

OUR ENVIRONMENT

Illinois Mud Turtle Still off Endangered List

The Illinois mud turtle will not be listed as an endangered species at this time, the Department of the Interior's U.S. Fish and Wildlife Service has decided. The agency's decision was based on new data received from the public in response to a proposal which would have afforded the dark brown turtle areas of critical habitat in Iowa and Illinois and other protection under provisions of the Endangered Species Act.

Information compiled during the public comment period and from meetings held in the two states by the agency following publication of the proposal increased the service's knowledge of the turtle's range and population. The additional data made available to the agency indicated the turtle is more numerous than had been assumed but confirmed that its habitat has been reduced. The service will continue to study the status of the Illinois mud turtle, officials said.

The Iowa area proposed as critical habitat for the turtle and known as Big Sand Mound is owned by Monsanto and Iowa-Illinois Gas and Electric Company. Monsanto's expanding Muscatine herbicide factory is located there, and the utilities company is constructing a generating station nearby.

The two companies have fenced off a 400-acre tract of land in Big Sand Mound and proposed it be managed as an ecological preserve by an advisory group of scientists and conservationists interested in preserving the area's unique plants and animals, including the Illinois mud turtle.

Fish Employed to Monitor Water Purity

A West German city has enlisted six Nile elephant fish to check out whether it's safe to drink the water. Each *Gnathonemus* fish (actually, a two-inch, black-striped goldfish) works unstintingly around the clock, two weeks straight, to provide a continuous check on Göppingen's water purity. Its unique job qualifications: a talent for detecting small amounts of metal contaminants and the ability to emit electric impulses.

City engineers simply plop one into an aquarium rigged with electrodes connected to a monitoring panel at utility headquarters and relax until the fish sounds a pollution warning by dropping its impulses under 200 a second. (An elephant fish in unpolluted water normally gives off over 1,000 impulses.)

Endangered Eaglet Survives Storms

On the morning of July 17, biological technician George Stapleton, of the U.S. Fish and Wildlife Service, observed an immature bald eagle soaring around Little Creek Reservoir on Crab Orchard National Wildlife Refuge, Carterville, Illinois. Similar events are occurring elsewhere in the upper Midwest at this time of year, so what makes this eagle so special? The bird is special because it's the first eagle ever to be hatched and reared on the refuge; moreover, the nest is only the second successful nest in Illinois in the past 37 years.

Efforts to produce the eagle began in early 1973 when a pair of eagles selected a snag in the reservoir and constructed a nest. Work on the nest ended abruptly when the tree fell during a storm in 1974. The eagles selected another snag nearby and again began building a nest. The eagles appeared to be interested in the nest throughout the winter months but usually joined the spring flights to northern states.

However, in the spring of 1979, things were different. Seemingly, the eagles were about to carry the nesting activities to completion. From a vantage point a quarter of a mile from the nest, technician Stapleton checked the nest through his scope almost daily. He was convinced the eagles were incubating during the entire month of April. For some unexplained reason, though, the eagles abandoned the nest and left the refuge on May 2. Observers were disappointed when they failed to see any sign of an egg or eaglet remains in an aerial survey over the nest a week later.

The eagles returned to the area in November 1979, and again began defending territory around the nest. Biologists were excited by the obvious seriousness of the nesting activity when on March 8, 1980, the pair was observed mating near the nest. By late March, Stapleton thought the eagles were incubating an egg. On April 25, he noticed a change in the behavior of the eagle sitting on the nest and suggested it might be caring for a young bird. Suspicions were confirmed on May 8 when an eaglet was observed moving about on the edge of the nest. Both proud parents were in attendance.

With the parents providing an ample supply of fish, the eaglet continued to grow at a rapid rate. The young bird had feathers and was close to the flight stage. On the evening of June 28, a severe thunderstorm with 100 mile-per-hour winds passed through the area. The tree was blown down and the nest sank beneath water. The young eagle apparently survived the storm and falling trees and was spotted sitting on a log near the stump that

had once supported the nest tree.

Biologists thought the young eagle had the best chance for survival—perhaps 50-50—if left alone under the care of its parents. A check of the area on July 1 indicated the parents were still caring for the young bird and it appeared to be in good condition.

On the afternoon of July 2, another severe storm moved through the area, creating severe damage to nearby communities and hundreds of trees on the refuge. The young bird, apparently conditioned to such abrasive powers of Mother Nature by now, survived the storm without harm. Technician Stapleton and the refuge staff were elated when the eagle finally took to flight on July 17.

Several questions remain to be answered: Will the eagles return to the area again next year? Will they select another tree and continue their nesting attempts? Can they be encouraged to select a live tree on land or perhaps a man-made nesting structure over the water? The refuge staff will make the area as attractive as possible to eagles. Optimistically, eagles may adopt Crab Orchard Refuge as a permanent nesting site and produce young in southern Illinois regularly.

Illinois Air Quality: A Mixed Report for 1979

Air quality over Illinois was a mixture of good news and bad news during 1979, according to the Annual Air Quality Report recently completed by the Illinois Environmental Agency. The report was compiled by the IEPA's Division of Air Pollution Control Ambient Air Monitoring Section. It is based on data compiled from the Division's air monitoring network consisting of 316 samplers throughout the state.

On the good news side, levels of ozone (O_3) and carbon monoxide (CO) were definitely lower during the year. However, on the bad news side of the ledger, levels of sulfur dioxide (SO_2), particulates (soot, dust, etc.) and nitrogen dioxide (NO_2) were higher, the report shows.

Dave Kolaz, manager of the section, said, "Air pollution is a highly variable phenomenon relying on the interplay of a variety of conditions. Foremost among these are the weather, geography, and economics. Weather conditions involve atmospheric stability, wind speed and direction, precipitation, solar radiation, and temperature. It's important to know the geography—whether the area is urban, rural, valley or plain. Economics considers such things as the concentrations of industries, boom or recession times, and whether it's a weekday or the weekend. All of these things are contributing factors to

the quality of the air we breathe in this state. These variations often can be seen as a pattern of daily, seasonal or longer range basis."

The report shows that trends established over the years for four of the seven major air pollutants over the past years were reversed during 1979. Ozone and carbon monoxide, which had been increasing, decreased, while particulates and sulfur dioxide, which were decreasing, increased.

In general, ozone levels were much lower in 1979 than in the previous three years. For the first time since monitoring began in 1974, none of the 43 stations in the network registered levels above .20 parts per million (ppm). The highest hourly average for the year was .186 ppm at Waukegan. That monitor also recorded the greatest number of days above the federal standard of .120 ppm, with nine days. Edwardsville had the greatest number of hours exceeding the state standard of .080 ppm, with 176.

On 60 of the 153 days in the ozone season at least one city or area was placed under an ozone advisory when levels exceeded 70 parts per billion (ppb) for a two-hour average and weather conditions were such that the levels were expected to recur the following day. This compares to 88 days in 1978 and represents a decrease of 18 percent. Edwardsville led with 37 days under advisory conditions. This is 23 percent lower than in 1978, when Marion was under advisory conditions for 72 days. In 1979 Marion had only 23 advisory days.

There was only one Yellow Alert issued in 1979, compared to eight in 1978, when levels of 170 ppb were exceeded. The single Yellow Alert was declared on July 21 for Waukegan. The Yellow Alert is issued when ozone levels reach 170 ppb for a one-hour average and conditions are such that recurrence is expected the following day.

Of the nine sites monitoring carbon monoxide only three registered violations of the eight-hour standard of 9 ppm. These occurred in Chicago, Calumet City, and Moline. The greatest number of excursions were recorded at the State Office Building in downtown Chicago with 59. This is a decrease of 30 percent over 1978, when 84 excursions occurred. This site also had the highest eight-hour excursion of 16 ppm and the highest one-hour average of 24.3 ppm.

The statewide average for particulates reversed a downward trend in 1979 when the statewide average was 74 micrograms per cubic liter ($\mu\text{g}/\text{m}^3$) as compared to 70 $\mu\text{g}/\text{m}^3$ in 1978. Once again Granite City topped the list with an annual average of 215 $\mu\text{g}/\text{m}^3$. This is the highest annual average since 1969 and the first year since 1976 that a site recorded an annual average above 200 $\mu\text{g}/\text{m}^3$. Of the highest nine sites in the state during the year, seven were located in Granite City. The lowest annual mean was 44 $\mu\text{g}/\text{m}^3$ recorded in Lake Bluff. Granite City also had the two highest

24-hour averages for the year.

Sulfur dioxide also showed increases reversing the long-term downward trend, with the annual statewide average standing at .012 ppm as compared to .010 in 1978. The increase was most noticeable in the Chicago/Cook County area from January through March, a period of severe winter weather which may have been a contributing factor.

Even with this increase the state remained well below the primary annual standard of .030 ppm. The highest annual average was .022 ppm, registered at GSA Building in Chicago and the State Office Building in East St. Louis. The lowest annual average was .006 ppm measured in LaSalle.

The longest continuous excursion ever recorded in Illinois occurred in Wood River and covered an 80-hour period with the highest 24-hour average of .248 ppm. Two other sites recorded violations of the 24-hour primary standard of .14 ppm. These were Springfield with .216 ppm and East St. Louis with .162 ppm.

Nitrogen dioxide levels continued a three-year trend of increasing levels. In 1979 there were 19 sites above the annual primary standard of .050 ppm. This compares to none in 1977 and 11 in 1978 with a high of .060 ppm. In 1979 the highest average was .078 ppm, recorded in Cicero while the lowest was .014, recorded in Edwardsville.

Non-methane hydrocarbons were monitored at two sites in 1979. The standard for this pollutant is a 6-9 a.m. average of .24 ppm not to be exceeded more than once per year. Both sites had 98 percent of the 6-9 a.m. averages higher than the standard.

Pollutants Suspected In Striped Bass Decline

Traces of arsenic, PCBs, and other chemicals are the latest clues in a biological detective story—the mysterious decline of Atlantic Coast striped bass. U.S. Fish and Wildlife Service biologists found the chemical residues in striped bass fry and fingerlings collected last summer from three East Coast rivers. Tests showed that the fish had weakened backbones, a condition the scientists believe is caused by toxic chemicals.

"A weakened backbone would certainly reduce the ability of striped bass to compete for food, avoid predators, or endure the stresses of migration and reproduction," according to Paul Mehrle, an FWS biochemist. "But we have a lot more work to do before we can say to what extent contaminants may be contributing to the decrease in the striped bass population."

The number of striped bass, a valuable sport and commercial fish, began dropping in the early 1970s and by 1978 had reached a 21-year low. Two federal

fishery agencies—FWS and the National Marine Fisheries Service—are conducting an emergency three-year program to determine the size and distribution of striped bass populations and to find out whether the decline is natural or due to some man-made phenomenon, such as pollution or over-fishing.

Contaminants are a prime suspect in the mystery because striped bass spawn in heavily polluted rivers where the delicate young fish stay for up to three or four months after hatching. Then the young must survive for two years or more in estuaries, where they are often exposed to more pollution. Later, some stocks of striped bass migrate out to sea where they spend most of their adult lives in coastal waters.

FWS scientists have found that young striped bass from the Hudson River contained relatively high levels of PCBs (polychlorinated biphenyls, an industrial chemical), lead, and cadmium. Fish from the Potomac River contained lead, zinc, arsenic, and selenium; and fish from the Nanticoke River (Maryland) contained significant levels of arsenic and selenium. In contrast, striped bass raised at the Edenton National Fish Hatchery in North Carolina contained no significant chemical residues. Tests also revealed that the backbones of Hudson River fish were 42 percent weaker than the uncontaminated hatchery fish, while backbones of fish from the Potomac and Nanticoke showed about a 20 percent reduction in strength.

Mehrle says the studies show that contaminants begin affecting striped bass during very early life stages—within the first three months.

The researchers have already begun additional studies to learn more about the effects of contaminants on striped bass. Adult female bass have been collected from the Hudson River, the Elk and Choptank rivers in Maryland, and the Cooper River in South Carolina, and their fertilized eggs sent to a laboratory. There, studies will be made of hatching success, and of survival, growth and development of the young for 90 days after hatch. Chemical residues in eggs and young will be measured throughout the study period. FWS scientists will then see if the presence of chemical residues can be correlated with reproductive success or survival and growth of young.

At this time there is no consensus as to what is causing the drop in the number of striped bass. Some scientists think a combination of factors is responsible, while others believe the decrease is part of a natural cycle that will eventually reverse itself without human help. The tests being conducted should help provide the evidence needed to determine whether pollution is contributing to the decline of the popular fish. In the meantime, the jury is still out on the case of the declining striped bass.



1980. "Illinois Air Quality: A Mixed Report for 1979." *Field Museum of Natural History bulletin* 51(9), 24–25.

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