

## THESIS ABSTRACTS

### FACTORS INFLUENCING BREEDING SUCCESS OF BALD EAGLES IN UPPER MICHIGAN

A study of factors responsible for poor population recovery rates of Bald Eagles (*Haliaeetus leucocephalus*) in the Upper Peninsula of Michigan was undertaken. The probable cause for low population growth rates on the Hiawatha National Forest is low chick production. This may result from removal of forage fish from inland lakes for sport fish management, human disturbance of nesting birds, and toxic contaminants. These factors were investigated in this study using the following methods: Bald Eagle productivity for breeding areas within 3.2 km of fish removals were compared spatially and temporally; foraging behavior was observed from blinds throughout the day, prey species were identified by observation of items carried to the nest and by collection of remains after fledging; concentrations of DDE, PCBs, and other organochlorine pesticides in blood plasma and mercury in feathers from nestling eagles were determined in order to relate contaminant exposure to nesting productivity; and White Suckers (*Catostomus commersoni*) and Bullheads (*Ictalurus* spp.) were stocked in winterkill lakes to determine if Bald Eagles would utilize a newly available food source.

Eagles in breeding areas where fish were removed for sport fish management (0.57 young per occupied nest) were significantly less productive than those breeding in areas where fish were not removed (1.30 young per occupied nest). The main food source of eagles was fish, with Northern Pike (*Esox lucius*) and Bullheads comprising 74% of all food items identified from prey remains. Hunters caused nesting eagles to become more aware or to take flight in four of four cases. Concentrations of PCBs and DDE from blood plasma from nestling eagles from breeding areas near the Great Lakes were significantly greater (PCB mean = 243 ppb; DDE mean = 147 ppb) than concentrations in plasma of nestlings from riverine breeding areas (PCB mean = 41 ppb; DDE mean = 19 ppb) and inland lake breeding areas (PCB mean = 27 ppb; DDE mean = 9 ppb). Bald Eagles and Osprey (*Pandion haliaetus*) fed on the fish stocked in the winterkill lakes but did not use this food source as much as that in naturally stocked lakes.

Results of this study strongly suggest that the factors most responsible for slow population recovery rates of Bald Eagles in the Upper Peninsula is poor chick production caused by removal of fish in interior breeding areas and by organochlorine contamination in breeding areas near the Great Lakes.—**William W. Bowerman, IV.** 1991. M.A. thesis, Department of Biology, Northern Michigan University, Marquette, MI 49855. Present address: Department of Fisheries and Wildlife, Pesticide Research Center, Institute for Environmental Toxicology, Michigan State University, East Lansing, MI 48824.

### NESTING ECOLOGY AND NEST SITE HABITAT OF SHARP-SHINNED AND COOPER'S HAWKS IN MISSOURI

I located nesting accipiters throughout the forested areas of Missouri and determined reproductive parameters and nest site habitat characteristics. Seventeen Sharp-shinned Hawk nests and 43 Cooper's Hawk nests were located. Ninety-four percent of the Sharp-shinned Hawk nests occurred in pine stands. Seventy-seven percent of Cooper's Hawk nests occurred in pine stands and 23% were in oak-hickory stands. The reoccupancy rate of accipiter nest sites was 70%. Mean clutch size for Sharp-shinned and Cooper's Hawks was 4.5 and 3.7 eggs, respectively. The vegetative structure of pine stands selected by both species was similar but the structure of Sharp-shinned Hawk sites represents an earlier successional stage than those selected by Cooper's Hawks. Management for these species in pine should be directed toward providing stands with high percent canopy closure and basal area.—**Kevin J. Kritz.** 1989. M.Sc. thesis, School of Natural Resources, University of Missouri-Columbia, Columbia, MO 65211.