

# Beaver Population Analyses 2008

By Robert E. Rolley, John F. Olson, and Michael L. Worland

## **Abstract**

The 2008 Beaver Helicopter Survey produced population estimates of approximately 27,800 and 17,500 beavers in Management Zones A and B, respectively. Estimates of the beaver population in the northern third of Wisconsin decreased 35% between 2005 and 2008 and more than 50% since 1995.

## **Background**

In 1989 the Wisconsin State Legislature provided funds for the WDNR to determine the feasibility of significantly reducing beaver numbers in problem areas. A portion of that money was used to develop a census method for evaluating the effectiveness of various beaver control efforts. Initial development and testing during 1990-92 resulted in a helicopter survey capable of estimating regional beaver populations within  $\pm 20\%$  (Kohn and Ashbrenner 1994). This survey was repeated in 1995, 1998, 2001, 2005, and 2008.

## **Methods**

Active beaver colonies within 42 randomly selected blocks in Beaver Management Zone A and 43 blocks in Zone B were counted from a Schweizer 333 (Fig. 1). The blocks ranged in size from 3.3 to 8.5 mi<sup>2</sup>, and averaged 5.5 mi<sup>2</sup>. The size and shape of each block was dependent upon locations of suitable boundaries (usually roads) which could be easily identified from the air. The total area surveyed was 228.7 mi<sup>2</sup> in Beaver Management Zone A and 238.6 mi<sup>2</sup> in Zone B.

Two observers plus the pilot were used to identify active colonies. Active colonies were identified by the presence of fresh feed piles, cuttings, and/or evidence that the lodge had been recently maintained. Each block was completely surveyed even though large portions of some blocks did not contain beaver habitat.

The estimated number of active colonies within each block was calculated by dividing the number observed by an observation rate of 0.81 (Payne 1981, Kohn and Ashbrenner 1994). Numbers of colonies within each Beaver Management Zone were then estimated by dividing the estimated number of colonies per mi<sup>2</sup> in the survey blocks into the gross area of the Zone. A mean colony size of 5.5 beaver per colony (Peterson 1979, Kohn and Ashbrenner 1994) was then used to estimate the beaver population within each Zone.

## **Results**

The 2008 Beaver Helicopter Survey was conducted during October 31-November 5. The survey required 67 hours of flight time, and the total aircraft cost (flight time, per diem for pilot and crew member, fuel truck, and hangar rental) was \$45,400.

The survey produced unadjusted estimates ( $\pm$ SE) of 4,101 ( $\pm$  672) active beaver colonies in Beaver Management Zone A and 2,573 ( $\pm$  435) colonies in Zone B. Adjusting these figures for an observation rate of 0.81 and an average colony size of 5.5 beaver per colony produced

population estimates of approximately 27,800 ( $\pm$  4,500) beavers in Zone A and 17,500 ( $\pm$  2,950) in Zone B for a total of 45,400 ( $\pm$  5,400) beavers in the northern third of the state (Table 1).

An average of 32% of the beaver harvest in Wisconsin during 2005-2008 was taken in Beaver Management Zones C and D based on returns of the Beaver Trapping Questionnaire (Dhuey and Olson 2006, 2007, 2008). Previously approximately 25% of the statewide harvest was taken from zones C and D. If the distribution of the harvest reflects the distribution of the population (assumes equal harvest rate among zones), then the statewide beaver population in 2008 may have been approximately 66,800 animals.

Surveys conducted periodically since the early 1990s show that the beaver population in the northern third of the state has decreased more than 50% from the mid-1990s level (Table 1). The 2008 population estimates for zones A and B were 46% and 59% lower than the 1995 estimates. Population estimates in 2008 were 32% and 40% lower than in 2005 in zones A and B, respectively. The decrease in beaver population estimate for northern Wisconsin between 2005 and 2008 was significant ( $Z = 2.73$ ,  $P = 0.006$ ).

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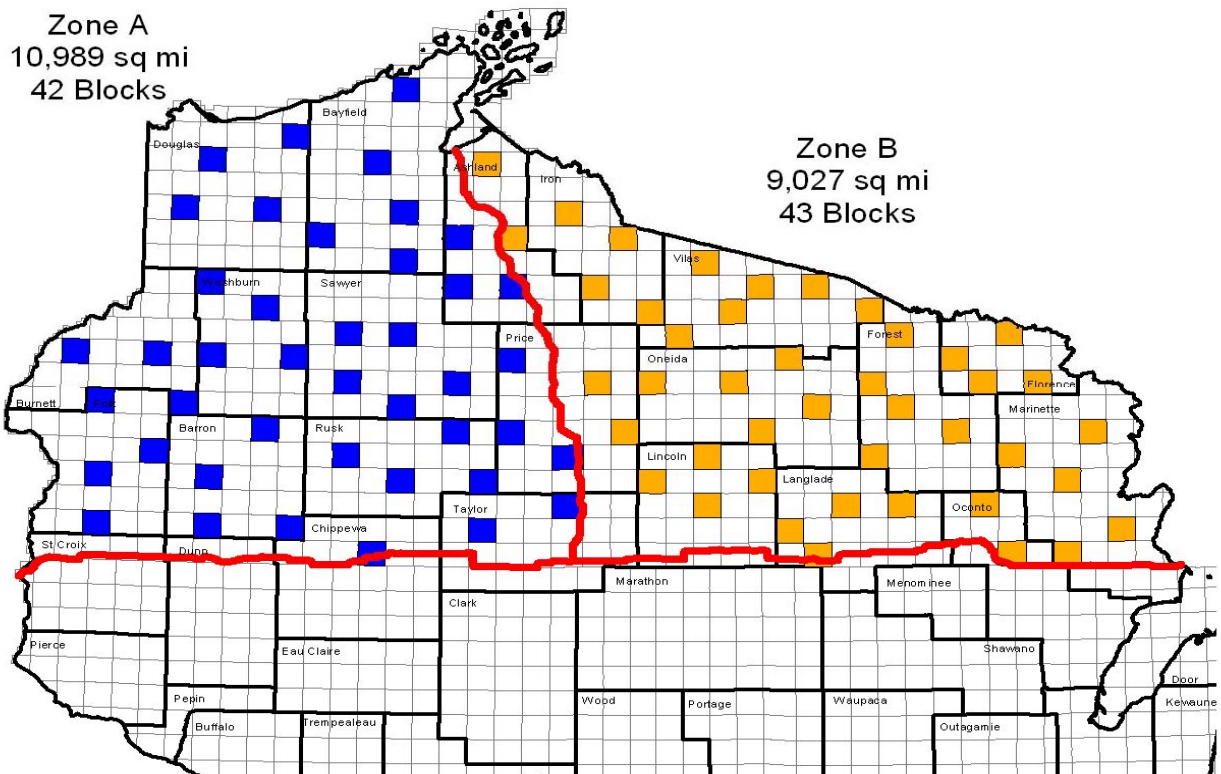
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**Figure 1.** Wisconsin's Beaver Management Zones A and B and general locations of blocks surveyed.

**Table 1.** Population estimates in Beaver Management Zones, 1992-2008. Estimates for zones A and B are based on the helicopter survey. Estimates for zones C and D are extrapolated from the northern zones based on the distribution of harvest.

Zone	1992	1995	1998	2001	2005	2008
A	40,300	51,800	45,000	38,900	40,800	27,800
B	40,800	43,100	22,900	20,800	29,000	17,500
Northern total	81,100	94,900	67,900	59,700	69,800	45,400
C & D	27,000 <sup>a</sup>	31,700 <sup>a</sup>	22,700 <sup>a</sup>	19,900 <sup>a</sup>	23,300 <sup>a</sup>	21,400 <sup>b</sup>
Statewide Total	108,100	126,600	90,600	79,600	93,100	66,800

<sup>a</sup> Assumes that 25% of statewide population occurs in Zones C and D.

<sup>b</sup> Assumes that 32% of statewide population occurs in Zones C and D.