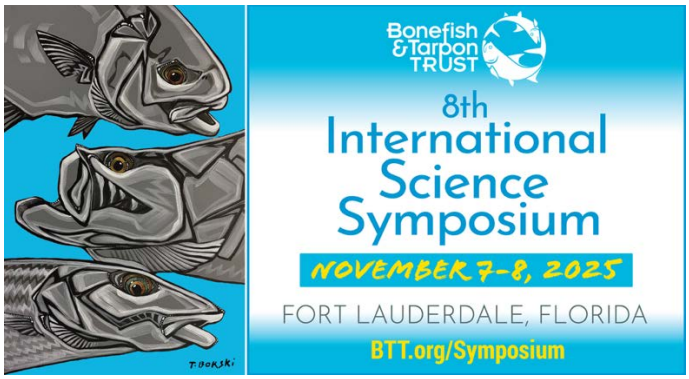


Exploring expected recovery times for Tarpon populations after population declines

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Tarpon populations have declined in parts of their range since the early 1900s, primarily due to habitat loss and fishing mortality. In response, both angler behavior and fishing regulations began to shift throughout the mid-1900s and early 2000s to reduce mortality, leading to a predominantly catch-and-release tarpon fishery in the U.S. In some regions, such as Texas, there are signs of increasing abundance. However, guides and anglers in the Florida Keys have recently raised concerns about apparent declines, suggesting that trends vary regionally and that the mechanisms driving both collapse and recovery need to be better understood. Because no formal stock assessment exists for tarpon and life-history data remain limited, it is difficult to assess recovery without an understanding of expected recovery timelines. To address this, we developed an age and size-structured population dynamics model to estimate how long recovery might take following different levels of population decline. Model inputs were based on published life-history information and statistical predictions, and simulations were run across a broad range of scenarios to reflect uncertainty. Our results demonstrated that recovery time is dependent on the level of population reduction. For example, a 30% reduction was estimated to require approximately 70 years to achieve 90% probability of recovery, while a 50% reduction could take up to more than 110 years. Future development of the model could support assessments on how different sources of mortality and variability in recruitment influence recovery timelines, helping to guide more targeted management actions. These findings also provide a valuable baseline for setting realistic recovery expectations and underscore the need for proactive conservation, habitat restoration, and long-term monitoring, especially in areas where declines may be emerging.

Format preference: Oral

Presenter: Dan C. Gwinn