

DENSITY, DEMOGRAPHY, AND MICROHABITAT OF CAMPELOMA DECAMPI (GASTROPODA: VIVIPARIDAE)

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ABSTRACT

Campeloma decampi, the Slender Campeloma, is a federally endangered snail endemic to the Tennessee River drainage in Alabama, U.S.A. We studied a population in Round Island Creek, Limestone County, in July, 2010, to obtain information about density, microhabitat, and demography. The overall mean density at the site was 49.2/m² (\pm 14.4 SE), but the distribution was highly clumped. We used generalized linear models and multi-model inference to examine the response of snail density to seven microhabitat explanatory variables. The greatest densities were associated with shallow, low-flow areas with silt and clay near the stream margin. Shell heights ranged from 4.3–34.7 mm, and the size distribution appeared to be composed of three cohorts possibly representing age 0+ recruits, age 1+ individuals, and individuals \geq 2 years of age. The population was dominated by small individuals (4–12 mm; modal size class = 6 mm), and individuals >20 mm made up only 7% of the population. This size distribution suggests that parturition occurs over a protracted period from late winter to summer and that most individuals produce only one or two broods in their lifetime; however, additional sampling and information about life span are needed to more conclusively describe the reproductive strategy.

KEY WORDS *Campeloma decampi*, Freshwater Gastropod, Endangered Species, Microhabitat, Density, Demography, Slender Campeloma

SIGNIFICANT RECENT RECORDS OF UNIONID MUSSELS IN NORTHEAST TEXAS RIVERS

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ABSTRACT

Five rivers in northeastern Texas, U.S.A. were surveyed for Unionid mussels from 2010 to 2012. We sampled 165 sites in the North and South Sulphur rivers, the Little Cypress Bayou, Black and Big Cypress creeks, the upper Sabine River, the Neches River, the Angelina River, the Attoyac Bayou, and the upper Trinity River. Each location was accessed by kayak and timed tactile surveys of 50 to 300 m of the river were conducted. We recorded a total of 20,134 mussels of 35 species, of which 16,714 were live. State listed species were found in all the rivers. The Neches River was the most speciose of all the large rivers of northeastern Texas and should be of prime conservation concern. The Sulphur River contained a few species that extended in from Oklahoma. The Trinity River, which runs through the Dallas/Fort Worth metroplex, surprisingly had two threatened species.

KEY WORDS Freshwater mussels, Unionidae, Northeastern Texas, Surveys, Conservation

A COMPARISON OF TWO TIMED SEARCH METHODS FOR COLLECTING FRESHWATER MUSSELS IN GREAT LAKES COASTAL WETLANDS

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ABSTRACT

Given the catastrophic losses of freshwater mussel diversity across the Laurentian Great Lakes, the identification and protection of remnant assemblages are priority conservation actions. In contrast to riverine mussels, there has been little evaluation of different sampling gear and strategies to support the design of coastal wetland inventory or monitoring programs. We compared timed-search (qualitative) collections from 21 Lake Ontario coastal wetlands using clam rake and visual/tactile methods. Live mussels were collected with visual/tactile searches from 90% of wetlands sampled, and from 71% with the clam-rake. A total of 756 live mussels (representing nine species) were collected. Collections included three mussel species at risk: *Ligumia nasuta*, *Quadrula quadrula*, and *Toxolasma parvum*. Compared to clam-raking, visual/tactile searches collected more than twice as many live individuals and fresh shells, a broader range of sizes and significantly more species (and at a faster rate). Estimates of live mussel abundance and species number associated with each method were imprecise ($CV > 0.35$). The concordance of variation in mussel assemblage structure among wetlands (as described by each method) was not consistent or in strong agreement. Based on our findings, we recommend visual/tactile searches for future coastal wetland sampling efforts.

KEY WORDS Unionid, Dreissenids, Clam rake, Visual/tactile, Wetlands, Monitoring

USE OF OCCUPANCY MODELING TO ASSESS THE STATUS AND HABITAT RELATIONSHIPS OF FRESHWATER MUSSELS IN THE LOWER FLINT RIVER, GEORGIA, USA

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ABSTRACT

The Flint River in southwestern Georgia is known for its historically diverse mussel fauna, but the current status of the fauna is poorly known. The rediscovery of two presumed extirpated and extinct species in 2006 and 2008 exemplifies the need for a large-scale survey of the river. We used an occupancy modeling approach to estimate the presence of mussel species at 39 locations along a 119 km reach of the lower Flint River between Lake Seminole and Albany Dam. Twenty species were collected and evidence of recent reproduction was documented for 8 species. *Elliptio crassidens*, *E. fumata/pullata*, and *E. nigella* were the most abundant species and accounted for 43%, 40%, and 8% of the total mussels collected, respectively. Among species, mean detection probabilities averaged 0.25 and ranged from 0.01 to 0.69, whereas occupancy averaged 0.56 and ranged from 0.03 to 1. We fitted models relating site-level and sample-level habitat characteristics and site location to detection and occupancy for nine species. Detection probabilities varied among species, substrate, searcher experience, and distance from Albany Dam. Estimated occupancy varied by species and substrate composition indicating different substrate use by different species. Our modeling approach indicated that our sampling design was efficient for detecting most species with the exception of rare species. The Lower Flint River continues to harbor a widely distributed and diverse assemblage of freshwater mussels. The occupancy modeling approach used in our study was a useful and efficient method to assess the status, distribution, and habitat use of freshwater mussels in the Flint River while also providing a measure of sampling efficiency. Similar model-based study designs may be effective in other streams, particularly when sampling resources are limited.

KEY WORDS Occupancy, Detection, Flint River, Freshwater Mussels, *Elliptoideus sloatianus*, *Elliptio nigella*