

# EFFECTS OF VARYING DISCHARGE ON THE ICHTHYOPLANKTON ASSEMBLAGE IN THE MARIAS RIVER, MONTANA

Benjamin J. Goodman and Christopher S. Guy, Montana Cooperative Fishery Research Unit,  
U. S. Geological Survey, 301 Lewis Hall, Montana State University, Bozeman, MT 59717,  
bgoodman@montana.edu

Susan L. Camp, USDI Bureau of Reclamation, Montana Area Office, P.O. Box 30137,  
Billings, MT 59107

William M. Gardner, Montana Fish, Wildlife and Parks, P.O. Box 938, 2358 Airport Road,  
Lewistown, MT 59457

Many lotic fish species use fluctuations in discharge as a cue for spawning. The effects of spring discharge variation on the spawning behavior of fish populations in the upper Missouri River have not been documented. Contrasting discharge events in the Marias River during the spring of 2006 and 2007 gave us the unique opportunity to study the response of ichthyoplankton density and richness to discharge variation. The objectives of this study were to examine spatial and temporal variation in the density of ichthyoplankton in the lower Marias River and to investigate the effects of varying discharge on the timing and location of spawning for resident fish species, especially sturgeon (*Scaphirhynchus* spp.). We sampled ichthyoplankton every four days in June and July of 2006 and 2007 at five sites in the Marias River, one site in the Teton River, and two sites in the Missouri River. Estimates of larval fish density varied temporally in the Marias River. Overall density of larval fish in the Marias River was greater in 2006 (0.206 fish/m<sup>3</sup>) than in 2007 (0.089 fish/m<sup>3</sup>). In 2006, sturgeon spawning occurred in the Marias River in conjunction with the spring hydrograph peak (134 m<sup>3</sup>/s) when temperatures were between 15 °C and 20 °C, while no evidence of sturgeon spawning was documented in the Marias River in 2007 in absence of a spring hydrograph peak (15 m<sup>3</sup>/s). These data suggest that increased discharge in the Marias River provides a spawning cue to sturgeon, while increasing overall ichthyoplankton density.