BISON, BUFFALO-FISH, AND THE CANVASBACK DUCK: UNDERSTANDING THE PRAIRIE LAKES REGION FROM AN ECOSYSTEM PERSPECTIVE

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Abstract: This presentation offers a novel description on how the prairie ecosystem functioned in 1491. The story is set in the 800 km^2 Heron Lake watershed in Southwest Minnesota, which is embedded in the "Prairie Lakes Region", an archaeologist's term used to describe a poorly drained glacial-lake studded landscape running from North Central Iowa through West Central Minnesota. The story begins in 1920 when the watershed's terminal receiving basin, a 4000 ha shallow water–wetland complex named Heron Lake goes eutrophic, and how 90 years of restoration efforts since have failed to restore it to its former clear water state. The presentation then goes back through time to explore historic interactions between keystone species, both terrestrial and aquatic, to determine how specific biotic networks or highly focused food chains contributed to the maintenance of Heron Lake's clear water state. A few specific keystone species, including the bison, buffalo fish, and canvasback duck are used to illustrate the relationship between biotic networks and energy-nutrient regulation in the ecosystem. In the end, we suggest that nutrient regulation in the Heron Lake watershed was under a strict set of highly focused biotic controls which maintained the former clear water state. The take-home message for policy and management offers an opportunity to move beyond restoration of vegetation towards restoration of biotic controls and networks which increase ecosystem function including nutrient regulation, while expanding community diversity and economic opportunities. Supported by stunning visuals, this presentation offers a refreshing approach towards restoration ecology in the Midwest…