party ... in litigation with the agency.” [5 U.S.C. § 552\(b\)\(5\)](#). Exemption 5 therefore incorporates the privileges that protect materials from discovery in litigation, including the deliberative process, attorney work-product, attorney-client, and commercial information privileges. We are withholding twenty-four (24) pages in full under Exemption 5 because they qualify to be withheld both because they meet the Exemption 5 threshold of being inter-agency or intra-agency and under the following privilege:

Deliberative Process Privilege

The deliberative process privilege protects the decision-making process of government agencies and encourages the frank exchange of ideas on legal or policy matters by ensuring agencies are not forced to operate in a fish bowl. A number of policy purposes have been attributed to the deliberative process privilege, such as: (1) assuring that subordinates will feel free to provide the decisionmaker with their uninhibited opinions and recommendations; (2) protecting against premature disclosure of proposed policies; and (3) protecting against confusing the issues and misleading the public.

The deliberative process privilege protects materials that are both pre-decisional and deliberative. The privilege covers records that reflect the give-and-take of the consultative process and may include recommendations, draft documents, proposals, suggestions, and other subjective documents which reflect the personal opinions of the writer rather than the policy of the agency.

The materials that have been withheld under the deliberative process privilege of Exemption 5 are both pre-decisional and deliberative. They do not contain or represent formal or informal agency policies or decisions. They are the result of frank and open discussions among employees of the Department of the Interior. Their contents have been held confidential by all parties and public dissemination of this information would have a chilling effect on the agency’s deliberative processes.

The deliberative process privilege does not apply to records created 25 years or more before the date on which the records were requested.

We reasonably foresee that disclosure would harm an interest protected by one or more of the nine exemptions to the FOIA’s general rule of disclosure.

In addition to me, the official responsible for this denial is:

Brigette J. Beaton, Attorney-Advisor
Office of the Regional Solicitor for
Interior Regions 2 and 4
U.S. Department of the Interior
75 Ted Turner Drive, S.W., Suite 304
Atlanta, Georgia 30303

After a careful review of the parent emails on pages 28 and 31 of the “Redacted Binder of Docs,” it appears that several labels are images from a signature block that was established as an attachment when the email was converted to a PDF. These images do not appear in the emails’ native form; only when converted to PDF. Those images are as follows:

/4. key deer ssa ownership/1.1 image001.jpg
/4. key deer ssa ownership/2.1 image001.jpg
/5. Revisions/3.1 image001.jpg
/5. Revisions/4.1 image001.jpg
/5. Revisions/5.1 image001.jpg
/5. Revisions/6.1 image001.jpg

In Section III. Question Regarding Information About Listing Decision Process Presented in draft *Vaughn* Index, you asked “Can FWS please clarify the approximate dates that the draft proposed rule to delist the Florida Key deer, and SSA were “pulled back”?”

The following is the proper timeline of events:

The Service conducted a Recommendation Team Meeting for the Key deer on January 10, 2018, based on the December 2017 draft of the Species Status Assessment (SSA).

A proposed rule to delist the Key deer was subsequently drafted.

In June 2019, the Service began planning to provide an update to the Florida Keys on the Key deer classification process to update and inform the community/stakeholders.

On July 25, 2019, the Service decided to further review our interpretation of the uncertainties around sea level rise that inform the recommendation from the Key deer SSA.

On or about July 30, 2019, the Ecological Service deputy Assistant Regional Director (ARD) asked the Science Application ARD to request a peer review from United States Geological Survey (USGS) Climate Science Center on the Key deer SSA with specific focus on the climate change and sea level rise discussions included.

To meet publication deadlines in the local media, an August 9, 2019, news release announcing an August 22, 2019, public meeting about the status of the Key deer, the Service stated that, “The SSA will be made available to the public after this informational session.”

Between that time and August 19, 2019, we received guidance from Headquarters that we could not release the SSA.

USGS provided their peer review, dated August 16, 2019 to the Service.

On October 2, 2019, we held a second Recommendation Team Meeting for the Key deer.

Conclusion

We are currently in the process of reviewing certain categories of records provided to you in previous releases and plan to provide an updated Vaughn Index and a response to the remaining items of concern in your April 21, 2020 letter on or before June 30, 2020.

For your information, Congress excluded three discrete categories of law enforcement and national security records from the requirements of FOIA. *See* [5 U.S.C. 552\(c\)](#). This response is limited to those records that are subject to the requirements of FOIA. This is a standard notification that is given to all our requesters and should not be taken as an indication that excluded records do, or do not, exist.

If you have any questions, please contact Marsha Yee, Assistant United States Attorney, at (202) 252-2539 or Brigitte Beaton, Attorney Advisor, at (404) 331-5611. Thank you for contacting the U.S. Fish and Wildlife Service.

Sincerely,

5/21/2020

X Tiffany McClurkin

Tiffany McClurkin
Atlanta Regional FOIA Coordinator
Signed by: TIFFANY MCCLURKIN

Enclosure

Attachment 9

Lori Miller September 30, 2019 E-mail and Key Deer SSA Sea Level Rise Science Update¹

¹ FWS released this record to Sierra Club on April 23, 2021 in response to Sierra Club's administrative FOIA appeal of FWS's decision to withhold records from a Sierra Club FOIA request to USGS.

Key Deer Climate Science and SLR Update

Miller, Lori <lori_miller@fws.gov>

Mon 9/30/2019 7:29 AM

To: Hinzman, Roxanna <roxanna_hinzman@fws.gov>; Colangelo, Nikki <Nikki_Colangelo@fws.gov>; Powell, Brian <brian_powell@fws.gov>; Israel D. Parker <Israel.Parker@ag.tamu.edu>; Boyles, Ryan P <rboyles@usgs.gov>; Dekar, Matthew P <matthewdekar@fws.gov>; Gonzalez, Rafael <rafael_gonzalez@fws.gov>; Burchett, Kathleen <kathleen_burchett@fws.gov>; Clarke, Ernest <ernest_clarke@fws.gov>; Roel R. Lopez <Roel.Lopez@ag.tamu.edu>; Forrest East <Forrest.East@ag.tamu.edu>; Becker, Drew N <Drew_Becker@fws.gov>

 1 attachments (303 KB)

Key Deer SSA SLR Update_20190930.docx;

Good morning. Attached is the climate science and SLR update. This previous version was a quick response to USGS comments and was intended to be used during our initial teleconference. The attached version is prepared for a broader audience. Please let me know if you have any questions or suggestions.

--

Lori Miller
Refuge Ecologist
Environmental Engineer
Everglades Program Team
Florida, Caribbean, and Gulf Coast Complex Refuges
U.S. Fish and Wildlife Service
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Vero Beach, FL 32960
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NOTE: This email correspondence and any attachments to and from this sender is subject to the Freedom of Information Act (FOIA) and may be disclosed to third parties.

Key Deer SSA Sea Level Rise Science Update September 30, 2019

Lori Miller – U.S. Fish and Wildlife Service (USFWS), Vero Beach, FL

The 2018 Florida Key Deer Species Status Assessment (SSA) considered sea level rise (SLR) projections based on 2013 science from the Intergovernmental Panel on Climate Change and a SLR scenario graphic (SSA Figure 15) from the Southeast Florida Regional Climate Change Compact (Compact) *Unified Sea Level Rise Projection for Southeast Florida* report. The SSA analysis and conclusions were presented to the decision makers in January 2018. Soon after, concerns were identified regarding the usage and interpretation of the 2013 science, including:

1. Newer peer reviewed SLR science from the National Oceanic and Atmospheric Administration (NOAA), the United States Geological Survey (USGS) became available to the public in January 2017 (NOAA 2017) and the U.S. Fish, and Wildlife Service is required to use the latest and best available science in documents and decisions.
2. The SLR scenario graphic (SSA Figure 15) adapted global SLR curves from IPCC (2013) to regional application by urban planners. This graph and an adapted blue cone were intended for both short and long-term planning horizons for infrastructure design and construction of pumps, bridges, seawalls, buildings, highways etc. The Compact notes, “this graphic would require significant reductions in greenhouse gas (GHG) emissions in order to be plausible and does not reflect current emissions trends.”
3. The wider spread between the SLR scenario lines at 2100 led to an interpretation of a high level of uncertainty when evaluating the effects of SLR to the species. It was not fully understood that each line in the scenario graph was developed with an independent data set, and each represent different assumptions regarding greenhouse gas reductions. Therefore, each scenario represents an independent outcome (see the Certainty and Confidence section below).

The 2013 science is still considered plausible according to the USGS peer review of the SSA in August 2019. USGS also pointed out that “the SSA does not include more relevant 2017 science and that doing so would improve the SSA.”

SLR Scenario Naming Conventions and Assumptions

2012-2013:

Over the past seven years, SLR scenarios have changed names depending on the organization running the models. In 2013, the Intergovernmental Panel on Climate Change (IPCC) created a technical report on climate change. This report was based on earlier modeling using the Coupled Model Inter-comparison Project Phase 5 (CMIP5) model. It was determined by IPCC, with high confidence, that the model did not reproduce the observed recent warming during 1998–2012.

The CMIP5 model created four (4) scenarios called Representative Concentration Pathways (RCP's) The RCPs were based on radiative forcing assumptions. Radiative forcing is the balance, or imbalance, of incoming sunlight energy with energy radiated back into space from the earth. The IPCC uses the term radiative forcing to explain the influence that GHGs have on this balance. An imbalance from GHG emissions leads to warming of the atmosphere and ocean. The RCP scenarios were expressed as:

RCP 2.6 = 2.6 W/m² radiative forcing – GHG emissions peak 2010-2020 then decline

RCP 4.5 = 4.5 W/m² radiative forcing – GHG emissions peak 2040 then decline

RCP 6.0 – 6.0 W/m² radiative forcing – GHG emissions peak 2080 then decline
RCP 8.5 – 8.5 W/m² radiative forcing – GHG emissions continue to rise through 2100

In 2012, the U.S. Army Corps of Engineers (USACE) and NOAA both independently created their own naming conventions. Another naming convention (C 1-5) was developed during this time period and was used in the University of Florida GeoPlan Sketch Tool. The sketch tool's primary focus was also on infrastructure, including preliminary assessments of transportation infrastructure vulnerable to current and future flooding. There was no NOAA Intermediate scenario identified in 2012/2013. The following are the scenarios associated with the C 1-5 nomenclature (UF 2017):

C1 = USACE Low (2013)/ NOAA Low (2012)
C2 = USACE Intermediate (2013) / NOAA Intermediate Low (2012)
C3 = NOAA Intermediate High (2012)
C4 = USACE High (2013)
C5 = NOAA Highest (2012)

2017:

In 2017, the NOAA updated SLR models that are dependent on greenhouse gas (GHG) emission rates and other regional processes. The NOAA Intermediate scenario was introduced while retaining NOAA Intermediate Low and NOAA Intermediate High. With increased SLR, in C3-C5 in particular, the NOAA Intermediate High scenario moved up and combined with the USACE High scenario. In 2017, the C 1-5 nomenclature was no longer in use. The following are descriptions and relationships between the historical naming convention and updated scenarios for comparison:

- C1 – NOAA Low Scenario – Decreasing GHG by 2020
- C2 – NOAA Intermediate Low / USACE Intermediate Scenario – Decreasing GHG by 2040
- C3 – NOAA Intermediate – Decreasing GHG by 2060
- C4 – NOAA Intermediate High / USACE High – Decreasing GHG by 2080
- C5 – NOAA High – Business As Usual
- NOAA Extreme – Potential for Rapid Ice Melt

Sea Level Rise Scenarios from the Updated NOAA 2017 Technical Report

Due to newer information and analyses in 2017, NOAA and USGS scientifically revised SLR projections of IPCC (2013). Revisions included recent observational and modeling literature related to the potential for rapid ice melt in Greenland and Antarctica along with other regional processes. Regional downscaling methods are used to provide climate information at the smaller scales and there is *high confidence* that downscaling adds value both in regions with highly variable topography and for various small-scale phenomena (IPCC 2013), such as islands and keys.

The NOAA (2017) report had two primary tasks:

1. Update scenarios for global SLR to include ocean-level increases due to ice sheet melting and mass reductions (*likely* with 66-100% probability).
2. Integrate regional factors for the U.S. coastline, such as;
 - a. Shifts in oceanic circulations (*likely* with 66-100% probability),
 - b. Changes in earth's gravitational field (fluxing of the crust and mantle),
 - c. Land subsidence or uplift due to glacial changes,
 - d. Sediment compaction, and
 - e. Groundwater and fossil fuel withdrawals.

¹For an understanding on the probabilities associated with scientific descriptors such as *likely*, *unlikely*, etc., see the Footnotes at the end of this report.

The NOAA (2017) projections are also dependent on future GHG emissions and associated ocean-atmosphere warming. There is *very high confidence* that the model accurately reproduced the more rapid warming in the second half of the 20th century. NOAA (2017) also adjusted the Global Mean Sea Level (GMSL) to account for the additional regional factors. Each line in the scenario graph was developed with independent data sets. The primary dependent factor is the amount of GHG emissions that are projected to continue, decrease, or increase releases over time. The projections presented in several peer-reviewed publications provide evidence to support a *likely* GMSL rise of 6.6 ft. to 8.9 ft. by 2100 (7.6 ft. to 9.9 ft. by 2100 if tidal influences are considered). Recent results regarding Antarctic ice-sheet instability indicate that such outcomes are more *likely* (66-100% probability) than previously thought (NOAA 2017). To ensure consistency with these recent updates to the peer-reviewed scientific literature, NOAA recommends a revised ‘extreme’ upper-bound scenario, which is 1.5 – 2.5 ft. higher than the upper bound scenario from NOAA (2012) and IPCC (2013).

Likelihood and Probabilities:

According to statistical analyses from Church et al., 2013a; Kopp et al., 2014; 2016a; Slangen et al., 2014; Grinsted et al., 2015; Mengel et al., 2016 cited in the NOAA (2017) report, the probability of exceeding the next to lowest scenario (C1 – NOAA Low Scenario – Decreasing GHG by 2020), that considers an immediate reduction in GHG (1 ft. SLR by 2100), is 100%. The probability of exceeding C2 – NOAA Intermediate Low / USACE Intermediate Scenario with decreasing GHG in 2040 (1.6 ft. SLR by 2100) is 96%. Thus, these two scenarios, along with the lowest scenario (2000 extrapolation), are eliminated from the current range of SLR scenarios (Miller et al. 2018) as shown in Figure 1.

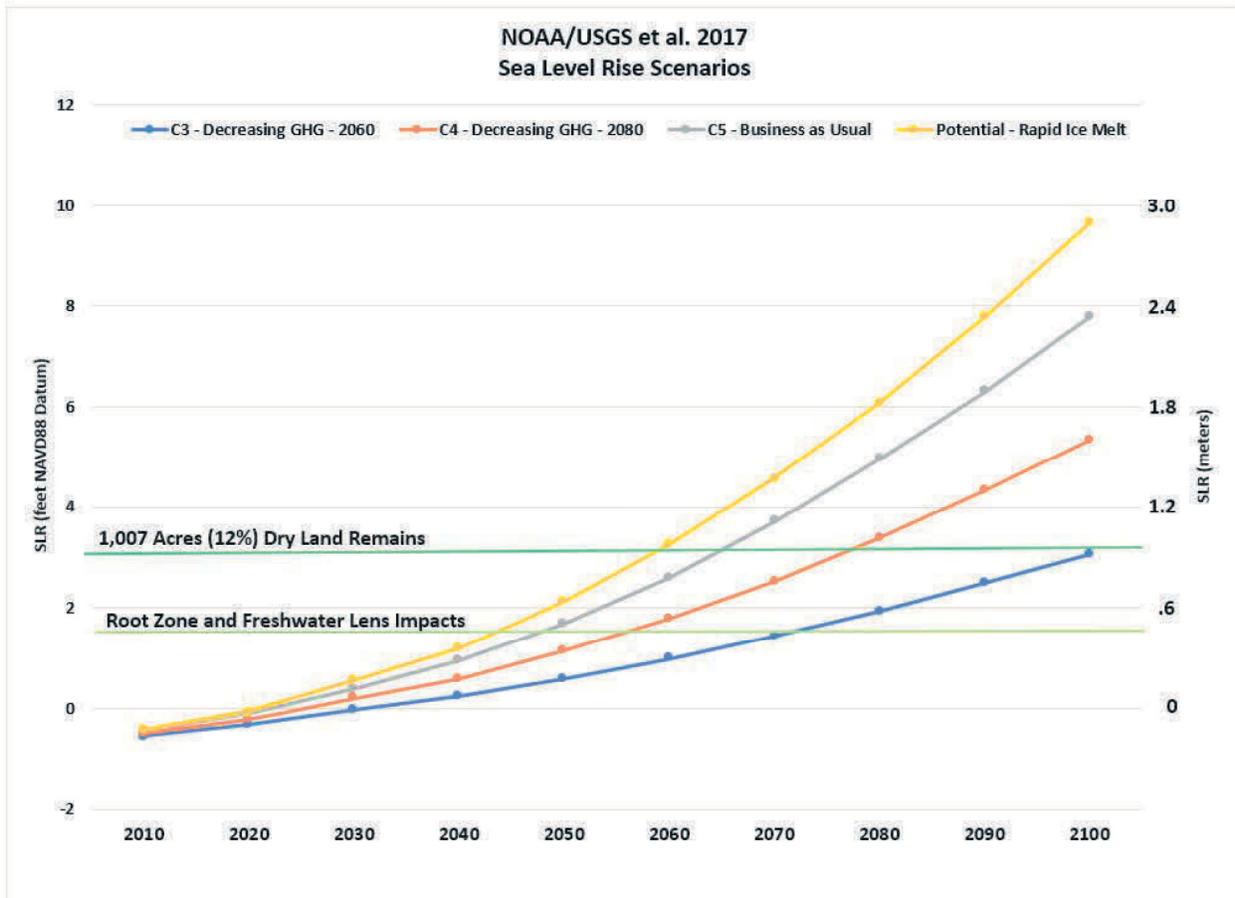


Figure 1 - The NOAA 2017 intermediate (GHG decreases in 2060), intermediate-high (GHG decreases in 2080), high (“business as usual” with no decreases in GHG), and extreme (rapid sheet ice melt) scenarios for sea level rise (USACE SLR Calculator).

While the lower-end scenarios have probabilities associated with them (IPCC 2013), probability of the higher-end scenarios are not factored nor included in NOAA (2017) report and are not yet available in the peer-reviewed literature. These high-end scenarios include contributions from ice-cliff and ice-shelf feedback processes that may significantly increase ice-sheet contributions to GMSL rise, particularly under high emissions scenarios (DeConto and Pollard, 2016). According to NOAA 2017, “even if society sharply reduces emissions in the coming decades, SLR will most likely continue to rise for centuries.”

High Tide and Tidal Flooding Effects:

The USGS peer review noted that the SSA is incomplete without the inclusion of the impacts from tidal flooding and increasing high tides. USGS believes high tides and tidal flooding are likely a high risk factor for habitat and freshwater pools on the Florida Keys.

NOAA tide gauges are measuring rapid increases in coastal flood risk along U.S. coastlines due to SLR rise (NOAA 2019). According to NOAA (2019), the most noticeable impacts from SLR is the increasing frequency of high tide flooding (HTF) and that projecting out into the future (i.e. 2030 and 2050) provides vital information for addressing coastal flooding impacts. NOAA (2019) used the 2017 SLR scenarios and indicated that today’s national HTF frequency of 5 days (national median) is likely to increase to 7–15 days by 2030 and 25–75 days by 2050 with much higher rates in many coastal locations (Figure 2).

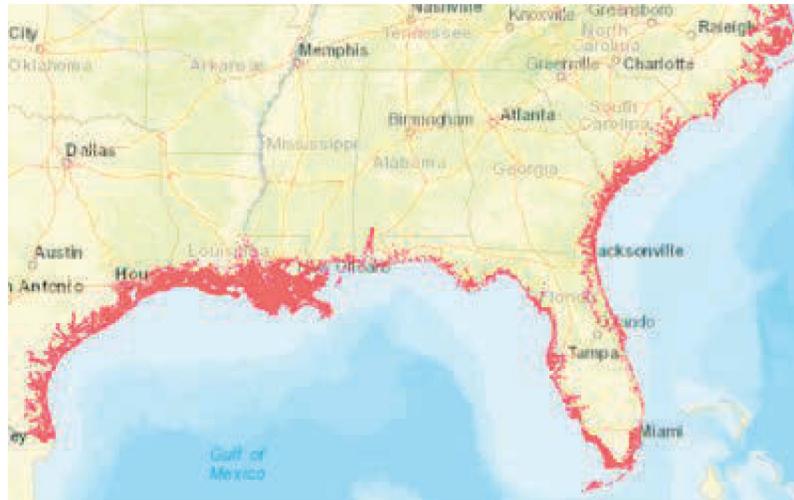


Figure 2 - Areas (red) at or below the HTF threshold. (NOAA 2019)

The NOAA (2019) tidal flooding analysis was based on data that has been highly vetted to provide a vigorous understanding of tidal influences and how SLR increases tidal elevations. Impacts of SLR have been and will continue to be experienced as increasingly deep and frequent tidal flooding (Ezer and Atkinson, 2014; Sweet et al., 2014; Sweet and Park, 2014), as cited in NOAA (2017). NOAA and USGS indicate that tidal influences add approximately 1.08 ft. (.33m) to the SLR elevations (Sweet and Marra, 2016) on the scenario curves (Figure 3).

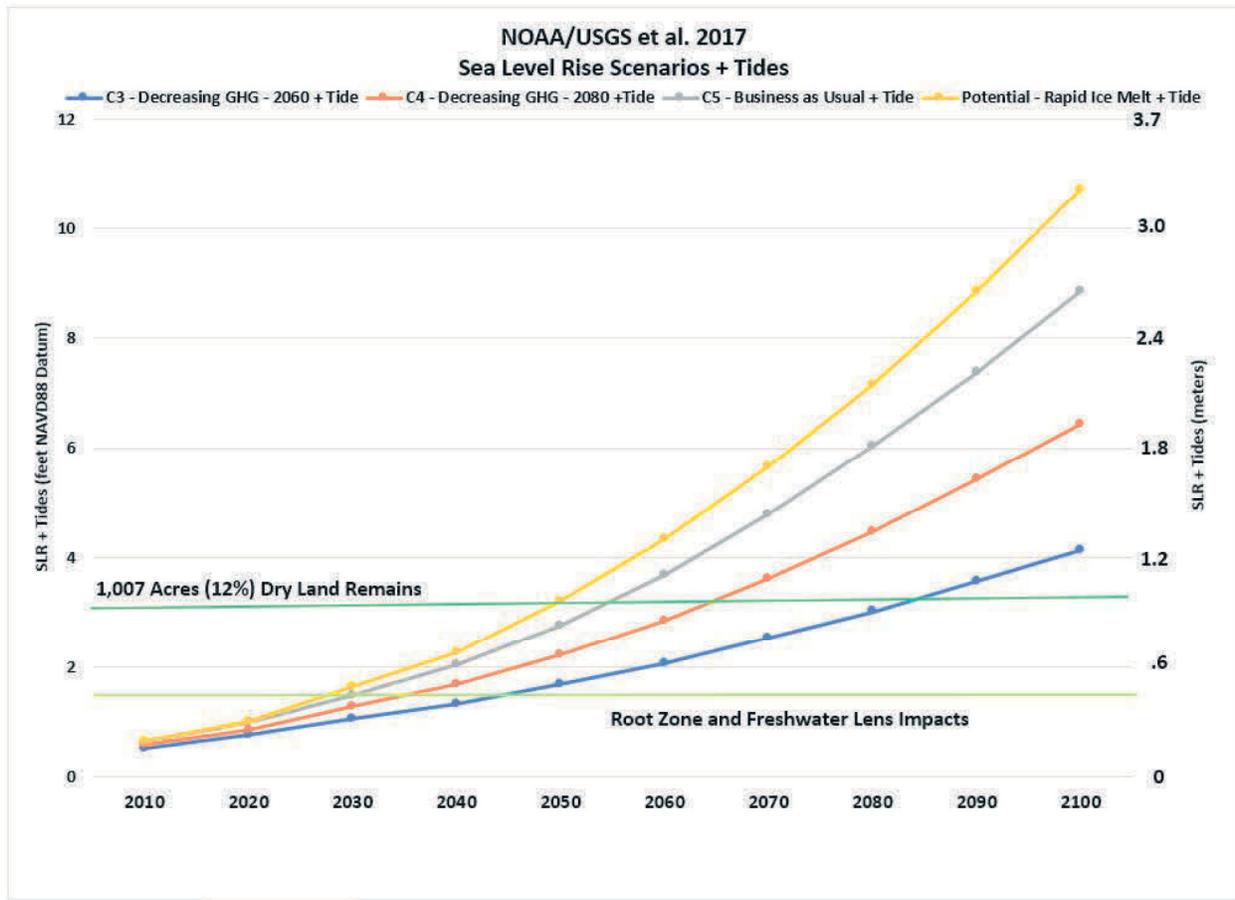


Figure 3 - The NOAA 2017 intermediate (GHG decreases in 2060), intermediate-high (GHG decreases in 2080), high (“business as usual” with no decreases in GHG), and extreme (rapid sheet ice melt) scenarios for sea level rise with an additional 1.08 ft. (.33m) tidal elevation.

Combining a tide and/or tidal flooding elevation with SLR projections causes impacts to root zones, freshwater lens, and upland vegetation communities much earlier in time. Table 1 indicates that inundation and pre-inundation impacts to the Florida Keys happens 10-20 years sooner depending on the scenario.

Scenario	3 ft. SLR	3 ft. SLR + Tide	Earlier Inundation
Decreasing GHG - 2060	2100	2085	+20 years
Decreasing GHG - 2080	2080	2065	+15 years
Business as Usual	2065	2055	+10 years
Potential - Rapid Ice Melt	2060	2050	+10 years

Table 1 – NOAA 2017 scenarios with high tide and tidal flooding.

Certainty and Confidence:

SLR began accelerating exponentially in the early 2000s (Benedict, 2018) as shown in Figure 4. There is a *high level of confidence* in this acceleration with the mathematical exponential acceleration meeting an $r^2 = 0.8538$.

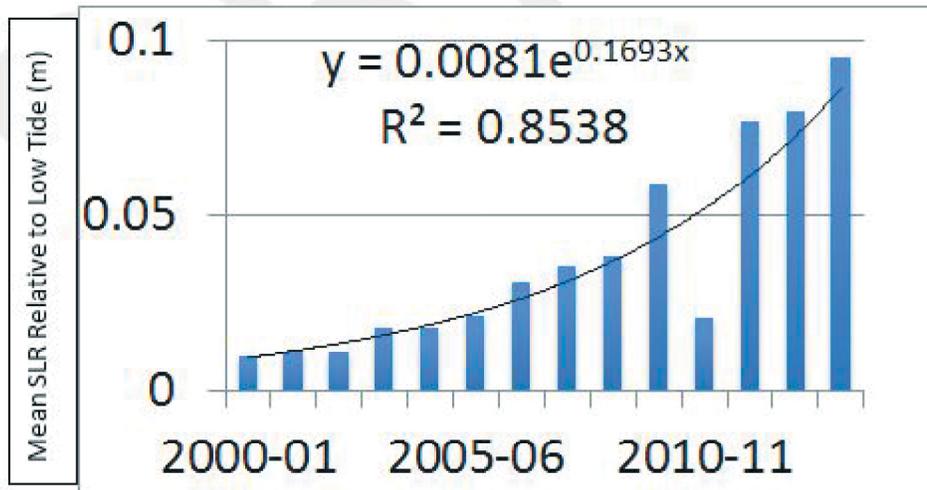


Figure 4 - The rate of SLR began its exponential (accelerated) rise in the early 2000s (Benedict, 2018).

During the acceleration period out to 2040-2050, SLR will likely move between various scenario lines. There is lower certainty from 2020-2050 due to global model uncertainty of acceleration rates (NOAA 2017). Beyond 2050, it is likely that the SLR rate of rise will become more apparent. Thus, there is higher certainty in SLR projections from 2050-2100 after the initial acceleration has been completely defined. The scenario “spread” at the timeline end of the scenarios (usually 2100) is not an indication of high uncertainty but rather a forecast of SLR due to varying GHG emission rates.

SLAMM Model Results

The Sea Level Affecting Marshes Model (SLAMM) simulates the dominant processes involved in wetland conversions and shoreline modifications during long-term SLR (SLAMM 2018). This model has been funded, vetted, approved and applied to more than 100 USFWS National Wildlife Refuges in Regions 4, 5, and 8. (The SLAMM version 6.4 is USFWS sponsored and includes roads and infrastructure). Other users include the U.S. Environmental Protection Agency (EPA), USGS, The Nature Conservancy (TNC), and National Wildlife Federation (NWF).

The South Florida Ecological Services Office (SFESO) requested SLAMM be run by Stetson University in February 2018 to visualize and compare impacts of the various SLR scenarios on habitat and land use within the Lower Keys. Modeling results provide projected land cover conditions with 1 ft., 2 ft., 3 ft., and 4 ft. of SLR (Table 2) and depicted in Figure 5.

Land Cover	Current Baseline		1 ft. Rise	
	Acres - Current	Percentage %	Acres - 1 ft. SLR	Percentage %
Developed Dry Land	1368	15	1223	14
Undeveloped Dry Land	2837	32	2311	16
Mangrove	1392	16	1933	22
	2 ft. Rise		3 ft. Rise	

Land Cover	Acres - 2 ft. SLR	Percentage %	Acres - 3 ft. SLR	Percentage %
Developed Dry Land	886	10	406	5
Undeveloped Dry Land	1381	15	601	7
Mangrove	3444	39	3859	43
4 ft. Rise				
Land Cover	Acres - 4 ft. SLR	Percentage %		
Developed Dry Land	175	2		
Undeveloped Dry Land	277	3		
Mangrove	3959	44		

Table 2 - SLAMM model calculations of acres and percent habitat, urbanization, and mangrove encroachment with the current baseline of land use with projections for 1 ft., 2 ft., 3 ft., and 4 ft. of SLR (SLAMM 2018).

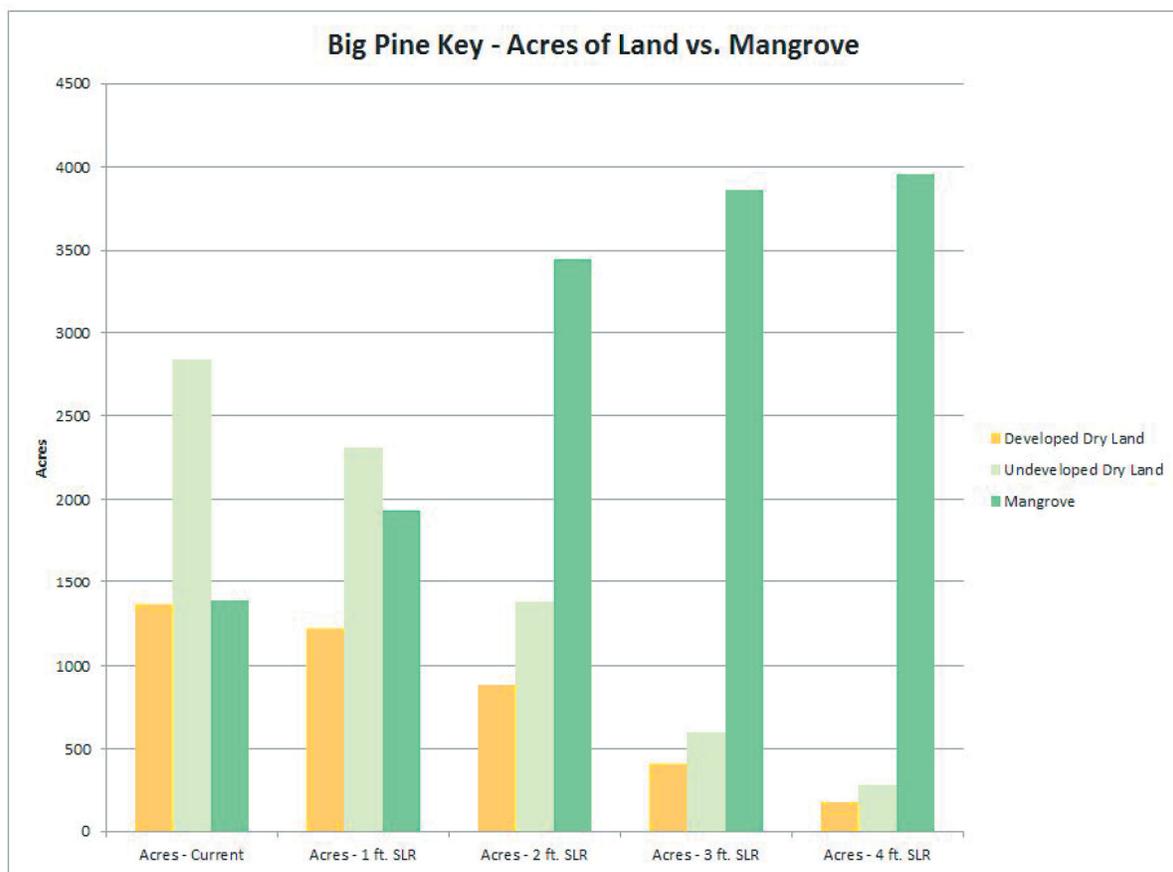


Figure 5 - Developed dry land (orange), undeveloped dry land (light green), and mangroves (dark green). (SLAMM 2018)

Table 2 and Figure 5 highlight the remaining developed dry land and undeveloped dry land with variations of SLR. These calculations are based on the USFWS identified upland habitat on Big Pine and

No Name Keys. Dry land will decrease in availability with as little as 1 ft. of SLR while coverage of mangroves becomes the majority vegetation community with SLR of 2 ft. By 3 ft. of SLR, mangroves will have encroached almost completely into the slash pine / upland vegetation communities. Only 7% of terrestrial habitat / undeveloped dry land and 5% of urban areas (12% total dry land) remains with 3 ft. of SLR.

Florida Temperature Increases and Environmental Trends

As previously described, Florida is vulnerable to SLR and pulse events as well as the effects of urbanization and increasing tourists. Florida is also vulnerable to changes in rainfall and temperatures expected due to changes in environmental trends. According to the NCA (2014), average temperatures in the Florida Keys have risen more than 1.5°F since 1991. Projected increases in Florida's average annual temperatures are an additional +1.5 to +4.5° F by 2050 and from +3 to +7° F by 2100 depending on the current GHG emissions rate and the region within Florida

State-wide temperature increases will change levels of humidity and rates of evapotranspiration leading to changes in vegetation growth, seasons, and location. Warmer air has the capacity to hold more water than cooler air, so if the temperature rises and there's no extra moisture added to the air, the relative humidity will go down. However, higher temperatures make higher levels of humidity possible. This is because warm air is capable of holding more moisture than cold air. Warm air has a stronger bond to water molecules, making the air feel drier and allowing more water to bond with air. Thus, if more moisture is available, then the relative humidity will likely be higher with a higher rate of evapo-transpiration. (NWS 2018)

As an example of anticipated impacts, increasing temperatures can affect the sex ratio of some species, especially reptiles such as sea turtles, leading to a decline in species populations. Sex determination has been documented for sea turtles and indicates that if a turtle's eggs incubate below 82° F, the turtle hatchlings will be male. If the eggs incubate above 88°F, the hatchlings will be female. (NOAA 2018). As the sex ratio between the number of males versus the number of females becomes larger, population decline is likely.

Florida Precipitation Pattern and Hurricane Intensity Trends

Annual precipitation has increased by 10 percent since 1900 in the Florida Keys (NCA 2014). Since the 1970s, heavy downpours have increased in frequency and intensity by 27 percent and are increasing island flooding along the coastal beaches and in low-lying areas. NOAA (2017) model simulations using the more recent CMIP5 predicts changes in precipitation seasonally for the Florida Keys with increases in dry season rainfall up to 20 percent and decreases in wet season rainfall up to 30 percent. An increase in dry season rainfall will increase water levels and hydro-periods during the important time of the year when many birds are preparing to breed and nest, migratory birds are stopping over to forage, alligators are preparing nesting holes, and plants are becoming more dormant. A decrease in wet season rainfall will likely lead to lower water levels and increased droughts during a time that plants are water-dependent for growing and flowering and wetland bird species are foraging. The change in timing of rainfall will likely stress ecosystems and cause changes in vegetation types. These are only a few examples of impacts to habitats and species.

NOAA 2017 models are in agreement regarding changes in tropical storm and hurricane wind and rainfall events with 20 percent increases in both rainfall rates and wind speeds expected near the center of the storms. These increases are linked, in part, to higher sea surface temperatures in the region where Atlantic hurricanes form and move through. It is important to note that other factors influence the frequency and intensity of hurricanes. Natural variability of the Atlantic Multi-decadal Oscillation (AMO), El Niño

Southern Oscillation (ENSO), human-induced emissions, and particulate pollution all influence the warming or cooling of sea surface temperatures which leads to the annual activity of tropical storms and hurricanes.

Footnotes:

¹In the IPCC (2013) report, the following terms were identified and categorized to indicate the assessed likelihood, or probability, of an outcome or a result: Virtually certain 99–100% probability, Extremely likely: 95–100%, Very likely 90–100%, Likely 66–100%, About as likely as not 33–66%, Unlikely 0–33%, Very unlikely 0–10%, Exceptionally unlikely 0–1%.

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Attachment 10

September 26, 2019 E-mail from FWS Deputy Chief of Div. of Restoration and Recovery Matt Dekar⁶

⁶ FWS released this record to Sierra Club pursuant to a FOIA request for records generated after the cut-off date for Sierra Club's February 2018 FOIA request.

From: [Colangelo, Nikki](#)
To: [Dekar, Matthew P](#)
Cc: [Powell, Brian](#)
Subject: Re: drafting the appendix
Date: Thursday, September 26, 2019 2:35:27 PM
Importance: High

Hi Matt,

Yes, we plan to use the Webex.

Nikki

On Thu, Sep 26, 2019 at 7:40 AM Dekar, Matthew <matthew_dekar@fws.gov> wrote:

Hi Nikki,

I am assuming you guys (and Rox) will be using the Webex and not travelling to Atlanta? A&M will be calling in as well.

Thanks,

Matt

On Thu, Sep 26, 2019 at 7:07 AM Dekar, Matthew <matthew_dekar@fws.gov> wrote:

Hi Nikki,

Sorry, you must have missed my chat on Tuesday but Israel does plan to provide explanatory text along with the tables and figures. Israel and Roel's major concern is that they might not be able to have the calculations completed in time given the delay in getting them the Tier 2 and 3 data. Roel told us to standby yesterday so I plan to ping him tomorrow (Friday) morning for an update. Please let Rox know that A&M was not provided the data in a timely manner (the data was requested last Thursday and we stressed the tight deadline). However, I am hopeful that we get everything by Monday in time for our meeting Wednesday. I will give you an update tomorrow after I talk with Roel and maybe we have to start thinking about a backup plan (hopefully not).

I have been coordinating with Chuck and Ernie and refuges will be represented on Tuesday - so we are good on that front.

I sent the agenda out for review Tuesday so I am not sure about adding Lori at this point for a full presentation. Maybe she can put together a few slides to present at the tail end of my presentation. Will that work? I will definitely add her to the invite.

Are you and Brian free tomorrow early afternoon to go over a few loose ends? Again, I will try to get a full update from Israel/Roel tomorrow morning.

Thanks!

Matt

On Wed, Sep 25, 2019 at 6:26 PM Colangelo, Nikki <nikki_colangelo@fws.gov> wrote:

Hi Matt,

Thanks for the update. The timeline for the agenda sounds good to me. Any updates from Israel on what they will be able to provide as part of the SSA Appendix and when we might expect that? I'd like to give Rox an update so she knows when to expect materials to review...I'm thinking Monday?

Will you invite Lori Miller, Kathy Burchett, and Ernie Clark (optional) from Refuges to the Oct. 2 meeting please? Want to make sure they part of the meeting leading up the elicitation.

Finally, Brian and I were talking earlier and are wondering if we should ask Lori to present the updated climate/SLR info since she's the most well versed in explaining the SLR science and models?

Will give you a call on Thursday morning.

Thanks.

Nikki

On Tue, Sep 24, 2019 at 12:52 PM Dekar, Matthew <matthew_dekar@fws.gov> wrote:

Hi Nikki,

I went with 30 minutes to balance giving time for lunch with wrapping this up in a timely manner. I am about to call Israel to get his feedback but Erin suggested we start at 9:30 and add 30 minutes to Israel's slot. With this addition, I think there is a good chance that we end the briefing portion early (before 12) and add time to lunch. Does that sound reasonable?

Attached is the HQ briefing that I plan to add on to for my portion (I plan to add a slide or two on the USGS report). I will send you a revised powerpoint by Friday or Monday to review.

I will report back today on my conversation with Israel.

Thanks!

Matt

On Tue, Sep 24, 2019 at 12:45 PM Colangelo, Nikki <nikki_colangelo@fws.gov> wrote:

Hi Matt,

Thanks for sharing the draft agenda. May want to consider an hour break to give RTM members time to get lunch and process the info that was just presented. I defer to Erin on how much time is needed to step through the elicitation questions.

Are you planning a powerpoint for the background and summary from the first recommendation meeting? I would also include a brief overview/reminder during this time slot of how we got to here (i.e., a second RTM).

Attachment 11

E-mails from Bob Glazer (Florida Fish and Wildlife Conservation Commission) and Todd Hopkins (FWS), dated June 27, 2019 through November 18, 2019, Related to FWS Attempt to “Embargo” of Keys Terrestrial Adaption Project report: Florida Keys Case Study on Incorporating Climate Change Considerations into Conservation Planning and Actions for Threatened and Endangered Species⁷

⁷ These e-mail records were released to Sierra Club as Microsoft Outlook.pst files in response to a Florida Public Records Law Public Records Request to the Florida Fish and Wildlife Conservation Commission.

From: Glazer, Bob <Bob.Glazer@MyFWC.com>
Sent: Thursday, June 27, 2019 12:26 PM
To: Hopkins, Todd
Cc: Stys, Beth; Benedict, Logan; Garrison, Dale
Subject: Final report - Keys Terrestrial Adaptation Project - Cooperative Agreement F16AC01213
Attachments: KEYSTAP - Final Report - FWC-Cooperative Agreement F16AC01213.pdf

Hello Todd

I am pleased to provide you with the final report originating from the Cooperative Agreement F16AC01213 to the Florida Fish and Wildlife Conservation Commission (our internal grant number 4303). As you recall, this project was meant to represent a way to address hard choices in listed species management related to those species found in the Florida Keys. I think the report is rich in information related to both the impacts projected to occur at different sea level intervals (i.e., 1ft, 2ft, 3ft, and 4ft) as well as provide options for conserving the species at each interval. We examined ex situ options as well as what it ant to manage for change, and overcoming barriers to implementation.

There is a lot to digest in the report but I think the Executive Summary provides a reasonable overview.

The PowerPoint presentations from all the workshops are also available at this Dropbox link (they are too large to attach to an email): <https://www.dropbox.com/home/FWS-KeysTAP/PowerPoints>

Please do not hesitate to let me know if you need clarification on any points or request revisions. I look forward to any feedback you may have.

Finally, please confirm receipt of this email since the file attachment is large and I want to make sure it made it to you.

By the way, we are well along on a paper focused on managing for change, and will be starting a new one on overcoming barriers to implementation.

Kind regards,

Bob and Logan

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From: Hopkins, Todd <todd_hopkins@fws.gov>
Sent: Monday, July 15, 2019 10:17 AM
To: Cook, Megan
Cc: Keller, Cherie; Salinas, Eva; Stys, Beth
Subject: Re: New: Report on climate adaptation strategies for Florida Keys terrestrial species

[EXTERNAL SENDER] Use Caution opening links or attachments

Megan,

It'll get into the catalog, but we are waiting a bit for the FWS. It just came out and we are working on how to communicate this info - it's climate change, it's bad news for most keys species, and FWS is wanting to de-list Key deer this FY ... we need to be sensitive about how much noise we make on this. I've looped in R4 ES and Refuges and Brian Hires (HQ) already. Once we get the "all clear" from the HQ and R4 comms folks, we'll post it.

Todd

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Science Applications supports collaborative conservation decision-making and coordinated action at landscape scales using the best available science.

NOTE: All correspondence and attachments received from or sent to me are subject to the Freedom of Information Act (FOIA), and may be disclosed to third parties.

On Mon, Jul 15, 2019 at 10:14 AM Cook, Megan <megan_cook@fws.gov> wrote:

Hi Todd - this report is great to see!

I wanted to check in about making sure this final report gets added to the Science Catalog. Laura MacLean has been putting together some recent SA program updates and was planning to include a link to this report but the report hasn't yet made its way to the [Science Catalog](#). The program updates should be ready for distribution within a week or two and it would be ideal to include a direct link to the Science Catalog.

I'm copying Cherie and Eva because they are handling the actual Science Catalog metadata and in looking at the existing Science Catalog records for this project, I realized there are some related QA/QC things to address. For the other products already in the catalog for this project (an [introductory presentation](#) and [range maps](#)), the ScienceBase item does not contain the actual files nor does metadata include a link to the files if stored somewhere other than ScienceBase. It appears these links and files are missing for many PFLCC products.

As a first step, could we please get the new product record created for this final report and upload the files for the other two products to the ScienceBase records so folks can access/download them? Then it appears some additional QA/QC work is needed to ensure all of the PFLCC product files/links are updated and accessible.

Cherie/Eva, please let me know if you want to chat or discuss further!

Thank you,
Megan

Megan Tetsuko Cook (she/her)
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megan_cook@fws.gov

On Mon, Jul 8, 2019 at 9:53 AM Hopkins, Todd <todd_hopkins@fws.gov> wrote:

All,

I wanted to let you know about a final report for a project that R4 Science Applications funded: *Florida Keys case study on incorporating climate change considerations into conservation planning and actions for threatened and endangered species*. The appendices have tables that document the consequences of: sea level rise, proposed conservation actions, trigger points and monitoring, and priority actions for 20 Florida Keys species. It's very possible that some of the strategies from this report can be extrapolated to other island systems.

Todd

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From: Glazer, Bob <Bob.Glazer@MyFWC.com>
Sent: Friday, August 23, 2019 2:45 PM
To: Stys, Beth <beth.stys@MyFWC.com>
Subject: Chris Bergh's notes from the Key Deer meeting

Beth

Chris sent me his notes from the public Key Deer meeting. There has been a lot of misinformation from the press as well as the FWS. As you know, they were trying to embargo our report until the dust settles on this issue so I am thinking that the information they provided is disingenuous to some extent. Anyway, here are his notes which he told me was OK to pass along to you:

I went to the Key deer meeting last night and here's what I gleaned; cut and pasted from my report to my boss.

"Well, it's no wonder everyone was confused, but this meeting cleared up a lot.

De-listing the deer has not been "proposed," just "recommended." USFWS Ecological Services Program staff in Vero conducted a Species Status Assessment (SSA) and recommended de-listing. The next step in the formal process is for FWS to "propose" de-listing and at that point there would be a notice in the federal register, public access to the SSA and supporting docs, call for more public comment and any data/info that that has not been provided already. If they got through that and still felt delisting was the ticket the Sec. of Interior would make the final decision.

But, before they proceed to proposing de-listing or not, they asked for peer review of the climate/sea level rise aspects by US Geological Survey because they, FWS, found SLR to be the most likely threat to undo the deer in the "foreseeable future." This was not stated publicly, but FWS staff at the meeting last night and others, now retired, have told me the SLR data used was stale and poorly applied. The USGS review landed on their desk on Tuesday and they would not say what it said. They have also set wheels in motion to obtain a new deer population estimate from Texas A&MU which has done these periodically but not since the screw worm and Hurricane Irma hits on the population. They will review the new SLR and population results and either change their "recommendation" or not.

Timing of this Key deer work and the larger ESA revision process were coincidental, not intentional.

They did not allow public "comment" but did allow the public to ask questions. Lots of good questions. Lots of angry and paranoid comments veiled as questions. My questions were:

1. Sources and dates of SLR data used in the SSA and the USGS review? Answer – "Best available for both." My insiders disagree that best (specifically the newest) available was used for the SSA and don't know about USGS yet. One of these insiders led the charge to get USGS on the case.
2. How is "foreseeable future" defined? Answer – "It's different for every species/situation and we can't tell you at this time, but you would find out if de-listing is proposed." While answering a subsequent question, 2050 was put out there as a meaningful timeline that they had been working with somehow, but not clearly stated as the "foreseeable future."

3. If de-listing occurs, there's a 5-year (with possibility of extensions) monitoring period in which they may find they erred and undo the de-listing. My question was about the mechanics of this process. Answer - This undoing has never been done before as far as anyone knew. There are criteria and triggers established up front which could lead to extension of monitoring or undoing the decision.
4. What happens to the Habitat Conservation Plan for Key deer and other Keys T+E species on Big Pine and No Name Key if the deer are de-listed? Answer – the HCP belongs to the County and they could do as they see fit, but other species are involved and it would not be as easy as walking away from it.”

I think it's premature to go too far into the deer issue until this other info lands.

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From: Hopkins, Todd <todd_hopkins@fws.gov>
Sent: Monday, November 18, 2019 1:11 PM
To: Covington, Scott; Stys, Beth
Cc: Martin, Mallory
Subject: Re: Florida Keys White Paper
Attachments: 20190724 Draft RTQs_Keys SLR-Climate Change Report.docx

[EXTERNAL SENDER] Use Caution opening links or attachments

All,

We went back and forth on this with Phil Kloers in the RO and Brian Hires in HQ back in August after the final report came to me in July. They wanted to wait (I believe) until the Key Deer SSA was revisited or at least settled. I've not seen anything public about a decision, but internally I'm told that after the USGS peer-review of the SSA, they decided not to de-list but rather to down-list the key deer. FWC has sent this report out to its people and I believe that AFWA or SEAFWA was also sent it. It isn't posted anywhere online yet that I know of. It was funded by Sci Apps and the work was done by FWC and TNC with significant FWS involvement (Traxler). Attached is a draft Respond To Queries (RTQ) that Ken Warren, our Public Affairs Officer here in Vero, drafted back in July - maybe it can be updated/modified?

Todd

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On Mon, Nov 18, 2019 at 1:00 PM Covington, Scott <scott_covington@fws.gov> wrote:

Hi Mallory,

This email is to follow up on my cryptic voicemail.

Todd, Beth Stys and I chatted last Thursday regarding Logan Benedict's (FL FWC) report on climate threats to T&E species on the Keys. I'll forward you the report.

As Acting External Affairs ARD, Todd cleared the document for publication, but where the document will be published is still up in the air? It wasn't determined if it can be published on a FWS website and if so, who would publish it? Or, should this be published by the state of Florida? The report is already out, but not in an official capacity. It should be

out there as soon as possible in an official way. For example, in some of the talks last week, a USGS researcher Suresh Subedi (Sp) duplicated some of the efforts that FL already did in their work - it's to everyone's benefit to see this work.

I want to be responsive to Logan's request, but this is outside my decision space since it's a Regional and Science Apps issue and I don't want to step on anyone's toes. I just want to ensure that Logan gets a nod from us on if he should just publish it on a state of FL website or if we believe that we should? AND, if he publishes it on the FL website, should External Affairs have a Comms Plan or at least talking points prepared? Questions that I can't answer.

I've been pulled in because my counterpart in Science Apps here has been reassigned to other duties, so I'm trying to be responsive to Logan's request.

I appreciate any help,
Scott

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