

NATURAL HISTORY

SURVEY REPORTS

MAY 1986, NO. 257

Slow Growth and Short Life Spans of Illinois River Carp

Common carp, *Cyprinus carpio*, are an important commercial resource of the Illinois and Mississippi rivers. In 1953 and 1954, commercial catches between 2 and 3 million pounds, valued then at around \$250,000, were taken from both rivers. Since then, however, annual catches from the Illinois River have been poor, ranging between 103,000 and 361,000 pounds between 1970 and 1982. Scientific collections have indicated that carp are actually more abundant in the Illinois River than the Mississippi, but that on the average they are 114 mm (4.5 in.) shorter. Commercial fishermen and river biologists have associated much of the post-1950's decline in Illinois River commercial harvests with the lack of large carp.

Over the past 3 years, Survey biologists Scott Jackson and Jim Cassens, at the Pool 26-River Research Lab near the confluence of the rivers, collected and aged carp to determine if Illinois River stocks are growing more slowly or living shorter lives than their Mississippi River counterparts. Both phenomena were confirmed. Ken Lubinski directed the study which was supported by funds from the National Science Foundation, the National Marine Fisheries Service, and the Illinois Department of Conservation, Project No. 3-383-R.

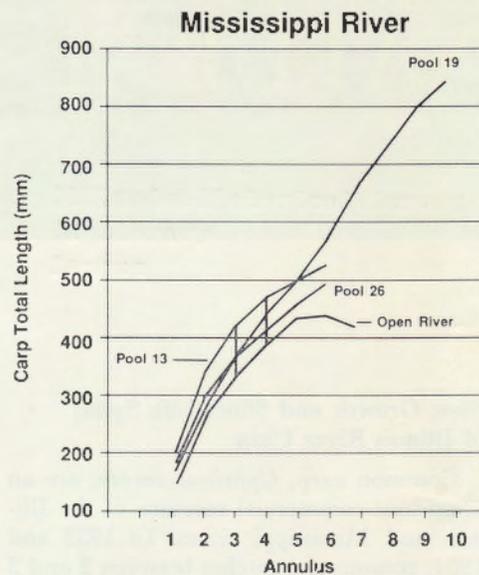
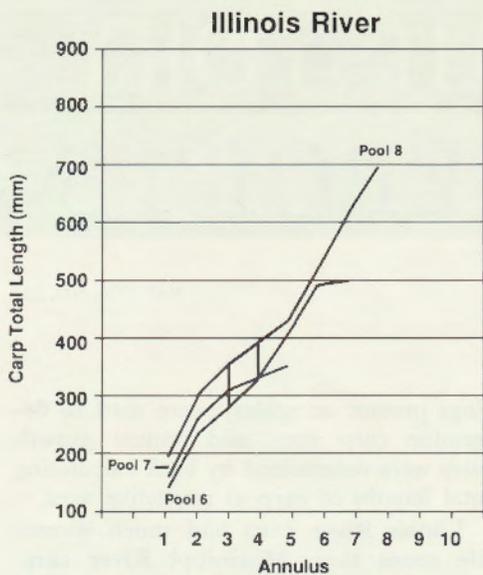
Specimens were collected from several navigation pools of both rivers and the open river reach (i.e., without dams) of the Mississippi River. Electrofishing collections yielded 758 carp and an additional 423 specimen were measured and aged at local fish markets. Scale annuli (annual growth

rings present on scales) were used to determine carp ages, and annual growth rates were determined by back calculating total lengths of carp at respective ages.

Illinois River carp had much shorter life spans than Mississippi River carp. Collections from the middle Illinois River (i.e., the Peoria and La Grange navigation pools) were dominated by 3-year-old fish and only 2 of the 343 fish collected were more than 4 years old. The oldest carp taken from the Illinois River was 8 years old. In contrast, carp stocks in Mississippi River navigation pools were dominated by 4-year-old fish, age classes between 5 and 8 were well represented and the maximum age observed was 10 years. In general, percentages of older fish increased in the downstream direction on the Mississippi River.

Illinois River carp also grew more slowly than Mississippi River carp. As an example, back-calculated total lengths of carp at age 4 from the middle Illinois River were between 332 and 334 mm (approximately 13.1 in.). Mississippi River carp at age 4, in contrast, ranged between 389 and 470 mm (15.3-18.5 in.) in total length. As with percentages of older individuals, carp growth rates increased in the downstream direction on the Illinois River and in the upstream direction on the Mississippi River.

Considerable evidence exists to support a hypothesis that carp age and growth problems on the Illinois River are due to a lack of quality food items in their diet. In the 1950's, a dramatic die-off of finger-nail clams, mayfly larvae, and other benthic macroinvertebrates occurred in the Illinois River. This die-off, generally attributed to



Total lengths of annuli of carp in the Illinois and Mississippi rivers.

a pollution complex, was most severe in the middle Illinois River, above the mouth of the Sangamon River. Recent surveys have shown that benthic macroinvertebrates are still scarce in this river reach. Interspecific competition and poor habitat quality may also contribute to the problem.

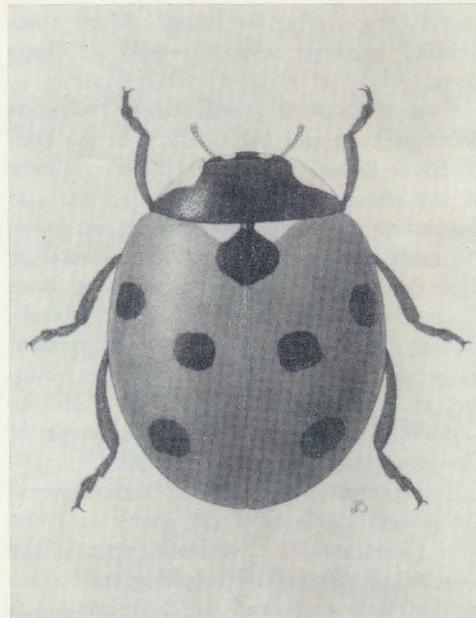
The combined studies on the Illinois River demonstrate how depletion of species that otherwise might be considered unimportant can have devastating impacts on well-known, and in this case, commercially valuable species. The near future outlook for the middle Illinois River is not good. Although river water quality has been improving, improvements in sediment quality have lagged behind. River biologists suspect that natural, self-cleaning mechanisms for river sediment may require considerably longer periods of time.

Welcome Ladybird

Foreign insect pests that are inadvertently imported into North America commonly arrive unaccompanied by the pathogens, parasites, and predators that control their numbers in their places of origin. One tactic used by economic entomologists to suppress exotic pest species is the introduction of certain of their natural enemies. This is a form of biological control.

In 1956, the United States Department of Agriculture began the first of a series of

attempts to introduce a Eurasian ladybird beetle, *Coccinella septempunctata* L., "C-7", for short, for the control of pest species of aphids — both native and introduced — on various crops. C-7 is a voracious predator of aphids in both the larval and adult stages. The adult C-7 is about three-eighths of an inch in length and has



Ladybird beetle, *Coccinella septempunctata* L. (drawing by John P. Sherrod).

seven well-defined covers.

Entomologists Clarence White and John C. White, with USDA scientist John C. White, released 40,000 ladybird beetles at various sites in the vicinity of the airport where the beetles released were accidentally introduced in 1974. While the beetles seemed unsuccessful in their population spread in the United States.

The beetle was first released in late August of 1974 in Kankakee County, Illinois, near John Bouseman and other entomologists in Grundy, Iroquois, Moultrie, and other counties. It is known distributed in the fall of 1974. Illinois Natural History Survey, Department of Entomology, United States Department of Agriculture will be monitoring the spread of C-7 in Illinois during the next few years.

If readers of this journal believe they believe in other counties other than those mentioned they may be sent a ladybird beetle by mail. Contact: John C. White, Section of Entomology, Illinois Natural History Survey, Peabody Drive, Urbana, Illinois 61820, for confirmation.

The Library in

Information is available and can be retrieved. That is, the existence of the Library information is not only a storehouse but an integral part of the Survey. The Library has a continuing commitment to provide information services to its users.

When the library location in 1950

seven well-defined black spots on red wing covers.

Entomologists William Luckmann and Clarence White of the Survey collaborated with USDA scientists in attempts to establish C-7 in Illinois. During 1975-1978, they released 40,000 adult beetles at several sites in the vicinity of Champaign. The beetles released were from a New Jersey population near Kennedy International Airport where C-7 seems to have been accidentally introduced sometime prior to 1974. While the Illinois releases and many other releases in the United States seemed unsuccessful, the New Jersey population is spreading across the northern United States.

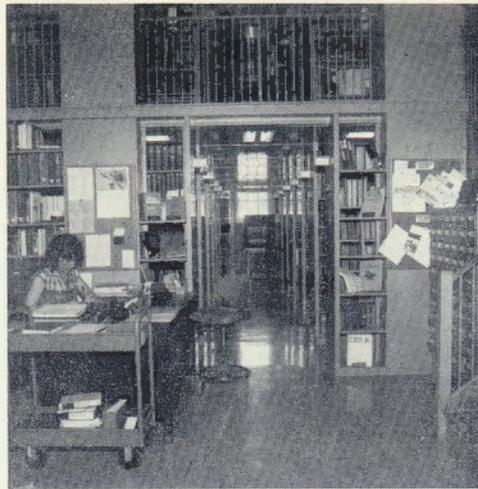
The beetle was first detected in Illinois in late August of 1985 near Momence in Kankakee County by Survey entomologists John Bouseman and Bill Ruesink. They and other entomologists have added Will, Grundy, Iroquois, Vermilion, Champaign, Moultrie, and Fayette counties to the known distribution of C-7 in Illinois during the fall of 1985. Entomologists of the Illinois Natural History Survey, the Illinois Department of Agriculture, and the United States Department of Agriculture will be monitoring the further spread of C-7 in Illinois during 1986 and subsequent years.

If readers of the *INHS Reports* find a beetle they believe to be C-7 from Illinois counties other than those mentioned above, they may be sent in alcohol to John Bouseman, Section of Economic Entomology, Illinois Natural History Survey, 607 East Peabody Drive, Champaign, Illinois, 61820, for confirmation.

The Library in the Information Age

Information is useful only if it can be retrieved. That is the basic premise for existence of the Natural History Survey Library information retrieval. The library is not only a storehouse for books, it is an integral part of research as it is conducted at the Survey. Past, present, and future, the Library has had and will have a continuing commitment to providing information services to its patrons.

When the library moved to its present location in 1950, information was accessi-



Survey Librarian Carla Heister sits at the desk near the entrance of the Library (photo by Les Woodrum).

ble in paper form, from the card catalog to indexing and abstracting tools such as Biological Abstracts to the journals and books containing the needed data/information. The technological advances of the 1960's and 1970's brought about an information explosion as never seen before. Just as the Industrial Revolution changed the agrarian society to an industrial society, the Information Explosion of post-World War II is changing the industrial society to an information society.

In the past, finding information on a subject was very time consuming. Manually searching indexes, abstracts, bibliographies, and card catalogs took hours, days, or weeks of valuable research time. The library helped in getting the needed literature searching completed efficiently, but not quickly. There was no one place to go for everything needed.

As the new technologies for computerization advanced, libraries found information storage and retrieval systems that could be used in many different aspects of library work. The catchwords, online, electronic data, and data base entered the vocabulary of the librarian. The development of interactive online cataloging, the online catalog, electronic mail, electronic data processing, electronic journals, and bibliographic, numerical, and full text data bases have caused major changes in library operations.

The Illinois

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Illinois Historical Survey
1A Library
Campus

The Survey Library has entered the mainstream of this electronic revolution. The advantage of being affiliated with the University of Illinois Library as well as being an agency library of the Illinois Department of Energy and Natural Resources has provided sources of advancement in the handling of information.

Through the University, the Survey Library has gained access to over 200 bibliographic, numeric, and full text data bases for online searching to retrieve citations and other pertinent information on a subject. The University Library card catalog, and therefore the Survey Library card

catalog, is now computerized and available online to any patron with a computer terminal and modem. The Library now houses a microcomputer which is used for online searching, word processing, data management, bibliographies, and circulation functions.

Information gathering techniques have changed in the 128-year history of the Natural History Survey Library, but the commitment to service is stronger than ever, according to Librarian Carla Heister and her assistant, Monica Lusk. The Library is here to aid in information gathering and that will never be outdated.

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