

Seasonal residency and overwintering behaviour of Striped Bass (*Morone saxatilis*) in the Annapolis River, Nova Scotia

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Striped Bass (*Morone saxatilis*) in the northern extent of their range migrate to overwintering habitats where they aggregate, become lethargic, and remain until water temperatures warm the following spring. In the Bay of Fundy, Striped Bass may spend nearly half of their lives in aggregated dormancy, making them vulnerable to anthropogenic changes in their environment and exploitation by fisheries. Therefore, understanding the overwintering behaviour of Striped Bass is critical to their conservation and management. Striped Bass were declared extirpated from the Annapolis River by COSEWIC in 2011, however, individuals from other spawning populations occur and are seasonally resident. To examine the seasonal residency and overwintering behaviour of Striped Bass in the Annapolis River, 47 Striped Bass ranging 55.0-75.5 cm TL were captured by angling and surgically implanted with acoustic transmitters. 34 of these fish have provided data on overwintering. Movements of these fish were monitored by a receiver array in the Annapolis River and Annapolis Basin in 2022-2024. Acoustic tracking, seasonal sampling, and measurements of water temperature were used to investigate winter thermal refuge, habitat preference, seasonal movement, and annual residency. Tagged fish demonstrated multi annual occupation of overwintering grounds. Overwintering habitat included a strong halocline. Study findings highlight previously undescribed overwintering aggregations of Striped Bass in the Annapolis River and year-round residency of sexually mature individuals suggesting that spawning may occur in the river.

Keywords: acoustic telemetry, anadromous fish, estuary, seasonal residency