Pearly Eyes in Illinois

The mention of butterflies usually brings to mind the image of brightly colored creatures sipping nectar at midday from equally brightly colored blossoms in sunny meadows or gardens. However, a small, exclusively North American genus (Enodia) of drably colored butterflies known as pearly eyes does not fit this popular conception. The three species of pearly eyes are forest insects, and their flight activity is generally at dawn and at dusk. At midday they often perch high on tree trunks where they are wary and difficult to approach.

Pearly eyes do not visit flowers; rather, they imbibe fluids from bird excrement, decaying animal flesh, and sap that flows from wounds on trees. The larval stages of these butterflies feed upon coarse grasses.

All three species of pearly eyes are known to occur in Illinois. The northern pearly eye, Enodia anthedon, occurs in suitable habitat throughout the state. Its larvae feed upon such forest grasses as broadleaf uniola and bottlebrush. The other two species—pearly eye, Enodia portlandia, and Creole pearly eye, Enodia creola—occur in a few counties of southern Illinois where their larval host, giant cane, grows. Long confused with the northern pearly eye because of their extreme similarity in appearance, the Creole pearly eye and pearly eye are considered rare and little-known. Perhaps due to the somberly drab coloration of these butterflies, they are little noticed in the dappled shade of their gloomy riverine haunts.

Only a few records are available for the Creole pearly eye and pearly eye in Illinois until the writer discovered a colony in Alexander County in 1992. To date, only a single population has been located, but a search to discover additional populations of this rare denizen of our southern forests continues.

John K. Bouseman
Center for Economic Entomology
Governmental Reorganization

On July 1, 1995, a major reorganization or consolidation of some departments of the State of Illinois was realized. This reorganization has its foundation in an Executive Order issued by Governor Jim Edgar on March 1, 1995. A new Department of Natural Resources (DNR) was formed to strengthen the state’s ability to protect, enhance, and responsibly use Illinois’ natural resources in order to provide the citizens of today and tomorrow with an outstanding quality of life. At the same time, it is expected that the reorganization will result in programmatic and administrative efficiencies.

The DNR contains the former Department of Conservation, the former Department of Mines and Minerals, the former Abandoned Mined Lands Reclamation Council, the Division of Water Resources of the Department of Transportation, and portions of the Department of Energy and Natural Resources (DENR). Those parts of DENR transferred to DNR include the Illinois Natural History Survey (INHS), the State Geological Survey, the State Water Survey, the Illinois State Museum, the Hazardous Waste Research and Information Center (HWRIC), and the Office of Research and Planning.

The Department of Natural Resources is led by Director Brent Manning and Deputy Directors John Comerio and Bruce Clay. Internally, the Department will be organized into 10 functional offices, one of which, the Office of Scientific Research Analysis, will contain the three Surveys, the State Museum, and the HWRIC. This Office will be headed by Assistant to the Director for Scientific Research and Integration, Karen A. Witter, erstwhile Director of the Department of Energy and Natural Resources from 1988 to 1991. Since 1991, Karen served as the Executive Director of the Governor’s Science Advisory Committee.

Some readers may recall reading in INHS’ Annual Report for 1991-1992 that I reported on an attempt to dissolve the Department of Energy and Natural Resources and to find new homes for the divisions in various state agencies or in the University of Illinois. A number of different options were explored in this effort and ultimately failed because of the concerns of the constituency and clients of the Surveys, HWRIC, the State Museum, and others. Their concerns, and ours, focused primarily on the need to maintain our ability to produce credible science. Of special concern was the possible placement in an agency with broad regulatory and enforcement powers that might attempt to influence the independence of our research in order to support regulations.

During the process of defining the reorganization, we were given assurances, from all significant levels of state government, that the concerns expressed during the earlier reorganization effort would be satisfactorily met. Undoubtedly, there will be many changes in store for INHS, but the bottom-line integrity of our science will be preserved.

The Board of Natural Resources and Conservation, founded by statute in 1917, will remain intact together with its duties including the oversight function of the three Surveys and HWRIC. The Board of the Illinois State Museum also will remain intact, together with its duties.

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Survey Ecologist Advises President's Council on Sustainable Development

In June 1993, President Clinton created the President's Council on Sustainable Development (PCSD). Composed of 25 leaders from industry and government, and representatives of environmental, labor, and civil rights organizations, the PCSD is charged with preparing a national sustainable development action strategy and with advising the President on matters related to sustainable development.

The sustainable development initiative will detail how the U.S. may provide its citizens, now and in the future, a high-quality life by maintaining ecosystems that provide renewable natural resources and natural services. The ecosystems include agricultural fields, forests, grasslands, wetlands, lakes, rivers, streams, and oceanic and coastal systems. The services these ecosystems provide include production of food, fuel, and materials (including yet-to-be-discovered raw materials for molecular engineering); moderation of floods and erosion; water purification; aesthetic values; outdoor recreation; and preservation of both biodiversity and the processes that generate it.

The work of the Council is accomplished primarily through eight task forces. These include Principles, Goals, and Definitions; Public Linkage, Dialogue, and Education; Population and Consumption; Sustainable Agriculture; Sustainable Communities; Eco-Efficiency; Energy and Transportation; and Natural Resources. The Natural Resources Task Force is developing an integrated vision of what constitutes sustainability for natural resources in the areas of biodiversity, ecosystems, and watersheds, with a focus on issues regarding wetlands, fisheries, agriculture, coastal resources, and forestry. The Task Force is using a process of discovery, employing 14 watershed workshops throughout the country to develop policies to foster, catalyze, and remove impediments to protection and sustainable management of natural resources.

The Natural Resources Task Force also receives advice and information from regional advisory committees. Illinois Natural History Survey aquatic ecologist Richard E. Sparks serves on the Midwest Regional Advisory Committee, which met three times and has submitted information and recommendations to the Task Force. He also served on a National Research Council Committee of the National Academy of Sciences that provided technical advice on a watershed approach to sustainable use and development of natural resources.

The Midwest Advisory Committee held its first meeting at La Crosse, Wisconsin, in July 1994 in association with the International Conference on Sustaining the Ecological Integrity of Large Floodplain Rivers. Two members of the Natural Resources Task Force were also present for special briefings by river scientists and managers from Europe and North America. These scientists discussed effects of river development on ecosystem integrity and the relationship between floodplain development and flood damages in the 1993 Midwest Flood and the 1993-1994 floods in western Europe.

At the November meeting in Des Moines, Iowa, the Advisory Committee heard from agribusinesses, levee district associations, the navigation industry, farm groups, and state land and water resource managers about the implications of world trade agreements (GATT and NAFTA) for the economies and ecosystems of the Midwest. Chief among the environmental concerns associated with expanded trade is an expected rise in the introduction of nonindigenous pests, including vectors for human diseases.

The final meeting of the Midwest Advisory Committee was in January 1995 in Baton Rouge, Louisiana, where state agencies, private timber companies, and en-

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Tree Cavity Abundance and Use by Nesting Wood Ducks

At the turn of the century, the wood duck (Aix sponsa) was considered by many to be on the brink of extinction, and as a result, wood ducks were granted full protection during the 1916-1940 waterfowl hunting seasons. However, the comeback of the wood duck to current abundant population levels rivals that of the white-tailed deer, giant Canada goose, and the wild turkey. In recent years, wood ducks have been the most common nesting duck in Illinois. Wood ducks also currently rank second in the number of ducks harvested in Illinois and have been second in the harvest of ducks in the Mississippi Flyway for most of the last 33 years. Although wood duck populations in Illinois, the Mississippi Flyway, and the Atlantic Flyway appear to be increasing, little is known of wood duck production and use of natural tree cavities in Illinois. No recent studies have determined the importance of natural tree cavities for nesting wood ducks in Illinois.

A major problem in wood duck management has been the inability to estimate the size of populations because of the species inhabitation of densely forested areas and its secretive nature. Estimation of wood duck population size and trends has been an important management goal in Illinois and the Mississippi Flyway because aerial surveys of this species have proven inadequate. In 1993, states in the Atlantic and Mississippi flyways, along with the U.S. Fish and Wildlife Service, developed a wood duck management strategy to outline databases needed to effectively manage wood duck populations. One specific objective of this strategy was to develop techniques that would provide estimates of regional breeding population sizes. Therefore, information on the size of the regional wood duck breeding population was necessary to enhance management of this species endemic to North America.

Our study on the abundance of natural cavities suitable for nesting by wood ducks, their nesting use by wood ducks, and success of the nests was an important step in estimating wood duck population size and growth in Illinois.

The study area encompassed portions of southwest Mason, northwest Cass, and eastern Schuyler counties and included 3,835 ha (ha = hectare, which = 2.5 acres) of the state-owned Sanganois Conservation Area. Sanganois is a floodplain forest at the confluence of the Illinois and Sangamon rivers and is considered to be one of the least disturbed bottomland areas along the Illinois River.

Cavity densities suitable for wood duck nesting at Sanganois were 2.12 cavities per ha, or an estimated total of 4,577 natural cavities in the 2,159 ha of forested wetland habitat on the study area. Eighty cavities were inspected for wood duck use during July 1994. Ten (12.5%) cavities were used for nesting by wood ducks yielding a wood duck nest density at Sanganois of 0.206 nests/ha. Of the 10 wood duck nests located in natural cavities, five were destroyed by raccoons, three hatched successfully, one was abandoned for unknown reasons, and the fate of one nest could not be determined. Thus, a simple estimate of nest success in natural cavities was 33.3%.

The density of cavities suitable for nesting by wood ducks at Sanganois was relatively high when compared with other studies. Only three previously reported surveys indicated higher

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Wood Ducks

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densities of natural cavities. Studies in New York, Minnesota, and New Brunswick reported 3.95 - 5.50 suitable cavities/ha of forested habitat. As expected, suitable cavity densities at Sanganois (2.12 cavities/ha) were more comparable with densities found in Indiana (1.23 cavities/ha) and Kentucky (1.26 cavities/ha) because cavity densities tend to be greater in the northern states than in the southern states. Also, tree species prone to cavity formation in the north are less common in the south, and tree injuries heal more quickly in the southern states, thereby reducing cavity formation rates. Cavity densities in other geographic regions ranged from 0.075 to 0.67 cavities/ha.

A wood duck natural cavity survey of bottomland forest near Sanganois in 1944 revealed 0.15 suitable cavities/ha. Upland black oak woodlots in central Illinois contained 0.51 suitable wood duck nesting cavities/ha during 1938-1961. These previous surveys in central Illinois revealed much lower densities of cavities suitable for nesting by wood ducks than our survey indicated. The increased density of natural cavities along the Illinois River probably represented the increased age and maturity of the forest stand along with a change in the bottomland forest composition to better cavity producing tree species, such as silver maple and black willow.

Reorganization

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The formation of the Department of Natural Resources comes at a most opportune time for several reasons. First, federal environmental law is being undermined by eliminating or reducing the appropriations that underpin the law in the interest of reducing the deficit. In some instances, the law is, or will be, directly attacked during the reauthorization process based on special interests rather than informed science. Because of a series of special reports and the support of the Conservation Congress, Illinois is in a stronger position than virtually any other state to provide the advice and options necessary to play an influential role in the national debate. Secondly, the old Department of Conservation was actively involved in a number of projects that could bring significant lands under partnership management in the near future. These macrosites offer unparalleled opportunities for the application of ecosystem management techniques and for making a positive impact on behalf of biodiversity. We are looking forward to the exciting opportunity and synergism of collaborating with others in planning the macrosites.

We intend to continue the publication of Survey Reports and to provide it free-of-charge to interested readers. Survey Reports may also be found in electronic format:

http://www.inhs.uiuc.edu/chf/pub/surveyreports/sr-index.html

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Chief, Illinois Natural History Survey
The plains pocket gopher (Geomys bursarius), the only gopher that lives in Illinois, is named for its fur-lined pockets, one under each jawbone, that carry food and nest materials.

In Illinois, the plains pocket gopher is found just east of the Mississippi River in St. Clair and Madison counties, then east and south of the Illinois River to its junction with the Kankakee River, and south of the Kankakee to the Indiana state line. Large rivers, like the Mississippi and Illinois, appear to be barriers to its distribution. The gophers inhabit areas where the soil is well-drained and there's an abundance of tuberous-rooted plants.

It is generally said that a pocket gopher's coat is the same color as the soil in which it lives. The Illinois population is unique among pocket gophers in the middle U.S., however, because its members are all black, regardless of the soil type they inhabit. Only the nose, feet, and the terminal half of the tail are white.

Gophers have large forefeet with five strongly-clawed toes to aid in digging and pushing dirt from the tunnel. Their toes are lined with bristles that may assist in moving dirt. The tail is bare near the tip to serve as a "feeler" when the animal backs up in the burrow. Pocket gophers can run backward almost as swiftly as forward. A unique adaptation allows the mouth to be closed behind the incisors; thus, these teeth can be used in the digging process. Gopher skin is loose and easily stretched, allowing the animal to readily reverse itself via a "feeler" in its narrow burrow.

The plains pocket gopher constructs underground burrows in which it spends nearly all of its life. With its front paws at either side of its face, the gopher shoves the dirt out of the tunnel, much like a small bulldozer. When the gopher is finished, the exit is plugged with tamped soil. Although the tunnels may be long, they are only 1.5 to 3 inches in diameter, just large enough for the gopher to get through. Each burrow includes a main nest, toilet chamber, and many food storage chambers. Here the gopher stores a variety of vegetable matter from roots, tubers, stems, and leaves—most any herb will do. Unlike the mole, pocket gophers are vegetarians and all of the many insects and other arthropods that may share its burrow are safe. Plains pocket gophers are solitary except during the breeding season.

Only a single litter is produced each year and one to six young are born between early March and early May. A newborn gopher is a fat, stubby creature with short legs and a tail; its naked dark skin appears to be too big and hangs loosely in many wrinkles and folds. The eyes and ears are sealed shut. By five weeks the eyes open and within two months the young gophers are on their own, building tunnels, working and reworking the soil—nature's bulldozers.

Illinois Mammal Facts

Objective: students are exposed to the diversity of Illinois mammals and to facts about selected species.

Materials: multiple copies of Illinois Mammal Facts

Vocabulary: badger(s), carnivore, endangered, habitats, herbivores, insects, opossum, predators, woodchuck

Comments: While low in relative number of species, 67 to be exact, the mammals of Illinois are certainly some of the most well-known inhabitants of the state. Mammals can have profound effects upon the landscape by their many activities, such as selective feeding on plants; tunneling through the leaf litter in forests, which helps to retard runoff and prevent flooding; and consuming large numbers of undesirable organisms, particularly insects. Perhaps their most useful value, though, particularly in a state that has been extensively developed, is an aesthetic one. An ever-increasing number of people travel throughout Illinois to catch glimpses of wild animals in their native habitats. Wildlife sitings may be as simple as seeing a family of raccoons traipsing across your suburban front yard at dusk, or as complex as viewing the interactions of male white-tailed deer during the rut each fall. But whether the sitting is of an elusive bobcat in the Shawnee Hills, the small brown blur of a white-footed mouse in an old field, or the nightly travels of bats at dusk, each sitting is unique and contributes to our appreciation of wild Illinois.

Procedure:
1. Introduce the subject of Illinois mammals and have students name as many species of Illinois mammals as they can.
2. Distribute copies of Illinois Mammal Facts and have students complete the exercise. Answers: habitats, herbivores, opossum, predators, insects, southern, woodchuck, carnivore, badger—badgers, endangered
3. Have groups of students come up with their own puzzles and exchange them with other groups.
Study the statements below and unscramble the word found in each sentence. Write that word in the blank following each statement.

1. Although mammals can be found throughout Illinois, many species have particular places, called TTAABISH, where they prefer to live. ____________________________

2. Those species of mammals that are RVHERSEBIO seldom need to travel very far in search of food. ____________________________

3. The UOSMOSP is the only member of its order found in Illinois. Most of its relatives live in Australia. ____________________________

4. Among the most voracious of RORDASTPE are the shrews. Some species eat three times their own weight every 24 hours! ____________________________

5. Little brown bats feed only on SSCTNEI. ____________________________

6. Swamp rabbits are rare in Illinois and occur only in far NUETSOHR Illinois. ____________________________

7. The OKHUOWDCC is a burrowing, gnawing rodent that eats mostly plants, including certain field crops, such as clover, alfalfa, and soybeans. ____________________________

8. The gray fox can climb trees and is primarily a VACEINRRO. ____________________________

9. During most of the year, the home of the EDRBGA is a shallow burrow. SERDBGA only eat other animals. ____________________________

10. The bobcat is GAEDNEEDRN in Illinois. This cat prefers a habitat of heavy forest cover with much underbrush broken by clearings and rocky outcrops. ____________________________
President's Council
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Environmental organizations described several successful, cooperative ventures in management of floodplain forests. An oceanographer and a state fisheries biologist also described the increasingly detrimental effects on the Gulf fisheries and shell fisheries of the excess nutrients (phosphorus and nitrogen) delivered by the Mississippi River. The nutrient loading is associated with fertilizer use in the Mississippi watershed and diminishment of nutrient retention resulting from wetland drainage in the floodplains and delta.

The draft report of the Council was released for public comment in July and a national action strategy will be presented to President Clinton in October. Anyone wishing to see the draft report or find out more about the Council should contact:
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