USACE Natural Resource Management

Freshwater Mussels

Rayed Bean and Cumberland Bean

Rayed Bean (*Villosa fabalis*): This is considered a small mussel species that generally does not exceed 1.5 inches in length. The exterior shell is smooth in texture and is green, yellowish-green or brown in color with dark-green wavy lines. Male and female shells are often different; male shells are typically elongated and female shells are typically smaller and elliptical. (USFWS)

Status: Endangered, listed 2012

NatureServe: Imperiled

G2
Imperiled

Cumberland Bean (*Villosa trabalis*): This is a small mussel which grows to be between 2 and 2.5 inches in length. The shell has an elongated, elliptical shape and covered with irregular growth lines. The shell color is dark green, but may appear black. The inner nacre varies from pearly white to bluish-white. (USFWS)

Status: Endangered, listed 1976

NatureServe: No Status Rank

No Status
Rank

Genus: *Villosa* is a genus of freshwater mussels. First described by Frierson in 1927, the genus contains 16 species. (Integrated Taxonomic Information System)

Photos Left to Right: Rayed Bean Exterior and Interior Shell (Ohio State University, G. Thomas Watters), Juvenile Cumberland Beans (Kentucky DFWR), Rayed Bean (USFWS) & Cumberland Bean (Kentucky DFWR)

Management and Protection:

- Similar to other freshwater mussels, primary threats to the mussels include the presence and construction of dams which alter habitat and fish host passage, pollution, sedimentation, and the increasing presence of invasive species. The round goby, a non-native fish species, may displace native host fish species, potentially limiting reproduction success.
- In the Little South Fork, Big South Fork, and Rockcastle River Drainages, acidic mine waste impacts the Cumberland bean. (USFWS)
- Preferring sand or gravel substrates, the rayed bean generally lives in smaller, headwater creeks; however, it can also be found in large rivers and wave washed areas of glacial lakes.
- The Cumberland bean inhabits small to medium streams which have sand or gravel bottoms. (USFWS)
    - USFWS established a reintroduction program in Tennessee and West Virginia where the rayed bean has been extirpated. Water quality and habitat have been restored and reintroductions of the rayed bean have been successful.

USACE ROLE: According to the Engineering Research and Development Center's Threatened and Endangered Species Team Cost Estimates, the USACE has expended over $566,000 on efforts related to the rayed bean and the Cumberland bean. These fund have been expended by multiple business lines including Environmental Stewardship, Hydropower, Recreation, Regulatory, and more. Expense types include Coordination and Determination, Site Visits and Inspections, and Inventory, Survey, and Monitoring efforts.

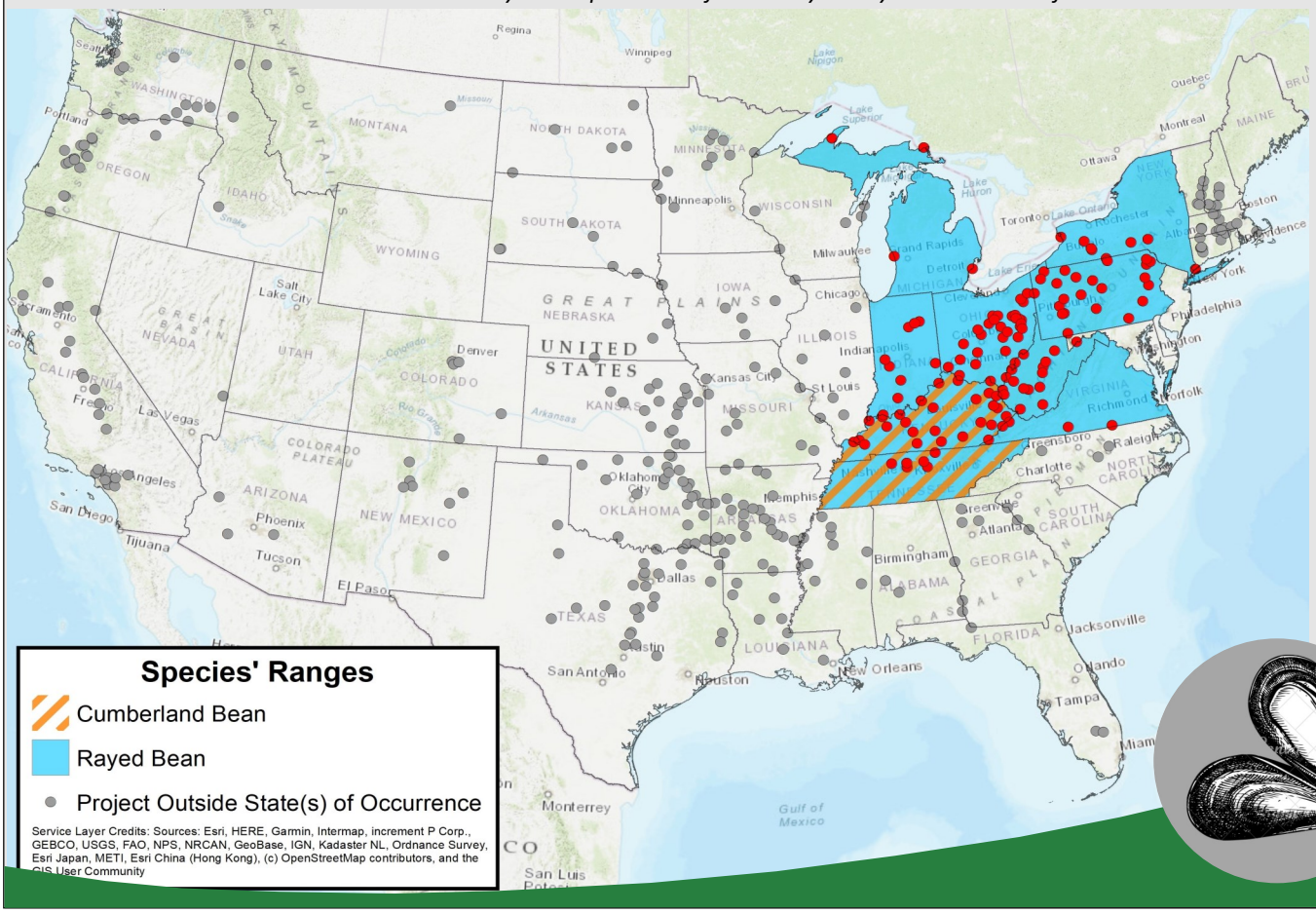
Rayed Bean= $531,019

Cumberland Bean= $35,837

10 projects within the Great Lakes and Ohio River Division have the potential for occurrence of the rayed bean. Projects such as Crooked Creek Lake, which under went a revision of the project Master Plan in 2020, noted that the federally listed species has not been confirmed to occupy project waters, but that suitable habitat conditions may be present. Additionally, in FY20 NRM Assessment, two projects within the Nashville District have the potential for the Cumberland bean to occur. Another Nashville District Project, Wolf Creek Dam, is listed as having rare occurrences of the Cumberland bean.

Photo: Aerial image of Wolf Creek Dam which is noted to have rare occurrences of the Cumberland Bean.

This fact sheet has been prepared as an unofficial publication of the U.S. Army Corps of Engineers (USACE). This online publication is produced to provide its readers information about best management practices related to special status species. Editorial views and opinions expressed are not necessarily those of the Department of the Army. Mention of specific vendors does not constitute endorsement by the Department of the Army or any element thereof.



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Source: Map provided by Ashleigh Boss, ORISE Fellowship, Institute for Water Resources