Mesohabitat and macroecological correlates for blue sucker (Cycleptus elongatus) occurrence in regulated rivers

Josh Perkin[1], Hannah A. Evans[1], Meghan I. Booknis[1], Noah S. Santee[1], Rebecca D. Mangold[1], Hayden C. Roberts[1], Jacob P. Wolff[1], Johnathan K. Ellard[1], and David Smith[2]

[1]Texas A&M University Department of Ecology and Conservation Biology
[2]US Army Engineer Research and Development Center

May 31, 2023

Abstract

Blue sucker (*Cycleptus elongatus*) occurs in the Mississippi River and Gulf of Mexico drainages of North America and is negatively affected by habitat fragmentation and flow regime alteration caused by dams. During fish assemblage surveys in August of 2022, we collected five specimens of juvenile blue sucker (312-428 mm total length) in the Angelina River upstream of Sam Rayburn Reservoir in east Texas (46,335-hectare surface area) where the occurrence of the species was previously unconfirmed. Given this unexpected finding, we (1) analyzed blue sucker mesohabitat associations to compare habitats we sampled with reports in the literature, and (2) reviewed blue sucker occurrence in state, national, and global databases across historical (1950-1980) and contemporary (1981-2022) periods to assess occurrence across gradients of habitat fragmentation and streamflow regulation. The blue sucker population in the Angelina River upstream of Sam Rayburn Reservoir was previously unconfirmed but is within the native range of the species. Mesohabitats occupied by blue sucker were consistent with literature reports, including fast velocity, shallow depth, and coarse substrates. The low degree of regulation (19% of natural runoff stored by upstream reservoirs) and a high degree of habitat connectivity (287 rkm of mainstem habitat) for the Angelina River upstream of Sam Rayburn Reservoir matched range-wide patterns of persistence within relatively intact (unfragmented and unregulated) or remnant (fragmented but unregulated) riverscapes. Our review reveals that blue sucker populations might persist (1) in remnant river fragments where local habitat templates are appropriate and (2) where effects of habitat fragmentation and flow regulation are not coupled.

Hosted file

`Evans_et_al_manuscript_submission.docx` available at https://authorea.com/users/624208/articles/646623-mesohabitat-and-macroecological-correlates-for-blue-sucker-cycleptus-elongatus-occurrence-in-regulated-rivers