

JOB COMPLETION REPORT
SURVEYS AND INVESTIGATIONS PROJECTS

As Required By
FEDERAL AID IN WILDLIFE RESTORATION ACT

ILLINOIS

Federal Aid Project No. W-49-R(25)

Study I: Population Trends and Characteristics

Job No. 12b: Cooperative raccoon investigations

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JOB COMPLETION REPORT
SURVEYS AND INVESTIGATIONS PROJECTS

STATE OF ILLINOIS

PROJECT NO.: W-49-R-25

STUDY NO.: 1

JOB NO.: 12b

JOB TITLE: Cooperative raccoon investigations

ABSTRACT: Raccoons were examined and data collected at Perardi Bros. Fur and Wool, Inc., Farmington, Fulton County, Illinois, as they have been for the past 22 seasons. Six trips were made to the furhouse and 535 raccoons examined. All of the data collected fell within the range of data collected at the same furhouse beginning with the 1955-56 season. If the data collected are indices to major changes in the population, they do not indicate major changes in the raccoon population in west central Illinois. However, these data probably would not reflect a major change in the population until the year after the change occurred. Young-of-the-year raccoons comprised 71.6 percent of the raccoons examined in 1977-78, and females comprised 47.3 percent. The mean litter size for the 1977 breeding season was 3.4. Juvenile males averaged 10.6 pounds and juvenile females 9.8 pounds. Adult males weighed an average of 16.3, parous adult females 13.0, and nulliparous adult females 13.0 pounds. Weights vary as much as 1.5 pounds from one year to the next but have shown no trends during the past 23 seasons. There were no significant differences in the mean weights of the various age and sex groups of raccoons killed by hunters and those killed by trappers. Hunters harvested 80.8 percent and trappers 16.9 percent of the raccoons examined. Salvaged raccoons killed on roads comprised the remaining 2.2 percent.

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JOB COMPLETION REPORT
SURVEYS AND INVESTIGATIONS PROJECTS

STATE OF ILLINOIS

PROJECT NO.: W-49-R-25

STUDY NO.: 1

JOB NO.: 12b

JOB TITLE: Cooperative raccoon investigations

OBJECTIVE: To determine the sex and age composition of the annual raccoon harvest in central Illinois, to obtain information on productivity, to analyze the data collected, and to prepare reports.

PROCEDURES: Every other week during the raccoon hunting and trapping season a large furhouse (Perardi Bros. Fur and Wool, Inc., Farmington, Fulton County, Illinois) was visited and data were collected on 100 raccoons brought in by hunters and trappers. Most of the raccoons were caught within 100 miles of Farmington; however, the exact locations of capture were unknown. Animals were selected at random and data collected before and after the raccoons were skinned by employees of the furhouse. The data collected at the furhouse included body weight (nearest 0.1 lb), body length (nearest 5 mm), sex, how caught (hunter, trapper, or killed on road), condition of nipples for females, condition of penis for males, general health (animals with distemper were noted), and toes missing from previous encounters with traps. Specimens collected included one front leg (halfway between the wrist and elbow), penis bone from males, one testis and epididymis from each male, and the uterus and ovaries from each female. In the laboratory the epiphyses and bacula were examined--with other recorded information--to determine age, one testis was weighed, two ovaries were weighed, each epididymis was examined for the presence of sperm, and each uterus was examined and the number of placental scars counted. All information was recorded in standardized data sheets in a notebook.

Similar data have been collected at this same furhouse beginning with the 1955-56 season. The data for the entire period will be placed on floppy discs as time permits, programs written, all data analyzed, reports written, and manuscripts prepared. Each year the data will be summarized in a series of tables and presented with the data for the previous years (back to the 1955-56 season); however, analysis of the data will be delayed until all data have been placed on discs.

Although not part of this project, a graduate student at the University of Illinois, is comparing the age, sex, body weights, and body lengths of raccoons taken by hunters and trappers for the past 5 seasons (the period for which these data are available). When her report is completed, a copy will be forwarded to the Illinois Department of Conservation.

FINDINGS AND ANALYSIS:

1977-78 Hunting and Trapping Season

within the range of similar data collected from the 1955-56 season through the 1976-77 season. Thus, if these data are indices to population changes--such as overharvest--they do not indicate any major changes in the raccoon populations in west central Illinois. If, however, the overharvest occurred during the 1977-78 season, data such as these probably would not reflect the change until the 1978-79 season.

Age Composition

Young-of-the-year animals comprised 76.2 percent of the females examined (Table 1). Only during the 1958-59 season, when young-of-the-year animals made up 78.6 percent of the females, have I found a higher percentage of young animals in the females harvested. Parous adults comprised 19.4 percent of the females, the lowest percentage found for this group except for the 1958-59 season (18.2 percent). Nulliparous adults (4.4 percent) were near the middle of the range found for this group during the past 23 seasons.

Young-of-the-year males (67.4 percent) did not show a similarly high percentage among the males examined. They were near the center of the range of previous data collected, as were the adults (32.6 percent) examined during the 1977-78 season (Table 2). Of the 535 raccoons examined for age, 71.6 percent were young-of-the-year animals. This figure is only slightly higher than the average for the 23 seasons from 1955-56 through 1977-78 (68.6 percent young-of-the-year). There were 7.8 young-of-the-year per parous female among the raccoons examined during the 1977-78 season. The 23-year average was 5.3 young per parous female. These figures do not represent the number of young animals per parous female in the population because young animals are more vulnerable than adults to hunters and trappers.

Sex Ratios

Females comprised 47.3 percent (Table 3) of the raccoons examined at Perardi Bros. Fur and Wool, Inc., during the 1977-78 season. The 23-year average was 47.6 percent females in the harvest at this furhouse. Of the 383 young-of-the-year raccoons examined in 1977-78, 50.4 percent were females (Table 1). Females comprised 39.5 percent of the adult raccoons examined during the past season (Table 2).

Placental Scars

Some of my earlier work has shown that placental scars persist longer in the wild than they do in captivity. Thus, the significance of two groups of placental scars in wild females is not clear. They may represent two litters in one year (when the first litter is resorbed or lost at or near birth) or they may represent litters from the previous year. It seems reasonably clear that groups of single scars in a uterus and the groups of dark scars--when two groups of scars are present--represent the number of embryos implanted during the most recent breeding season (average litter size).

The mean litter size for the 1977 breeding season, as determined from single and dark groups of placental scars, was 3.4 (Table 4). The 23-year mean for average litter size determined in this manner was 3.5.

Body Weight

Raccoons I have examined in Illinois during the past 23 seasons may vary as much as about 1.5 lb from year to year depending on age and sex (Tables 5 and 6); however, the weights have shown no trends. Thus, it seems that the annual variations in body weights are largely caused by weather conditions, which may result in reduced feeding some years and which result in differential harvests early and late in the season from one year to the next. Thus, unusually mild weather during January will result in a proportionately large number of raccoons caught during this month when the average weights are lower than they are in November and December. Also, unusually cold weather in December will result in less daily feeding by raccoons and an increased loss of weight.

Young-of-the-year males weighed an average of 10.6 pounds (Table 5) compared with 9.8 pounds for young-of-the-year females (Table 6). Adult males averaged 16.3 pounds (Table 5), parous adult females 13.0 pounds, and nulliparous adult females 13.0 pounds (Table 6.). The 23-season averages were: young-of-the-year males, 11.4 lb; adult males, 16.3 lb; young-of-the-year females, 10.6 lb; parous adult females, 14.0 lb; and nulliparous adult females, 12.9 lb.

The average weight for all raccoons is of little or no significance because it varies according to the number in each age and sex group in the total sample.

Juvenile males killed by hunters weighed an average of 10.5 lb compared with 9.7 lb for juvenile males killed by trappers. Adult males taken by hunters averaged 16.3 lb and those taken by trappers 14.5 lb. Juvenile females from hunters weighed 9.7 lb compared with 10.6 lb for juvenile females from trappers. Parous adult females killed by hunters weighed an average of 13.0 lb each and those killed by trappers 14.0 lb each. I have no explanation for these differences between males and females; however, a preliminary analysis of the data for the past 5 seasons indicates no significant differences between raccoons taken by hunters and those taken by trappers.

Harvest by Hunters and Trappers

Hunters took 80.8 and trappers 16.9 percent of the raccoons examined. Raccoons killed by cars comprised the remaining 2.2 percent. During the 1976-77 season, hunters accounted for 82.9 and trappers for 15.5 percent of the raccoons and cars for 1.6 percent. There were few differences in the various age and sex groups. Cars accounted for 2.1 percent of the juvenile females, 2.0 percent of the parous adult females, and 3.6 percent of the juvenile females. No adult males or nulliparous adult females were killed by cars and brought to the furhouse. Also, 9 of 12 (75.0 percent) raccoons killed by cars and brought to the furhouse were killed on or before 5 December.

RECOMMENDATIONS:

The study should continue for 2 more years to allow for completion of the analysis of the data collected during the past 23 seasons.

DATA AND REPORTS:

Original data and related reports in this investigation are on file in the Section of Wildlife Research, Illinois Natural History Survey, Natural Resources Building, Urbana, Illinois 61801.

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Table i. Age composition of female raccoons examined at Perardi Bros. Fur and Wool Co., Inc., Farmington, Fulton County, Illinois.

| Season | Young-of-the-year (percent) | Parous Adults (percent) | Nulliparous Adults (%) | Young-of-the-year (percent females) |
|---------|-----------------------------|-------------------------|------------------------|-------------------------------------|
| 1955-56 | 68.52 (37) ^a | 31.48 (17) | (0) | 44.58 (83) |
| 1956-57 | 65.71 (92) | 29.28 (41) | 5.00 (7) | 40.53 (227) |
| 1957-58 | 72.41 (63) | 24.14 (21) | 3.45 (3) | 48.46 (120) |
| 1958-59 | 78.57 (99) | 18.25 (23) | 3.17 (4) | 47.37 (209) |
| 1959-60 | 67.77 (143) | 28.44 (60) | 3.79 (8) | 47.99 (298) |
| 1960-61 | 70.36 (178) | 28.46 (72) | 1.18 (3) | 51.30 (307) |
| 1961-62 | 65.96 (248) | 30.32 (114) | 3.72 (14) | 50.10 (305) |
| 1962-63 | 66.36 (286) | 28.77 (124) | 4.87 (21) | 45.54 (328) |
| 1963-64 | 68.48 (81) | 30.51 (36) | 0.85 (1) | 51.92 (156) |
| 1964-65 | 67.95 (157) | 24.68 (57) | 7.36 (17) | 47.00 (334) |
| 1965-66 | 64.29 (178) | 32.14 (86) | 3.57 (10) | 50.00 (356) |
| 1966-67 | 74.83 (107) | 19.58 (28) | 5.59 (8) | 50.71 (211) |
| 1967-68 | 68.65 (127) | 25.94 (48) | 5.41 (10) | 45.85 (377) |
| 1968-69 | 64.54 (162) | 31.88 (80) | 3.58 (9) | 47.37 (342) |
| 1969-70 | 65.45 (161) | 27.64 (68) | 6.91 (17) | 43.40 (371) |
| 1970-71 | 71.37 (177) | 21.77 (54) | 6.85 (17) | 50.42 (351) |
| 1971-72 | 67.03 (122) | 24.72 (45) | 8.24 (15) | 46.56 (262) |
| 1972-73 | 62.20 (181) | 30.93 (96) | 6.87 (20) | 48.92 (370) |
| 1973-74 | 60.09 (137) | 32.89 (75) | 7.02 (16) | 39.03 (351) |
| 1974-75 | 60.84 (174) | 33.22 (95) | 5.94 (17) | 47.15 (369) |
| 1975-76 | 70.85 (141) | 22.61 (45) | 6.53 (13) | 46.00 (306) |
| 1976-77 | 71.19 (169) | 24.15 (57) | 4.66 (11) | 47.60 (356) |
| 1977-78 | 76.24 (193) | 19.37 (49) | 4.35 (11) | 50.39 (383) |

^a Numbers in parentheses indicate sample sizes.

Table 2. Age composition of raccoons examined at Perardi Bros. Fur and Wool Co., Inc., Farmington, Fulton County, Illinois.

| Season | Males | | All Raccoons Young-of-the- year (%) | Percentage of adults that are females |
|---------|---------------------------|---------------|---|---|
| | Young-of-the- year (%) | Adults (%) | | |
| 1955-56 | 73.02 (46) ^a | 26.98 (17) | 70.94 (117) | 50.00 (34) |
| 1956-57 | 68.88 (125) | 31.12 (61) | 67.56 (336) | 44.04 (109) |
| 1957-58 | 72.83 (67) | 27.17 (25) | 72.62 (179) | 48.98 (49) |
| 1958-59 | 69.18 (110) | 30.82 (49) | 73.33 (285) | 35.53 (76) |
| 1959-60 | 72.09 (155) | 27.91 (60) | 69.95 (426) | 53.12 (126) |
| 1960-61 | 61.45 (169) | 38.54 (106) | 65.72 (528) | 44.50 (191) |
| 1961-62 | 61.60 (247) | 38.40 (154) | 63.71 (777) | 45.39 (282) |
| 1962-63 | 74.19 (342) | 25.81 (119) | 70.40 (892) | 54.92 (264) |
| 1963-64 | 59.52 (75) | 40.48 (51) | 63.93 (156) | 42.04 (80) |
| 1964-65 | 73.75 (177) | 26.25 (63) | 70.91 (471) | 54.01 (137) |
| 1965-66 | 62.46 (178) | 37.54 (107) | 63.68 (559) | 47.29 (203) |
| 1966-67 | 65.00 (104) | 35.00 (56) | 69.64 (303) | 39.13 (92) |
| 1967-68 | 69.12 (150) | 30.88 (67) | 68.91 (402) | 46.40 (125) |
| 1968-69 | 69.23 (180) | 30.77 (80) | 66.93 (511) | 52.66 (169) |
| 1969-70 | 71.92 (210) | 28.08 (82) | 68.96 (538) | 45.72 (538) |
| 1970-71 | 71.31 (174) | 28.69 (70) | 71.34 (492) | 50.35 (141) |
| 1971-72 | 72.92 (140) | 27.08 (52) | 70.05 (374) | 53.57 (112) |
| 1972-73 | 66.08 (139) | 33.92 (97) | 64.12 (577) | 53.14 (207) |
| 1973-74 | 73.79 (214) | 26.21 (76) | 67.76 (518) | 54.49 (167) |
| 1974-75 | 64.78 (195) | 35.21 (106) | 62.86 (587) | 51.38 (218) |
| 1975-76 | 72.69 (165) | 27.31 (62) | 71.83 (426) | 48.33 (120) |
| 1976-77 | 70.68 (188) | 29.32 (78) | 70.92 (502) | 46.58 (146) |
| 1977-78 | 67.38 (190) | 32.62 (92) | 71.59 (535) | 39.47 (152) |

^a Numbers in parentheses indicate sample sizes.

Table 3. Sex ratios of raccoons examined at Perardi Bros. Fur and Wool Co., Inc., Farmington, Fulton County, Illinois.

| Season | Number Females | Number Males | Percent Females |
|---------|----------------|--------------|-----------------|
| 1955-56 | 54 | 63 | 46.15 |
| 1956-57 | 140 | 190 | 42.42 |
| 1957-58 | 87 | 92 | 48.60 |
| 1958-59 | 126 | 159 | 44.21 |
| 1959-60 | 211 | 215 | 49.53 |
| 1960-61 | 269 | 275 | 49.45 |
| 1961-62 | 369 | 404 | 47.12 |
| 1962-63 | 442 | 487 | 47.47 |
| 1963-64 | 120 | 129 | 48.19 |
| 1964-65 | 231 | 240 | 49.04 |
| 1965-66 | 280 | 295 | 48.70 |
| 1966-67 | 143 | 160 | 47.19 |
| 1967-68 | 185 | 217 | 46.02 |
| 1968-69 | 251 | 260 | 49.12 |
| 1969-70 | 246 | 292 | 45.72 |
| 1970-71 | 247 | 244 | 50.30 |
| 1971-72 | 182 | 194 | 48.40 |
| 1972-73 | 290 | 286 | 50.35 |
| 1973-74 | 225 | 290 | 43.69 |
| 1974-75 | 286 | 301 | 48.72 |
| 1975-76 | 199 | 227 | 46.71 |
| 1976-77 | 236 | 266 | 47.01 |
| 1977-78 | 253 | 282 | 47.29 |

Table 4. Placental scars in raccoon uteri collected at Perardi Bros. Fur and Wool Co., Inc., Farmington, Fulton County, Illinois.

| Season | Number of Farous Uteri | No. Groups of Scars | | Total Number of Scars | | Mean Litter Size | |
|---------|------------------------|---------------------|-------------------|-----------------------|------|------------------|------|
| | | Pale ^a | Dark ^b | Pale | Dark | Pale | Dark |
| 1955-56 | 16 | 1 | 16 | 2 | 58 | 2.00 | 3.62 |
| 1956-57 | 29 | 4 | 29 | 9 | 103 | 2.25 | 3.55 |
| 1957-58 | 18 | 7 | 18 | 18 | 71 | 2.57 | 3.94 |
| 1958-59 | 22 | 10 | 22 | 31 | 77 | 3.10 | 3.50 |
| 1959-60 | 56 | 25 | 56 | 49 | 203 | 1.96 | 3.62 |
| 1960-61 | 77 | 34 | 77 | 91 | 250 | 2.26 | 2.74 |
| 1961-62 | 77 | 24 | 74 | 66 | 298 | 2.75 | 4.03 |
| 1962-63 | 122 | 55 | 110 | 143 | 377 | 2.00 | 2.64 |
| 1963-64 | 31 | 14 | 28 | 33 | 90 | 2.00 | 2.73 |
| 1964-65 | 56 | 20 | 56 | 50 | 201 | 2.50 | 3.59 |
| 1965-66 | 81 | 16 | 62 | 43 | 230 | 2.69 | 3.71 |
| 1966-67 | 28 | 6 | 28 | 14 | 103 | 2.33 | 3.68 |
| 1967-68 | 49 | 17 | 48 | 45 | 187 | 2.70 | 3.90 |
| 1968-69 | 80 | 9 | 80 | 22 | 311 | 2.44 | 3.89 |
| 1969-70 | 66 | 19 | 66 | 52 | 249 | 2.74 | 3.77 |
| 1970-71 | 65 | 11 | 54 | 35 | 191 | 3.18 | 3.54 |
| 1971-72 | 49 | 7 | 42 | 17 | 153 | 2.43 | 3.64 |
| 1972-73 | 75 | 12 | 75 | 36 | 254 | 3.00 | 3.39 |
| 1973-74 | 70 | 14 | 70 | 54 | 248 | 3.86 | 3.54 |
| 1974-75 | 87 | 21 | 87 | 52 | 313 | 2.48 | 3.60 |
| 1975-76 | 44 | 15 | 44 | 45 | 160 | 3.00 | 3.64 |
| 1976-77 | 56 | 18 | 56 | 57 | 200 | 3.17 | 3.57 |
| 1977-78 | 48 | 13 | 48 | 32 | 167 | 2.46 | 3.48 |

^a Presumably from the previous breeding season.

^b Presumably from the most recent breeding season.

Table 5. Mean body weights (lb) of male raccoons weighed at Perard Bros. Fur and Wool Co., Inc., Farmington, Illinois.

| Season | Young-of-the-year | Adults | All Males | All Raccoons |
|---------|-------------------------|-------------|-------------|--------------|
| 1955-56 | 10.70 (41) ^a | 14.40 (26) | 12.43 (77) | 11.62 (130) |
| 1956-57 | 11.66 (132) | 15.95 (59) | 12.99 (191) | 12.44 (327) |
| 1957-58 | 12.10 (60) | 17.35 (29) | 13.41 (89) | 12.77 (159) |
| 1958-59 | 11.34 (107) | 16.11 (48) | 12.82 (155) | 12.16 (278) |
| 1959-60 | 11.08 (145) | 16.06 (57) | 12.48 (202) | 11.94 (318) |
| 1960-61 | 11.19 (157) | 17.11 (95) | 13.42 (252) | 12.65 (512) |
| 1961-62 | 11.12 (247) | 15.38 (154) | 12.75 (401) | 12.19 (777) |
| 1962-63 | 11.57 (342) | 17.18 (119) | 13.02 (461) | 12.45 (897) |
| 1963-64 | 10.58 (75) | 16.19 (51) | 12.85 (136) | 12.30 (244) |
| 1964-65 | 10.98 (175) | 16.45 (63) | 12.43 (238) | 11.92 (465) |
| 1965-66 | 11.47 (178) | 16.10 (107) | 13.21 (285) | 12.52 (559) |
| 1966-67 | 11.57 (103) | 16.97 (56) | 13.46 (159) | 12.53 (322) |
| 1967-68 | 12.15 (150) | 16.59 (65) | 13.49 (215) | 12.84 (398) |
| 1968-69 | 11.55 (180) | 17.06 (80) | 13.75 (260) | 12.66 (511) |
| 1969-70 | 11.23 (209) | 15.31 (82) | 12.38 (291) | 11.81 (537) |
| 1970-71 | 12.46 (205) | 17.96 (59) | 13.96 (264) | 13.05 (519) |
| 1971-72 | 12.28 (140) | 17.22 (52) | 13.62 (192) | 12.90 (374) |
| 1972-73 | 11.26 (188) | 15.62 (95) | 12.73 (284) | 12.15 (574) |
| 1973-74 | 11.36 (213) | 15.29 (76) | 12.40 (289) | 12.39 (561) |
| 1974-75 | 11.22 (195) | 15.73 (106) | 12.81 (301) | 12.23 (585) |
| 1975-76 | 11.39 (158) | 16.46 (60) | 12.78 (218) | 11.95 (408) |
| 1976-77 | 10.63 (188) | 16.16 (77) | 12.24 (265) | 11.57 (499) |
| 1977-78 | 10.56 (189) | 16.26 (92) | 12.42 (281) | 11.56 (535) |

^a Numbers in parentheses indicate sample sizes.

Table 6. Mean body weights (lb) of female raccoons weighed at Perardi Bros. Fur and Wool Co., Inc., Farmington, Illinois.

| Season | Young-of-the-year | Parous | Nulliparous Adults | All Females |
|---------|-------------------------|-------------|--------------------|-------------|
| 1955-56 | 9.54 (37) ^a | 12.53 (16) | (0) | 10.44 (53) |
| 1956-57 | 10.88 (90) | 13.46 (39) | 11.78 (7) | 11.67 (136) |
| 1957-58 | 11.37 (56) | 14.08 (20) | 13.20 (3) | 12.12 (79) |
| 1958-59 | 10.78 (96) | 13.70 (23) | 11.12 (4) | 11.34 (123) |
| 1959-60 | 10.41 (143) | 13.58 (65) | 12.19 (8) | 11.43 (216) |
| 1960-61 | 10.52 (175) | 15.01 (72) | 13.37 (3) | 11.91 (260) |
| 1961-62 | 10.68 (243) | 13.39 (114) | 13.10 (14) | 11.59 (376) |
| 1962-63 | 10.67 (286) | 14.32 (124) | 13.84 (21) | 11.87 (431) |
| 1963-64 | 10.96 (31) | 13.31 (36) | 15.00 (1) | 11.71 (118) |
| 1964-65 | 10.23 (155) | 13.00 (56) | 14.02 (16) | 11.38 (227) |
| 1965-66 | 10.47 (178) | 14.26 (86) | 13.67 (10) | 11.81 (274) |
| 1966-67 | 10.73 (107) | 14.67 (28) | 12.54 (8) | 11.49 (143) |
| 1967-68 | 11.03 (175) | 14.65 (43) | 12.54 (10) | 12.02 (193) |
| 1968-69 | 11.06 (162) | 14.00 (33) | 12.59 (9) | 12.05 (204) |
| 1969-70 | 10.08 (161) | 13.42 (68) | 11.95 (17) | 11.13 (246) |
| 1970-71 | 11.36 (176) | 15.03 (54) | 15.76 (16) | 12.45 (246) |
| 1971-72 | 11.11 (122) | 14.78 (49) | 12.64 (15) | 12.14 (186) |
| 1972-73 | 10.17 (180) | 14.11 (99) | 13.03 (20) | 11.59 (299) |
| 1973-74 | 10.67 (132) | 16.18 (64) | 11.39 (18) | 12.39 (212) |
| 1974-75 | 10.29 (173) | 13.92 (95) | 12.21 (16) | 11.61 (284) |
| 1975-76 | 10.41 (133) | 13.35 (42) | 13.18 (11) | 11.24 (186) |
| 1976-77 | 9.78 (167) | 13.70 (56) | 11.81 (11) | 10.81 (234) |
| 1977-78 | 9.85 (194) | 13.03 (49) | 13.00 (11) | 10.60 (254) |

^a Numbers in parentheses indicate sample sizes.