

## A Riparian Habitat Hypothesis for Successful Reproduction of White Sturgeon

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*White sturgeon (Acipenser transmontanus) has recruitment failure or severe interannual variability in much of its range. Exceptions are Columbia River below Bonneville Dam, Snake River below Hells Canyon Dam, lower Fraser River, and Sacramento River. Since rivers were impounded or flows regulated, once-continuous populations now isolated by natural barriers or dams often have not reproduced successfully, despite successful spawning events. Research has not adequately explained recruitment failures or why certain populations are successful. This paper proposes that submerged riparian habitat during seasonal high water is needed for early development. Where recruitment is successful, channels are complex and floodable riparian vegetation or rocky substrate is abundant. There, spawning occurs in turbulent zones upstream (1–5 km) of seasonally submerged riparian habitat, eggs can disperse into inundated habitat and adhere to newly wetted surfaces for incubation, yolk-sac larvae can move to riparian crevices for prefeeding development, feeding larvae have food-rich flooded habitat for early growth, and larvae can transition to juveniles as water recedes to permanent channels. Such habitat is lacking where recruitment is low and present only in high-flow years where recruitment is sporadic. These observations suggest that management should rehabilitate riparian zones and provide high river flows during spawning to stimulate natural recruitment.*

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