

Public Abstract

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Title:Genetic variation and population structure in the endangered Houston toad in contrast to its common, sympatric relative, the coastal plain toad

The Houston toad (*Bufo houstonensis*) is a federally endangered amphibian found only in Texas. Since its description in 1953, the number of toads has declined precipitously; in recent years, the Houston toad has been observed in only half of its former range. Anthropogenic habitat change poses the most serious threat; climate change, predation by invasive species, disease, and hybridization may also jeopardize Houston toads. This is the first study to evaluate levels of genetic variation and relationships among populations in this species. I determined the number of populations, the levels of genetic diversity within and among populations, and migration/movement rates using mitochondrial sequence data and microsatellite loci. Nine populations were found, the most divergent being in Austin County, Texas. Genetic variation was high across the range and within populations. I addressed similar questions in an abundant and sympatric relative, the coastal plain toad (*Bufo nebulifer*). The two species had comparable levels of genetic variation. Finally, I investigated hybridization using molecular markers. Hybridization between Houston toads and two sympatric species, coastal plain toads and Woodhouse's toads (*Bufo woodhousii*), was detected. With continued habitat alteration and rising temperatures, habitat isolation and offset breeding season have already partially broken down as isolating mechanisms and may deteriorate further; consequently, opportunities for hybridization events will increase. Recommendations for Houston toads include supplementation programs to increase the number of individuals, preservation of all three habitat types (breeding/nursery, occupied, and dispersal), special attention to stewardship of the Austin County population, and involvement of the general public in conservation efforts.