

# WATERFOWL, NONGAME BIRDS & INVERTEBRATES ASSOCIATED WITH CULTIVATED WILD RICE PADDIES IN MINNESOTA

A cooperative research project report of the  
Northwest Experiment Station at the University of Minnesota, Crookston

## OVERVIEW

In 1992, about 17,000 acres of wild rice were cultivated in Minnesota paddies. A number of waterfowl use these paddies, beginning with spring migrants in April, followed by breeding birds in late spring and summer, then fall use by migrants after paddies are again flooded in September and October. Wildlife-related studies of cultivated wild rice paddies in Minnesota have been limited to two which examined spring breeding waterfowl use. However, a number of studies have been carried out on water quality and agronomic production practices, mostly conducted by Bemidji State University, Minnesota Pollution Control Agency and the University of Minnesota through the North Central Experiment Station at Grand Rapids. This study was designed to address primarily wildlife-related issues of cultivated wild rice production, but that necessitates evaluating other aspects of the paddy environment such as water quality, aquatic invertebrates, vegetation besides wild rice and land use adjacent to wild rice paddies. Discussions were initiated in the summer of 1992 with a variety of individuals and groups having an interest in wild rice/wildlife issues. Major issues were identified and refined into those which needed more information for resource management decision making and those which were researchable, given available resources of personnel, equipment, study area and funding. A project was approved through the Minnesota Agricultural Experiment Station and organized through the Northwest Experiment Station at Crookston, where the principal investigator has a joint appointment. The overall project had the following objectives:

1. To evaluate waterfowl production and use of cultivated wild rice paddies in northwest Minnesota.
2. To inventory invertebrate populations in cultivated wild rice paddies and evaluate effects of associated agricultural practices.
3. To inventory nongame bird use of cultivated wild rice paddies and assess the value of paddies as habitat for black terns, American bitterns and Wilson's phalaropes.

The intensive study area is located about 12 miles northeast of Oklee in Polk, Pennington and Clearwater counties. The terrain is quite flat, occurring in the lake plain of Glacial Lake Agassiz, with organic soils derived from reed-sedge peat. The study centers on a block of land containing about 1,600 acres of wild rice distributed in about 40 paddies, owned by the Gunvalson brothers, Paul Imle, and Gully Farms. The study area is along the Clearwater River which serves as the water source for wild rice production. A variety of idle brushland, pastureland, small grain fields, woodlands and Conservation Reserve Program (CRP) land is distributed throughout the study area. The original vegetation of the area was poorly-drained lowlands dominated by shallow marshes and grass-sedge communities. Better-drained, low ridges in the area were dominated by bur oak savannas and scattered occurrences of oaks with intermixed aspen. The study area is representative of the prairie and prairie-forest transition area where about half of the cultivated wild rice is produced in Minnesota. The study area is also positioned in a major waterfowl migration corridor of the prairie pothole and lake country of western Minnesota, about 40 miles south of the Agassiz National Wildlife Refuge and Thief Lake Wildlife Management Area. It is adjacent to an extensive area of natural wetlands on the Red Lake Indian Reservation.

## NONGAME BIRDS

-- *Dr. Dan Svedarsky, University of Minnesota*

A singing male census of nongame birds was conducted along a 5-mile route of roads and dikes with a portion of the study area considered representative of cultivated wild rice paddies and associated habitats. Censuses were taken early morning on May 30th, June 5th and June 22nd. Other than black terns, most birds were associated with emergent vegetation (primarily cattail) along paddy edges and upland habitats of: paddy dikes and roads, adjacent grass fields, grassbrush areas, and small groves of trees (principally trembling aspen and bur oak). The following species were recorded in general order of abundance: red-winged blackbird, savannah sparrow, song sparrow, brown-headed cowbird, common yellowthroat, killdeer, American goldfinch, clay-colored sparrow, common grackle, American robin, yellow warbler, warbling vireo, least flycatcher, alder flycatcher, sharp-tailed sparrow, common flicker, yellow-headed blackbird and eastern kingbird.

Featured nongame bird species in this study were Wilson's phalaropes, black terns and American bitterns. Black terns are described separately and the following accounts summarize observations for Wilson's phalaropes, American bitterns and other noteworthy species:

- **Wilson's phalarope:** Small numbers were observed throughout the study area along saturated mud flat habitats of paddies, but no nests were recorded. One instance of "broody" behavior was observed on July 21st.
- **American bittern:** Seven nests were found when cable-dragging upland fields associated with wild rice paddies; nests were commonly over 0.5 mile from paddies. Three of the seven nests hatched but fledgling success is unknown. Adults were commonly observed feeding along paddy ditches and occasionally in the interior of the paddy.

- **Sandhill crane:** Three crane nests were located near paddies; two hatched and the other was abandoned after a second nesting attempt. Adults and young were observed along the edge of the intensive study area, indicating that a minimum of two additional successful nests were present for a density of about one breeding pair per square mile in the general area where cranes were nesting.
- **Northern harrier:** Five nests were found and two were successful. Four nests were in large expanses of dense grass cover and one was along a paddy dike.
- **Marbled godwit:** Low numbers of adults were regularly observed in late April and May feeding along paddy edges and adjacent hayfields or pastures. One unsuccessful nest was located in a field which had been hayed the year before.
- **American avocet:** As many as three pairs of avocets were observed throughout May, with one nest established along the edge of a large paddy where an expanse of unvegetated peat was exposed. The nest was incubated for about two weeks; then abandoned around July 1st. Avocets foraged in paddies containing 6-10 inches of water.

A variety of shorebirds, occasionally in considerable numbers, foraged along paddy edges on saturated peat flats and shallow water areas. On October 2nd, about 400 greater and lesser yellowlegs, pectoral sandpipers, “peeps”, and lesser golden or blackbellied plover were feeding in newly-flooded paddies. On October 5th, a scattered group of “plovers” were feeding in a freshly-cultivated paddy, and later analysis of core samples from this paddy indicated an abundance of crane fly larvae (Tipulidae) about 2.5 cm in length, which are believed to be what the plovers were feeding on. On October 8th, about 125 plovers and 30 greater yellowlegs were resting and feeding in a paddy being flooded. The air temperature was about 25°F.

## **WATERFOWL RESEARCH IN CULTIVATED WILD RICE PADDIES**

*--Jay Huseby, University of North Dakota (graduate student)*

Each spring, large numbers and many species of waterfowl arrive in Minnesota on their annual spring migration. Some continue northward to their Arctic breeding grounds, but many choose the “Land of 10,000 Lakes” as the place where they will nest. Fantastic courtship displays and frenzied feeding activity bring Minnesota’s marshes, lakes and rivers to life as waterfowl pour into the region.

Migratory waterfowl (ducks, geese and swans) have lifestyles revolving around their annual movement between breeding and wintering grounds. Habitat loss and alteration have contributed to decreasing numbers of many species, with 40 to 60% of the original wetlands in the lower 48 states lost in the last 150 years. Thus, new or enhanced wetland habitats have become increasingly important to waterfowl.

A primary concern in managing waterfowl is to increase the amount of habitat available for reproduction, migration and wintering. To maintain waterfowl numbers, annual reproduction must be adequate to compensate for annual mortality. The quality of a habitat for waterfowl production is measured by estimating nesting density, number of nests hatching, and survival of ducklings.

Cultivated wild rice farming had its beginnings in Minnesota during the mid-50’s and had expanded to about 17,000 acres by 1992. Cultivated wild rice is grown in diked paddies which are flooded in early spring and drained in late summer, prior to harvest. Water levels are maintained at about 10 inches throughout the growing season. Some paddies are fall-flooded after harvest, to reduce the amount of water that must be pumped from rivers the following spring.

The study area is in northeast Polk County along the Clearwater River on a block of paddies owned and operated by the Gunvalson Brothers, Paul Imle and Gully Farms.

Migratory use of paddies is determined by conducting a weekly census route of 17 paddies of various sizes and shapes, representing about 780 acres of paddies. Species composition and density (number of birds per flooded paddy acre) are recorded for each paddy along the 5 mile route.

Potential nesting cover is searched in mid-May, after some hens have begun incubation. Large open blocks of nesting cover are searched by dragging a length of chain between two all-terrain vehicles driving parallel to each other, 35 feet apart. Nesting hens are flushed as the chain passes harmlessly over their nests. Areas inaccessible to cable dragging are systematically searched by researchers on foot. Once a nest is located, it is marked for future location and various nest data is recorded.

Mallard nests located during nest searching are revisited at an estimated incubation state of 20 days. During the visit, a nest trap is placed over the nest to catch the hen when she returns to resume incubation. Once hens are captured, they’re equipped with small radio transmitters, banded and returned to the nest. On the day of predicted hatch, researchers return to the nest to attach transmitters to 3-4 of the ducklings. Individual hens and ducklings are then monitored via radio telemetry, and daily survival, movements and habitat use are determined.

Preliminary results indicate wild rice paddies are being used extensively by waterfowl during spring and fall migration. Densities of over 20 birds per flooded paddy acre have been observed during periods of peak migration. Paddies and associated nesting cover

are also utilized for nesting. Over 160 waterfowl nests were located and monitored during the 1993 field season.

Wild rice paddies as potential habitat for waterfowl is a concept that has far-reaching implications. As natural habitats are lost or degraded as a result of human manipulation, it will become imperative to have a thorough understanding of wildlife biology in manipulated environments. Studying the use of agriculturally-created artificial wetlands by waterfowl may provide a basis for future management decisions.