

## Advances in the Renewable Natural Resources Program of Illinois

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**M**Y participation in this program today, speaking on the subject, "Advances in the Renewable Natural Resources Program of Illinois," brings to mind two previous papers presented on annual programs of the Illinois State Academy of Science and later published as a part of the Transactions.

*Early attitude toward natural resources.*—The first of these papers was presented by S. A. Forbes at the Bloomington meeting in 1912 and its title was "The Native Animal Resources of the State." This paper sketched a broad, general picture of the abundance of the native animal life of Illinois when the state was occupied by the Indians, and the subsequent reduction of these particular resources in the wake of its rapid settlement by white men. The philosophy of the 1912 period is fairly well revealed by a quotation from this article, as follows: "The whole process has evidently been a perfectly natural and inevitable one—as much so as the flood of the tide in the wake of the revolving moon—and immensely advantageous also from every point of view except that of the inadequate, incompetent and ill-adapted population which it has reduced or suppressed." A militant progressive conservation program, aimed to check further reductions of our renewable native natural resources and to increase certain desirable ones was, as yet, unprojected. Glimmerings of the future, however, were indicated in this paper by the demand expressed for "prompt, vigorous and intelligent rectification and control" of pollution of waters, particularly the Illinois River; which was then showing the effects of the opening of the Chicago Drainage Canal, and in another paragraph by a plea for this Academy to promote by resolution the passage of the National Migratory Bird Act.

*Modern attitude toward natural resources.*—The second paper I wish to mention is one it was my privilege to present on a symposium on "Conservation of Illinois Agricultural and Human Resources" at the time of the Decatur meeting of this Academy in 1934. This essay was entitled "Utilization of Illinois Lands for Forestry, Wildlife and Recreation." I cite this latter paper because its content reveals a marked turning point in the attitude of scientists and the general public in the approach to the renewable native natural resources problems of Illinois. Realization had come that the depletion of such resources had gone too far for the public good in many instances, and a definite program was beginning to take shape for preserving and, if possible, increasing what was left of certain desirable resources of this kind. In this paper there was (1) a facing of the fact that, while restrictive legislation can perhaps retard the decline of certain renewable and highly desirable natural resources, it does not necessarily increase them or even insure their preservation; (2) the recognition that, regardless of the value and desirability of some fish hatcheries and game farms, such a program, because of the costs involved, offers in our State no sure-fire panacea for a general increase of valuable fish and game resources; and (3) the start of a delineation of a sound land utilization program for Illinois in regard to forestry, wildlife and recreation. Four years have gone by since 1934 and during this period definite advances in harmony with this 1934 conservation program have been made. These advances, when we stand close to them in time and space, may seem slight, but, judged from the philosophy of 1912, they are epochal steps.

No single unit of government or group of people is entirely responsible or can take all the credit for this rapidly-advancing program. In spite of its diversity, in origin and administration the pattern of this program is clearly definable and fortunately its different elements are most compatible. It is my belief that the very diversity of the organizations participating in this youthful program is a guarantee that it will have better balance and perspective. We have not reached as yet such perfection in planning for the infinite preservation and increase in renewable natural resources that as a nation or state we can afford to put all of our plans in one brief case or follow one stereotyped procedure.

*Natural resources defined.*—I have mentioned our renewable natural resources several times thus far in this paper and perhaps I have already proceeded too far without defining the particular type of resources I am including or excluding under this phrase. By renewable natural resources I have reference to the living flora and fauna, particularly those of demonstrable economic importance, of this State. To the average citizen this implies forest and wildlife resources. Wildlife resources include, of course, our fish, bird and mammal populations, and forest is to be broadly interpreted as applying to plant life, in general. The fundamental difference between a conservation program dealing with non-renewable natural resources, such as was the subject of the preceding speaker's address, and a program for renewable natural resources is that the non-renewable cannot be cropped successively without reducing the total resources of that kind, whereas in many instances the renewable resources, with proper management, can be cropped successively without reducing the total resource, and under certain conditions such resources can, moreover, be increased. To prevent getting too far afield, my definition of renewable natural resources for today's purpose must be further restricted to exclude those renewable natural resources which have already definitely reached such a place in management and development that they are generally considered as agricultural crops.

### BACKGROUND OF THE PROGRAM

Every story and play has a background or foundation and so does a renewable natural resources program for Illinois. Fortunately, due to many years of effort by investigators and scientists of varied stripe and hue, this background is not fictitious but real. A long and detailed description of this State is not necessary before such an audience as this. It does seem necessary, however, to point out that the location of Illinois, in the heart of a large land area, and its extent, a distance of almost 400 miles from north to south, about 285 miles from east to west, presents differences which must be considered in planning for a sound renewable natural resources program. The distance in miles from north to south in the latitude of Illinois is sufficient by itself to influence the composition of the flora and fauna without the aid of a great variation in elevations as proved by the existence within our borders of cypress swamps, mistletoe and cotton fields in extreme southern Illinois and the tamarack bogs of the northeastern counties. The general interior continental location of our State is sufficient also to make our lands a meeting place of eastern and western species of plants and animals, as well as those of northern and southern affinities. Here and there, too, all over the State there are diverse local ecologically different habitats such as the sandy areas near Havana, Kankakee and Savanna, the comparatively recent glacial lakes of Lake and McHenry Counties, the generally distributed large and small river systems, the areas originally with prairie or forest cover, and, in that part of the State in which we are today, a worn-down mountain range, frequently referred to as the Ozarkian Uplift.

*Need for varied program.*—Because of these differences, no blanket or single-track conservation program can be adopted for Illinois and produce the best results. The hunting season in the northern part of the state, if correctly timed for breeding seasons, rarely, if ever, would coincide with that in the southern tip. The migratory waterfowl which provide such extensive shooting at times in certain localities, particularly the Illinois River valley,

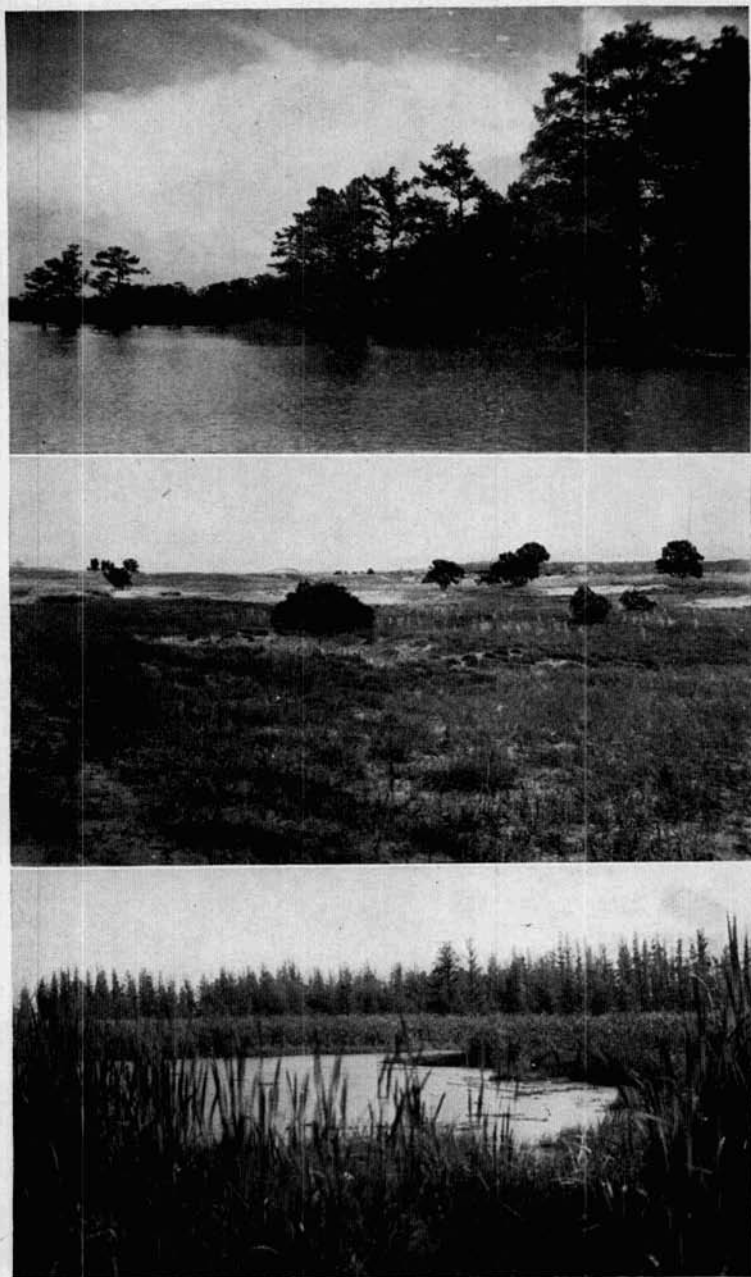


PLATE I.

**Upper.** Cypress stand along the edge of Horseshoe Lake in southern Illinois.  
**Middle.** Sand dunes and flats near Savanna, in the northwestern part of the State.  
**Lower.** Tamarack bog near Volo, in northeastern Illinois.

are mostly hatched far without our borders and are mainly visitors temporarily in our custody. The harmonizing of any sizeable upland game bird or fur-bearing mammal population on such valuable agricultural tracts as compose large areas in our state indeed presents a difficult problem. In a state endowed by nature with waters of very high relative productiveness of fishery resources, the problem of supplying adequate fishing for the many citizens of the state is made difficult by natural limitations in water area, and by most valuable agricultural and industrial industries which diminish aquatic plant and animal life through drainage activities, silting as a result of erosion of denuded soils, and pollution.

All of these statements mean, first that a renewable natural resources program in Illinois must be varied to suit the particular locality; secondly, that, because of high land values, a relatively low proportion of poor to good agricultural land and a large population, any area specifically dedicated to forestry and wildlife resources should be developed to its maximum state of usefulness; and lastly, that it is imperative that any such program be conceived and developed upon impartially- and scientifically-acquired data.

### EXTENT OF RENEWABLE NATURAL RESOURCES

Now, what are the renewable natural resources of Illinois which should have special consideration in our state program and which should come within the scope of my topic, and what are the recent advances implied in the title of my paper? Obviously, since our state has a flora and fauna which contains some 2,800 different kinds of plants, 20,000 insects, 240 mollusks, 85 reptiles and amphibians, 170 fish, 365 birds and 54 mammals, I cannot go into any detail concerning many individual kinds or species. My remarks, therefore, are centered about such general groupings as forests, fish, game birds, and fur-bearers, all of which have very definite and tangible values.

The fact that forests, fish, game birds and fur-bearers are only now beginning to command the serious attention of the State may seem to imply that their economic values are negligible. This is not the case. These same resources were once practically the total support of the inhabitants of this region, furnishing food, clothing and shelter. This is certainly proof of their basic or fundamental values. Now that all the good soil areas of the state are under cultivation and the problem of providing for the necessities and leisure moments of a large population is beginning to bear down, these types of resources are coming to be looked upon with covetous eyes.

A couple of years ago the U. S. Junior Chamber of Commerce estimated that 13 million citizens of this country purchasing hunting and fishing licenses were spending annually about 750 million dollars in pursuit of their favorite recreation. In 1935, 267,606 hunting licenses and about 300,000 fishing licenses were issued in Illinois. Add to these figures the number of persons not required to buy licenses, because of hunting or fishing only on their own lands or because of being under age, and the importance of this industry when translated into dollars and cents begins to be revealed in its true light. Then, too, there is a much larger army of people interested in furthering and preserving these same resources purely because of their general enjoyment and appreciation of the out-of-doors.

The statement that my remarks concerning renewable natural resources are centered chiefly about such general groupings as forests, fish, game birds and fur-bearers should not be interpreted to mean that other forms of biological resources do not have definite beneficial or detrimental values. The chinch bug in 1934 reduced the collective income of the farmers of Illinois over 30 million dollars. The state program in this instance, however, is one of control associated with agricultural crops and by earlier definition is eliminated from discussion in my subject today. It does show, however, how important some other forms of our plant and animal life can be. All biological scientists, naturalists and conservationists know that birds in general exert a tremendous influence in holding in check many insects and that birds as a group are beneficial to man and should be preserved and the numbers of many kinds increased. The same may be said for many forms of animal life, including even the lowly and often needlessly destroyed

snakes. Other forms of life, both plant and animal, while of lesser importance economically, add much to the beauty, enjoyment and interest of our fields and woodlands, and thereby are of concern to all lovers of the out-of-doors. Fortunately, when our renewable natural resources program is planned so as to preserve and further the increase of our forests, fish, game birds and fur-bearers, most other forms of plant and animal life profit accordingly and all categories of conservationists, scientists, sportsmen and nature enthusiasts can support such a program.

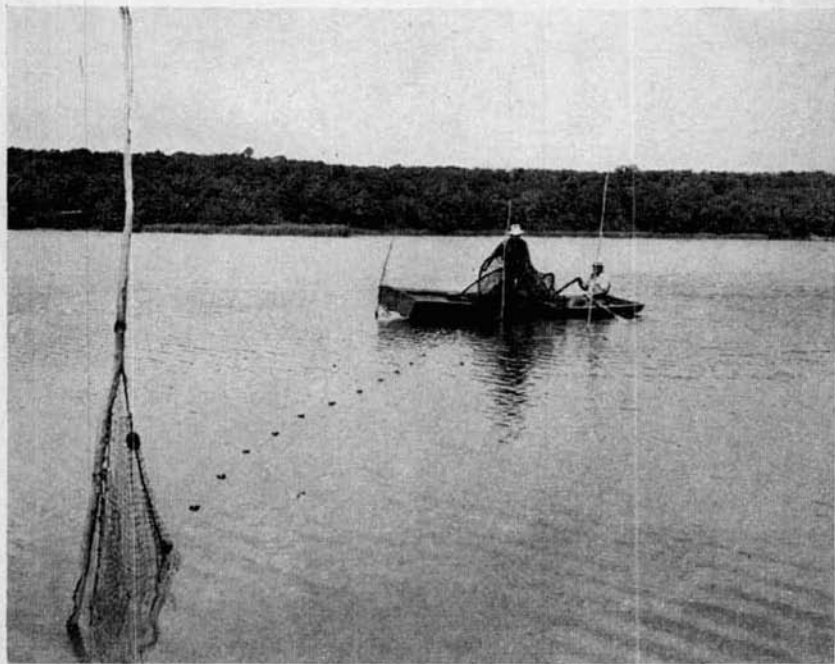


Fig. 1.—Lifting nets in Maple Lake, located in the Forest Preserve District of Cook County. Through study of fish populations, the Natural History Survey is able to make recommendations to improve fish management of Illinois lakes.

**Fish.**—The value of our fisheries resources is easily underestimated because of the character of this particular industry. I have already mentioned the large army of fishermen. Based upon the actual water area of the state there is for each fisherman about one-half acre of water with a varied rating from zero to high productiveness. In 1908 the number of men employed in the fishing industry in Illinois, particularly in the Illinois River valley, was given in a census report as 4,359. That same year the Illinois River alone produced \$721,000 worth of commercial fish, and over \$350,000 worth of mussel shell products came from our rivers. In my Academy paper of 1934, already referred to, I stated as one of the points of a sound utilization program for Illinois the "restoration in the interest of fish, game, forestry and recreation to as natural or improved state as possible of much of the former floodplains and bottom land lakes of our river systems, particularly of the middle and lower Illinois River valley, and the impounding of new water areas wherever useful and practical. Clean waters are prerequisites to the fullest success of this program." This statement requires no modification now. The impounding of small scattered water areas in counties without good lakes and rivers is the only answer to increasing local fishing.

**Forests.**—The statement that the forests of a state are an economic asset requires no proof before such a gathering as this. There is a direct value

of the timber products such as logs, boards, boxes, implement handles, cord wood, mine props, railroad ties, etc., which reached a figure in 1920 of 88 million dollars. The forest products of farm woodlots alone in Illinois was evaluated in a 1935 census as a \$4,500,000 industry. There is, in addition, the indirect value of timbered areas for the preventing of erosion in poor soil type areas and hence their value in reducing the silting of streams, for the harboring of valuable wildlife resources and for the recreational uses of such areas. All of these values are now becoming of importance equal to



Fig. 2.—An example of forested area in the Ozarkian uplift in the southern part of the State. Saddleback Ridge, near Wolf Lake.

or perhaps greater than the board foot values of timber. According to a forestry survey of the State made by the Natural History Survey, about 42 per cent of the State was originally forested. This 15 million acres of forest, with its average stand of 7,500 board feet per acre, had dwindled to about 3 million acres, with about 2,000 board feet per acre, in 1926. An ideal or theoretical forest area for Illinois, based upon soil types and a sound utilization program, calls for the restoration of about 6 million acres of forest, using for this purpose the land which is now forested, some which is now semi-cleared, and some which at the present time is practically waste land from any point of view.

*Game birds.*—Game birds cannot be sold upon the open market, except pheasants under game breeders laws, and, therefore, unlike timber products and certain fisheries and fur-bearer resources, no figures can be presented concerning their annual commercial value. The amount of money spent by sportsmen in quest of quail and migratory waterfowl is an astonishing sum, as indicated by the sale of 267,606 hunting licenses in Illinois in 1935 and 53,251 migratory waterfowl hunting stamps in 1937. The initial cost of licenses is small compared with the investments in numerous waterfowl hunting clubs, the renting of blind or shooting privileges, guide services, cost of guns and ammunition, travel, meals and lodging, and a large number of other incidentals considered a necessity by the average sportsman.

Quail, pheasants and migratory waterfowl such as mallards, blue-winged teal, pintails, Canada geese and a few others bear the brunt of game bird



hunting in Illinois. The quail is the principal game bird in southern and central Illinois. Along the river courses of the State, particularly the Illinois and Mississippi, is centered the greatest part of duck hunting. In extreme southern Illinois, not far from Carbondale, is the best goose shooting. In northern and north-central Illinois the introduced ring-necked pheasant provides considerable sport for hunters. A few other species of birds contribute to the hunter's bag but they are relatively unimportant in

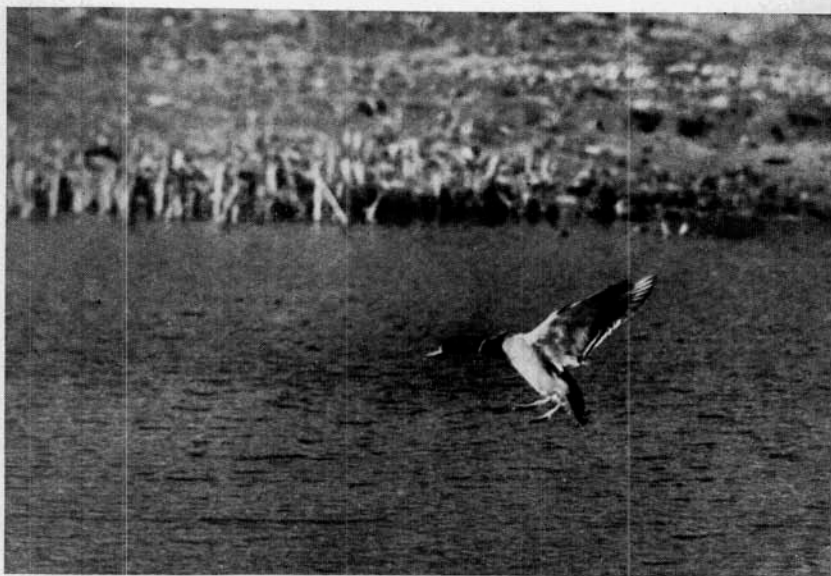


Fig. 3.—Mallard drake alighting. The mallard is one of the principal varieties of migratory waterfowl frequenting Illinois waters. Photo by courtesy of Paul S. Smith.

comparison with quail, the ring-necked pheasant and various species of migratory waterfowl. Prairie chicken, a fine game bird and once abundant in the State, are on the protected list, and our present population of them would soon be decimated if a general open season on them were permitted. Good statistics are lacking concerning the numbers of game birds killed, but the U. S. Biological Survey reports that for the United States the average kill of ducks per season by purchasers of duck stamps is ten. This figure is undoubtedly low and it is safe to say that between 350,000 and 600,000 ducks are shot annually in Illinois, depending upon whether the season is bad or good and the season short or long.

*Mammals.*—Among the mammals, the cotton-tail rabbit affords the chief hunting, and the number killed in all parts of the State annually exceeds the total for any other species of game. Because of their comparative abundance, rabbits up until the 1937 hunting season were still sold on the open market. The year 1937 was considered a poor year in Illinois for rabbit shooting; nevertheless, sportsmen in such a highly-cultivated area as the vicinity of Decatur, in Macon County, reported an average kill of more than three for each time they went hunting. Other mammals which must be considered among our particularly valuable renewable natural resources are muskrats, opossums, raccoons, minks and squirrels. For several years our Natural History Survey has been assembling information regarding the income derived in Illinois from the trapping and hunting of fur-bearers, and from the sale of their pelts. Our data indicate an income, even though production is unaided by man, of one million to two million dollars a year. Of the furbearers responsible for this income, the muskrat is by far the most important and accounts for one-half of the total. The average catch of

muskrats per Illinois trapper reporting is about 30. The highest catch is in the marsh areas of Lake and McHenry counties where the average jumps to about 90 pelts per trapper. The lowest production of muskrat pelts is in southern Illinois and is explained by the absence of marshy areas and by unstable water levels.

*Preserving and increasing natural resources.*—The objectives of the renewable natural resources program for Illinois must definitely, then, provide for the preservation and, if possible, the increase of such valuable re-



Fig. 4.—The muskrat (left) is by far the most important Illinois fur-bearer. The cotton-tail rabbit (right) is the most hunted of Illinois game.

sources as our fishes, game birds and fur-bearing mammals. Other wildlife resources will also profit by the same program. How is such a program to be advanced? The experience of past years indicates that legislation may help to retard declines of wildlife populations but does not necessarily increase such resources. Propagation of fish and game populations in sufficient numbers to supply the demand is not the answer because of the costs and other factors involved, however valuable or worth while for certain purposes some fish hatcheries and game farms may be. To preserve these resources and, better still, to increase them so that they are a direct economic asset, they must be provided with areas supplying sufficient food and cover to enable them to reproduce naturally. The "cropping" of such resources, increases permitting, should be in accordance with accurate information concerning minimum desirable population levels and changing cyclic fluctuations determined by impartial scientific investigations.

Thus far in this paper I have presented the general background and most important objectives of a renewable natural resources program for this State. In my remaining remarks I will outline those steps or actions which I consider as the most important and tangible recent advances in such a program.

#### RECENT ADVANCES

There is an old saying that while you watch the tea kettle it never boils and another one that at times one cannot see the forest for the trees. In other words, there is such a state of affairs as being so closely associated with a general movement and so enthusiastic about it that progress along that particular line seems negligible or tortuously slow. Even a conservative biological scientist or the most effervescent nature advocate should be able to recognize, however, that the advances within recent years in the formation and growth of a sound renewable natural resources program in Illinois have been extraordinary. In view of the fact that I am speaking about a program involving a large governmental unit and an extensive geographical



area, I believe that I am justified in using the term "recent" to cover a period of about five years. Governmental action in a democracy ordinarily proceeds slowly because it is not brought about by fiat.

*Support through the press.*—One of the outstanding advances in Illinois and the nation during this period has been the sudden, almost explosion-like, increased interest upon the part of all classes of citizens in the preservation and increase of forest and wildlife resources. A good gauge or yardstick for measuring this increase is the prominent space given by the press, both rural and metropolitan, to publicity concerning the kinds of these resources, their values and necessity in our present niche of civilization, and descriptions of enterprises having to do with their promotion or development. Newspapers and magazines have a way of appraising subject matter of interest to the public, and the columns of space being devoted to forests and wildlife resources are highly indicative of reader interest. This means better and sounder conservation programs by virtue of public support and interest.

*Support through organizations.*—Another indication of the great advance during recent years in renewable natural resources appreciation is the present number of organizations entirely or in part dedicated to furthering such programs. Fifteen or twenty years ago such organizations were not so numerous and possessed little numerical strength. Fishing and hunting clubs, to be sure, were somewhat of an exception to this statement, but in most instances their membership was not sponsoring the type of conservation now rampant throughout the country. Today almost all large civic organizations such as garden and women's clubs, and the Boy and Girl Scouts, have definite departments promoting the cause of conservation. In addition, we have within the State numerous other laymen organizations, such as the Izaak Walton League, Farmers-Sportsmen's Clubs, Conservation Council, Associated Conservation Organizations of Illinois, Illinois Audubon Society, Prairie Club, Wild Flower Preservation Society, Wilderness Society, American Forestry Association, dedicated solely to such programs and interests. One of these organizations, the Illinois Farmers-Sportsmen's Club, has a membership in this State at the present time of about 80,000 members.

Such an aroused public interest has in turn stimulated the scientific study of our renewable natural resources and forced the reevaluation of conservation theories and practices, many of which, unfortunately, have been and are being found quite wanting. Three years ago there was held at Urbana under the sponsorship of the State Natural History Survey a Wildlife Conference, the first of its kind in the Middle West and perhaps in the country. This was essentially a fish and game clinic at which scientists from all the north-central states, without being dominated by administrators or the political type of conservationists, freely discussed wildlife management practices in an effort to winnow out the chaff from the wheat, to coordinate such researches and to orientate scientific studies of wildlife resources in such a way that demonstrable sound management practices would result. This conference is now an established affair between the states concerned and has served, too, as a forerunner of nation-wide activities along this line. Conservation activities in the past, except possibly in the case of forestry, have been exceedingly wasteful of public monies, have had policies based largely upon fancies and undemonstrated assumptions, and often have been directed by individuals who knew little of and cared less for the biological or scientific principles involved.

*National forestry program.*—The biggest single advance in the renewable natural resources program of this State in the last five years was the establishment in southern Illinois of a national forest unit. I am glad to say that the Illinois State Academy of Science, through its conservation committee, actively supported this forward-looking movement and that the foundation for its being was laid by the Natural History Survey over a period of years. Because of soil values and present land uses the area for a national forest unit breaks into two separate parts, each of which, however, is a single large administrative unit.

Time forbids a detailed statement concerning the accomplishments to date within this national forest unit but they are many, varied and of out-



Fig. 6.—Fire tower on High Knob, Hardin County. Many such towers have recently been built to aid in giving fire protection to national and state forests of Illinois.

standing importance. During the past four years 125,033 acres have been purchased by the Forest Service and an additional 32,525 acres have been optioned and approved by the Reservation Commission. Slightly over 20 per cent, therefore, of the 784,000 acres gross area within the approved unit boundaries have been purchased or are in process of acquisition. This is a great advance, indeed, and 25 years ago the most enthusiastic advocate of an increased forestry program in Illinois would have shied at predicting such an accomplishment. Fire control on this area has steadily advanced and there are now 14 primary and secondary lookout towers with a connecting telephone system to aid this work. Fire control means the growth of new forests, a reduction in soil erosion, a decrease in the silting of streams and generally-improved wildlife conditions. Other accomplishments involved extensive new road construction and the improvement of old ones, the development of recreational centers for picnicking and camping, the reforestation and planting of badly-eroded spots to the extent of some 1,766 acres in 1937, establishment of forestry experimental plots, the Dixon Springs pasture and soil erosion project in cooperation with the Farm Security Administration

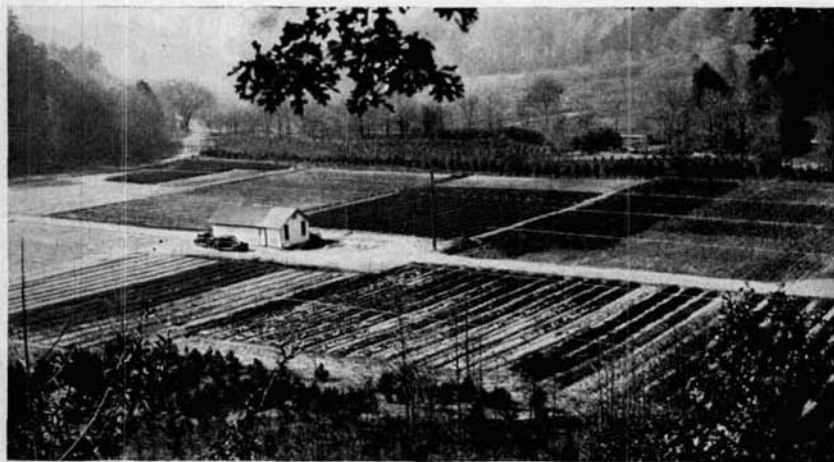
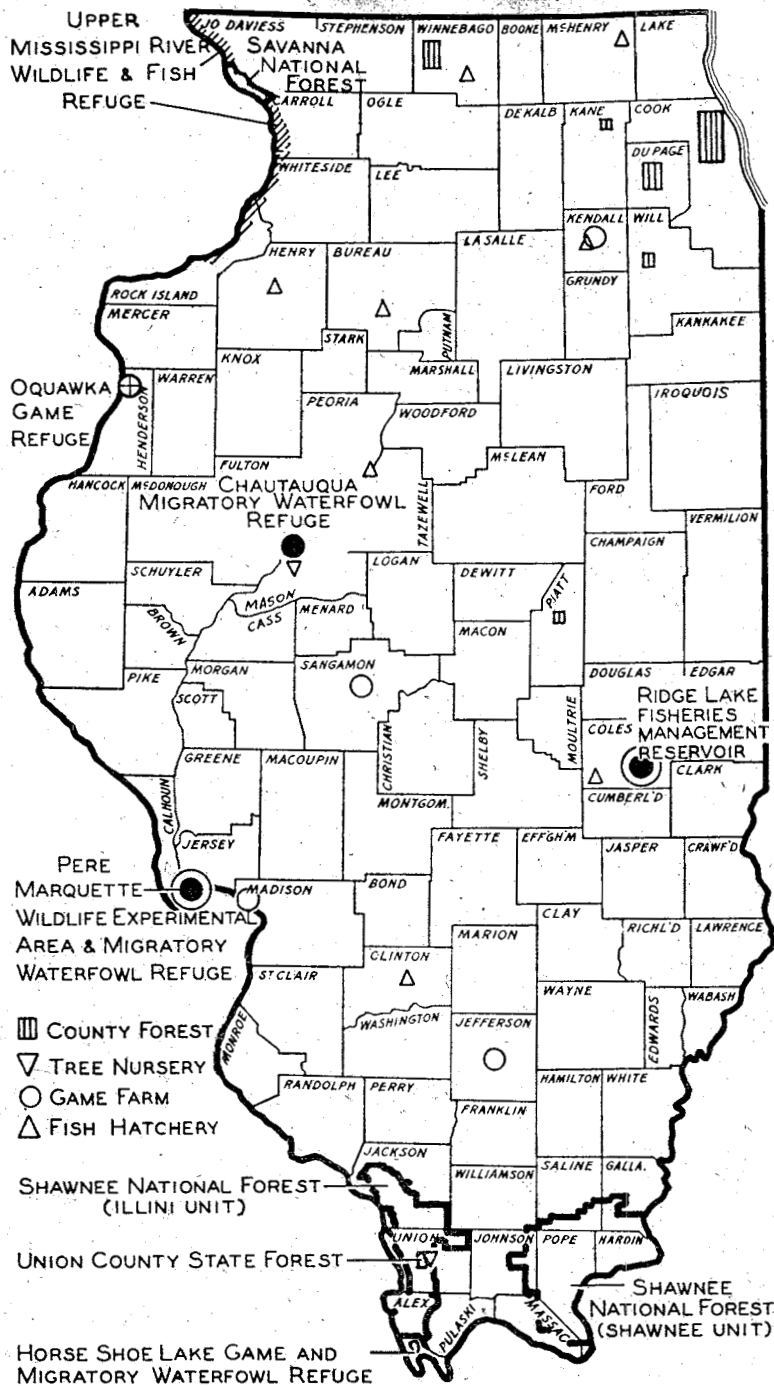


Fig. 7.—One of the State nurseries that raise forest trees. The Thompson Tree Nursery, near Anna. Photo courtesy State Dept. of Conservation.



and the University of Illinois, the construction of 45 ridge ponds or catch basins to further wildlife, particularly during drouth periods, the completion of ranger station buildings at Murphysboro and Jonesboro, and plans for the development of experimental and game refuge areas in cooperation with the State Natural History Survey. It should be stated in connection with this record of accomplishments that CCC and relief labor supplied most of the man power and without this aid the program could not have been so far advanced.

*State forestry program.*—The State Division of Forestry also has made noteworthy advances within recent years in the cause of a sound forestry program for Illinois. The State forest located near Jonesboro was acquired



Fig. 8.—The Chautauqua Lake Migratory Waterfowl Refuge, a few miles north of Havana.

only nine years ago and contains 3,482 acres. Within the last few years this area has been greatly improved from the standpoint of recreational use. Although there has been a tree nursery there since 1929 the real development of this nursery, now officially known as the Thompson Nursery, was initiated in 1936. In cooperation with the U. S. Forest Service, the production of this nursery has been stepped up to the extent that some 3,500,000 trees are now produced there annually. In 1934 another State nursery, the Horner Tree Nursery, was established eight miles east of Havana and this nursery has contributed greatly to the production of seedlings, particularly black locust, for erosion control. January 1, the State Division of Forestry, in cooperation with the U. S. Forest Service, under the terms of the Clarke-McNary Law, began to increase nursery stock production and general State forest fire protection, both of which enterprises are real advances in forestry work in this State. Another project which should be mentioned is the forestation of abandoned strip-mine lands in cooperation with mine operators and this spring 400,000 trees have been planted on such areas under direct supervision of the State Department of Forestry. Last, but not least, the last session of the Legislature appropriated \$50,000 for the establishment of another new State forest unit which probably will be located in poor-soil-type areas in a central or northern part of the State where it will be accessible to large population centers.

Cook, Will, Winnebago, DuPage, Kane and Piatt counties have done much to improve their county forests for wildlife and recreational uses during the past several years with CCC and relief labor but time prohibits any detailed statement here except to say that, although such holdings are small when compared with State and national forests, they are exceedingly important because of the large number of citizens served by them.

*Migratory waterfowl preservation.*—Advances in migratory waterfowl preservation have been notable within recent years. Horseshoe Lake, which is host to so many water birds during the migration seasons, is well known to all and will not be considered here because of its comparatively early establishment in 1927. Within the last three years the U. S. Biological Survey has established near Havana, Illinois, a migratory waterfowl refuge of about 4,000 acres. This area has been so improved that once more Chautauqua Lake is a permanent body of water and not a corn field as a result of drainage. Already the area is frequented in fall and spring by many thousands of ducks, geese and other water birds because here they find food and a safe haven. The importance of this refuge in preserving an abundant supply of these valuable resources is very great and marks a big step in a renewable natural resources program both of the continent and of this State. Under a cooperative agreement with the Biological Survey, the State Natural History Survey will use this refuge as a census station and investigational area.

*Game research and management.*—The State Natural History Survey also has greatly orientated its work and program during the last five years to meet the practical demands of an enlarged and sounder renewable natural resources program for Illinois. The first step in this direction was the establishment, July 1, 1934, of Game Research and Management as a new section of the Natural History Survey, to be coordinated with other investigations in the fields of entomology, applied botany and plant pathology, aquatic biology and forestry. The money for starting this work was released by Governor Henry Horner from a Survey contingency fund, and in 1935 this work was definitely established as an activity directly provided for in the Survey budget by act of the Legislature and approval of the Governor. This program was started with the idea of accomplishing the following objectives:

- (1) A general survey of all sections of the State from the standpoint of present and past game resources and more detailed surveys in certain selected areas.

- (2) Studies of our more important game species, both bird and mammal, from the standpoint of desirability, food habits, shelter or cover prerequisites, general habits, reproductive capacities, influence of weather conditions, enemies, diseases and parasites.

- (3) The establishment of a wildlife technical service to be available to the State Department of Conservation, and other departments of State and national agencies, as well as to layman organizations and private individuals.

- (4) The promotion of a game increase program with the farmers of Illinois through sportsmen's clubs, farm bureaus and other agricultural agencies.

- (5) The need of dovetailing game management practices with our existing program of fisheries research and forestry extension, because they are all very closely interrelated in subject matter.

*Experimental wildlife areas.*—The money provided in 1934 and following years has enabled the Survey to add to the staff a well-trained game specialist and to provide him with a part-time winter and full-time summer assistant. This newly-established service rapidly demonstrated its value and it soon became evident that this personnel was inadequate to meet the demands of this new program throughout the State and at the same time to establish by investigations the basic scientific data necessary. In 1937 the State Legislature appropriated additional funds to the Natural History Survey to strengthen and expand its program and staff for carrying on this work. By 1936 it had become evident that in order to get the type of scientific data necessary for the management of game resources it was necessary to establish some outdoor experimental areas for extensive censusing with regard to fluctuations of wildlife populations and to test out management theories for both fish and game under practical conditions. This new appropriation of 1937 was released by Governor Henry Horner on January 1, 1938, and is enabling the Survey to establish such experimental areas in cooperation with other State and federal agencies which are in a



position at this time to aid such programs by supplying land, personnel of a varied type and the labor of CCC camps.

Two large projects are now under way as a result of this action, and these, I believe, have every possibility of returning to the State in the form of valuable scientific data, in the preservation of certain wildlife resources, and by demonstration of tested management practices, contributions which will be equal to or exceed the total combined work of this nature which has been done by various state agencies to date.

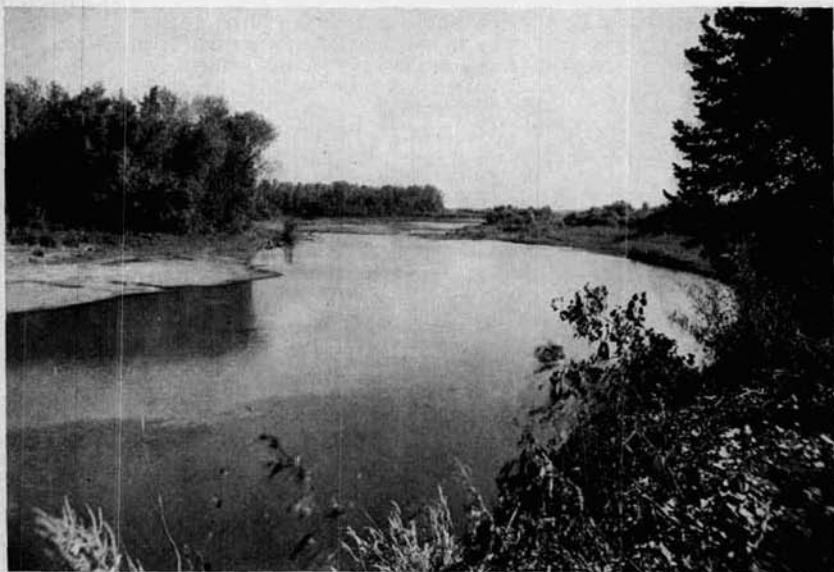


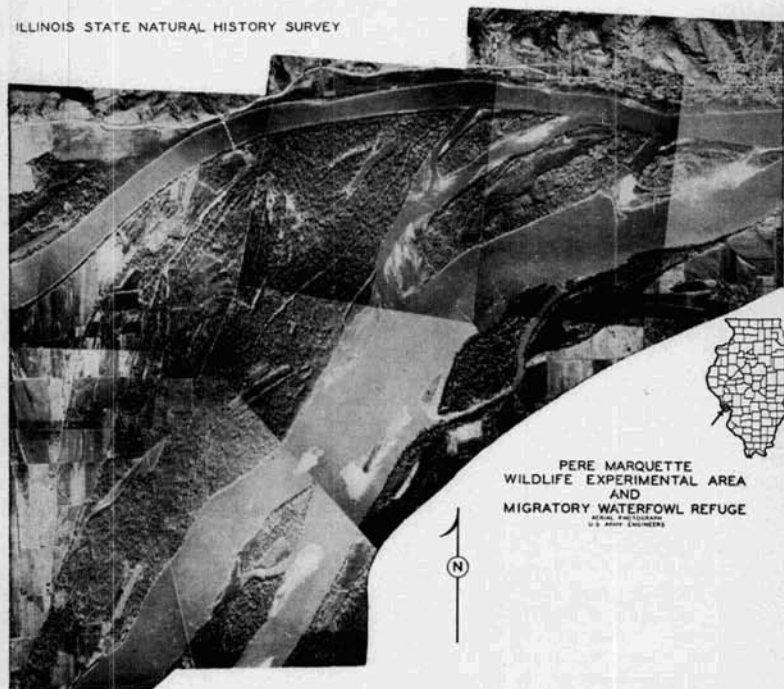
Fig. 9.—A minor channel connecting the Mississippi and Illinois Rivers near Grafton. This borders the Pere Marquette Wildlife Experimental Area and Migratory Waterfowl Refuge.

*Pere Marquette Area.*—The first of these projects has been named the Pere Marquette Wildlife Experimental Area and Migratory Waterfowl Refuge. It is located in the extreme southern tip of Calhoun County, between the confluence of the Illinois and the Mississippi rivers. It gets the first part of its name from the fact that it will be adjacent to Pere Marquette State Park, now being extensively developed by the State Department of Public Works and Buildings and the National Park Service. As the rest of its name implies, this outdoor laboratory will be dedicated to the scientific study and practical management of the renewable natural resources of this area and will serve as a refuge or haven for the migratory waterfowl which use the Illinois and Mississippi river valleys as flyways during their spring and fall migrations. If this area contributed nothing else to the cause of conservation in this State except to furnish a safe haven for such valuable birds, located as it is about halfway between Horseshoe Lake Refuge of the State Department of Conservation and the Chautauqua Lake Refuge of the U. S. Biological Survey, it would be worth every cent of its cost. In developing this project, the National History Survey has been most fortunate to secure the active cooperation of the U. S. War Department, which, because of the installation of the locks in the Mississippi River near Alton and the resulting impounding of the waters at the 420-foot contour, has found it necessary to purchase this bottom land. About 3,000 acres of this land, at the location already mentioned, is now being developed for this experimental area and refuge in cooperation with the National Park Service and the State Department of Public Works and Buildings. Several additions to the staff of the Natural History Survey have been made for the express

purpose of carrying out the scientific program on this and other tracts of the same fundamental character within the State.

Besides serving a number of valuable scientific purposes, this area will be so developed that under certain conditions and times it will be available for visitation by the general public interested in the wildlife of the State;

ILLINOIS STATE NATURAL HISTORY SURVEY



PERE MARQUETTE  
WILDLIFE EXPERIMENTAL AREA  
AND  
MIGRATORY WATERFOWL REFUGE  
JOHN HUTCHINGS  
U.S. ARMY ENGINEERS

Fig. 10.—Aerial view of the Pere Marquette Experimental Area and Migratory Waterfowl Refuge.

thus serving as a demonstration project and adding greatly to the recreational and educational features of the Pere Marquette State Park and the adjacent U. S. Recreational Demonstration Area.

**Ridge Lake.**—The second project now in course of development is the building of a small experimental reservoir of about 23 acres in the Fox Ridge State Park southeast of Charleston, Illinois, to be known as Ridge Lake. This reservoir is being so constructed that it will enable the Survey to carry on a fisheries management program such as cannot be duplicated at the present time anywhere in the State and probably in the country. Soil maps have been made by the Soil Survey of the Illinois Agricultural Experiment Station. The State Geological Survey has contributed to a detailed mapping of the basin and supplied other geological information in connection with the dam site. The State Water Survey has contributed information concerning the availability of surface waters and assisted in the designing of a dam of unique type which will enable us to control the reservoir from the standpoint of its fisheries management. Not only will this project contribute important information for the guidance of future reservoir construction in the State in regard to utilization of wildlife resources, but it will form also a valuable asset to the aesthetic and recreational features of the park. This project has been made possible by the cooperation of certain agencies already mentioned, the citizens of Charleston who provided the money to buy additional private lands for increasing the park area to accommodate the reservoir, the State Department of Public Works and Buildings and the

National Park Service. The labor, as in the case of the Pere Marquette Experimental Area, is being provided by relief and CCC camps. A small laboratory will be established there to house equipment and personnel utilized in making a detailed study of this lake as it passes through various stages so that such matters as plankton development, change in chemical content of the water, development of bottom fauna, vegetation and fish populations can be studied in relation to maximum fisheries production in such waters. A limnologist has been added to our Section of Aquatic Biology especially to handle the investigational program centered around this reservoir and to work on State reservoir problems in general as they affect fish and other wildlife resources.

*National forest experimental area.*—A third experimental area and refuge, typical of the Ozarkian Uplift and not far from Carbondale, is now reaching a stage which augurs well for its official inauguration within a few months. This is an experimental area and refuge in the National Forest Unit to be developed in cooperation with the U. S. Forest Service. The staff and personnel employed to carry on the experimental program in the Pere Marquette Refuge and Ridge Lake Reservoir will promote research and management practices in this area and will be aided by members of the scientific staff of other sections of the Natural History Survey and the U. S. Forest Service.

All three of these projects are fundamentally different, the Pere Marquette Area stressing migratory waterfowl resources, the U. S. Forest Area emphasizing upland game and fur-bearing mammal populations and Ridge Lake in Fox Ridge State Park the management of our most important game fish. These three projects represent a marked departure in the scientific program of the State, since they introduce the element of scientific field studies in representative water or land type areas in contrast with indoor laboratory researches. Both types of study are essential and must supplement one another, particularly when the State is faced with a dynamic and practical renewable natural resources management program.

*Pittman-Robertson Act.*—Another most important step, although not completely taken, is so definitely a part of the near future that it should be mentioned at this time; this is a federal bill known as the Pittman-Robertson Act. This legislation passed the national Congress last year and sets aside in the federal treasury certain taxes on munitions to be used to aid state programs of game restoration. It is modeled after the national highway legislation which brought the country out of the mud and gave us a unified and coordinated highway program. This bill is very carefully written and so set up that money will go only to states which have a sound program for game restoration. The money is distributed in proportion to the area of a state and the number of hunting licenses issued. Illinois ranks well with most other states in area of square miles and stands about fifth in number of hunting licenses issued; all of which guarantees a considerable allotment of funds to this State. As I have already mentioned, this money is to be used for the actual restoration and development of wildlife areas and the promotion of scientific studies which will aid in the preservation and increase of desirable wildlife populations. Over a period of years, the funds available should accomplish a great deal toward these ends. From all points of view, I believe that this is the most important national or state bill which has been passed to aid wildlife resources in the states and country at large since the passage of the first Migratory Bird Act in 1913 and the establishment of national parks and forest units.

*Prospects for the future.*—Although you and I, as conservationists, are in the same position as the housekeeper watching the kettle which seemingly never boils, rapid advances in the renewable natural resources program of this State and the country are being made. This means, too, that the preservation of most of our remaining renewable natural resources in Illinois is assured and that the decline in numbers of certain wildlife populations is being stopped. In addition, there is every prospect that, within certain limits, there will be increases of certain desirable wildlife populations and an improved technique available for intelligently managing our woodlands, farms and inland waters.