

Effects of Vegetation Reduction on
Aquatic Invertebrates and Water Quality
in North Dakota

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We are studying the effects of using glyphosate herbicide (RODEO formulation) on invertebrates and water quality. Selected wetlands were aerially treated with glyphosate at 70% areal coverage in 1990, 1991, and 1992 to fragment dense cattail stands and disperse large flocks of blackbirds that use these areas as roost sites. During the day, the blackbirds feed in neighboring sunflower fields. Fragmenting the dense cattail stands may reduce localized damage to sunflowers.

The focus of this study is on aquatic invertebrate communities and water quality parameters in treated and untreated wetlands. The structure and composition of aquatic invertebrate communities are being monitored to identify treatment effects. Two versions of an activity trap were used to sample planktonic and nectonic invertebrates. Both trap types were constructed from two-liter plastic bottles. The first trap type was set for 24 hours every 14 days, and the other trap type was left in position for the entire sampling period, with samples collected every 14 days. The potential for additional nutrient loading and possible anoxia may alter invertebrate communities. Additionally, the opening of the wetland canopy may affect invertebrate communities. To aid in analysis, invertebrates are being grouped into various classifications (e.g., taxonomic, feeding

type, and waterfowl food importance). In addition to aquatic invertebrates, selected water-quality parameters are being monitored to identify characteristics related to wetland treatment. The characteristics being monitored are water depth, temperature, pH, redox potential, dissolved oxygen, and conductivity. In 1993, chlorophyll-*a* concentrations, nitrate, and phosphorus are also being monitored.

The use of previously and newly treated wetlands will provide data on both long-term and short-term effects. Seven treated and five control wetlands in two regions are being sampled in this study. In 1992, data gathering began on 4 May and ended on 19 August. In 1993, data collection began on 27 April and will terminate in late August or when water depths become less than 15 cm. Comparisons will be made within years as well as between years. Preliminary data indicate no significant differences between treated and control wetlands for invertebrate groups.