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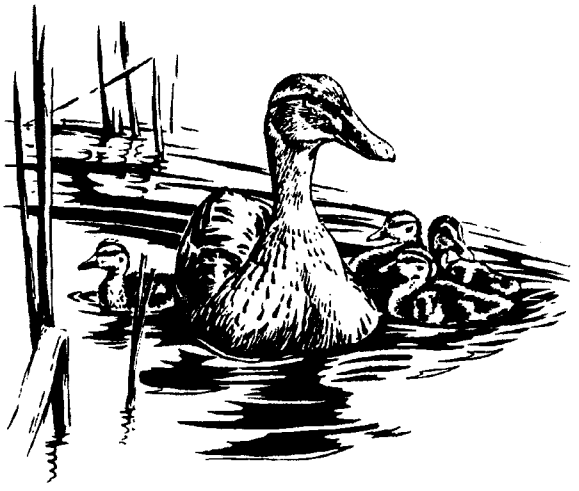

Mallard Investigations

W-130-R-3

Quarterly Federal Aid Performance Report

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3 March 2000

QUARTERLY FEDERAL AID PERFORMANCE REPORT

Mallard Investigations W-130-R-3

Stephen P. Havera--Illinois Natural History Survey, Havana

1 January through 31 March 2000

STUDY I: NESTING BIOLOGY OF MALLARDS IN ILLINOIS

JOB NO. I.1. Nesting History and Reproductive Success of Mallards in Illinois

During this quarter, preparations were made for the spring 2000 mallard (Anas platyrhynchos) nesting season. Data was analyzed and comparisons were made between the 1998 and 1999 nesting seasons.

Methods

Mallard hens were classified as central Illinois residents if they attempted to nest or remained in the study areas (Banner or MSD; Hine et al. 1998) during the nesting season. Data analysis was conducted using the Statistical Analysis System (SAS Institute 1988). Significance levels were set at $P \leq 0.05$, and we report means as ± standard error. The mean number of nest attempts per resident hen, nest initiation dates and incubated clutch sizes for first nest attempts, incubation periods, and body condition indices (body mass [g]/wing chord [mm]; Ringelman and Szymczak 1985, Hine et al. 1996) were compared between age classes (adult and yearling, Krapu et al. 1979), study sites, and years (1998 and 1999) using Wilcoxon 2-sample tests. Nest

initiation dates were determined by subtracting the number of eggs in a nest when found from the date the nest was found (Paquette et al. 1997). We assumed an egg laying interval of 1 egg/day and that incubation started when the last egg was laid. Incubation periods were calculated as (((HATCH DATE - NEST INITIATION DATE) - CLUTCH SIZE) + 1). Nest success was expressed as a simple percentage and comparisons were made between the age classes, study sites, and years using G-tests (Sokal and Rohlf 1995:731).

Results

Nest Attempts

Twenty-eight resident mallard hens equipped with radio transmitters attempted to nest during spring/summer 1998. Nine hens (7 adults and 2 yearlings) were located at Banner. Adults initiated 1.7 ± 0.42 nests/hen and yearlings initiated 2.5 ± 0.50 nests/hen. No differences ($|Z_1|$ = 1.09, $\underline{P}$ = 0.28) were detected between the age classes. Combining the age classes at Banner yielded 1.89 ± 0.35 nests/hen. Nineteen radio-marked hens (12 adults and 7 yearlings) nested at MSD during spring/summer 1998. Adults initiated 1.50 ± 0.23 nests/hen while yearlings initiated 1.86 ± 0.26 nests/hen. Like Banner, no differences were detected in the age comparisons at MSD ($|Z_1|$ = 1.17, $\underline{P}$ = 0.24) so the age classes were pooled indicating 1.63 ± 0.17 nests/hen. Also, nesting effort was similar between the study sites ($|Z_1|$ = 0.51, $\underline{P}$

= 0.61); therefore, the 28 hens attempted 1.71 ± 0.85 nests/hen in 1998.

The nesting history of 33 resident mallard hens (16 adults and 17 yearlings) was known for spring/summer 1999 at MSD. Adults initiated 1.63 ± 0.18 nests/hen while yearlings initiated 1.12 ± 0.08 nests/hen. Age class comparisons indicated that adults initiated more nests than yearlings ($|Z_1|$ = 2.39, $\underline{P}$ = 0.02) precluding further comparisons.

Nest Initiation Dates

The initiation dates for first nests were similar between the age classes and study sites ($\underline{P}$ > 0.36) during spring 1998. Likewise, nest initiation was similar ($\underline{P}$ = 0.53) between age classes during spring 1999. Comparisons between 1998 and 1999, however, indicated mallard hens initiated nesting earlier in 1998 (22 April, $\underline{n}$ = 25) than in 1999 (6 May, $\underline{n}$ = 33) ($|Z_1|$= 3.65, $\underline{P}$ < 0.01).

Clutch Size

Incubated clutch sizes for first nest attempts were identified for 21 nests (9.2 ± 0.47 eggs) during spring 1998 and 12 nests (9.3 ± 0.35 eggs) during spring 1999. No differences were identified in the clutch sizes between the age classes, study sites, and years ($\underline{P}$ > 0.19). The initial clutch size ($\underline{n}$ = 33) of mallard nests during the 1998 and 1999 nesting seasons was 9.2 ± 0.32 eggs.

Incubation

The incubation period for mallard nests in central Illinois during 1998 (n = 10) and 1999 (n = 6) was determined. Due to a limited sample, incubation periods were only compared among the years. Incubation lasted 26.8 ± 0.51 days in 1998 and 27.0 ± 0.93 days in 1999. The pooled incubation period across years ($|Z_1|$ = 0.00, P = 1.00) was 26.9 ± 0.46 days.

Body Condition

Body condition indices indicated that resident mallard hens had similar energy reserves when comparing the age classes between the study sites and years ($P > 0.19$). Therefore, age classes and study sites were pooled to examine body condition indices among the years. Mallard hens were in better physical condition in 1998 (4.19 ± 0.06 g/mm, n = 28) than in 1999 (3.93 ± 0.04 g/mm, n = 37) ($|Z_1|$ = 3.29, $P < 0.01$).

Nest Success

Mallard nest success at Banner in 1998 was similar among the age classes (G_1 = 2.35, P = 0.13) when 3 of 17 (17.6%) nests hatched. Likewise, nest success did not differ between the ages at MSD during 1998 (G_1 = 1.23, P = 0.27) when 7 of 26 (26.9%) nests hatched. Nest success estimates were pooled among the study sites (G_1 = 0.51, P = 0.48) for spring/summer 1998 when 10 of 43 (23.3%) nests hatched. Adult and yearling nest success was similar in 1999 (G_1 = 0.84, P = 0.36) when 7 of 46 (15.2%) nests

hatched. Also, the percentage of hatched mallard nests in 1998 was similar to 1999 (G_1 = 0.93, $\underline{P}$ = 0.33). Overall, a simple estimate of mallard nest success during the 1998 and 1999 nesting seasons in central Illinois was 19.1 percent (17 of 89 nests hatched).

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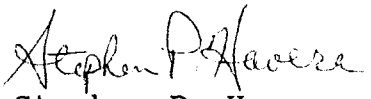

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