

January 27, 2022

Deanne Criswell
Administrator
Federal Emergency Management Agency
500 C St., SW
Washington, DC 20472

Submitted via Federal eRulemaking Portal

Re: Comments in response to the Request for Information on the National Flood Insurance Program's Floodplain Management Standards for Land Management and Use, and an Assessment of the Program's Impact on Threatened and Endangered Species and their Habitats; Docket ID: FEMA-2021-0024

Dear Administrator Criswell:

The Southern Environmental Law Center (“SELC”), on behalf of American Rivers, Audubon South Carolina, Audubon Society of Northern Virginia, Cahaba River Society, Cape Fear River Watch, Cape Henry Audubon Society, Carolina Wetlands Association, Catawba Riverkeeper, Center for Biological Diversity, Clean Water Expected in East Tennessee, Congaree Riverkeeper, Coosa Riverkeeper, Defenders of Wildlife, Friends of Buckingham, Georgia Interfaith Power and Light, Highlanders for Responsible Development, Initiative to Protect Jekyll Island, Inland Ocean Coalition, Mountain True, North Carolina Conservation Network, North Carolina Wildlife Federation, Ogeechee Audubon Society, Ogeechee Riverkeeper, Potomac Riverkeeper Network, RedTailed Hawk Collective, Save Our Saluda, South Carolina Coastal Conservation League, South Carolina Wildlife Federation, Sierra Club, South Carolina Native Plant Society, Southern Forests Conservation Coalition, Tennessee Chapter Sierra Club, Tennessee Environmental Council, The Clinch Coalition, The Dolphin Project, The Friends of Indian River, Upstate Forever, Virginia Conservation Network, Warioto Chapter of the National Audubon Society, Wetlands Watch, Wildlands Network, and Winyah Rivers Alliance (collectively, “Conservation Groups”), submits these comments in response to the Federal Emergency Management Agency’s (“FEMA”) Request for Information (“RFI”) on reforming the National Flood Insurance Program’s (“NFIP”) floodplain management standards for building and land use. Our organizations work in the Southeastern states of Virginia, North Carolina, South Carolina, Georgia, Alabama, and/or Tennessee, which forms the geographic focus for these comments.

The Southeast region, from its low-lying coastal plains and wetlands to its inland streams and rivers, is full of iconic, water-rich communities and habitats. Many of our communities and biodiverse ecosystems have already suffered from increasingly severe and more frequent flooding fueled by climate change. At the same time, exploding population growth throughout the Southeast threatens to place additional short-sighted development in vulnerable floodplains. In order to protect our Southeastern communities and ecosystems from further losses, FEMA

must update its NFIP standards. We welcome this opportunity to guide FEMA’s decision-making in crafting forward-thinking and climate-conscious standards that will prevent unwise development decisions and advance conservation of imperiled natural resources throughout our region.

Our recommendations, which are described more fully below, include the following:

- **Incentivize floodplain preservation and limit new development in the floodplain.** The most important thing the NFIP can do is abandon its historical approach of allowing development in vulnerable floodplains. Instead, the NFIP should prioritize floodplain preservation as a recognized best practice that keeps more homes from being placed in harm’s way while maintaining natural flood-storage, thus protecting both communities and floodplain ecosystems.
- **Adapt NFIP standards to account for climate change.** In order to keep development out of floodplains, FEMA must update programs and mapping to account for climate change. When floodplain development is allowed, FEMA should standardize best practices for floodplain construction across the NFIP.
- **Make additional resources available for low-wealth communities and communities of color.** FEMA must ensure any updates to the NFIP standards will not impose financial burdens for low-wealth or historically discriminated populations, including providing more resources to support homeowners in heirs’ property communities with NFIP participation.
- **Improve the evaluation of impacts to and conservation efforts for imperiled species.** FEMA must consider the full scope of effects from the NFIP to threatened and endangered species at the regional level, rather than on a national level as the agency has previously attempted. Additionally, FEMA should consider incorporating standards and actions into the NFIP that will result in greater benefit to imperiled wildlife and habitat.

1. Existing Floodplain Standards

1.1 Background

FEMA regulations outline the criteria used to assess the adequacy of community floodplain management actions and the ways in which FEMA defines compliance with floodplain standards. 44 C.F.R § 60 (2011). The criteria are meant to limit development of flood-prone land, guide new construction away from flood hazards, reduce flood damage, and “otherwise improve the long-range land management and use of flood-prone areas.” 42 U.S.C § 4102(c). The standards must be legally enforceable, applied uniformly throughout a community, and take precedence over less restrictive local laws, ordinances, or codes. Communities may go above and beyond these requirements, and FEMA encourages more stringent standards through financial incentive programs in the Community Ratings System (“CRS”). 42 U.S.C § 4022(b)(1).

In order to become and remain eligible for NFIP coverage, communities must comply with FEMA floodplain management standards.¹ 42 U.S.C. § 4022, 1315. More than 22,000 communities across the U.S. participate in the NFIP, accounting for nearly 5 million policies and \$1.32 trillion in insurance coverage.² In the six states of Alabama, Georgia, North Carolina, South Carolina, Tennessee, and Virginia, there are 3,420 communities participating in the NFIP, with over 605,000 policies and \$164 billion in property coverage.³

1.2 Shortcomings in implementation

One of the most significant shortcomings with NFIP implementation is that the floodplain standards do not actually discourage floodplain construction; rather, they merely create boxes to be checked prior to floodplain development. *See* 44 C.F.R. § 60.3, 60.4 (2011). The NFIP has historically allowed development to be placed in vulnerable floodplains and removed a significant amount of the financial risk that deterred floodplain development prior to the program's creation.⁴ Instead of reducing overall exposure to flooding, the NFIP has allowed for more development in the floodplain than would occur in the absence of this subsidized insurance.⁵ Now, making matters worse, flood risk is increasing as climate change brings more extreme and more frequent rainfall, as well as sea level rise and higher storm surges in our coastal areas, making strong policies that discourage floodplain development more necessary than ever. *See below* section 2.1.

Despite the implementation of the NFIP standards for over 45 years, flood risk and damages from flood events have worsened. Since the NFIP was created, nearly 37,000 properties in the U.S. have met the criteria to become what the program refers to as Severe Repetitive Loss Properties.⁶ These properties, the most flood-prone structures insured under the NFIP, have flooded an average of five times each. Tens of thousands more properties have flooded at least twice and are considered repetitive loss properties. In Charleston, South Carolina alone, there are over 754 properties that have flooded at least twice with damages over \$1,000. Similarly, Norfolk, Virginia reported 944 repetitive loss properties in 2016.⁷ Since 1980, flooding events and tropical cyclones in the Southeast have caused over \$363 billion in damage.⁸ Through time,

¹ *See also* 82 Fed. Reg. § 33453 (2017).

² *Data: Policy Information by State*, FED. EMERGENCY MGMT. AGENCY (September 30th, 2021), <https://nfipservices.floodsmart.gov/reports-flood-insurance-data>.

³ *Id.*

⁴ Kenneth Bagstad et al., *Taxes, subsidies, and insurance as drivers of United States coastal development*, ECOLOGICAL ECONOMICS 63 285-298 (2007); Scott G. Knowles and Howard C. Kunreuther, *Troubled Waters: The National Flood Insurance Program in Historical Perspective*, THE JOURNAL OF POLICY HISTORY 26(3) (2014).

⁵ Christine A. Klein, *The National Flood Insurance Program at Fifty: How the Fifth Amendment Takings Doctrine Skews Federal Flood Policy*, 31 Geo. Envtl. L. R. 285, 330 (2019).

⁶ Anna Weber, *Losing Ground: Severe Repetitive Flooding in the United States*, NATIONAL RESOURCES DEFENSE COUNCIL (2020), <https://www.nrdc.org/resources/losing-ground-severe-repetitive-flooding-united-states>.

⁷ City of Norfolk, 2021 VIRGINIA COMMUNITY PREPAREDNESS FUND GRANT, 143 (2021), <https://www.dcr.virginia.gov/dam-safety-and-floodplains/document/CFPF-21-01-22-S-CID510104-CityofNorfolk-CFPF.pdf>.

⁸ NOAA defines the Southeast to include Virginia, North Carolina, South Carolina, Georgia, Alabama, and Florida. *Billion Dollar Weather and Climate Disasters*, NAT'L. OCEANIC & ATMOSPHERIC ADMIN. (January 2022), <https://www.ncdc.noaa.gov/billions/summary-stats/SECR/1980-2021>.

these damages have increased—the past 10 years alone account for \$135.4 billion in damages from flooding and tropical cyclones in the Southeast.

Another significant shortcoming of the NFIP is inadequate implementation of floodplain regulations. When communities fail to adequately adopt and enforce NFIP building and land use standards, people and property are put at risk. Even the most protective local floodplain regulations are only as good as their implementation. Academic research, FEMA-commissioned reports, independent investigations, and surveys of state and local floodplain managers have all identified compliance and enforcement challenges that undermine the NFIP’s effectiveness.⁹ As climate change continues to exacerbate flooding nationwide, ensuring adequate compliance with and enforcement of the NFIP will become increasingly important to minimize flood damages.

Several of the policy recommendations outlined below are considered best practices for floodplain and flood risk management in normal circumstances, and are encouraged by the CRS, but these policies are especially necessary in light of the additional flooding risk posed by climate change. The best way to support floodplain managers and staff across communities is to standardize and implement best practices through improved federal standards.

2. Key Considerations for Updating NFIP Standards

Climate change, along with equity and program accessibility, should be central to any changes to the NFIP standards FEMA considers. These issues are particularly important in the Southeast for the reasons described below.

2.1 NFIP standards must factor in the risks from climate change

President Biden’s Executive Order 14,008 calls for immediate action by all federal agencies, including FEMA, to mitigate the progression and effects of climate change on all ecosystems and communities.¹⁰ As acknowledged in the RFI, the U.S. is already experiencing increased flooding and flood risk from climate change. 86 Fed. Reg. at 56718. Research indicates that the Southeast and its economy will suffer from climate change more than other regions in the U.S., partly due to the impact of flooding on the many low-lying coastal communities throughout the region.¹¹ By 2050—before the end of a new 30-year mortgage—much of the Southeast coast could experience between 2 and 2.5 feet of sea level rise, according to the National Oceanic and Atmospheric Administration (“NOAA”) 2017 Intermediate-High curve.¹²

⁹ See Margaret Mathis and Suzanne Nicholson, AN EVALUATION OF COMPLIANCE WITH THE NATIONAL FLOOD INSURANCE PROGRAM PART B: ARE MINIMUM BUILDING REQUIREMENTS BEING MET, American Institutes for Research (2006), https://www.fema.gov/sites/default/files/2020-07/fema_nfip_eval_community_compliance_b.pdf.

¹⁰ Exec. Order 14,008, 86 Fed. Reg. 7619, 7619 (Jan. 27, 2021).

¹¹ See Solomon Hsiang et al., *Estimating Economic Damage from Climate Change in the United States*, SCIENCE 356 (6345) 1362-1369 (June 2017), <https://www.science.org/doi/10.1126/science.aal4369>; Lynne Carter et al., *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II* at Ch. 19: Southeast, U.S. GLOBAL CHANGE RESEARCH PROGRAM (2018), <https://nca2018.globalchange.gov/chapter/19/>.

¹² This scenario is consistent with observations of sea level rise along the Southeast coast, and it models a future with emission levels similar to today. In a comparison of the observed local sea level rise trends and local projections in several U.S. locations, NOAA found that “in most circumstances, *the range of interannual relative*

Hurricanes, made stronger by climate change, have already unleashed significant damage in our region. Hurricane Florence in 2018 dropped approximately 8 trillion gallons of rain on North Carolina, according to National Weather Service radar estimates, and accumulated nearly 36 inches of rainfall.¹³ With Hurricane Matthew in 2016 and Hurricane Florence in 2018, parts of the North Carolina coastal plain were dealt two so-called 1,000-year storms in only two years.¹⁴ In Virginia, Hurricane Matthew came close on the heels of two other large rain events and dropped 6 to 11 inches of rain on the Hampton Roads area in a short amount of time, causing “500-year” flooding that damaged about 2,000 structures.¹⁵ During Hurricane Irma in 2017, the tide gauge in Brunswick, Georgia broke while measuring a storm surge at 6.9 feet over mean high tide.¹⁶ By this time, Irma had already been downgraded to a tropical storm, and the center of the storm was over 100 miles away. Even in the storm’s weakened state, its surge broke the 6.2-foot storm surge record Hurricane Matthew had set in Brunswick the year before.

Extreme rainfall has also become more common in our region. For example, there is an upward trend in the number of extreme rain events North Carolina experiences each year.¹⁷ And in the summer of 2021, communities outside of Nashville, Tennessee were damaged by a summer storm system that unleashed over 15 inches of rain on the area in a single weekend;¹⁸ more than 270 homes were destroyed in this deadly flooding.¹⁹ Making matters worse, in a climate scenario where today’s emission levels remain constant, the number of extreme rainstorms in the Southeast will increase by two to three times the historic average by the end of the 21st century.²⁰ Before the end of the century, throughout the Southeast, extreme summer thunderstorms that typically result in 100-year flooding events are expected to drop between 40

sea level change/variability since 2000 has been bounded (to date) by the trajectory of the Intermediate-High scenario.” William Sweet et al., *Global and Regional Sea Level Rise Scenarios for the United States*, NAT’L OCEANIC AND ATMOSPHERIC ADMIN 35 (2017), https://tidesandcurrents.noaa.gov/publications/techrpt83_Global_and_Regional_SLR_Scenarios_for_the_US_final.pdf.

¹³ Nat’l Weather Serv., *Hurricane Florence: September 14, 2018*, NOAA (last visited Apr. 14, 2021), <https://www.weather.gov/ilm/HurricaneFlorence>.

¹⁴ National Weather Service, *Hurricane Florence: September 14, 2018*, http://www.nws.noaa.gov/oh/hdsc/aep_storm_analysis/.

¹⁵ Kimberly Pierceall, *500-year event: Hampton Roads was walloped with rare 1-2-3 storm punch*, THE VIRGINIAN PILOT (Oct. 2016), https://www.pilotonline.com/weather/article_020639ec-dadf-5809-be47-bf27477dab5b.html.

¹⁶ Larry Hobbs, *Irma’s wrath brings floods wind damage*, THE BRUNSWICK NEWS (Sept. 2017), https://thebrunswicknews.com/news/local_news/irmas-wrath-brings-floods-wind-damage/article_570de98c-fe78-54da-8fda-409b3237fcb0.html.

¹⁷ A day with rainfall totaling 3 inches or more qualifies as an extreme rain event in this report. Kenneth Kunkel et al., *North Carolina Climate Science Report*, North Carolina Institute for Climate Studies 6 (2020), https://ncics.org/wp-content/uploads/2020/10/NC_Climate_Science_Report_FullReport_Final_revised_September2020.pdf.

¹⁸ Nicole LoBiondo, *Catastrophic flooding in Tennessee leaves at least 22 dead dozens missing*, Accuweather (Aug. 24 2021), <https://www.accuweather.com/en/severe-weather/catastrophic-flooding-turns-deadly-in-middle-tennessee/1004182>.

¹⁹ Aya Elamroussi, *More than 270 homes were destroyed in central Tennessee as flash flooding killed 18, officials say*, CNN (Aug. 25, 2021), <https://www.cnn.com/2021/08/25/us/tennessee-flooding-wednesday/index.html>.

²⁰ U.S. Global Change Research Program, *Precipitation Change in the United States*, CLIMATE SCIENCE SPECIAL REPORT: FOURTH NATIONAL CLIMATE ASSESSMENT, Volume I at 207-230, <https://science2017.globalchange.gov/chapter/7/>.

and 80 percent more rain than today.²¹ Larger rain events not only flood communities, but also cause increased erosion and turbidity, which reduce stream and aquatic habitat quality.²² The problem is made worse by urbanization and development, which increases impervious surfaces and associated polluted stormwater runoff into waterways.²³

Failure to take into account the risk of rising seas and stronger storms is already having disastrous effects for the NFIP communities and ecosystems that rely on mapping products, guidance, and standards set by the NFIP. The result is a misleading and incomplete depiction of flood risk that can actually discourage participation in the program.²⁴ In order to positively impact community resilience and species conservation, the NFIP must take into account the risk of rising seas and stronger storms and set standardized floodplain management best practices at the federal level based on those risks, rather than relying on individual localities to determine and implement those standards.

2.2 FEMA must acknowledge and address the inequities in flooding impacts on vulnerable and low-wealth communities

As a result of historical discriminatory policies, like redlining and segregation, as well as economic and social disparities, low-wealth communities and communities of color are often located in highly vulnerable floodplains.²⁵ To make matters worse, climate change impacts will be felt most acutely by frontline communities already facing other stressors, such as poverty and social injustices.²⁶

After a storm strikes, low-income communities often face more challenges and barriers to recovery due to complicated and burdensome federal and state assistance programs—a year after Hurricane Harvey, many wealthier neighborhoods had completed repairs while residents in less affluent areas were still living out of half-demolished structures.²⁷ Ineffective government

²¹ Andreas F. Prein et al., *Increased rainfall volume from future convective storms in the US*, NATURE CLIMATE CHANGE (Dec. 2017), <https://doi.org/10.1038/s41558-017-0007-7>.

²² S.Y. Lee et al., *Impact of urbanization on coastal wetland structure and function*, *Austral Ecology* 31(2) (2006), <https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1442-9993.2006.01581.x>.

²³ See https://www.bhamgov.org/A1_Runoff%20Potential.pdf and <https://files.nc.gov/ncdeq/Water%20Quality/Surface%20Water%20Protection/SPU/SPU%20-%20BMP%20Manual%20Documents/BMPMan-Ch03-SWCalcs-20090616-DWQ-SPU.pdf>.

²⁴ Heather Long, *Where Harvey is hitting the hardest, 80% lack flood insurance*, WASHINGTON POST (Aug. 29, 2017), <https://www.washingtonpost.com/news/wonk/wp/2017/08/29/where-harvey-is-hitting-hardest-four-out-of-five-homeowners-lack-flood-insurance/#:~:text=Hurricane%20Harvey%20struck%20Southeast%20Texas,which%20is%20expected%20to%20worsen>.

²⁵ Daniel Cusick, *Past Racist Redlining Practices Increased Climate Burden on Minority Populations*, SCIENTIFIC AMERICAN (Jan. 2020), <https://www.scientificamerican.com/article/racist-redlining-increased-climate-burden-minority-neighborhoods/>.

²⁶ Chester Hartman & Gregory D. Squires (eds.), *THERE IS NO SUCH THING AS A NATURAL DISASTER: RACE, CLASS AND HURRICANE KATRINA* (2006). See also, e.g., Zack Colman & Daniel Cusick, *2 Hurricanes Lay Bare the Vulnerability of America's Poor*, SCI. AM. (Oct. 1, 2018), <https://www.scientificamerican.com/article/2-hurricanes-lay-bare-the-vulnerability-of-americas-poor/>.

²⁷ Danny Vinik, *'People just give up': Low-income hurricane victims slam federal relief programs*, POLITICO (May 2018), <https://www.politico.com/story/2018/05/29/houston-hurricane-harvey-fema-597912>.

communication may also pose a barrier to disaster preparations, such as evacuation planning, leaving communities unnecessarily exposed.²⁸ Smaller communities can lack capacity to prepare for and adapt to climate disasters due to limited financial resources.²⁹ Heirs' property communities, found throughout the Southeast, have an especially difficult time accessing disaster recovery assistance due to an absence of clear title and other documents required to qualify for recovery programs. *See below* section 3.3.1.

As FEMA makes changes to the NFIP standards, any action that results in a financial burden for low-income or historically discriminated populations should be avoided or mitigated by providing financial assistance or another benefit to these communities.³⁰ For example, any adoption of more stringent substantial damage standards should include financial and other assistance for vulnerable communities and low-income residents to be able to make repairs. Additionally, we encourage FEMA to do specific outreach to low-income communities, following up on this RFI, to ensure that these voices are adequately represented in the feedback the agency considers and that participation in this public decision-making process is itself equitable.

3. Recommendations to Improve NFIP Floodplain Management Standards and Programs

Given the shortcomings with the current NFIP and the key considerations outlined above (e.g., climate change and equity), creating resilience to climate change and supporting improved community adaptation are central to each recommendation outlined below. To improve the NFIP, FEMA must incentivize floodplain preservation and limit new development in the floodplain, update flood risk maps to account for the latest data and future conditions, support heirs' property communities with program participation, standardize a national flood hazard real estate disclosure requirement, and improve requirements for construction within the floodplain.

3.1 Preserve the floodplain and control new development in the floodplain

The NFIP standards must acknowledge that flood damages could be reduced if actions are taken early to protect floodplains and wetlands.³¹ Inconsistent floodplain protections can cause undesirable effects across a watershed; if an upstream community has fewer restrictions on floodplain development compared to downstream communities, the flooding problems downstream will be exacerbated by the land use policies upstream. Allowing any development in

²⁸ Substance Abuse and Mental Health Services Administration, *Disaster Technical Assistance Center Supplemental Research Bulletin: How Disasters Affect People of Low Socioeconomic Status*, (July 2017), https://www.samhsa.gov/sites/default/files/dtac/srb-low-ses_2.pdf.

²⁹ Sylvia N. Wilson & John P. Tiefenbacher, *The barriers impeding precautionary behaviours by undocumented immigrants in emergencies: The Hurricane Ike experience in Houston, Texas, USA*, ENV'T HAZARDS (Mar 1, 2012).

³⁰ See Max Tesselaar et al., *Regional Inequalities in Flood Insurance Affordability and Uptake under Climate Change*, Sustainability (2020).

³¹ See U.S. EPA, *Wetlands: Protecting Life and Property from Flooding*, <https://www.epa.gov/sites/default/files/2016-02/documents/flooding.pdf>.

the Special Flood Hazard Area (“SFHA”)³² places more homes and infrastructure at risk and allows encroachments that can be detrimental to the natural and beneficial functions of the floodplain. A federal adoption of sound floodplain management would help manage flood risk, as would improving land use policies and zoning to address floodplain development and the preservation of riparian buffers.³³

Decades of short-sighted planning and decision-making on transportation and land development proposals have led to vast swaths of natural areas along our coasts and in our floodplains being paved over and replaced with highways as well as residential and commercial development. The homes and infrastructure in these low-lying areas are particularly vulnerable to flooding and other impacts of climate change. Further, the wetlands and natural areas they replaced were valuable resilience resources—and habitat for Southeastern species—that helped absorb floodwater and buffer existing neighborhoods and communities from storms. The result is a daunting amount of development, communities, and infrastructure at direct risk of inundation and related harm.

The FEMA RFI suggests that potential changes to control new development in the floodplain could include limiting construction in any identified riparian buffer zone, requiring a more restrictive regulatory floodway standard, requiring compensatory conservation credits/areas for all development in portions of the SFHA that provide natural and beneficial functions, requiring low impact development standards and/or permeable surfaces that may benefit wildlife and habitat, and prohibiting or limiting construction in any portion of the SFHA. 86 Fed. Reg. at 56717. There is no question that each of these measures would improve community resilience. In particular, we urge FEMA to adopt more stringent standards that discourage further development in floodplains, particularly within the SFHA, and better protect communities and the many natural benefits floodplains provide.

Further, FEMA should directly incentivize communities to implement Natural and nature-based infrastructure through the NFIP standards. Natural and nature-based infrastructure relies on natural floodplain and wetland resources which can bring multiple benefits and actually perform better than traditional, “grey” flood protection measures.³⁴ For rural communities in particular, protection using natural solutions could involve the preservation of wetland and floodplain resources. Wetlands have the ability to reduce, delay, and retain floodwater,³⁵ among other ecosystem services.³⁶ Protecting floodplain wetlands has been proven to reduce flood

³² The SFHA generally includes the 100-year floodplain in most communities and delineates the area where NFIP standards are applied. *Special Flood Hazard Area*, FED. EMERGENCY MGMT AGENCY, <https://www.fema.gov/glossary/special-flood-hazard-area-sfha>.

³³ Klein 2019, *supra* note 5, at 29–30.

³⁴ Greg Browder et al., *Integrating Green and Gray: Creating Next Generation Infrastructure*, WORLD BANK GROUP AND WORLD RESOURCES INSTITUTE (2019), <https://openknowledge.worldbank.org/handle/10986/31430>.

³⁵ Andrew Bullock and Mike Acreman, *The role of wetlands in the hydrological cycle*, HYDROLOGY AND EARTH SYSTEM SCIENCES 7,3, 358-389 (2003), <https://hal.archives-ouvertes.fr/hal-00304786/document>.

³⁶ William J. Mitsch, Blanca Bernal, and Maria E. Hernandez, *Ecosystem services of wetlands*, INTERNATIONAL JOURNAL OF BIODIVERSITY SCIENCE, ECOSYSTEM SERVICES & MANAGEMENT, 11 no. 1:1-4 (2015), <https://www.tandfonline.com/doi/full/10.1080/21513732.2015.1006250?scroll=top&needAccess=true>. *Functions and Values of Wetlands*, EPA 843-F-01-002c, U.S. ENVIRONMENTAL PROTECTION AGENCY (Mar. 2002),

damages.³⁷ Maintaining existing wetlands so that they continue to provide natural flood storage and storm buffering services helps minimize the costs of flood events and the need for future costly flood control projects.

Natural and nature-based infrastructure is already providing incredible value to communities throughout the Southeast. Floodplains of the Waccamaw River and swamplands just north of Conway, South Carolina reduce flooding by up to 1.5 feet for floods up to a 200-year event, and provide an average of \$6.14 million in avoided damage annually.³⁸ Structures impacted by Hurricane Florence in the Pee Dee River basin in South Carolina saw an average of \$47,000 less damage due to water storage by upstream floodplains. Following Hurricane Florence, a floodplain area of about 156,000 acres around the Great Pee Dee, Little Pee Dee, and Lynchers rivers stored enough water to fill over half a million Olympic-sized swimming pools.³⁹ Because the floodplain absorbed this extreme flooding and slowly released the water over 10 days, downstream Georgetown County weathered the storm without major flooding.

Floodplain preservation is a best practice that reduces flooding damages and protects communities by keeping more homes from being placed in harm's way while maintaining the natural flood-storage capacity. This outcome is squarely aligned with the original goals of the NFIP. Therefore, the NFIP standards must be updated to reflect a preference for avoiding and preserving the natural floodplain and its beneficial functions.

3.2 Improve flood risk mapping

3.2.1 FEMA must develop flood maps with updated storm probability data.

The 100-year and 500-year floodplain delineations provided by FEMA are used as the basis of many important policy and planning decisions at the community level. It is crucial that these flood level estimations and the statistics that feed into them are as accurate as possible. Across the nation, the federal NOAA Atlas 14 assessment provides information on expected rainfall and flooding from various storm event probabilities for a given community.⁴⁰ This analysis has not been updated for North Carolina, South Carolina, Tennessee, or Virginia since 2004. The most recent data included in that update is from the 1990s. This calculation affects a wide range of policy matters, including the lines drawn on the FEMA Flood Insurance Rate Maps ("FIRMs"), the base flood elevation in a neighborhood, community planning, and where flood insurance policies are required for federally-backed mortgages. If the statistics do not account for the frequency of the extreme rainfall observed within the past twenty years, then the

<https://nepis.epa.gov/Exe/ZyPDF.cgi/200053Q1.PDF?Dockey=200053Q1.PDF>.

³⁷ Mike Acreman and J. Holden, "How wetlands affect floods," *Wetlands* 33, no. 5 (October 2013), 773-786, <https://link.springer.com/article/10.1007/s13157-013-0473-2>.

³⁸ *Id.*

³⁹ One acre-foot is equal to 1,613.3 cubic yards, therefore the forest stored approximately 1,936,000,000 cubic yards. Assuming an Olympic swimming pool is 3300 cubic yards, the floodplain stored enough water to fill over 586,665 Olympic swimming pools. Williams et al, "Hurricane Florence Flooding in Georgetown County: A Qualitative Exploration of the Interactions of Estuary and Tidal River," *JOURNAL OF SC WATER RESOURCES* (2019).

⁴⁰ Geoffrey Bonnin et al., *Precipitation Frequency Atlas of the United States: Volume 2 Version 3.0*, NAT'L OCEANIC AND ATMOSPHERIC ADMIN. (2006), https://www.weather.gov/media/owp/oh/hdsc/docs/Atlas14_Volume2.pdf.

policy decisions that follow will not account for the present flood risk in an area. It is difficult for any community to guard against future damages without understanding the size and probability of storms today.

Funding to revise the NOAA Atlas 14 statistics has been limited and has significantly delayed updates to these statistics for states and communities across the country. FEMA and NOAA should establish a permanent partnership to fund updates to the NOAA Atlas 14 statistics concurrent with each map revision cycle. Historical risk alone can no longer predict current or future flood risk, and the floodplain lines derived from storm probabilities will affect how many people are in harm's way decades into the future.

3.2.2 FEMA must develop flood maps that reflect future conditions.

Despite being required to do so by law, *see* 42 U.S.C. 4101b.(b)(3)(D), FEMA has not developed flood maps that reflect both current and future flood risks. The majority of flood hazard maps currently used to determine minimum building design and other floodplain development standards are, at best, a reflection of the current flood risk and more often an imperfect representation of past risk. As a result of 2012 legislation, FEMA formed a Technical Mapping Advisory Council (“TMAC”) in recognition of the need for improved data and mapping techniques.⁴¹ TMAC released a report in 2016 outlining how FIRMs could incorporate future sea level rise and coastal erosion conditions.⁴² Yet these recommendations have not been acted upon since. All FIRMs should include sea level rise and climate risk projections so that communities can incorporate these risks into their development and resilience planning.

To meet its duty concerning floodplain mapping, FEMA must incorporate the best available science regarding sea levels, precipitation, and intensity of hurricanes in any revision or update of NFIP flood maps. FEMA must make multiple future condition flood elevations available on each FIRM so that communities can incorporate this information into planning. For coastal areas, FEMA should use NOAA's most recent sea level rise projections and incorporate this data on sea level rise directly into the modeling and calculations used for vulnerable areas. For riverine areas in particular, FEMA should take the impacts of future development and land use change into account when creating and updating maps.

We recommend that FEMA use a scenario equivalent to the NOAA 2017 Intermediate-High curve or a similar scenario, as opposed to lower sea level rise scenarios, when mapping future sea levels. The NOAA 2017 Intermediate-High scenario curve projects between 2 and 2.5 feet of sea level rise along Southeastern shorelines by 2050, compared to baseline sea levels in the year 2000. This scenario is consistent with observations of sea level rise along the Southeast coast, and it models a future with emission levels similar to today.⁴³ Sea level rise scenarios

⁴¹ Nicole E. Rohr, *Rising to the Level of Climate Science: Rhode Island, the National Flood Insurance Program, and Sea Level Rise Projections*, 22 Roger Williams U. L. Rev. 506 (2017).

⁴² FEMA, TMAC ANNUAL REPORT, (2016), [https://www.fema.gov/media-library-data/1492803841077-57e4653a1b2de856e14672e56d6f0e64/TMAC_2016_Annual_Report_\(508\).pdf](https://www.fema.gov/media-library-data/1492803841077-57e4653a1b2de856e14672e56d6f0e64/TMAC_2016_Annual_Report_(508).pdf).

⁴³ In a comparison of the observed local sea level rise trends and local projections in several U.S. locations, NOAA found that “in most circumstances, the range of interannual relative sea level change/variability since 2000 has been bounded (to date) by the trajectory of the Intermediate-High scenario.” NOAA 2017, *supra* note 12, at 35.

lower than the NOAA 2017 Intermediate-High curve are less reliable as they do not account for an increase in ice melt and associated contributions to sea level rise rates. Recent findings on ice sheet instability validate moderate and high climate scenarios; research predicts that ice sheet melt has a tipping point, and melt past that point could initiate a chain reaction of rapid melt that most climate models have not considered.⁴⁴ Though researchers can only estimate the amount of warming it would take to trigger this avalanche of melt, crossing that tipping point will significantly contribute to and accelerate sea level rise. Observations from NASA and the European Space Agency in 2018 revealed that Antarctic ice melt is tracking close to the International Panel on Climate Change (“IPCC”) worst case climate scenario.⁴⁵ Research shows that both Greenland⁴⁶ and Antarctica’s⁴⁷ ice sheets are melting faster and in greater volume than expected and that the ocean is also warming more rapidly than predicted.⁴⁸ In recent years NASA scientists have discovered that the Thwaites glacier in Antarctica is more unstable than previously thought,⁴⁹ and the collapse of this ice mass alone could increase global sea levels by 2 feet.⁵⁰ The years 2020 and 2019 marked the globe’s second and third warmest years on record, respectively, and both years were only slightly cooler than the warmest record set in 2016.⁵¹ For these reasons, moderate scenarios of sea level rise are a better reference point than the lower scenarios. Crucially, underestimating the encroachment of rising seas could lead to unwise planning decisions, weaker resilience measures, and ineffective responses.

The effects of stronger storm surges in combination with sea level rise should also be considered by the mapping updates, as this combined flooding threat will drastically change shorelines and flooding exposure across the Southeast coast. The Atlantic basin already sees more major hurricanes (i.e., Category 3 or higher) today than it did before the 1980s.⁵² In addition, a warming climate is producing greater storm surge,⁵³ rainfall,⁵⁴ and, as a result, greater

⁴⁴ Robert M. DeConto and David Pollard, *Contribution of Antarctica to past and future sea level rise*, NATURE 531, 591-597 (2016), <https://www.nature.com/articles/nature17145>.

⁴⁵ Ice Sheet Mass Balance Inter-Comparison Exercise (IMBIE), *Mass balance of the Antarctic Ice Sheet from 1992 to 2017*, NATURE 558, 219-22 (2018), <https://www.nature.com/articles/s41586-018-0179-y>.

⁴⁶ Jason E. Box et al., *Global sea level contribution from Arctic land ice: 1971-2017*. ENVIRONMENTAL RESEARCH LETTERS 13(12) (2018), <https://iopscience.iop.org/article/10.1088/1748-9326/aaf2ed>. See also <https://www.nytimes.com/2019/01/21/climate/greenland-ice.html?action=click&module=Well&pgtype=Homepage§ion=Climate%20and%20Environment>.

⁴⁷ Eric Rignot et al., *Four decades of Antarctic Ice Sheet mass balance from 1979-2017*, PNAS 116(4), 1095-1103 (2018), <https://www.pnas.org/content/116/4/1095>.

⁴⁸ Lijing Cheng et al., *How fast are the oceans warming*, SCIENCE 363(6423), 128-29 (2019), <http://science.sciencemag.org/content/363/6423/128>.

⁴⁹ Stef Lhermitte et al., *Damage Accelerates Ice Shelf Instability and Mass Loss in Amundsen Sea Embayment*, PNAS (Oct. 2020), <https://www.pnas.org/content/117/40/24735>.

⁵⁰ P. Milillo et al., *Heterogeneous retreat and ice melt of Thwaites Glacier, West Antarctica*, SCIENCE ADVANCES 5(1) (2019), <http://advances.sciencemag.org/content/5/1/eaau3433/tab-pdf>. See also <https://www.nbcnews.com/mach/science/hole-opens-under-antarctic-glacier-big-enough-fit-two-thirds-ncna965696>.

⁵¹ <https://www.noaa.gov/news/2020-was-earth-s-2nd-hottest-year-just-behind-2016>.

⁵² Peter J. Webster et al., *Changes in tropical cyclone number, duration, and intensity in a warming environment*, SCI. (Sept. 16, 2005), <https://doi.org/10.1126/science.1116448>.

⁵³ Ning Lin et al., *Physically based assessment of hurricane surge threat under climate change*, NATURE CLIMATE CHANGE (Feb. 14, 2012), <https://doi.org/10.1038/nclimate1389>.

⁵⁴ See, e.g., Christina M. Patricola & Michael F. Wehner, *Anthropogenic influences on major tropical cyclone events*, NATURE (Nov. 14, 2018), <https://doi.org/10.1038/s41586-018-0673-2>.

property damage⁵⁵ each time a hurricane hits. Climate change is also causing tropical storms to become less predictable,⁵⁶ gain strength more rapidly,⁵⁷ and withstand maximum intensity well outside the historic geographic “hurricane zone.”⁵⁸

Accounting for future conditions such as sea level rise and larger storms will help make the flood risk maps of the NFIP more accurate predictors of risk. A clearer understanding of which locations are most vulnerable to current and future flooding will, in turn, enable communities to better prepare for the threats of climate change.

3.3 Manage and reduce existing floodplain risk

3.3.1 Updates to NFIP floodplain standards should support heirs’ property owners.

A significant percentage of “heirs’ property” lies in and around coastal floodplains, meaning the NFIP floodplain standards have a significant impact on these lands. “Heirs’ property” refers to an arrangement collectively dividing land ownership among heirs in the absence of a legal document appointing the next owner, and is a form of property succession that became common in Black communities in the Reconstruction Era.⁵⁹ At that time, Black landowners often did not create wills to establish formal ownership because they were denied access to the legal system or did not trust it due to discrimination. It is estimated that heirs’ property constitutes approximately 3.5 million acres in the South, representing nearly a third of the total area of Black-owned land.⁶⁰ Studies in North Carolina,⁶¹ Alabama,⁶² and coastal South Carolina⁶³ counties found that heirs’ property can make up between 50 and 88 percent of Black-owned land.⁶⁴

⁵⁵ Morris A. Bender et al., *Modeled impact of anthropogenic warming on the frequency of intense Atlantic hurricanes*, SCI. (Jan. 22, 2010).

⁵⁶ Hurricane trajectories are meandering and stalling more, making their behavior harder for meteorologists to predict. This was exemplified by Hurricane Sandy’s abrupt left-hand turn towards the New Jersey coast in 2012 and Hurricanes Harvey and Florence’s stalling over Houston, TX, and Wilmington, NC, respectively. See, e.g., Timothy Hall, *Webinar: How Climate Change is Impacting Hurricanes*, S. ALL. CLEAN ENERGY (May 30, 2018), <http://www.cleanenergy.org/2018/05/30/climate-change-impacting-hurricanes/>.

⁵⁷ Kieran T. Bhatia et al., *Recent increases in tropical cyclone intensification rates*, NATURE COMM’NS (Feb. 7, 2019).

⁵⁸ GEOPHYSICAL FLUID DYNAMICS LABORATORY, *Global Warming and Hurricanes*, (last updated Mar. 29, 2021), <https://www.gfdl.noaa.gov/global-warming-and-hurricanes/>.

⁵⁹ Center for Agriculture and Food Systems, *Heirs’ Property*, <https://farmlandaccess.org/heirs-property/#footnotes>.

⁶⁰ Lizzie Presser, *Kicked Off the Land: Why so many black families are losing their property*, THE NEW YORKER (July 2019), <https://www.newyorker.com/magazine/2019/07/22/kicked-off-the-land>.

⁶¹ M. Schulman et al., *Problems of landownership and inheritance among Black smallholders*, AGRICULTURE AND HUMAN VALUES 2(3): 40–44 (1985).

⁶² R. Zabawa et al., *Factors associated with Black-owned land loss*. JOURNAL OF AGRICULTURAL AND FOOD INFORMATION 2(4): 23–41 (1994).

⁶³ F.R. Rivers, *The public trust debate: implications for heirs’ property along the Gullah Coast*, SOUTHEASTERN ENVIRONMENTAL LAW JOURNAL 15: 147–69 (2006).

⁶⁴ C.J. Gaither et al., *Heirs’ property and land fractionation: fostering stable ownership to prevent land loss and abandonment*, E-GEN. TECH. REP. SRS-244, 33, (2019), https://www.srs.fs.usda.gov/pubs/gtr/gtr_srs244.pdf.

Development in coastal floodplains, enabled by the NFIP, threatens heirs' property in the Southeast. Forced partition sale of heirs' property often leads to land loss because a partial owner does not need to secure the consent of the other owners to force a sale, and owners are often unable to compete with offers from developers.⁶⁵ Several developments in the floodplain of coastal South Carolina, for example, lie on former heirs' property.⁶⁶

Additionally, it is difficult for heirs' property owners to access federal flood insurance without clear property title. Recently, recognizing the burden that proof of title was placing on communities in the wake of a disaster, FEMA expanded the types of documentation accepted to prove ownership and access post-disaster financial assistance.⁶⁷ This policy change will make it easier for heirs' property owners to access federal funds following a flood or a hurricane; however, a corresponding policy change is needed to proactively assist these same communities *before* a flood. FEMA must make a similar allowance for alternative documentation of ownership in the NFIP to remove barriers for heirs' property communities to access federal flood insurance. Proactive participation in this program could help these communities bounce back faster and maintain cohesion after a flood event. FEMA should also explore the opportunity to create a program within the NFIP to specifically support heirs' property owners.

3.3.2 FEMA must offer improved long-term mitigation options for repeatedly flooded properties.

As discussed above, our first priority should be to keep development out of floodplains. But where development in floodplains already exists, the NFIP should increase incentives to mitigate future disaster damages, rather than keeping homeowners and communities in a cycle of flood, rebuild, repeat. As noted in the RFI, one out of every six dollars spent by the NFIP in the past 30 years has gone to a Severe Repetitive Loss Property, which has driven the program's enormous debt.⁶⁸ The disaster assistance provided by federal programs has historically emphasized rebuilding a damaged home in place to pre-storm conditions; however, simply rebuilding to the conditions that contributed to disaster damages will not safeguard against future disasters and climate change impacts.

The NFIP has an existing flood risk mitigation program, called Increased Cost of Compliance ("ICC"), which can help reduce risk from repeated flooding. ICC coverage is a required part of most NFIP policies and is available to home owners with a policy after their home has been affected by a flood. For residential structures, ICC provides funds for some mitigation measures, which include elevation, relocation, demolition, and certain types of

⁶⁵ Center for Heirs' Property Preservation, Documentary: 5 Historic African American Communities, (Dec. 2020), https://www.youtube.com/watch?v=Uc_xiURCcDE.

⁶⁶ Barrier islands such as Hilton Head, and suburbs surrounding Charleston including Daniel Island and Mount Pleasant used to be heirs' property communities. David Slade and Angie Jackson, *South Carolina land slipping away from families amid fragile claims and explosive growth*, POST AND COURIER (Dec. 2018), https://www.postandcourier.com/business/real_estate/sc-land-slipping-away-from-families-amid-fragile-claims-and-explosive-growth/article_3b6f4fa2-dc56-11e8-9145-33ac81ce0616.html.

⁶⁷ See Fed. Emergency Mgmt. Agency, WRITTEN TESTIMONY OF DEANNE CRISWELL ADMINISTRATOR, 2021, <https://oversight.house.gov/sites/democrats.oversight.house.gov/files/Criswell%20Testimony.pdf>.

⁶⁸ Congressional Research Service, INTRODUCTION TO THE NATIONAL FLOOD INSURANCE PROGRAM, (Nov. 2021), <https://sgp.fas.org/crs/homesec/R44593.pdf>.

floodproofing. The current maximum payout of \$30,000 is insufficient to cover most activities allowed through the program such as elevating a flood-damaged structure, which can easily cost 3-5 times the ICC spending limit. Crucially, ICC does not cover long-term mitigation options, such as home buyouts and the elevation of utilities.

To increase the adaptation options homeowners have after a flood, FEMA should increase the ICC payout from \$30,000 to at least \$60,000 and add a new ICC coverage option to premiums that could cover at least \$100,000. These steps would help make more mitigation options available to homeowners through the existing ICC program; however, FEMA should also consider additional programs to equitably make buyouts more available for homeowners who need assistance relocating to higher ground after a flood.⁶⁹

3.3.3 FEMA should create a national flood hazard disclosure requirement.

Homebuyers and renters across the country are notified if their new home contains lead or asbestos, but due to the lack of a federal flood hazard disclosure requirement, many do not learn that they have committed to a property with flood risk until after a storm hits. Residents have a right to know the flood history and risk that comes with a home so that they can take steps to reduce the risk of damages and purchase flood insurance, if available. The President of the National Association of Realtors recently spoke in support of flood disclosures, stating: “Denying consumers basic information about known water damage in a home would threaten America’s real estate market.”⁷⁰

Buyers interested in a potential new home can guess about its flood history by looking at a FEMA floodmap; however, these delineated floodplains are not always an accurate depiction of flood risk or history, as discussed above. Flood disclosures eliminate this guessing game and lead to higher consumer satisfaction among buyers. Currently, two states within SELC’s region have no flood hazard disclosures, and even the states with some form of disclosure merely recommend that the bare minimum of information on a property’s flood history is shared in a real estate transaction.⁷¹ Until there is a federal standard, this haphazard approach leaves many people in the dark about their flood risks.

States should be required to pass disclosure laws that provide residents with information about flood risk in order to participate in the NFIP. Sellers and landlords should have to disclose information such as the following:

- Whether the home has ever been damaged by a flood and the extent of the damage;

⁶⁹ Any buyout program should be focused toward primary residences and have a maximum spending limit of \$500,000 available per housing unit in order to ensure resources are equitably distributed.

⁷⁰ South Carolina Realtors, *Realtors Hold Panel Examining Nation’s Flood Disclosure Policies*, <https://www.screaltors.org/realtorsr-hold-panel-examining-nations-flood-disclosure-policies/>.

⁷¹ Alabama and Georgia have no statewide flood hazard disclosure requirement. Virginia passed a flood disclosure requirement that went into effect in 2022 (Va. Code 55.1-708.2). NRDC, *Flood Disclosure Map*, <https://www.nrdc.org/flood-disclosure-map>.

- Whether the home is located in a mapped floodplain and, if it is, the flood zone classification (e.g., 100-year or 500-year) of the property and the source and date of this information; and
- Whether the seller and/or previous owners ever received federal disaster aid that would require all future owners to obtain and maintain flood insurance on the property and, if they have, the type of aid and amount received.

3.4 Improve construction practices

The NFIP floodplain management standards should demonstrate a clear preference for avoiding further floodplain development. To the extent future floodplain development is permitted, the following recommendations would help improve community resilience to higher water levels caused by climate change.

3.4.1 FEMA should adopt higher freeboard standards for structures in A zones and V zones.

Currently, new or substantially improved structures constructed in the floodplain of a community participating in the NFIP must be elevated to at least Base Flood Elevation (“BFE”), or the level of the 100-year flood. 44 C.F.R. 60 (A)(c)(3). Designing and constructing buildings and infrastructure above the BFE can reduce flood risk, increase safety, and prevent property loss. Freeboard, or elevation above BFE, for new construction provides a factor of safety both for current flood events and future climate change impacts, such as sea level rise, that will make higher flood levels more frequent. Multiple states and NFIP-participating communities, have already adopted a freeboard standard requiring that structures be elevated 2 feet above the height of the 100-year flood—the Hampton, Norfolk, Poquoson, Wachapreague, York County, and Portsmouth communities in Virginia have all enacted freeboard requirements of 3 feet or more.⁷² Some local jurisdictions have already adopted up to 4 feet of freeboard, a practice recommended by FEMA for maximum insurance savings.⁷³

For non-critical structures in “A zones” (generally defined by the 100-year floodplain), FEMA should adopt a higher freeboard standard, requiring, at a minimum, **2 feet** of freeboard above BFE for new construction and for substantial damage or improvements to existing structures. For non-critical structures in “V zones” (coastal high-hazard areas), FEMA should require a higher freeboard standard of **4 feet** above the BFE for new construction and for substantial damage or improvements to existing structures.

3.4.2 FEMA should require a higher level of flood protection for critical infrastructure.

Unlike other FEMA disaster programs, the NFIP does not require a higher level of flood protection for critical infrastructure, such as emergency operations centers, nursing homes, or power plants. The federal government, including FEMA, has required higher flood protection for

⁷² Wetlands Watch, *Freeboard Requirement*, <https://wetlandswatch.org/freeboard-requirement>.

⁷³ See FEMA, CRS CREDIT FOR HIGHER REGULATORY STANDARDS, at 9 (2006), https://consensus.fsu.edu/FBC/Flood-Resistant-Standards/CRS_430_Higher_Standards_2006.pdf.

federally funded critical infrastructure for decades. Federal agencies generally use the 0.2 percent annual chance flood, or 500-year flood, as the minimum level of protection for critical federal infrastructure projects in floodplains. But under the NFIP, non-federally funded infrastructure is held to the same flood risk standard as a single-family home: protection from the 100-year flood. In the Southeast in particular, this oversight has resulted in massive volumes of toxic coal ash waste being situated directly in or next to floodways.⁷⁴

FEMA already encourages NFIP communities to adopt a “critical facilities standard” by providing CRS credit to communities that prohibit construction of critical facilities in the 500-year floodplain. Communities can receive partial credit for protecting critical facilities to the height of the 500-year flood. To make these best practices for critical infrastructure part of the NFIP standards, FEMA should:

- Prohibit new critical infrastructure within the 500-year floodplain, unless there is no other feasible location.
- If location outside of the 500-year floodplain is not feasible, require redeveloped, substantially improved, or new critical infrastructure to be elevated to the 500-year flood elevation, plus a level of freeboard that accounts for future conditions or the historical flood of record, whichever is greater.

3.4.3 FEMA should prohibit fill and build.

To raise a building site in a flood-prone area, developers often bring in a substantial amount of fill dirt to raise the homes above flood risk, which in turn displaces stormwater and flooding onto surrounding neighborhoods. Flooding displacement as a result of fill and build practices has created severe problems in coastal cities such as Charleston, South Carolina.⁷⁵ When building in already developed areas prone to flooding, such construction should be limited to the use of post and pile foundations, tall crawlspaces, and the placement of homes or businesses on top of garages.

The NFIP floodplain management regulations should be amended to include the following provision:

The use of fill for building construction is prohibited in all special flood hazard areas (100-year floodplain) shown on Flood Insurance Rate Maps (FIRM). For any stream or body of water not identified by the FIRM, including intermittent streams, the developer shall determine the 100-year floodplain through a certified engineering analysis. These

⁷⁴ See Kendra Pierre-Louis et al., *Florence’s Floodwaters Breach Coal Ash Pond and Imperil Other Toxic Sites*, The New York Times (Sept. 24, 2018), <https://www.nytimes.com/interactive/2018/09/13/climate/hurricane-florence-environmental-hazards.html#:~:text=Imperil%20Other%20Toxic%20Sites,-By%20KENDRA%20PIERRE&text=Surging%20floodwaters%20from%20Florence%20and,Fear%20River%20in%20North%20Carolina>.

⁷⁵ Editorial Staff, *Editorial: Stop flood-inducing ‘fill and build’ practice in Charleston*, POST AND COURIER (2019) https://www.postandcourier.com/opinion/editorials/editorial-stop-flood-inducing-fill-and-build-practice-in-charleston/article_90374130-ec58-11e9-98f0-e38c9f878eea.html.

elevations shall be determined in accordance with FEMA's recognized methods and be based on future conditions.

4. FEMA Must Fulfill its Endangered Species Act Obligations in Revising the NFIP Standards

As described above, climate change and irresponsible development in the floodplain are threatening the communities of the Southeast. Our natural ecosystems, and threatened and endangered species in particular, also suffer from the effects of these combined threats.

The Endangered Species Act (“ESA”), passed in 1973, is “the most comprehensive legislation for the preservation of endangered species ever enacted by any nation.” *TVA v. Hill*, 437 U.S. 153, 180 (1978). A focus on conserving habitat for endangered and threatened species has been critical to the ESA’s success. The first purpose of the ESA is to “provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved.” 16 U.S.C. § 1531(b). Congress has long recognized the threat of habitat loss as a primary driver of species extinction. *Hill*, 437 U.S. at 179–80 (summarizing legislative history regarding habitat loss and destruction). In particular, the Senate Conference Report acknowledged that “[o]ften, protection of habitat is the only means of protecting endangered animals which occur on non-public lands.” S. Rep. No. 93-307 at 4 (1973).

It is well established that “sufficient loss of habitat will lead to species extinction.”⁷⁶ Indeed, habitat destruction and degradation are the leading causes of species imperilment and extinction, both in the United States and around the world.⁷⁷ The U.S. Fish and Wildlife Service (“FWS”) has repeatedly acknowledged that “[i]dentification of the habitat needs of listed species and the conservation of such habitat is the key to recovering endangered and threatened species.”⁷⁸ Accordingly, the ESA’s conservation policy and goals depend on protecting habitat and ecosystems, not individual species in isolation. FEMA’s revisions to its NFIP program present opportunities for the agency to further conservation of imperiled species—particularly those in the biodiverse Southeast.

4.1 The Southeast’s biodiversity is at risk

The climate and geography of the Southeastern United States have enabled it to support high levels of biodiversity for millions of years.⁷⁹ In particular, the rivers and streams of the Southeast support an astounding level of biodiversity relative to the rest of the United States,

⁷⁶ NAT’L RESEARCH COUNCIL, SCIENCE AND THE ENDANGERED SPECIES ACT 72 (1995).

⁷⁷ See, e.g., Stuart L. Pimm et al., *The biodiversity of species and their rates of extinction, distribution, and protection*, SCI. (May 30, 2014); David S. Wilcove et al., *Quantifying threats to imperiled species in the United States: Assessing the relative importance of habitat destruction, alien species, pollution, overexploitation, and disease*, BIOSCI. (Aug. 1998).

⁷⁸ See, e.g., 64 Fed. Reg. 31871 (June 14, 1999).

⁷⁹ See, e.g., Reed F. Noss et al., *How Global Biodiversity Hotspots May Go Unrecognized: Lessons from the North American Coastal Plain*, 21 DIVERSITY AND DISTRIBUTIONS 236 (2015).

hosting 38 percent of the entire country’s freshwater fish species, 43 percent of its snails, 60 percent of its mussels, and 52 percent of its turtles.⁸⁰

The Southeast’s water-rich, biodiverse ecosystems are also highly imperiled. In 2016, the Southeast was recognized as one of only two Global Biodiversity Hotspots in the United States, indicating high species diversity threatened by significant habitat destruction.⁸¹ The Southeast hosts over 1,800 endemic plant species, yet has already suffered enormous habitat loss: 85.5 percent of its habitat has been “highly altered or converted to anthropogenic land cover.”⁸² As one of the fastest growing areas of the country,⁸³ the Southeast currently faces many threats from human activities—including development, logging, agriculture, pollution, poor land management, and introduction of invasive species, among others—and the impacts of human presence on habitats in the Southeast are becoming increasingly problematic. As cities expand, urban sprawl fragments and destroys previously intact natural habitats, introducing a host of threats to wildlife.⁸⁴ Densely developed areas may also facilitate the expansion of invasive species.⁸⁵ A portion of this development is facilitated by federal flood insurance,⁸⁶ which often has an outsized impact in the Southeast due to the region’s diverse and complex natural resources located in or near floodplains.

The climate crisis is also exacerbating threats to species and habitat. As discussed above in Section 2.1, climate change is impacting the Southeast in various ways, particularly through increased rainfall and increasingly frequent and severe storms. Sea level rise is already causing a net loss of wildlife habitat while also impeding connectivity between habitats.⁸⁷ Climate change is also expected to significantly transform habitats throughout the Southeast in the near future, through higher temperatures, extreme precipitation, increased drought, more frequent and intense wildfires, rising sea levels, increased flooding, higher invasive species prevalence, shifting ocean currents, and increased storm severity. As a result, the Southeast will likely see large species range shifts in the coming decades, and the pre-existing issues of development and urban sprawl in the region will almost certainly hamper the ability of species to move in response to these

⁸⁰ Charles Lydeard & Richard L. Mayden, *A Diverse and Endangered Aquatic Ecosystem of the Southeast United States*, 9 CONSERVATION BIOLOGY 800 (1995).

⁸¹ Reed F. Noss, *Announcing the World’s 36th Biodiversity Hotspot: The North American Coastal Plain*, CRITICAL ECOSYSTEM PARTNERSHIP FUND (Feb. 18, 2016), <https://www.cepf.net/stories/announcing-worlds-36th-biodiversity-hotspot-north-american-coastal-plain>. To be designated a “Hotspot,” a region must have more than 1,500 endemic plant species, and must have lost at least 70 percent of its natural habitat.

⁸² *Id.*

⁸³ See U.S. Census Bureau, Press Release, *Southern and Western Regions Experienced Rapid Growth This Decade*, U.S. DEP’T OF COMMERCE (May 21, 2020), <https://www.census.gov/newsroom/press-releases/2020/south-west-fastest-growing.html>.

⁸⁴ Adam J. Terando et al., *The Southern Megalopolis: Using the Past to Predict the Future of Urban Sprawl in the Southeast U.S.*, 9 PLOS ONE e102261 (2014).

⁸⁵ Sean B. Menke et al., *Urban areas may serve as habitat and corridors for dry-adapted, heat tolerant species; An example from ants*, URBAN ECOSYSTEMS (Sept. 9, 2010).

⁸⁶ Christine A. Klein, *The National Flood Insurance Program at Fifty: How the Fifth Amendment Takings Doctrine Skews Federal Flood Policy*, 31 Geo. Envtl. L. R. 285, 330 (2019).

⁸⁷ U.S. Geological Survey, “Understanding Impacts of Sea-Level Rise and Land Management on Critical Coastal Marsh Habitat” (Dec. 31, 2019), <https://www.usgs.gov/programs/climate-adaptation-science-centers/science/understanding-impacts-sea-level-rise-and-land>.

threats.⁸⁸ Biodiversity loss can and should be minimized by climate-smart policies that protect and restore habitat.

The ESA plays an important role in protecting imperiled species from the combined threats of habitat destruction and climate change. Across the Southeast, there are currently 258 species protected by the ESA as endangered, threatened, or experimental populations.⁸⁹ These range from iconic estuarine species such as the Atlantic sturgeon to numerous species of river-dependent darters and freshwater mussels, which play a critical role in preserving regional water quality. Of all listed species in the Southeast, over half inhabit freshwater ecosystems, including 101 species of mussels, snails, and crayfish, as well as 36 fish species.⁹⁰ In floodplains, rivers and streams merge with the Southeast's forest ecosystems, including forested wetlands. These highly productive and dynamic environments protect water quality by removing nutrients and pollutants from stormwater runoff.⁹¹

4.2 The ESA's application to the NFIP

Protecting Southeastern habitats, including floodplains, is critical to the ESA's goals to prevent the extinction of, and ultimately recover, imperiled Southeastern species. Functioning floodplains are key to the health of many species of fish and wildlife and provide important habitat corridors for many species. Unsustainable development of river floodplains can harm water quality, wetlands, and habitat.

As FEMA acknowledges in its RFI, it has a duty under section 7 of the ESA to ensure that implementation of the NFIP does not jeopardize threatened and endangered species or destroy or adversely modify their critical habitat. 86 Fed. Reg. at 56717. This acknowledgment marks an important shift. Historically, and even in its most recent Biological Evaluation conducted in 2016, FEMA maintained that ESA section 7(a)(2) did not apply to its administration of the NFIP. *Ecological Rights Found. v. FEMA*, 384 F. Supp. 3d 1111, 1117 (N.D. Cal. 2019). A series of court decisions, however, have established that ESA section 7 *does* apply to the NFIP. *See Coal. for a Sustainable Delta v. FEMA*, 812 F. Supp. 2d 1089 (E.D. Cal. 2011); *Fla. Key Deer v. Paulison*, 522 F.3d 1133 (11th Cir. 2008); *Nat'l Wildlife Fed'n v. FEMA*, 345 F. Supp. 2d 1151 (W.D. Wash. 2004). In each decision, the court determined that NFIP was subject to section 7(a)(2), and that to the extent FEMA made a "no effects" determination for ESA impacts, it was unsupported.

These cases held that issuance of flood insurance is a legally relevant "cause" of development that threatens listed species such as the Florida Key deer. Their reasoning, exemplified in *Paulison*, was that the ESA applies to "any action authorized, funded, or carried out" by the action agency, and the consulting agencies must consider the "effects of the action as a whole," including "indirect effects," which are "caused by the proposed action and [] later in

⁸⁸ Lee Hannah, *Climate change, connectivity, and conservation success*, CONSERVATION BIOLOGY (Dec. 2011).

⁸⁹ To compile these numbers, SELC reviewed FWS's Environmental Conservation Online System, NMFS's Species Directory, Federal Register notices, and the Code of Federal Regulations. A full list of listed Southeastern species is available upon request.

⁹⁰ *Id.*

⁹¹ Environmental Protection Agency (EPA), "Why are Wetlands Important?" <https://www.epa.gov/wetlands/why-are-wetlands-important>.

time, but still [] reasonably certain to occur.” *Paulison*, 522 F.3d at 1143 (citing 50 C.F.R. § 402.02 (2008)). The Eleventh Circuit held that development was a foreseeable indirect effect of issuing flood insurance, because “development is encouraged and in effect authorized by FEMA’s issuance of flood insurance.” *Id.* Because “FEMA has the authority in its administration of the NFIP . . . to prevent the indirect effects of its issuance of flood insurance by, for example, tailoring the eligibility criteria that it develops to prevent jeopardy to listed species,” “its administration of the NFIP is a relevant cause of jeopardy to the listed species.”⁹² *Id.*

In 2016, when it last revised the NFIP regulations, FEMA prepared a Biological Evaluation⁹³ to assess the potential effects of the NFIP on listed species and designated habitats. FEMA defined the proposed action as implementation of the NFIP throughout the United States. Given the vast geographical extent of the action area, FEMA’s Evaluation discussed affected species and habitats in broad categories, identifying nine “primary habitats” such as wetlands, fresh waters, and beaches. *Id.* at 1118. The Evaluation concluded the NFIP would have “no effect” on threatened and endangered species or critical habitat—again without considering any possible impacts from floodplain *development*. *Id.*

In 2019, a federal district court struck down the 2016 Evaluation, concluding it was arbitrary and capricious for FEMA to exclude floodplain development from its analysis. *Ecological Rights Found.*, 384 F. Supp. 3d at 1117. Specifically, the court held that floodplain development was not solely a matter of state and local permits, and rejected FEMA’s suggestion that the NFIP does not cause development to occur as a direct or indirect effect. It held that the ESA’s “may affect” inquiry establishes a “relatively low threshold,” and that ample evidence showed that the NFIP causes or encourages floodplain development and likely jeopardizes listed species. *Id.* at 1122. The district court also noted that FEMA’s 2016 Evaluation should have assessed the NFIP’s actual effects on floodplain development. NFIP regulations address a “wide array of development modalities, from structural elevation and drainage to the construction of levees. Yet the Evaluation . . . presented no meaningful analysis of FEMA’s discretion, through the floodplain management criteria, to minimize harm to ESA-listed species and habitats.” *Id.* at 1124. Finally, the district court faulted FEMA for pursuing a single national Evaluation, which permitted only a “broad approach” because of the “vast geographic area” under study. *Id.* at 1123. It held that this “wide-angle perspective unduly obscured important local variables in listed species and critical habitats, floodplain development practices, and other factors that should have been taken into account.” *Id.*

Ecological Rights Foundation confirms that implementation of the NFIP “may affect” listed species and provides several important takeaways for FEMA’s forthcoming revised Evaluation.

⁹² These cases decided between 2004–2011 led to consultations between FEMA and FWS and the National Marine Fisheries Service. In subsequent years, the wildlife agencies published several Biological Opinions concluding that the NFIP was likely to jeopardize listed species and habitats in Washington, Oregon, and Florida. *Ecological Rights Found.*, 384 F. Supp. 3d at 1117.

⁹³ “Biological Evaluation” is not a term used in the ESA statute or implementing regulations. A Biological Evaluation appears to be the functional equivalent of a Biological Assessment.

Section 7(a)(1) of the ESA also applies to FEMA. As FEMA acknowledges in the RFI, ESA section 7(a)(1) mandates that federal agencies use their authorities to conserve threatened and endangered species and minimize any adverse impact to them. 86 Fed. Reg. at 56715. To “conserve” means to use “all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this chapter are no longer necessary.” 16 U.S.C. § 1532(3). In *Paulison*, the Eleventh Circuit held that section (7)(a)(1) imposes a judicially reviewable obligation upon all agencies, including FEMA, to “carry out programs for the conservation of endangered and threatened species,” and that although agencies have some discretion in designing conservation programs, “total inaction is not allowed.” 522 F.3d at 1146.

4.3 Recommendations for the FEMA RFI

As FEMA revises its NFIP standards, it must fulfill its ESA obligations under Section 7. FEMA must engage in a full consideration of effects to threatened and endangered species at an appropriate regional scale. Further, FEMA must consider conservation actions it can take to further the recovery goals of the ESA. The NFIP presents an opportunity for FEMA to make significant contributions to habitat and species conservation in the Southeast.

4.3.1 FEMA should consider effects of the NFIP to threatened and endangered species at the regional level.

In its RFI, FEMA states that it plans to “re-evaluate the implementation of the NFIP under the ESA *at the national level.*” 86 Fed. Reg. at 56715 (emphasis added). FEMA therefore appears to be recommitting to the same scale of analysis that the district court recently faulted as impossibly overbroad. *See Ecological Rights Found.*, 384 F. Supp. 3d at 1123 (“Given the extraordinary diversity of flora and fauna throughout the United States, it is hard to see how a single national biological evaluation could ever hope to be genuinely useful or true to Congress’s mandate to protect species and habitats in their local environments.”).

We recommend that FEMA instead conduct regional Biological Evaluations, to facilitate a more detailed understanding of how the NFIP affects endangered and threatened species in the biologically distinct regions of the United States, thus accounting for “important local variables in listed species and critical habitats, floodplain development practices, and other factors.” *See Ecological Rights Found.*, 384 F. Supp. 3d at 1123.

FEMA should select regions of analysis demarcated according to similar habitats and resident species. FWS’s regional offices may be able to provide assistance in defining the appropriate regional scales, although we note that even those regions are large and encompass a huge variation of habitats and species—for example, Region 4 of FWS encompasses ecosystems spanning from Appalachian mountain forests in western North Carolina down to the tropical beaches of the Florida Keys.

In the Southeast in particular, impacts to local floodplain biodiversity are becoming more prevalent due to increases in population and development around urban centers.⁹⁴ As one example, Tennessee's Duck River exemplifies both the biological richness and imperilment of many ecosystems in the South. The Duck is one of the most biologically diverse rivers in North America, showcasing a nearly unsurpassed variety of freshwater animal life, particularly fish and freshwater mussels.⁹⁵ The Duck River basin provides habitat for 35 species listed as endangered, threatened, candidates, or otherwise imperiled.⁹⁶ These species are vulnerable to anthropogenic perturbations including landscape clearing and conversion, increased impervious surfaces, impoundment, agricultural runoff, phosphate mining, gravel dredging, and municipal and industrial wastewater discharge.⁹⁷ The upper region of the Duck watershed is now experiencing rapid urbanization and population growth, exacerbating these longstanding threats.⁹⁸ The watershed has already experienced extreme flooding, which is only expected to worsen as development continues.⁹⁹ Floodwaters commonly cause significant water pollution by carrying tons of sediment, litter, pesticides, and other chemicals from human development downstream into rivers, and also harm aquatic environments by greatly accelerating erosion of streambanks and increasing turbidity.¹⁰⁰ The massive influxes of sediment associated with extreme precipitation events, combined with other pollutants, can cause measurable harm to aquatic plant and animal species.

The Cape Fear River near Wilmington, North Carolina is another valuable Southeastern ecosystem impacted by flooding. During Hurricane Florence in 2018, the region received as much as 36 inches of rain, and the Cape Fear River reached a record height of 22.5 feet.¹⁰¹ The ensuing plume containing sediment, millions of gallons of hog manure, and other pollutants flowed into the Atlantic Ocean and was so severe it was visible from space via satellite imagery.¹⁰² Flooding from Hurricane Florence was detrimental to aquatic life; substantial fish kills were recorded in the Cape Fear watershed following the storm, and approximately one dozen Endangered Atlantic Sturgeon were among the casualties.¹⁰³ The anoxia created from such

⁹⁴ Sammy L. King et al., *The ecology, restoration, and management of southeastern floodplain ecosystems: A synthesis*, 29 *Wetlands* 624–34 (2009), <https://link.springer.com/article/10.1672/08-223.1>.

⁹⁵ U.S. Army Corps of Engineers, Duck River Watershed Plan—Final Watershed Assessment (May 2018) at 2, <https://bit.ly/32bsb9j>.

⁹⁶ *Id.*

⁹⁷ Tennessee Wildlife Resources Agency, 2020 Duck River Quantitative Mussel Survey at 2.

⁹⁸ Duck River Watershed Plan at 2.

⁹⁹ *Id.*

¹⁰⁰ U.S.EPA, PRELIMINARY DATA SUMMARY OF URBAN STORM WATER BEST MANAGEMENT PRACTICES, at 1-1 (1999), https://www.epa.gov/sites/default/files/2015-11/documents/urban-stormwater-bmps_preliminary_study_1999.pdf.

¹⁰¹ John Bacon, *Florence aftermath: 35 dead; flooding leaves North Carolina residents seeking food, water*, USA TODAY (Sept. 18, 2018), <https://www.usatoday.com/story/news/nation/2018/09/18/florence-flooding-cuts-off-wilmington-food-water-distributed/1343567002/>.

¹⁰² Eli Meixler, *NASA Captures Polluted Carolina Rivers Spilling Into the Ocean After Hurricane Florence*, TIME (Sept. 26, 2018), <https://time.com/5406624/nasa-carolina-river-pollution-hurricane-florence/>; Kendra Pierre-Louis, *Lagoons of Pig Waster Are Overflowing After Florence: Yes That's As Nasty as It Sounds*, THE NEW YORK TIMES (Sept. 19, 2018), <https://www.nytimes.com/2018/09/19/climate/florence-hog-farms.html>.

¹⁰³ Kyle Rachels, *Fisheries Impacts of Hurricane Florence*, North Carolina Wildlife Resources Commission (2019), <https://www.ncwrc.org/2019/09/19/fisheries-impacts-of-hurricane-florence/>, NCAFS 2019 Abstracts & Podcasts – NCAFS (fisheries.org).

extreme flooding conditions can also cause marsh die off along the coast.¹⁰⁴ Yet in this rapidly growing area, developers continue to propose new construction in floodplains, such as a massive proposed \$700 million 20-story development on the banks of the Cape Fear River.¹⁰⁵ Such developments are not only vulnerable to flooding and sea level rise themselves, but by replacing natural shorelines with impervious surfaces, they also make flooding worse for other areas and habitats.

On the flip side, regular, natural flooding events may actually benefit some federally listed species in the Southeast, especially plants that specialize on river scour habitats such as Ruth's golden aster and Cumberland rosemary. These plants need regular flooding to survive and have been negatively affected by dams and the elimination of flooding events throughout their habitat.

In sum, conducting region-specific Biological Evaluations would enable FEMA to more effectively assess threats to endangered and threatened species by examining biologically distinct regions of the country separately. A more granular approach would lead to a more accurate assessment of, and more targeted management decisions for, imperiled ecosystems such as those found across the Southeast.

4.3.2 FEMA should consider the effects of NFIP-facilitated floodplain development in making its “may affect” determination.

As the federal courts have recognized in *National Wildlife Federation, Coalition for a Sustainable Delta, Florida Key Deer*, and most recently *Ecological Rights Foundation*, the NFIP facilitates and encourages private development in floodplains, and FEMA must consider that development as an “effect of the action” for ESA consultation purposes. *See* 50 C.F.R. § 402.02.

To comply with the ESA, FEMA must analyze the “NFIP’s effects on how floodplain development actually takes place,” which requires “analysis of FEMA’s discretion, through the floodplain management criteria, to minimize harm to ESA-listed species and habitats.” *See Ecological Rights Found.*, 384 F. Supp. 3d at 1124. FEMA acknowledges in its RFI that “the agency must consider the NFIP’s effect on floodplain development and the extent to which NFIP actions influence land development decisions.” 86 Fed. Reg. at 56718. Such an inquiry would entail considering, on a regional basis, the effects of FEMA’s construction and management criteria on floodplain development patterns for communities that receive flood insurance after complying with FEMA’s criteria. *See Paulison*, 522 F.3d at 1142. These criteria are intended to “guide the development of proposed construction away from locations which are threatened by flood hazards” and “otherwise improve the long-range land management and use of flood prone areas.” 42 U.S.C. § 4102(c).

¹⁰⁴ Camille L. Stagg et al., *Extreme Precipitation and Flooding Contribute to Sudden Vegetation Dieback in a Coastal Salt Marsh*, *PLANTS* 10, 1841 (2021).

¹⁰⁵ Kendall McGee, *NAACP, environmentalists oppose massive development on Cape Fear River*, *WECT 6 News* (Nov. 23, 2021), <https://www.wect.com/2021/11/23/naacp-environmentalists-oppose-massive-development-cape-fear-river/>.

Given the certainty that implementation of the NFIP “may affect” listed species and critical habitat in each region FEMA analyzes, FEMA should proactively initiate formal consultation with FWS on its revision of the NFIP floodplain management standards for land management and use regulations. *See* 50 C.F.R. § 402.14.

4.3.3 FEMA should consider how to maximize beneficial impacts to habitat and wildlife through the NFIP.

The RFI appropriately acknowledges that “[c]onserving the natural and beneficial functions of the floodplain and reducing flood risk can work in tandem with the ESA requirement of conserving threatened and endangered species and critical habitat.” 86 Fed. Reg. at 56715. It also notes that protecting species could also ultimately reduce the risk of flooding to human communities: “measures taken to conserve biodiversity in floodplains often benefit people, by reducing the risk of flooding and conserving the beneficial functions of the floodplain.” *Id.*

Indeed, as the district court in *Ecological Rights Foundation* observed, the NFIP could have *beneficial* effects on protected species if properly applied. Specifically, the NFIP “presents an opportunity to preserve or even enhance floodplain environments to the benefit of their plant and animal life.” 384 F. Supp. 3d at 1123 (citing Community Rating System incentives for “good floodplain management practices that protect the habitat of ESA species,” as well as FEMA’s mandate in 42 U.C.C. § 4022(b) to “encourage adoption of more effective measures that protect natural and beneficial floodplain functions”). Further, as explained above, FEMA has an obligation under Section 7(a)(1) to actively consider incorporating conservation measures into a program for the benefit of ESA-listed species.

FEMA should ensure that efforts to prioritize floodplain habitat protection go hand-in-hand with climate resilience measures that work with ecosystems, not work against them. In many instances throughout the Southeast, however, the worthy goal of resilience has led to proposals for hardened structures that further degrade coastal habitats. For instance, a terminal groin planned for Ocean Isle Beach, NC, and a seawall around Charleston, SC are intended to combat the effects of erosion and storm surge, respectively, but will have myriad negative effects on nesting shorebirds, sea turtles, wetlands, and essential fish habitat.¹⁰⁶ As FEMA acknowledges in the RFI, floodplain management standards that protect wildlife habitat are very likely to *increase* resilience of human developments. 86 Fed. Reg. at 56715. Nature-based solutions such as protecting and restoring wetlands and riparian buffers would result in more effective, less costly flood protection while also protecting habitat for fish and wildlife. *See above* section 3.1.

¹⁰⁶ *See* NC Audubon, “Seeking a Better Approach to Erosion on Ocean Isle Beach,” <https://nc.audubon.org/news/seeking-better-approach-erosion-ocean-isle-beach>; Coastal Conservation League, “US Army Corps of Engineers Charleston Peninsula Sea Wall,” <https://www.coastalconservationleague.org/projects/charleston-peninsula-coastal-flood-risk-management-study-by-the-us-army-corps-of-engineers/>.

Because participating communities' land use and control measures must meet FEMA's eligibility criteria (*see* 42 U.C.C. § 4102(c)), FEMA should consider how more stringent criteria could better prevent development and fragmentation of flood-prone wildlife habitat. Avoiding development in floodplains, and restoring degraded floodplain habitats, will also provide much-needed habitat corridors for rare and common species alike. One proactive step FEMA should take is to continue, update, and expand its ESA-species mapping effort, known as Flood Risk Endangered Species Habitat ("FRESH").¹⁰⁷ FRESH currently overlays flood-prone areas throughout the United States with ranges and designated critical habitat for threatened and endangered species to enable CRS-participating communities to make floodplain management decisions that will improve species conservation efforts.¹⁰⁸ FEMA could consider incorporating more information into FRESH in order to make it even more valuable, such as integrating data about future sea level rise and anticipated marsh migration corridors. Such information could help decision-makers visualize how species habitat will be lost or shift in the face of climate change.

FEMA should also consider how to maximize the water quality benefits of floodplain protection. Many estuary-dependent species, such as the Atlantic sturgeon, are sensitive to water quality and harmed by development pressure in riparian areas, which causes the discharge of polluted stormwater runoff. Protecting and restoring riparian buffers, and minimizing encroachment of impervious surfaces, would prevent new sources of pollution and filter runoff from existing sources. Protecting riparian buffers can also reverberate up the food chain, because pollutants stored in fish tissues eventually reach predators such as shorebirds and dolphins.¹⁰⁹ Accordingly, FEMA should further explore how to implement the suggestion in the RFI to limit construction in riparian buffer zones. *See* 86 Fed. Reg. at 56717.

Finally, we note that considering the beneficial effects of protecting floodplain habitat would protect all plant and animal species that live in riparian and estuarine areas, not just formally-listed threatened and endangered species. This is significant for several reasons. First, conservation efforts are more effective—with species responding and recovering more quickly—when implemented earlier, while populations are healthier and have not yet reached the point of needing ESA protections.¹¹⁰ Second, if management decisions can prevent a species from declining to threatened or endangered status, this avoids expenditure of agency resources for recovery plans, captive breeding, critical habitat designation, consultation, and enforcement of the take prohibition, all of which typically accompany a listing. Finally, because of a long backlog, many species are already in trouble even if they are not officially listed as threatened or endangered. There are currently hundreds of species designated as "candidates" or "under review" in the Southeast, indicating they may deserve ESA protections but have not yet received

¹⁰⁷ FEMA, FRESH Web-based Mapping Application User's Guide, https://www.fema.gov/sites/default/files/documents/fema_FRESH-users-guide.pdf.

¹⁰⁸ *See* Insurance Services Offices, Inc., "Preparing a Floodplain Species Assessment and A Floodplain Species Plan for Credit under the Community Rating System of the National Flood Insurance Program (2020), https://crsresources.org/files/500/fsa-preparingfloodspeciesassessmentplan_crs_12_14_2020.pdf.

¹⁰⁹ NC Division of Water Quality, Bioaccumulation in North Carolina Fish, <https://files.nc.gov/ncdeq/Water%20Quality/Planning/TMDL/Mercury/Bioacc.pdf>.

¹¹⁰ *See, e.g.,* Chris S. Elphick et al., *Correlates of population recovery goals in endangered birds*, CONSERVATION BIOLOGY (Oct. 2001).

them. It can take ten years or more for agencies to list species due to backlog and limited resources.¹¹¹ In the meantime, protecting floodplain habitats can prevent species declines even before the ESA's protections kick in, thus prioritizing resource expenditures for the most at-risk species.

5. Conclusion

As discussed above, climate change and increased floodplain development disproportionately threaten the communities and ecosystems of the Southeast. To address these issues, we encourage FEMA to implement stronger minimum floodplain management standards, with a particular focus on keeping new development out of our most vulnerable floodplains. In updating these standards, FEMA must also work to alleviate the NFIP's impacts on community safety and unique ecosystems.

We appreciate this opportunity to comment on reforming the floodplain management standards of the NFIP. If we can answer questions or provide additional information, please do not hesitate to contact us.

Sincerely,



Jenny Brennan
Science and Policy Analyst



Alex Hardee
Associate Attorney



Sierra Weaver
Coast and Wetlands Program Lead



Ramona McGee
Wildlife Program Lead



Christopher K. DeScherer
South Carolina Office Director

¹¹¹ Emily E. Puckett et al., *Taxa, petitioning agency, and lawsuits affect time spent awaiting listing under the US Endangered Species Act*, BIOLOGICAL CONSERVATION (July 4, 2016).

On behalf of:

American Rivers

Peter Raabe, Southeast Region Director

Audubon South Carolina

Julia Dietz, Policy Director

Audubon Society of Northern Virginia

Tom Blackburn, President

Cahaba River Society

Ben Wegleitner, River Sustainability Director

Cape Fear River Watch

Kemp Burdette, Cape Fear Riverkeeper

Cape Henry Audubon Society

Pat Quinn, President

Carolina Wetlands Association

Rick Savage, Executive Director

Catawba Riverkeeper

Brandon Jones, Catawba Riverkeeper

Center for Biological Diversity

Noah Greenwald, Endangered Species Director

Clean Water Expected in East Tennessee

Deborah Bahr, Director

Congaree Riverkeeper

Bill Stangler, Congaree Riverkeeper

Coosa Riverkeeper

Chad Hoffman, Program Director

Defenders of Wildlife

Ben Prater, Southeast Program Director

Friends of Buckingham

Chad Oba, President

Georgia Interfaith Power and Light

Codi Norred, Executive Director

Highlanders for Responsible Development

Rick Lambert, Director

Initiative to Protect Jekyll Island

Mindy Egan, Treasurer

Inland Ocean Coalition

Vicki Nichols Goldstein, Executive Director

Mountain True

Bob Gale, Ecologist and Public Lands Director

North Carolina Conservation Network

Grady McCallie, Policy Director

North Carolina Wildlife Federation

Manley Fuller, VP of Conservation Policy

Ogeechee Audubon Society

Leslie Weichsel, President

Ogeechee Riverkeeper

Damon Mullis, Riverkeeper

Potomac Riverkeeper Network

Phillip Musegaas, Vice President - Programs and Litigation

RedTailed Hawk Collective

Donna Chavis, Founder

Save Our Saluda

Melanie Ruhlman, President

South Carolina Coastal Conservation League

Jason Crowley, Senior Program Director

South Carolina Wildlife Federation

Sara Green, Executive Director

Sierra Club

Athan Manuel, Lands Protection Program Director

South Carolina Native Plant Society

Rick Huffman, Advocacy Chair

Southern Forests Conservation Coalition

Pauline Endo, Planning Committee Leader

Tennessee Chapter Sierra Club

Axel Ringe, Water Quality Chair

Tennessee Environmental Council

Jeff Barrie, Chief Executive Officer

The Clinch Coalition

Sharon Fisher, President

The Dolphin Project

Peach Hubbard, President

The Friends of Indian River

Rogard Ross, President

Upstate Forever

Megan Chase, State Policy Director

Virginia Conservation Network

Pat Calvert, Senior Policy and Campaigns Manager

Warioto Chapter of the National Audubon Society

Steven Hamilton, Director

Wetlands Watch

Skip Stiles, Executive Director

Wildlands Network

Ron Sutherland, Chief Scientist

Winyah Rivers Alliance

Christine Ellis, Executive Director