

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

- Over 181,000 sturgeon samples have been collected by program volunteers over the past 23 years (Figure 1).
- The program currently computes abundance estimates using an Integrated Spatial and Age-structured Mark-Recapture (ISAMR) model. Abundance trends for juvenile, sub-adult, and adult sturgeon are shown in Figure 2.
- In 2021, the estimated abundance of 60-279 cm fork length (FL) sturgeon (age 7-55) in the lower Fraser River was $45,558 \pm 4.2\%$.
- Juvenile sturgeon (60-99 cm FL) abundance has declined substantially since 2002.
- Sub-adult sturgeon (100-159 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 estimates have shown long-term declining trends for most size classes of sturgeon over the assessment period.
- A hatchery-origin White Sturgeon, released in May 2016 from the Nechako River sturgeon hatchery, was recaptured five years later, in June 2021, in the lower Fraser River approximately five kilometers downstream of Yale (and over 730 kms downstream from its release location in the Nechako River).

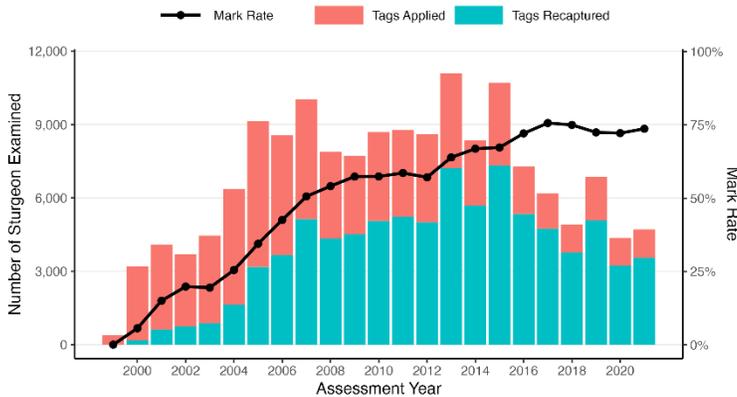


Figure 1. Annual numbers of tags applied, the reported number of tag recaptures, and the annual mark rates (proportion of sampled fish that possessed a tag at the time of capture) for 60-279 cm FL White Sturgeon, 1999-2021.

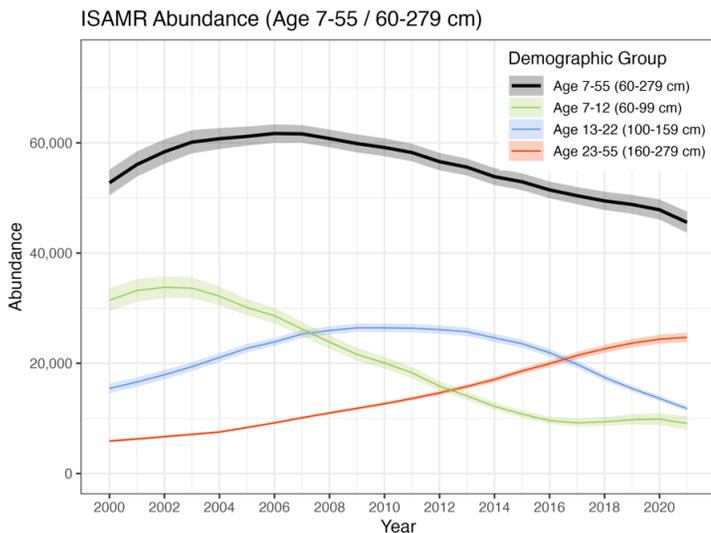


Figure 2. ISAMR abundance estimates of age 7-55 (60-279 cm FL) Lower Fraser River White Sturgeon from 2000 to 2021. Shading indicates 95% credible intervals.

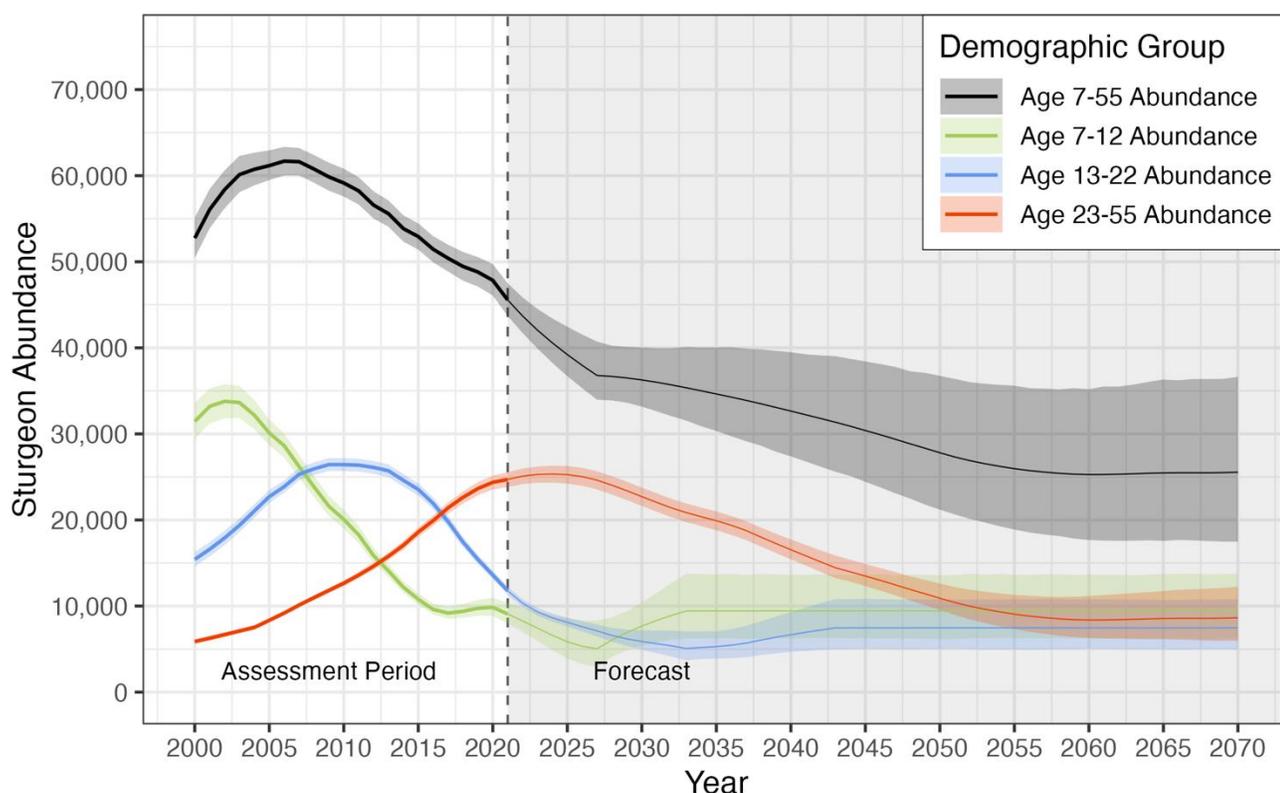


Figure 3. ISAMR abundance forecasts for Lower Fraser River White Sturgeon for 2021-2070, assuming that annual recruitment remains the same as recent estimates (i.e., 2012-2021 recruitment). Grey shading indicates forecasted years.

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

- The annual proportions of juvenile (< 100 cm FL) White Sturgeon sampled from the Albion Test Fishery have steadily declined over the past 22 years, from 56.8% in 2000 to 32.8% in 2021.

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

- Juvenile White Sturgeon recruitment rates in the lower Fraser River are currently below the level of population sustainability.
- The current and forecast abundance of mature adult fish in the population should be sufficient to increase juvenile recruitment rates over the next decade as long as specific actions are taken now to reduce impacts and improve environmental conditions.
- The authors recommend immediate actions to improve recruitment 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;
- reductions of annual capture rates and the targeting of individual large sturgeon 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/>