

## UNDERWATER PHOTOGRAPHY OF STURGEON IN OVER-WINTERING BEDS (671 words)

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In November 2004, Golder Associates Ltd. conducted a small scale pilot study to determine if a little benthic vehicle (LBV) could operate and provide useful data on Nechako River white sturgeon.

### Study Methods

The SeaBotix Little Benthic Vehicle 300 (LBV) remote operated underwater vehicle was used for this pilot study. This unit consisted of the LBV with protective bumper frame, control console, surface power supply, and 300 m umbilical. The features of this LBV included: a four thruster configuration (2 forward, 1 lateral, and 1 vertical); 270° field of vision; 180° camera tilt; 2 video cameras (0.3 lux colour and 0.03 lux low-light black and white); halogen lights that track the cameras; and sensors for depth, heading, underwater audit, and temperature. Images captured by the cameras were transferred to the surface monitor via a fiber-optic cable enclosed in an 8.4 mm diameter umbilical cord.

### Photo 1 Little Benthic Vehicle (LBV)

After testing several of the LBV components, the unit was placed in the water and was maneuvered in the various directions to obtain the desired footage. This unit can be operated at depths up to 300 m and in current speeds of up to 150 cm/s (3 knots), although its mobility decreases as current speed increases (mainly due to increased drag on the umbilical).



### Study Results

The weather was overcast in the morning and snowing. By late morning, the snow turned to rain under partly cloudy skies. The Secchi depth was 2.5 m whereas horizontal visibility while operating the LBV was approximately 2 m. Water temperature was 1° C.

### Photo 2 A white sturgeon photographed by the LBV

Clusters of 50 to 100 white sturgeon were recorded by the LBV during the survey of an area previously identified as being used by the endangered Nechako River white sturgeon for overwintering (RL&L 1997). Several white sturgeon with external tags and fin clips were observed on the footage; however, it appeared that many of the individuals may not have been previously captured by researchers. The vast majority of the individuals observed were adults and it was possible to obtain length data from some of the specimens using the LBV scaling lasers.



Most of the individuals observed exhibited little or no activity during the four hour period of the survey. Some individuals were observed holding off the bottom while others were stationed on the bottom. The density of adult fish was high and within some areas, individuals were in very close proximity to each other. Within these high density areas, observed individuals were generally oriented in a uniform direction.

The substrate was visible using the LBV cameras. In areas where white sturgeon were observed, the substrate consisted of predominately fines (i.e., silt, sand) with some areas of coarser substrate material (i.e., gravel, cobble) intermixed with fines, as reported previously by RL&L Environmental Services Ltd. (RL&L 1997).

### Potential Future Applications

There are a number of potential future applications for this technology in relation to the research and information needs identified in the Nechako River White Sturgeon Recovery Plan. These include, but are not limited to, the following:

- Observation of white sturgeon spawning behaviour and site selection, including egg release, spawner enumeration, predator presence, habitat, spawner abundance, etc.;
- Observation of specific white sturgeon life stages, previously impossible or difficult to observe; including egg deposition, yolk-sac larvae, larvae and young juveniles;
- Juvenile white sturgeon habitat use and descriptions of this habitat;
- Adult white sturgeon habitat use and critical habitat descriptions;
- Adult and juvenile white sturgeon density estimates in critical habitats such as overwintering locations;
- Success of release of cultured white sturgeon during recovery initiatives; and
- White sturgeon life history (e.g., length) and mark/recapture (e.g., Floy or radio tag, fin clip) enumeration without the need for intrusive physical recapture and handling.

Reference:

RL&L Environmental Services Ltd. 1997. Fraser River White Sturgeon Monitoring Program. Region 7 (Omenica-Peace) – 1996 Investigations. Report prepared for BC Ministry of Environment, Lands and Parks, Fish and Wildlife Section, Prince George, BC. RL&L Report No. 520: 78pp + app.