INVERTEBRATE COMMUNITY CHARACTERISTICS IN RELATION TO ECOREGION, SHORELINE MANAGEMENT AND HABITAT IN EASTERN SOUTH DAKOTA LAKES

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ABSTRACT

The objective of this effort was to define relationships between measures of invertebrate community structure, littoral zone habitats and shoreline characteristics. Littoral invertebrates, vegetative biomass, substrate texture, water temperature, conductance, dissolved oxygen, pH, shoreline slope, shoreline aspect, canopy cover and shoreline land-use were sampled from 14 lakes within the Northern Glaciated Plains (NGP, n=8) and Northwestern Glaciated Plains (NWGP, n=6) ecoregions in eastern South Dakota. Five random sites were sampled from each basin during the growing seasons once in 1996 and twice in 1997-1999. Dissolved oxygen, cobble/boulder substrate and canopy-cover were higher in the NGP while water temperature, macrophyte biomass and shoreline vegetation densities were higher in NWGP. Swimmers and Corixidae were greater in NGP sites, while gliders, collector-filterers, shredders, and Gastropoda were more abundant in NWGP sites. Residential areas (41%) dominated lake shorelines adjacent to NGP sites while game production areas (29%) were prevalent adjacent to NWGP sites. Water temperature, macrophyte biomass and fine sediments were positively correlated with invertebrate metrics, while dissolved oxygen and shoreline vegetation densities were negatively correlated. Oligochaeta and engulfers were positively correlated with coarse substrate, while burrowers, collector-filterers, clingers, shredders, scrapers and Gastropoda were negatively correlated. Macroinvertebrate data were also found to vary between shoreline land-uses. Gliders, scrapers and Gastropoda were more abundant adjacent to game production areas compared to open grassland areas. Game production areas also harbored a greater abundance of gliders in adjacent littoral areas when compared to littoral areas adjacent to pastured areas. Oligochaeta and engulfers were found in greater abundance adjacent to residential areas compared to open grassland areas. Results of this effort lead toward development of invertebrate community signatures of lake shoreline condition. These signatures may be used to facilitate lake management efforts within an ecoregion context.