

# PLAZA 3 ROOM – WEDNESDAY MORNING

ROOM: Plaza 3

TIME: Wednesday 8:20 AM

TITLE: Population characteristics of pallid sturgeon in the lower Platte River–Nebraska

AUTHOR(S):

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ABSTRACT: We examined catch statistics of pallid sturgeon, *Scaphirhynchus albus*, throughout the lower Platte River Nebraska (159 km). The lower Platte River was divided into two sampling segments so that sampling effort could be distributed to areas known to have higher abundances (lower segment) and an area believed to have lower abundances. We captured 24 pallid sturgeon throughout the entire reach of the lower sampling segment (i.e., 52 km). Pallid sturgeon were not historically present in the upper sampling segment. However we captured two hatchery-reared pallid sturgeon at river kilometer 67 and 76. Trotlines (30.5-m main line with 20 baited hooks) captured 19 of 26 total pallid sturgeon and catches were almost equally distributed between spring (9 fish) and summer (10 fish). Trammel nets (2.5-cm mesh, 38 m long, 1.8-m depth) captured seven pallid sturgeon during the summer sampling period. Fourteen pallid sturgeon were identified as hatchery origin and were representatives from the 2001, 2002, 2005, 2006, and 2008 year classes that were stocked at various locations along the Missouri River. We captured one wild origin fish that was telemetered in the Missouri River and had been at large for eight months. The remaining four individuals are of unknown origin and are pending genetic confirmation. This year marks the beginning of a five-year study designed to understand the importance of sturgeon species in the Platte River. Information gained on the factors driving population dynamics of sturgeon will be important for increased effectiveness of management activities for these species in riverine systems throughout their native range.

KEYWORDS: pallid, sturgeon, population

ROOM: Plaza 3

TIME: Wednesday 8:40 AM

TITLE: Nonlethal stable isotope analysis of endangered pallid sturgeon diets

AUTHOR(S):

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**ABSTRACT:** Pallid Sturgeon *Scaphirhynchus albus* are a federally endangered species. Recovery efforts have focused on stocking and construction of shallow water habitat. Information on food habits is particularly important for understanding ontogenetic diet needs, but has been limited owing to small sample sizes and the time/costs associated with traditional diet studies. Stable isotope analysis (SIA) has become an increasingly useful tool for monitoring time integrated food habits in ecological studies. However, SIA techniques generally utilize lethally obtained tissue, which is problematic when studying endangered species. The objectives of this research were to (1) determine if non-lethally obtained pectoral fin tissue could be readily substituted for lethally obtained muscle tissue for SIA in pallid sturgeon, and (2) determine if specific diets can be identified using pectoral fin tissue (nonlethal) and/or muscle tissue (lethal). Feeding trials of known diets were administered to juvenile pallid sturgeon held in individual aquaria for up to 186d. Linear regression showed a significant, positive correlation between tissue types for both  $^{15}\text{N}$  ( $r = 0.79$ ,  $p < 0.001$ ) and  $^{13}\text{C}$  ( $r = 0.97$ ,  $p < 0.001$ ). For all diets and both isotopes, fin isotope values were enriched compared to muscle. Mean residual differences between fin and muscle for both  $^{15}\text{N}$  and  $^{13}\text{C}$  were relatively low at 0.617 (SD 0.345) and 0.648 (SD 0.244) respectively, indicating little variability existed in isotope values between lethal and nonlethal tissues. The use of non-lethal techniques for SIA of pallid sturgeon would reveal important food habits information without sacrificing specimens and help play a crucial role in the recovery of this endangered species.

**KEYWORDS:** Isotopes

ROOM: Plaza 3

TIME: Wednesday 9:00 AM

TITLE: Responses of an unregulated shovelnose sturgeon population to commercial harvest

AUTHOR(S):

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ABSTRACT: The collapse of caviar fisheries in the Volga River and Caspian Sea, has increased demand for domestic caviar, thereby increasing harvest of shovelnose sturgeon in the Middle Mississippi River (MMR). Currently, harvest impacts are unknown. We sampled density, length and age structure, and the reproductive demographics of shovelnose sturgeon in the MMR during 2000 through 2006 to determine the impact of harvest on this population. Simulation modeling assessed how different length limits affected population yield and reproductive potential. Annual mortality for MMR shovelnose sturgeon was higher than previously published mortality rates for this species. Both adult density ( $P < 0.001$ ) and recruitment strength (2000,  $P < 0.05$ ; 2001,  $P < 0.05$ ; 2003,  $P < 0.05$ ) declined with harvest. Furthermore, the length and age structure has shifted to larger and older fish. Commercial exploitation is negatively affecting the shovelnose sturgeon population in the MMR, potentially causing a collapse of the fishery if not addressed. Recently, the boundary states (IL and MO) have enacted management regulations (harvestable slot and closed seasons) to maintain sustainability of the shovelnose sturgeon fishery.

KEYWORDS: sturgeon, harvest,

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TIME: Wednesday 9:20 AM

TITLE: Spatiotemporal dynamics of Indiana stream fish assemblages after 50 years of anthropogenic disturbances

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ABSTRACT: We examined spatial and temporal patterns for stream fish assemblages of Indiana based on recent (1996-2007) and historic collections (1945). A Nonmetric Multidimensional Scaling ordination resulted in distinct changes in contemporary and historic fish assemblages by watersheds, and decreased variation among recent assemblages compared to historic assemblages. We used a second ordination technique, Canonical Correspondence Analysis, to test recent collections (1996-2007) for fish assemblage variation that is explained by environmental variables. This resulted in a gradient of assemblages based on lentic to lotic habitats, stream size, stream gradient, and habitat complexity. We suggest that the fish assemblages of Indiana streams are structured primarily by habitat complexity and have been altered by multiple anthropogenic disturbances including habitat alteration, fragmentation, and invasive species.

KEYWORDS: Indiana, dynamics, fish

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TIME: Wednesday 9:40 AM

TITLE: Identifying river of origin for age-0 sturgeon in the middle Mississippi River using fin ray microchemistry

AUTHOR(S):

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ABSTRACT: Shovelnose sturgeon populations in the Mississippi and lower Missouri Rivers are declining and in need of rehabilitation due to overfishing and habitat degradation. Unfortunately, little is known about shovelnose sturgeon spawning locations or dispersal patterns. Individuals inhabiting the middle Mississippi River (between the mouths of the Missouri and Ohio Rivers) may originate from either the Missouri or Mississippi Rivers, although the relative importance of these two potential recruitment sources is unknown. Pectoral fin ray microchemistry has been used to document periods of marine and freshwater residency in anadromous sturgeon species, but this technique has not been applied to reconstruct environmental history of freshwater sturgeons. The objectives of this study were 1) to determine whether age-0 shovelnose sturgeon from the middle Mississippi and lower Missouri Rivers exhibit distinct trace elemental signatures in their pectoral fin rays that reflect the characteristic elemental signatures of these two rivers and 2) to use trace element signatures in fin ray cross sections to identify river of origin for age-0 fish collected from the middle Mississippi River. Pectoral fin ray Sr:Ca ratios were significantly different between age-0 fish collected in the two rivers, consistent with differences in otolith chemistry observed in other fish species. Our results indicate that fin ray microchemistry provides a new technique to identify recruitment sources for shovelnose sturgeon in the Mississippi River basin.

KEYWORDS: Sturgeon, origin, microchemistry