recorded as immature. Because weekly censuses tally only eagles seen within the refuge and its perimeter, more distant eagles were not tallied, and we were able to assign an age to every individual.

A Habitat Rehabilitation and Enhancement Project underway at CNWR in 1997-98 and 1998-99, along with severe weather, reduced our censuses to 15 each of these winters. Weather and circumstances beyond our control also caused cancellations in other years (n=81, range 15-18 for each of the five years). Weekly censuses were comparable year over year in that census dates for each week were within three days of the mean date for the five years involved. No fewer than five eagles were recorded on a refuge census, nor fewer than seven on a CBC.

For statistical testing, adult and immature eagles counted on CBCs were grouped in decades 1973-82, 1983-92, and 1993-2002. We then applied the Kruskal-Wallis Test (K-WT) (Conover 1980) to address two questions: Did the total CBC sample population increase significantly over the three decades? Did the immature portion of the same sample increase significantly over the same period? The K-WT statistic was considered significant if it exceeded the .05 tail value of the chi-square statistic with two degrees of freedom.

Results

Bald Eagle counts for 30 CBCs are displayed in Table 1. The total population increased significantly ($T=14.88$, d.f.=2, $p<0.005$). The number of immature eagles also increased significantly ($T=15.64$, d.f.=2, $p<0.005$). Further, in the third decade the population structure was skewed toward immature (Table 1 and Figure 1).

The possibility that increased effort might account for the results was examined. Appendix A shows that mean party hours declined in the third decade, while the number of eagles seen per party hour continued to increase and is now four times the first decade.

The mean number of adult and immature eagles recorded at CNWR on comparable dates during the five winters 1997-98 through 2001-02 is displayed in Figure 1. In four of the five winters, immature eagles greatly outnumbered adult eagles. For the five winters, immature eagles comprised 46.3- 67.8% (mean 57.8%) of the population.

Discussion

The ratio of immature to adult eagles aged by us at CNWR (Figure 1) was far greater than for 43 annual counts (1961-2003) reported by Ingram (2003), which averaged 28.8% immature and 3.2% age-unknown for the Midwest (Saint Croix and Mississippi rivers north of Minneapolis, Minnesota, to Tennessee). For the five years we reported in Figure 1, Ingram (2002) reported 31-38% immature for the Midwest. However, in January 2001, a watercraft survey organized by Bert Princen and Mark Werner of Peoria Audubon augmented the traditional shore survey conducted by Ingram, and found 54% immature eagles, close to our measure of 57% for 2000-01. Herkert (2000) reported that the January 2000 Bald Eagle Survey on a route south of Havana along the Illinois River tallied 41.9% immature (3% unaged). The portion of the Mississippi River included in the same Herkert survey listed only 25.5% as immature, but 22.7% were listed as unaged. In 2001-02, Joe Kath of the Illinois Department of Natural Resources (IDNR) compiled the IDNR Winter Bald Eagle Survey, which tallied 44.3% as immature (1.6% unaged) on the Mississippi portion of the count. Along the Illinois River, 38.7% were immature (14.2% unaged), but in 2002, when 2.1% were unaged along the Illinois River, 41.1% were aged immature. Of the 195 eagles reported from sites other than the two big rivers during 2001 and 2002, no eagle was unaged, and 41.0% were reported immature (J. Kath pers. comm.).

Ingram (2002) questioned the extent of the Bald Eagle recovery as reflected by the reduced number of immature eagles tallied during the January 2002 and 2003 counts. Before questioning the recovery, we suggest that factors which might influence count outcomes be examined. The fact that no eagles were unaged on sites away from the big rivers (Kath pers. comm.) and our experience at CNWR suggest that proximity to eagles tallied might be a factor. In any case, reliable age criteria are provided in Cohen (1993) and Wheeler and Clark (1995), which should be studied by eagle counters. Weather is another factor to consider. In addition to visibility, mild conditions with open water on floodplain lakes as well as rivers