Badger Alert!
The Survey is beginning the second year of a study of the badger (*Taxidea taxus*) in Illinois. Funded by the Illinois Department of Conservation and the U.S. Fish and Wildlife Service, the project addresses the status and ecology of badgers in the Midwest. Although trapping records can be used to reconstruct historical trends in the abundance of many fur-bearing mammals, such data for badgers in the Midwest are lacking. At the time badgers could be legally trapped, they were of limited and sporadic importance in the fur market. As a result, the take of pelts was irregular and trends in abundance were not well documented. Because scattered evidence indicated that badger populations were declining after World War II and because badgers have few natural predators except for humans, most midwestern states, including Illinois, have granted badgers protected status in recent decades.

Over the past ten years, sufficient evidence has been compiled to indicate that badgers are present in most counties of Illinois, and work at present focuses on delineating the primary badger range within the state. In addition, biologists hope to study the ecology of badgers intensively in several regions of the state that represent various environmental conditions.

The ecological, morphological, and physiological adaptations of this carnivore are of considerable biological interest. Badgers breed in midsummer, and delayed implantation of embryos occurs in January or February. One to four young per pregnant female are born in early spring. The badger is a truly fossorial (adapted to digging) mammal, and few such mammals are found in North America. Some of its adaptations include a wedge-shaped head on a short neck; large nictitating membranes that protect the eyes from dirt; short, erect ears also protected from dirt by long hair; very muscular forelegs; partially webbed toes; and two-inch curved claws with pressure receptors (Pacinian corpuscles). The badger has unusually loose skin, a trait responsible for anecdotal references to a badger "turning around in its skin."

Although their physiological adaptations are unique, badgers are better known for their pugnacious personality. Many rural inhabitants of Illinois during the early 1900s relish a story or two regarding their encounters with this animal. Badgers are indeed relatively solitary and seem more than willing to hold their ground with any mammal that disturbs them. For humans, however, badgers are more bark than bite—unless cornered. Other mammals that encounter badgers and are willing to remain in the vicinity are likely to become the badger's next meal, especially if they are burrowing mammals, or to be the recipients of a charge—feigned or real—accompanied by an impressive array of vocalizations including hisses, snarls, and barks!

Because badgers are primarily nocturnal, they rarely come in direct contact with humans. Their presence usually goes undetected unless they dig extensively near human residences in search of prey or a den site. Although extensive digs can be found, in many cases badgers quickly
Endangered Species and the U.S. Army

Extinction is a natural response to changing ecological conditions. Changes wrought by humans and their activities, however, have generally accelerated this process over the past century. Although habitat destruction is the principal threat to most species, other factors include exploitation of a species, the introduction of new species into an area, and pollution of soil, water, and air.

The Endangered Species Act, passed by Congress in 1973, provides protection for species on the verge of extinction. At the federal level, an endangered species or subspecies is defined as one in danger of extinction throughout all or a significant portion of its range. A threatened species or subspecies, on the other hand, is one likely to become endangered within the foreseeable future. Federally listed species are designated by the U.S. Fish and Wildlife Service. In Illinois, the Department of Conservation lists as endangered any species in the state in danger of extinction as a breeding species. Species likely to become endangered within the foreseeable future are considered to be threatened.

Section 7(a) of the Endangered Species Act (Public Law 97-304) requires all federal agencies to implement programs for the conservation of threatened and endangered species on or adjacent to their property. The U.S. Army, for example, has specific regulations to protect such species on army installations. Regulation AR420-74 requires installation commanders to assure that the existence of threatened and endangered species will not be jeopardized. It also stipulates that an inventory be made of all such species and their habitats that are indigenous to or dependent on installations. Species that appear on either federal or state lists must be protected.

In cooperation with the Construction Engineering Research Laboratory (CERL) of the U.S. Army Corps of Engineers, researchers at the Survey’s Center for Aquatic Ecology are completing an annotated directory of threatened and endangered animal species found on U.S. Army installations east of the Mississippi River. This publication will not only assist army personnel in the identification of threatened or endangered species found on installations but will also help army planners to minimize threats to these species. In addition to known occurrences on or near installations, life history information and management guidelines for these species will be included in the directory.

Each of the 47 installations listed in the directory has unimproved grounds of 50 or more acres. Combined, they total almost two million acres. Because installations are often located along coastlines, in agricultural regions, or near urban areas, they sometimes encompass the last large remnant of a disappearing habitat. In Illinois, for example, bald eagles nest and winter in areas of the Savanna Army Depot in Carroll and Jo Daviess counties. The white-tailed jackrabbit and the river otter, state endangered and threatened species respectively, have also been seen on the installation. State and federally listed mollusks may be found in the Mississippi River adjacent to the installation as may threatened or endangered species of herons, egrets, and fish in the marsh areas of the installation. The bald eagle also winters on the Joliet Army Ammunition Plant in Will County. This migrant species is shown above with its nest in osage orange. Nest photo by Alfred O. Gross; bird photo by Richard R. Graber.
preserve biological diversity on the 25 million acres of land controlled by the Department. This agreement enables the Conservancy to work directly with the Department in the effort to identify and preserve biodiversity on army installations across the country. The directory will undoubtedly play an important role in this cooperative endeavor.

Renee Sherman, Center for Aquatic Ecology

Standardizing Annelid Nomenclature
In 1981 the American Fisheries Society (AFS) established the Committee on Names of Aquatic Invertebrates. Its charge is to achieve standardization of the scientific and vernacular nomenclature of aquatic invertebrates. To date two volumes, one devoted to mollusks (AFS Special Publication 16, 1988) and the other to decapod crustaceans (AFS Special Publication 17, 1989), have been published. A volume in press addresses the Ctenophora and Cnidaria, and two volumes in draft focus on the amphipod and isopod crustaceans.

In 1989, Dr. Kathryn A. Coates of the Royal Ontario Museum, Toronto, and Mark J. Wetzel of the Survey were selected by the Committee on Common Names of the North American Benthological Society and the AFS Committee on Names to compile the sixth volume of this series, the clitellate and aphanoneuran annelids (Acanthobdellida, Aphanoneura, Branchiobdellida, Hirudinea, and Oligochaeta). Other scientists contributing to this volume include Drs. Ralph O. Brinkhurst, Stuart R. Gelder, John W. Reynolds, and Jaqueline Madill. Although the nomenclature of the Polychaeta is being compiled by a subcommittee chaired by Dr. Kristian Fauchald, the Committee on Names has proposed that the clitellate, aphanoneuran, and polychaete lists be published in a single volume. This comprehensive publication will include the scientific and previously established vernacular names of all freshwater, marine, and terrestrial annelids occurring in the United States and Canada. Distributional information for each species will also be included.

To date, over 900 species of clitellate and aphanoneuran annelids distributed among 196 genera in 25 families have been collated. The annelids will be presented in a natural or phyyletic sequence of classes, orders, and families, with the genera and species within each family arranged alphabetically. Previous volumes in this series included extinct species and those listed by the U.S. Fish and Wildlife Service as endangered or threatened; however, no annelids to date are found in either of these groups. An index of common and scientific names will conclude the volume.

All aquatic and terrestrial species of annelids known to occur on the American continent north of Mexico and all marine species known to inhabit the contiguous shore waters on or above the continental shelf and occurring at a depth of 200 meters or less and within 320 kilometers of the coast are included. Coastal islands are embraced by this coverage but not the Hawaiian Islands, the Bahamas, Cuba, Bermuda, or other islands in the West Indies. Arctic coverage encompasses the USA–USSR boundary north of the Bering Strait to the west coast of Greenland, including Baffin Bay and Davis Strait and waters west of the east end of Hudson Strait, including Hudson Bay, Ungava Bay, Frobisher Bay, and Cumberland Sound. To qualify for inclusion, a species must be known to occur in the region either through authenticated published accounts or established research collections. Native as well as introduced species in the region of coverage will be included.

Unlike previous volumes in this series, common names for annelids will not be recommended. With the exception of a few leeches, aquatic annelids are unfamiliar to nonspecialists and common names for them are not in use. Common names are, however, more frequently used for terrestrial annelids, most notably the earthworms.

The AFS Committee on Names hopes that this volume will identify taxonomic groups in need of systematic revision, foster interest in surveying annelid…

Survey researchers sampling for aquatic Annelida in Horse Creek, Sangamon County, Illinois, in July 1990. At the left, Mark Wetzel uses a piston coring device to obtain a sample of the stream substrata. On the right, Jeff Yockey sieves one of those samples prior to sorting and identifying the organisms. Photos by Barbara J. Kasprowicz.
populations in poorly studied areas, and encourage anectid specialists to publish systematic and distributional data that they have already collected. After the volume is published, proposed changes and additions will be collected and revisions made where necessary. A second edition is proposed for release some five or ten years after the first.

Mark J. Wetzel, Center for Biogeographic Information

Publication on Plains Leopard Frog
If our native flora and fauna are to be protected, their distributions and habitat requirements must be clearly understood. Publications of the Survey traditionally provide such information for species in Illinois and surrounding areas. As a result, the flora and fauna of our state are among the best known in the world. An addition to this body of information is Biological Notes 136, "Distribution, Habitat, and Zoogeography of the Plains Leopard Frog (Rana blairi) in Illinois," by Lauren E. Brown and Michael A. Morris. Unrecognized until 1973, the plains leopard frog occurs throughout much of the great plains region of the central United States. Its distribution in Illinois includes the central portion of the state and the area bordering the Mississippi River to extreme southern Illinois. Although the species, whose habitat prior to human settlement was probably prairie, is now known from 194 localities in the state, it is not abundant at any of these localities. The relative rarity of the plains leopard frog in Illinois may be attributed to its inability to live in areas that have been converted to cropland.

Carol Johnston, Center for Biodiversity