

Abstract

Lake Sturgeon Biology in Rainy Lake, Minnesota and Ontario

Wells Eugene Adams, Jr.

December 2004

Rainy Lake contains a native population of lake sturgeon *Acipenser fulvescens* that has gone largely unstudied. The objectives of this study were to document the population characteristics of lake sturgeon in Rainy Lake, determine spawning locations and generalized lake sturgeon movement patterns through the use of biotelemetry, and to relate climate, Namakan Lake discharge, and Rainy Lake water levels to year-class strength of lake sturgeon in Rainy Lake. Results of gill net efforts throughout the study indicate a substantial population of lake sturgeon in Rainy Lake. Based on body condition and growth, lake sturgeon in Rainy Lake were relatively plump and fast growing compared to a 32-population summary. Size structure analysis revealed a lack of smaller (<105 cm total length) and larger (>150 cm total length) lake sturgeon. Age-structure analysis indicated a similar trend, with few younger (<10 years) and older (>50 years) lake sturgeon, and a maximum of 59 years. Of the 322 lake sturgeon captured or recaptured during this study, 217 were in the area adjacent to the Squirrel Falls Dam, indicating the importance of this location. Telemetry data reinforced the high utilization of the Squirrel Falls area by lake sturgeon, with 37% of the re-locations occurring in that area. Squirrel Falls was the only site which spawning was confirmed by collection of lake sturgeon eggs,

although other spring aggregations in areas associated with Kettle Falls, the Pipestone River, and the Rat River could indicate spawning activity. Movement of lake sturgeon between the Seine River and the South Arm of Rainy Lake indicates the likelihood of one integrated population on the east end of the South Arm. The lack of re-locations in the Seine River during the months of September and October may have been due to lake sturgeon moving into deeper water areas of the Seine River and out of the range of telemetry gear or simply moving back into the South Arm. Few correlations existed between lake sturgeon year-class indices and both annual and monthly climate variables. The same was true for lake sturgeon year-class strength and Namakan Lake discharge. Correlation between Rainy Lake elevation and the lake sturgeon year-class strength indices across years yielded consistent, but weak correlations during the time period between late April and early June when spawning of lake sturgeon occurs. The lake sturgeon has historically been a resource of both cultural and economical importance to the Rainy Lake area. The unique biological characteristics of this species combined with the size of the system in which they live require biologists to utilize diverse management strategies. A proactive approach will allow lake sturgeon in this system to continue their role in the Voyageurs National Park aquatic ecosystem for many years to come.