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Movements and survival of hatchery reared juvenile cisco (*Coregonus artedi*) in Saginaw Bay, Lake Huron

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ABSTRACT:

Cisco (*Coregonus artedi*) were abundant historically throughout Lake Huron, including Saginaw Bay, but only a few remanent populations remain in northern Lake Huron today. Reestablishment of cisco is an important component of management plans to restore populations and sustainable fisheries in Lake Huron. Cisco restoration efforts have focused on release of hatchery-reared fish, but the fate and behavior of stocked fish immediately after release is unknown. Losses due to predation and post-stocking behavior of hatchery-reared fish are important variables that may influence success of restoration stocking programs. We determined whether an acoustic receiver array with approximately 20 km² of coverage located at the release location was sufficient to determine movements and fate of cisco during the first month after release as well as determine presumed predation mortality. Juvenile cisco (n = 26; mean total length = 160 mm) were implanted with acoustic tags outfitted with a sensor to detect consumption by a predator and released on October 9, 2021 from shore at a location in Saginaw Bay. Movements of tagged fish were monitored using an array of 63 acoustic receivers deployed near the release location. Thirteen fish (50%) emigrated more than 4 km from the array, seven fish (27%) were consumed by predators while in the array within 17 days of release, and fates of six fish (23%) were unknown. Of the fish that emigrated, 50% left the receiver array within four days and none were detected after 17 days. Cisco moved downstream with water currents during the first day after release, but this relationship was not observed in subsequent days. This study provides evidence that hatchery-reared juvenile cisco are capable of rapid movements after release but are vulnerable to predation. Future acoustic telemetry studies to fully quantify sources of mortality and spatial extent of movements by hatchery-reared cisco will require a receiver array designed to track movements over large distances and means to detect predators that consume tagged cisco.