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Response of Breeding Waterfowl and Broods to
Glyphosate-treated Wetlands in North Dakota

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In 1992; 20 wetlands were censused for breeding pairs and broods. The wetlands were selected from semipermanent, cattail-dominated wetlands that were treated with herbicide during 1990-91. In 1990, 12 wetlands were randomly assigned as controls (untreated) for 70 or 90% areal treatment with glyphosate herbicide (RODEO formulation). An additional 12 wetlands were treated in 1991 and were randomly designated to be controls (untreated) or to receive 50 or 70% areal treatment with glyphosate. The herbicide was applied aurally (5.8 l/ha) with a fixed-wing aircraft. The wetlands treated at 50% were not censused in 1992. The wetlands were censused in random order by two observers. Two breeding pair censuses and three brood surveys were conducted during 1992.

Our preliminary analysis was based on general categories of waterfowl (total waterfowl, dabblers, and divers), treatment categories (control, 70%, and 90%), and basin size, which included large amounts of dry land in some cases. Preliminary analysis of wetlands treated in 1990 showed no significant ($P > 0.1$) difference between treatments and controls. However, the highest mean number of ducks/ha and pairs/ha consistently occurred on wetlands treated at 70% areal coverage of herbicide. Results of our preliminary analysis on wetlands treated in 1991 showed no significant ($P > 0.1$) difference between treatments and controls. The highest number of ducks/ha and pairs/ha were found in controls and wetlands treated at 70%.

Future analyses will be based on actual live vegetation to open water ratios, total surface water area, and waterfowl nesting period (early- or late-nesting species). The censuses will be repeated in 1993 and wetlands treated at 50% during 1991 will be included.