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Public Comments Processing
Attn: FWS-R4-ES-2012-0078
Division of Policy and Directives Management
U.S. Fish and Wildlife Service
4401 N. Fairfax Drive, MS 2042-PDM
Arlington, VA 22203

cc: Larry Williams
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South Florida Ecological Services Office
1339 20th Street
Vero Beach, FL 32960-3559

Re: FWS-R4-ES-2012-0078; Proposed Endangered Species Status for the Florida Bonneted Bat

Dear Mr. Williams,

These comments on the proposed rule to list the Florida bonneted bat (*Eumops floridanus*) as an endangered species are submitted on behalf of the Center for Biological Diversity ("Center"). The Center is a national, nonprofit conservation organization with more than 450,000 members and online activists dedicated to the protection of endangered species and wild places. The Center recently opened a southeast office headquartered in St. Petersburg, Florida. The Center's southeast office focuses on Florida biodiversity issues and is supported by thousands of Floridians who share the Center's mission.

The Center strongly supports an endangered listing for the highly imperiled Florida bonneted bat. As noted in the Proposed Rule, climate change and particularly sea-level rise pose high-magnitude and growing threats to the bonneted bat. These comments (a) summarize and transmit important scientific information on sea-level rise and storm surge projections for south Florida in the range of the bonneted bat, (b) discuss the significant threats that sea-level rise poses to known roosting locations, and (c) discuss the need for critical habitat designation that buffers the Florida bonneted bat from climate change threats. The Center urges the U.S. Fish and Wildlife Service ("USFWS") to promptly designate critical habitat for the bonneted bat, including all suitable roosting and foraging habitat as well unoccupied inland habitat that will be protected from inundation by sea-level rise and storm surge and thus will provide essential future habitat for the bonneted bat. Each of these points is discussed in detail below.

I. Scientific studies on current and projected sea-level rise, storm intensity and storm surge, and coastal squeeze in south Florida in the range of the bonneted bat

A. Global sea-level rise is accelerating in pace and is likely to increase by one to two meters within this century

Global average sea level rose by roughly eight inches over the past century, and sea-level rise is accelerating in pace (Karl et al. 2009). Global average sea level rose at an average rate of 3.2 ± 0.5 mm per year between 1993 and 2011 (Rahmstorf et al. 2012) compared with 1.6 ± 0.2 mm per year between 1961 and 2003 (Domingues et al. 2008). In fact, the sea-level rise trend between 1993 and 2011 was 60% faster than predicted by the IPCC for this time interval (Rahmstorf et al. 2012).

As noted in the Proposed Rule, recent studies indicate that sea-level rise will be substantially higher than projected by the 2007 IPCC Fourth Assessment Report. The IPCC Fourth Assessment Report projected a global mean sea-level rise in the 21st century of 18 to 59 cm (7 to 23 inches), although the report explicitly acknowledged that this estimate did not represent a "best estimate" or "upper bound" for sea-level rise because it assumed a negligible contribution from the melting of the Greenland and west Antarctic ice sheets (IPCC 2007). Studies that have improved upon the IPCC estimate have found that a mean global sea-level rise of at least one to two meters is highly likely within this century (Rahmstorf 2007, Pfeffer et al. 2008, Vermeer and Rahmstorf 2009, Grinsted et al. 2010, Jevrejeva et al. 2010). Rahmstorf (2007) used the tight, observed relationship between global average temperature rise and sea-level rise over the recent observational record (~120 years) to project a global mean sea-level rise of 0.5 to 1.4 m by 2100. Other studies have estimated global mean sea-level rise by 2100 as follows: 0.75 m to 1.90 m (Vermeer and Rahmstorf 2009), 0.8 m to 2.0 m (Pfeffer et al. 2008), 0.8 m to 1.3 m (Grinsted et al. 2010), and 0.6 m to 1.6 m (Jevrejeva et al. 2010). In its 2012 sea-level rise assessment, the National Research Council estimated global sea-level rise at 8 to 23 cm by 2030, 18 to 48 cm by 2050, and 50 to 1.40 m by 2100 (NRC 2012). Moreover, studies that have reconstructed sea-level rise based on the geological record, including oxygen isotope and coral records, have found that larger rates of 2.4 to 4 m per century are possible (Milne et al. 2009).

B. Sea-level rise of one to two meters in south Florida is highly likely within this century

On a regional level, sea-level rise projections for south Florida in the range of the bonneted bat also indicate that sea-level rise between one to two meters is highly likely within this century. The Southeast Florida Regional Climate Change Compact Counties—Monroe, Miami-Dade, Broward, and Palm Beach counties—released the Southeast Florida Regional Climate Change Action Plan in October 2012 which included a detailed "Unified Sea Level Rise Projection" for south Florida.[1] The sea level rise projections for south Florida are similar what has been estimated globally the National Research Council: 8 to 18 cm (3 to 7 inches) by 2030,

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

23 to 61 cm (9 to 24 inches) by 2060, and 48 cm to 1.45 m (19 to 57 inches) by 2100 (Southeast Florida Regional Climate Change Compact Technical Ad hoc Work Group 2011). Based on sea-level rise projections from the best-available science, the USFWS should analyze the impacts of sea-level rise of up to two meters on the bonneted bat's habitat since this falls within the range of likely scenarios, and because sea-level rise will be exacerbated by increasing storm surge.

C. Storms and storm surge are increasing in intensity

Increasingly intense storms and storm surge in this century will increase the impacts of sea level rise on the bonneted bat's coastal habitat. Several studies have found that the frequency of high-severity hurricanes is increasing in the Atlantic (Elsner et al. 2008, Bender et al. 2010, Kishtawal et al. 2012), along with an increased frequency of hurricane-generated large surge events (Grinsted et al. 2012) and wave heights (Komar and Allan 2008). High winds, waves, and surge from storms can cause significant damage to the bat's coastal habitat. When storm surges coincide with high tides, the chances for damage are greatly heightened (Cayan et al. 2008). As the sea level rises, storm surge will be riding on a higher sea surface which will push water further inland and create more flooding of coastal habitats (Tebaldi et al. 2012). For example, one study estimated that hurricane flood elevations along the Texas coast will rise by an average of 0.3 meters by the 2030s and 0.8 meters by the 2080s, with severe flood events reaching 0.5 meters and 1.8 meters by the 2030s and 2080s, respectively (Mousavi et al. 2011). Thus, the USFWS must take into account the added impacts from more severe hurricanes and increasing storm surge and coastal flooding on the bat's habitat.

D. Coastal squeeze threatens the bonneted bat's habitat

The bonneted bat faces significant risks from coastal squeeze that occurs when its habitat is pressed between rising sea levels and coastal development that prevents landward movement (Scavia et al. 2002, FitzGerald et al. 2008, Defeo et al. 2009, LeDee et al. 2010, Menon et al. 2010, Noss 2011). Human responses to sea-level rise including coastal armoring and landward migration also pose significant risks to the ability of the bat's habitat to move landward (Defeo et al. 2009). Projected human population growth and development in Florida threaten many of the coastal, urban roosting sites of the bonneted bat with coastal squeeze, particularly in North Fort Myers, Naples, Homestead, and Coral Gables/Miami (Zwick and Carr 2006).

E. Climate change threats should be analyzed through the year 2100 at minimum

The USFWS should use a timeframe through at least 2100 to analyze the climate change threats to the bonneted bat. Climate change projections through 2100 are the standard in the climate literature, including the IPCC assessments. For example, the IPCC Fifth Assessment is using a suite of emissions pathways, the Representative Concentration Pathways, which provide emissions trajectories and impacts analysis through 2100, with estimates of uncertainty (van Vuuren et al. 2011). Furthermore, the National Marine Fisheries Service (NMFS) determined in three recent listing-related decisions that the year 2100 represents the most appropriate, science-based timeline for considering climate change threats to species. For example, the proposed listing rules for the ringed seal and bearded seals concluded that climate projections through the end of the 21st century "currently form the most widely accepted version of the best available data about future conditions" (75 Fed. Reg. 77482, 77503). NMFS in its peer-reviewed Status Review Report for 82 coral species petitioned under the U.S. Endangered Species Act similarly stated that "the year 2100 was used as the time horizon for this risk evaluation because this century was the timeframe over which the BRT [biological review team] had access to reasonable, scientifically vetted predications of key threats and their impacts," and "the IPCC collection of CO_2 emissions scenarios and climate models provided projections with adequate confidence to the year 2100" (Brainard et al. 2012: 100). NMFS in its proposed rule for these corals concurred: "We agree with the BRT's judgment that the threats related to global climate change (e.g., bleaching from ocean warming, ocean acidification) pose the greatest potential extinction risk to corals and have been assessed with sufficient certainty out to the year 2100" (NMFS 2012: 25). These determinations by NMFS and NMFS scientists that climate projections through 2100 represent the best-available science for assessing climate change threats provide a solid basis for applying the same timeframe to the climate change analyses for the bonneted bat.

II. Sea-level rise will have significant impacts on bonneted bat roost sites

The Proposed Rule reports that bonneted bat roost sites have been found at 23 to 26 colony sites at 11 locations, as summarized in the table below.

Location of roost sites	Number of colonies
Babcock-Webb WMA	4 to 6
Babcock Ranch	2
North Fort Myers	2
Naples	1
Fakahatchee Strand Preserve SP	2 to 3
Big Cypress National Preserve	3
Everglades City	1
Everglades National Park	1
Ten Thousand Islands	1
Homestead	1
Coral Gables/Miami	4

Seven of the 11 roost site locations are on the Florida coast and two additional locations (Everglades National Park and Big Cypress National Preserve) are extremely low-lying areas that are highly vulnerable to sea-level rise. As discussed above, projected sea-level rise in south Florida of at least two meters must be considered in the sea-level rise impacts analysis, and a precautionary approach should consider even higher levels of sea-level rise to account for the effects of increasing storm severity, storm surge, and wave heights.

We estimated the potential for inundation of the 11 roost site locations using the NOAA Sea Level Rise and Coastal Flooding Impacts Viewer[2] at sea-level rise levels from one to six feet (~30 cm to 1.8 m). Based on this tool, nine of the 11 roost locations will be either fully or partially inundated under this range of sea-level rise. Four locations would be largely or completely inundated starting at one foot of sea-level rise, threatening the five to six colonies

[2] http://www.csc.noaa.gov/digitalcoast/tools/slrviewer.

they support within the next few decades: Fakahatchee Strand Preserve State Park, Everglades City, Everglades National Park (Long Pine Key), and Ten Thousand Islands area. Five other locations would be partially inundated at levels of one to six feet, putting 11 more colonies at risk: Homestead, Miami/Coral Gables, Big Cypress National Park, Naples, and North Fort Myers. Only two locations which support six to eight colonies would remain unaffected: Babcock-Webb WMA and Babcock Ranch. This analysis highlights the extreme vulnerability of bonneted bat roosting habitat to sea-level rise.

Additionally, it is likely that the forested areas with which bonneted bats are closely associated may retreat. Florida bonneted bats have been known to roost in longleaf pine in pine flatwoods, in the shafts of royal palms, and it is thought that forested areas and old, mature trees are essential roosting habitat for the species. A case study on coastal forest retreat at Withlacoohee Gulf Preserve in Yankeetown, Florida found that the coastal forest is retreating as salt water intrudes freshwater at an estimated rate of seven meters per year over the last 100 years (Williams et al. 2003). Therefore, even before coastal forest areas are totally inundated, they can experience significant ecological changes.

III. Critical habitat designation must buffer the Florida bonneted bat from climate change threats

As described in the Proposed Rule, critical habitat designation would provide significant conservation benefits to the Florida bonneted bat. We urge the USFWS to propose critical habitat designation as soon as possible based on the habitat information discussed in the Proposed Rule and that being gathered by current research.[3] The critical habitat designation should not only protect existing roosting and foraging habitat areas, but should also protect currently unoccupied areas that are important for facilitating habitat movement for the Florida bonneted bat in response to sea-level rise. A recent report on the effects of climate change and sea level rise on Florida biodiversity noted that protected areas "along all of Florida's coasts face the same problem: the very habitats they are trying to protect are moving right out from under their protection" (Cameron Devitt et al. 2012). The same will likely be true for the Florida bonneted bat if USFWS only designates currently occupied habitat as critical habitat.

A. A finding of "Not Determinable" will not be defensible

USFWS must publish a final listing decision within one year of publishing the proposed listing decision.[4] When the final listing decision is issued, USFWS must designate critical habitat for the species *concurrently* "to the maximum extent prudent and determinable."[5] A "not determinable" finding allows USFWS to extend the time for designating critical habitat. Under the Endangered Species Act ("ESA"),[6] This means that when critical habitat is "not

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[3] USFWS should prioritize and expedite comprehensive studies on the distribution and habitat requirements of the Florida bonneted bat.
[4] 16 U.S.C. § 1533(b)(5)(A), (b)(6)(A).
[5] Id. § 1533(a)(3).
[6] Id. § 1533(b)(6)(C)(ii). *See also* 50 C.F.R. § 424.17(b)(2) (If critical habitat is not determinable, the Service "may extend the 1-year period specified in paragraph (a) of this section by not more than one additional year.")

determinable," USFWS has one year from the date of the final listing decision (i.e., two years from the proposed listing decision) to designate critical habitat. At or before the end of the one-year extension, "the Secretary *must* publish a final regulation, based on *such data as may be available at that time*."[7] That final deadline applies even if a longer deliberative process might produce a "better" critical habitat designation.[8]

However, the "not determinable" findings should rarely be made. It is expected that USFWS will make "the *strongest attempt possible* to determine critical habitat within the time period designated for listing."[9] Here, USFWS claims that it is unable to identify the physical and biological features essential for the conservation of the Florida bonneted bat because (1) the "optimal conditions that would provide the biological or ecological requisites of this species are not known"; and (2) USFWS does not know "specifically what essential physical or biological features of that habitat are currently lacking. USFWS is to use the best available science in determining critical habitat. That "optimal conditions" are unknown is not a barrier to designating. Similarly, it is not USFWS' task to understand what features of occupied habitat are currently lacking. Instead USFWS should synthesize information about what is known about the species and its habitat needs.

B. Unoccupied inland habitat areas that can provide roosting and foraging habitat should be identified and designated as critical habitat for the bonneted bat

The ESA requires the designation of critical habitat for listed species, encompassing all areas "essential to the conservation [survival and recovery] of the species." Importantly in a climate change context, the ESA explicitly allows the Services to designate critical habitat "outside the geographical area occupied by a species at the time it was listed, upon a determination that such areas are essential for the conservation of the species" (16 U.S.C. § 1532(5)). As species and habitats shift in response to climate change, protecting habitat areas outside of the current range, including stepping stone patches and corridors to facilitate species movements to new areas and shifting habitat, will become critical to allowing species to persist in a changing climate. In the case of the bonneted bat, the Services should identify and designate inland habitat that will protected from inundation by sea-level rise and increasing storm surge to help buffer the bonneted bat from climate change. As discussed above, nine of the 11 roosting locations for the bonneted bat are highly vulnerable to inundation by sea-level rise, necessitating the proactive protection of suitable inland areas as future roosting and foraging habitat.

C. The USFWS has the legal authority and ample precedent for designating unoccupied habitat to buffer the bonneted bat from climate change threats

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[7] 16 U.S.C. § 1533(b)(6)(C)(ii) (emphasis added).

[8] *See* Enos v. Marsh, 616 F. Supp. 32, 61 (D. Haw. 1984), *aff'd*, 769 F.2d 1363 (9th Cir. 1985); N. Spotted Owl, 758 F. Supp. at 625-26 ("In no event may the secretary delay the designation of critical habitat for more than twelve months . . . "); Colo. Wildlife Fed'n v. Turner, Civ. No. 92-F-884, 1992 U.S. Dist. LEXIS 22046, at *13-14 (D. Colo. Oct. 27, 1992). *See also* *Ctr. for Biological Diversity v. Evans*, No. C 04-04496 WHA, 2005 WL 1514102 (N.D. Cal. June 14, 2005) ("Congress did not contemplate paralysis while critical habitat issues were studied to death.").

[9] H.R. Rep. No. 97-597 (1982), *reprinted in* 1982 U.S.C.C.A.N. 2807, 2819-2820 (emphasis added). *See also* N. Spotted Owl, 758 F. Supp. at 625.

The USFWS has designated unoccupied habitat at the time of listing as critical habitat for six species to buffer them from climate change impacts. These species include the Western snowy plover for which unoccupied upland coastal habitat was designated to facilitate inland movement in response to sea level rise (77 Fed. Reg. 36728); the Quino checkerspot butterfly for which an unoccupied northern, higher-elevation habitat unit was designated to facilitate movement in response to hotter, more arid conditions due to climate change (74 Fed. Reg. 28776); the dusky gopher frog for which an unoccupied habitat unit was designated for the purposes of re-establishing a population to help buffer it from climate change (77 Fed. Reg. 35118); and three montane plant species for which unoccupied habitat was designated to facilitate upslope and downslope movement in response to climate change (77 Fed. Reg. 48368). Thus, there is ample precedent, legal authority, and conservation imperative for the USFWS to similarly identify and designate unoccupied inland habitat for the bonneted bat to buffer it from the effects of sea-level rise and increasing storm surge.

We are submitting these comments and pdfs of the cited references via www.regulations.gov. If you have any questions about the comments submitted, please contact Shaye Wolf at (415) 632-5301 or at swolf@biologicaldiversity.org.

Sincerely,

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