A New Look at the Survey

Beginning with this issue, Survey Reports comes to you in a new format. Similar changes in other members of the Survey's family of publications—most notably the Bulletin and Biological Notes—will follow. We believe that by projecting a unified image our publications will heighten public awareness of the Survey and its important mission.

Readers, we hope, are attracted to the freshness and simplicity of the Survey's new design, both the unique block of type and the interesting symbol. We trust that these elements in combination will soon communicate the message—"from the Survey." Over time the symbol will establish its own denotative meaning, as all logos do. Those who look for a more immediate connotative value have suggested that the symbol represents a stylized eye that reminds us of the Survey's mission: to watch over the plant and animal resources of the state. That eye cannot be a particularly cheerful one because of the ever increasing rapidity with which species are lost from the planet and the growing list of threatened species. The symmetry of the symbol suggests the balance that must be achieved between the utilization and preservation of our living natural resources.

In the 132 years since its inception, the Illinois Natural History Survey has come to be recognized as the premier natural history survey in the nation, and many constituencies look to us for leadership. Over the course of the past year, we examined the organizational structure of the Survey to determine if it was the most efficient and effective to carry out our mission. We elected to follow the observation of Will Rogers, "Even if you're on the right track, you'll get run over if you just sit there." To that end we examined our programs and discussed our future in a systematic way. Our intent was to address the crucial issues of tomorrow in a time of fiscal restraint.

At the beginning of this fiscal year, we implemented the following organizational changes that we believe have both short- and long-term advantages.

The titles of the research units were changed from sections to centers and the titles of their leaders from section heads to center directors. Although this change is minor, we have moved both in concept and in terminology from a structure based on partition to one that emphasizes unity. A new administrative position, Assistant Chief for Planning, was established with the objective of helping the Survey to become responsive through planning rather than to be merely reactive.

The sections of Faunistics Surveys and Insect Identification and Botany and Plant Pathology were combined to form the Center for Biodiversity. We believe that botanists and zoologists working together in an integrated fashion within a single unit will have a synergistic effect on one another. This Center also brings together the major portion of public and professional services in the identification of species. In addition, the new arrangement brings the Survey's biological collections under unified management, a crucial step in ensuring their care and continuity.

Finally, a new unit was formed. The Center for Biogeographic Information was created in recognition of the increasing importance of computers to science and to the provision of biological information to state agencies and Illinois citizens. Placing our portion of the Illinois Geographic Information System and the Survey's computer network together creates an integrated computer environment. The unit also contains a service segment made up of contract staff, whose major function is to provide biological information to municipal, county, state, and federal entities. This information...
assists those agencies in making decisions about projected uses of the Illinois landscape.

Thus the Survey’s new look is more than cosmetic, although our publications are experiencing a face-lift. We hope that readers are reminded of the long and proud history of the Survey when they see the solid, traditional block of type on the masthead, but we also hope that the contemporary look of the new logo conveys our acceptance of the challenges that are yet to be met if we are to safeguard the living resources of the state.

Lorin I. Nevling, Chief

Natural Areas, Rare Species, and Highways: Can They Coexist?
One regrettable aspect of the contemporary Illinois landscape is that in many parts of the state one can drive for miles and see no native plant communities or even many individual plants native to North America. The sad fate of the prairie in the Prairie State is well documented. Where formerly over 21,000,000 acres of prairie occurred, now only about 0.01% of that amount, or 2,300 acres, remain in high-quality condition (Illinois Natural Areas Inventory data). These remnants are found primarily as small, widely dispersed islands in an otherwise modified terrain dominated by nonnative species. Illinois lamentably ranks near the bottom among all states in the amount of land retaining an appearance of its natural condition.

Superimpose on this fragmented landscape a rural roadway system of more than 100,000 miles that is maintained by federal, state, and county governments and, despite the rarity of natural vegetation in Illinois, conflicts between highway construction and these fragile habitats will inevitably occur. For more than five years, staff at the Survey’s Center for Biogeographic Information have been conducting biological surveys at the proposed sites of Illinois Department of Transportation (IDOT) projects. These studies have primarily been designed to determine the presence of natural areas, wetlands, and state and federally listed threatened and endangered species.

Although many IDOT project sites visited by Survey biologists do not contain habitats with a high degree of natural quality, some are important exceptions. Through a process of formal consultation between IDOT and the Illinois Department of Conservation (IDOC), the results of these studies have contributed to the protection of significant areas. The story of one such site is told below.

The Watseka Railroad Prairie, a noteworthy prairie remnant two miles in length, occurs in railroad right-of-way along U.S. Route 24 just east of Watseka in Iroquois County. Sands deposited on the shores of the Pleistocene-aged Lake Watseka and subsequently blown throughout the region have given a distinctive feature to the soils in the area. Although no deep sands were deposited in the prairie remnant, the soils are quite sandy and an interesting prairie community with characteristics of both black-soil and sand prairies developed on the site. Survey botanist Dr. Robert Evers (now retired) visited this site during the early 1960s, recognized its importance, and arranged for the Toledo, Peoria, and Western Railroad to leave this remnant undisturbed.

U.S. Route 24 is now scheduled for widening, and the design proposal called for elimination of about half the width of this already narrow prairie remnant. Records in the vascular plant herbarium at the Survey documented that Dr. Evers had collected a rare plant species, the state-endangered pink milkwort (*Polygala incarnata*), at this site and reported the presence of numerous plants at that time. Pink milkwort is a diminutive annual species that benefits from fire; however, this remnant had evidently never been managed with prescribed fire. One consequence of the suppression of fire in prairie remnants that occur in highway or railroad rights-of-way is the invasion of such alien grasses as meadow fescue and Kentucky bluegrass, which are planted along most midwestern roadsides. In the absence of fire, these European cool-season grasses eventually form a dense matrix that reduces the original species richness of the site.

Despite intensive searches of the remnant during 1986, no pink milkworts...
were found. During 1987, a thorough inventory of the prairie was made (again no pink milkworts were found) and permanent plots were established to measure the response of the vegetation to prescribed fire. The first management fire was conducted the following spring, but no pink milkworts appeared during the drought of 1988 (native annuals, in general, fail to germinate without adequate soil moisture). A second burn occurred in the spring of 1989. Finally, on the last visit to the site (road construction is planned for 1990), a small population of pink milkwort was found in an area that had been searched repeatedly during previous years. This discovery documents one of only two or possibly three known populations of this prairie/savanna species remaining in Illinois. The IDOT has agreed to minimize disturbance to the highest quality prairie, the area that contains the pink milkwort population. In addition, seeds of prairie species collected from the site will be sown in areas of the Railroad Prairie where construction disturbances occur.

With the regular use of prescribed fire, there is hope that this population of Polygala incarnata will continue to recover. Continued monitoring of the site will permit us to correlate shifts in the composition of the prairie to the recovery of pink milkwort. In the case of this site, persistence was necessary to reverse the effects of years of fire suppression.

As proposed, several other highway projects have the potential to threaten valuable natural resources. Future biological surveys, like the survey at the site of the Watseka Railroad Prairie, will enable highway planners to develop designs that accommodate natural areas and the sometimes fragile habitats of threatened and endangered plants and animals.

John B. Taft, Center for Biogeographic Information

Periodical Cicadas to Emerge in Northern Illinois

Having been underground for more than a decade as nymphs feeding on the root sap of trees and shrubs, the adults of the periodical cicada, incorrectly called locusts by many people, will emerge in the spring of 1990 in northern Illinois. In the predawn hours of the last days of May through the first days of June, the inch-long, brown nymphs tunnel their way out of the soil and clamber the trunks of trees (or other vertical surfaces). A few feet up the trunk, their skins split down the back and the lime green and white adults emerge. The brown shells of the nymphs remain on the trunk for several days before falling to the ground, where they eventually break apart.

Sitting head-upward on the trunk, the wet cicadas dry and their outside coverings cure and tan; their green and white bodies turn black, their eyes are red, and their clear wings are marked with orange veins.

During sunny hours of the day, the males sing to attract the voiceless females to them. The 1 1/2-inch-long cicadas mate during June, and the females lay their eggs into slits that they have cut into the twigs and branches of trees and shrubs. When large numbers of cicadas are present, these slits can be numerous enough to kill some twigs and branches or weaken them so that they break off in the wind. Older trees and shrubs may appear to be severely damaged but will survive without lasting injury. Very young trees, those with trunk diameters of less than 1 1/2 inches, may be killed or severely damaged.

Very young trees may need to be protected by covering them with screening, cheesecloth, or mesh bags such as those used in shipping onions. The mesh should be securely tied around the base of the trunk to keep cicadas from crawling underneath the mesh and up the trunk. Spraying trees with carbaryl, sold as Sevin, will protect them from attack for a few days. Unless trees are very small and a large number of cicadas are present, control measures will probably not be necessary.

Eggs that were laid in June hatch into nymphs six or seven weeks later; by this time the adults have died. These young nymphs drop to the ground, tunnel into the soil, and find a tree or shrub root on which to feed. Either 13 or 17 years will pass before these insects again appear above ground.

In June 1990, periodical cicadas will emerge north of a line running from Rock Island County south to northern Sangamon County and then north to northern

The adult periodical cicada. Photo by Philip L. Nixon
Iroquois County. These insects are a 17-year brood that last emerged in 1973. Other broods of cicadas occur in other parts of Illinois. Generally, cicadas in the southern half of Illinois go through a 13-year life cycle and those in the northern half experience a 17-year cycle. In central Illinois, some broods are from the shorter and others from the longer life cycle.

Annual or dogday cicadas are over 1½ inches long, larger than periodical cicadas. The adults are green or brown with black markings and appear each year from July to September but in smaller numbers than the periodical cicada. They tend to sing in the evening, about sunset. Their nymphs, like those of the periodical cicada, are brown but are over an inch long and usually feed on the sap of tree roots for two to five years.

Philip L. Nixon, Extension Entomologist

Lone Star Tick in Illinois
The tick most frequently submitted to the Survey for identification is the lone star tick, *Amblyomma americanum* (L.). This tick, a serious pest of humans, livestock, and wildlife in the southern United States, is well known as a vector of Rocky Mountain spotted fever and tularemia. Its common name derives from a prominent silvery white spot on the back of the female. The tick attacks humans in all of its active life stages (larva, nymph, and adult). The larvae often attack in clusters and are commonly known as "seed ticks."

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Female lone star tick with its prominent back marking. Illustration by M.M. Makepeace, courtesy State Biological Survey of Kansas.

The adults and nymphs are prevalent in spring and early summer; the larvae generally appear later in summer.

The lone star tick was first detected in Illinois in the mid-1960s by Survey wildlife specialists studying white-tailed deer in southern Illinois. Deer are the most important host for the adult ticks, and heavy infestations can kill them. The lone star tick established itself across the Shawnee Hills region of southern Illinois and is familiar to residents there. In recent years it has been detected in a few scattered localities in central and northern Illinois. This recent extension of its range may be related to dispersal by the increasing populations of deer in the state.

Entomologists at the Survey are monitoring the spread of this important tick, and readers of *Survey Reports* who encounter it in central and northern Illinois are urged to send specimens in alcohol to the Survey in care of the author.

John K. Bouseman, Center for Economic Entomology

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