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EIGHTH ANNUAL REPORT OF THE PRAIRIE GROUSE COMMITTEE, ILLINOIS CHAPTER-THE  
NATURE CONSERVANCY

Period Covered: 1 July 1974 through 30 June 1975

Date of Preparation: Winter 1975-76

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History Survey, Effingham

POPULATION STATUS: JASPER COUNTY DOWN, MARION COUNTY UP

There were 175 prairie chicken cocks counted on seven census areas in five counties of south-central Illinois in the spring of 1975. This total was 18 percent lower than counts made on the same census areas in 1974 (Table 1).

In Jasper County, counts made in 1975 revealed a total of 102 cocks, a decline of 29 percent from the 143 cocks counted at Bogota in the spring of 1974 (Table 2). This decrease represented a second consecutive spring decline after the population's steady increase from the low point of 37 cocks in the spring of 1968. As in 1974, the 1975 decline was attributed to a poor nesting season the previous year. Intensive nest studies at Bogota in both 1973 and 1974 documented the lowest levels of nest success (31 percent and 41 percent, respectively) recorded in the past 12 years. Three years of abnormal weather (mostly too wet)--and the detrimental effects of the abnormal weather on nest cover--a reduced food base for predators, and a high rate of predation on nests (and probably broods, also) were the factors to which the poor hatches of 1973 and 1974 were attributed. It appears that harassment, competition, and nest parasitism from an increasing local pheasant population have also become serious problems at Bogota.

Despite the population decline, more prairie chickens used the 80-acre Jamerson McCormack Sanctuary on the south edge of the study area in 1975 than in 1974. As many as nine cocks, with up to 11 hens, were observed booming on and near the McCormack 80 in the spring of 1975 as compared with four cocks in 1974, two cocks in 1973, and one cock (the first since acquisition in 1965) in 1972.

The flocks associated with sanctuaries in Jasper and Marion counties constituted 85 percent of the known statewide population of prairie chickens in 1975. In 1975, all booming grounds were again located within, on, or adjacent to the sanctuaries at Bogota and each of the seven sanctuary complexes supported at least one booming ground. In Marion County, the flock near Farina increased from 25 cocks to 35 cocks. The flock near Kinmundy-Forbes Park dropped from 13 cocks to 12 cocks (Table 1).

The four flocks not associated with sanctuaries declined 22 percent, collectively, from 1974 to 1975. The flock near Mt. Erie in Wayne County declined from nine to eight cocks. The Clay County flock near Bible Grove dropped from eight to four cocks. The flock near Hoyleton in Washington County declined from 10 to 9 cocks. A previously unreported booming ground containing five cocks was located near New Minden in Washington County about 4 miles west of the Hoyleton booming ground.

In general, the Bogota flock did not fare as well as the small flocks outside the main sanctuary system. The apparent difference in success was probably a result of the small numbers of birds involved in the outlying flocks. The hatching of only one or two clutches would probably be sufficient to maintain the outlying populations at their low levels. These small flocks of prairie chickens would be less available to predators than the larger flocks at Bogota. Prairie chicken nests would probably be so few and so scattered that they would not be readily found by predators.

The Bogota flock, on the other hand, is large enough to provide more readily available prey. In fact, the density of prairie chicken nests on sanctuaries at Bogota exceeded by 15 percent (1973) and by 42 percent (1974) the recorded density of nests of all other ground-nesting birds combined. Other ground-nesting species include quail, pheasant, mourning dove, upland sandpiper, meadowlark, and grasshopper sparrow.

#### BOOMING GROUND VISITORS CONTINUE TO AID RESEARCH

During the spring of 1975, 437 persons visited the prairie chicken booming grounds in Jasper County on a reservation basis. From a beginning of 56 people in 1966, the number of visitors has increased each spring. Through the spring of 1975 2,714 visitors had spent a morning in the blinds. In the spring of 1975, 60 groups representing 16 different universities and colleges, 9 Audubon clubs, plus numerous other agencies and individuals, were present on 29 different mornings. We try to limit the number of visitors to 20 per morning. Illinois supplied 59 percent of the visitors in 1975, Indiana 22 percent, Ohio 10 percent, and lesser numbers came from Pennsylvania, Missouri, Tennessee, Kentucky, and Washington, D.C.

Visitors aided the research project by recording their observations during 78 blind mornings (one or more observer per blind per morning). Observer records indicated that the period of 29 March through 13 April was the peak of hen activity on the display grounds. The first copulation in 1975 was noted on 1 April. A peak in mating activities occurred between 6 April and 14 April. A total of 55 prairie chicken copulations were observed by visitors in blinds last spring.

Marsh hawks continued to be the most common source of disruption on the booming grounds; harriers were noted on 61 of the 78 blind mornings last spring. There was no evidence of kills of prairie chickens by harriers, but

circumstantial evidence indicated one kill by a red-tailed hawk. Cock pheasants were seen during 12 blind mornings. On two mornings, aggressive behavior by pheasants toward prairie chickens was noted. Visitors also witnessed interactions between prairie chickens and crows, coyotes, raccoons, dogs, and killdeers. Airplanes also caused some disturbance among prairie chickens.

Better facilities are needed for visitors at our field headquarters on the Mr. and Mrs. Chauncey McCormick Sanctuary in Jasper County. Plans call for the Illinois Department of Conservation to construct two state-approved vault toilets, a graveled drive and 5-car parking area, a water system, and a pole building--suitable for visitor orientation, field office, and storage for equipment, seed, and blinds. We hope that the transfer of 4.7 acres (the old farmstead portion) of the McCormick Sanctuary to the Department of Conservation can be completed soon to permit the IDC to start this needed capital improvement in the spring of 1976.

#### NEST SUCCESS: LOW AGAIN IN 1975!

For the third consecutive year, nest success at Bogota was below 50 percent. Of the 59 nests found in 1975, 24 (41 percent) were successful, 29 (50 percent) were destroyed by predators, and 5 (9 percent) were abandoned. The fate could not be determined for 1 nest. Nest success in 1975 was essentially unchanged from 1974 despite the apparently more favorable spring weather conditions in 1975.

Over a 12-year period (1963-74) the four major trends in the population level of prairie chickens at Bogota have been well correlated with nest success as indicated by our sample of 513 nests. Average hatching success and population responses were as follows: (1) 36 percent average success--decline for 2 years (1963-64); (2) 48 percent success--relative stability for 3 years (1965-67); (3) 62 percent success--increases for 5 consecutive years (1968-72); and (4) 36 percent average hatch success--declines for 2 years (1973-74) (Table 3). Also, analysis of the annual population changes with nest success for the 12 years revealed a significant correlation ( $r = 0.556$ ,  $P < 0.05$ ).

Thus, it is now evident that success of nests must average 50 percent for a population of greater prairie chickens to maintain its numbers. The primary limiting factor acting on the Bogota prairie chicken population appears to have shifted from poor nest success caused by spring plowing of nests in insecure cover on private land during the years 1963-68, to poor nest success due to predation on sanctuary land in 1973-75. Opossums, raccoons, skunks, and coyotes, in that order, are believed to be the major predators involved in nest destruction on the sanctuaries. As the success of nests at Bogota in 1975 was only 41 percent, we cannot be optimistic for that population in the spring of 1976. There were a few promising signs, however. Although the number of fertile eggs per clutch was unchanged, the number of

hatched eggs per clutch increased from 8.9 in 1974 to 9.6 in 1975, and the hatchability of eggs increased from 82.3 percent to 93.0 percent. These increases resulted in more chicks being produced per successful nest in 1975.

Also, a hen kill occurred at only 1 (3 percent) of the 29 destroyed nests in 1975. The mean rate of hen kills at destroyed nests was 12 percent over the previous 12-year period.

It is hoped that these favorable indicators, plus the apparently favorable brood-rearing conditions in 1975, mark at least a slowing in the population decline of the past 2 years at Bogota.

For the past 3 years, when overall nest success was low, five sanctuaries have demonstrated high rates of nest success. These sanctuaries (Marks, J. McCormack, Fuson, Otis, and Galbreath) are all on the periphery of the sanctuary complex and have supported lower densities of prairie chickens than sanctuaries in the core of the area (Yeater, Field, McGraw, Donnelley, and C. McCormick). During 1973-75, 190 prairie chicken nests were found on the core sanctuaries of which only 61 (32 percent) hatched. During the same period, 11 of the 17 nests (65 percent) found on the outlying sanctuaries hatched. Apparently, predation on prairie chicken nests increases as nest density increases. However, nest densities of other prey species must also be considered. In 1972, the nest density of prairie chickens was the highest ever recorded on the sanctuaries, yet nest success was 65 percent. But nests of small mammals and ground-nesting birds were also plentiful.

Our sanctuaries may be providing "islands" of habitat that support high numbers of prey species, thus attracting significant numbers of predators. As prairie chickens increase on individual sanctuaries, we may expect increased rates of nest predation. Especially high rates would be expected in years when prairie chickens maintain their numbers while other prey species decline.

The current high levels of predation on prairie chicken nests still escapes adequate explanation. Such factors as inclement weather, a low food base for predators, pheasants, and perhaps unrealistically high densities of prairie chicken nests are no doubt involved. In addition, the massive alteration of habitat on the 8,000 acres acquired by Central Illinois Public Service Company for their electrical power generating complex near Bogota has undoubtedly resulted in altered numbers and dispersal patterns of a sizable mammal population. Habitat for many of the dispersing predators likely includes the nearby prairie chicken sanctuaries.

Solutions to the problem of controlling predation on chicken nests are equally elusive. Nevertheless, we must continue efforts to eliminate predator den sites on the sanctuaries. We must also continue to search for the types of grassy vegetation and methods of culture that result in relatively predator-resistant nest cover. Current plans call for live-trapping predators by project personnel along the perimeter of one sanctuary (probably the Donnelley) during April and May 1976 to determine if such a program can increase hatching success. Only 4 (22.2 percent) of the 18 nests on the Donnelley Sanctuary hatched in 1975.

An annual harvest of furbearers on the sanctuaries by selected local trappers during the regular trapping season should be seriously considered by the PGC as an alternative approach to the predator problem. We hope that such measures will not be necessary. At any rate, it is vital to learn through continuance of our nest study whether any direct form of predator control should be a continuing part of management policy.

We are currently attempting to broaden our nest study to include an evaluation of vegetative structure in relation to nesting and nest success. We hope that this research will enhance our basis for cover management.

#### PHEASANTS: A GROWING PROBLEM AT BOGOTA

Interactions between native and introduced species is a well-known phenomenon. However, conflicts among such species as prairie chickens and pheasants have not been well documented. Unfortunately, we are in a unique position to document interactions between these two species on the Bogota Study Area.

From 1963 through 1968, only an occasional pheasant was seen or heard crowing at Bogota during our booming ground surveys for prairie chickens (Table 4). Four pheasant cocks were noted crowing on sanctuaries in 1969, and by 1974 the number had increased to 14 cocks. In the spring of 1975, at least 18 territorial cock pheasants were noted on sanctuaries plus a minimum of 4 cocks that crowed routinely on nearby private land. Despite our efforts, pheasants used every sanctuary at Bogota by 1975.

The association of pheasants and prairie chickens has resulted in several observations: (1) aggressive harassment of prairie chickens by pheasant cocks; (2) pheasant cocks courting prairie chicken hens; (3) probable competition of pheasants and prairie chickens for space on sanctuaries for crowing and booming territories, nest sites, and brooding areas; and (4) parasitism of prairie chicken nests. The full import of these observations is difficult to ascertain. However, pheasants are known to hybridize with prairie chickens (Lincoln 1950). Sharp (1957) concluded that competition between pheasants and prairie chickens "could eventually eliminate isolated pockets of prairie chickens in the states where they exist." From recent observations in Wisconsin, Dr. Raymond K. Anderson (Anderson 1969 and personal communication 1976) believes that the harassment of hen prairie chickens by cock pheasants could "interfere with their breeding cycle and even preclude breeding." Thus far we have not had the opportunity to observe the behavior of pheasants in the presence of a brood of prairie chickens.

The first pheasant nest on a prairie chicken sanctuary was found in 1969. Since then, from 4 to 10 pheasant nests have been found annually (Table 4). In addition, 13 cases of parasitism of prairie chicken nests by pheasants were discovered from 1970 through 1975. Pheasant eggs were found in 1.6

to 6.9 percent, annually, of a total of 440 prairie chicken nests during this 5-year period. In two of four instances of parasitism observed in 1975, pheasants apparently caused the failure of the prairie chicken nest. One nest that contained six prairie chicken eggs and four pheasant eggs was abandoned. The other nest contained 12 intact prairie chicken eggs, most with dead 22- or 23-day embryos, and 7 pheasant eggs, 5 of which had hatched. According to work by Dr. H. H. Shoemaker of the University of Illinois, the incubation periods of prairie chickens is 25 days whereas that of pheasants is 23 days. It remains a moot question whether a prairie chicken or pheasant hatched the pheasant chicks and abandoned the nearly full-term prairie chicken embryos. Both of the above nests were typically prairie chicken nests. Prairie chicken feathers were incorporated into both nest bowls.

Pheasant broods are now common on the sanctuaries at Bogota. On the Yeatter and Mark sanctuaries, where pheasant broods were most common in 1974, the numbers of prairie chickens on booming grounds dropped about 50 percent between 1974 and 1975--the overall drop in cocks was 29 percent at Bogota. On the sanctuaries in Marion County where pheasants are not present (fortunately), one flock (Kinmundy) held stable and another (Farina) increased 40 percent between 1974 and 1975.

It is possible, but unsubstantiated, that stocking of pheasants by local sportsmen is supplementing natural reproduction on the Bogota area. Stocking of pen-reared pheasants would increase the potential for introducing disease to prairie chickens. Whether the pheasants at Bogota are the result of natural reproduction, stocking, or both, their presence provides a temptation to hunters to trespass on sanctuaries and therefore increases the likelihood of prairie chickens being shot and harassed by hunters.

Pheasants are repeat nesters, are somewhat later nesters than prairie chickens, and have a considerably longer nesting season than prairie chickens even though the nesting seasons overlap. Because of the differences in nesting habits, pheasant nests may be somewhat more secure from predation and the species can maintain its numbers at considerably lower rates of nest success than prairie chickens.

The problem is two-fold: (1) the desire by local farmers and sportsmen to have pheasants presents a people problem, and (2) the presence of pheasants poses a threat, or at least an additional adverse factor, to prairie chickens and their preservation.

Our plans for the spring of 1976 include an attempt to reduce pheasant numbers on the sanctuaries by live-trapping in crowing territories using live game-farm pheasants as bait. This approach, utilizing the Stoddard cock-and-hen trap, is effective for bobwhite quail during the breeding season. We hope that it will prove effective on pheasants. Any measures to control pheasants on the sanctuaries will require the understanding and cooperation of the Illinois Department of Conservation (especially the Division of Law Enforcement) and local residents in Jasper County. If pheasants can be readily live-trapped, we plan to transplant them to Sam Parr State Park, about 6 miles from the nearest sanctuary, as an aspect of local public relations.



## HABITAT MANAGEMENT: SOME PROBLEMS

### Problems Relating to Sanctuary Ownership

Chronological lists of habitat management activities are detailed in Tables 5, 6, 7, and 8 for the years 1974 and 1975. The breakdown in these tables is according to ownership or lease by The Nature Conservancy (Tables 5 and 6) or the Illinois Department of Conservation (Tables 7 and 8).

The cash-bid approach to management was implemented in 1975 on the state-owned prairie chicken sanctuaries, which include 567 acres or 36 percent of the total sanctuary acreage. Cash-bidding is the standard approach used by the Department of Conservation in managing their lands for wildlife in Illinois.

One advantage to the cash-bid procedure used by the state is that some of the routine chores of the sanctuary manager are eliminated--such as procurement of elevator receipts, weight tickets, and fertilizer and herbicide bills--with which to document the state's share of crop yields, income, and expenses. Also, each farmer receives a written cropping schedule, covering a 2-year period, for each field he farms on the sanctuaries. Theoretically, repeated contacts with farmers should not be necessary.

However, there are the following disadvantages in managing the prairie chicken sanctuaries in this fashion largely because our major operation is grassland management:

1. The taxable acreage (acres harvested or grazed) for each farmer must be reported each August to the County Supervisor of Assessments. We must make sure the figures are recorded correctly and farmers assessed correctly. This reporting has been a problem, especially in Marion County.

2. The fees, based on acres harvested or grazed times the cash-bid rate, must be collected from each farmer prior to 1 December of each year and sent to Springfield with a letter explaining the details. All deviations from the cropping schedule (unavoidably there are many) must be explained to the satisfaction of state auditors.

3. The lessees are reluctant to read the details of the lease agreements. They must be reminded repeatedly of their obligations. Some bidders are mainly interested in soybean acreage and care little about the specified grassland management. Grass seedings may be poorly done. Few of the grass seedings made in the spring of 1975 were mowed for weed control as specified in the leases.

4. The harvest of redtop seed is still our major management operation. In 1975, six factors limited the acreage harvested: (1) a low market price for redtop seed, (2) poor yields because of drought in June, (3) high wind and heavy rain at the onset of the harvest that caused much of the seed to be shattered, (4) high humidity during harvest, (5) the cash bids by some

farmers were too high to cover their expenses, and (6) the obligation to pay taxes on the acreage harvested. Thus, a large acreage of redtop was left unmowed and subject to lodging, a condition generally unsuitable to nesting prairie chickens. On the sanctuaries owned by The Nature Conservancy, we were able to get better management by giving tenants a larger share (in some cases all) of the redtop seed crop.

5. Treatment with limestone and other expenses over \$200 on State Sanctuaries requires approval of field requisitions and competitive bids. These procedures are cumbersome and time consuming. By the time approval is gained and successful bidders determined, it is often too late to make the expenditure. Purchases require multiple invoice-vouchers and receiving reports.

We feel that the disadvantages of cash-bid management far outweigh the advantages. We propose that the State lease its sanctuaries to The Nature Conservancy for it to manage for the benefit of the prairie chicken under terms as follows:

1. Leases be for a nominal sum--perhaps \$1 per year--and The Nature Conservancy receive all income from the sanctuaries and pay routine management expenses. The State would, of course, pay any costs of capital development or improvement.

2. If possible, the lease be for a 5- or 10-year period. There should however, be a cancellation clause in the lease.

3. The Nature Conservancy would pay the taxes as required on acres pastured or from which crops are harvested. Tenants probably would not accept a farming agreement with the obligation to pay taxes on the harvested and grazed acres without assurances of income to meet the tax obligation. Assumption of the tax obligations by TNC on the harvested and grazed acres would solve this problem and greatly simplify our reports to the Supervisors of Assessments.

It would greatly simplify our operations if The Nature Conservancy maintained a bank account in Effingham to which receipts could be deposited and from which operating expenses could be paid. There are discounts to be taken advantage of from fertilizer dealers and penalties and extra costs to be avoided on tax payments. A local bank account with the sanctuary manager authorized to pay small bills to local vendors would expedite payments. Quarterly reports to the PGC could document all transactions and would permit more accurate accounting of operating income and expenses by the PGC. Any excess of income over operating expenses could be transferred to the state chapter or national offices at any time. However, approval or disapproval of a local checking account should not be a factor in the proposal that the IDC lease the State's sanctuaries to The Nature Conservancy.

It is assumed that the PGC would break even on expenses and income on a lease arrangement of the state-owned sanctuaries. Taxes paid by the PGC would only apply to harvested and grazed areas. If additional PGC sanctuaries were sold to the IDC, we could escape some of the present tax burden. Woodlots, waterways, and other idle acreages such as the entire Walters 40, would not be subject to taxes as state-owned land.

#### GAINING MAXIMUM UTILIZATION OF SANCTUARIES

To date, 18 acquisitions totaling 1,561 acres (1,001 in Jasper County, 560 in Marion County) are being managed for prairie chickens by the Natural History Survey. It is becoming more difficult each year to purchase land needed to obtain the goal of 1,500 acres of sanctuaries in each county due to (1) the scarcity of suitable land for sale and (2) the dramatic increase in the price of land in recent years. The present sanctuary acreage was purchased at an average price of \$370.59 per acre. Per-acre prices ranged from \$225.00 in 1962 to \$800.00 in 1974. By contrast, recent public auctions of land comparable to much of the present sanctuaries have resulted in land sales as high as \$2,450.00 per acre in Jasper County. Prices of this magnitude diminish the likelihood that our goal in acquiring land can be accomplished. Therefore, each tract in the present sanctuary system must be managed to its fullest potential.

Unfortunately, nearly 10 percent (143 acres) of the present sanctuary land is of little value to prairie chickens. Trees and brush dominate much of the Galbreath 110-acre Sanctuary and portions of two other tracts (Fuson and Walters) at Bogota either by solid stands or by the hemming-in effect of fencerows and dendritic draws.

In addition, about 20 percent of the total sanctuary acreage is plowed annually for the necessary rotation of soybeans and small grains to establish new meadow seedings. Seedings are limited to redtop-timothy meadows, which in time decline in vigor and are invaded with weeds and woody vegetation. Plowing, row-cropping, and reseeding provide sites for booming grounds in strategic locations on the larger sanctuaries; however, booming grounds need not comprise more than 8 percent of the total sanctuary acreage annually.

Through prairie restoration it may be possible to maintain a larger proportion of the sanctuary acreage in nest cover than with the present system of redtop-timothy management. Excellent densities of nests and good nest success in the domestic grasses have been documented by our annual nest study; however, because of the problems associated with management, we should not depend entirely on domestic grasses. Some degree of prairie restoration has been accomplished on 178 acres. We must now learn how to manage prairie vegetation for maximum nest success. About 50 acres of prairie grasses are now sufficiently established to harvest for hay. During the summer of 1975, five fields totaling 42 acres of native grasses were mowed for hay during late July and early August. The regrowth after haying was impressive in the five

plots, thus offering test plots for nesting in 1976. Nest searches to be conducted on these 42 acres in 1976 may hold the key to future management efforts.

Thus, it is hoped that by (1) continuing our efforts at prairie restoration, (2) demonstrating its acceptance by both prairie chickens (for nesting) and local farmers (for hay and perhaps pasture), and (3) minimizing the acreage of woodland and brush, we can increase the productive capacity of the present sanctuary acreage for prairie chickens. It is also hoped that nest cover may ultimately encompass up to 92 percent of the sanctuary acreage on an annual basis instead of the 60 to 70 percent maintained under the current management program.

#### NEED FOR CHEMICAL CONTROL

The old adage among ecologists, "Nothing succeeds like succession" is particularly appropriate in the prairie-forest transition zone of southern Illinois. Invasion of grasslands on prairie chicken sanctuaries by woody vegetation can be serious as soon as 3 years after seeding. In most instances, the speed of invasion by woody plants depends on the proximity of seed sources. One of the most rapid shrub invaders is multiflora rose (Rosa multiflora). Tree invaders include ash (Fraxinus spp.), maple (Acer spp.), and cottonwood (Populus deltoides), all of which have seeds that are readily disseminated by wind. Other problem species include mulberry (Morus spp.), honey locust (Gleditsia triacanthos), hawthorn (Crataegus spp.), Japanese honeysuckle (Lonicera japonica), and trumpet creeper (Campsis radicans). Desirable woody species include wild black cherry (Prunus serotina), oaks (Quercus spp.), dogwood (Cornus racemosa), and dewberry (Rubus flagellaris), but even these species should be limited to scattered trees, clones, or patches on prairie chicken sanctuaries. Some of the above woody species have shortened the longevity of redtop meadows from about 8 to only 4 or 5 years. Invaded fields can be reclaimed most successfully by plowing, cropping 1-2 years with soybeans using herbicides, and then reseeded to grasses. However, short rotations on the limited sanctuary acreage limit the amount of nest cover available on an annual basis. Our goal must be to find ways to increase annually available nest cover from about 65 percent of the sanctuary acreage under the current management program to about 90 percent.

Some fields are not suitable for control of succession by plowing and reseeded. Such areas include slopes subject to erosion and fields in which prairie restoration is under way. Fire can be a useful tool in retarding succession in such areas. However, fire alone will not control succession in many situations. Fuel supplies under large trees or on soils of low fertility are often inadequate to burn with sufficient intensity to control woody growth. Where fuel supplies are adequate to kill top growth, resprouting perpetuates the problem. However, periodic fire promotes the development of fire-tolerant prairie flora and thereby gradually increases fuel supplies for subsequent burns.

Control of woody plants by annual mowing with a heavy-duty rotary cutter is sometimes desirable, but, because of the resprouting problem, mowing is ineffective, costly, and too consumptive of energy. Also, thorns of honey locust, hawthorn, and multiflora rose cause frequent tire problems. Large trees may be felled or girdled by chain saw or axe, but resprouting is often a problem.

The judicious use of chemical control agents appears to offer the most efficient means of controlling woody plants, especially when used in conjunction with fire, physical methods, and prairie restoration. One of the most promising chemicals in terms of effectiveness, efficiency, selectivity, ease of handling, and safety, appears to be picloram. Picloram (TORDON 10K) is a pelletized formulation of 10 percent 4-amino-3, 5, 6-trichloropicolinic acid. Toxicological studies indicate that picloram has low toxicity to fish, birds, mammals, and soil microorganisms. Picloram is applied by hand (perhaps in conjunction with our annual nest search), a pinch at a time, at the base of individual stems or sprouts. The pellets are activated by rain, which moves the chemical into the root zone. Picloram has been successfully used in maintaining openings in forests for wildlife (McCaffery et al. 1974). We see no reason why it cannot be used in our situation. However, approval from the Chapter and Regional Offices of TNC is needed before it is used.

#### FINANCES: WE'RE LOW

Income to the PGC from habitat management (\$12,376.86) for FY 1974-75 was over four times greater than expenses for habitat management (\$2,906.18) (Tables 9 and 10). Additional income from the Federal Farm Program, oil leases, and donations brought the total income to \$15,344.00. However, other expenses including taxes, legal fees, abstracts, rent for the Jamerson McCormack and Lacey sanctuaries, phone bills, interest, and most of all, the purchase of the Loy 100-acre tract (\$80,000) brought total expenses for FY 1974-75 to \$96,219.91.

As of 30 June 1975 PGC records indicated cash assets of \$378.83 (Table 11). All purchase contracts have been completed, thus remaining liabilities include the Jamerson McCormack and Lacey 80-acre leases (\$1,550) and repayment of a loan (\$11,342.99) from the National Office of The Nature Conservancy. According to our figures the cash balance of the PGC as of 30 June 1975 amounted to \$3,380.89 (Table 12). The difference between these sums for cash assets is apparently due to the various sums sent to the National Office to reduce indebtedness.

Preliminary accounts of income and expenses for FY 1975-76 are given in Tables 13 and 14. Income figures for this period are probably complete for the habitat management category. We hope that donations will exceed the \$2,688 indicated on Table 13. The large drop in income from habitat management from the previous fiscal year is mostly due to the decline in the market price of redtop seed and to a poor harvest of grass seed as discussed earlier. Expense figures for FY 1975-76, including those for habitat management, taxes, and rent (Table 14) slightly exceeded income (Table 13) largely because of the carry-over of 69.2 percent of 1974 taxes into the 1975-76 fiscal year.

Table 15 summarizes income and expenses on the state-owned sanctuaries for fiscal years 1973-74, 1974-75, and gives preliminary figures for FY 1975-76. The Department of Conservation has been paying the bills for the numerous commodities and contractual services listed on Table 15. Income to the Illinois State Treasurer exceeded expenses to the IDC during the past 2 fiscal years, but largely because of the new cash-bid system and increased expenses, expenses will likely exceed income for FY 1975-76 on the State sanctuaries.

APPROVED:



Glen C. Sanderson, Head  
Section of Wildlife Research  
Illinois Natural History Survey

DATE:

18 May 1976

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Table 1. Spring counts of prairie chicken cocks on booming grounds in 1974 and 1975.

Census Area	Number of Cocks		Percent Change
	1974	1975	
Jasper County			
Bogota	143	102	-29
Marion County			
Farina	25	35	+40
Kinmundy-Forbes Park	13	12	- 8
Wayne County			
Mt. Erie	9	8	-11
Washington County			
Hoyleton	10	9	-10
New Minden	--	5	--
Clay County			
Bible Grove	8	4	-50
Total	208	175	-18 <sup>a</sup>

<sup>a</sup> Excludes New Minden flock which was first censused in 1975.

Table 2. Summary of counts of prairie chickens on booming grounds on the Bogota Study Area in 1974 and 1975.

Booming Grounds	1974				1975			
	Cocks		Highest Count	Hens Highest Count	Cocks		Highest Count	Hens Highest Count
	Regularly Present				Regularly Present			
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Yeatter	21	24	30	16	12	13	16	14
M. Field	35	36	40	14	31	33	34	15
McGraw	14	15	18	4	0	0	0	0
Donnelley East	26	28	36	20	26	27	28	15
Donnelley West	3	4	4	5	0	0	0	0
Mark 40	3	4	4	11	3	3	4	6
Mark 40 North	2	2	3	0	0	0	0	0
Galbreath	3	5	12	2	1	2	3	2
C. McCormick	3	5	5	9	11	12	12	4
J. McCormack	4	4	4	10	7	9	9	11
Otis North	5	5	11	1	0	0	0	0
Fuson West	4	7	7	3	3	3	4	3
G. Marshall	1	1	1	0	0	0	0	0
Fritchle-Eckel	2	3	4	1	0	0	0	0
Total	126	143 <sup>a</sup>	179	96	94	102 <sup>a</sup>	110	70

<sup>a</sup> Best estimate of the number of males.



Table 3. Status of prairie chicken population in relation to the fate of nests found by systematic searches, and according to reports by local residents, Bogota Study Area, 1963-74.

	1963-64	1965-67	1968-72	1973-74
Average Annual Percent Change in Population Status:	-26	- 4	+45	-29
Percent of Nests:				
Hatched	36	48	62	36
Destroyed by plow	42	28	5	0
Destroyed by mower	8	3	1	0
Destroyed by predation	12	23	26	61
Abandoned	2	0	7	5
Number of Nests	59	40	271	143

Table 4. Estimated number of cock pheasants crowing on Bogota Study Area, pheasant nests found on sanctuaries, and parasitism by pheasants of prairie chicken nests, 1963-75.

Year	Est. No. of Cock Pheasants	Pheasant Nests Found	Prairie Chicken Nests with Pheasant Eggs	
			Number	Percent
1963-68	Occas. cock	0	0	--
1969	4	1	0	--
1970	6	7	1	1.6
1971	8	10	1	1.6
1972	6	4	1	1.2
1973	8	9	4	4.7
1974	14	4	2	2.9
1975	22	7	4	6.9
		42	13	

Table 5. Habitat management activities completed in 1974 on prairie chicken sanctuaries owned or leased by The Nature Conservancy (994 acres) in Jasper and Marion counties.

	TNC Sanctuaries and Acres										Totals (994 acres)
	Jasper Co. (594 acres)					Marion Co. (400 acres)					
Chronological Lists of Crops and Activities	C. McCor- mick 140	Fuson 164	E. Donnel- ley 60	J. McCor- mack 80	Galbreath 110	Walters 40	Butler 160	Lacey 100	Loy 40	Loy 100	
Mgmt. of Nest Cover											
Prescribed burns-March	15	0	0	0	0	40	0	0	0	0	55
Brush treatment	1	1	0	0	1	12	0	0	0	0	15
Hay harvest	4	11	17	0	0	0	14	16	0	0	62
Pasture grazed	0	26	0	0	0	0	26	0	0	0	52
Redtop seed harvest	59	87	34	10	38	0	100	67	36	0	431
Redtop residue harvest	0	0	0	0	0	0	50	35	36	0	121
Firelanes disked (mi)	0.60	0.25	0.50	0	2.0	0.25	0	0	0	0	3.6
Prescribed burns-Aug.	0	10	7	0	10	0	0	0	0	0	27
Weeds & brush mowed	10	5	13	25	3	0	0	0	0	0	56
Prairie grass seed harvest	10	0	0	0	0	0	0	0	0	0	10
Mgmt. for Bmg. Grds. & New Sodds											
Legume seedings	0	0	7	0	0	0	9	16	0	0	32
Redtop seedings	21	11	7	16	0	0	18	8	0	0	81
Wheat harvest	0	0	0	0	0	0	0	16	0	0	16
Oats harvest	21	11	7	16	0	0	18	0	0	0	73
Small grain stubble mowed	5	11	7	8	0	0	18	16	0	0	65
Soybeans harvest	12	26	0	0	14	0	9	0	0	0	61
Limestone applied	8	26	9	0	0	0	15	0	0	0	58
Wheat seeded	16	0	0	0	0	0	0	0	0	17	33
Bulldozing (hrs)	0	0	0	0	0	0	7	2	5	0	14

Table 6. Habitat management activities completed in 1975 on prairie chicken sanctuaries owned or leased by The Nature Conservancy (994 acres) in Jasper and Marion counties.

Chronological Lists of Crops and Activities	TNC Sanctuaries and Acres												Totals (994 acres)	
	Jasper Co. (594 acres)						Marion Co. (400 acres)							
	C. McCorkrick 140	Fuson 164	E. Donnelly 60	J. McCorkrick 80	Galbreath 110	Walters 40	Butler 160	Lacey 100	Loy 40	Loy 100	acres			
Mgmt. of Nest Cover														
Prescribed burns-March	10	0	0	0	40	40	0	0	0	0	0	0	0	90
Brush treatment	1	1	1	25	5	15	1	1	1	0	0	0	0	51
Hay harvest (tame)	0	0	7	0	0	0	0	0	14	0	0	0	0	21
Pasture grazed	0	26	0	0	0	0	0	0	26	0	0	0	0	52
Hay harvest (prairie)	8	10	0	0	0	0	0	0	0	0	0	0	0	18
Redtop seed harvest	32	62	29	15	14	0	85	70	36	36	0	0	0	343
Redtop residue harvest	0	44	0	15	0	0	36	70	36	0	0	0	0	201
Firelanes disked (mi)	0.5	0	0.3	0.5	2.0	0	0	0	0	0	0	0	0	3.3
Prescribed burns-Aug.	9	0	0	0	0	0	0	0	0	0	0	0	0	9
Weeds & brush mowed	10	5	13	25	3	3	0	0	0	0	0	0	0	56
Prairie grass seed harvest	2	0	0	0	0	0	0	0	0	0	0	0	0	2
Mgmt. for Bmg. Grds. & New Sod														
Legume seedings	0	0	0	0	0	0	0	0	0	0	0	0	0	17
Redtop seedings	16	8	0	0	0	0	13	0	13	0	0	0	0	99
Wheat harvest	16	0	0	0	0	0	0	0	0	0	0	0	0	33
Oats harvest	0	8	0	0	0	0	13	0	0	0	0	0	0	83
Small grain stubble mowed	16	0	0	0	0	0	0	0	0	0	0	0	0	95
Dozer heap cleanup	0	0	0	x	0	0	0	0	0	0	0	0	0	x
Soybeans harvest	12	18	9	16	14	0	15	0	15	0	0	0	0	104
Limestone applied	18	0	9	16	0	0	10	0	10	0	0	0	0	53
Wheat seeded	12	18	9	0	14	0	15	0	15	0	0	0	0	88
Soybeans planned - '76	18	0	9	16	24	0	10	20	0	0	0	0	0	97

x = Substantial man-hours spent--acreage not applicable.

Table 7. Habitat management activities completed in 1974 on 567 acres owned by the State of Illinois dedicated as Nature Preserves and managed for the preservation of remnant native flocks of prairie chickens.

Chronological Lists of Crops and Activities	State-owned Sanctuaries and Acres										Totals (567 acres)
	Jasper Co. (407 acres)					Marion Co. Survey					
	Yeater	M. Field	McGraw	W. Donnel-	Otis	Mark	Mark	Mark	Survey	acres	
	77	111	135	20	ley 60	58	17	40	160		
Mgmt. of Nest Cover											
Prescribed burns-March	5	5	0	2	17	0	0	0	0	29	
Brush treatment	0	1	1	1	0	1	0	0	0	4	
Pasture grazed	0	0	0	0	0	0	0	0	40	40	
Hay harvest-prairie	3	0	0	0	0	0	0	0	0	3	
Redtop seed harvest	0	19	0	0	0	0	0	7	64	90	
Redtop residue harvest	0	0	0	0	0	0	0	0	64	64	
Firelanes disked (mi)	1.0	0.5	0	0.5	0.3	0.2	0.3	0.5	0.5	3.3	
Prescribed burns-Aug.	0	5	0	0	0	0	0	0	0	5	
Weeds and brush mowed	52	57	11	48	26	2	4	20		220	
Mgmt. for Emg. Grds. & New Sodds											
Legumes seeded	0	0	0	7	0	0	0	0	0	7	
Redtop seedings	0	0	0	0	0	0	0	0	0	0	
Soybeans harvest	0	8	8	0	15	0	11	12		54	

Table 3. Habitat management activities completed in 1975 on 567 acres owned by the State of Illinois dedicated as Nature Preserves and managed for the preservation of remnant native flocks of prairie chickens.

Chronological Lists of Crops and Activities	State-owned Sanctuaries and Acres										Totals (567 acres)
	Jasper Co. (407 acres)					Marion Co. Survey					
	Yeater	M. Field	McGraw	W. Donnel-	Otis	Mark	Mark	Mark	Survey		
	77	111	135	20	ley 60	58	17	40	160		
Mgmt. of Nest Cover											
Prescribed burns-March	4	11	0	0	2	5	7	11	0	40	40
Brush treatment	0	0	0	0	0	0	0	0	2	2	2
Hay harvest-timothy	12	8	0	0	0	0	0	0	0	20	20
Pasture grazed	0	0	0	0	0	0	0	0	40	40	40
Hay harvest-prairie	11	7	0	0	0	0	5	0	0	23	23
Redtop seed harvest	0	4	0	0	0	0	0	7	56	67	67
Redtop residue harvest	0	0	0	0	0	0	0	0	56	56	56
Firelanes disked (mi)	2.0	1.0	0	0	0	0	0	0	0	2.0	2.0
Prescribed burns-Aug.	0	20	0	0	0	0	0	0	0	20	20
Weeds and brush mowed	14	13	0	0	24	12	1	4	45	116	116
Prairie grass seed harvest	0	0	0	0	0	0	0	7	0	7	7
Mgmt. for Bmg. Grds. & New Sodds											
Legume seedings	0	0	0	0	0	0	0	0	0	0	0
Redtop seedings	7	8	8	8	12	15	0	12	6	68	68
Wheat harvest	7	0	0	0	0	0	0	0	6	13	13
Oats harvested & unharvested	0	8	8	8	12	15	0	12	12	67	67
Small grain stubble mowed	3	0	0	0	0	0	0	12	0	15	15
Soybeans harvest	0	20	0	0	0	14	6	0	10	50	50
Limestone planned	12	0	0	0	12	0	13	0	6	43	43

Table 9. Income detailed by source and sanctuary to PGC for FY 1974-75.

	Sanctuary and Acres						Totals (994 acres)		
	Jasper Co.			Marion Co.					
Source	C. McCormick 140	Fuson 164	E. Donnelly 60	J. McCormack 80	Galbreath 110	Butler 160	Lacey 100	Loy 40	Loy 100
Habitat Management									
Wheat							420.96		\$ 420.96
Grass seed <sup>a</sup>	1,039.87 <sup>c</sup>	2,143.27 <sup>b</sup>	642.17	188.44	670.45	2,267.04	1,210.78	828.83	8,990.85
Hay			88.40						88.40
Soybeans	733.72 <sup>d</sup>	1,775.13				367.80			2,876.65
Subtotals	1,773.59	2,918.40	730.57	188.44	670.45	2,634.84	1,631.74	828.83	12,376.86
Federal Farm Program							90.14		90.14
Oil Lease							- - - -	2,610.00	2,610.00
Donations									267.00
									Total Income
									\$15,344.00

<sup>a</sup> The grass seed from several sanctuaries was mixed together. The income in these cases was divided proportionately according to the acreage harvested.

<sup>b</sup> Sum does not include 240 lbs. of seed saved for reseeded (value \$105.00).

<sup>c</sup> Sum does not include 1,600 lbs. of timothy saved for reseeded (value about \$200.00).

<sup>d</sup> Balance after various deductions.

Table 10. Expenses detailed by source and sanctuary to PGC for FY 1974-75.

	Sanctuary and Acres								Totals (994 acres)	
	Jasper Co. (594 acres)				Marion Co. (400 acres)					
Source	C. McCormick 140	Fuson 164	E. Donnelly 60	J. McCormack 80	Galbreath 110	Walters 40	Butler 160	Lacey 100	Loy 40	Loy 100
Habitat Management										
Limestone	146.00	475.28		323.80			545.40			\$ 1,490.48
Potash							236.25			236.25
Fertilizer on wheat	119.17									72.58
Fertilizer on soybeans	27.57	83.75								111.32
Chain saw servicing										25.17
Brush treatment										40.65
Cans for seed										31.96
Legume seed					147.00					216.00
Seed cleaning and bags										37.60
Bulldozing										378.00
										Subtotal \$ 2,906.18
Taxes (30.8 percent of 1974)*				1,426.73						1,426.73
Legal fees, abstracts, etc.	95.00			32.00						60.00
Rent				750.00						300.00
Phone bills										90.00
										Subtotal \$ 3,253.73
Interest	360.00			210.00						570.00

Table 10 - continued.



Table 10. Continued - page 2.

Land	6,000.00	3,500.00	79,990.00	<u>89,490.00</u>
			Total Expenses	\$96,219.91

\* Only the 1st installment of 1974 taxes for Jasper County were paid during FY 1974-75--this amounted to 30.8 percent of the total taxes due and left 69.2 percent to be paid in FY 1975-76.

Table 11. Balance sheet for fiscal years ending 6-30-74 and 6-30-75.

	6-30-74	6-30-75
<b>ASSETS</b>		
Cash	\$ 72,741.80	\$ 378.83
Land at Cost		
C. McCormick 140 A. (1966)	60,000.00	60,000.00
Fuson 163.5 A. (1970)	47,999.00	47,999.00
Donnelley 60 A. (1967)	31,500.00	31,500.00
J. McCormack 80 A. (1965)	25,000.00	25,000.00
Butler 160 A. (1969)	45,600.00	45,600.00
Lacey 20 A. (1969)	8,000.00	8,000.00
Loy 40 A. (1971)	20,000.00	20,000.00
Galbreath 110 A. (1972)	27,500.00	27,500.00
Walters 40 A. (1973)	10,000.00	10,000.00
Loy 100 A. (1974)		80,000.00
*Subtotal (Land)	\$275,599.00	*\$355,599.00
<b>TOTAL ASSETS</b>	<u>\$348,340.80</u>	<u>\$355,977.83</u>
<b>LIABILITIES</b>		
Obligations on Land		
C. McCormick	\$ 6,000.00	
Donsbach contract	3,500.00	
J. McCormack lease	750.00	750.00
Lacey 80-acre lease	800.00	800.00
Loan repayment-National Office, TNC		11,342.99
<b>TOTAL LIABILITIES</b>	\$ 11,050.00	\$ 12,892.99
<b>EQUITY</b>	<u>\$337,290.80</u>	<u>\$342,706.84</u>
<b>TOTAL LIABILITIES &amp; EQUITY</b>	\$348,340.80	\$355,599.83

\*Because of the recent inflation of land values, land assets probably exceed \$900,000.

Table 12. Cash position; income and expenses for fiscal years ending 30 June 1974 and 30 June 1975.

	1973-74	1974-75
<b>ASSETS</b>		
Cash Balance 1 July	\$66,181.65	\$72,741.80
<b>INCOME</b>		
Sale of crops & refunds	\$16,138.67	\$12,376.86
Government programs	877.84	90.14
Flooding easement	2,500.00	
Oil lease		2,610.00
Donations	12,630.74	267.00
Subtotal Income	\$32,147.25	\$15,344.00
Loan from National Office		11,342.99
Total Income	\$32,147.25	\$26,686.99
<b>EXPENSES</b>		
Land	\$15,840.00	\$89,490.00
Leases	1,550.00	1,550.00
Interest	1,520.40	570.00
Taxes	5,300.82	1,426.73
Habitat mgmt. & misc.	1,825.88	3,183.18
Total Expenses	\$25,587.10	\$96,219.91
CASH BALANCE 30 June	\$72,741.80	\$ 3,208.88*

\*The difference between this sum and the sum of \$378.83 indicated as cash assets on 30 June 1975 on Table 11 is apparently due to various sums sent to the National Office, TNC to reduce indebtedness.

Table 13. Preliminary accounting of income detailed by source and sanctuary from sanctuaries owned or leased by The Nature Conservancy for FY 1975-76 as of 1 March 1976.

Source	Sanctuary and Acres										Totals (1974 acres)			
	Jasper Co.					Marion Co.								
C. McCorkrick	Fuson	E. Donnell	J. McCorkrick	Galbreath	Walters	Butler	Lacey	Loy	Loy					
140	164	160	80	110	40	160	100	40	100					
Habitat Management														
Wheat	245.00										304.76	\$ 549.76		
Hay (red clover)						130.00						130.00		
Grass seed											493.42	492.50	282.94	1,268.86
Soybeans	599.96	1,142.25	558.81	993.43	799.94						692.19	1,167.89	5,954.47	
											Subtotal	\$ 7,903.09		
Donations (As per National Office on 3-31-76)												2,688.00		
											Total Estimated Income	\$10,591.09		

Table 14. Preliminary accounting of expenses detailed by source and sanctuary incurred or planned for sanctuaries owned by The Nature Conservancy for FY 1975-76 as of 30 March 1976.

Source	Sanctuary and Acres						Totals (994 acres)			
	Jasper Co. (594 acres)			Marion Co. (400 acres)						
	C. McCork mick 140	Fuson E. ley 60	Donnel- ley 60	J. McCork- mack 80	Galbreath 110	Walters 40	Butler 160	Lacey 100	Loy 40	Loy 100
Habitat Management										
Limestone	384.53		169.90	339.82			197.60			\$ 1,091.85
Fertilizer on wheat (76 crop)	70.89	153.06	82.12		83.21		58.33			285.07
Fertilizer on soybeans (75)			23.95	42.58			58.05			124.58
soybeans (76 est)	90.00		45.00	80.00	120.00		50.00	100.00		485.00
										Lime and fertilizer subtotal
										\$ 2,434.11
Brush treatment (Tordon)(est.)		X			X			X		500.00
Misc. (est.)									X	100.00
Taxes (69.2 percent of 1974)*										3,205.43
Taxes (½ 1975-est.)										2,500.00
Rent										750.00
										800.00
										Total Estimated Expenses
										\$10,289.54

\*Only the 1st instalment of 1974 taxes for Jasper County were paid during FY 1974-75--this amounted to 30.8 percent of the total taxes due and left 69.2 percent to be paid in FY 1975-76.

Table 15. Summary of income and expenses on state-owned Nature Preserves (567 acres) managed for prairie chickens for fiscal years 1973-74, 1974-75, and 1975-76 (preliminary).

Item	1973-74	1974-75	1975-76 (prelim.)
<b>INCOME (to Ill. State Treasurer)</b>			
Wheat	\$ 91.05	--	(Cash-bid system initiated)
Redtop and timothy seed	1,862.33	\$ 1,703.99	
Soybeans	901.52	1,818.28	
Hay	50.00	--	
Pasture	24.00	24.00	
<b>Total</b>	<b>\$ 2,928.90</b>	<b>\$ 3,445.47</b>	<b>\$ 1,035.05</b>
<b>EXPENSES (to Ill. Dept. Conservation)</b>			
Limestone	\$ 356.25	--	\$ 1,505.00
Gasoline	145.44	\$ 307.47	150.30
Diesel fuel	--	21.99	--
Fuel tank & hose	--	50.50	--
Brush treatment (Picloram)	--	--	170.00
Legume seed	170.00	--	200.00 (est.)
New seeder	74.50	--	--
Fence materials	404.00	--	500.00 (est.)
Tractor & mower repairs & service	567.33	360.24	226.82
Bulldozer rental	137.50	--	--
Mowing weeds & brush	65.00	50.00	100.00
Combining prairie grass	110.00	--	--
Summer help	--	488.00	--
<b>Totals</b>	<b>\$ 2,030.02</b>	<b>\$ 1,278.20</b>	<b>\$ 2,852.12</b>
<b>Balance</b>	<b>+ 898.88</b>	<b>+ 2,167.27</b>	<b>- 1,817.07</b>

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