The 2004 Adult White Sturgeon Monitoring project was initiated in order to monitor Nechako River white sturgeon during the expected period of spawning activity (mid-May to mid-June), and to complete field surveys should a congregation of sturgeon be observed. Funding and management of the project was provided by Alcan Primary Metal on behalf of the Nechako River White Sturgeon Recovery Team.

Radio telemetry and monitoring

Radio telemetry overflights of the Nechako River between the Stuart and Nautley rivers were conducted between the 28th of April and the 25th of May on a weekly basis in order to determine the presence and movement patterns of previously tagged fish. The flights originated from the Vanderhoof airport and were flown over the Nechako River from the Stuart River confluence upstream to the confluence of the Nautley River. A fixed-wing plane wired for telemetry work was used to complete the aerial surveys. Expert low-level flying was provided by Eric Stier of Guardian Aerospace.

In addition to the radio telemetry flights, radio telemetry base stations were installed and monitored cooperatively with the Ministry of Water, Land and Air Protection at three riverside locations within the study area. The base stations were used to record sturgeon movements several times each hour.

Spawning Congregation

The initial telemetry flights generally documented sturgeon holding in their overwintering habitat, but the movement of individual sturgeon increased as water temperatures warmed in early May.

A congregation of sturgeon was observed during the telemetry flight on the morning of May 18, and was located upstream of Vanderhoof. A total of 22 sturgeon were counted

from the fixed wing plane. The congregation was observed from a helicopter later in the afternoon, and documented using a video camera (a link to a sample of the video can be found at www.triton-env.com). Several counts were completed from the helicopter with a maximum of 36 sturgeon observed. Due to low turbidity and shallow depths in the Nechako, spawning sturgeon were easily observed.

Spawning behaviour was observed from the helicopter, which included the pairing of sturgeon, and the release of gametes by one pair. Sturgeon were observed as singles, pairs, and occasionally in groups of three or four. Most pairs consisted of a smaller fish (presumed to be male) in close proximity to a larger fish (presumed to be female), with the head of the male typically two-thirds down the length of the female. Male fish would typically cross over from one side of the female to the other. Groups of sturgeon typically consisted of one larger fish (female) with two or three smaller fish vying for position beside the female. During the observed gamete release, the head of the male was slightly upstream of the female and it turned its ventral surface towards the female, rapidly undulating as it released milt.

Egg collection and habitat description

The data collection phase of the project was initiated the day after the congregation was observed. A total of three sturgeon eggs were collected by kick netting, and one egg was collected on a substrate mat. The physical parameters documented at the spawning location on the Nechako River are relatively unique compared to other systems such as the Fraser or Columbia rivers. Specifically, the depths at which the eggs were deposited were notably shallower, and the water velocities slower than spawning habitat parameters documented in the other systems.

Larval sampling

Larval sampling was initiated on May 27th, and made use of two different sampling techniques: kick netting and fyke nets. Kick netting resulted in the capture of a yolk sack larva on May 29th, 2004. Detailed habitat data was collected at the site where the

single sturgeon larva was captured. Water velocity along the kick-netting transect was less than 1.25 m/sec and the substrates consisted largely of clean gravel with only a minor component of cobble.

On Raising a Sturgeon Larva

The larva captured on May 29 was moved to an aquarium in the Prince George office of Triton Environmental Ltd.. The aquarium was filled with Nechako River water to reduce stress to the fish, and the bottom of the tank was lined with gravel and small cobble collected from the Nechako River. Upon release into the tank, the sturgeon larva immediately worked its way into the interstitial spaces between the rocks, and was quickly hidden from view.

Over the course of the next week staff would frequently observe the tank for any signs of movement, but to no avail. After one week we decided to check to see if the fish had died, in the hopes that if we found the carcass early enough it would still be recognizable and could be preserved. Gently sifting though the substrates, we were hoping to see the little sturgeon dart out from under a rock. But still there was no sign of the larva. Finally, after about ten days there was a sighting. The sturgeon had emerged, and was swimming upwards at the top of the tank for several minutes, and then drifting down to the bottom to check out the substrates. This continued on for several days.

A theory was developed that the sturgeon was trying to disperse, and was not finding the type of substrate it was looking for. The cobble and gravel from half of the tank were replaced with sand, and almost immediately the sturgeon settled on the bottom over the sand and remained quite inactive.

Jim Trask at Triton Environmental has been faithfully feeding the larva a steady diet of bloodworms and invertebrates collected from the Nechako River, since its emergence from the substrates in mid-June. The sturgeon does not seem to be a picky eater, and any potential food items placed in the tank are methodically consumed. On one occasion, two

small longnose dace were accidentally released into the tank with some invertebrates. The next morning there was only one dace, and a couple of days later the sturgeon was once again the sole inhabitant of the tank.

The feeding of the sturgeon is always a popular time of day around the office, and several guests have shown up to observe the spectacle. The sturgeon is an extremely efficient eater, typically swimming along the bottom of the tank detecting food with four sensitive barbells that hang down in front of its mouth. When food is detected, the mouth protrudes and the prey is sucked up. The detection and ingestion of food happens in a fluid motion that does not require the sturgeon to halt or slow down its forward motion. On occasion, the sturgeon has been observed capturing food suspended within the water column.

The sturgeon appears to be in good health, and has maintained a fairly consistent growth rate. As of the beginning of February, the sturgeon had a fork length of approximately 20 cm.

Sturgeon Release Plan

A release plan has been developed by the Ministry of Water, Land and Air Protection, based on the proposed release strategy for the conservation fish culture program. The sturgeon will be released once it has reached a length of approximately 30 cm, which should occur sometime during the spring of 2005. The sturgeon will be tagged with a Passive Integrated Transponder (PIT) tag, and released into suitable sturgeon rearing habitat within the Nechako River.

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