

December 23, 2021

Docket No. FWS-R4-ES-2021-0053
Public Comments Processing
Attn: FWS-R4-ES-2021-0053
U.S. Fish and Wildlife Service

Re: Designation of Critical Habitat for the Miami tiger beetle (*Cicindelidia Floridana*)

Please accept these comments on behalf of the Center for Biological Diversity, Bat Conservation International, Miami Pine Rockland Coalition, North American Butterfly Association – Miami Blue Chapter, Sierra Club-Miami Chapter, Tropical Audubon Society, and our thousands of members in south Florida on the U.S. Fish and Wildlife Service’s (Service) proposed critical habitat designation for the Miami tiger beetle (*Cicindelidia Floridana*).¹ We support the Service’s proposal to designate 1,977 acres across 16 units in Miami-Dade County for the Miami tiger beetle. We also encourage the Service to consider additional suitable habitat for the tiger beetle, including the Ludlam Pineland Preserve, and to include the preserve and offsite mitigation area of Coral Reef Commons in the final designation.

At least one million species are facing extinction in the coming decades, and half of them are insects (Cardoso et al 2020, p. 2). Approximately 41% of insect species worldwide are declining and factors include habitat destruction, climate change, and invasive species (Sanchez-Bayo & Wyckhuys 2019, p. 10, 16-17). Among insects, tiger beetles have specific habitat requirements and are often found in limited geographic ranges, which exacerbates the threats (Knisley & Gwiazdowski 2020, p. 293). The Miami tiger beetle is a small, incredibly rare insect endemic only to the pine rocklands of Florida and was thought to be extinct until it was rediscovered in 2007 (Brzoska et al 2011, p. 2). The Service listed it as a federally endangered species in 2016 but is still threatened by development, climate change, and sea-level rise in its small and highly fragmented habitat. Within the unique habitat of the pine rocklands in Miami-Dade County, there are 260 taxa of endemic native plants and 15 endemic vertebrate species (USFWS 2021a, p. 3-162). Among them are other endangered species such as the Florida bonneted bat, Florida leafwing butterfly, Bartram’s scrub-hairstreak butterfly, Florida Brickell-bush, Carter’s small-flowered flax, deltoid spurge, and tiny polygala. All of them utilize or depend on the pine rocklands (USFWS 2021a, p. 3-164, 3-168, 3-169, 3-171, 3-173) and would also benefit from a final designation of critical habitat for the Miami tiger beetle.

1. The Service must designate critical habitat to prevent further Miami tiger beetle habitat loss.

Habitat loss and changes in habitat configuration are one of the greatest threats to biological diversity (Kehoe et al 2020, p. 749), and one of the biggest threats facing the Miami tiger

¹ *Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Miami Tiger Beetle (Cicindelidia Floridana)*, 86 Fed. Reg. 49945 (Sept. 7, 2021).

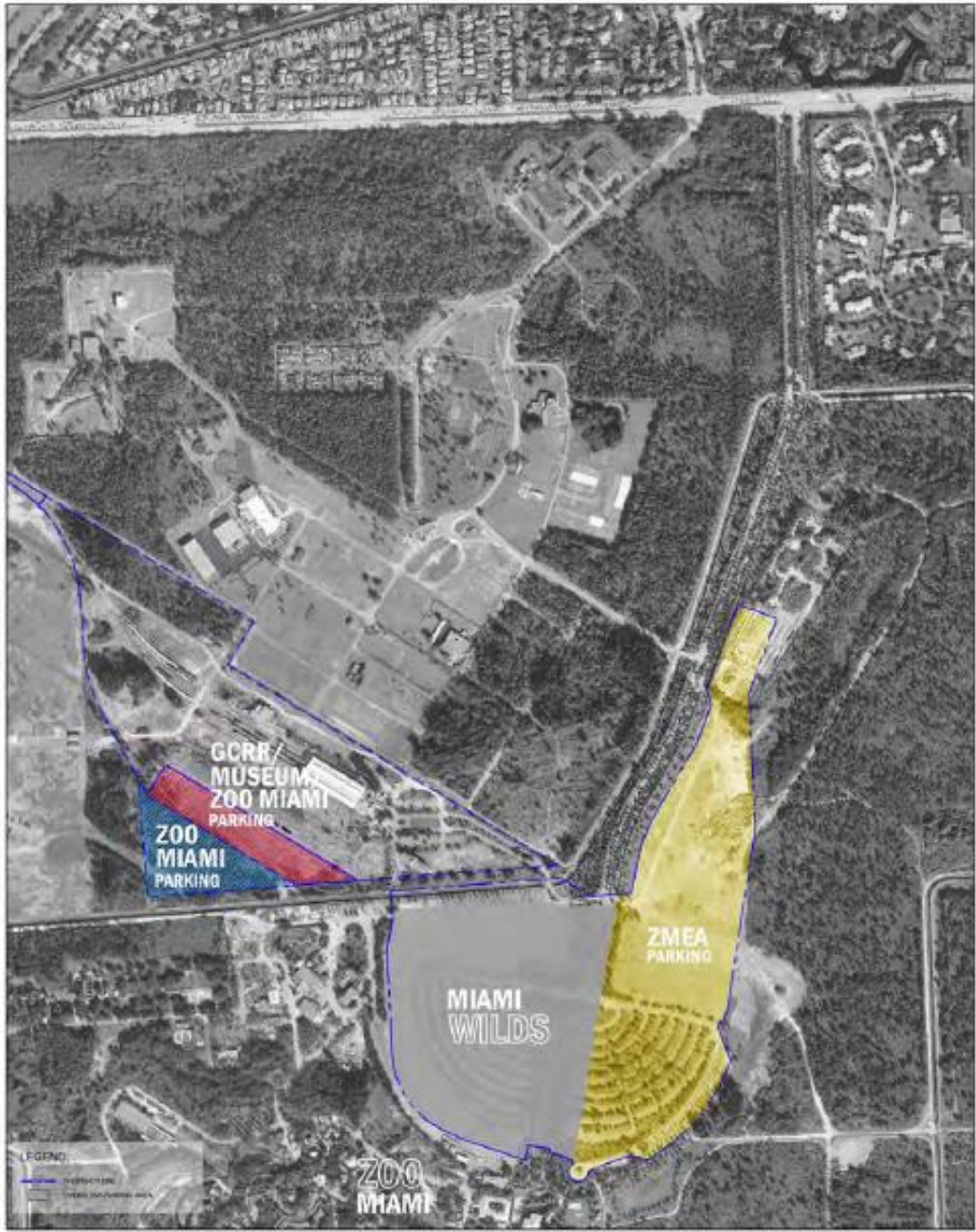
beetle. The pine rocklands are a unique and globally endangered plant community that has experienced more than a 98% decline in its pre-European settlement area due to ecological degradation, land conversion, and outright destruction (Bergh & Wisby 1996, p. 1). It is also the only place the Miami tiger beetle is found. Establishing critical habitat with dispersal corridors is imperative to the beetle's survival. Nearly all the pine rocklands have been destroyed except for some preserved patches in Miami-Dade County, two of which the Miami tiger beetle are currently found. The remaining pine rockland habitat in Miami is highly fragmented with most being less than 50 ha in size and embedded in urban landscapes (Williams et al 2007, p. 257). Miami's human population has increased by 19.73% in the last 10 years (World Population Review 2021, p. 1), and is expected to experience 40% population growth by 2070 (from a 2010 baseline) (Carr and Zwick 2016, p. 30). As a result, native habitats in Florida are rapidly disappearing, especially the pine rocklands (Kautz & Cox 2001, p. 56). Smaller habitats such as the fragmented areas of the pine rocklands are only able to support smaller populations, which are then usually linked to higher extinction rates. This trend is even more true with habitat specialists, including the Miami tiger beetle (Kehoe et al 2020, p. 749). Species with specific habitat demands are less tolerant of fragmentation, since urban patches are often highly disturbed (Fengolio 2021, p. 4). The expansion of urban settlements has increased disproportionately in the past few decades and is a major threat to biodiversity (Fenoglio 2021, p. 1). Establishing critical habitat for a species' survival is necessary and we encourage the Service to consider all pine rockland habitat suitable for the Miami tiger beetle in this critical habitat proposal, as well as dispersal corridors for expansion and overall distribution of the species.

We would also like to stress the importance of previously disturbed areas within pine rockland habitat that still provide critical areas for the beetles during their life history. Specifically, unpaved roads and formerly scraped pine rockland habitat are utilized by Miami tiger beetles, most likely as dispersal corridors, foraging habitats, and mating (Wirth 2021, p. 2). This is supported by Miami tiger beetle observations as recently as August of this year (Figure 1) within the Richmond Pine Rocklands (unit 14). In the interim of establishing appropriate management techniques, especially prescribed burns, these areas are likely to serve as important habitat for the beetle and help connect the highly fragmented landscape. We stress the need to retain modified pine rockland habitat in the final critical habitat designation, as it appears to retain the necessary habitat characteristics to support the Miami tiger beetles, even after habitat modifications such as scraping or clearing (Wirth 2018, p. 432).




Figure 1. Map showing proposed critical habitat designation for the Miami tiger beetle within the Richmond Pine Rocklands. Locations of recorded Miami tiger beetle sightings are indicated by open circle. Red circles are verified sightings on access road from August 2021 (BCI, submitted MTB records).

Finally, the critical habitat proposed within the Richmond Pine Rocklands, specifically the area surrounding the Miami Zoo, is under threat from urban development. Miami Wilds is a new water park, hotel, and retail shop that is being slated for construction next to the Zoo and currently outside of the proposed critical habitat (Miami Wilds 2020a, p. 1). Their website claims that the attractions will lie entirely outside any protected areas, and Miami Wilds' map online represents that claim (Miami Wilds 2020b, p. 2, 3). However, as of August 2021, a parking lot is slated to be added directly within the critical habitat of the tiger beetle (Figure 2), which is situated very near to where the three most recent Miami tiger beetle sightings have been found (Figure 1). The area labeled "Zoo Miami Parking" in Figure 2 is part of the proposed critical habitat for the beetle, per FWS (USFWS 2021, p. 49983). As mentioned, even previously disturbed pine rockland habitat provides critical habitat for the Miami tiger beetle and the continued and gradual loss of habitat is a major threat to their existence. This area must remain within the critical habitat designation, without compromise, and despite pressures to develop based on economic grounds. All existing habitat must be preserved to ensure the survival of this incredibly threatened beetle.



PARKING AREAS

 NORTH
0 700

MIAMI WILDS

Figure 2: Overall Parking Development for Zoo Miami Entertainment Area (Miami Wilds 2021).

II. The Service must designate critical habitat that allows the Miami tiger beetle to survive and recover from climate change and sea level rise threats.

The proposed critical habitat designation for the Miami tiger beetle acknowledges that climate change and resulting sea level rise continue to pose a threat. All climate change scenarios indicate negative effects on pine rockland habitat throughout Miami-Dade County with key climate change impacts including rising temperatures, increased frequency of heat waves and other extreme weather events, and flooding of coastal regions by sea level rise and increasing storm surge (Melillo et al 2014, p. 2). An overwhelming international scientific consensus has established that human-caused climate change is already causing widespread harms and that climate change threats are becoming increasingly dangerous. The Intergovernmental Panel on Climate Change (IPCC), the international scientific body for the assessment of climate change, concluded in its Climate Change 2021: The Physical Science Basis report that: “[i]t is unequivocal that human influence has warmed the atmosphere, ocean and land. Widespread and rapid changes in the atmosphere, ocean, cryosphere and biosphere have occurred,” and further that “[t]he scale of recent changes across the climate system as a whole and the present state of many aspects of the climate system are unprecedented over many centuries to many thousands of years.” (IPCC 2021, p. SPM-5, SPM-9)

As the climate warms, Atlantic hurricane rainfall and intensity are increasing, making hurricanes more destructive (US Global Change Research Program 2018, p. 74). Large storm surge events of the magnitude of Hurricane Katrina have already doubled and are projected to increase in frequency by twofold to sevenfold for each degree Celsius of temperature rise (Grinstead et al 2012, p. 109; Grinstead et al 2013, p. 5369). Heat waves and heavy precipitation events have already become more frequent and intense and will continue to increase in intensity and frequency (US Global Change Research Program 2017, p. 185, 199). Urbanization also effects temperatures, which can 12°C higher than nearby rural areas (Fenoglio 2021, p. 4), leaving the pine rocklands hotter and wetter. These effects of climate change are increasing stress on species and ecosystems, causing changes in distribution, phenology, physiology, vital rates, genetics, ecosystem structure and processes, in addition to increasing species extinction risk (Warren et al 2011, p. 2). Florida is one of the most vulnerable states with regards to sea-level rise and the pine rockland habitat is projected to lose as much as 16,608 acres (close to 99% of total habitat) with three meters of sea level rise (Strauss et al 2012, p. 4, 6-7; Benedict et al 2018, p. 7-i). Storm surge is projected to increase by 25-47% along the US Gulf and Florida coasts due to the combined effects of sea level rise and growing hurricane intensity (Balaguru et al 2016, p. 108). It is imperative that the Miami tiger beetle have as many sites as possible of habitat preserved to accommodate these climatic changes. The Service must analyze how to manage these sites over time to accommodate these threats in the critical habitat designation.

III. Miami tiger beetle habitat requires special management considerations and protections.

To ensure that habitat fragmentation and loss, climate change, and sea level rise don't spell the end of the Miami tiger beetle, certain precautions must be at the forefront of the critical habitat proposal. These units must be maintained to prevent encroaching vegetation, while

sustaining a diverse understory of scrub that include sufficient patches of sand substrate to provide the nutrients, moisture, and soil chemistry the Miami tiger beetle needs (USFWS 2021b, p. 49950; Knisley 2011, p. 9). While noted in the proposal, maintenance must include prescribed burns to manage native and invasive vegetation encroachment, no pesticide use in neighboring areas that could be used as dispersal corridors and limit urban development that could degrade the few remaining fragments of habitat (USFWS 2021b, p. 49951). Consideration should be given to artificial light, which is known to attract other species of tiger beetles, leading to increased mortality (Knisley & Gwiazdowski 2020, p. 4). If reestablishment programs are to be considered successful, it is imperative that they are managed correctly.

Pine rockland habitat is maintained by periodic fires (approximately twice per decade) which influence species composition and structure, control invasives and growth of hardwood species, allow light to reach the understory, and allow for pine regeneration (Knisley 2011, p. 9, 30-31). Fire also controls hardwood hammock habitat from overtaking the pine rockland habitat. Without periodic fires, hardwoods could shade out pine rockland understory species within twenty to thirty years, as well as invite invasive plant species such as Brazilian-pepper, causing loss to the Miami tiger beetle and other species that make up the pine rockland community (Knisley 2011, p. 30-31). Due to the possible trampling of adult or larval tiger beetles and the overall benefits of prescribed fires, mechanical control of pine rockland vegetation should not be considered a viable alternative. Trampling can also occur during mosquito and other pest spraying. Any pesticide uses within or around the units should be discouraged due to trampling and incidental loss of Miami tiger beetles that may establish itself in the new habitats. Urban development can degrade the habitat units as well by creating edge effects, which are disturbances on the outer edge of the unit that can include changes in temperature, wind speed, and weed invasion, essentially creating new environments that can disrupt native ecosystems and extend further into the native habitat (Fischer et al 2009, p. 434). Development brings other disturbances as well, such as increased foot traffic, artificial lighting, noise, and litter. The most common drivers leading to terrestrial insect species loss (impervious surfaces, habitat fragmentation, urban heat islands, pollution, and non-native plants) lead to larger impacts on insects in urban areas compared to rural areas, due to edge effects and habitat loss (Fenoglio 2021, p. 1).

IV. The Service must designate unoccupied critical habitat to ensure the survival and recovery of the Miami tiger beetle.

The Center also supports designating two other habitat units for the Miami tiger beetle as part of the critical habitat proposed rule: the Ludlam Pineland Preserve and the Coral Reef Commons' onsite preserve and offsite mitigation area. The Ludlam Pineland Preserve is a 10-acre protected pine rockland preserve, currently unoccupied by the tiger beetle, with sandy trails and some interior sandy patches (Knisley et al 2011, p. 41). Sufficient patches of sand substrate are a critical habitat determinate for the beetle and as the majority of the former habitat has been lost due to human-related disturbances, it is imperative that as much habitat

as possible is conserved to ensure the success of the Miami tiger beetle (Knisley and Gwiazdowski 2020, p. 4, 5) (Figure 3).

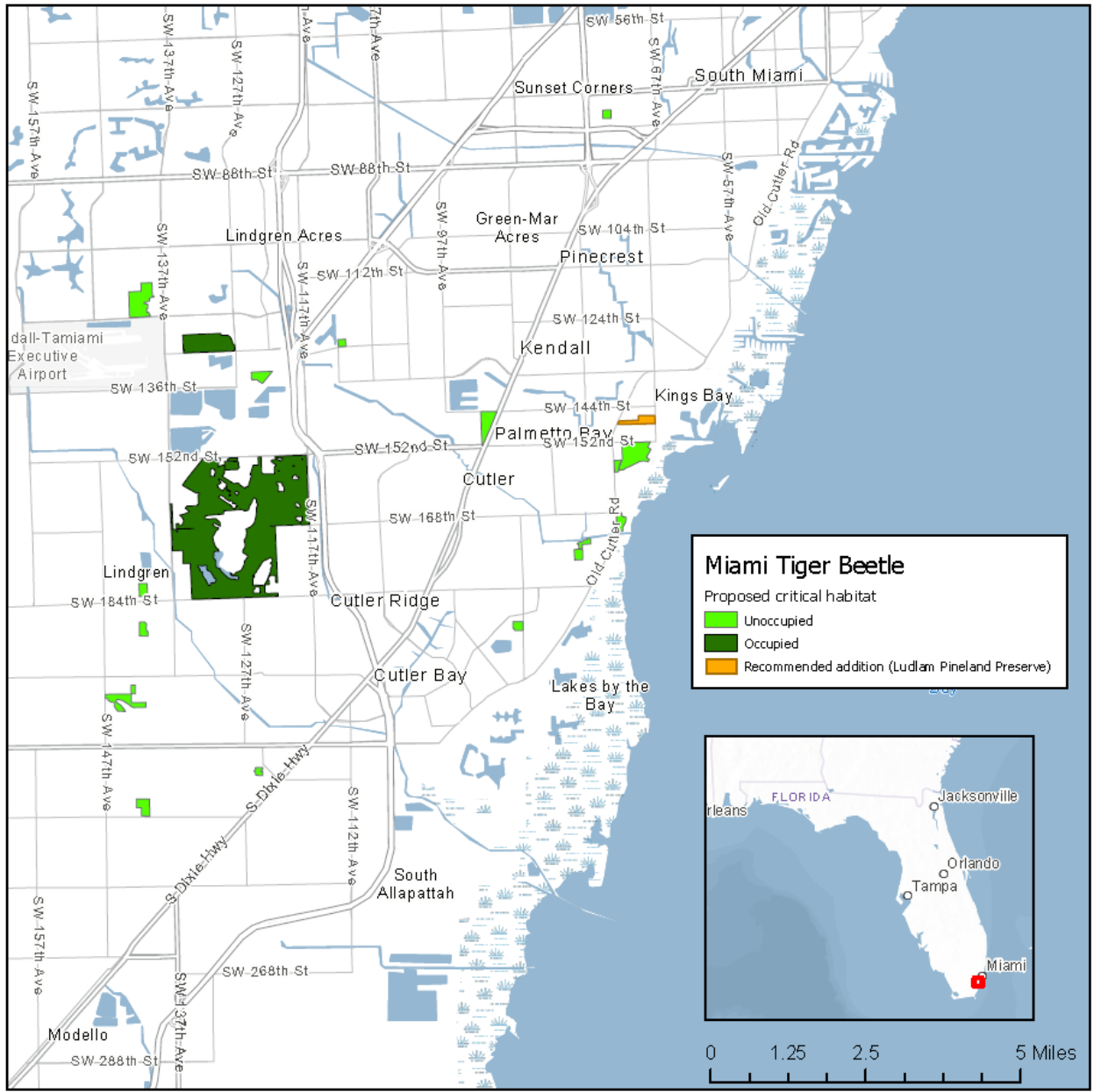


Figure 3. Proposed critical habitat, showing occupied and unoccupied, as well as Ludlam Pineland Preserve. (Center for Biological Diversity, 2021)

a. The Service has no rational basis for excluding essential Miami tiger beetle habitat from its final designation.

The Coral Reef Commons’ onsite preserve and offsite mitigation area is an occupied habitat that, while currently included in the Richmond Pine Rocklands (Unit 14), is being considered for exclusion from the final critical habitat designation due to the Coral Reef Commons Habitat

Conservation Plan (HCP) (USFWS 2021b, p. 49965). The HCP was created due to the Coral Reef Commons development in 2017 and established an onsite preserve and offsite mitigation areas to maintain healthy pine rockland habitat using invasive and exotic plant management, mechanical treatment, and prescribed fire (USFWS 2021b, p. 49965). However, the HCP states that the preserved area was designated only for the Florida leafwing butterfly, Bartram's scrub-hairstreak butterfly, Florida Brickell bush and Carter's small-flowered flax; no other habitat was proposed or designated for any other federally listed species that were addressed by the plan, including the Miami tiger beetle (Church Environmental 2017, p. 16). For the HCP to replace the federally proposed critical habitat for the Miami tiger beetle, the beetle's express management needs would need to be written into the plan. While the tiger beetle shares the same habitat as the four species listed in the HCP, the mitigation measures are not the same. Consideration would need to be given for an Integrated Pest Management (IPM) plan that includes the Miami tiger beetle's specific needs, how and when mechanical treatment would occur, whether any of the applicators for the IPM or the mechanical treatment can identify the beetle, with special attention to the sandy patches where the beetle lives. It has already been noted that mechanical control may lead to trampling of tiger beetles and does not have the same benefits as other control methods (USFWS 2021b, p. 49951). For the HCP to be an adequate replacement for federally designated critical habitat, surveys for the beetle would need to be taken and an amendment for protection would need to be added to the plan. Any sites excluded from the final critical habitat proposal within the Richmond Pine Rocklands, including construction staging areas, should be surveyed for suitable substrate and/or any signs that the beetle may already be present.

We strongly support the Service designating critical habitat for the Miami tiger beetle and urge it to include the Ludlam Pineland Preserve and the Coral Reef Commons' onsite preserve and offsite mitigation areas. These units are the best quality habitat left in the pine rocklands of Miami-Dade County essential for the conservation of the Miami tiger beetle, specifically for rearing, expansion, and translocation efforts to increase the tiger beetle's populations. If you have any questions or wish to discuss this matter, please contact me at 202-731-4323 or tstrobel@biologicaldiversity.org. Thank you for taking our comments into consideration.

Sincerely,

Center for Biological Diversity
Tamara L Strobel, Staff Scientist

Sierra Club Miami Chapter
Steve Leidner, Conservation Chair

Tropical Audubon Society
Paolo Ferreira Miani, Executive Director

North American Butterfly Association,
Miami Blue Chapter
Dennis J. Olle, President

Bat Conservation International
Jon Flanders PhD, Director, Endangered
Species Interventions

Miami Pine Rockland Coalition
Al Sunshine, President

References

Balaguru K, Judi DR, Leung LR. 2016. Future Hurricane Storm Surge Risk for the U.S. Gulf and Florida Coasts Based on Projections of Thermodynamic Potential Intensity. *Climate Change*: 99-110.

Benedict L, Glazer B, Traxler S, Bergh C, Stys B, Evans J. 2018. Florida Keys Case Study on Incorporating Climate Change Considerations into Conservation Planning and Actions for Threatened and Endangered Species. A Project Report for USFWS Cooperative Agreement F16AC01213: 1-152.

Bergh C, Wisby J. 1996. Fire History of Lower Keys Pine Rocklands. The Nature Conservancy, Florida Keys Initiative: 1-38.

Brzoska D, Knisley CB, Slotten J. 2011. Rediscovery of *Cicindela scabrosa floridana* Cartwright (Coleoptera: Cicindelidae) and its Elevation to Species Level. *Insecta Mundi*: 1-7.

Cardoso P, Barton PS, Birkhofer K, Chichorro F, Deacon C, Fartmann T, Fukushima CS, Gaigher R, Habel JC, Hallmann CA, Hill MJ, Hochkirch A, Kwak ML, Mammola S, Noriega JA, Orfinger AB, Pedraza F, Pryke JS, Roque FO, Settele J, Simaika JP, Stork NE, Suhling F, Vorster C, Samways MJ. 2020. Scientists' Warning to Humanity on Insect Extinctions. *Biological Conservation*: 1-12.

Carr MH and Zwick PD. 2016. Technical Report, Florida 2070: Mapping Florida's Future – Alternative Patterns of Development in 2070: <http://1000friendsofflorida.org/florida2070/wp-content/uploads/2016/09/florida2070technicalreportfinal.pdf>. (Accessed October 2021).

Church Environmental. 2017. Coral Reef Commons Habitat Conservation Plan.

Fenoglio MS, Calviño A, González E, Salvo A, Videla M. 2021. Urbanisation Drivers and Underlying Mechanisms of Terrestrial Insect Diversity Loss in Cities. *The Royal Entomological Society*: 1-15.

Fischer J, Lindenmayer DB, Hobbs RJ. Landscape Pattern and Biodiversity. *The Princeton Guide to Ecology*: 431-437.

Grinsted A, Moore JC, Jevrejeva S. 2012. Homogeneous Record of Atlantic Hurricane Surge Threat Since 1923. *PNAS*: 19601-19605.

Grinsted A, Moore JC, Jevrejeva S. 2013. Projected Atlantic Hurricane Surge Threat from Rising Temperatures. *PNAS*: 5369-5373.

Intergovernmental Panel on Climate Change (IPCC). 2021. Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the

Intergovernmental Panel on Climate Change. <https://www.ipcc.ch/report/sixth-assessment-report-working-group-i> (Accessed October 2021).

Kautz RS, Cox JA. 2001. Strategic Habitats for Biodiversity Conservation in Florida. *Conservation Biology*: 55-77.

Kehoe R, Frago E, Sanders D. 2020. Cascading Extinctions as a Hidden Driver of Insect Decline. *Ecological Entomology*: 743-756.

Knisley CB. 2011. Taxonomy, Biology and Conservation of the Florida Tiger Beetle, *Cicindela floridana*. *South Florida Ecological Services*: 1-45.

Knisley CB, Gwiazdowski R. 2020. Conservation Strategies for Protecting Tiger Beetles and Their Habitats in the United States: Studies with Listed Species (Coleoptera: Carabidae: Cicindelidae). *Annals of the Entomological Society of America*: 293-301.

Miami Wilds. 2020a. Miami Wilds: About Project. <http://www.miamiwilds.com/aboutproject/> (Accessed December 2021).

Miami Wilds. 2020b. Miami Wilds: The Plan. <http://www.miamiwilds.com/miamiwildsplan/> (Accessed December 2021).

Miami Wilds. 2021. Parking Concession Agreement at Zoo Miami Entertainment Area. Miami-Dade County.

Melillo JM, Richmond TC, Yohe GW. 2014. Climate Change Impacts in the United States: The Third National Climate Assessment. U.S. Global Change Research Program.

Sánchez-Bayo F, Wyckhuys KAG. 2019. Worldwide Decline of the Entomofauna: A Review of its Drivers. *Biological Conservation*: 8-27.

Strauss BH, Ziemiński R, Weiss JL, Overpeck JT. 2012. Tidally Adjusted Estimates of Topographic Vulnerability to Sea Level Rise and Flooding for the Contiguous United States. *Environmental Research Letters*: 1-12.

U.S. Fish and Wildlife Service (USFWS 2021a). Multi-Species Recovery Plan – Pine Rocklands. <https://www.fws.gov/verobeach/MSRPPDFs/Pinerock.pdf> (Accessed October 2021).

U.S. Fish and Wildlife Service (USFWS 2021b). 2021. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Miami Tiger Beetle (*Cicindelidae floridana*). Department of the Interior.

U.S. Global Change Research Program. 2017. Climate Science Special Report: Fourth National Climate Assessment, Vol. I. Full Report: <https://science2017.globalchange.gov/> (Accessed October 2021).

U.S. Global Change Research Program. 2018. Fourth National Climate Assessment, Volume II: Impacts, Risks, and Adaptation in the United States. Full report: <http://nca2018.globalchange.gov/> (Accessed October 2021).

Warren R, Price J, Fischlin A, de la Nava Santos S, Midgley G. 2011. Increasing Impacts of Climate Change Upon Ecosystems with Increasing Global Mean Temperature Rise. *Climatic Change*: 1-38.

Williams DA, Wang Y, Borchetta M, Gaines MS. 2007. Genetic Diversity and Spatial structure of a Keystone Species in Fragmented Pine Rockland Habitat. *Biological Conservation*: 256-268.

World Population Review. 2021. <https://worldpopulationreview.com/us-cities/miami-fl-population> (Accessed October 2021).

Wirth CC. 2018. Determining Type Locality Habitat and Historic Land Use at Current Sites of the Miami Tiger Beetle, *Cicindelia floridana* (Cartwright) (Coleoptera: Carabidae: Cicindelinae). *The Coleopterists Bulletin*: 4270432.

Wirth CC. 2021. Miami Tiger Beetle 5-Year Status Review Comments. Purdue University.