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A Local Incursion of American Goldfinches into the Virginia Piedmont

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OBJECTIVE

In early February 1992, American Goldfinches (*Carduelis tristis*) were reported to be in large numbers by local backyard bird feeder watchers. These reports suggested that Campbell County, Virginia, might be in the midst of a larger-than-normal incursion of American Goldfinches. Banding was started on 28 February 1992 to document this event.

BACKGROUND

The American Goldfinch is classified as a common permanent resident and often an abundant migrant in the Virginia Piedmont (Kain 1987). Bent (1968) reported that goldfinches are frequently found in large flocks during the non-breeding season and flocks numbering in the thousands have been reported during spring migration to their nesting grounds in eastern North America. Bevier (1983) suggested that American Goldfinches winter throughout most of their breeding range in the east and west, but they leave the interior of the range. Based upon Bent's (1968) and Bevier's (1983) observations, it is possible Campbell County experienced a normal, but large, incursion of American Goldfinches.

STATION LOCATION AND OPERATION

The banding station is located on the western edge of the Virginia Piedmont in Campbell County, one-quarter mile from the intersection of Route 460 and State Route 622.

Mist net placement and arrangement was set up to facilitate capture of American Goldfinches using experience gained during a 1987 Pine Siskin (*Carduelis pinus*) invasion. Two 12-meter (39.3

feet) long mist nets (4 trammels with 3.2 cm [1-1/4" mesh]) was arranged in the shape of a "V" directly under a 15.3 meter (50 ft.) tall Red Maple (*Acer rubrum*). Two 0.46 meter (1.5 ft.) long tubular plastic thistle (*Niger*) bird feeders, covered with wire mesh, were suspended from the lowest tree branch approximately 2.0 meter (6.5 ft.) from the ground. The feeders hung into the center of the "V" below the top trammel.

The majority of the birds captured landed in nearby trees then descended downward toward the feeders. A third net was used occasionally in order to improve the capture rate. A single net was opened on occasion to modify any effect of net placement on the capture rate of the goldfinches. The nests were opened and closed randomly, but were never left open at night. Nets were checked every fifteen to thirty minutes. The station was opened on 42 of 66 days, net hours = 561.4, from 29 February 1992 to 16 May 1992.

RESULTS

Nine hundred and five birds were banded at the Campbell County station from 29 February through 14 May 1992. The station yield was 1.6 birds per net hour. Eighty-eight percent (791) were American Goldfinches.

DISCUSSION

A. Evidence for an Incursion

All banding information showed large numbers of American Goldfinches were present in Campbell County during the period from 29 February to 15 May 1993. Graph 1, a bar graph of the number of

American Goldfinches banded annually, revealed the highest number of American Goldfinches captured was in 1992. It is not possible to compare the numbers of American Goldfinches captured versus earlier yields because the mist nets had been placed to facilitate the capture of American Goldfinches. The effect of net placement on the capture rate was not studied; consequently, it is not known what effect the placements had on the number of birds captured. Examination of indices of number of birds/net day and number of birds/net hour showed 1992 was the best year for capture of American Goldfinches in Campbell County. Graph 2, a bar graph of yearly station capture data for March, April, and May, also revealed the highest number of birds were captured in 1992.

B. Evidence from Other Local Sources

The 250 American Goldfinches reported on the 14 December 1991 Lynchburg Christmas Bird Count and the 110 individuals seen on the 6 June 1992 Lynchburg Bird Club Breeding Bird Count suggest that large numbers were present in the immediate area from December 1991 to June 1992. We were unable to locate literature references to American Goldfinch numbers for the spring season at this geographic location. Kain (1987) reported the one-day spring peak count in the Virginia Piedmont was 215 at Green Springs, Louisa County, on 17 April 1977; while the one-day peak count for summer was 105 in the City of Lynchburg on 25 June 1984. The largest number of American Goldfinches banded by us in one day during the study period was 70 on 4 April 1992 from 9:45 a.m. until 4:36 p.m.

C. Effect of Weather

Weather, through variations of daily temperature, degree of sunshine, amount of precipitation, and strength of winds, can affect the rate and timing of migration of birds. The 1992 spring season in the Virginia Piedmont appeared to be cooler and generally damper than recent spring seasons. There were occasional short periods when it was warm and sunny. Selected weather data listed in Table 1, as reported by the National Weather Station located about five miles from the banding station, offered no clear explanation for the incursion.

Table 1.	Campbell County. 29 February to 14 May 1992 Weather.			
PART A	CLOUD COVER DAYS			
MONTH	CLEAR	P. CLOUDY	CLOUDY	NO SUN
FEB	1	0	0	0
MAR	13	5	13	5
APR	5	11	14	2
MAY	10	8	13	7
PART B	PRECIPITATION DAYS			
MONTH	> .01 INCH	< .01 INCH	FOG	
FEB	10	1	4	
MAR	9	0	2	
APR	11	1	1	
MAY	6	0	2	
PART C	TEMPERATURE DAYS			
MONTH	PLUS	MINUS TEMPERATURE		
FEB	1	0		
MAR	15	16		
APR	16	14		
MAY	6	8		
SOURCE: Local Climatological Data - Monthly Summary for Feb., Mar., Apr., May 1992. NOAA Airport Tower Building, Lynchburg, VA.				

D. Another Trend

The large number of American Goldfinches that were banded presented a unique opportunity. Frequently, researchers are forced to use pooled samples in order to get significant data. Pooled samples contain birds that were captured in different years and/or different locations. Our large unpooled sample was re-examined for additional information about American Goldfinches. Capture data, Table 2, for the months of March, April, and

May showed more male (62%) than female (38%) American Goldfinches were captured during this time period. Was the observed higher male-to-female capture ratio an isolated instance for this banding station?



Table 2. American Goldfinch. Male/Female Ratios.			
	Male	Female	% Male
FEB	6	1	86
MAR	182	86	68
APR	209	120	64
MAY	<u>93</u>	<u>94</u>	<u>50</u>
TOTAL	490	301	62

E. Station Results (1986-1992)

Examination of the data in Table 3 revealed more male than female American Goldfinches were captured each year in which this banding station was operated. The percentage of males captured remained relatively high, above 60% every year except 1990, when it fell to 53%. These results showed the higher capture ratio of male to female American Goldfinches was not a single year anomaly. Furthermore, the data revealed that a skewed male/female ratio appeared to be a normal occurrence for this portion of the Virginia Piedmont. Explanations were sought for this observed higher male-to-female capture rate.

Table 3. American Goldfinch. Station Male/Female Ratio.								
Year	No. Total	No. Male	No. Female	No. Unknow	No. Month	% Male	% Female	% Unknow
1986	21	15	2	4	9a	71	10	19
1987	103	72	27	4	11	70	26	4
1988	53	35	17	1	12	66	32	2
1989	77	59	11	7	11	77	14	9
1990	267	147	119	8	10	53	45	3
1991	93	68	22	3	10	73	24	3
1992	791	494	301	0	4b	62	38	0

a. The station was initially opened in April 1986.

b. Only 4 months of banding are included for 1992.

EXPLANATIONS

Slack (1992), in a study banding migrating owls, listed a number of influences that affect (skew) the mist net capture ratio of male to female birds. These influences included behavioral differences between the sexes, use of invalid sexing criteria for owls, and different migration routes for the sexes. Ketterson and Nolan (1976), in a study of Dark-eyed Juncos (*Junco hyemalis*) dealing with differential winter distribution of the sexes listed additional influences that could contribute to a skewed male/female capture ratio. We examined our banding experience and data for evidence of any of these influences on the observed capture rate.

1. Behavioral Influences

Stokes (1979) reported fall and winter feeding behavior of American Goldfinch flocks by noting occasionally aggressive postures are exchanged between birds that feed close together. He suggested such postures may help establish the dominance of some birds over others without actual fighting taking place. Coutlee, in a 1967 behavioral study using wild and caged wild birds, also reported aggressive interactions among American Goldfinches. He noted a bird was considered to win an encounter when its activity evoked either a submissive display or flight by its opponent. Random aggressive interactions between individual birds at the feeders were observed by both authors throughout the March-to-May study period. Occasionally, such an aggressive interaction caused one or more birds to suddenly fly from the feeders and become trapped in the mist nets.

Our observation of American Goldfinch behavior at feeders support Coutlee's (1967) claim of aggressiveness of American Goldfinches during the migration period. We believe aggressive interactions between American Goldfinches at feeders contributed, in part, to the higher male/female ratio of captured birds. We do not know to what degree the capture ratio was skewed by the aggressive tendencies of the American Goldfinches.

2. Influence of Molt

Any difficulty in sexing American Goldfinches during the March-to-May period would also contribute to a higher male-to-female capture ratio. Stokes (1979) noted that male goldfinches in the winter have a similar plumage to that of the female; but in summer, they are distinguished easily by the bright yellow body plumage and the black crown. This description fits the Bird Banding Laboratory's major criteria for sexing American Goldfinches (Anon., 1977). We observed the majority of individuals banded at the station undergo a change (molt) from winter to breeding plumage during the study period. The American Goldfinches were sexed and aged following Bird Banding Laboratory guidelines (Anon., 1977). A greater than 95% probability of successful determination of sex and age of American Goldfinches can be obtained when the Bird Banding Laboratory criteria are used.

However, the extent of observable molt on the skull of a goldfinch going from winter to spring plumage created a challenge for us. At one extreme there was a heavy molt (no feathers on the skull); while, at the other extreme, the molt had not yet appeared. We estimated these extremes to be 1% or less of the total number banded. Our problem in sexing molting American Goldfinches would not account for the difference in capture ratio of male versus female.

3. Differential Migration Influence

It has been demonstrated by others, e.g., Ketterson and Nolan (1976), that differential migration contributed to an observed skewed male/female capture ratio of birds. Examination of the effect of differential migration for the observed higher male-to-female capture ratio of American Goldfinches at the Campbell County, Virginia, station is currently under study. Mathematical analysis of the bimodal plots of wing lengths versus sex will be reported in a future paper.

SUMMARY

Mist net captures documented an incursion of large numbers of American Goldfinches into Campbell County during the period 29 February until 14 May 1992. More males than females were captured during the study period at the Campbell County station. Further examination revealed more males than females had been captured each year in which the station operated. The causes of this skewed capture rate are currently under investigation.

Some of the influences that have been shown to contribute to a skewed mist net capture ratio were examined. Aggressive behavior at feeders and problems in sex identification due to molting were examined as possible contributors. We did not study further the degree of involvement of these two influences on the capture ratio.

Variable spring weather, although not severe, may also have contributed to a larger-than-ordinary number of American Goldfinches present in the local Piedmont region of Virginia during the period March to May 1992.

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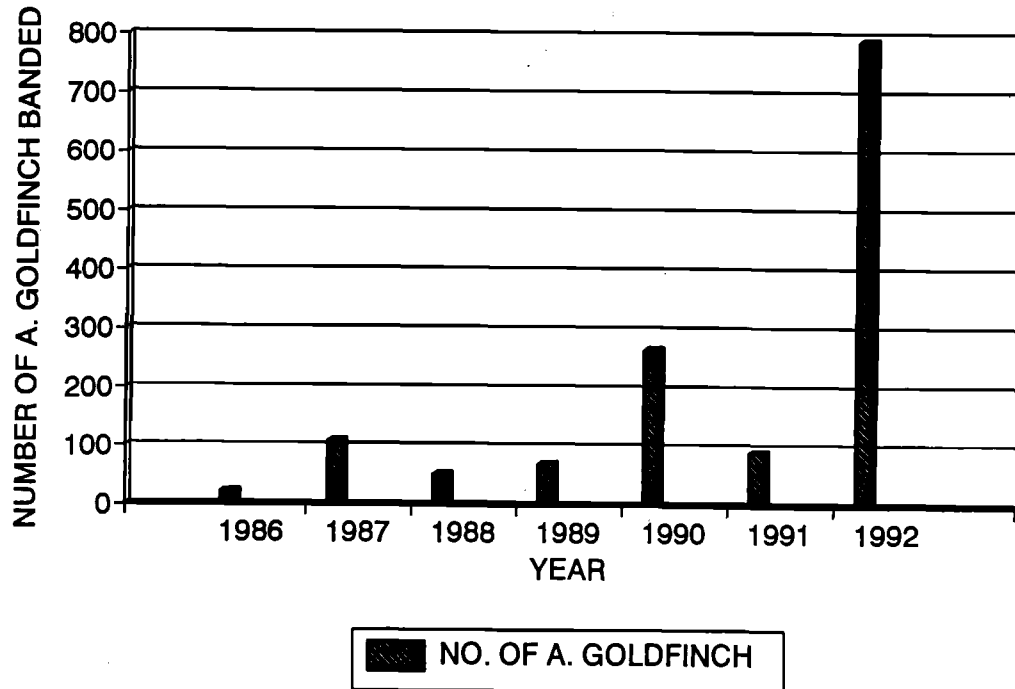
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GRAPH 1
ANNUAL NOS. OF A. GOLDFINCH



GRAPH 2
SPRING MONTHS = NUMBER/MONTH

