Estimating population size of select indicator fishes at The Nature Conservancy’s Emiquon Nature Preserve prior to Illinois River re-connection

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Background
- Study and management of Largemouth Bass Micropterus salmoides (LMBS) and Black Crappie Pomoxis nigromaculatus (BKCP) are a priority for many natural resource agencies and organizations.
- Both species are indicators of ecosystem health because they can be used to assess the effects of natural and anthropogenic disturbance in aquatic ecosystems and are monitored in lakes and reservoirs throughout Illinois. One such area is a large floodplain restoration project known as The Nature Conservancy’s (TNC) Emiquon Nature Preserve (EMQ) (Fig 1).
- EMQ has been disconnected from the Illinois River since the early 1900’s, drained and put into agricultural production until 2000, and restored back to a floodplain lake beginning in 2007.
- TNC began building a water control structure in 2015 that will result in a managed reconnection with the river.

Objective
- Establish pre-reconnection population estimates for LMBS and BKCP to benefit TNC managers by allowing them to more precisely evaluate the status of sportfish populations within EMQ.

Methods
- Fishes were collected May-October, 2015.
- Pulsed-DC boat electrofishing was used to target LMBS while fyke and tandem-fyke nets were used to target BKCP on a bi-weekly basis (e.g. week 1 = LMBS, week 2 = BKCP).
- All LMBS (≥150 mm) and BKCP (≥100 mm) were marked with two clear flyo tags to evaluate tag retention.

Methods cont.
- Marked and recaptured fishes while also recording total length (mm).
- Program R was used for a Schnabel model to estimate population size.
- Fisheries Analysis and Modeling Simulator (FAMS) and supplemental EMQ LMBS and BKCP otolith aging data collected April-May, 2015 was used to estimate total annual mortality, total annual survival, and theoretical maximum age using unweighted catch-curve regression analysis.
- These were also used to estimate maximum length (\(L_\infty\)) and growth rate (\(K\)) using the von Bertalanffy growth function.

Discussion
- BKCP population estimate lacked recaptures which may be due to very high population size and lower tag retention than LMBS.
- Supplemental otolith aging data suggests BKCP population is primarily 3 and 4 year olds, LMBS population is primarily 6 and 7 year olds which may be due to low recruitment.
- No output for LMBS unweighted catch-curve regression due to lack of younger year olds which may be due to low disturbance in aquatic ecosystems and are a priority for many natural resource agencies and organizations. Both species are indicators of ecosystem health because they can be used to assess the effects of natural and anthropogenic disturbance in aquatic ecosystems and are monitored in lakes and reservoirs throughout Illinois. One such area is a large floodplain restoration project known as The Nature Conservancy’s (TNC) Emiquon Nature Preserve (EMQ) (Fig 1). EMQ has been disconnected from the Illinois River since the early 1900’s, drained and put into agricultural production until 2000, and restored back to a floodplain lake beginning in 2007. TNC began building a water control structure in 2015 that will result in a managed reconnection with the river.

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