

Sep 21 2005

Revelstoke Times

First Nations help prevent local extinction of white sturgeon in Arrow Lakes

By Mark Tiley

Special to The Times Review

It's 8 a.m. and the mist is still hovering over the Columbia River at Revelstoke, as Jim Clarricoates and I head down river to begin our field day of assessing white sturgeon habitat and tracking adult sturgeon movements. It's been raining over the last few days and the water is uncharacteristically muddy, further obscuring the ever-present logs and stumps, many of which are just barely below the water's surface. These old stumps take on a menacing character that look to puncture our zodiac or damage our motor in a blink of an eye, putting a sudden end to our valuable sturgeon fieldwork.

While we watch for obstacles, we're wondering, how many sturgeon will we locate today? In what type of habitat will they be holding? And why have these huge, seemingly invincible fish that have been around for a least 175 million years and can live to be more than 100 years old, failed to reproduce successfully, despite confirmed spawning events, since around the mid-1960s to early 1970s? In our past work with Westslope Fisheries, an environmental consulting firm based in Cranbrook, BC, we have been fortunate to have found and tagged several of the estimated 50 adults that still remain in the Arrow Lakes Reservoir. The tags emit a unique sound signal from which we can detect individual fish up to two kilometers away. By tracking tagged sturgeon, adult seasonal migration patterns and spawning, rearing and overwintering habitats in the Arrow Lakes Reservoir system have been identified.

Jim and I are members of the Canadian Columbia River Inter-Tribal Fisheries Commission (CCRIFC), an organization that assists the Ktunaxa and Secwepemc First Nations with fisheries management and research in the Columbia River Basin. CCRIFC is also a member of the Upper Columbia River White Sturgeon Recovery Team, an organization that was formed in order to identify the exact causes for sturgeon recruitment failures and the actions needed for their recovery. The Ktunaxa word for white sturgeon is wiyat, pronounced wee yath. The Secwepemc word for sturgeon is x̄^o7i, pronounced Hoo ee. The white sturgeon is an integral part of First Nations culture and is still an important part of the history and culture of the Columbia River communities today. The First Nations do not want the sturgeon to share the same fate as the once abundant Pacific salmon that migrated from the ocean to as far upstream as Columbia Lake near Invermere. The salmon disappeared from the Upper Columbia River altogether when their spawning migration was blocked in the late 1930s and early 1940s by the construction of Grand Coulee Dam in Washington State.

It is not known how many white sturgeon historically occurred in the Arrow Lakes system before the mid-1960s, but some long-term residents of the Arrow Lakes area have indicated that seeing or catching them as recently as the early 1980s was not unusual and they are certain sturgeon used to occur in far greater numbers. Modeled estimates suggest that the Arrow Lakes system likely supported a much larger population than occurs today, but was comparatively smaller than populations that spawned downstream of the Arrow Lakes. The Upper Columbia white sturgeon were updated from vulnerable status to endangered in 2003 by the Committee on the Status of Endangered Wildlife in Canada. Provincially they have been red listed as "critically imperiled" meaning that local extinction of the species is imminent unless major efforts are implemented to reverse the population decline.

The causes of decline are not fully understood; however, what is almost certain is that their failure to reproduce successfully in the Arrow system is somehow related to the presence and/or operations of hydroelectric facilities. Construction on the Mica and Keenleyside Dams under the terms of the Columbia River Treaty began around the time the sturgeon recruitment failure began. In fact, many sturgeon populations of the Columbia River system and throughout the world are in decline, and dams are commonly identified as one of the main contributing causes for these declines. However, exactly how the dams contribute to recruitment failure is uncertain. Human development, changes in flow patterns, loss of habitat, introduction of exotic species and harvesting are also contributing factors to the white sturgeon's decline.

The Columbia River has been dramatically altered since the dams were built. Sediment and nutrients that were transported downstream by the current of the Columbia River now settle out in the Kinbasket, Revelstoke and Arrow Lakes Reservoirs. Thus, water downstream of Revelstoke Dam is much clearer and low in nutrients, making sturgeon eggs and young far more visible to predators.

The Arrow Lakes Reservoir floods the Columbia River downstream of Revelstoke every year. Combined with a lack of nutrients and dramatic daily fluctuations in Revelstoke Dam discharge, the aquatic habitat structure of the river from Revelstoke to Beaton has been altered, possibly making survival for young sturgeon very difficult.

The dams may block sturgeon migrations, possibly preventing them from reaching essential spawning and rearing areas. The loss of salmon, which made a tremendous contribution to the productivity of the Upper Columbia River ecosystem, and historical over-fishing have also likely contributed to the sturgeon declines.

CCRIFC's research has focused on improving our understanding of white sturgeon habitat requirements and assessing the effects of cold temperatures

on sturgeon egg and juvenile survival. Mica and Revelstoke Dams withdraw water from deep down in their reservoir. As a result, Columbia River temperatures in the Revelstoke area are colder in the summer and warmer in the winter compared to historic conditions.

It appears from study results that the altered seasonal temperature trends have not directly resulted in recruitment failure as eggs and juveniles can still survive and grow despite the temperature changes. However, temperature can still affect behaviour and growth, so the altered temperatures in combination with predation, changes in habitat and reduced food availability may be limiting the survival of sturgeon young.

Jim and I know that it will likely take years before the causes of recruitment failure is identified and still more time will pass before the actions necessary to reverse the declines are implemented, but we hope that the work we carry out today will provide essential information that will help piece together the very challenging puzzle of how to bring about the recovery of the Arrow white sturgeon before they are gone forever.

If you have any information about sturgeon that you would like to share, please contact CCRIFC biologist Mark Tiley at 250-837-2154 or send him an e-mail at mark.tiley@telus.net.

For more information about white sturgeon research and recovery initiatives in the Upper Columbia River, please visit the Upper Columbia River White Sturgeon Recovery Initiative website at <http://uppercolumbiasturgeon.org>.