Section of Wildlife Research

Illinois Forest Game Investigations

W-87-R-7

Quarterly Federal Aid Performance Report

by

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Illinois Natural History Survey

1 April through 30 June 1986
Illinois Forest Game Investigations

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Study No. VII-A; Title: Landscape Heterogeneity and Deer Abundance.
Job 101.2; Title: Data analysis and reporting.

Measurement of the landscape attributes in 4-mi² sample plots
surrounding all known wintering areas in central and northern Illinois
has been completed. The descriptions have been loaded into a computer
for analyses which compare landscape characteristics among counties
within and between deer management regions. These analyses will be
completed during this quarter.

Study No. VII-B; Title: Population Dynamics of the Illinois Deer Herd--
Past History, Current Status, and Future
Management Options.
Job 102.2; Title: Regional analysis of Illinois deer harvests.

Not active during this segment.

This progress report may contain tentative or preliminary
findings. It may be subject to future modifications and revisions.
To prevent the issuing of misleading information, persons wishing to
quote from this report should obtain permission from the project
leader.
The 1985 "raw" deer harvest data were received and analyzed during this quarter. A revised population model was used to predict 1986 pre-hunt deer populations. This model determined the number of deer that had to be present to support non-hunting (derived from Platt County study results) and hunting (actual number harvested plus crippling loss) related mortality, given constant reproductive rates. For each county, the model was aligned with harvests during the last 10 years standardized for the number of hunters (an index of deer population size). The model did a good job of predicting past deer harvests in most counties as indicated by R2 values exceeding 0.90 for most county regressions (number of hunters and predicted deer population size regressed on the actual harvest of deer). The 1986 deer season will be a test of how well the county models do at predicting future harvests. The summarized deer harvest data, population model, county simulation data, and county predictions of deer population size were written onto Apple microcomputer floppy disks and sent to Department of Conservation forest game biologist, Forrest Loomis.

Regional and temporal differences in the sex-age structure of harvested deer in Illinois since 1957 are being evaluated. The results of these analyses will provide basic information on characteristics of the deer harvest, essential if we are to predict the outcome of altered harvest strategies.
We continue to load and edit locations of radio marked deer and sightings of all marked deer into computer files for later analysis. We are also summarizing observations and radio fixes for deer on dispersed summer ranges away from the Allerton study area.

Spotlight counts of deer continued until the end of April, at which time vegetation had become dense and deer sightings had declined. Seven adult does with transmitters, which are still functioning, were tracked during this quarter to determine their pre- and post-fawning home ranges. For each of these deer, we have at least 1 previous year of home range information during the fawning period. Comparisons will be made to determine if does exhibit fidelity to specific fawning home ranges from year to year.
During this quarter, we continued to progress from data collection to data analyses/reporting. Most notably, we finished our collections of deer for evaluations of nutritional indices and the nutritional assessment of NE Illinois deer herds, a cooperative study with the Brookfield Zoo. In mid-April, ground tissues were sent to Michigan State University for whole body analyses.

Postmortem examinations were terminated concurrently with the collection of deer from Busse Woods Nature Preserve. This represents the third consecutive winter that we have collected extensive demographic and nutrition-related data from the Busse Woods herd. Lab technicians: 1) finished weighing, measuring, and aging fetuses, 2) measuring and weighing antlers, and 3) completed kidney fat indices.

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The INHS Chemical Analytical lab is nearing completion of analyses for heavy metals, pesticides, and PCB's in deer tissues. Lung, liver, and kidney tissue samples from 68 Busse Woods deer were recently submitted to the Illinois Veterinary Diagnostic Laboratory for histopathological analyses.

Age determinations, based on cementum annul counts, were recently completed for 138 adult deer. Results were similar to previous determinations and will be summarized in the third annual report. However, we continue to see strong evidence of old age structure (oldest specimen estimated as 14 years).

Tracking of radio-collared deer on the Des Plaines River has continued at irregular intervals. The 6 surviving does continue to display limited movements. No evidence of long range movements has been detected. We expect to terminate this segment of the study by early fall.

On multiple occasions, deer have been captured in Cook County, instrumented with radio-collars, transported, and released on the Joliet Army Training Center (JATC). Radio-tracking has been conducted by J.M. Jones who provided the following summary of notable movements.

This was a quarter of much activity as young deer, previously released in Cantigny Woods at the JATC (Fig. 1), exhibited long distance movements uncharacteristic of the older translocated animals. Six does were radio-located tri-weekly: 2 (#530 and #550) were from the original translocation during December 1984; fawn (#830) was transported to JATC on 22 January 1986; 2 animals (#170 and #490) were captured with drive nets and transported to JATC on 27 March 1986; and on 22 April 1986, the last doe (#630) was darted/tranquilized by
Chicago Animal Control personnel, transported to a Cook County Forest Preserve by van, transferred to a wooden transport crate, and transported to JATC by INHS personnel (Table 1).

Fawn #630 had been darted between ribs, resulting in a punctured lung as indicated by the presence of "frothy" blood at the wound. The diameter of the dart wound was about 5mm; air escaped from the wound with each inhalation. The condition of the deer was evaluated as very poor on release. However, this animal has exhibited long distance movements as yet undocumented for any other translocated animal during this study. This fawn moved approximately 3.5 km onto Jollet Army Ammunition Plant (JAAP) property within 3 days post-release and attempts to locate her on 16 May were unsuccessful. A Cook County Forest Preserve employee reported sighting the fawn on 28 May in a residential area near Orland Park (southern Cook County) - nearly 37 km NE of the last relocation. Ground verification on 29 May showed the animal to be 1.5 km north of the previously reported location. The fawn was sighted, appeared in good health, and the dart wound had apparently healed. The radio signal was not found in early June, but was relocated near Midlothian Country Club by aerial radio-tracking on 9 June - approximately 9 km ESE of the 29 May location and only 3-4 km south of where the deer was originally captured by the Chicago Animal Control. On 10 June, #630 was found between the villages of Midlothian and Posen, in a small band of trees bordering the Tri-state Tollway (I-294).

Similarly, we observed dispersal in 2-year-old #550 and fawn #170. The former has been radio-tracked for 1.5 years, except during June-December 1985, when relocation efforts were unsuccessful. Until
recently, this deer had been located on various portions of the JAAP, but in late May or early June 1986 the animal could not be found. Aerial radio-tracking located #550 in a private woodlot nearly 14 km ESE of the last known location. Deer #170 was the only translocated animal to move NW of the release site and it crossed the Des Plaines River within a month after release. Since mid-May, this deer has remained in or near a privately owned woodlot 5 km NW of Cantigny Woods.

Radio-monitoring to determine movements and survival of these transplanted deer will continue on a bi-weekly, or, as necessary basis.

Job 104.2; Title: Deer range evaluation for metropolitan northeastern Illinois.

J.M. Jones has also been responsible for vegetation assessments. In the following paragraphs he reports on his recent activities.

One hundred, sixty permanently-staked 20-m transects were established in Busse Woods (Fig. 2) during April 1986. These included 25 each in Busse Woods North and Busse Woods North-Nature Preserve, and 15 each in Busse Woods South-Northwest section and Busse Woods South-Southeast section. Transects were marked with 3/8” rebar and fluorescent orange paint. Distances between transects and from woods edge to the transects were paced and compass bearing through woods were recorded. These permanent sampling sites were randomly selected along transect lines established during summer 1985 (see previous FAP reports) and will be used, much like the exclosures and control plots built at the onset of this study, to evaluate changes or trends in vegetation composition, density, cover, and vertical stratification over time.
Sampling of forest understory plants <1 m started in April 1986 and continued into May. Twenty-meter transects/intercepts were used to determine percent cover, and two 1-m square quadrats located randomly along each 20-m line were used to evaluate density and frequency of low-growing plants. A total of 128 line intercepts and 352 quadrats were evaluated in Busse Woods and in the Des Plaines exclosure and control plot. These data will be compared among areas and with similar data collected in 1984 and 1985. Preliminary analyses indicated higher percent cover and density of all plants <1 m in Busse Woods during 1986. Much time was devoted to entering vegetation data onto the Apple IIe computer and statistical comparisons will be available in the near future.

Analysis of shrub/sapling densities in the 4 large woodlots of Busse Woods will be undertaken in late June; however, unlike analyses during summer 1985, the 5- x 5-m quadrats will be centered about the line end markers of the new permanent transects. Complete species inventories of all shrubs, saplings and trees >1 m present in Busse and Des Plaines exclosures and control plots will be conducted during early July. A technique for determining the extent of canopy closure using a tripod-mounted camera with "ektagraphic" or "kodalith" film (which shows only black or white) will be evaluated in July also. Horizontal foliar densities, determined with a density profile board, will be evaluated along permanent transect lines in BWN, BWN-NP, BWS-NW, and BWS-SE. Additionally, vertical stratification sampling will be conducted in Busse and Des Plaines exclosures and control plots (similar to 1984 and 1985 analyses), as well as other sites in the Des Plaines Division and Palos Division, CCFPD.
Tree damage was observed during winter 1985-86 and during spring vegetation sampling. Unlike the leaves, twigs and stems damaged by deer browsing—common in the high deer density areas—and stripping of bark/girdling of trees were observed in BWN, BWN-NP and to a much lesser extent in the BWS woodlots. This damage included some deer damage to elm (*Ulmus* sp.) trees in the northwest corner of the Nature Preserve, but was mostly extensive squirrel damage to sugar maple (*Acer saccharum*) saplings. One box elder (*Acer negundo*) was found to have minor damage. An attempt to determine the distribution, numbers, extent, and species of these damaged trees was made in June, but the exposed inner layer had turned dark and the damaged trees were difficult, if not impossible, to differentiate from undamaged trees. Even during mild winters (like winter 1985-86) with remains of an abundant mast crop, direct competition between a high-density deer herd and an abundant squirrel population (personal observation) possibly caused depletion of the preferred food sources and prompted the use of subsistence food items such as bark.

Job 104.3; Title: Management strategies and implementation of experimental control of urban deer.

Experimental manipulation of the Busse Woods deer herd continued until mid April. Techniques evaluated for deer removal included rocket netting, drive netting with ground drivers, drive netting using ground drivers and helicopters, shooting over bait sites, and spot-light shooting. A comparative evaluation of the cost-efficiency of these techniques will be presented in the 3rd annual report. We did not reach the herd reduction objective of approximately 4 deer/km² (10
deer/mi²). Thus, deer removal will continue during the fall-winter period, 1986-87.

We have been working closely with the IDOC and private organizations to develop suitable methods for resolving issues on carcass disposal. To date, the majority of deer collected during our study have been used for research purposes (reproduction, toxicology, condition, parasites, age, measurements etc.) and then buried. After postmortem examinations by INHS personnel, some carcasses were given to the: 1) IDOC for forensics and law enforcement research, and 2) CCFPD - food for captive raptors and predators at River Trails Nature Center, CCFPD.

Both the public (Husar, Chicago Tribune, 12 January 1986) and state agencies (T. Miller, pers. commun.) realize that if deer are to be removed from a site (research, depredation permits, herd reduction) maximum utilization of the animals is a primary concern. A major issue is whether venison, from animals collected under state permits, can be given away for human consumption. A corollary issue involves the development of procedures/requirements for the handling, processing, and selecting sources for dispersal of venison. The Urban Deer Study, in cooperation with the IDOC, will be exploring these issues during the next collection period. Currently, we are seeking outlet sources in 2 areas: 1) not-for-profit organizations that provide food to the indigent, and 2) agencies (i.e. penal institutions, mental health facilities) where individuals are institutionalized by the state.
Job 104.4; Title: Data base management, analysis, and reporting on urban deer research.

Considerable time was allocated to data reduction (hand and computer) and computer data entry. We have found that the Statistical Processing System (SPS Version 4.2 for Apple Ile) software may not be suitable for analyzing some of the large data sets (i.e. necropsy data, nutrition and others) that we have collected. Large data sets, currently saved on floppy diskettes for use on the field office Apple Ile system, are being converted for entry onto the University of Illinois mainframe computer system.

We are continuing to increase the size and quality of our field office literature resource base. Reprints are routinely requested from authors publishing manuscripts on white-tailed deer and related topics. Reprints have been cataloged on index card files and on the Bookends computer reference management system for the Apple Ile.

An Application for Federal Aid (AFA), requesting a 3-year (FY87-FY89) project extension for the Urban Deer Study, was finalized and submitted during this quarter. Both the IDOC and the USFWS requested that specific changes be made in the AFA. Sections of the original AFA were added or rewritten by senior staff and were resubmitted.

We continue to receive a large number of requests, from both professionals and the public, for information on deer and deer-related topics. Examples of typical requests that were received this quarter were: 1) Missouri DNR, techniques used to estimate deer numbers and deer-caused damage, 2) Ohio state University, questionnaire on deer damage to agriculture, 3) Morton Arboretum, identification of a growth
found on a deer killed by a vehicle, 4) U.S. Park Service/Cook County Forest Preserve District, walking tour of Busse Woods Nature Preserve, and 5) private citizen, concerned over deer in yard and possible transmission of Lyme disease, 6) private citizen, concern over safety of newborn fawn found on cement slab at back door of residence, and 7) numerous call from police departments regarding how to handle deer injured/killed in vehicle accidents.

The large number of requests for information/assistance on urban wildlife problems that our office receives without solicitation clearly identifies a need for urban wildlife extension in NE Illinois.

Preparation of this quarterly report.
Table 1. Summary of deer being monitored at, or near, Jollet Army Training Center.

<table>
<thead>
<tr>
<th>Collar Freq.</th>
<th>Date of Capture</th>
<th>Method of Capture</th>
<th>Method of Transport</th>
<th>Age at Capture</th>
<th>Status during April-June 1986</th>
</tr>
</thead>
<tbody>
<tr>
<td>149.530</td>
<td>Dec. 84</td>
<td>Rocket net</td>
<td>Wooden Crate</td>
<td>Adult</td>
<td>Remained in small woodlot on JAAP.</td>
</tr>
<tr>
<td>149.550</td>
<td>Dec. 84</td>
<td>Rocket net</td>
<td>Wooden Crate</td>
<td>Fawn</td>
<td>Remained on JAAP until 22 May, relocated on 9 June from air; 14 km* ESE of last location.</td>
</tr>
<tr>
<td>149.800</td>
<td>Jan. 86</td>
<td>Rocket net</td>
<td>Wooden Crate</td>
<td>Fawn</td>
<td>Found collar in creek on 25 Apr., apparently slipped in early Apr. Within 0.5 km of release site.</td>
</tr>
<tr>
<td>149.490</td>
<td>Mar. 86</td>
<td>Drive net</td>
<td>Horse Trailer</td>
<td>Adult</td>
<td>Remained within 1 km of release site.</td>
</tr>
<tr>
<td>149.170</td>
<td>Mar. 86</td>
<td>Drive net</td>
<td>Horse Trailer</td>
<td>Fawn</td>
<td>Moved across Des Plaines River onto private property. Five km NW of release site.</td>
</tr>
<tr>
<td>149.630</td>
<td>Apr. 86</td>
<td>Dart gun</td>
<td>Van/wooden crate</td>
<td>Fawn</td>
<td>Located 48 km NE of release site &amp; within 4 km of capture site.</td>
</tr>
</tbody>
</table>

*Distances moved are rough approximations, more exact values will be presented in future reports.
Figure 1: Release site and surrounding area, south of Joliet, Will Co., Illinois.

JATC = Joliet Army Training Center
JAAP = Joliet Army Ammunition Plant
RS = Release Site

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Figure 2: Woodlots sampled within Ned Brown Preserve, CCFPD.