

DELMARVA FOX SQUIRREL STUDY
BLACKWATER NATIONAL WILDLIFE REFUGE
REPORT #5 (1991)

Purpose:

This study was carried out to determine the Delmarva fox squirrel population in the 52-acre Egypt Road tract, and to increase the scientific knowledge of the life history and habitat preference of the endangered squirrel. This is the fifth census conducted in this woodlot location. Earlier censuses were conducted in 1971, 1976, 1980, 1983. The objectives of this study are as follows: (a) to accurately determine the existing population of Delmarva fox squirrels on one major type of Blackwater refuge woodland, (b) to gather base data for population comparisons in the other woodland types, and (c) to monitor biannually this benchmark population to determine Delmarva fox squirrel population status on the refuge.

Justification:

The Delmarva fox squirrel (Sciurus niger cinereus) is a large, grayish, tree squirrel inhabiting four counties of the Eastern Shore of Maryland, with introductions at Chincoteague National Wildlife Refuge, Virginia. This subspecies of fox squirrel is on the endangered species list maintained by the U.S. Department of the Interior. Hunting of this squirrel has been prohibited in Maryland since 1971.

Information such as critical or preferred habitat types and best management techniques for the squirrel are needed to provide criteria for possible future management practices. Through population studies such as this one, squirrel densities in different types of woodlands can be determined. This can then serve as an indication of the habitat types of greatest value to the survival and recovery of the species.

The study will also provide data for use by the Delmarva Fox Squirrel Recovery Team in evaluating possible restocking programs.

Method:

The mark-recapture method, used in this study in previous years, was again used for determining the population. The study area that was laid out in 1970 by a grid system covering the entire 52-acre block located adjacent to Egypt Road was used. Seven transect lines, spaced five chains (330') apart, run magnetic east-west. Posts every three chains (198') along the transect lines mark the trap locations. Twenty-nine grid points are in the 52-acre block (see Diagram 1).

This year's study, however, utilizes a different capture

method. Squirrels are captured from nest boxes which have been placed in the study block. At each of the 29 grid points, two nest boxes have been placed, one to the north and one to the south of the grid points. These boxes have been placed 15-20 feet above the ground on dominant trees. The boxes are checked at night, beginning at approximately 9:00 p.m. A ladder is utilized to reach boxes and, after entrance holes are plugged, the nest box is brought to the ground and checked for squirrel activity. Squirrels are removed from nest boxes, anesthetized, and eartagged. Squirrels are weighed, examined for physical defects and external parasites, placed back in the box, and returned to tree sites. All necessary data is recorded. Gray squirrels are eartagged utilizing the same procedures used with Delmarva fox squirrels.

The recapture method is live-trapping utilizing #106 (9x9x26) Tomahawk live traps. One live-trap was placed at each grid point. All traps were wired open and pre-baited for one week prior to trapping. Trapping was conducted for three days (3/29, 4/1, 4/2). All traps were set before daybreak on the morning of trapping and checked mid-morning after the active feeding period, and rechecked again after 4:00 pm. Traps were closed during the night.

The fox squirrel population was determined using the Lincoln index, or mark-recapture ratio. The formula used in this index to calculate estimated population is $N=Tn/t$ where:

T = number marked in the pre-census period
 t = number of marked animals trapped in the census period
 n = total animal trapped in the census period
 N = population estimate

Results:

A total of 15 Delmarva fox squirrels and 4 grays were captured and eartagged from nest boxes during the original capture period on 3/11/91. One Delmarva fox squirrel and one gray squirrel were lost as escapees during tagging operations. The recapture trapping produced 12 untagged Delmarva fox squirrel, and 6 tagged Delmarva fox squirrels on the first day, 1 untagged Delmarva fox squirrel and 12 tagged Delmarva fox squirrels on the second day, and 3 tagged Delmarva fox squirrels the third day. One gray squirrel was recaptured during the trapping operation. (See Chart #1)

There was one Delmarva fox squirrel mortality due to anesthetics, handling, or shock. Staff is not aware of any apparent error in the handling of the Delmarva fox squirrel that died. Several injured noses on the squirrels were observed during recapture trapping efforts. These injuries were treated with antiseptic prior to releasing.

Weather during the box check was clear and cool (temperature 26°-37° F; winds were North 10-12 mph. The box check was conducted from 10:00 p.m. to 5:00 a.m. Weather during the trapping period was warm (50°-70° F.) Skies were partly cloudy on 3/29 and 4/1, and cloudy on 4/2. Trapping weather was comparable during all three days.

Based on data collected, and using the mark-recapture ratio, the estimated population in the study area is as follows:

$N = Tn/t$ where N = population estimate
 T = total trapped in pre-census period
 n = total trapped in census period
 t = marked animals trapped in census period

$N = 15 (29)/10 = 43.5$ or approximately 44 Delmarva fox squirrel

$$\text{Standard error} = \sqrt{\frac{T^2 n (n-t)}{t^3}} = \sqrt{\frac{15^2 (29) (19)}{1000}} = \sqrt{\frac{123975}{1000}} =$$

$$\sqrt{123.975} = \pm 11.13 = 33 \rightarrow 55 \text{ DFS}$$

95% confidence limit

Four gray squirrels were captured during the box check, and one gray was recaptured.

$$N = Tn/t = 4(5)/1 = 20$$

Conclusions:

The objectives of this study were met by this year's census.

OBJECTIVE A: To accurately determine the existing population of Delmarva fox squirrels on one major type of Blackwater refuge woodland. - An estimated population of 44 Delmarva fox squirrels was in the woodlot, with a population range of between 33-55 Delmarva fox squirrels.

OBJECTIVE B: To gather base data for population comparisons in the other woodlots. - Population censuses will be conducted in another habitat type in the coming year.

OBJECTIVE C: To monitor biannually this benchmark population to determine Delmarva fox squirrel population status on the refuge. - This area will be trapped on a biannual basis in order to determine refuge population.