ILLINOIS
NATURAL HISTORY
SURVEY
ANNUAL REPORT

HIGHLIGHTS 1983 - 1984

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ILLINOIS NATURAL HISTORY SURVEY
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More than 125 years ago, Illinois recognized the need to understand its living natural resources. Today, the Illinois Natural History Survey stands as the oldest and largest organization of its kind in the nation. With a staff of nearly 200, the Survey studies the animal and plant life of the state to determine the most effective means of protecting and using intelligently these resources for the maximum economic, educational, and recreational benefits of all Illinois citizens.

In the first half of this century, much of the attention of the Survey was focused on determining which species occurred in the state, the habitat requirements of each species, and the interrelations among various species of plants, birds, mammals, fish, and invertebrates. With literally thousands of species in Illinois, it is not surprising that this task has not yet been completed. In addition, the Natural History Survey is now faced with the responsibility of making recommendations about the protection and management of these species at a time when increasing demands are being made on the natural resources of the state. With increased human activity has come an increase in the need to manage agricultural systems, harvest raw materials, and manipulate streams and lakes. To make the best judgments about these competing activities, it is necessary to have scientifically collected data documenting the current status and trends in the state’s plant and animal populations. Furthermore, there is a need to conduct experiments designed to determine how the biota respond to alternative management approaches. Thus, the Natural History Survey has the responsibility of understanding the living natural resources of the state, and providing information that will enable citizens of Illinois to appreciate and enjoy these resources now and in the future.

The mission of the Illinois Natural History Survey includes:

- Performing scientific enquiry concerning the life histories, population dynamics, and ecosystem properties of the living natural resources of Illinois
- Investigating the fields of botany and zoology of the state; acquiring, organizing, and utilizing knowledge about these fields; and discharging responsibilities as the official repository for the collections of insect and animal specimens of the state
- Formulating and providing recommendations about the status, protection, development, and use of the biological resources of Illinois
- Publishing scientific studies and furnishing information based on scientific principles enabling Illinois to use, enjoy, and manage its biological resources

This report describes, in a very brief manner, selected Natural History Survey projects designed to meet this challenging mission. The centerfold map shows the locations of projects throughout the state. Survey publications, books and book chapters, journal articles, symposium papers, and project reports are listed in the latter part of this annual report.

GENERAL ACTIVITIES OF THE ILLINOIS NATURAL HISTORY SURVEY

Although the remainder of this report describes specific projects of the Survey, a number of general activities are listed here. The Survey:

- Makes recommendations to state and federal agencies about the management of fish, wildlife, and plant populations
- Presents research papers at state, national, and international scientific meetings and symposia
- Reviews reports, plans, and regulations to ensure the scientific soundness of the biological considerations
- Conducts thousands of chemical analyses of soil, water, and biological tissues
- Provides management capabilities for Illinois living natural resource data and information
- Hosts workshops and training sessions for groups ranging from school children to world-renowned experts in specialty areas
- Collects and curates over 6,000,000 specimens of plants and animals
- Develops and uses mathematical models to predict biological responses to changes in environmental conditions
- Contributes to the theoretical bases underlying the behavior of biological systems
- Designs and constructs sophisticated field and laboratory equipment to measure biological processes
- Identifies annually hundreds of plant and animal specimens for citizens of Illinois and for professional biologists throughout the world
- Diagnoses and prescribes treatments for pests and diseases of ornamental and agricultural plants
- Contributes to numerous television, radio, and newspaper presentations about the state’s living natural resources

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Current Natural History Survey research projects are listed on these pages, and the location of each project is also given. Each project is given the number that represents that project on the map at the center of this report.

Natural History Survey botanists, entomologists, ichthyologists, herpetologists, mammalogists, and ornithologists collect and preserve specimens and document information about them and their habitats in many locations in Illinois each year. A historical examination of the Survey’s specimen-collecting activities would show that they have occurred in nearly every part of the state. However, researchers do not make collecting trips to every collecting location in every year. Collection sites are not marked on the map, with the exception of a few connected with ongoing research projects.

Plant Studies

1. Surveys of endangered and/or threatened plant species and habitat for Illinois Department of Transportation. 2 miles southeast of Crystal Lake, McHenry County.
2. Surveys of endangered and/or threatened plant species and habitat for Illinois Department of Transportation. 1 mile northwest of Richmond, McHenry County.
5. Vegetation studies at Volo Bog. Lake County.
6. Studies of the vegetation, including fungi, of Illinois bogs. Lake County.
7. Studies of bryophytes (mosses and liverworts). Castle Rock Conservation Area, 2 miles south-west of Oregon, Ogle County.
8. Studies of diseases of amenity trees, including host range, etiology, phenology, and chemical control. Morton Arboretum, Lisle, Du Page County.
10. Studies of bryophytes (mosses and liverworts). Clark Run, 1 mile north-northeast of Utica, La Salle County.
11. Studies of bryophytes (mosses and liverworts). Matthiessen State Park, 2.5 miles south-southwest of Utica, La Salle County.
12. Studies of bryophytes (mosses and liverworts). Starved Rock State Park, 1 mile southeast of Utica, La Salle County.
14. Surveys of endangered and/or threatened plant species and habitat for Illinois Department of Transportation. Along Cedar Creek between Monmouth and Galesburg, Warren County.
19. Study of aquatic plant control by hybrid carp. Utterback’s Pond near Gibson City, Ford County.
20. Study of the control of thistles by an introduced weevil on reclaimed strip mine lands. 6 miles northeast of Cuba, Fulton County.
22. Studies of the abundance of waste grain foods for wildlife relative to fall tillage practices. Northern Champaign County.
24. Studies of the abundance of waste grain foods for wildlife relative to fall tillage practices. Mason County.
26. Surveys of endangered and/or threatened plant species and habitat for Illinois Department of Transportation. Along the Illinois River south and east of Valley City, Pike County.
27. Vegetation studies at Pike County Conservation Area and vicinity. Pike County.
28. Surveys of endangered and/or threatened plant species and habitat for Illinois Department of Transportation. 3 miles east of Charleston, Coles County.
29. Inventory of prairie plants. Near Carlinville, Macoupin County.
30. Studies of bryophytes (mosses and liverworts). Rocky Hollow, 9 miles southeast of Martinsville, Clark County.
32. Study of resistance to pine wilt disease of 102 Scotch pine cultivars. Salem, Marion County.
34. Vegetation studies near zinc smelter. Sandoval, Clinton County.
35. Illinois river mycological (fungal) studies. Mississippi River near Grant Tower, Jackson County.
36. Studies of bryophytes (mosses and liverworts). Giant City State Park, 8 miles north-northeast of Anna-Jonesboro, Union County.
37. Studies of bryophytes (mosses and liverworts). LaRue-Pine Hills Ecological Area, 11 miles northwest of Anna-Jonesboro, Union County.
39. Illinois freshwater swamp mycological (fungal) studies. LaRue Swamp Nature Preserve, Union County.
40. Surveys of rare and endangered plant species. LaRue-Pine Hills Ecological Area, Union County.
41. Illinois freshwater swamp mycological (fungal) studies. Heron Pond Nature Preserve, Johnson County.
42. Illinois freshwater swamp mycological (fungal) studies. Forman Cypress Swamp, near Forman, Johnson County.
43. Illinois freshwater swamp mycological (fungal) studies. Belknap Swamp, near Belknap, Johnson County.
44. Surveys of incidence of pine wilt disease in Scotch, red, and white pine plantings. Dixon Springs Agricultural Center near Dixon Springs, Pope County.

45. Studies of bryophytes (mosses and liverworts). Bell Smith Springs, 4 miles west-northwest of Eddyville, Pope County.
46. Studies of bryophytes (mosses and liverworts). Burden Falls, 6 miles northwest of Eddyville, Pope County.
47. Studies of bryophytes (mosses and liverworts). Cretaceous Hills Nature Preserve, 5 miles southwest of Bay City, Pope County.
48. Studies of bryophytes (mosses and liverworts). Hayes Creek Canyon, 1 mile north of Eddyville, Pope County.
49. Studies of bryophytes (mosses and liverworts). Jackson Hollow, 7 miles west of Eddyville, Pope County.
50. Studies of bryophytes (mosses and liverworts). Lusk Creek Canyon, 4 miles northeast of Eddyville, Pope County.
51. Studies of ornamental trees and shrubs. Bloomington, McLean County.
52. Studies of ornamental trees and shrubs. Brookfield, Cook County.
53. Studies of ornamental trees and shrubs. Chicago, Cook County.
55. Studies of ornamental trees and shrubs. Danville, Vermilion County.
56. Studies of ornamental trees and shrubs. Des Plaines, Cook County.
57. Studies of ornamental trees and shrubs. Elmhurst, Du Page County.
58. Studies of ornamental trees and shrubs. Evanston, Cook County.
59. Studies of ornamental trees and shrubs. Glen Ellyn, Du Page County.
60. Studies of ornamental trees and shrubs. Glenview, Cook County.
61. Studies of ornamental trees and shrubs. Glen Ellyn, Du Page County.
63. Studies of ornamental trees and shrubs. Homewood, Cook County.
64. Studies of ornamental trees and shrubs. Kenilworth, Cook County.
65. Studies of ornamental trees and shrubs. La Grange, Cook County.
66. Studies of ornamental trees and shrubs. La Grange Park, Cook County.
67. Studies of ornamental trees and shrubs. Lake Forest, Lake County.
68. Studies of ornamental trees and shrubs. Mt. Prospect, Cook County.
69. Studies of ornamental trees and shrubs. Oak Park, Cook County.

Fig. 1. — Ascospores of a new fungal genus and species, Lepidopterella palustris Shearer and Crane, isolated from submerged twigs in Elvira Cypress Swamp (Deer Pond), Johnson County. This fungus is a rare species that occurs in warm seasons. The generic name means little butterfly, and the species name, palustris, means swampy.
72. Studies of ornamental trees and shrubs. Park Ridge, Cook County.
73. Studies of ornamental trees and shrubs. Peoria, Peoria County.
74. Studies of ornamental trees and shrubs. River Forest, Cook County.
75. Studies of ornamental trees and shrubs. Riverside, Cook County.
76. Studies of ornamental trees and shrubs. Rockford, Winnebago County.
77. Studies of ornamental trees and shrubs. Shawnee National Forest, several counties in southern Illinois.
78. Studies of ornamental trees and shrubs. Sinnissippi Forest near Oregon, Ogle County.
79. Studies of ornamental trees and shrubs. Skokie, Cook County.
80. Studies of ornamental trees and shrubs. Springfield, Sangamon County.
81. Studies of ornamental trees and shrubs. Westchester, Cook County.
82. Studies of ornamental trees and shrubs. Western Springs, Cook County.
83. Studies of ornamental trees and shrubs. Wilmette, Cook County.
84. Studies of ornamental trees and shrubs. Winnetka, Cook County.

Aquatic Invertebrate Studies
85. Studies on the effects of sedimentation and siltation on molluscs. Kankakee River near Momence, Kankakee County.
86. Studies of the effects of organic pollution from sewage treatment facilities on benthic (bottom-dwelling) organisms. Scattering Forks Branch near Tuscola, Douglas County.
87. Studies on the pond polyculture of Malaysian prawns and Chinese carps as alternative food resources. Isotope studies to determine the feeding habits of the polyculture components. Sam A. Parr Fisheries Research Center, Stephen A. Forbes State Park, Marion County.
88. Ecological studies and monitoring of crustacean and fish populations. LaRue-Pine Hills Ecological Area, Union County.
89. Life-history studies of crayfishes and fishes. Big Creek, Hardin County.
90. Studies of aquatic oligochaetes, aquatic insect ecological energetics, and faunal surveys. Cache River near Karnak, Pulaski County.
91. Studies of aquatic insect ecological energetics and faunal surveys. Mermet Lake, Massac County.

Fig. 2. — A Natural History Survey entomologist using a device to capture beneficial and injurious insects in alfalfa. The trap is quickly dropped onto the alfalfa plants, and all insects within the trap are removed, identified, counted, and recorded.
Fig. 3. — The caterpillar of the moth, *Amphipoea velata*, a new, minor pest of corn in Illinois.

93. Caddisfly life-history studies, Middle Fork of the Vermilion River, Vermilion County.
94. Damselfly population studies, Burden Falls, Pope County.

**Terrestrial Invertebrate Studies**

95. Long-term studies on interactions among tillage practices, insecticides, and soil insects, including insect population dynamics and insecticide behavior and efficacy. Ellingson farm near Belvidere, Boone County.
96. Studies evaluating insecticidal ear tags used to protect pastured cattle against flies. Wauconda, Lake County.
97. Life-history studies of the aphid, *Rhopalosiphum cerasifoliae*. Illinois Beach State Park, Lake County.
98. Collection site for and studies of the biosystematics of the aphid subfamily Lachnoidea. Illinois Beach State Park, Lake County.
99. Site for monitoring alfalfa weevil populations through emergence traps (fall of 1983) and stem samples for larval populations (spring 1984) in preparation for fall perimeter spray program tests. Mt. Carroll, Carroll County.
100. Studies of the biology and control of the stalk borer and the hop vine borer. Lanark, Carroll County.
101. Tests of cucurbitacins (extracts from squash-group plants) as baits in traps for corn rootworms. Mt. Morris, Ogle County.
102. Evaluations of parasitic wasps released to control house flies on a dairy farm and evaluations of insecticides sprayed on barns and cattle to control flies. Oregon, Ogle County.
103. Tests of cucurbitacins (extracts from squash-group plants) as baits in traps for corn rootworms. Oregon, Ogle County.
104. Integrated pest management (IPM) test plots; studies of effects of IPM practices, crop rotation, and tillage practices on grain yields and pest populations. De Kalb, De Kalb County.
106. Collection site for and studies of the biosystematics of the aphid subfamily Lachnoidea. Morton Arboretum, Lisle, Du Page County.
107. Biological and ecological studies of beneficial and injurious insects associated with alfalfa. Fulton, Whiteside County.
108. Studies on the effect on yields and quality of the timing of insecticide applications to control potato leafhoppers on alfalfa. Morrison, Whiteside County.
111. Long-term studies of the interactions among tillage practices, insecticides, and soil insects, including insect population dynamics and insecticide behavior and efficacy. Northwest Illinois Agronomy Research Center near Monmouth, Warren County.
Fig. 4. — A survey entomologist spraying an experimental plot to kill soybean looper larvae after they had produced a desired level of defoliation. The large velvetleaf plants were planted in this plot so that the effects of the interactions of defoliation and weeds could be studied.


114. Site for monitoring the population dynamics of weevil introduced for the biological control of thistles on reclaimed strip mine lands. 6 miles northeast of Cuba, Fulton County.

115. Studies of the population dynamics of the European corn borer, with special emphasis on the factors that influence the transmission of a microsporidian parasite of the corn borer. 3 miles east of Roanoke, Woodford County.


117. Biological and ecological studies of beneficial and injurious insects associated with alfalfa. Kilbourne, Mason County.

118. Site for monitoring alfalfa weevil populations through emergence traps (fall of 1983) and stem samples for larval populations (spring 1984) in preparation for fall perimeter spray program tests. Havana, Mason County.


120. Site for collecting insects of the family Ther-vidae. Sand Ridge State Forest, Mason County.

121. Collection site for and studies of the biosystematics of the aphid subfamily Lachnoidae. Sand Ridge State Forest, Mason County.

122. Studies of pollination of sunflowers by native solitary bees. Sand Ridge State Forest, Mason County.

123. Evaluations of corn rootworm insecticides. Bloomington, McLean County.

124. Site for collecting forest arthropods in pitfall traps. Nettie Hart Woods near Mahomet, Champaign County.

125. Biological studies of Adita species (moths). Lake of the Woods Park near Mahomet, Champaign County.


127. Site for monitoring corn leaf aphids, potato leafhoppers, and other insects entering Illinois. Bondville, Champaign County.

128. Studies of economic injury levels, host plant resistance, and bionomics of soybean-associated arthropods, particularly the bean leaf beetle. Studies of the effects of defoliation and weed competition and of the effects of soil insecticides.
in the absence of insect pests on soybean yields and of phytotoxic interactions of soil insecticides and herbicides. Urbana-Champaign, Champaign County.

129. Site for monitoring the spread of the Japanese beetle. Urbana-Champaign, Champaign County.

130. Long-term studies of the interactions among tillage practices, insecticides, and soil insects, including insect population dynamics and insecticide behavior and efficacy. 1.5 miles south of Champaign, Champaign County.

131. Integrated pest management (IPM) test plots; studies of effects of IPM practices, crop rotation, and tillage practices on grain yields and pest populations. University of Illinois farms, Urbana-Champaign, Champaign County.

132. Studies of the effects of the timing of insecticide applications after cutting to control potato leafhoppers in alfalfa. University of Illinois farms, Urbana-Champaign, Champaign County.

133. Studies of the economic threshold for the potato leafhopper in alfalfa. University of Illinois farms, Urbana-Champaign, Champaign County.

134. Studies of insecticides to control the fall armyworm in corn. Urbana-Champaign, Champaign County.

135. Studies of corn rootworm populations in no-till fields. Urbana-Champaign, Champaign County.

136. Tests of cucurbitacins (extracts of squash-group plants) as baits in traps for corn rootworms. Urbana-Champaign, Champaign County.

137. Studies, using a tracking radar unit, of migrating insects, emphasizing interactions of insects with atmospheric factors, identification of insects with radar and telescopes, and documentation of the mechanisms of landing-site selection. Southwest of Champaign, Champaign County.

138. Sites for monitoring the spread of the Japanese beetle. Iroquois County.

139. Sites for monitoring the spread of the Japanese beetle. Vermilion County.

140. Surveys of Noctuidae (moths). Forest Glen, Vermilion County.

141. Biological studies of Adita species (moths). Weinberg-King State Park, Schuyler County.

142. Tests of cucurbitacins (extracts of squash-group plants) as baits in traps for corn rootworms. Mt. Sterling, Brown County.

143. Surveys of Noctuidae (moths). Walnut Point State Park, Douglas County.

144. Site for monitoring corn leaf aphids, potato leafhoppers, and other insects entering Illinois. Perry, Pike County.

145. Studies of corn rootworm control in no-till cornfields. Orr Agronomy Research Center, Perry, Pike County.

146. Studies of the effects of tillage practices on the population dynamics of the black cutworm. Orr Agronomy Research Center, Perry, Pike County.

147. Site for monitoring corn leaf aphids, potato leafhoppers, and other insects entering Illinois. Brownstown, Fayette County.

148. Studies of host plant relationships on natural prairie. Farina, Fayette County.

149. Sites for monitoring the spread of the Mexican bean beetle. Clark County.

Fig. 5. — A Ford County pond drained to reveal the amount of vegetation removed by herbivorous carp.
150. Sites for monitoring the spread of the Mexican bean beetle. Crawford County.
151. Site for monitoring corn leaf aphids, potato leafhoppers, and other insects entering Illinois. Belleville, St. Clair County.
152. Studies of black cutworm control in no-till cornfields. University of Illinois-Southern Illinois University Research Center, Belleville, St. Clair County.
153. Studies of the effectiveness of an insect growth regulator applied to control the alfalfa weevil. University of Illinois-Southern Illinois University Research Center, Belleville, St. Clair County.
155. Surveys of leafhopper populations and of the incidence of brittle root disease in horseradish fields and surveys of population levels of the imported crucifer weevil in horseradish roots and planting stock. Madison and St. Clair counties.
156. Studies of insects associated with pine wilt disease. Salem, Marion County.
157. Site for monitoring alfalfa weevil populations through emergence traps (fall of 1983) and stem samples for larval populations (spring 1984) in preparation for fall perimeter spray program tests. Lively Grove, Washington County.
158. Studies of the effectiveness of an insect growth regulator applied to control the alfalfa weevil. Lively Grove, Washington County.
159. Biological and ecological studies on the beneficial and injurious insects associated with alfalfa. Lively Grove, Washington County.
161. Tests of cucurbitacins (extracts from squash-group plants) as baits in traps for corn rootworms. Franklin County.
163. Tests of cucurbitacins (extracts from squash-group plants) as baits in traps for corn rootworms. Gallatin County.
164. Site for monitoring corn leaf aphids, potato leafhoppers, and other insects entering Illinois. Dixon Springs Agricultural Center near Dixon Springs, Pope County.
165. Evaluations of insecticidal ear tags and insecticide mists sprayed on pastured cattle to control imported crucifer weevil in horseradish roots. Dixon Springs Agricultural Center near Dixon Springs, Pope County.
166. Integrated pest management (IPM) test plots; studies of effects of IPM practices, crop rotation, and tillage practices on grain yields and pest populations. Dixon Springs Agricultural Center near Dixon Springs, Pope County.
168. Collection site for and studies of the biosystematics of the aphid subfamily Lachnoidea. Shawnee National Forest, southern Illinois.


Fish Studies

170. Searches for and studies of several rare fishes, including the pugnose shiner, blacknose shiner, and blackchin shiner. Chain-O-Lakes State Park, Lake County. (Not shown on map.)

171. Studies of winter fisheries, using divers, to determine fish use of the main channel during winter and to help to determine the effects of thalweg disposal on the commercial fisheries. Mississippi River, Pool 13, near Savanna, Carroll County.

172. Studies of organisms subjected to a stressful environment to determine how populations respond and how stress affects the gene pool. Oregon, Ogle County.

173. Studies of hybrid carp as a possible biological control of aquatic plants. Utterback's Pond near Gibson City, Ford County.

174. Baseline studies of a largemouth bass population in a lake that is to become the cooling lake for a nuclear power plant. Clinton, De Witt County.

175. Studies of genetics of a bass population and studies of the effects of stocking muskellunge. Robert Allerton Park, Piatt County.

176. Studies of fish sampling methods to standardize the sampling methods of Illinois Department of Conservation fisheries biologists. Urbana-Champaign, Champaign County.

177. Studies, using electrophoretic techniques on selected isozyme systems, of genetic differences between northern and Florida largemouth bass so that appropriate genetic populations of bass can be stocked in Illinois. Urbana-Champaign, Champaign County.

178. Studies of cuckold bluegill populations to help determine their genetic and ecological significance. Urbana-Champaign, Champaign County.

179. Studies of the genetic basis for high or low vulnerability to capture of stocked bass. Homer, Champaign County.

180. Site for monitoring populations of the endangered bluebreast darter. Middle Fork of the Vermilion River, Vermilion County.


Fig. 7. — Spawning cages used in studies of reproductive activities of two species of darters (small fish), Big Creek, Hardin County.
182. Studies of mercury and selenium interactions in fish and in the lake ecosystem. Lake Sangchris, Christian County.
183. Site for monitoring water-quality parameters and larval fish populations to determine the effects of impoundment and fluctuating water levels. Lake Shelbyville, Moultrie and Shelby counties.
184. Studies of mercury and selenium interactions in fish and in the lake ecosystem. Lake Shelbyville, Moultrie and Shelby counties.
185. Studies to determine the effects of stocking hybrid tiger muskies in an impoundment dominated by largemouth bass and bluegill. Ridge Lake, Fox Ridge State Park, Coles County.
186. Studies of common carp populations to determine why sizes and catches have declined and what can be done to preserve the commercial carp fishery. Grafton, Jersey County.
187. Fish life-history studies and periodic monitoring for the endangered harlequin darter and eastern sand darter. Embarras River near Greenup, Cumberland County.
188. Studies of the hybrid of the black and white crappie to determine whether it is suitable for stocking in small bodies of water. Sam A. Parr Fisheries Research Center, Stephen A. Forbes State Park, Marion County.
189. Studies on the pond polyculture of Chinese carp and Malaysian prawns as alternative food resources. Isotope studies to determine the feeding habits of the polyculture components. Sam A. Parr Fisheries Research Center, Stephen A. Forbes State Park, Marion County.
190. Studies of organisms subjected to a stressful environment to determine how populations respond and how stress affects the gene pool. Saline River near Equality, Gallatin County.
191. Periodic searches for the endangered, possibly extirpated, bluehead shiner. Wolf Lake, Union County.
192. Ecological studies and monitoring of fish and crustacean populations. LaRue-Pine Hills Ecological Area, Union County.
193. Life-history studies of fishes and crayfishes. Big Creek, Hardin County.

Fig. 8. — A roadside in the Sibley Study Area, Ford County, seeded to brome and alfalfa to provide nesting habitat for pheasants and other ground-nesting birds and small mammals.
Bird Studies
194. Studies of the interaction of modern mixed farming practices and pheasant abundance. Oneco Township, Stephenson County.
196. Studies of pheasant populations and roadside habitat. Livingston County.
197. Studies of wood duck nesting biology, survival, behavior, and migration. Mississippi River, Pool 19, Hancock County.
198. Studies of the condition of canvasback ducks during spring migration. Mississippi River, Pool 19, Hancock County.
199. Studies of roadside management techniques and censuses and nest studies to evaluate the responses of nesting birds. Anchor Township, McLean County.
200. Long-term studies of population ecology and management of pheasants and development of computer simulation models. Sullivan and Peach Orchard townships, Ford County.
201. Studies of pheasant populations and roadside habitat. Ford County.
202. Studies of roadside management techniques and censuses and nest studies to evaluate the responses of nesting birds. Prairie Green Township, Iroquois County.
203. Studies of the abundance of waste grain foods for birds and other wildlife relative to fall tillage practices. Mason County.
204. Studies of factors affecting pheasant brood survival and surveys of the insect fauna. Forest City, Havana, Kilbourne, and Quiver townships, Mason County.
205. Studies of wood duck nesting biology, survival, behavior, and migration. Wetlands of Mason County.
206. Fall, winter, and spring weekly or bimonthly censuses of waterfowl species occurring on 16 major lake and river systems of Illinois. Headquarters, Havana, Mason County.
207. Studies of roadside management techniques and censuses and nest studies to evaluate the responses of nesting birds. Along Interstate 72, Piatt County.
208. Studies of roadside management techniques and censuses and nest studies to evaluate the responses of nesting birds. Along Interstate 72, Macon County.
209. Studies of the abundance of waste grain foods for birds and other wildlife relative to fall tillage practices. Northern Champaign County.

Fig. 9. — Part of the winter deer herd at Allerton Park, Piatt County. One deer is wearing a Natural History Survey plastic identification collar.
211. Studies of roadside management techniques and censuses and nest studies to evaluate the responses of nesting birds. Harwood Township, Champaign County.

212. Studies of the population ecology, habitats, and dynamics of a woodcock population. Forest Glen Nature Preserve, Vermilion County.


216. Studies of waterfowl food habits by identifying and quantifying gizzard contents. Mississippi River wetlands.

217. Studies of waterfowl migration by banding. Lake Sangchris, Christian County.


221. Studies of lead poisoning in waterfowl (mostly mallards and geese). Rend Lake, Jefferson and Franklin counties.

222. Surveys classifying and quantifying major waterfowl wetlands. Big Muddy River, Jackson County.

**Mammal Studies**

223. Studies of the biology, ecology, and management of deer in the Chicago metropolitan area and studies of the complex array of factors contributing to deer-human problems in an urban environment. Cook, Du Page, Kane, and Lake counties.

224. Long-term, data-gathering studies of physical condition, sex, age, reproductive history, and diseases of raccoons. Farmington, Fulton County.

225. Long-term studies of the dynamics of cottontail abundance on an area not used for agriculture. Robert Allerton Park, Piatt County.

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Fig. 10. — Typical abandoned mine site near Standard, Putnam County, showing severe erosion and lack of vegetative cover.
226. Studies of the life history and ecology of white-tailed deer in an intensively farmed landscape. Piatt County Study Area.

227. Studies of the effects on squirrel populations of providing nest boxes. Vermilion River Observatory, Vermilion County.

228. Studies of endangered and threatened species, including the Illinois wood rat. LaRue-Pine Hills Ecological Area, Union County.

Interdisciplinary Studies

229. Studies of the effects of point source pollution on the genetic composition of populations of aquatic and terrestrial plants and animals. Near Byron, Ogle County.

230. Studies of the effects of various tillage systems, crop rotations, and pest management practices on soybean and corn yields and on arthropods, weeds, and diseases associated with these crops. De Kalb, De Kalb County.

231. Studies of the effects of point source pollution on the genetic composition of populations of aquatic and terrestrial plants and animals. West Chicago, Du Page County.

232. Studies of overwintering success of gypsy moth eggs and on mass trapping as a means of controlling the gypsy moth. Wood Dale, Du Page County.

233. Studies of overwintering success of gypsy moth eggs and of mass trapping as a means of controlling the gypsy moth. Bensenville, Du Page County.

234. Ecological studies of plant-soil interactions on abandoned strip-mine lands. Spring Valley, Bureau County.

235. Ecological studies of plant-soil interactions on abandoned strip-mine lands. Dalzell, Bureau County.

236. Ecological studies of plant-soil interactions on abandoned strip-mine lands. Ladd, Bureau County.

237. Ecological studies of plant-soil interactions on abandoned strip-mine lands. Cherry, Bureau County.

238. Ecological studies of plant-soil interactions on abandoned strip-mine lands. Rutland, La Salle County.

239. Ecological studies of plant-soil interactions on abandoned strip-mine lands. South Wilmington, Grundy County.

240. Studies of water quality, phytoplankton, zooplankton, benthos, and fish communities to provide baseline data on a body of water that is to provide cooling water for a nuclear power plant. Kankakee River near Braidwood, Will County.


244. Ecological studies of plant-soil interactions on abandoned strip-mine lands. Near Wenona, Marshall and La Salle counties. (Not shown on map.)

245. Long-term ecological research, a comprehensive study to be conducted over 25–30 years in cooperation with the Illinois State Water Survey, Illinois State Geological Survey, and Western Illinois University. Mississippi River, Pool 19, Hancock County.

246. Studies of the Rice Lake area resulted in June 1983 in the first land report by the Lands Unsuitable for Mining Program in response to a petition submitted to the Illinois Department of Mines and Minerals by the Save Rice Lake Association. In January 1984 the Rice Lake area was declared unsuitable for mining as a result of this report. Rice Lake, Fulton County.

247. Studies of the mercury and selenium levels in fish from power-plant cooling lakes and from other lakes. Powerton, Tazewell County.

248. Studies of 75,000 acres of trees for susceptibility to gypsy moth damage. 33 counties, headquarters of gypsy moth project in Urbana-Champaign, Champaign County.

249. Studies attempting to find protozoan (microsporidian) diseases that will infect gypsy moths. Gypsy moth project headquarters, Urbana-Champaign, Champaign County.

250. Studies of parasitic wasps that may attack the gypsy moth. Gypsy moth project headquarters, Urbana-Champaign, Champaign County.

251. Studies of the toxicity of various materials to key biological components of aquatic systems. Urbana-Champaign, Champaign County.

252. Studies determining economic values for ecological perturbations and coupling them to the state's input-output model. Urbana-Champaign, Champaign County.

253. Studies of the feasibility of growing Chinese water chestnuts, Malaysian prawns, and several fish species in closed, recirculating troughs as alternative food resources. Urbana-Champaign, Champaign County.

254. Studies of the effects of various tillage systems, crop rotations, and pest management practices on soybean and corn yields and on arthropods, weeds, and diseases associated with these crops. Urbana-Champaign, Champaign County.
255. Studies of the effects of water-level changes on biological components of streams and rivers to determine what levels are necessary to provide the habitat required by aquatic communities to feed, reproduce, and rest. Jordan Creek and Salt Fork of the Vermilion River, Vermilion County.

256. Sites for monitoring gypsy moth pheromone traps placed by the U. S. Department of Agriculture and the Illinois Department of Agriculture. Every county, headquarters in Springfield, Sangamon County.

257. Studies of the relationship between the amounts of selenium released to the environment through the smokestack of a coal-fired electric generating plant and the concentrations of selenium in the soils in the vicinity of the plant and the biological cycling of the element through the food chain at the associated cooling lake. Lake Sangchris, Christian County.

258. Studies of the mercury and selenium levels in fish from power-plant cooling lakes and from other lakes. Lake Shelbyville, Moultrie and Shelby counties.

259. Long-term ecological research, a comprehensive study to be conducted over 25-30 years in cooperation with the Illinois State Water Survey, Illinois State Geological Survey, and Western Illinois University. Mississippi River, Pool 26, Grafton, Jersey County.

260. Studies of the mercury and selenium levels in fish from power-plant cooling lakes and from other lakes. Otter Lake, Macoupin County.

261. Studies of mercury and selenium levels in fish from power-plant cooling lakes and from other lakes. Coffeen Lake, Montgomery County.

262. Studies of the mercury and selenium levels in fish from power-plant cooling lakes and from other lakes. Baldwin Lake, Randolph County.

263. Analysis of water quality. Hoiten Lake, East St. Louis, St. Clair County.

264. Studies of the effects of point source pollution on the genetic composition of populations of aquatic and terrestrial plants and animals. Sandoval, Marion County.

265. Studies of the mercury and selenium levels in fish from power-plant cooling lakes and from other lakes. Cedar Lake, Jackson County.

266. Studies of mercury and selenium levels in fish from power-plant cooling lakes and other lakes. Crab Orchard Lake, Williamson County.

267. Studies of the effects of point source pollution on the genetic composition of populations of aquatic and terrestrial plants and animals. Will Scarlet Coal Mine, Williamson County.

268. Studies of native Calosoma beetles as predators of the gypsy moth. Dixon Springs Agricultural Center, near Dixon Springs, Pope County.

269. Studies of the effects of various tillage systems, crop rotations, and pest management practices on soybean and corn yields and on arthropods, weeds, and diseases associated with these crops. Dixon Springs Agricultural Center, near Dixon Springs, Pope County.
AQUATIC BIOLOGY PUBLICATIONS

Survey Publications

Books and Book Chapters

Scientific Journal Articles

Symposium Proceedings and Abstracts of Symposium Papers

Project Reports
Plant Studies
Aquatic Invertebrate Studies
Terrestrial Invertebrate Studies
Fish Studies
Bird Studies
Mammal Studies
Interdisciplinary Studies


Sparks, R. E., ed. 1983. Ecological structure and function of major rivers in Illinois-large river LTER. Prepared for the National Science Foundation.


Papers Presented at Seminars, Symposia; and Professional Meetings


Philipp, D. P. 1983. Application of genetic techniques to fisheries management. Seminar presented to the Biology Department, Queen's University, Kingston, Ontario. 3 October.

Philipp, D. P. 1983. Application of genetic techniques to fisheries management. Seminar presented to the Biology Department, Carlton University, Ottawa, Ontario. 5 October.

Philipp, D. P. 1983. Application of genetic techniques to fisheries management. Seminar presented to the Biological Sciences Department, Simon Fraser University, Vancouver, British Columbia. 5 November.


Reinbold, K. A. 1983. Brain acetylcholinesterase activity as a measure of insecticide poisoning in fish. Seminar presented to College of Veterinary Medicine, University of Illinois, Urbana, IL. 2 December.


BOTANY AND PLANT PATHOLOGY
PUBLICATIONS

Survey Publications


Books and Book Chapters


Publications of Other Research Organizations


Scientific Journal Articles


Symposium Proceedings and Abstracts of Symposium Papers

Project Reports
Papers Presented at Symposia, Seminars, and Professional Meetings


Iverson, L. R. 1983. Environmental consequences after surface mining in North Dakota, Britain, and Illinois. Department of Agronomy, University of Illinois, Urbana-Champaign. 15 November.


Neely, D. 1983. Dutch elm disease in the USA. Royal Australian Institute of Parks and Recreation, Plant Research Institute, Burnley, Australia. 22 August.


Robertson, K. R. 1983. How to identify a member of the genus Amaranthus. Meeting of the American Institute of Biological Sciences, Grand Forks, ND. 10 August.


ECONOMIC ENTOMOLOGY
PUBLICATIONS

Survey Publications


Felsot, A. 1983. No pesticides found in well water samples. Illinois Natural History Survey Reports 251.


Publications of Other Research Organizations


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Kogan, J. 1983. SIRIC component of the Annual International Soybean report to USAID.


Jeffords, M. R. 1983. The Illinois gypsy moth program, governor's staff, Champaign, IL.


Jeffords, M. R. 1984. The gypsy moth: A threat to Illinois trees. Presentation to University of Illinois Administrative Staff, College of Agriculture, Urbana-Champaign, IL.


Levine, E. 1983. Temperature requirements for development of the common stalk borer, *Papaipema nebris* (Lepidoptera: Noctuidae). North Central Branch, Entomological Society of America, St. Louis, MO.

Levine, E. 1983. Effect of low temperatures on the survival of black cutworm and armyworm eggs and larvae. Entomological Society of America, Detroit, MI.


FAUNISTIC SURVEYS
AND INSECT IDENTIFICATION
PUBLICATIONS

Survey Publications

Books and Book Chapters


**Project Reports**


**Papers Presented at Seminars, Symposia, and Professional Meetings**


WILDLIFE RESEARCH PUBLICATIONS

Survey Publications


Books and Book Chapters


Publications of Other Research Organizations


Scientific Journal Articles


Symposium Proceedings and Abstracts of Symposium Papers


Project Reports


Papers Presented at Symposia, Seminars, and Professional Meetings


Warner, R.E. 1983. Agriculture and wildlife resources in the midwest. Workshop speech presented at Soil Conservation Service, Champaign, IL.


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