

**Alberta Conservation Association
2009/10 Project Summary Report**

Project Name: *Trout Stocking Evaluation*

Fisheries Program Manager: Peter Aku

Project Leader: Bill Patterson

Primary ACA staff on project:

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Partnerships

Alberta Fish and Game Association – Onoway Chapter
Alberta Student Temporary Employment Program
Alberta Sustainable Resource Development

Key Findings

- Low-effort angler surveys using programmable trail cameras provided adequate results compared to more intensive creel surveys on larger lakes.
- Number of angling hours at Salter’s, Star and Heritage lakes were 1,765, 10,595 and 5,847, respectively.
- Anglers harvested 318, 1,081, and 655 Rainbow Trout from Salter’s, Star, and Heritage lakes, respectively. Harvested fish ranged from 183 – 503 mm in total length.
- Good fishing opportunity, type of species, closeness to home, and scenery were key factors that influenced angler choice of lake to fish.
- Of anglers interviewed, 69% were satisfied with their fishing experiences.
- When asked, “How would you improve this fishery?” anglers answered, “increase numbers of fish”, “increase size of fish”, “improve services”, and “change nothing”.
- Estimated fish densities using gill nets were 78, 34, and 35 fish/hectare at Salter’s, Star and Heritage lakes, respectively. Net catch ranged in total length from 168 to 489 mm. The population at Salter’s included 1 and 3 year old fish, while Star and Heritage lakes included 1 and 2 year old fish.

Introduction

Stocking fish is a common fisheries management technique used to maintain or create new sport fisheries. Annually, Alberta Conservation Association (ACA) and Alberta Sustainable Resource Development (ASRD) jointly stock over 3,000,000 Rainbow Trout into over 266 waterbodies. However, despite this considerable effort, the success and effectiveness of these stocking

programs has yet to be evaluated. This study is designed to improve the stocking programs, by evaluating the ability to meet management goals and angler expectations. To this end, we conducted angler surveys to evaluate angler use, satisfaction, and fishing quality, as well as stock assessments to measure abundance and population structure. This work included the development and testing of assessment tools; for example, low effort creel surveys and a fall gill netting protocol.

Methods

We conducted low-effort creel surveys at Salter's, Star and Heritage lakes from June to late August 2009. We interviewed anglers as they finished their angling trips and collected date, time of day, trip length, and number of fish caught. We calculated estimates for number of anglers, angling effort, harvest and yield from angler interview and camera data. We also interviewed anglers about their fishing experience and level of satisfaction related to their fishing trip. This information will help us understand angler preferences.

We used programmable trail cameras (effort cameras) to collect photographs of anglers on each lake every day from 0800 h to 2200 h (i.e., angling day). We validated the trail cameras by conducting angler counts (instantaneous counts) each hour as photographs were taken and used the mean number of anglers/hour captured by the camera and by counting to derive correction factors for camera counts.

Angling effort and harvest were estimated using angler catch rates and angling trip data. Parameters were extrapolated using a spatial correction factor that accounted for areas of the lake that were not captured by the camera.

During the fall, we set three multi-mesh gill nets in each lake to estimate the abundance and structure of the Rainbow Trout population. Gill nets were soaked for approximately 24 h and catches were standardized to area of net and 24 h. In addition, we collected dissolved oxygen and temperature profile data and used this information to set nets in oxygenated water. We measured lengths and weights of all fish and collected otoliths for age determination. We estimated fish density (fish/hour/hectare) using the total catch and a catchability coefficient (q) derived for Rainbow Trout by G. Sterling of ASRD (Unpublished data).

Results

During the creel surveys, we interviewed 81, 331, and 179 anglers at Salter's, Star and Heritage lakes, respectively. Anglers' fishing trips were 1.7 to 3.4 hours long. Estimated number of anglers ranged from 743 at Salter's to 3,493 at Heritage (Table 1). Total fishing hours ranged from 1,795 at Salter's to 10,595 at Star Lake.

Table 1. Estimates of angling parameters from the angler surveys conducted at Salter’s, Star and Heritage lakes. The 95% confidence interval around the estimate is shown in brackets.

Lake	Angling trips (95% CI)	Angling hours (95% CI)	Number of fish harvested (95% CI)	Number of fish released (95% CI)
Salter’s	743 (504 – 1,029)	1,765 (1,291 – 2,276)	318 (232 – 410)	2,004 (1,465 – 2,583)
Star	3,189 (2,448 – 5,280)	10,595 (9,208 – 12,038)	1,081 (939 – 1,228)	2,257 (1,961 – 2,564)
Heritage	3,493 (2,644 – 4,574)	5,847 (4,905 – 6,899)	655 (549 – 773)	368 (309 – 435)

The catch rates varied from 0.18, 0.10, and 0.11 fish harvested/hour at Salter’s, Star and Heritage lakes, respectively. Harvested fish ranged from 183 – 503 mm in total length. The release catch rates were substantially higher than the harvest rates; 1.14, 0.21, and 0.06 fish released/hour, respectively.

The effort cameras took approximately 1,530 photographs at Salter’s and Star lakes and 3,060 at Heritage Lake. We conducted 216, 149 and 185 instantaneous counts at Salter’s, Star, and Heritage lakes, respectively. At all three lakes, the mean number of anglers (per hour) captured by camera was not significantly different from that counted within camera view by an observer (Table 2).

Table 2. Comparisons of the mean number of anglers/hour photographed to the mean number of anglers/hour counted inside the camera’s view.

Lake	Mean number of anglers/h counted	Mean number of anglers/h photographed	t-test ($\alpha = 0.05$)
Salter’s	1.02	0.90	P = 0.161
Star	5.17	5.17	P = 1.000
Heritage	1.89	1.70	P = 0.396

Generally, anglers indicated they were satisfied with their experiences at these lakes. We conducted 44, 34 and 32 face-to-face angler surveys at Salter’s, Star and Heritage lakes, respectively. On average, the majority (86%) of anglers were satisfied with their angling experience. About half (49%) were satisfied with the number of Rainbow Trout they were

catching and 45% were neutral or unsatisfied. Slightly fewer (44%) were satisfied with the size of Rainbow Trout they were catching, while 52% were neutral or unsatisfied. The most common responses to the open-ended question “Why did you come to this lake?” was “The lake is close to home” (44%) and was “Good fishing” (16%). When asked, “What would you change about the lake?”, 31% said “Nothing”, 21% and 19% replied “Increase size” and “Increase numbers”, respectively, while 17% said “Improve services”.

During the fall gill netting protocol, we captured an average of 34, 15 and five Rainbow Trout/gill net at Salter’s, Star and Heritage lakes, respectively. Corresponding density estimates were 78, 34 and 35 fish/ha, respectively. These fish ranged in length from 168 to 489 mm TL. In addition, the Rainbow Trout from Salter’s included 1 and 3 year old fish, while Star and Heritage lakes included 1 and 2 year old fish.

Conclusions

Low-effort angler surveys combined with programmable effort cameras provided adequate estimates of angling effort and catch at Salter’s, Star and Heritage lakes. In terms of adequacy, the dispersion around the estimates of angler effort and catch were equivalent to those from creel surveys previously conducted on native Walleye and Northern Pike lakes. All three lakes received substantial angling effort. Anglers were generally satisfied with their angling experiences at these lakes, including the sizes and numbers of fish being caught. Anglers primarily visited these lakes because they were close to their homes. The most common suggestions were to improve services, change nothing, stock larger fish, and stock more fish. The results from the gill netting survey suggest the method was successful at estimating abundance and structure (i.e., age-class and length-class).

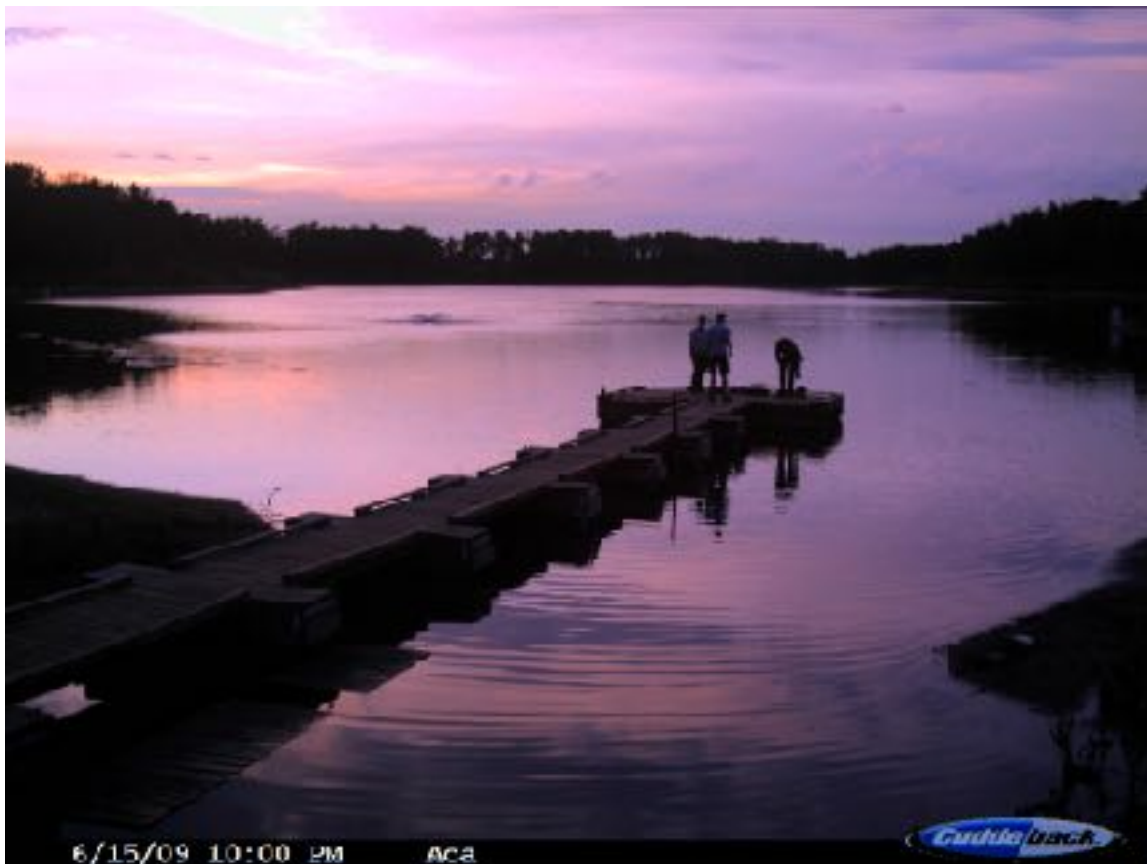
Communications

- Notified local detachments of RCMP of activities on nearby lakes.
- Series of presentations to ASRD biologists and managers.
- Local newspapers notified of activities at nearby lakes.
- Series of presentations to Alberta Fish and Game Association – Onoway Chapter regarding methodology and results.

Literature Cited



Alberta Conservation Association staff setting up effort camera at Star Lake. Left to right: Brendan Ganton, Shane Wood. (Photo: Ryan Boechler)



An example of a picture taken by a programmable trail camera. (Photo: Cuddeback Expert 3.0)



Alberta Conservation Association employee, Emily Turton, measuring and releasing a Rainbow Trout. (Photo: Bill Patterson)