

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 172,000 sturgeon samples have been collected by program volunteers over the past 22 years (Figure 1).
- The program currently computes abundance estimates using an Integrated Spatial and Age-structured Mark-Recapture (ISAMR) 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 (60-99 cm fork length/FL) abundance has declined 70.8% over the past 18 years.
- Subadult 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 for 60-179 cm FL White Sturgeon in 2020 (3.9 cm/year) was 31.6% lower than the respective average annual growth rate in 2002 (5.7 cm/year).

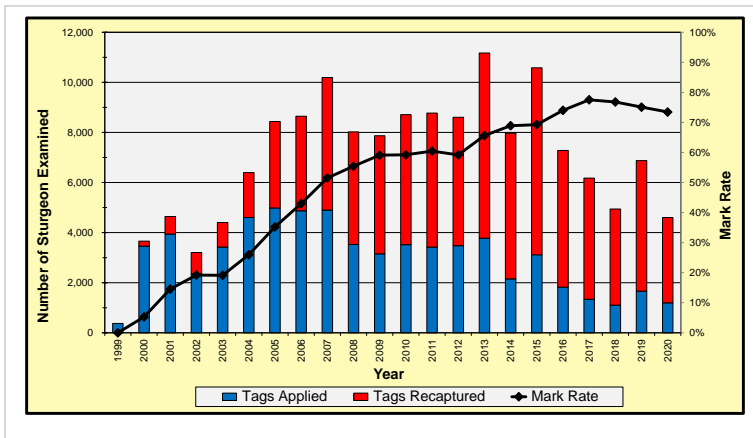


Figure 1. Annual numbers of tags applied, the reported number of tag recaptures, and the annual mark rates (proportion of sampled fish that possessed a tag at the time of capture) for 60-279 cm FL White Sturgeon sampled in the core assessment area of the lower Fraser River, 1999-2020.

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

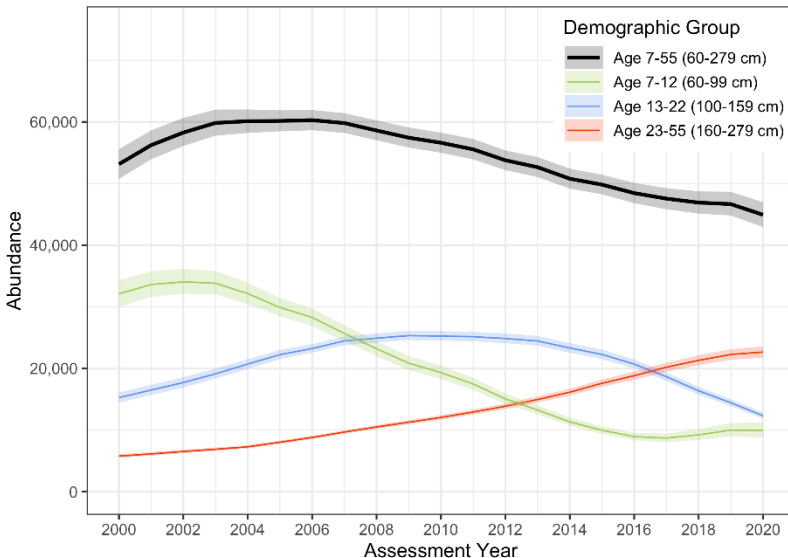


Figure 2. ISAMR abundance estimates of age 7-55 (60-279 cm FL) Lower Fraser River White Sturgeon from 2000 to 2020. Shading around lines indicates uncertainty associated with the annual estimates. (Source: Challenger et al. 2021.)

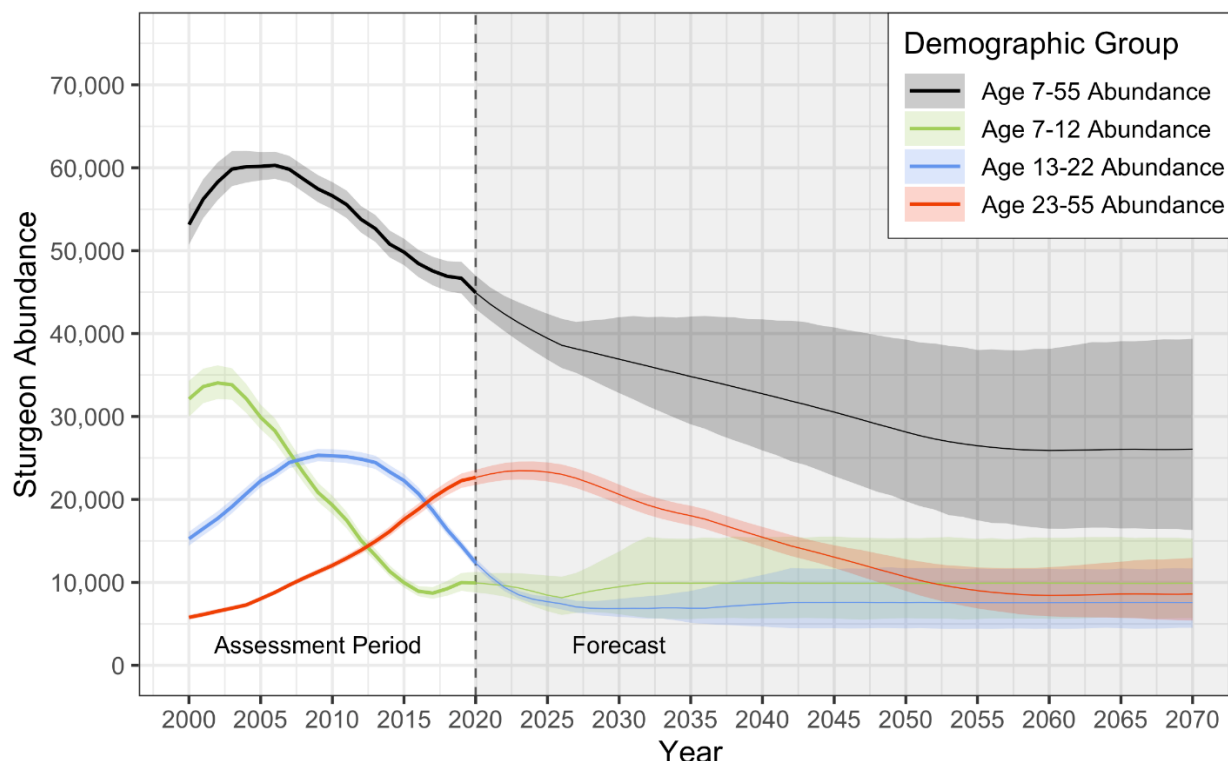


Figure 3. ISAMR abundance forecasts for age 7-55 Lower Fraser River White Sturgeon for 2021-2070, assuming that annual age-7 recruitment remains the same as recent estimates (i.e., 2012-2020). Grey background shading indicates forecast years, while shading around lines indicates uncertainty associated with the annual estimates and forecasts. (Source: Challenger et al. 2021.)

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

- The number of White Sturgeon sampled in the Albion Test Fishery in 2020 ($n = 82$) was 89% lower than the respective number sampled in 2006 ($n = 770$), and the proportion of juvenile (< 100 cm FL) White Sturgeon sampled by the Albion Test Fishery decreased by 33% between 2000 and 2020.
- The average annual growth rate for all size groups of White Sturgeon in 2020 (3.9 cm/year) was 31.6% lower than the respective average annual growth rate in 2002 (5.7 cm/year).

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, as indicated by the continued population decline in forecast abundance.
- 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 conducive to White Sturgeon reproduction and recruitment.
- The authors recommend immediate actions to improve recruitment and survival rates for juvenile sturgeon.

Priority actions that can and should be taken include:

- protection of overwintering, spawning, and juvenile rearing habitats;
- restrictions of fishing and boating activity in known sturgeon spawning areas;
- transition from gill net fisheries to selective fishing methods to reduce levels of injury and mortality;
- the enactment of regulations to decrease the numbers of sturgeon captured in the recreational fishery; and
- the protection of key prey species utilized by all life stages of White Sturgeon (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/>