



FEMA BRIC FY21 Analysis of Nature-Based Solutions

Completed by: Emily Donahoe, Policy Specialist for Resilient Coasts and Floodplains
August 31, 2022

1. Summary

On Aug. 1, 2022, FEMA announced that [53 competitive projects were selected](#) for the second annual Building Resilient Infrastructure and Communities (BRIC) national competition “based on the highest composite score until the funding amount available” was reached. The total amount funded was \$1 billion.

Filtering for projects FEMA tagged as nature-based solutions (NbS), there are 21 out of 53 projects (\$391,673,188 total) that FEMA identified as having nature-based project components. This is compared to FY2020, where [FEMA claims](#) that 18 out of 22 projects included nature-based project components. [FEMA defines NbS](#) as, “sustainable environmental management practices that restore, mimic, and/or enhance nature and natural systems or processes and support natural hazard risk mitigation as well as economic, environmental, and social resilience efforts,” and provides NbS projects up to 10 points (out of 115) in the [Technical Criteria](#) evaluation

Based upon a best-judgment review of the BRIC FY21 [project summaries](#), 10 projects that FEMA tagged as NbS contain NbS as a primary or significant project component (representing \$116,143,188), and 11 projects tagged by FEMA as NbS appear to have NbS as a smaller component or it is unclear (representing \$275,530,000). These conclusions are limited to the broad information available in the project summaries provided by FEMA. The exact dollar amounts allocated to specific nature-based components cannot be determined at this time.

Projects that FEMA tagged as NbS are located in the following states:

- California (5)
- Connecticut (3)
- Florida (1)
- Massachusetts (1)
- New York (3)
- North Carolina (2)
- Oklahoma (1)
- Pennsylvania (1)
- South Carolina (1)
- Virginia (1)
- Wisconsin (1)
- Wyoming (1)

12 out of 21 projects that FEMA tagged as NbS are identified as Justice40 projects.

An additional 6 projects were not tagged by FEMA as NbS, but include nature-based components (\$23,160,000).

Projects not tagged by FEMA as NbS, but include nature-based components are located in the following states:

- Nebraska (1)
- North Carolina (4)
- South Carolina (1)

3 out of these 6 projects not tagged as NbS, but contain nature-based components are identified as Justice40 projects

FEMA's tags assigned to projects that are not tagged as NbS but have nature-based components include: Clean Water Protection; Habitat Conservation; Erosion Protection; Public Park Improvement; Creek and Floodplain Restoration; Air Quality Protection; Community Resilience; Climate Resilience; Infrastructure; Wastewater Safety; Partnerships to Enhance Outreach; Rural Economic Protection;

Taken together, the selected FY21 BRIC projects include 27 projects with nature-based components (totaling \$414,833,188), 15 of these projects are identified as Justice40, and the projects are located in the following states:

- North Carolina (6)
- California (5)
- New York (3)
- Connecticut (3)
- South Carolina (2)
- Florida (1)
- Massachusetts (1)
- Nebraska (1)
- Oklahoma (1)
- Pennsylvania (1)
- Virginia (1)
- Wisconsin (1)
- Wyoming (1)

Opportunities for Improvement

1. Improve the FEMA tagging system to be more uniform and appropriately include all relevant projects that have nature-based components (e.g., include projects that are currently only tagged as habitat conservation, creek and floodplain restoration, etc.).
2. Include more detailed project descriptions to provide funding break downs for nature-based components vs. traditional/grey infrastructure components.
3. Clarify definitions for nature-based solutions to easily identify which project components are considered nature-based.

2. Detailed Analysis

10 projects FEMA tagged as NbS have NbS as the primary or significant project component (representing \$116,143,188):

- [South Florida Water Management, FL: Flood Mitigation with Living Levee, Shoreline and Pump Station Repairs](#) - \$50 million to combat increased flood risk and sea level rise
 - NbS: installing a living shoreline
 - FEMA Tags: Florida; HMGP FY21 Selections; Nature-Based Solutions; Building Resilient Infrastructure and Communities (BRIC)
 - Identified as a Justice40 project
- [Orange County, CA: Nature-Based Shoreline Adaptation Project](#) - \$9.8 million to implement a nature-based shoreline adaptation project
 - NbS: deployment of a hybrid, vegetated dune covering to raise shoreline elevation and restore habitat with native plantings
 - FEMA Tags: California; Erosion Protection; Habitat Conservation; HMGP FY21 Selections; Nature-Based Solutions; Building Resilient Infrastructure and Communities (BRIC)
- [New York, NY: Clinton Houses/East Harlem Community Stormwater Resiliency](#) - \$8.36 million to implement a nature-based flood control and multi-functional open space solution to mitigate impacts of extreme rainfall
 - NbS: detention and retention basins to manage up to 1.78 million gallons of rainfall runoff, and address extreme heat mitigation using multi-functional open spaces
 - FEMA Tags: New York; HMGP FY21 Selections; Nature-Based Solutions; Building Resilient Infrastructure and Communities (BRIC)
 - Identified as a Justice40 project
- [New York, NY: Breukelen Houses Stormwater Protection](#) - \$19.84 million to implement multi-functional nature-based solutions to increase flood resilience and reduce extreme heat
 - NbS: using innovative design to create multi-functional spaces, including providing a subsurface space to manage rainfall runoff, green infrastructure, and resilient plantings
 - FEMA Tags: New York; HMGP FY21 Selections; Nature-Based Solutions; Building Resilient Infrastructure and Communities (BRIC)
 - Identified as a Justice40 project
- [Fair Bluff, NC: Fair Bluff Park Phase 2](#) - \$2.44 million to remediate the floodplain of the Lumber River
 - NbS: Acquire and demolish 51 commercial properties and remediate the area to its natural hydrologic condition
 - FEMA Tags: North Carolina; HMGP FY21 Selections; Nature-Based Solutions; Rural Economic Protection; Building Resilient Infrastructure and Communities (BRIC)
 - Identified as a Justice40 project
- [Conway, SC: Utilizing the Natural Environment and Parks for Flood Reduction](#) - \$2.17 million to protect a vulnerable population center from increased flood and stormwater intensity
 - NbS: implement a 7.8 acre constructed stormwater wetland that will detain and retain runoff from the watershed; construct a community park to provide

- community amenities; floodplain restoration project to restore the Crabtree Swamp and its floodplain
 - FEMA Tags: South Carolina; HMGP FY21 Selections; Nature-Based Solutions; Building Resilient Infrastructure and Communities (BRIC)
- [Imperial Beach, CA: Bayside Community Resiliency: The Living Levee Project](#) - \$15.16 million to implement a flood risk mitigation project to improve resilience to sea level rise
 - NbS: implement a living levee and stormwater retention and wetland system to mitigate current flooding hazards and future sea level rise hazards, and preserve coastal resources
 - FEMA Tags: California; HMGP FY21 Selections; Nature-Based Solutions; Building Resilient Infrastructure and Communities (BRIC)
 - Identified as a Justice40 project
- [Lander, WY: Structure Relocation and Property Acquisition](#) - \$2.09 million to acquire and relocate property and implement floodplain restoration.
 - NbS: property acquisition and relocation to restore habitat and the natural floodplain functions
 - FEMA Tags: Wyoming; HMGP FY21 Selections; Nature-Based Solutions; Rural Economic Protection; Building Resilient Infrastructure and Communities (BRIC); Infrastructure
- [Gastonia, NC: Critical Infrastructure Restoration and Stream Protection](#) – \$5.98 million to rehabilitate a creek bank to lessen impacts of highwater during flood events
 - NbS: using nature-based solutions and materials to stabilize and rehabilitate approximately 8,000 linear feet of Duharts Creek; using bio-engineered structural enhancements, natural fiber matting, and revegetation with native plants
 - FEMA Tags: North Carolina; HMGP FY21 Selections; Nature-Based Solutions; Wastewater Safety; Building Resilient Infrastructure and Communities (BRIC); Infrastructure
 - Identified as a Justice40 project
- [Meriden, CT: Building Removal and Greenway Development to Reduce Flooding Impacts and Improve Town Aesthetics](#) - \$303,188 for building removal and greenway development to reduce flooding impacts
 - NbS: demolishing and removing existing buildings and substructures that cause flooding, and deconstruction of paving and parking areas to construct a greenway and maintain the property as open space and public trail
 - FEMA Tags: Connecticut; Air Quality Protection; HMGP FY21 Selections; Nature-Based Solutions; Public Park Improvement; Building Resilient Infrastructure and Communities (BRIC)
 - Identified as a Justice40 project

11 projects FEMA tagged as NbS have smaller NbS elements added onto their projects, or the project descriptions are unclear (representing \$275,530,000):

- [County of Nevada, CA: Nature-Based Mitigation and Wildfire Retrofitting for Climate Resiliency](#) - \$31.03 million for infrastructure and nature-based solutions to provide critical protection from wildfires for vulnerable communities
 - NbS: near-home defensible space vegetation management, landscape level fuel modification

- FEMA Tags: California; HMGP FY21 Selections; Nature-Based Solutions; Building Resilient Infrastructure and Communities (BRIC); Climate Resilience
- [Virginia Beach, VA: Eastern Shore Drive Drainage Improvement Project](#) - \$25.14 million to implement infrastructure, nature-based solutions, and community outreach/education to improve resilience against chronic flooding
 - NbS: rain garden, meadow plantings, bank restoration
 - FEMA Tags: Virginia; HMGP FY21 Selections; Nature-Based Solutions; Building Resilient Infrastructure and Communities (BRIC); Community Resilience
- [Tulsa, OK: Improving Infrastructure to Protect Residential and Commercial Facilities](#) - \$19.58 million to improve resilience to flooding, heat, and water quality
 - NbS: detention ponds and culverts, planting trees, limiting development
 - FEMA Tags: Oklahoma; Hazard Mitigation Grant Program (HMGP); HMGP FY21 Selections; Nature-Based Solutions; Building Resilient Infrastructure and Communities (BRIC)
 - Identified as a Justice40 project
- [Sacramento River West Side Levee District, CA: Floodplain Restoration and Levee Resiliency Project](#) - \$18.92 million to implement a combination of nature-based solutions and levee hardening to protect the Grimes community against flooding
 - NbS: restoring the Sacramento River floodplain’s riparian habitat, reducing erosive forces
 - FEMA Tags: California; Erosion Protection; HMGP FY21 Selections; Nature-Based Solutions; Rural Economic Protection; Building Resilient Infrastructure and Communities (BRIC)
 - Identified as a Justice40 project
- [Philadelphia, PA: The Cohocksink Flood Mitigation Project](#) - \$25.01 million to improve capacity of combined sewer system and implement green infrastructure
 - NbS: incorporate “green streets infrastructure,” stormwater planters, and tree planting
 - FEMA Tags: Pennsylvania; Clean Water Protection; HMGP FY21 Selections; Nature-Based Solutions; Building Resilient Infrastructure and Communities (BRIC)
 - Identified as a Justice40 project
- [New York, NY: Seaport Coastal Resiliency Project](#) - \$50 million to reduce flood risk to Historic South Street Seaport
 - NbS: The project will use “innovative design and engineering strategies to... improve access to the waterfront, implement green and nature-based solutions to improve marine habitat and address the urban heat island effect.”
 - FEMA Tags: New York; HMGP FY21 Selections; Nature-Based Solutions; Building Resilient Infrastructure and Communities (BRIC)
- [Meriden, CT: Meriden Harbor Brook Flood Resilience](#) - \$11.17 million to reduce recurring flood damage
 - NbS: provide floodplain and habitat enhancements, and provide waterfront trail systems
 - FEMA Tags: Connecticut; HMGP FY21 Selections; Nature-Based Solutions; Building Resilient Infrastructure and Communities (BRIC)
 - Identified as a Justice40 project
- [Madison, WI: Pheasant Branch Tributary Greenway](#) - \$6.03 million to mitigate flood risks with an infrastructure project with nature-based components
 - NbS: expanding floodplain capacity and “including nature-based solutions”

- FEMA Tags: Wisconsin; HMGP FY21 Selections; Nature-Based Solutions; Building Resilient Infrastructure and Communities (BRIC)
- [Boston, MA: Equitable Climate Resilience at Boston's Moakley Park](#) - \$24.06 million to implement an earthen berm and stormwater management improvements to protect an environmental justice neighborhood
 - NbS: coastal landscape elements to mitigate flooding impacts
 - Identified as benefiting an environmental justice community
 - FEMA Tags: Massachusetts; HMGP FY21 Selections; Nature-Based Solutions; Public Park Improvement; Building Resilient Infrastructure and Communities (BRIC)
- [Kern County, CA: Enhancing Drought Management with Groundwater Storage](#) - \$39.5 million to enhance drought management and groundwater storage
 - NbS: restoring an over-drafted aquifer and improve local habitats
 - FEMA Tags: California; Clean Water Protection; HMGP FY21 Selections; Nature-Based Solutions; Building Resilient Infrastructure and Communities (BRIC)
 - Identified as a Justice40 project
- [New Haven, CT: Inland Coastal Flood Resiliency Project](#) - \$25.09 million to mitigate flood risk to protect the railroad.
 - NbS: nature-based coastline protection
 - FEMA Tags: Connecticut; HMGP FY21 Selections; Nature-Based Solutions; Regional Transportation & Economic Development Protection; Building Resilient Infrastructure and Communities (BRIC); Climate Resilience

6 projects were not tagged by FEMA as NbS, but the projects have NbS components

(representing \$23,160,000):

- [Greenville, NC: St. Andrews Drives Critical Infrastructure Protection and Stream Restoration](#) - \$3.45 million for stream restoration and stabilization improvements to reduce erosion and flood risks
 - NbS: restoring and enhancing the floodplain and riparian ecosystem's natural functions
 - FEMA Tags: North Carolina; Creek and Floodplain Restoration; HMGP FY21 Selections; Infrastructure Hazard; Building Resilient Infrastructure and Communities (BRIC)
- [Papio-Missouri River Natural Resources District, NE: The West Papio Regional Basin 4](#) - \$5.34 million to construct a dam and water control basins, with a few NbS components
 - NbS: provide a 17.3-acre lake for fishing and paddle sport recreation, a walking trail with connectivity to the surrounding neighborhoods, and 60 acres of green space using a native seed mix to provide wildlife habitat
 - FEMA Tags: Nebraska; Clean Water Protection; Habitat Conservation; HMGP FY21 Selections; Building Resilient Infrastructure and Communities (BRIC)
- [Siler City, NC: Blood Run Pump Station Relocation](#) - \$5 million to demolish and relocate the pump station outside of the 100-year floodplain in conjunction with streambank enhancement
 - NbS: demolish and reconstruct the pump station in tandem with streambank enhancement to restore the floodplain
 - FEMA Tags: North Carolina; HMGP FY21 Selections; Rural Economic Protection; Wastewater Safety; Building Resilient Infrastructure and Communities (BRIC)
 - Identified as a Justice40 project

- [Pollocksville, NC: Building Elevations to Restore the Town's Commercial Corridor](#) - \$1.08 million to mitigate future flood damage with a combination of green and grey infrastructure improvements
 - NbS: Hybrid green and grey infrastructure improvements to mitigate the risk of repetitive flood damage
 - FEMA Tags: North Carolina; HMGP FY21 Selections; Partnerships to Enhance Outreach; Rural Economic Protection; Building Resilient Infrastructure and Communities (BRIC)
 - Identified as a Justice40 project
- [Mount Pleasant, SC: Old Village Draining Improvement](#) - \$5.68 million to implement green infrastructure and nature-based solutions to increase flood resilience to low-lying areas
 - NbS: incorporate nature-based solutions through restoration and install green infrastructure, including restoring roadside grass swales to provide bioretention, positive drainage, conveyance of stormwater and filtering to remove pollutants; implement low-impact development solutions to protect, restore, or mimic natural water cycle including bioswales, permeable pavements, green streets and alleys, and green parking
 - FEMA Tags: South Carolina; HMGP FY21 Selections; Wastewater Safety; Building Resilient Infrastructure and Communities (BRIC)
- [Fayetteville, NC: Flood Protection with Improved Drainage Infrastructure](#) - \$2.61 million to improve infrastructure and use green infrastructure to protect vulnerable communities from flooding
 - NbS: vegetation and green infrastructure will be examined during final design to provide additional benefits; consideration of local ecosystems to coexist with existing infrastructure and bolster sustainability
 - FEMA Tags: North Carolina; HMGP FY21 Selections; Building Resilient Infrastructure and Communities (BRIC); Infrastructure
 - Identified as a Justice40 project

This analysis was initially completed on 08/17/2022, but was updated on 08/31/2022 to reflect the changes that FEMA made to the BRIC FY21 selected project descriptions on their website.