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Truncilla macrodon (Bivalvia: Unionidae), in the Brazos River,
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FIRST ACCOUNT OF A LIVING POPULATION OF TEXAS FAWNSFOOT,
TRUNCILLA MACRODON (BIVALVIA: UNIONIDAE), IN THE BRAZOS
RIVER, TEXAS

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ABSTRACT—A recent survey of the lower Brazos River in Grimes and Washington counties, Texas, resulted in the first record of a living population of *Truncilla macrodon* since its description in 1859. *Truncilla macrodon* is endemic to the Brazos and Colorado basins of central Texas. Anthropogenic impacts resulted in a decline in abundance and distribution for this species prior to extensive scientific study. Given the absence of information on natural history for this species, we documented preliminary physical and biological characteristics associated with this population.

RESUMEN—Un reciente estudio realizado en la parte abaja del río Brazos en los condados de Grimes y Washington, Texas, resultó en el primer registro de una población de *Truncilla macrodon* desde su descripción inicial en 1859. *Truncilla macrodon* es una especie endémica a las cuencas de los ríos Brazos y Colorado, en el centro de Texas. Impactos antropogénicos resultaron en una reducción en la abundancia y distribución de esta especie antes de que se realizaran estudios científicos sobre la misma. Debido a la ausencia de información sobre la historia natural de esta especie, documentamos características biológicas y físicas preliminares asociadas a esta población.

Texas fawnsfoot, *Truncilla macrodon*, is a rare unionid mussel (family Unionidae) endemic to the Brazos and Colorado rivers of central Texas (Howells et al., 1996, 1997). Since its original description in the mid-1800s, perhaps <300 specimens have been documented. Moreover, <15 specimens have been found alive in >30 years. All of these were apparently moribund, having been flood-deposited on bars just prior to collection (R. G. Howells, in litt.). Consequently, little is known regarding the life history and habitat requirements of this species (Howells et al., 1996).

During a recent survey in 2008, a population of *T. macrodon* was discovered in the Brazos River near its confluence with the Navasota River (Grimes and Washington counties), Texas. Observations gathered from this population within its natural habitat provide much needed ecological information for this species. Accordingly, the purpose of this note is to describe preliminary physical and biological characteristics associated with this population.

The Brazos River is characterized by an annual discharge of 6 km³, a watershed of 111,000 km², and a length of 1,516 km, making it the third

largest river in Texas (Huser, 2000). The surveyed portion of the lower Brazos River is ca. 8 km SW Navasota, Texas. This site is characterized by steep banks with extensive riparian vegetation.

Densities of mussels were quantified using a systematic sampling design with three random starts. Four 1.83-m long metal studded T-posts were inserted into the substrate to form borders of a 17 by 3-m transect, while a nylon string was used to demarcate boundaries of the search area and to mark off 0.25-m² quadrats within the transect. Random numbers were used to determine the starting location for systematic sampling and quadrats were sampled every meter. A 1-h timed search downstream of the transect also was used to quantify densities of *T. macrodon*. Depth and velocity of water were measured every meter along a transect running parallel to the upstream and downstream portion of our search area.

In total, 10 live *T. macrodon* were collected in our study area. Length of shells was 11.67–24.99 mm with a median length of 15.76 mm. Interestingly, all of the individuals collected were small, suggesting recent recruitment and successful reproduction. Population densities for *T. macrodon* were low, with a mean of 0.06 individuals/0.25 m² and 6 individuals/h. Additionally, two other unionid species were observed, specifically *Leptodea fragilis* and *Quadrula houstonensis*.

Truncilla macrodon was partially buried (ca. 5–10 mm) in a shallow pool with soft sandy sediment on the left bank of the river. *Truncilla macrodon* was located by observing tracks in the substrate, such that one individual, for example, was attached to a conglomeration of sand by byssal threads. A fine deposit of mud layering the substratum was documented at our site, indicating a recent decrease in discharge. Mean daily discharge from the gauging station (48 km south of our sampling site) at Hempstead, Texas (United States Geological Survey site 08111500), indicates that instream flow decreased from 78.0 to ca. 14.0 m³/s. During the survey, average depth of water was 0.16 m, while average velocity was 0.018–0.003 m/s at the upstream and downstream portions of our transect, respectively.

Historically, North America contained the greatest diversity of freshwater mussels, with nearly 300 species in the United States (Neves, 1993). Modern anthropogenic impacts (e.g., impoundments, water pollution, and habitat fragmentation) have brought about extirpations

and a significant decline for many populations of unionids (Lydeard et al., 2004). This also has been the case in Texas, where many streams no longer support populations of unionids (Howells et al., 1996, 1997).

Our findings represent the first record of a population of *T. macrodon* since its initial description in 1859 and suggests that this species has a low tolerance for anthropogenic impacts. It also serves as a reminder that unknown populations of rare endemic unionids do exist and that further studies are needed to identify these elusive populations. Additionally, because this species has suffered dramatic reductions in geographic range (Howells et al., 1997), further studies are needed to determine why *T. macrodon* has persisted in this portion of the Brazos River.

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