

A MECHANISTIC MODEL TO EXPLAIN DIFFERENTIAL RECRUITMENT SUCCESS OF PALLID STURGEON AND SHOVELNOSE STURGEON IN THE UPPER MISSOURI RIVER BASIN

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Shovelnose sturgeon (*Scaphirhynchus platyrhynchus*) and the federally endangered pallid sturgeon (*S. albus*) inhabit in the lower Yellowstone River and fragmented hydroscape of the Missouri River between Fort Peck Dam and Lake Sakakawea. Populations of both species contain reproductively mature individuals that produce viable eggs and sperm, and spawning

is known to occur in both species. Whereas shovelnose sturgeon exhibit annual recruitment success, there is little to no evidence of recent recruitment in pallid sturgeon. Experimental studies of larval sturgeon drift dynamics provide a mechanism to explain the differential recruitment success in these species. Larval pallid sturgeon drift for 11-17 days after hatching, and may be transported 435 km downstream after hatching. Larval shovelnose sturgeon have a shorter drift duration (6 days), and drift only 200 km downstream after hatching. Larval drift models suggest that an adequate length of river is not available downstream from suspected spawning areas currently used by pallid sturgeon to meet the larval drift requirements. Thus, if spawning occurs in the pallid sturgeon population, export of larvae to the downstream reservoir likely accounts for lack of survival and recruitment. In contrast, due to the shorter drift distance required by larval shovelnose sturgeon, sufficient river length is available to facilitate larval survival and recruitment.