

**Alberta Conservation Association
2007/08 Project Summary Report**

Project name: *Winagami Lake Walleye Spawning Inventory*

Project leader: Nathan Carruthers

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Partnerships:

Alberta Sustainable Resource Development

Key findings

- A total of 1,491 walleye were caught and marked. Of the 1,134 male and 333 female walleye marked, 578 males and 43 females were recaptured in the downstream trap. Only five male walleye were recaptured at the upstream trap, suggesting that spawning may occur somewhere between the two trap locations.
- Walleye were caught during the spawning period as far upstream as the spillway in Boone's Slough. However, where walleye spawn remains unknown.
- No walleye were present in Boone's Slough by the fall, suggesting that water levels were high enough to allow walleye to safely return to Winagami Lake in 2007.

Introduction

Historically, the walleye (*Sander vitreus*) fishery in Winagami Lake has been maintained through a stocking program. Attempts to enhance natural recruitment (spawning shoals) through habitat enhancements have had marginal success (Wright 1998; Schroeder, ASRD, pers. comm.). However, in recent years, walleye have been observed to make a spawning migration from Winagami Lake, through a small channel to an adjacent slough (Boone's Slough) (Schroeder, ASRD, pers. comm.). Attraction to the slough as a potential spawning site may be two-fold: 1) the flowing water area from the slough to the lake may serve as a spawning site and 2) the nutrient-rich nature of the slough presents it as an adjacent post-spawning feeding area. It is unlikely that fish could spawn upstream from Boone's Slough as the spillway at the east end of the slough acts as a barrier to fish movement.

Fluctuating water levels and flow rates may prohibit the movement of fish from the slough back to Winagami Lake. Specifically, a 400-m stretch of wetland between Boone's Slough and Winagami Lake may act as a barrier to fish movement once water levels have dropped. Trapped walleye in the slough are unlikely to survive either the summer months due to poor water quality

conditions (e.g., low dissolved oxygen) or winter as the slough may not be deep enough to overwinter fish.

The goals of this study were to 1) determine the extent of spawning migration through the Boone's Slough channel, 2) determine if changes in water level result in spawning walleye being trapped in Boone's Slough, and 3) to identify potential habitat enhancement requirements.

Methods

We used two pound trap nets to monitor movement of walleye between the lake and the Boone's Slough during the spawning season between 30 April and 7 May 2007. Each trap measured 3.65 x 3.65 m, with 1.8 m deep leads and was set to span the entire width of the channel. One trap each was set in the channel, 650 m upstream and 600 m downstream of the lake and Boone's Slough, respectively. Before installing the fish traps, gill nets were deployed for a maximum of 30 h near each trap location to verify the presence of walleye. Walleye were caught in all three nets and were released immediately after capture. We emptied traps daily and all fish caught were sexed, marked with a hole punched in the left pelvic fin and released upstream of the trap. We determined sex and maturity by the presence of milt for males and either eggs or a visible ovipositor for females. We recorded fork lengths (FL) for a random subsample of 159 females and 496 males. On 4 October 2007, we set four Fall Walleye Index Nets at pre-determined locations in Boone's Slough to determine if any walleye were still present in Boone's Slough. The nets were set perpendicular to the shoreline at depths ≥ 2 m for approximately 24 h.

Results

A total of 1,491 walleye were caught and marked during the spawning period. Of the 1,134 males and 333 females marked, 578 and 43 males and females, respectively, were recaptured downstream of the Boone's Slough. Only five males were recaptured in the upstream trap. During the fall gill netting survey, a total of 79 northern pike, one yellow perch and one white sucker were caught. No walleye were caught, suggesting that in 2007 water levels were high enough to allow fish to return from Boone's Slough into the lake.

Conclusion

Our data indicate that walleye make spawning movements into the channel between Winagami Lake and Boone's Slough. The large numbers of walleye caught in the downstream trap suggest that the main spawning effort may occur somewhere in the channel, as relatively few fish were caught in the upstream trap. However, walleye were caught directly below the Spillway in Boone's Slough. In the future, we need to better explore both the channel and the spillway area in an attempt to determine where exactly spawning occurs. Water levels were high enough in 2007 to allow fish to return to Winagami Lake suggesting that no walleye were trapped and lost to poor water conditions in 2007.

Communications

- ACA activity report prepared.

Literature cited

Wright, K. 1998. Enhancement of spawning habitat for walleye in Winagami Lake, Alberta, 1998. Activity report produced by the Alberta Environmental Protection, Natural Resource Service, Fish and Wildlife, Fisheries Management Branch, Peace River, Alberta, Canada. 7 pp + App.



A Pound Trap set in tributary to Winagami Lake. The trap was used to capture walleye as they moved to spawning areas. (Photo: Dave Jackson)



Dave Jackson holding a walleye caught during trapping at Winagami Lake. (Photo: Amanda Nunn)



Walleye in downstream pound trap at Winagami Lake. (Photo: Dave Jackson)