Abstract:

Stock reproductive potential informs population dynamics and response to harvest. Indices of body condition, like relative weight (Wr), may indicate individual energetic state and provide a mechanistic link between spawning stock traits and recruitment. We tested for relationships between Wr of three female size classes (381 – 457, 457 – 559, and >559 mm total length), reproductive traits, and age-0 recruitment using data from 92 walleye (Sander vitreus) populations in the Ceded Territory of Wisconsin during 1989 - 2015 and a lake-specific time series from Escanaba Lake, WI, during 1958 - 2014. In Escanaba Lake, Wr was positively related to maturation in small females, and fecundity and gonadosomatic index in intermediate fish. Among and within populations, Wr demonstrated compensatory density dependence and positive relationships with growing degree days. Recruitment was positively related to large female Wr variation across lakes and negatively related to small female Wr variation in Escanaba Lake. Improving the condition of large female walleye may promote recruitment, and Wr may serve as an accessible metric of reproductive potential in walleye stock-recruit analyses.