
An American Goldfinch Population Study on a July Day (1999)

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ABSTRACT

A one-day banding demonstration on 5 Jul 1999 yielded a larger-than-usual sample of American Goldfinches (*Carduelis tristis*), compared to previous years, and provided qualitative data on the age/sex composition of a summer American Goldfinch population in the Virginia Piedmont.

INTRODUCTION

Spout Springs, Appomattox County, VA, has been the location, four of the past five years, for a presentation and banding demonstration to a Longwood College field Biology course. Appomattox County lies 28.1 highway miles (45.2 km) east of Campbell County, Virginia. Both counties were sites of earlier studies (Hansrote and Hansrote 1993, 1995; Hansrote 1996). The two banding sites are in the Piedmont physiographic region of Virginia. Local temperatures on 5 Jul were mid 80° to mid 90°F (27C to 32C) which caused the habitat to be very dry.

METHODS

Mist nets were set up during the afternoon of 4 Jul 1999 in preparation for the next day's bird banding demonstration. Two 2.1 X 5.5 m (7 X 18 ft) mist nets with 50 denier/2-ply, 4 shelves with 3.2 cm [1-1/4"] mesh were placed approximately 0.6 m (2 ft) from the feeders. A series of five multiport tubular bird feeders were suspended from a 50.8 cm (20 in) wide roof which was attached to a series of 2.1 m (7 ft) poles. The feeders were located in a line approximately 7.6 m (25 ft) in length in a cleared area under a stand of 6.1 m (20 ft) to 9.1 m (30 ft) tall Virginia Pine Trees. The poles were placed parallel to a concrete driveway.

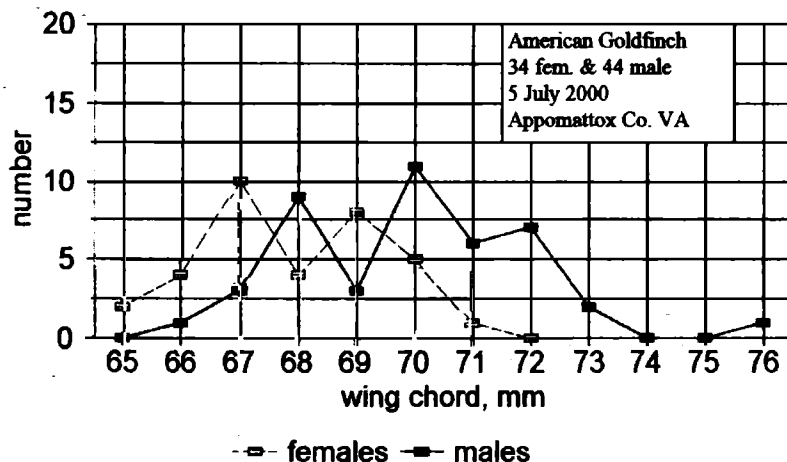
During Mar/Apr the property owner relocated feeders into the above location in preparation for the summer demonstration. The tubular feeders were filled with black oil sunflower and Niger seed. One feeder contained, in separate compartments, sunflower, Niger and a wild bird seed mixture. Wild bird mix and sunflower seed were scattered on the ground below the feeders. The net location abutted a residential yard which contained planted flowers and vegetables. A bird bath was situated in the middle of the front yard approximately 12.2 m (40 ft) from the net location. The porch of the house, where net watchers sat, was about 24.4 m (80 ft) from the net location. The nets were furled and secured with tape for the night.

On 5 Jul, between 0600 and 0700, the banding station was set up in the shade next to the house. The two nets were opened at 0700. Seven captured birds were held in containers awaiting the arrival of the class. About 0800, the van arrived containing 14 students and instructor.

The banding presentation and demonstration followed the procedures and techniques outlined by Hansrote (1996). Net spotters equipped with binoculars sat where they could watch the nets. As soon as birds were captured in the nets, the presentation stopped and the netted birds immediately removed. Because of the heat, birds were aged and sexed quickly according to Bird Banding Laboratory guidelines (CWS & USFWS 1977). Pertinate data were recorded and the birds immediately released. Wing chord values for each sex were graphed (Graph 1) versus the number of birds with that wing chord length to yield a frequency plot. This graphing technique was used because older goldfinches were aged only as AHY in the station records.

Graph 1

Frequency Plots of Bird Wg-chords



Traditionally, black oil sunflower, thistle seed (Niger), and mixed wild bird seed are used to lure birds into feeders near the nets. A generalization can be made that whenever nets are placed close to the feeders the feeding activity of birds is somewhat related to the number of birds captured. That is, the more birds at the feeders, the more opportunities for birds to become entangled in the nets. This generalization was examined after the banding session ended. An arbitrary time interval of one-hour was chosen. Using station data, the number of birds banded during each one-hour interval was obtained from station records. The numbers of males and separately the females captured by hourly intervals were graphed (Graph 2) versus a 24-hour clock.

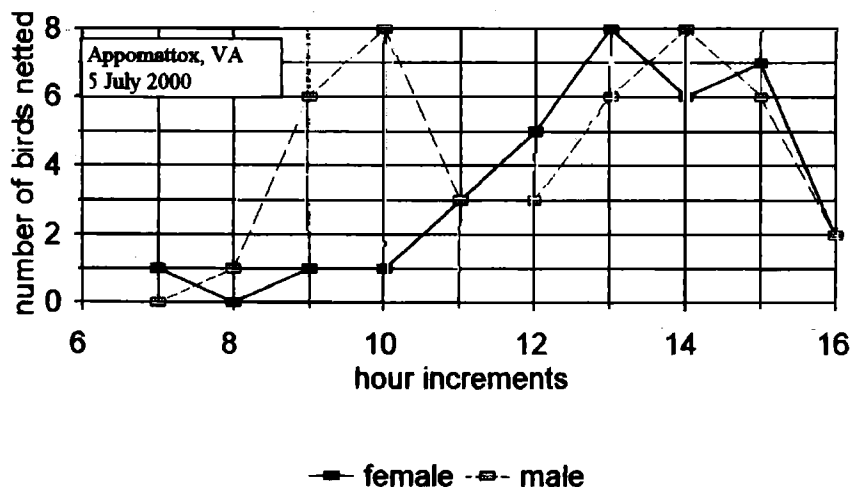
RESULTS

During the presentation and demonstration period from 0800 until 1140, 30 birds, including a Tufted Titmouse (*Baeolophus bicolor*), three Chipping Sparrows (*Spizella passerina*), and two House Finches (*Carpodacus mexicanus*) were banded. The remainder were 24 American Goldfinches. Occasionally, a bird would fly from the feeder into a mist net only to 'bounce off' and escape.

The class left about 1140. Large numbers of goldfinches continued to come to the feeders. The property owners, after consultation, permitted the banding to continue. Both of the property owners aided the author in watching and tending nets.

Graph 2

Frequency of Capture of Am. Goldfinch



One additional bird species, a Carolina Chickadee (*Poecile carolinensis*), was netted about 1300. During the remainder of the day, American Goldfinches flew into the pine trees then down to the feeders. Each time this happened some goldfinches were caught in the nets and removed. New birds were caught and removed in 12-15 minute intervals. This feeding activity and banding sequence continued until about 1620 before slowing down. The station was closed about 1640.

Throughout the day, at any one point in time, net watchers reported between 10 and 20 goldfinches at the feeders with more birds observed above the feeders in the pines trees. Griggs (1997) noted that goldfinches forage together in a flock even during nesting time. The feeding groups of goldfinches were scanned for banded birds. On occasion one or rarely two birds with bands were observed among each group of active feeders. Only two American Goldfinches banded on 5 Jul were recaptured on the same day. These two observations suggest that the 79 banded goldfinches were a portion of a larger unknown-size flock. Thirty-four female (43%), 44 male (56%) and one sex undetermined American Goldfinch were captured. The goldfinch yield was 91% of the total 87 birds netted. The average hourly yield was nine birds.

Both male and female frequency plots of wing-chord versus number of birds are shown on Graph 1. The frequency plots revealed two peaks in the population curve for the female and three peaks for male banded goldfinches. On the female plot, the peak with the lowest wing-chord value (67 mm) represent after-hatching-year (AHY) birds, while the peak on the male plot with the lowest wing-chord value (68 mm) represent (AHY) males. The longer wing-chord peaks on each population plot represent older birds possibly second year (SY) and after-second-year (ASY) birds. No hatching-year (HY) birds were detected.

Graph 2, the number of goldfinch captured within each one-hour interval, reveal the tendency for preferred times at the feeder. Male goldfinches' feeding activity increased steadily from 0800 until 1000 and tapered off between 1000 and 1100, holding for one hour before the male numbers increased until 1400. Once again the numbers fell

rapidly until 1640 when the banding activity halted for the day.

The female activity plot in Graph 2 showed the number banded was low until 1000 hours, then rose to a peak at 1300, gradually decreasing in numbers until 1640. This observed difference in feeder activity suggests morning hours at the feeders were dominated by male goldfinches, while the afternoon hours revealed both sexes at the feeders.

DISCUSSION

The number of American Goldfinches banded in one-day presentations at the Appomattox site (compared only for the time period when the class was on site) were: 1999 (24), 1998 (7), 1997 (no demonstration), 1996 (3), and 1995 (0). Thus, the 79 American Goldfinches banded on 5 Jul 1999 presented an opportunity to study a summer population. The one-day peak count of American Goldfinch recorded for the Virginia Piedmont was 105 in Lynchburg on 25 Jun 1984 (Kain 1989). In eastern U.S., American Goldfinches generally nest late. In the Virginia Piedmont, breeding occurs from 27 Jul to 27 Aug (Kain 1989). The goldfinches that were banded must have been part of a mixed flock of goldfinches in the process of pairing-up and getting ready to disperse to nest and breed (Stokes 1979).

Seventy-nine banded goldfinches is an adequate sample size for a wing-chord study (Pyle 1997). The weather held constant over the course of the banding so all birds banded would be affected the same. The wing chord data in this study had not been obtained using the traditional technique of pooling wing chord data from different geographic locations and different times of the year. This study, taken on the same day, removed many of the factors that influence wing chord measurements; therefore, any differences detected in wing chord values are valid. The 1999 Appomattox age/sex and wing chord data obtained on 5 Jul were unique.

As is expected, the age groups within each goldfinch sex appear at different peaks on the frequency plots versus wing length in Graph 1. Parks and Parks (1968) and Prescott (1983) report AHY male goldfinches have longer wing chords than female AHY birds. Therefore, the initial peak

(wing chord value) on the frequency plots are AHY birds, while older birds (SY, ASY and older) exhibit longer wing length and the peaks are located at higher wing-chord values.

The frequency plots in Graph 1 reveal slightly more AHY than older female goldfinches in the Appomattox population. In addition, there were more older (SY and ASY) males than AHY aged male goldfinches in the same population. The frequency plot distribution of male and female birds should represent a pre-breeding flock of American Goldfinches.

The 1999 Appomattox County and the earlier 1992 Campbell County American Goldfinch study (Hansrote and Hansrote 1995) were held in the same physiographic location, the Virginia Piedmont. The observation regarding the location of age group peaks, i.e. AHY birds of either sex have the lowest peak (wing length) on the plot of wing chord measurements, remained consistent in both the spring and summer populations of American Goldfinches. However, the Appomattox frequency

plots revealed differences in the wing-chord location of the age-group peaks when compared with those peaks recorded for the late winter and spring months. These differences could be accounted for by normal feather wear, sample size, the excessive heat and dry conditions recorded on 5 Jul (a shaded porch thermometer registered 98-99°F [36-37C] during the afternoon) or even by the inexperience of students who assisted in taking about 30% of the morning wing-chord measurements.

Based upon results reported in a 1995 paper describing a 1992 incursion, the question was raised, does the accepted pooling technique used to determine an average wing chord value for a bird species affect the result differently when the value is obtained from a unique sample taken on the same day at the same geographic location. The Table contains data from the average wing chord values of two populations of American Goldfinches banded in the same physiological region. Examination of the average wing chord values for the two population reveals the unique sample taken on 5 July 1999

Table 1. Comparison of wing-chord data for two American Goldfinch Populations.

SUMMARY		
Study	1*	2
Dates Banded	29 Feb-14 May 1992	5 July 1999
Sample Size	791	79
Location	Campbell Co. VA	Appomattox Co. VA
FEMALE		
Age group peaks** mm	68 AHY, 70	67 AHY, 69
Wing chord range mm	62-74	65-71
Average wing chord	68.80(±)1.65	67.91(±)1.57
MALE		
Age group peaks*, mm	70 AHY, 71, 72,75	68 AHY, 70,72
Wing chord range mm	67-78	66-76
Average wing chord	71.44 (±) 1.50	69.95 (±) 2.51
POPULATION		
Average wing chord	70.43 (±) 2.07	69.05 (±) 2.09
Wing chord range	62-76	65-76
* Data from <i>N. Am. Bird Bander</i> . 20:5-9.		
** Age group peaks with wing-chord values longer than AHY are older birds--either SY, ASY, or older.		

yielded a lower wing chord value for female, male and total population of American Goldfinches than a sample pooled over three months' time. While this result confirmed our suspicions, it is not known if the lower wing chord values obtained from a unique sample will be found to be universal for all bird species.

During the late winter and spring months of 1992, monthly changes in the location of age group peaks in wing chord frequency plots allowed us to qualitatively follow age group changes in the local goldfinch population. In the 1992 study, the older female age group appeared to become smaller in May which suggested the older females may have left the banding area. This age group change of one sex inferred differential migration of American Goldfinch may have taken place. Examination of the age group peaks of the 1999 Appomattox goldfinch population wing chord frequency plot suggests that early in the summer month of Jul 1999, the population of the feeding flock of goldfinches contained a mixture of AHY and older age groups of both sexes. Wing chord values for age and sex groups within a goldfinch population overlap making it restrictive to calculate percentage values from the frequency plot. However, qualitative comparison of the areas under the age group peaks reveal slightly more AHY than older goldfinch females were present in the 5 Jul flock when compared to the May 1992 results. At the same time, an estimate of the number of AHY versus older goldfinch males reveals there were a greater number of the older male goldfinches present in the 5 Jul flock. The 1999 Jul wing chord results for a pre-breeding flock of American Goldfinches lends more credibility to the previously reported detection of differential migration by age/wing chord group.

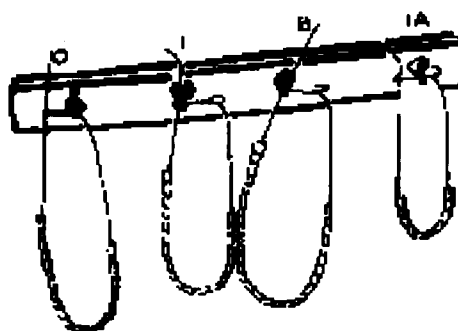
Examination of the capture data shown in Graph 2 raises a question about the social behavior of goldfinches at the feeder. We are aware that in addition to nets being placed close to the feeders other influences could skew the capture data. To wit, the approach of the bander toward the nets to remove netted birds as well as goldfinch behavior reported by Stokes (1997) who observed American Goldfinches show aggressiveness in order to dominate at a feeder. The influences that might cause a feeding bird to leave the feeder and become

entangled in the net were not part of the study. Therefore, a more detailed study would have to be undertaken in order to validate this one-day observation. One days' banding data are not definitive; however, this single experiment suggests there may be a preferred order of feeding activity in the summer between male and female goldfinch.

To answer the obvious question of why the goldfinches actively fed all day when it was so hot, we suggest they fed because of increased energy demands made on them by the dry, hot weather conditions when coupled with the usual July tasks of nest building and breeding.

ACKNOWLEDGMENTS

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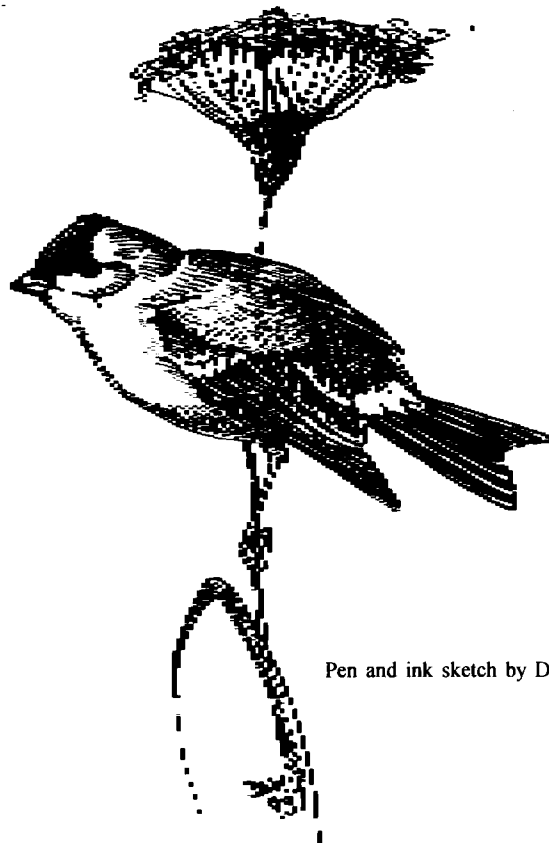
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Pen and ink sketch by Dave W Hughes