



Keyask Generation Project

Sea Falls 2013 Juvenile Inventory: Preliminary Results

Memorandum

Subject: Sea Falls 2013 Juvenile Inventory: Preliminary Results

To: Dr. Friederike Schneider-Vieira
North/South Consultants Inc.

From: Craig McDougall
North/South Consultants Inc.

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Introduction

The Sea Falls – Sugar Falls reach of the upper Nelson River is located near the community of Norway House, Manitoba, just downstream of the eastern outlet of Playgreen Lake. The Nelson River Sturgeon Board has stocked Lake Sturgeon in this area since the mid 1990s, in response to the assumed extirpation of sturgeon from this reach of the river. Between 1994 and 2011, 20,885 fingerlings (age 0) and 1,107 yearlings (age 1) were stocked into the Sea Falls to Sugar Falls reach. In fall 2012, the first study aimed at evaluating stocking success was undertaken. Results are presented in McDougall and Pisiak (2012). In 2013, a follow-up survey was conducted to increase the understanding of the reintroduced population. The specific objective of the study was to develop a mark-recapture estimate of the number of juvenile Lake Sturgeon present in the reach, thereby facilitating post-stocking survival estimates. Additional background information including a more detailed history of stocking in the area (pre-2012) is provided in McDougall and Pisiak (2012).

Methods

From September 16 to 26, 2013, juvenile Lake Sturgeon investigations were conducted in the Sea Falls – Sugar Falls reach of the Nelson River. The field crew was comprised of Darcy Pisiak (NSC), Harold Wilson (Norway House), and Leon Simpson (Norway House). Methodologies employed were consistent with those used in 2012 (McDougall and Pisiak 2012); juvenile gill net gangs (1, 2, 3, 5 and 6" meshes) were set overnight explicitly in deep-water habitats. Lake

Sturgeon captured were measured for fork length, total length, and weight. Each fish captured was scanned for previously applied PIT tags using a Biomark 601 reader. Floy tag numbers for previously tagged fish were also recorded. Fish lacking either PIT or Floy tags were marked with one or both (if size permitted). Field PIT tag data were compared with Grand Rapids hatchery PIT tag records to confirm particulars (cohort, stocking year, stage, etc.).

Preliminary Results

Data analysis (particularly the ageing component) is ongoing, but preliminary results are as follows. A total of 152 individual Lake Sturgeon were captured. Of the 100 fish large/old enough (>350 mm) to have been captured during 2012, 73 (73%) possessed PIT tags linking them back to Sea Falls age 1 stockings. Based on these fish, and the 67 PIT tagged age 1 stocked Lake Sturgeon captured in 2012, a total of 122 unique PIT tagged Lake Sturgeon have been recaptured in the reach. Considering that only 1,014 yearlings with PIT tags were stocked (all between 2008 and 2011), 12.0% have now been recaptured. This can now be considered the minimum estimate of post-stocking survival (0.12), and is highly conservative in that it assumes the following:

- There has been no mortality (including harvest) or emigration (e.g. fish moving downstream) following the post-stocking period (end of the fish's first winter in the wild);
- No tag loss or malfunction has occurred; and
- All juveniles present in the reach have now been recaptured.

Each of the assumptions listed above are likely not valid, resulting in an underestimate of post-stocking survival. A more accurate survival estimate can be calculated by generating a population estimate of juvenile fish from mark-recapture data collected during the 2012 and 2013 Sea Falls – Sugar Falls gillnetting surveys. A Lincoln-Petersen estimator is most applicable based on the data collected; however, this method will likely still result in an underestimate because the previously listed assumptions still apply. Essentially PIT tagged fish captured (considered marked) and live released in 2012 (n = 65) were all assumed to be susceptible to recapture in 2013. The number of those fish recaptured again in 2013 (n = 18), in combination with 2013 PIT tagged catch totals (n = 73) yields an estimate for the number of juvenile Lake Sturgeon present in the reach of 256 (95% CI: 196 – 401). From those data, and the known number of PIT tagged fish stocked (n =1,014) between 2008 and 2011, the post-stocking survival estimate is 25% (95% CI: 19 – 40%). Again, this is likely an underestimate, especially because the results of McDougall and Pisiak (2012) indicate that, based on growth chronology interpretation, considerable numbers of PIT tags appear to have been lost or malfunctioned or missed during scanning. However, ageing analysis of 2013 captured Lake Sturgeon have yet to be completed, so these data are not yet available to incorporate into the Lincoln-Petersen estimate.

Of the 52 Lake Sturgeon small/young enough (<350 mm FL) to have only been susceptible to capture during 2013, 50 (95%) possessed PIT tags, and all PIT tags link back to age 1 stockings in late 2012 or early 2013. It should be noted that 33 of 50 PIT tagged fish captured were stocked in 2013 and therefore had yet to pass the critical post-stocking period (end of first winter in the wild).

Preliminary Conclusions

Preliminary analysis of the 2013 Sea Falls data is consistent with the conclusions of the 2012 Sea Falls – Sugar Falls study (McDougall and Pisiak 2012). Age 1 (yearling) stocking appears to have been highly effective in re-establishing juvenile Lake Sturgeon in the formerly extirpated Sea Falls – Sugar Falls reach of the Nelson River.

References:

McDougall, C.A. and D. J. Pisiak. 2012. Results of a Lake Sturgeon inventory conducted in the Sea Falls to Sugar Falls reach of the Nelson River – Fall, 2012. A Lake Sturgeon Stewardship and Enhancement Program report prepared for Manitoba Hydro by North/South Consultants Inc., Winnipeg, Manitoba. 47 p.