

Since April 2000, the FRSCS Lower Fraser River White Sturgeon Monitoring and Assessment Program has relied on trained volunteers to tag sturgeon and collect sampling data. Each year, FRSCS volunteers sample several thousand live sturgeon for the presence of uniquely numbered “PIT” tags. Sturgeon samples used for abundance and other analytical purposes are taken from a “core assessment area” that includes over 200 linear kilometers in the lower Fraser River watershed downstream of Lady Franklin Rock (near Yale).



Key Points and Findings

- More than 165,000 sturgeon sampling events have been recorded by volunteers since 1999 (Figure 1).
- The program currently uses two models to generate abundance estimates: an Integrated Spatial and Age-structured Mark-Recapture (ISAMR) model and a Bayesian mark-recapture (BMR24) model. The trends for juvenile, subadult, and adult sturgeon are shown in Figure 2.
- The abundance of sturgeon in the lower Fraser River has been declining since 2006.
- Juvenile sturgeon (60-90 cm fork length/FL) abundance has declined substantially over the past 15 years.
- Subadult sturgeon (100-169 cm FL) abundance has been declining since 2012.
- Adult sturgeon (160-279 cm FL) abundance has increased gradually since the beginning of the program.
- The ISAMR model can be used to forecast future trends in sturgeon abundance.
- If recent trends continue, the Lower Fraser River White Sturgeon population is forecast to decline at an average annual rate of 1.4% per year over the next 30 years (see Figure 3 below).
- The average annual growth rate for 60-179 cm FL White Sturgeon in 2019 (3.6 cm/year) was 36.8% lower than the respective average annual growth rate in 2002 (5.7 cm/year).

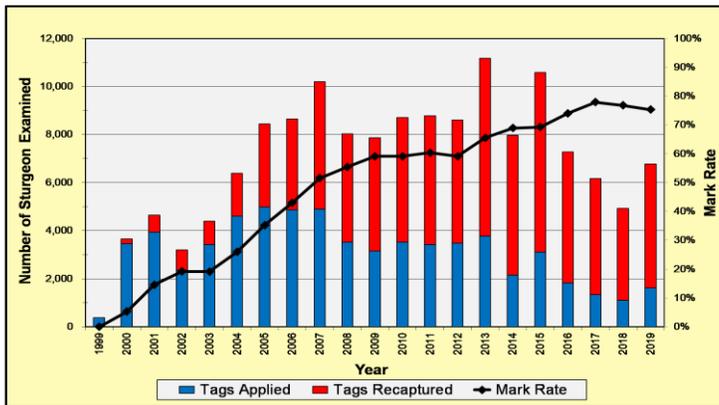


Figure 1. Annual numbers of tags applied, the reported number of tag recaptures, and the annual mark rates (proportion of sampled fish that possessed a tag at the time of capture) for 60-279 cm FL White Sturgeon, 2000-2019. From Nelson et al. 2020.

ISAMR Abundance (Age 7-55 / 60-279 cm)

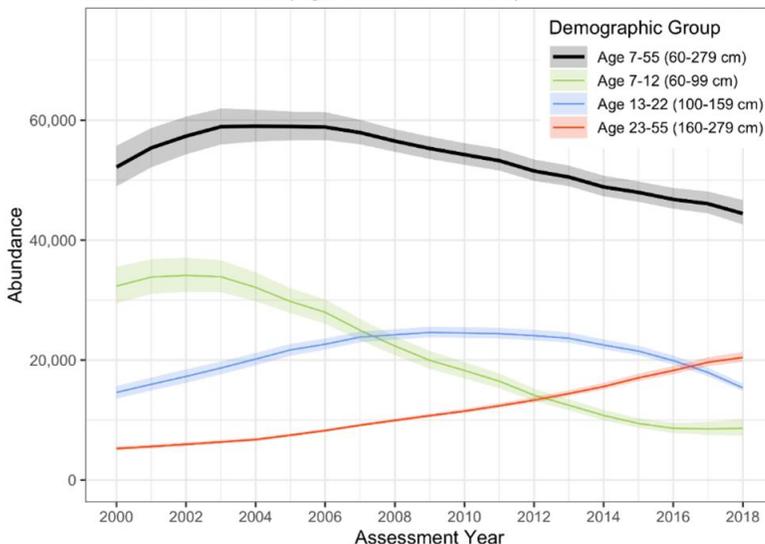


Figure 2. ISAMR abundance estimates of age 7-55 (60-279 cm FL) Lower Fraser River White Sturgeon from 2000 to 2019. Shading indicates 95% credible intervals. From Challenger et al. 2020.

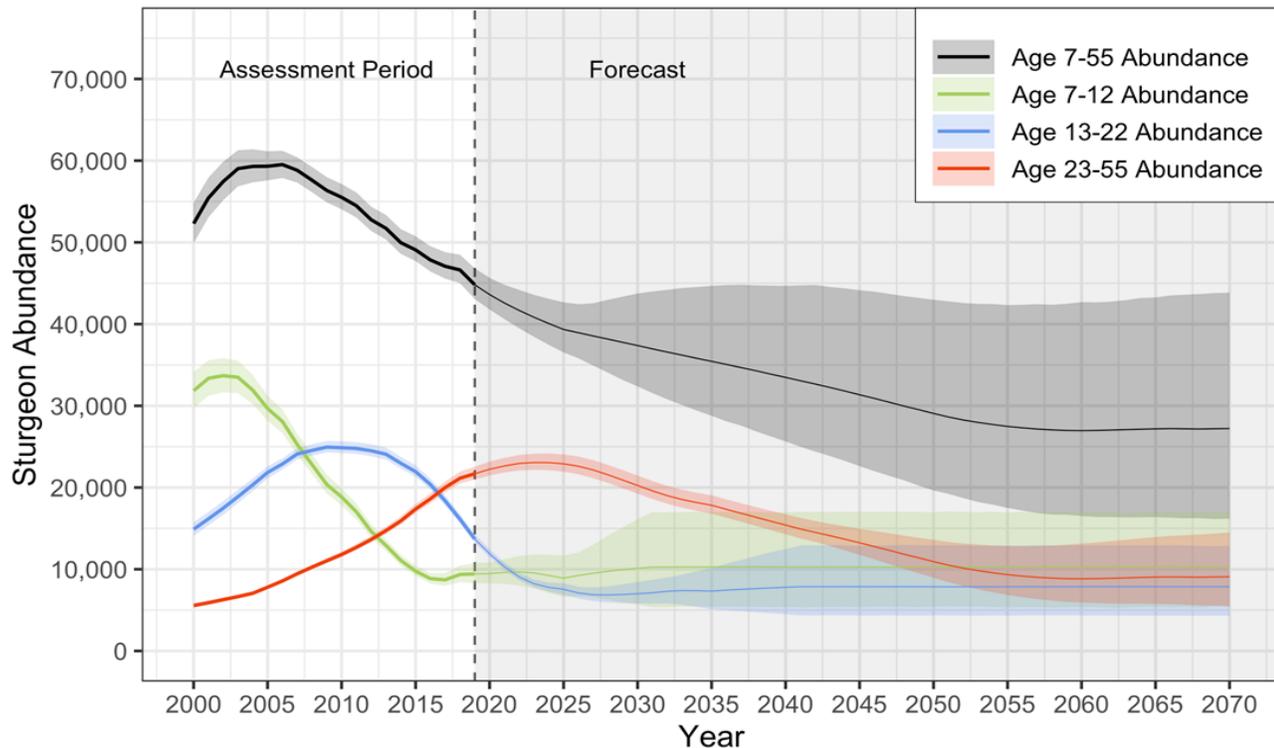


Figure 3. ISAMR abundance forecasts for Lower Fraser River White Sturgeon for 2019-2070, assuming that annual recruitment remains the same as recent estimates (i.e., 2012-2018 recruitment). Grey shading indicates forecasted years. From Challenger et al. 2020.

Aside from abundance model results, there are other concerning demographic indicators:

- The proportion of juvenile (< 100 cm FL) White Sturgeon captured by the Albion Test Fishery decreased by 63% between 2000 and 2019.
- The average annual growth rate of White Sturgeon in the lower Fraser River in 2019 (3.6 cm/year) was 37% lower than in 2002 (5.7 cm/year). Growth is an indicator of sturgeon population health and condition; declining growth rates can result from a reduction in food supply and/or an increase in physical or physiological stress.

The future of wild Fraser River White Sturgeon – what can be done to help?

- The numbers of juvenile White sturgeon entering the population are currently insufficient to maintain adult abundance.
- The current and forecast abundance of mature adult fish in the population should be sufficient to increase juvenile abundance over the next decade as long as specific actions are taken now to reduce impacts and improve environmental conditions.
- Although the causal mechanisms of the declines are unclear, the FRSCS recommends immediate actions to improve the numbers and survival rates for juvenile sturgeon.

Priority actions include:

- protection of overwintering, spawning, and juvenile rearing habitat;
- restricted fishing and boating activity across known sturgeon spawning areas during the spawning period;
- a reduction of the incidence of net interceptions from all net fisheries during all times of the year;
- a reduction in the annual capture rates in the recreational fishery; and
- the identification and protection of spawning and rearing areas for the prey species upon which juvenile and adult sturgeon depend (e.g., salmon and eulachon).

Detailed annual program reports that present both study methods and results are available at:

<https://www.frasersturgeon.com/research-for-survival-reports/>