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Appendix B - Cooperative Urban Deer Management in Cook County, Illinois

Annual Job Progress Report
Submitted to
ILLINOIS DEPARTMENT OF CONSERVATION
DIVISION OF WILDLIFE RESOURCES
Project Number W-87-R-8
Biology, Ecology, and Management of Deer in the Chicago Metropolitan Area

1 July 1986 - 30 June 1987
by
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28 September 1987
Appendix B. Recommendations for a cooperative new initiative on urban deer management for Cook County, Illinois.
EXECUTIVE SUMMARY:

TITLE: Cooperative Urban Deer Management in Cook County, Illinois

In this report, we focus on the need to address deer-human conflicts in Cook County, Illinois. Specifically, we provide information that can be used by principal wildlife (Illinois Department of Conservation) and land resource (Cook County Forest Preserve District) agencies, to develop a cooperatively supported new initiative on urban deer management in Cook County, where deer-related damage has exceeded threshold levels of social and ecological tolerance.

PROBLEM

In suburban Cook County, white-tailed deer (Odocoileus virginianus) have proliferated under protected status on county-owned forest preserve sanctuaries. Exact deer numbers are not known, however on some sites, minimum densities have exceeded 39 deer/km2 (100 deer/mile2)—far in excess of the ability of the resource base to support such numbers on a sustained basis.

The consequences of large deer numbers are increased conflicts. In 1986, a record number of deer-vehicle accidents were reported on state-numbered highways in Cook (N=469) and Lake (N=250) counties. Total economic loss from these 719 deer-vehicle accidents was estimated at $1,064,551.00. Deer on O'Hare International Airport, near and on active runways, is an intolerable situation with potential for catastrophic loss of human life; a deer-United Airline 737 jet collision on 17 March 1987, caused no human injuries but resulted in over $114,000.00 in aircraft damage. High deer densities on some county forests
and state nature preserves have caused irreversible damage to native understory vegetation, and are noticeably impacting vegetation at other locations. Homeowners near forest preserves where deer are at high density, have sustained extensive browsing and antler damage to ornamental and garden plants. Lyme Disease, a serious bacterial infection transmitted to humans by a deer tick, prevalent in other urban areas and spreading in distribution in the United States, is of future concern.

The prognosis for deer-human conflicts in northeastern Illinois is continued increase if steps are not taken to control deer numbers. Over time, preserves will only become more compartmentalized because of peripheral suburban development, thus, increasing the frequency of negative deer-human interactions. Severe winters will temporally decrease deer abundance through high mortality from starvation, but this passive approach will be much more costly in social, political, ecological, and economic terms, than initiating a sustained preventative program of urban deer management.

STATUS OF RESOURCES NOW AVAILABLE

Present staffing of both lead agencies, the IDOC and the CCFPD, is inadequate to meet urban deer management needs. Two IDOC personnel, a District Wildlife Manager (based in DuPage County) and the Forest Game Supervisor (based in Springfield), are involved in urban deer management, but such work is not the principal duty of either. The CCFPD employees 23 naturalists that function primarily as public educators. However, the CCFPD has no staff wildlife biologist.
NEEDS AND GOALS

Wildlife and land resource agencies should possess high level professional expertise in urban deer ecology, public relations, and on-site management capabilities to address deer-related issues, if and when such actions are warranted. Suggested goals of urban deer management for northeastern Illinois are:

1) To facilitate cooperative management programs based on the principle that urban deer conflict resolution is best seen as a responsibility shared among state agencies, local governments, and the public.

2) To develop state-of-the-art expertise on urban wildlife management and local deer ecology that can be readily accessed for the purposes of public education, and to provide a basis for management evaluations.

3) To develop on-site staff capabilities necessary to reduce or mitigate deer-human-ecological conflicts in response to recognized needs of urban communities and local governments.

4) To increase public and local agency awareness of urban deer ecology and to promote more detailed understanding of the consequences of an urban environment shared with wildlife.

5) To promote and maintain a positive image for urban wildlife management.

AGENCY RESPONSIBILITIES

The Illinois Department of Conservation, as the legal custodian of non-migratory state wildlife, has partial responsibility for urban wildlife management. The Cook County Forest Preserve District, as principal landowner of deer habitat in Cook County, shares co-responsibility for urban deer management with the IDOC.

PROPOSED URBAN DEER (WILDLIFE) INITIATIVE

Personnel

A wildlife extension specialist is needed to coordinate
community involvement in urban deer management and to provide information and education to cooperating agencies, public, and media. An urban wildlife biologist/manager is needed to direct and implement management actions which include, but are not limited to, deer removal through live-trapping or lethal reduction, monitoring of habitat and deer demography, and coordinating cooperative research.

**Funding**

Each lead organization should make a substantial commitment for program support that clearly defines, and guarantees, multi-year program integrity. We suggest that an equitable division of IDOC:CCFPD funding be based on 60:40 contributions.

**PROPOSED BUDGET**

**Cook County Forest Preserve District**

<table>
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<th>Description</th>
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<tr>
<td>Direct funding for commodities, contractual services, transportation, equipment etc.</td>
<td>$25,000.00</td>
</tr>
<tr>
<td>Provide gasoline for 2 vehicles (@ $2,000.00 per vehicle annually)</td>
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<tr>
<td>Office space and utilities (equated @ $750.00 per month)</td>
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<tr>
<td>Logistic support (estimated value of support drawn from maintenance divisions and nature centers)</td>
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</tr>
<tr>
<td><strong>Subtotal (value of CCFPD contributions)</strong></td>
<td><strong>$40,000.00</strong></td>
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**Illinois Department of Conservation**

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct funding for personnel, commodities, contractual services, equipment etc.</td>
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<td><strong>Total project budget per year</strong></td>
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ADMINISTRATIVE RESPONSIBILITY

Long term

Staff positions should be administered under one organizational structure. We suggest that the IDOC accept this responsibility which is consistent with its role in wildlife management. Acceptance of this responsibility should be conditional on a guarantee of long-term support from the CCFPD.

Short term (if necessary)

It is essential that an Urban Deer Management Program be implemented as soon as possible to provide overlap with the final stage of INHS Urban Deer Research scheduled to conclude on 30 June 1989. Interim contractual services could be used if one or both IDOC staff positions cannot be immediately established. Prairie chicken management at Bogota serves as a model where interim administration, provided by INHS, has been used for interim management.

BENEFITS-- A cooperative urban deer management program will:

1) Provide a unified coalition between state and county with shared goals on urban wildlife damage.

2) Provide on-site professional expertise on urban deer management that will be a source of information, education, and training.

3) Establish a system capable of mitigating deer damage, if and when actions are warranted.

4) Decrease agency costs relative to implementing a program independently.

5) Standardize means for addressing deer issues on county property, and will provide mechanisms for ecological monitoring and collection of new data.

6) Identify population and habitat trends that enable prediction of deer-related problems.
INTRODUCTION

Recognition of human need for open space as an integral land-use component of metropolitan areas (Levin 1987, Salwasser 1987, Schauman et al. 1987), has resulted in preservation of urban green belt systems that provide quality deer habitat within zones of intensively developed urban landscape. The provision of requisite habitat and the ability of deer to successfully colonize and proliferate on sites near human population centers have necessitated that urban deer management programs be considered for an increasing number of North American metropolitan areas (Appendix A).

There would be no controversy, or need for management, if deer interactions in an urban setting were benign. However, this is not the case. White-tailed deer (Odocoileus virginianus) are successful animals with adaptive characteristics that enable their exploitation of a wide range of successional habitat-types (Baker 1984). Literature is replete with examples of temporal overexploitation of forage resources by herds that increase to exceptionally high densities (Martin and Krefting 1953, Roseberry et al. 1969, Casey and Hein 1983, Ismael and Rongstad 1984, Wemmer and Stuwe 1985, and others). This "overshoot phenomenon" (McCullough 1984), cannot be sustained indefinitely. However, the inevitable decline in deer numbers is typically delayed well after the initial period of heavy impact on vegetation. The importance of this time lag is that when deer numbers persist at high levels, in excess of the habitat's capacity to support them, this magnifies degradation of local vegetation, which can
significantly increase frequencies of other deer-human conflicts.

Biotic and abiotic factors, independent of human control, can substantially influence fluctuations in local deer numbers. For example, a large mast crop that improves late summer-fall nutrition will cause does to be in better condition, increase productivity, and enhance over-winter survival. Similarly, mild winters that favor survival allow more subadults to reproduce the following year. Conversely, decimating factors such as severe winters and lower nutrition will increase mortality and result in lower numbers of deer. However, "good" and "bad" years rarely alternate in sequence, nor do they occur in balanced predictable patterns. Consequently, herd numbers can build and decline with inertia that is difficult to change over periods of a few years.

The prevalent notion among the urban public that a "balance of nature" will maintain deer herd stability, particularly on small highly perturbed systems such as urban forest preserves, is parochial logic that largely ignores interannual herd dynamics and the resultant ecological and socio-economic consequences.

Public perceptions of deer are highly polarized. Some urban residents, particularly those that do not sustain deer-related property damage and have limited contact with wildlife, perceive deer as an extension of anthropomorphic animated creatures that are typically found in children's books and films. They view deer as benign, non-threatening herbivores that should be left in peace. Somewhere in the middle are conservation-oriented residents that see deer as a component of a system. They are concerned by impacts caused by deer, but are divided on what
actions should be taken because of differences in personal philosophies that range from protectionist to utilitarian. Sportsmen, who advocate consumptive use of wildlife resources through public hunting, represent the other extreme.

Consumptive use of deer as a renewable resource is a cornerstone of wildlife management in North America. Public firearm hunting is well recognized as a cost-effective method to regulate deer numbers in rural settings. However, in an urban environment where deer habitat is interspersed on human-dominated landscape, use of public hunting to limit deer numbers is strongly opposed by the urban majority. Opposition centers on concern for public safety, which is frequently integrated with philosophical positions that link and repudiate firearm use, hunting, and cruelty to animals.

The conflicting nature of deer in urban environments is relatively simple to summarize—even if management solutions are not. The presence of deer in urban environs is a product of local land-use decisions, which have placed high value on urban sanctuaries. Deer effectively utilize sanctuary resources and flourish because of their protected status. Under protected status, high deer numbers typically develop and can cause economic and ecological damage that often exceed human tolerance levels. Effective damage abatement can be achieved by a reduction in deer numbers, yet public hunting, a traditional cost-effective management tool used to regulate deer herds, is opposed by urban publics. With more intensive and costly effort, less efficient management tools can reduce negative interactions on areas of limited size, but are generally not feasible for
broad scale applications. Realistic answers to urban deer conflicts are not easily determined. Perhaps it is an understatement to say that urban deer management represents a major wildlife management challenge—one in which success hinges on a complex blend of ecological, political, and socio-economic factors. Irregardless of final solutions, management will have to be a continuing, probably annual effort, so long as habitat exists and deer have access to that habitat.

In this paper we suggest a framework on which to initiate a program of urban deer management for northeastern Illinois. The Illinois Natural History Survey (INHS) has studied urban deer conflicts in the Greater Chicago metropolitan area since 1983 and will complete it's stated research objectives in June 1989. This paper is not intended as a summary of INHS Urban Deer Study achievements, nor does it address specific research objectives. Development of an urban deer management structure is critically important but independent of INHS research objectives. However, we conclude that new initiatives will be necessary to implement final management recommendations because the scope of urban deer conflicts in the Chicago Metropolitan area far exceeds extant personnel commitments now available from local wildlife and land resource agencies. Provision of preliminary management recommendations, prior to research project completion, is done for the benefit of principal agencies to provide them lead time to develop, propose, and evaluate possible new initiatives on cooperative urban deer management within their respective systems.
It is essential that an interagency cooperative urban deer management structure be in place and operational before the research program ends. The INHS Urban Deer Study was specifically designed as a precursor to management with the intent that implementation of management would overlap the final phase of research. By this overlap, management personnel would benefit from INHS's guidance and experience, which will help eliminate costly mistakes that can delay and reduce effectiveness of future programs. In the sections that follow we:

- Describe urban deer habitat in Cook County
- Develop a perspective on current deer-human conflicts
- Assess extant deer management
- Develop the role of research as a precursor to urban deer management
- List specific management needs and goals
- Propose an organizational structure for the management of urban deer
- List benefits derived from the implementation of an urban deer management program in northeastern Illinois (Cook County)

PRESERVATION OF DEER HABITAT IN COOK COUNTY

Habitat preservation and restoration are key factors that have enabled deer herds to become reestablished in highly developed sections of northeastern Illinois. Since 1915, county governments have acquired large sections of non-developed and rural landscape for the "purpose of protecting and preserving the flora, fauna, and scenic beauties ... in their natural state and condition, for ... the education, pleasure and recreation of the public (Wendling et al. 1981)." County forest preserves
form the nucleus of primary deer habitat in northeastern Illinois.

The Cook County Forest Preserve District (CCFPD) is one of the oldest and largest county forest preserve systems in the United States. It is a mosaic of over 30 discrete refuges (range 16-6,070 ha) that comprise almost 12% (27,080 ha) of Cook County landscape. About 20% of CCFPD land has been developed for educational and recreational uses, which include 5 nature centers, Brookfield Zoo, Chicago Botanical Gardens, and an extensive system of maintained picnic and recreation sites. Non-developed properties are a diverse mixture of native hardwood forests, reforestations, riparian systems, old field succession, and leased agricultural fields. The general design of larger forest preserve properties involves concentration of human recreational impacts on peripheral sites and reduced access to interior sections.

Forest preserve properties vary in their degree of insularity. Private lands adjacent to forest preserves, particularly in north and central Cook County, have been extensively developed for residential, commercial, and industrial uses. In these areas, the interface between preserve and private property remains unfenced, although, a distinct line of demarcation is clearly evident by differences in land use. Deer concentrate on preserves but will readily cross heavily used roads to utilize resources on adjacent properties. Urban forest preserves will only become more insular over time. This will contribute to continuance, and perhaps escalation, of deer-human
DEER-HUMAN CONFLICTS

An increasing number of North American cities and special use areas (i.e., airports, arboretums, state parks and others) experience increasing frequencies of deer-human conflicts. However, to the best of our knowledge, deer-human conflicts in the Chicago metropolitan area represent an extreme because of high frequency of occurrence and wide dispersion of incidents. No metropolitan area compares with Cook County in magnitude and breadth of deer-human interactions--an urban environment where literally thousands of deer coexist among millions of people.

Reference to "the deer problem" in northeastern Illinois is frequently made as if it were a singular entity. This approach is convenient for brevity, but yields an oversimplified impression of extant deer-human conflicts. "The deer problem" in northeastern Illinois is not of singular type, nor one highly restricted in area. Instead, deer problems are a set of basic conflict types, spatially distributed across a broad area, that are uniquely influenced by site-specific conditions--conditions that change over time.

Reduced to the simplest divisions, there are 3 primary types of deer-human conflicts that occur repeatedly in urban environments. These include impact on plants through browsing or antler rubbing, spatial conflicts that cause accidents and/or general disruption of normal human activities and transmission of diseases. Although many site specific variations exist, all deer-related conflicts thus far identified in northeastern
Illinois are of the aforementioned three types:

**Damage to plants**

**Damage to ornamental plants.** Most extensive damage has occurred in northcentral and northeastern Cook County on properties near the Des Plaines River and the North Branch of the Chicago River. Browsing damage has been reported in northwest/central/southern Cook County, southeast and northeast Lake County, and DuPage County--Waterfall Glen Preserve (Table 1).

**Damage to native and restored plant communities.** Most obvious on forest preserves with high density deer herds-- Des Plaines River and Ned Brown Preserves in northern Cook County. Severe damage on Busse Woods State Nature Preserve, a 440 ac site, located on Ned Brown Preserve. Evidence of increased damage reported for Palos-Sag Valley in central Cook County (Dring, CCFPD, pers. commun.) and Ryerson Conservation Area near the Des Plaines River in southern Lake County (Brouillard, Lake Co. For. Pres. Distr., pers. commun.). Impact on native plant communities is also strongly suspected on Waterfall Glen Preserve, DuPage County.

**Damage to plant collections.** Arboreta have reported moderate damage from browsing and antler rubbing. A modest number of deer occupy Morton Arboretum and adjacent DuPage County Hidden Valley Forest Preserve. The Chicago Botanical Gardens in northeastern Cook County, located on forest preserve property near Skokie Lagoons/Chicago River north branch, has reported moderate deer browsing damage.

**Spatial conflicts**

**Deer-vehicle accidents.** Cook (N=469), Lake (N=250), Kane (N=124), and DuPage (N=76) counties rank 1st, 2nd, 8th, and 21st, respectively, for reported deer-vehicle accidents on state numbered highways in 1986 (unpubl. Illinois Dep. Transportation report) (Table 2). Fifty-three people were injured in deer-vehicle accidents in the 4-county area during 1986. Average economic loss per accident during 1986 was $1,480.60 (INHS, unpubl. data).

**Deer-aircraft accidents.** Two deer have been struck and killed by commercial airline jets (31 March 1982 and 17 March 1987) on O'Hare International Airport. Cost of repair exceeded $114,000.00 for the 1987 accident. Suitable habitat on O'Hare property adjacent to runway 14R/32L sustains a resident deer herd thought to be supplemented by occassional immigration from Des Plaines River herds (Indian Boundary Division). A minimum of 37 deer were counted near runway 14R/32L by aerial census during March 1987. Deer have also been reported on or near active runways at Glenview Naval Air Base, Midway Airport, and Palwaukee Airport in Cook County.
Deer in unusual locations. Individual deer frequently disperse into areas that are intensively developed. Dispersal frequently results in accidental death or injury to deer. Highest frequency of incidents occurs annually during spring. Between April-June 1987, displaced deer were reported to INHS: Arlington Park Race Track, Buffalo Grove, Chicago Animal Control (N=12 separate deer), Cook County Department of Animal Control, Glenview, Northbrook, Northwestern University, Palatine, Rolling Meadows, Wheeling, and numerous private citizens.

Disease transmission

California encephalitis var. Jamestown Canyon virus. Serology of all adult deer tested in northern Cook County has been positive for exposure to J.C. virus (P. Grimstad, pers. commun.). However, the IDOC currently feels that J.C. virus is of little concern to northeastern Illinois residents (T. Miller, IDOC, pers. commun.).

Lyme Disease. Lyme disease has received recent attention in scientific and popular articles (Warner 1986, Woolf 1986, Miller 1987). Lyme Disease has been reported in more than 20 states and at least 19 countries on 3 continents. High incidence was found in southern Wisconsin deer herds. A bacterial (spirochete Borrelia burgdorferi) infection transmitted by the deer tick (Ixodes dammini), manifests arthritic, heart inflammation, and nervous system dysfunction. No known records exist for northeastern Illinois (August 1987), although, the large number of urban deer interacting with a dense human population, represents an ideal situation for disease transmission.

Babesiosis. Transmitted by deer tick, babesiosis (Babesia microti) symptoms resemble malaria. Frequently isolated from ticks that also carry Lyme disease. First case reported in Wisconsin in 1985. No known records in northeastern Illinois (August 1987).

A fourth conflict type, collectively termed secondary conflicts, has extreme effects on urban deer management. Secondary conflicts involve public perception/opinion of management decisions and actions. Single incidents that are poorly handled can inflict long-term damage to program credibility. Poor judgment displayed by ill-prepared professionals during traumatic incidents, such as injured or displaced deer situations, are often magnified to highly
detrimental proportions by public and media. Even well-planned management actions have potential for controversy because of polarity and intensity of public and media opinion on deer issues. Awareness and control of secondary conflicts are as critical to program success as is the direct management of urban deer. Public criticism should always be anticipated and prepared for in advance. Preparation will help a manager or an agency maintain a positive position, rather than being forced into a negative or reactive response.

Secondary conflicts

**Incidents that involve injured deer**

Over 50 injured deer were handled by INHS personnel, without major incident, from 1984 through 1986. The majority resulted from deer-vehicle collisions when deer sustained fractured legs and non-lethal internal injuries. Observation of a large, struggling, bloody animal, often with twisted limbs, is an emotionally traumatic experience for most people. Over time, we recognized that injured deer situations involved two major problems that needed to be assessed and controlled. Readily apparent was need for humane and efficient handling of the injured deer. However less obvious, was recognition that the individuals present, including some police officers, typically experienced emotional trauma which influenced their behavior and ability to make rational assessments.

**Malnourished deer and winter mortalities**

As a rule, in both rural and urban environments, deer mortality is high during severe winters with extended periods of low temperature or deep snow. In general, individual animals die unnoticed in rural settings. However, urban forest preserves are extensively used by humans for winter recreation which increases probability that people will find carcasses or animals in weakened condition. Public factions address winter dieoffs according to their own special interests, and ill-prepared agencies may be pressured into reactive positions. Public-offered "solutions" range from artificial feeding and translocation to condemnation by some sportsmen who view deer mortality as a wasted resource that should have been utilized via annual hunting. The last episode of high winter mortality in northeastern Illinois during the early 1980's contributed significantly to the
decision to conduct research on urban deer herds (T. Miller, IDOC, pers. commun.). Since that time, herds have increased in size, aided by the consecutive mild winters of 1985-86 and 1986-87. There is current need for management agencies to discuss and prepare responses prior to future winter dieoffs which will surely occur in the next few years.

STATUS OF DEER MANAGEMENT IN COOK COUNTY

Illinois Department of Conservation

Two personnel are currently involved in deer management activities in Cook County. Such work is not, however, the principal duty of either. A District Wildlife Manager (DWM), responsible for a 5-county-area and based in DuPage County, responds to property owner complaints on deer browsing damage. The IDOC Forest Game Supervisor/state deer biologist (FGS), headquartered in Springfield, issues Nusiance Deer Removal permits and generally functions in an advisory capacity on urban deer issues. Pittman-Robertson funds administered by the FGS supported the INHS Urban Deer Research Project from 1983 to the present.

Exclusive of INHS research activities, we know of only one attempt in Cook County to manage a deer herd by direct removal. In 1982-83, following a deer-aircraft collision at O'Hare International Airport, the IDOC and U.S. Fish and Wildlife Service implemented a series of herd reduction efforts in which a total of 22-23 deer were removed from O'Hare property by shooting. Between 1983 and 1987, O'Hare personnel live-trapped deer in an attempt to offset herd increase. Their efforts were clearly ineffective as only 3-5 deer (Gebhardt, O'Hare, pers. commun.) were captured and translocated. A minimum of 37 deer were counted on O'Hare property in March 1987 (INHS, unpubl.)
Cook County Forest Preserve District

The CCFPD employees 23 naturalists dispersed county-wide among 7 locations (CCFPD Conserv. Dep., pers. commun.). As a group, the naturalist staff provides skilled nature interpretation and possesses excellent communicative abilities in their primary role as public educators. The CCFPD does not directly manage deer, although, land use decisions that influence availability and quality of deer habitat profoundly affects demography of the local deer herds.

Carcass disposal and consumptive use of deer

Deer carcasses on public highways are removed by the Illinois Department of Transportation (state highways), Cook County Highway Department (county roads), and township and municipal road maintenance crews. The IDOC allows the general public to salvage carcasses of deer killed by vehicles. The claimant must contact an IDOC regional office within 24 hours of carcass possession.

Cook, DuPage, Kane, and Lake counties have remained closed to public firearm hunting for deer. Archery hunting for deer on private land is permitted by the IDOC in all Illinois counties. A 1964 Cook County ordinance that prohibits archery hunting for deer is in conflict with state regulations (Dziedzina 1984). A limited number of deer are killed annually by archers hunting on private land in Cook County (reported kill during 1986: 12 bucks and 3 does; unpubl. data, IDOC).
THE INHS URBAN DEER STUDY: A PRECURSOR TO MANAGEMENT

Background

Prior to 1983, deer herds in northeastern Illinois had never been intensively studied. To our knowledge, neither the IDOC nor the CCFPD have historic records of comprehensive censuses, or related demographic data, for deer in Cook County. The most valuable data collected on deer herds prior to 1983 include: 1) deer-vehicle accident records for state numbered highways from 1975-present (Illinois Department of Transportation, unpubl. data), and 2) records from deer carcass examinations (weight, sex, age, & location) performed by naturalists at the River Trail Nature Center naturalists (CCFPD) in the late 1960's and early 1970's (Schwarz, CCFPD, unpubl. data).

In early 1983, the IDOC contracted with the Illinois Natural History Survey for a study of white-tailed deer ecology, deer-human interactions, and management options in northeastern Illinois. Research emphasis was guided by anticipated future management needs that included: 1) collection of baseline data to establish herd and habitat profiles, 2) assessment of deer-human interactions, 3) evaluation of alternative management strategies, 4) development of interagency cooperation, 5) public awareness and participation, and 6) pilot studies to explore issues and to establish management precedents (see project objectives, Appendix B).

Accomplishments

The first 4 years of research were successful. Preliminary baseline data were collected, deer-related damage was assessed,
cooperative contacts among agencies and the public were developed, and experimental manipulation of a high density herd was initiated.

Benefits derived from the use of research as a precursor to management extend beyond the final written products that will address research objectives. The presence of state sponsored research has temporally filled a management void and is considered to be a response by the IDOC to public needs—as yet, however, no permanent actions have been taken. Progress has been made in developing cooperative community support of programs, establishing precedence in areas of controversy, and in testing elements of program structure:

Local cooperation and direct participation – Viewed as a risk among management agencies, the success of urban deer management is dependent on shared responsibility among state and local governments, private organizations, and the public. The prevailing cooperative attitudes among agencies and individuals has evolved over time and should be regarded as a base on which to establish a future program of deer management.

Example: An IDOC committement to fund 6-year urban deer research program.

Example: Cook County Forest Preserve District, cooperator from project inception, offered logistic support, office space, and financial support for Busse Woods deer reduction program.

Example: Illinois Nature Preserves Commission, offered additional financial support for Busse Woods deer reduction program.

Example: A carcass collection program that involved network of 89 agencies/individuals that reported locations of carcasses over a 23-month period.

Example: Assistance of > 200 public volunteers used to handle deer during live-capture, mark, and release activities. Large groups of individuals (> 25) assembled for trap and translocation, and drives.
Example: Establishment of a Community Liaison Committee that links Urban Deer program to the public through community leaders.

Example: Cooperative nutritional assessment research with Brookfield Zoo and Michigan State University staff.

**Precedence establishment** - Actions once established are accepted more readily than new initiatives.

Example: Herd reduction on Busse Woods Nature Preserve represents capability of management to reduce and control maintain herd size, when and if, such actions are warranted.

Example: Donation of carcasses for human consumption. Agencies would receive severe criticism if carcasses of deer culled during herd reduction were not used. On a pilot study venison from 52 deer was donated to charitable organizations for human consumption.

**Pretest of management structure** - Successful elements of research programs can be emulated by management.

Example: One project spokesperson, central source of consistent information. On-site knowledge that is current, reliable, and sensitive to local conditions.

Example: Two person management team. Division of responsibilities into high profile public contact and low profile field emphasis is ideally suited to address program goals and objectives.

Example: Interagency cooperative support.

Example: Preparation of written news releases in advance of potentially controversial activities. Release made only when and if necessary, usually after-the-fact.

**On-site presence and lag-time** - Research program has provided the time necessary for state and county governments to evaluate options without becoming locked into firm management commitments. On-site presence of deer biologists has filled a personnel void when temporal responses to the public were desired.

Example: IDOC and CCFPD routinely refer public and media to INHS to answer questions on deer/wildlife conflicts.

Example: IDOC forwarded deer damage complaints to INHS as potential sites for research on removal.
PROGRAM NEEDS AND GOALS

Management of urban deer herds is a choice that is largely determined by community tolerance for deer-related conflicts. The collective responsibility of wildlife and land resource agencies is to be a working extension of public and community needs. To accomplish this, it is essential that state and county governments possess high level professional expertise in all aspects of urban deer ecology, public relations, and on-site management capabilities to address deer-related issues if and when such actions are warranted. Present staffing is inadequate to meet current needs.

NEED: DEVELOP ON SITE STATE-OF-THE-ART EXPERTISE ON URBAN DEER ECOLOGY AND MANAGEMENT

NEED: POSSESS ON SITE CAPABILITY TO EVALUATE AND PERFORM MANAGEMENT RESPONSES NECESSARY TO REDUCE OR MITIGATE DEER-HUMAN CONFLICTS

Management of urban deer is a responsibility that must be shared among state and local governments, and the public. No single agency can effectively perform all duties necessary to mitigate urban deer conflicts. Therefore, efforts to improve or facilitate capabilities of other organizations (indirect management) are as important as activities that are directly involved with the management of urban deer. Lead agencies will need to develop cooperative programs that utilize the wide range of available local resources and to promote a community philosophy of shared responsibility.

NEED: DEVELOP COOPERATION AMONG LEAD AGENCIES, LOCAL GOVERNMENTS, AND THE PUBLIC IN ADDRESSING DEER MANAGEMENT ISSUES

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It is not practical for an urban deer management program to be directly involved in all crises relating to individual animals. Deer are injured and/or found in unusual locations almost daily across the Greater Chicago Metropolitan area. It would be logistically impossible to provide adequate and timely response to every situation from a single central location.

Injured and displaced deer incidents are almost always reported first to municipal police departments. Village, county, and state police departments are the agencies best suited to handle routine emergency situations because they have: 1) the first officials present at an accident scene, 2) directional authority over the public, 3) experience in working with people under stress, 4) direct radio communication with a dispatcher, and 5) authority to discharge a weapon if necessary to dispatch an injured deer. Many municipalities have animal control wardens as a part of their law enforcement, although most are not available at night, and few are prepared to handle injured wildlife the size of deer.

Clearly, there is a continuing need to work with local police to improve and maintain their ability to handle situations that involve injured and displaced deer. The role of the Urban Deer Management Program would be to assess extant response capabilities and provide technical information including seminars or training to improve these capabilities. We believe that a computerized system could be developed that would help identify jurisdictional response for all areas in Cook County. Ultimately, the scope of this network could be expanded to include other forms of wildlife problems.
NEED: ASSESS CAPABILITIES OF MUNICIPALITIES TO HANDLE INJURED OR DISPLACED DEER

NEED: FACILITATE NEEDS OF MUNICIPALITIES IN HANDLING INJURED OR DISPLACED DEER THROUGH INDIRECT MANAGEMENT (INFORMATION, EDUCATION, AND EXTENSION).

The INHS Urban Deer Study was initiated in 1983, in part to establish a data base on local deer herds from which management decisions could be derived. Deer numbers and habitat resources will change over time thereby necessitating the need to continually update data collection. Provisions to monitor environmental factors such as population parameters, habitat conditions, and deer-related damage are a necessary on-going function of urban deer management.

NEED: LONG TERM DATA COLLECTION ON LOCAL DEER HERDS AND HABITATS

Urban deer management is not unique to Chicago--other regions are, and will be, facing similar deer-human conflicts. Much can be learned through contact with deer managers as they address their own site-specific problems in other areas. Thus, there is a need to identify key individuals involved in management of urban deer herds and to develop means for periodic contact to enhance exchange of information and experiences.

Since the start of the INHS Urban Deer study, we have been contacted by urban deer biologists/managers from Boulder, Colorado; Cleveland, Ohio; Connecticut, Madison, Wisconsin; Midland, Michigan; Milwaukee, Wisconsin; Minneapolis, Minnesota; New York, Texas, and Winnipeg, Canada. There is an outstanding opportunity to learn from other urban deer management situations,
and, perhaps, to take the lead to coordinate an information exchange among these widely dispersed regions.

**NEED:** COORDINATE INTERACTION AMONG OTHER URBAN DEER PROGRAMS

A majority of urban residents do not sustain wildlife damage to personal property. Most are relatively naive about deer impacts to "community-owned" property such as floral and faunal resources on local sanctuaries. Attitudes and perceptions of these "non-affected" constituents can have a major influence on any management program. Therefore, the need to improve public awareness of deer damage, ecology, deer-human conflicts, and the wildlife resource as a whole, should be an integral component of an urban deer management program.

**NEED:** IMPROVE PUBLIC AWARENESS OF DEER ECOLOGY AND RELATED CONFLICTS

Attempts to resolve deer-human conflicts are potentially controversial. An urban deer management program should purposefully incorporate positive elements in such programs that will help offset any negative influences. Opportunities to expand a deer management program into a broader urban wildlife program should be considered as a long-term goal.

**NEED:** TO MAINTAIN A POSITIVE PROGRAM IMAGE

**NEED:** TO EXPAND FROM URBAN DEER CONFLICT RESOLUTION INTO A COMPREHENSIVE URBAN WILDLIFE PROGRAM

Urban deer management needs can be restructured into the following long-term goals:
- To facilitate cooperative management programs based on the principle that urban deer conflict resolution is a responsibility shared among state agencies, local governments, and the public.

- To develop state-of-the-art expertise on urban wildlife management and local deer ecology that can be readily accessed for the purposes of public education, and to provide a basis for management evaluations.

- To develop on-site staff capabilities necessary to reduce or mitigate deer-human-ecological conflicts in response to deer-related problems of urban communities and local governments.

- To increase public and local agency awareness of urban deer ecology and to promote broader understanding of the consequences of an urban environment shared with wildlife.

- To develop and maintain a positive image for wildlife management.

**URBAN DEER MANAGEMENT PROGRAM STRUCTURE**

We stress that solving urban deer problems is a community obligation, yet there is need for lead agencies to coordinate and focus community efforts. Responsibility rests with the state wildlife agency and the principal owners of land where deer reside. The Illinois Department of Conservation (IDOC) is legal custodian of non-migratory wildlife and clearly has partial responsibility for urban deer management. In Cook County, the forest preserve district administers properties that total 12% of county landscape. Forest preserve sanctuaries are the primary locations of habitat that sustains large deer herds. Therefore, as principal landowner of deer habitat, the CCFPD shares co-responsibility with the IDOC as lead agencies for the management of urban deer in Cook County.
The urban deer management team that we propose should be partitioned into two basic areas of staff responsibility in order to achieve program goals. The first set of duties involves indirect management of deer—actions that will facilitate more professional and efficient handling of deer problems at municipal and private citizen levels. The second set of activities involve direct management—deer management actions that cannot, or should not, be delegated to other organizations or individuals such as the control and monitoring of deer herds on selected county forest preserves.

Indirect management will be a key element in meeting program goals and coordinating community involvement and understanding. The major function of indirect management is urban wildlife extension:
o Facilitate municipal responses to deer-related crises
  a) Assess response capabilities of municipalities
  b) Coordinate training of municipality personnel
  c) Network information transfer among municipalities

o Provide information and education to cooperating agencies
  public and media
  a) Accumulate and update technical expertise
  b) Survey public opinion on selected issues
  c) High profile single program spokesperson

o Unify information transfer among urban deer management
  and research programs in North America

o To supervise direct management activities

o To explore special projects in urban wildlife management
  that will benefit the wildlife resource, educate the
  public, and enhance program image

  Direct management is an essential program component, not
necessarily because it will be used in all cases, but because the
choice to exercise management options should remain readily
available. Furthermore, control programs such as herd reduction
on Busse Woods Nature Preserve, require long-term ecological
monitoring with periodic adjustments in herd size. The major
function of direct management is to affect solutions to deer-
related problems on county forest preserves and adjacent private
property:

  o Proficiency and experience in deer removal
    a) Live capture
    b) Lethal removal

  o Coordinate deer translocation and carcass disposition

  o Expertise in non-lethal techniques to reduce damage
    a) Barriers
    b) Repellents
Cook County has over 5 million human residents--each with a different voice. Each resident should have the means to express his or her concerns on management of urban deer. Also, there is need to disseminate information to those individuals in the community with expressed interest in urban deer management. Obviously, an urban deer management team cannot interact with every such person. The INHS Urban Deer study has successfully interacted with a Community Liaison Committee (Table 3) and has found it to be a useful organizational structure and one that could help meet the need for 2-way communication.

We suggest that a similar committee, composed of upper level administrators from organizations that have interests in urban deer management, be assembled to provide an advisory function as a part of the urban deer management program organizational structure. The "Urban Deer Management Committee" should represent a wide spectrum of interests and philosophies,
and should function in an advisory capacity only. Final authority for decisions and actions should remain with lead agencies. The shift from research to management offers opportunity to retain the current Liaison Committee, or reorganize committee composition as desired.

Possible routes of information transfer

Cooperative wildlife extension programs have traditionally been based on individual and small group contacts. However, a much broader scale of public contact would be necessary for urban wildlife extension needs. To this end, efforts should be made to use information transfer systems that are already established. Greater efficiency will be achieved when information can be
routed through intermediate cooperators. The following example lists some of the potential routes of information transfer:

Herd reduction-- a community supported decision

Herd reduction and subsequent control should not be attempted without adequate community support. Potential conflicts should first be acknowledged at community or agency levels before any action is taken. Deer may have a substantial impact on community resources, but if the community in general does not perceive a problem, then there is no basis of public on which to implement management actions. On deer issues, one
should not expect agreement among all individuals. However, it is not necessary to have majority support—only consensus. Perhaps, the best measurement of community recognition of a deer problem is whether or not the constituents that sustain deer damage have convinced community leaders to publically support efforts to mitigate the damage. If this level of community support is attained there is basis to evaluate alternative management actions.

Herd reduction by INHS on Busse Woods Nature Preserve provides an example of recognition of a deer problem by the community, and community support for resolution of the problem:

- Demographic and ecological baseline data were collected
  
  In 1983-1984, INHS Urban Deer study personnel identified 2 sites (Busse Woods and northern Des Plaines River forest preserves) in Cook County, where vegetation was severely impacted by high deer densities. Baseline data were collected on herd demography, physical condition, vegetation, and deer-related impacts. The landowner (CCFPD) and IDOC were apprised of herd and habitat conditions.

- Public recognition of a problem
  
  In spring/summer 1985, Mr. George Fell, Natural Land Institute, identified severe vegetation degradation at Busse Woods Nature Preserve and suggested to the Illinois Nature Preserves Commission (INPC) that deer exclusion was necessary to restore floral composition on the highly impacted preserve. The landowner (CCFPD) evaluated construction/maintenance costs of fence and solicited opinions from wildlife professionals on fence effectiveness. The CCFPD decided that fence construction was not a cost-effective solution to reduce deer browsing impacts.

- Support from community leaders
  
  In August 1985, the INPC toured Busse Woods Nature Preserve and observed deer-caused impacts to vegetation. The tour was followed by strong INPC support for herd reduction.
Development of herd reduction plan, objectives, and decision rule

In August 1985, the INHS Urban Deer Study proposed an experimental herd reduction that included 3 objectives:

- To reduce deer browsing pressure to level that allows for plant understory regeneration
- To significantly reduce deer-vehicle collisions on adjacent highways
- To significantly improve average deer condition

A decision rule was adopted to maintain deer density at or below 8 deer/km2 (20 deer/mile2).

Multi-agency cooperative support

Cooperative funding for herd control was provided by the IDOC, CCFPD, and INPC. Herd reduction plans were discussed at a Community Liaison Committee meeting.

Implementation of herd reduction

Over a 2-year-period, October 1985-April 1987, 259 deer were removed from Busse Woods Nature Preserve and adjacent areas by INHS personnel.

Evaluation

INHS personnel established permanent transects and plots to quantify vegetation responses to lowered browsing pressure. Deer-vehicle accidents were summarized annually from records of police departments adjacent to Busse Woods. Herd condition was monitored through postmortem evaluations of collected deer. Aerial counts were conducted annually.

Annual control and long-term monitoring

Provisions were made by INHS to control herd size and monitor vegetation, vehicle accidents, and deer condition until completion of research in July 1989.

Suggested division of responsibility among lead agencies

These recommendations are based on the assumption that all funding for an urban deer management program will be shared by lead agencies (i.e., IDOC and CCFPD). We recognize that the actual division of any funding would be negotiated. The critical point is that each organization would make a substantial
commitment for program support. The commonly raised argument of "who is responsible" for urban deer management is irrelevant in that the typical urban resident does not differentiate between state and county. Both agencies sit in the same "conservation pot" in the eyes of the public. A positive relationship can only be developed if agencies recognize that effective urban deer management can be best achieved through mutual trust, and with contributions that are equitable, and clearly defined. It is essential that lead agencies recognize the positive benefits attainable only through their shared cooperation.

Two staff positions are called for and need to be administered by one organizational structure; we suggest that the IDOC accepts this administrative responsibility. This would be consistent with the IDOC's current role in funding INHS research and consistent with the IDOC's normal role and expertise in wildlife management. If permanent positions cannot be established, perhaps because of head-count limitations, then use of contractual services should be investigated for an interim period until permanent positions can be established.

It is reasonable that long-term contributions of CCFPD would also be similar to the support that it has provided to the INHS Urban Deer Study. Specifically, the CCFPD has provided 1) office space, 2) a one-year, $22,000.00 contract for deer herd reduction, and 3) occasional logistic support as needed.

The IDOC is best qualified to estimate costs needed to support an urban deer management program. For the purpose of suggesting initial contributions for lead agencies, we estimate that program costs would be about $100,000.00 per year. An
equitable division of IDOC:CCFPD support would approximate a 60:40 ratio. Cooperative support should be predicated on multi-year agreements that guarantee funding for minimum periods of 3-5 years.

**Cook County Forest Preserve District**

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
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<td>Direct funding</td>
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<td>Fuel for 2 vehicles</td>
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<td>Office space at CCFPD facility credit</td>
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<td><strong>Subtotal</strong></td>
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**Illinois Department of Conservation**

<table>
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<th>Description</th>
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<tr>
<td><strong>Total project budget per year</strong></td>
<td><strong>$100,000.00</strong></td>
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**Potential benefits from a cooperative urban deer management**

A cooperative urban deer management program will provide a unified coalition between state and county with shared goals on urban wildlife damage abatement. On-site professionals will be capable of mitigating deer damage, if and when actions are warranted. A cooperative urban deer program will standardize means for addressing deer issues on county property, and will provide mechanisms for ecological monitoring and collection of new data. Such data, will identify population and habitat trends that will help predict future deer-related problems.
LITERATURE CITED


35


Table 1. Locations of deer browsing damage on ornamental plants as reported to the Illinois Department of Conservation (Garrow, pers. commun.) and the Illinois Natural History Survey.

<table>
<thead>
<tr>
<th>County</th>
<th>Village</th>
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<td>Mt. Prospect</td>
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<tr>
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<td>E. Lake Shore Dr.</td>
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<td>Woodley Rd.</td>
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<td><strong>DuPage</strong></td>
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<td></td>
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<td></td>
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Table 2. Number of deer-vehicle accidents reported on state numbered highways in northeastern Illinois between 1978-1986 (Illinois Dep. Trans., unpubl. records).

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<td>443</td>
<td>473</td>
<td>641</td>
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Table 3. Agencies and organizations with representatives serving on the Community Liaison Committee for the INHS Urban Deer study.

<table>
<thead>
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<th>Agency/Organization</th>
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<tr>
<td>American Humane Association</td>
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<tr>
<td>Fund for Animals</td>
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<td>Great Lakes Outdoor Writers</td>
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<td>Illinois Audubon Society</td>
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<td>McGraw Wildlife Foundation</td>
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<td>Morton Arboretum</td>
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<td>O'Hare International Airport</td>
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<tr>
<td>Sierra Club</td>
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<td>U. S. Department of Agriculture</td>
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Appendix A. North American cities and special use areas (airports, arboretums, state parks etc.) with recognized deer-human conflict(s).

Angel Island, California- 1 mile² island in San Francisco Bay. Administered by California State Park system. Severe damage to native vegetation. Deer habituated to people. Long history of deer reduction and control of black-tailed deer (Odocoileus hemionus). Culling by marksmen stopped by San Francisco Anti-cruelty society. Live-trap and translocation > 200 deer viewed as not cost effective. Experimental use of chemosterilents unsuccessful in controlling rate of increase of herd. Currently, deer are shot by professional marksmen with carcasses donated to charities.

Boulder, Colorado- city is located in foothills on traditional mule deer (Odocoileus hemionus) winter range. Conflicts with deer-vehicle accidents and browsing damage to ornamental plantings. Active research and monitoring program on 17 mile² area. Herd size estimated at 700-1000 deer.

Carey Arboretum, Millbrook, New York- research on deer fence and repellents. Special regulated sport hunting.

Cleveland, Ohio- limited study of deer movements on municipal park district properties. Ohio State graduate student presently on followup study.

Front Royal, Virginia- Smithsonian, National Zoo property. Controlled hunting stopped through political process initiated by animal protectionist group. Deer herd studied by graduate students. Currently, deer driven from fenced property by drives. Research proposal to study impact of deer on rodent survival.


Ipswich, Massachusetts- Crane Memorial Reservation, 2100 ac. Research on deer management computer models, evaluation of deer impact, recommendations for herd reduction.

cont.
Appendix A. (cont.)

Madison, Wisconsin—Deer browsing and antler damage on Univ. of Wisconsin-Madison Arboretum. Graduate student studied deer removal techniques, reduced herd from 50 to about 4 deer. Subsequent live-trapping program did not offset rate of herd increase. Current herd size about 40 animals.

Milwaukee, Wisconsin—occasional deer conflicts in city handled by Milwaukee Humane Society (Nielson, pers. commun.). Schlitz Audubon Center has active deer removal program using live-traps and translocation technique. Removal integrated into naturalist program. Center is 188 acres with deer herd of < 50 animals (Nichols, pers. commun.).


Pittsburgh, Pennsylvania—Pittsburgh Airport has active deer removal program. Electric fence borders active runways.


Appendix B. Illinois Natural History Survey Urban Deer Study
research objectives.

Job No. 104-1
Biology and ecology of urban deer

Objective: To investigate and quantify pertinent aspects of life history, ecology, health, abundance, dynamics, and distribution of deer in metropolitan areas of northeastern Illinois relative and necessary to their successful management.

Job No. 104-2
Deer range evaluation for metropolitan northeastern Illinois

Objective: To measure, map, and otherwise quantify and qualify the present and potential deer range of northeastern Illinois including assessments of present impacts on vegetation.

Job No. 104-3
Management strategies and implementation of experimental control of urban deer

Objective: To design, implement, and evaluate possible alternative strategies for management of deer in urban areas with special respect to northeastern Illinois. Pilot management programs to be undertaken as cooperative programs with the Illinois Department of Conservation and local public agencies sustaining significant deer problems.

Job No. 104-4
Data base management, analysis, and reporting on urban deer research

Objective: To compile, organize, computerize, and manage for ready access, security, and preservation all data resulting from this study relating to deer, deer range, and other aspects of natural resource information generated by this project. Data to be integrated into data base.