Table 2. A nesting comparison for Canada geese of different sources based on the observation of neck collars.

	No. collared	No. collared geese nesting		Percent collared geese nesting	
		1971	1972	1971	1972
Hatched locally (Flyers)a	63	21	16	33.3	25.3
Wild-trapped (Flyers)b	74	29	25	39.2	33.8
Hand-reared (Flightless)c	75	35	23	46.7	30.7

aHatched on Rockefeller Refuge prior to 1969
bCaptured in Saskatchewan 1968, transported to Louisiana when 2 weeks old and permitted to fly when able.
cGiant Canadas purchased in Minnesota and transported to Louisiana when 6 months old.

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REFINEMENT OF A METHOD FOR CALCULATING WOOD DUCK SURVIVAL

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ABSTRACT

Web-tagging and banding returns from Wood Ducks *(Aix sponsa)* returning to their natal area after their first migration indicated that four times as many females returned as males. The proportion of returning ducks that had been banded as well as web-tagged was, however, the same for males and females.

Most researchers who investigate pre-flight survival of Wood Ducks, utilize the technique of marking nestlings and recovering them after they reach flight stage. The procedures outlined by Grice and Rogers (1965) are most often followed. In this method, a portion of the ducks that had been web-tagged as nestlings are trapped as they reach flight stage, banded and released. This produces, in the wild population, two types of marked birds: those which are web-tagged only (single marked); and those which are web-tagged and banded (double marked).

Grice and Rogers theorized that the ratio between the double marked and the single marked segments of the population, at the conclusion of the natal year, would be the same the following year when the ducks returned from migration. Therefore, by recovering marked ducks after the natal year and calculating this ratio, survival at the pre-flight stage can be determined.

Researchers utilizing this technique have found that it is often difficult to recover substantial numbers of marked ducks during the post-natal years. It is especially difficult to recover the marked males. Grice and Rogers theorized that the reason so few marked males are encountered after the natal year is that Wood Ducks mate while on the wintering grounds and males accompany females to other natal areas. This tends to disperse males from their own natal area, causing fewer of them to be available for trapping.

Grice and Rogers omitted males from the formula when calculating survival because so few were encountered in post-natal years. Since the accuracy of statistical estimates improves as the size of a sample increases, it would be helpful if all recoveries could be used.

It can be expected that some males will mate with females from their own natal area, and will return with them. If enough males had been marked during the natal year, it could be assumed that of those returning, the ratio of double marked to single marked would be the same as it was in the natal year. If the sex ratio of marked birds during the natal year was even, then the ratio of double marked to single marked drakes returning in subsequent years would equal that of females, even though the number encountered may be considerably less.

A survival study was conducted at the Big Lake National Wildlife Refuge, located near Manila, Arkansas, during 1970 and 1972, utilizing the procedures outlined above. During this study enough recoveries of both males and females were made in subsequent years to test the assumption concerning the ratios of double marked and single marked males and females.

During the summer of 1970, 1,290 day-old Wood Ducks were web-tagged on the Big Lake area. Ninety-four of these were trapped at flight stage later in the year and banded; forty-eight, or about half, were females. The following year, 35 were captured which had been web-tagged the year before. Of these, 28 were females and four had been doubled marked; only seven were males and only one was double marked. Even though the females were four times as numerous as males, the ratio between double marked and single marked was the same, 1:6.

Though based on relatively few returns, the findings indicate that post natal-year recoveries of male Wood Ducks need not be excluded from calculations of pre-flight survival. This fact may be useful to investigators studying Wood Duck survival in areas of the South where Wood Ducks may not migrate so extensively as those produced in the North, and where chances of encountering males on their natal area in subsequent years may be greater.

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