

Population Viability Analysis of White Sturgeon in the Snake River

Funded by Idaho Power Company (IPC)

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We developed a PVA model for white sturgeon populations in the Snake River to evaluate management alternatives that have been proposed as part of relicensing for Middle Snake River dams. We used the PVA model to quantify the effects of habitat fragmentation by dams on white sturgeon (Jager et al. 2000) in a theoretical river system. In 2001, we used the model to evaluate the relative effects of various factors that have been implicated as playing a role in population declines in some river segments (Jager et al. 2001). In 2002-2003, we simulated realistic strategies designed to reconnect fragmented populations, (translocation, upstream and downstream fish passage) with and without other mitigation actions (e.g., reduced trash-rack spacing, improved water quality). These simulations provided the White Sturgeon Technical Advisory Committee with information needed to recommend conditions for relicensing dams in the Middle Snake River. The model has since been used to evaluate reconnection strategies involving translocation or upstream passage in rivers with different configurations. In 2003-2004, the PVA model was used to evaluate demographic and genetic costs and benefits of sturgeon aquaculture (Jager 2005). Many of these publications can be found [here](#).

Because there are a number of different factors that potentially influence white sturgeon in each river segment, we designed specific models to address those questions. [Mark Bevelhimer](#) developed a bioenergetic model to quantify the effects of load following operations on white sturgeon growth and reproduction. He found that temperature differences among the river segments alone explain significant differences in reproductive potential over the lifetime of a female (Bevelhimer 2002). This information feeds into the PVA model to quantify population-level effects. Annett Sullivan developed a spatial model designed to quantify the effects of water quality in Brownlee Reservoir. She found that predictions of population-level effects to depend on model assumptions about movement (Sullivan et al. 2003).



Initial participants in the PVA project visit Bonneville Dam (left). From left to right, Jim Chandler and Ken Lepla (IPC), Mark Bevelhimer (ORNL), Webb Van Winkle, Phil Bates (IPC), and Doug Dixon (EPR), photo by H. Jager.



Photo of juvenile sturgeon taken by Ken Lepla.



A fisherman fishing for white sturgeon below Bonneville Dam.