

**Alberta Conservation Association  
2008/09 Project Summary Report**

**Project name:** *Winagami Lake Walleye Spawning Inventory*

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**Project leader:** Nathan Carruthers

**Primary ACA staff on this project:**

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**Partnerships:**

Alberta Sustainable Resource Development

**Key findings**

- Results from our 2007 and 2008 surveys confirm the existence of spawning migration from Winagami Lake to Boone's Slough by the presence of ripe walleye in the channel connecting both systems as well as in Boone's Slough.
- In 2007, we captured 1,134 male and 333 female walleye in pound traps set between Winagami Lake and Boone's Slough.
- In both years, we captured walleye in gill nets during the spawning period as far upstream as the spillway in Boone's Slough. However, where walleye spawn remains unknown.
- No walleye were caught in Boone's Slough during the fall, suggesting that walleye were able to return to the lake without being trapped in poor water conditions.

**Abstract**

Historically, the walleye (*Sander vitreus*) fishery in Winagami Lake has been maintained through a stocking program. Attempts to enhance natural recruitment through habitat enhancements have had marginal success. However, anecdotal evidence in recent years suggests that walleye make spawning migrations from Winagami Lake, through a small channel to the adjacent Lower Heart reservoir (Boone's Slough). However, fluctuating water levels may prohibit the movement of fish from the slough back to Winagami Lake. We used pound traps and gill netting to document the establish the existence of spawning migration between Winagami Lake and the Boone's Slough. Results from our 2007 and 2008 surveys confirm the existence of spawning migration from Winagami Lake to Boone's Slough by the presence of ripe walleye in the channel connecting both systems as well as in Boone's Slough. No walleye were caught in Boone's Slough during the fall of either year, suggesting that water levels may have been high enough to

allow fish to return from Boone's Slough into the lake thereby avoid being trapped in poor water conditions. Winagami Lake is a stocked lake that until now has never been considered a sustainable fishery. Walleye attempting to spawn in unfavorable habitats may provide an opportunity to encourage successful spawning through habitat enhancement.

## **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, anecdotal evidence in recent years suggests that walleye make spawning migrations from Winagami Lake, through a small channel to the Lower Heart reservoir (Boone's Slough) (Schroeder, ASRD, pers. comm.) (Figure 1). We confirmed this spawning migration in Boone's Slough during a 2007 spring survey (the first year of this study). 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. However, fluctuating water levels, especially the channel between the two systems may prohibit the movement of fish from the slough back to Winagami Lake. 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, which is conducted over two years (2007 and 2008) 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.

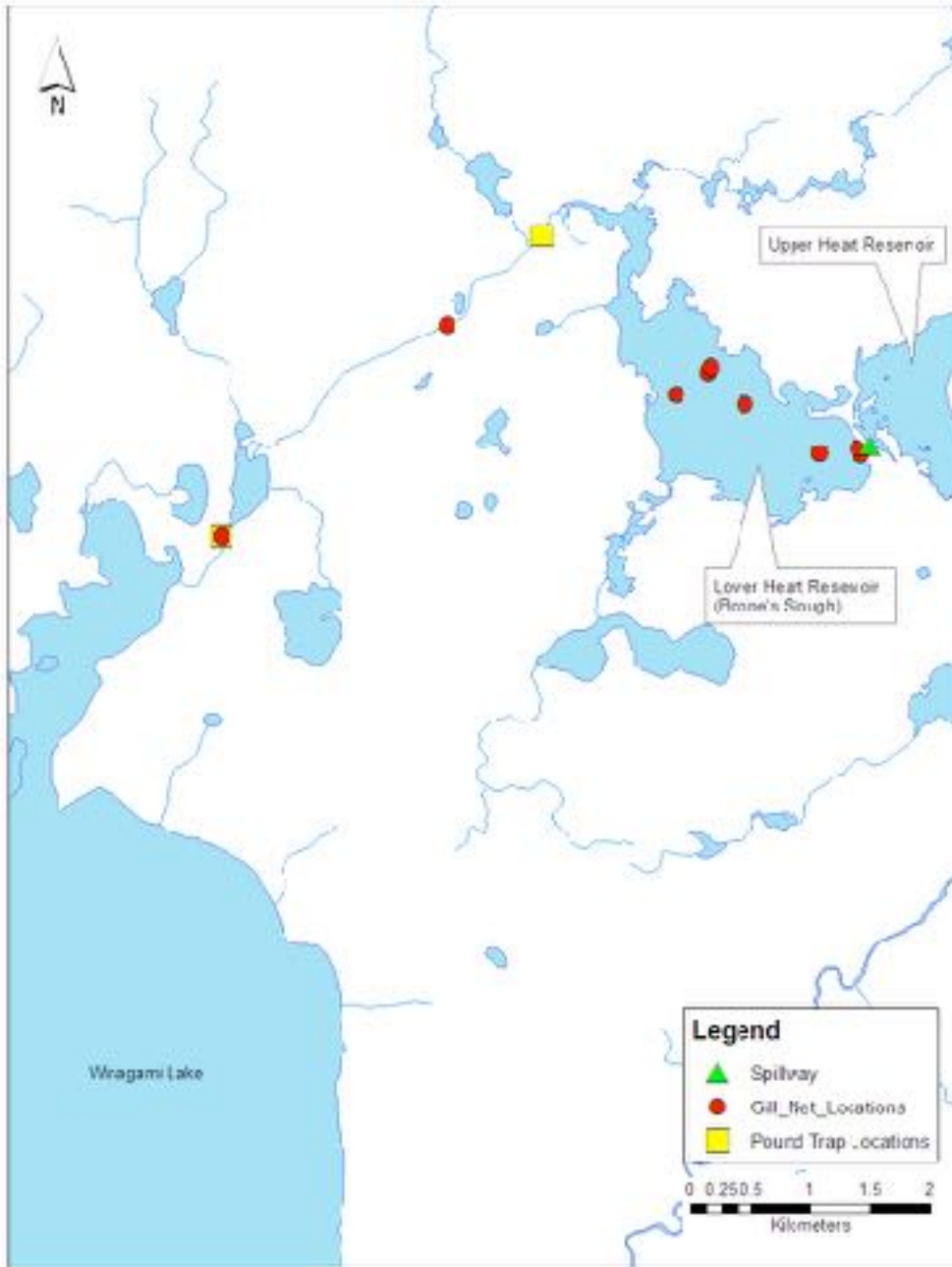


Figure 1. Map of gill net and pound trap locations the Winagami Lake and Boone's Slough system.

## Methods

For the 2007 survey, 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 (Figure 1).

We returned in October of 2007 and set 4 multi-panel Fall Walleye Index Nets (FWIN) (Morgan 2000) at pre-determined locations in the Boone's Slough to determine if any walleye remained. In 2008, we used five FWIN nets to confirm the presence of walleye in Boone's slough during the spawning period. On 14 May 2008 we set the nets at mid-day at depths  $\geq 2$  m for approximately 30 minutes each. Four of the nets were set at the same locations in Boone's Slough as in the fall of 2007; the fifth net was set at a location near the spillway that separates Boone's Slough from the Upper Heart Reservoir. We repeated this FWIN sampling protocol on 9 October 2008. We collected fork lengths and weights from the fish we caught. We also determined the sex of walleye caught in the spring by the presence of milt for males and either eggs or a visible ovipositor for females. All fish were released unharmed.

## **Results**

In 2007, we marked a total of 1,491 walleye were caught in pound traps during the spawning period. Of the 1,134 males and 333 females marked, 578 males and 43 females were re-captured downstream of the Boone's Slough. Only five males were re-captured 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. In 2008, we caught 10 ripe male walleye during the spring FWIN survey in the Boone's Slough and all were captured in the net set below the spillway. Other species caught during the spring were 17 northern pike and 19 white suckers. We also observed white suckers spawning during the spring gillnetting, just below the spillway. In the fall of 2008, we caught 37 northern pike and one white sucker. No walleye were caught during the fall of either year, suggesting that water levels may have been high enough to allow fish to return from Boone's Slough into the lake.

## **Conclusion**

The 2008 data confirms results from our 2007 survey indicating that walleye make spawning movement from Winagami Lake into Boone's Slough. The large number of walleye caught in the downstream trap suggests that the main spawning effort may occur somewhere in the channel, as relatively few fish were caught in the upstream trap. No walleye were caught during the fall of either year, suggesting that water levels may have been high enough to allow fish to return from Boone's Slough into the lake thereby avoid being trapped in poor water conditions.

## **Communications**

- ACA activity report prepared.

## Literature cited

Morgan, G.E. 2000. Manual of instructions: Fall walleye index netting (FWIN). Ontario Ministries of Natural Resources, Fish and Wildlife branch, Peterborough, Ontario, Canada. 35p.

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.

## Photos:



A pound trap set in tributary to Winagami Lake 2007. The trap was used to capture walleye as they moved to spawning areas. (Photo: Dave Jackson)



Dave Jackson holding a walleye caught during 2007 trapping at Winagami Lake. (Photo: Amanda Nunn)



Walleye in downstream pound trap at Winagami Lake 2007. (Photo: Dave Jackson)