# SHORT-TERM EFFECTS OF SMALL DAM REMOVAL ON A FRESHWATER MUSSEL ASSEMBLAGE

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#### ABSTRACT

Dam removal is increasingly used to restore lotic habitat and biota, but its effects on freshwater mussels (family Unionidae) are not well known. We conducted a four-year study to assess short-term effects on mussels after removal of a small hydropower dam on the Deep River (Cape Fear River drainage), North Carolina, USA, in 2006. We conducted annual pre- and post-removal monitoring of mussel density, richness, and survival (post removal only) with transect surveys and quadrat excavation, and assessed changes in substrate composition at two impact sites (tailrace and impoundment) and two reference sites. Before-after-control-impact (BACI) analyses of variance did not detect a significant change in mussel density (total or individually for the three most abundant species), species richness, Eastern Elliptio (*Elliptio complanata*) mean length, or substrate composition in the tailrace or drained impoundment following dam removal. Apparent annual survival estimates of Eastern Elliptio at the tailrace site did not differ among sampling periods and were similar to control sites. We observed minimal mussel mortality from stranding in the dewatered reservoir. These results demonstrate that adverse short-term impacts of dam removal on downstream mussel assemblages can be minimized with appropriate planning, timing, and removal techniques, but additional monitoring is warranted to determine long-term effects on mussels within the restored river reach.

**KEY WORDS** Apparent survival, BACI, *Elliptio*, imperiled species, mussel density, quantitative sampling, restoration, Unionidae