

# Limited Genetic Divergence in Populations of the Sheepshead in the Northern Gulf of Mexico

Joel D. Anderson, Texas Parks and Wildlife, Perry R. Bass Marine Fisheries Research Station, Palacios, TX 77465

William J. Karel, Texas Parks and Wildlife, Perry R. Bass Marine Fisheries Research Station, Palacios, TX 77465

---

*Abstract:* Two named subspecies of sheepshead exist in the northeastern Gulf of Mexico (*Archosargus probatocephalus probatocephalus* and *A. p. oviceps*). These subspecies are morphologically distinctive; previously published data was used to demonstrate that frequency distributions of each of five meristic counts are significantly different between the subspecies ( $P < 0.05$ ). However, genetic characteristics suggest limited divergence. For instance, Bayesian structure analysis of microsatellite genotypes indicated that all sampled populations of Gulf of Mexico sheepshead constitute a single stock, with a posterior probability of  $P \approx 0.9999$ . Variance partitioning of mtDNA haplotypes suggests significant but limited divergence between subspecies ( $F_{st} = 0.036$ ,  $P < 0.005$ ), but isolation by distance, rather than subdivision among discrete genetic stocks, is likely driving the significance of variance analyses. Overall, sheepshead molecular genetic data indicate very limited genetic subdivision between the subspecies, despite considerable divergence in morphological form. Two competing hypotheses are discussed that address this disparity: 1) morphological divergence is “plastic” and environmentally responsive, and 2) divergent selection on morphological traits, or on traits linked to morphology, has resulted in morphological divergence in the face of high levels of gene flow. Each hypothesis carries implications for the management of sheepshead populations in the Gulf of Mexico.

Proc. Annu. Conf. Southeast. Assoc. Fish and Wildl. Agencies 62:216