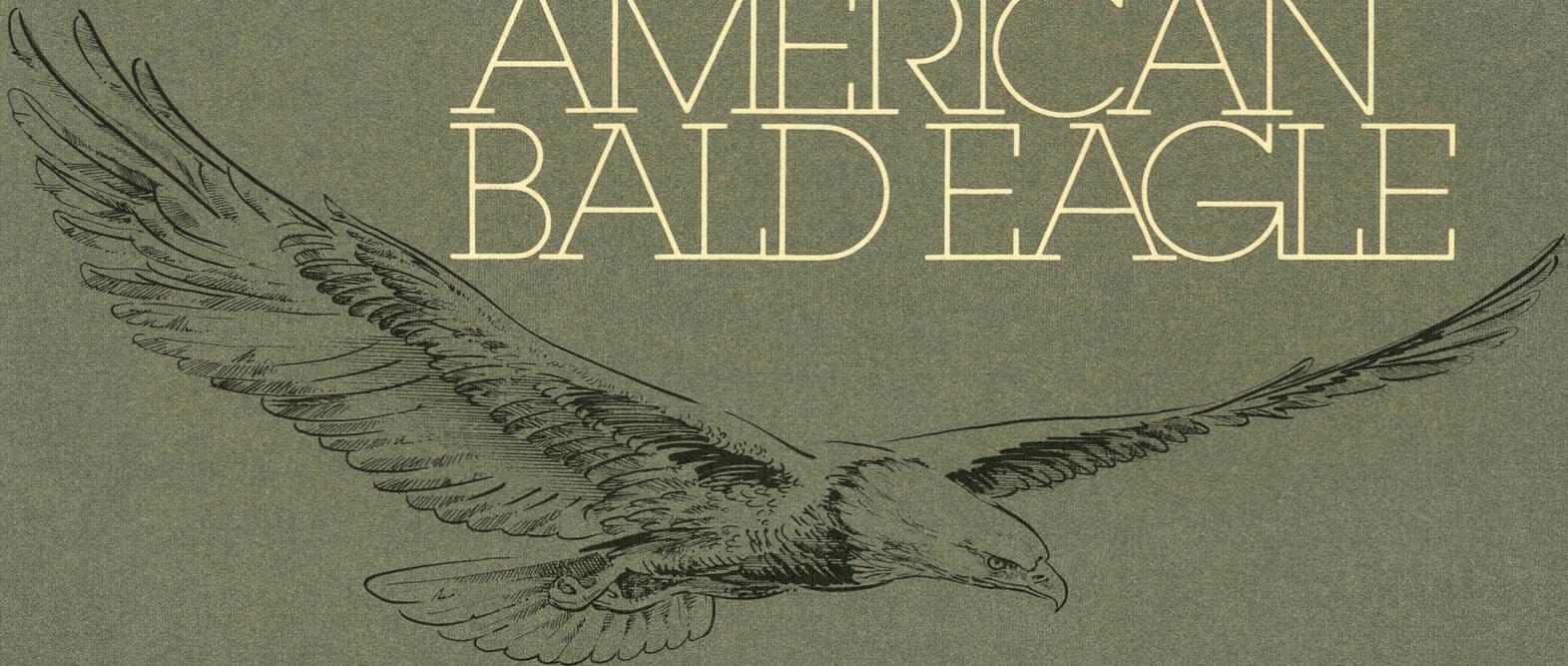
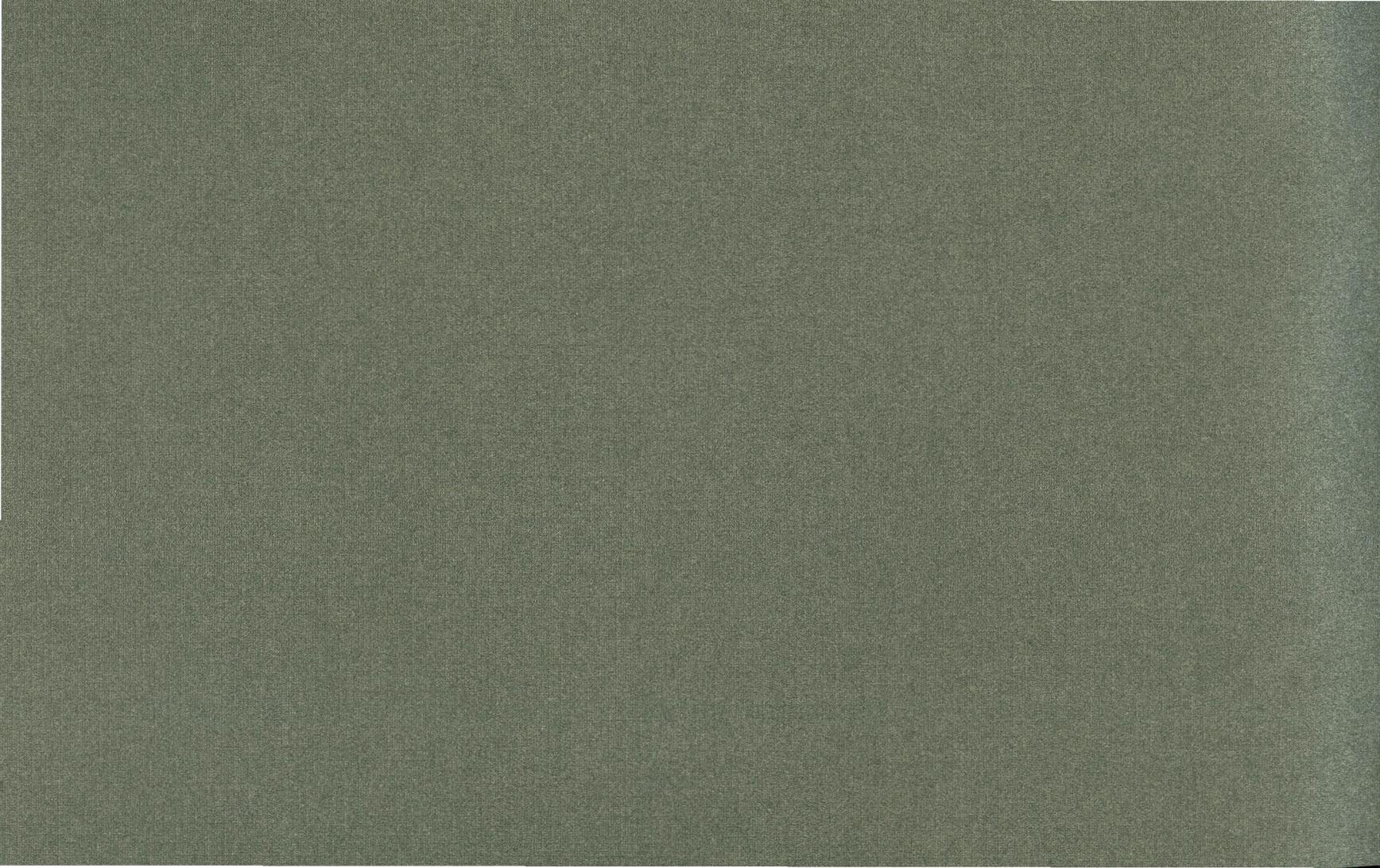


THE  
AMERICAN  
BALD EAGLE

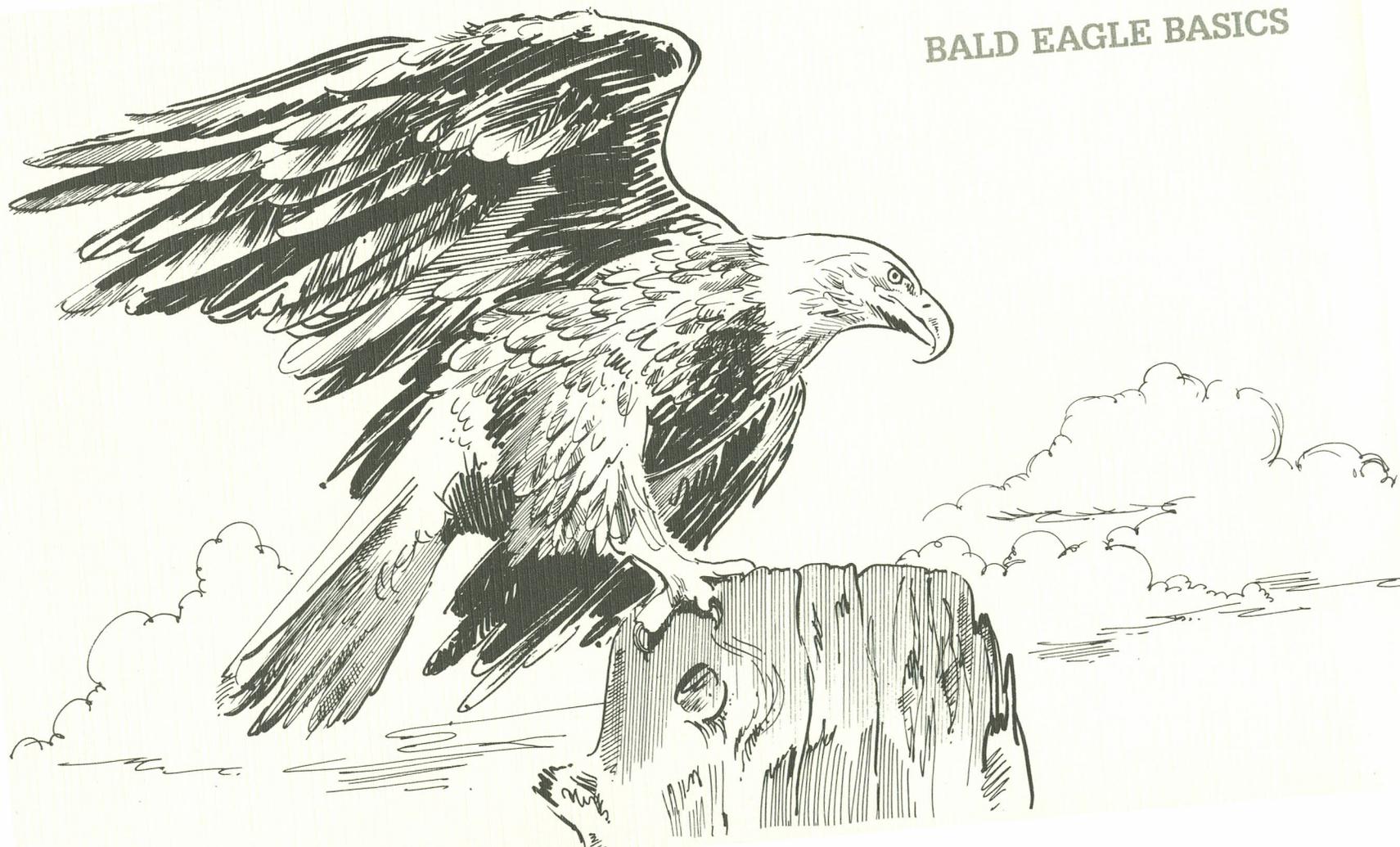




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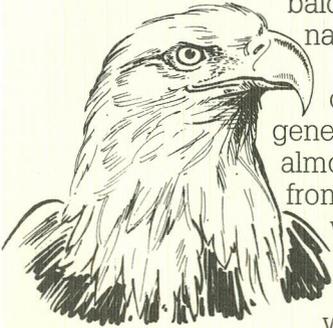
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# BALD EAGLE BASICS



The bald eagle is truly an all-American bird—the only species of eagle unique to our continent. It once soared over most of what is now the continental United States. But today the only great assemblage (as many as 50,000 birds) can be found in Alaska. The eagle is listed as “endangered” in 43 of the lower 48 states and “threatened” in the remaining five.

With its majestic proportions, the bald eagle is one of nature’s most imposing birds of prey. Males generally measure almost three feet from head to tail, weigh eight to ten pounds, and have a wingspread of about 6½ feet.



Females run larger and may reach 42 inches in length, weigh up to 14 pounds, and have a wingspread as wide as eight feet. The bird’s huge, pale eyes, fierce yellow beak and great, black talons add to its grand appearance. Its distinctive white head and tail feathers appear only after the bird is four to five years old.

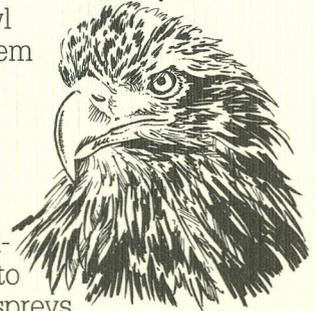
Bald eagles are believed to live as long as 30 years in the wild, even longer in captivity. And they pair for life. But if one dies, the survivor will accept a new mate. Although the birds may range long distances, they usually return to within 100 miles of where they were raised to



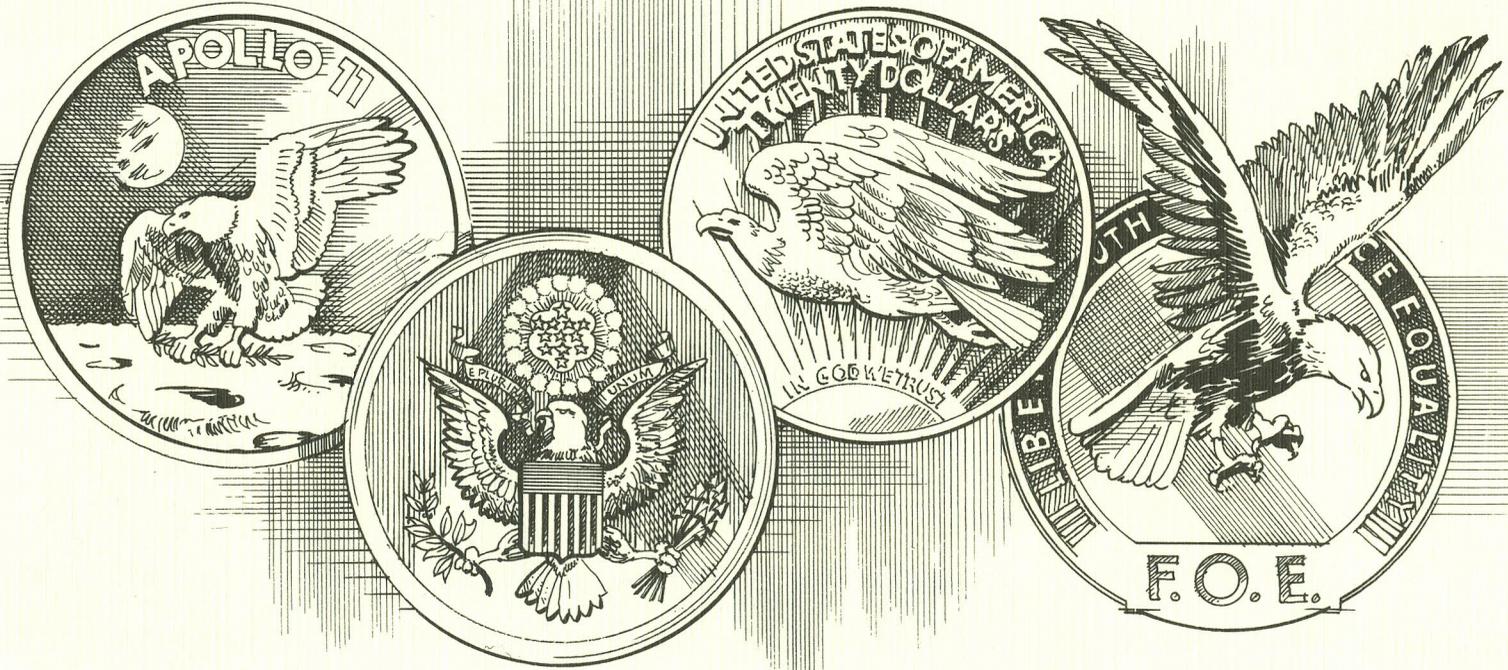
build large nests. Nests that have been reused for several years can eventually grow to weigh as much as 4,000 pounds.

Once each year bald eagles normally lay one to three eggs which hatch in about 35 days. The young are flying within three months and go off on their own about a month later. It’s estimated that only some 50 percent survive to adulthood.

The staple of the bald eagle diet is fish. But the birds are efficient predators who will also feed on anything from waterfowl to snakes. It may seem out of character, but the magnificent creatures are also known to scavenge garbage dumps, carrion and roadside animal kills, in addition to stealing food from ospreys.



# YEAR OF THE EAGLE



*"Its grace and power in flight, its vigilance and loyalty in defending its family group, and, most of all, its courage, make the eagle a proud and appropriate symbol for the United States."*

That's how the President proclaimed the bicentennial year of the eagle. And few Americans today would dispute his words. But that wasn't necessarily the case back in 1782 when the Continental Congress chose the bald eagle to grace our new nation's Great Seal.

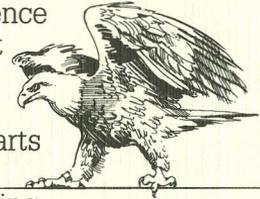


Indeed, before finally settling on the eagle as our national symbol, the founding fathers considered and discarded two other designs —neither of which included the eagle. Even afterward, some, like Benjamin Franklin, objected to the choice. He wrote that the bald eagle was “a bird of bad moral character” which didn't “get his living honestly”.

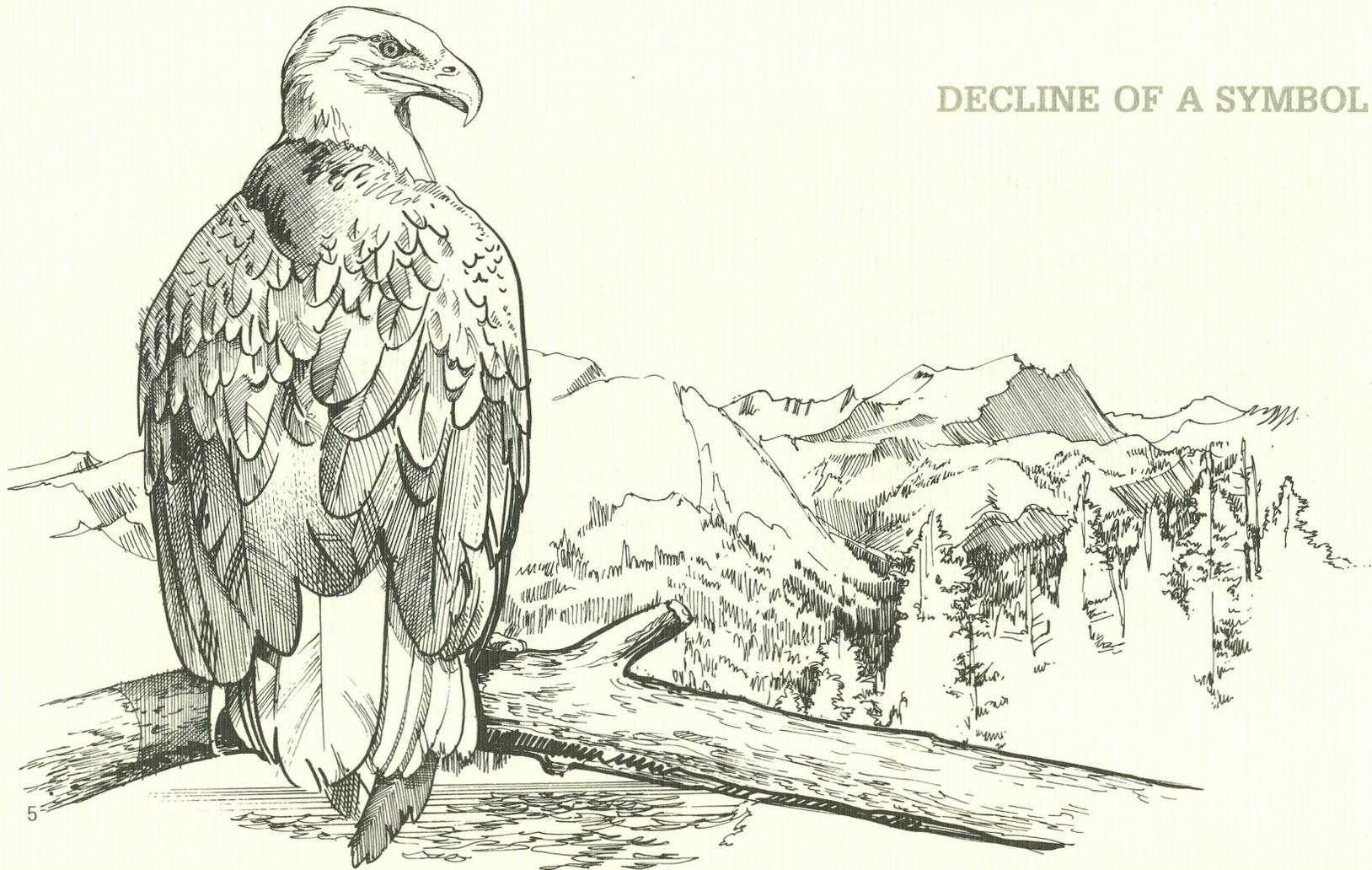
Most people, however, didn't share such misgivings. And over the past two centuries, the bald eagle became interwoven in the fabric of American life. Artisans, architects and designers used the eagle motif in everything from furniture and buildings to coins and toys. Hundreds of organizations

and businesses adopted the bird as their emblem or trademark. Even today that appeal remains strong.

Not too long ago, however, the majestic bird itself was disappearing in the wild. By the early 1970s, in fact, the bald eagle faced extinction in many areas. But as Americans marked the 200-year love affair with their national symbol, there was added reason to celebrate. The eagle's decline has largely been halted. And although its battle for existence continues, in most places the bird is holding its own. Indeed, in some parts of the country its numbers are growing.

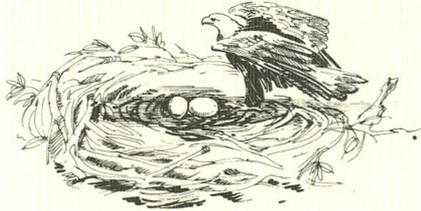


## DECLINE OF A SYMBOL



When settlers first landed in the new world, experts believe anywhere from 25,000 to 75,000 bald eagles roamed the skies over the present continental United States. But like many other endangered species, this magnificent bird became the victim of habitat destruction, human depredation and environmental degradation.

Bald eagles have few natural enemies. But they do need a special kind of environment—quiet isolation and tall, mature trees in which to build their huge nests. Over the years the wilderness was cleared to make way for towns and farms.

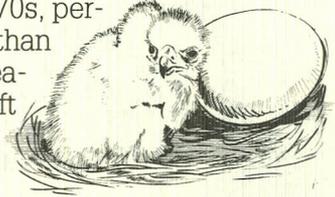


Virgin forests were cut for lumber and fuel. In the process, the isolation of the wild was shattered and lofty nesting trees became fewer. As their normal life cycle was disrupted, bald eagle populations declined.

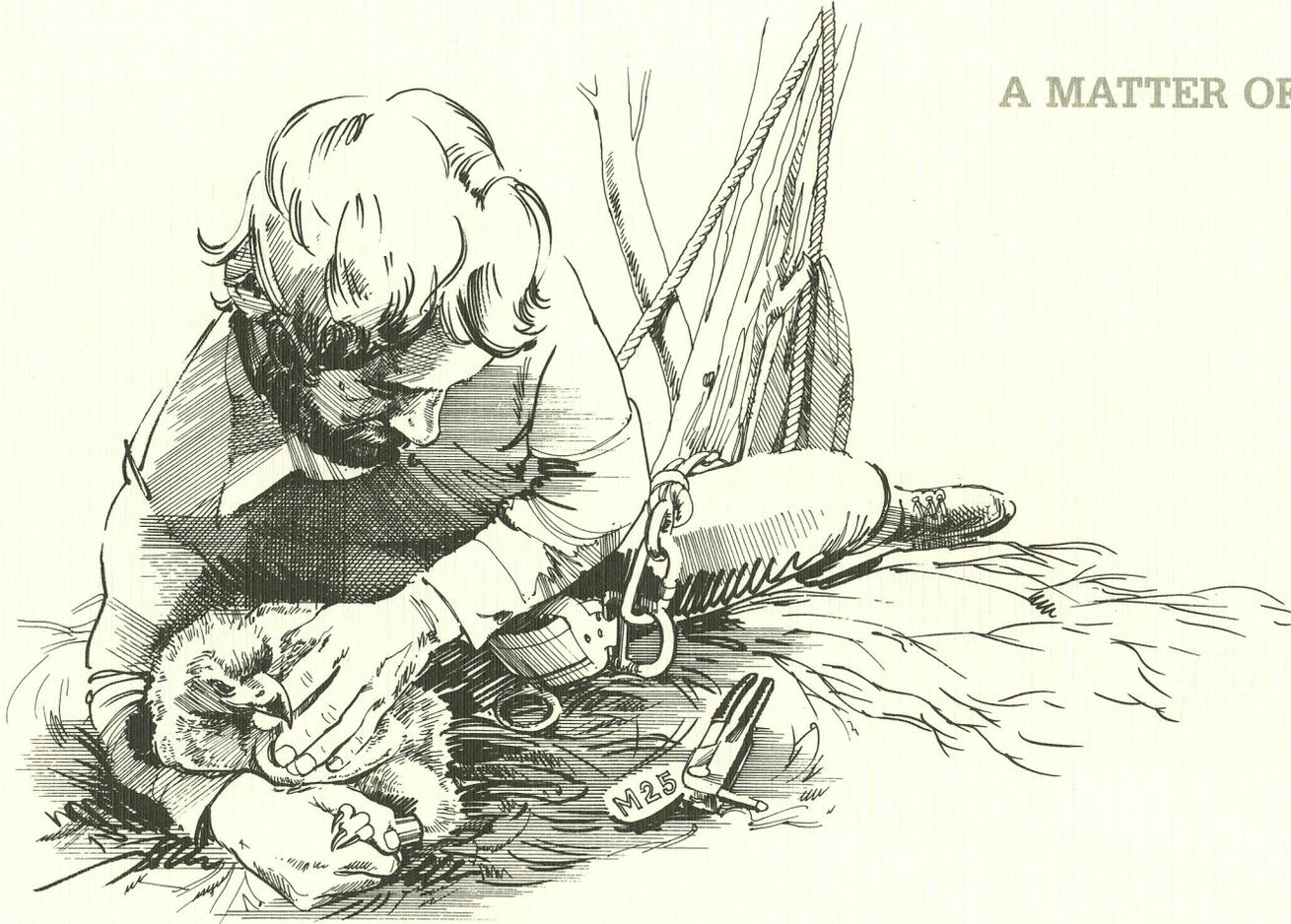
Meanwhile these proud birds of prey became prey themselves. Although bald eagles prefer to feed on fish, folklore portrayed them (along with other raptors) as marauders who killed chickens, lambs and other livestock. As a consequence, greater numbers were shot over the years by farmers, ranchers and careless hunters. Still another hazard to the eagle's existence was posed by nest-robbing egg collectors.

But a possible new threat appeared during the decades following World War II, with the introduction of the pesticide DDT. Broadly effective

and believed relatively nontoxic, it was applied extensively on croplands throughout the country and indeed the world, where it was credited with saving millions of lives from disease and starvation. Later, unanticipated environmental consequences became known. DDT residues could wash into lakes and streams, and be absorbed by the aquatic plants and organisms that sustain fish. The fish, in turn, were eaten by eagles. The birds subsequently laid thin-shelled eggs that often were crushed during incubation, and their reproduction rate dropped. By the early 1970s, perhaps fewer than 3,000 bald eagles were left in the lower 48 states.



# A MATTER OF SURVIVAL



As long ago as the turn of the century, writer John Burroughs lamented that “only a small proportion of Americans today have ever seen the emblem of their country soaring above them, wild and free”. Over the decades, a few states did take action. And in 1940 Congress, noting that the bald eagle was “threat-

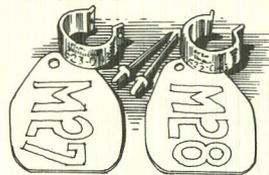
ened with extinction”, made it illegal to shoot the birds or remove their eggs from nests.

But it was not until the 1950s that broad public concern arose over the fate of the bald eagle, after amateur bird banders noted a sudden drop in the number of young being produced by formerly fertile pairs of eagles.

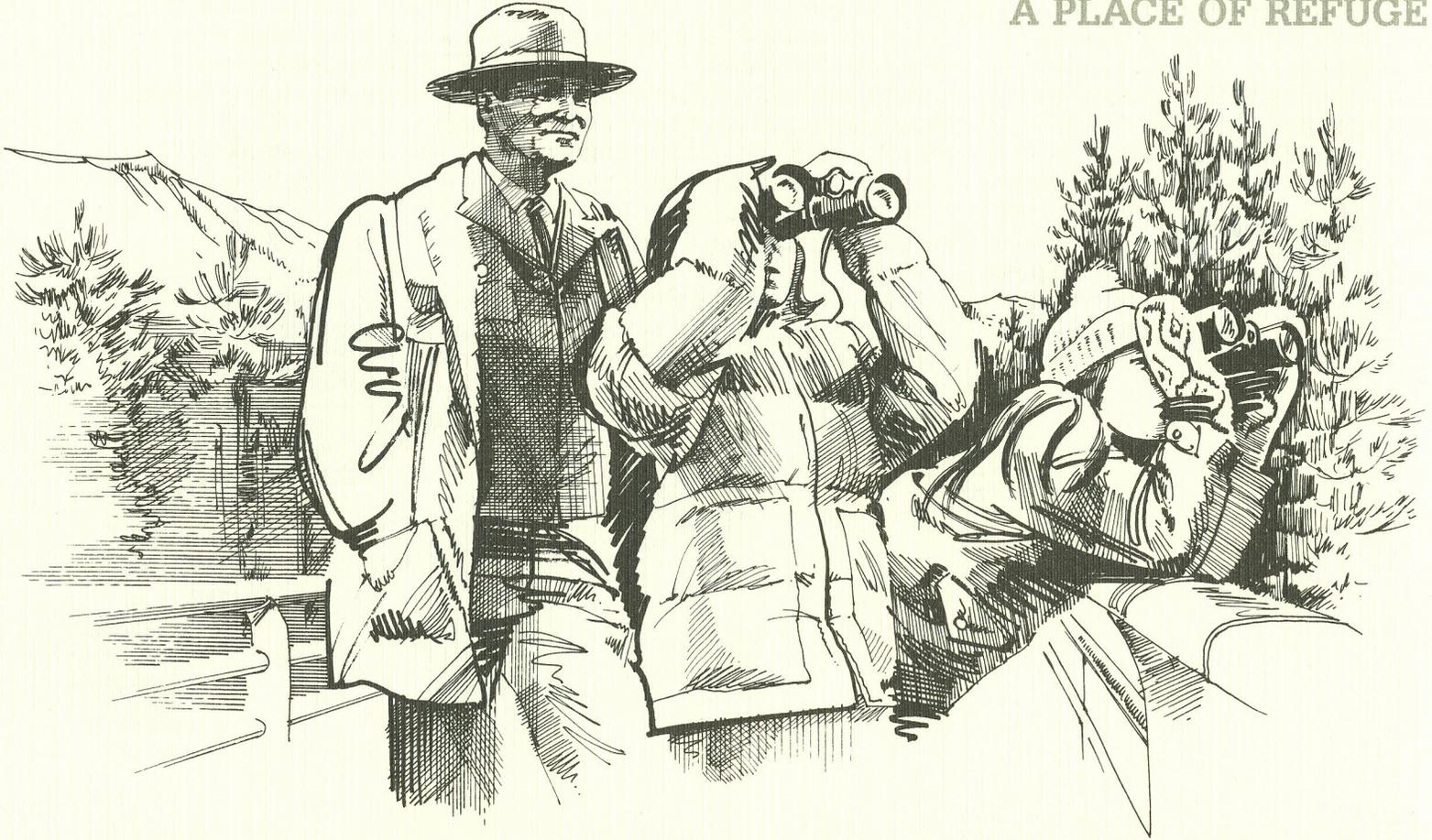
Scientists at the U.S. Department of the Interior’s Fish and Wildlife Service, working with other vulnerable species, found that a

substance called DDE was being formed as certain birds metabolized DDT. They established that DDE was causing the birds to lay thin-shelled eggs.

These findings played a role in the ban on the general use of DDT in 1972. Meanwhile, the chemical industry has developed effective new crop protection chemicals that are environmentally safe—and minimize danger to bald eagles and other wildlife.



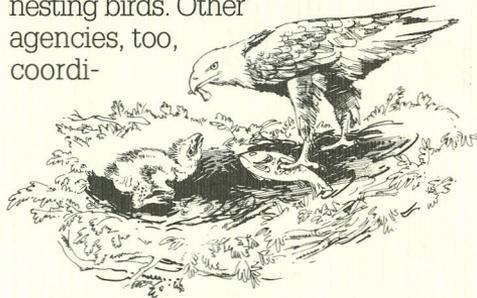
## A PLACE OF REFUGE



Steadily encroaching development—everything from timbering to vacation home construction—has made the serene, remote surroundings so favored by eagles increasingly scarce. To preserve these special environments, it's necessary to identify their locations. And indeed, over the past decade or so, researchers have learned a great deal about the homing grounds of the species.

The Fish and Wildlife Service, state agencies and conservation groups have carried out intensive ground and aerial surveys. And experts now believe their census of resident bald eagles in the continental United States is 95 percent comprehensive. As a result, more and more eagle areas are being protected.

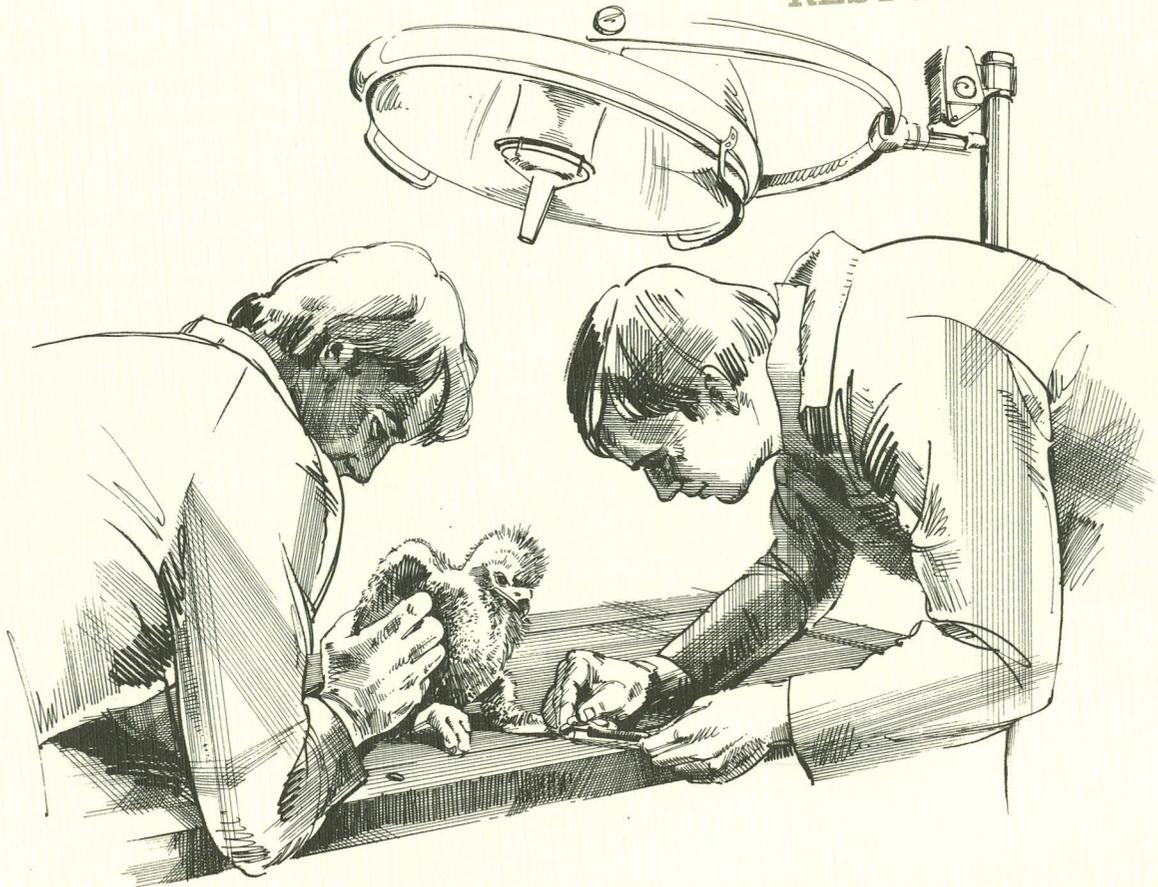
The federal government and some states have acquired considerable expanses of such important habitat. In fact, some preserves have been established specifically for the great birds and half of America's 410 National Wildlife Refuges contain eagles. The Forest Service creates buffer zones around eagle nesting trees and schedules timbering activities to avoid disturbing nesting birds. Other agencies, too, coordi-



nate with the Fish and Wildlife Service and, if necessary, modify projects to protect eagles.

Organizations such as the National Wildlife Federation, the Nature Conservancy and the Eagle Valley Environmentalists also have purchased eagle habitat. In some cases, the conservationists themselves are managing the areas. In others, responsibility has been turned over to federal authorities. Corporations and private individuals are joining these preservation efforts—protecting and maintaining bald eagle habitat on their property, and even granting conservation easements to permanently shield the birds from the upsetting inroads of civilization.

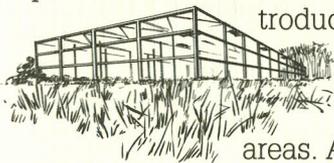
# RESTOCKING THE SPECIES



Not too many years ago there were some 70 breeding pairs of bald eagles in the state of New York. But by the beginning of the 1980s, that number had dwindled to a single pair. Similar declines occurred in Pennsylvania, Missouri, New Jersey, Arkansas and many other states.

A natural buildup of such sorely depleted (or no longer existing) eagle populations is a painfully drawn out process—even though the contamination threat has eased and growing amounts of critical habitat are coming under protection. The reason? Bald eagles are extremely slow to re-colonize their former home territories.

The key approach for speeding up nature's timetable is the reintroduction of young birds into these barren areas. And a vital



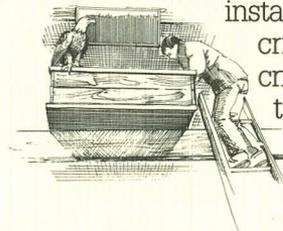
source of eaglets for such reintroductions is captive propagation—a technique developed to a science by the U.S. Fish and Wildlife Service's Patuxent Wildlife Research Center. Experts believe that the growing contribution of captive breeding, together with the infusion of young birds from areas with healthy eagle populations, can restore the species to its historical range in a fairly short time.

Since the mid-1970s, Patuxent researchers have put together the world's largest captive breeding colony of bald eagles (made up mostly of injured birds that can't be released back in the wild). Few eagles had ever been bred in captivity. And there was little experience to go on. But the Patuxent scientists were able to capitalize on knowledge gained from working with other endangered species such as whooping cranes, Andean condors and

Aleutian Canada geese.

For example, they've been able to double the number of eggs normally produced each year by eagle pairs through a technique called "double clutching." The first clutch of two or three eggs laid by the female is removed from the nest and artificially incubated (for about 38 days). The birds promptly "recycle" and produce another clutch of eggs which they incubate themselves.

Over the years the researchers also evolved specialized husbandry methods to meet the particular requirements of bald eagles—methods which included every facet of eagle care, habitat and diet. At the same time, they refined artificial incubation technology—developing, for



instance, precise criteria for such critical factors as temperature and humidity.

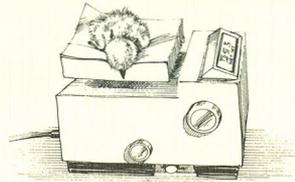
All these efforts have paid off. By the end of 1983, the Patuxent breeding colony had supplied more than 50 healthy young to help replenish the species in the wild. Indeed, since 1977 the Center's captive offspring have been a major factor in restoring bald eagles to nine states—New York, Virginia, Delaware, New Jersey, Pennsylvania, Maine, Georgia, Tennessee and Ohio.

About half of the Patuxent eaglets are introduced into the wild through "fostering." This technique involves the placing of three-week-old birds in the nests of eagle pairs which either produce infertile eggs or lay no eggs at all. The barren birds then readily adopt the young and raise them as their own.

The other eaglets, which were parent-raised, are released through "hacking", a procedure adapted from falconry. Slightly older birds are put in lofty "hacking towers" located in wilderness areas. At first,

handlers (who stay out of sight) provide food for the young eagles. But over a period of weeks, progressively less food is supplied—forcing the fledglings to learn to hunt their own prey. Soon the birds become fully able to fend for themselves, just as they would have had they been raised by adult parents in nature.

The large captive colony at Patuxent gives researchers a unique opportunity to build their knowledge of bald eagle physiology, behavior, husbandry, and reproduction. And the scientists feel that this growing body of knowledge could enable some zoos to start their own propagation programs—using methods pioneered at Patuxent. Such additional breeding

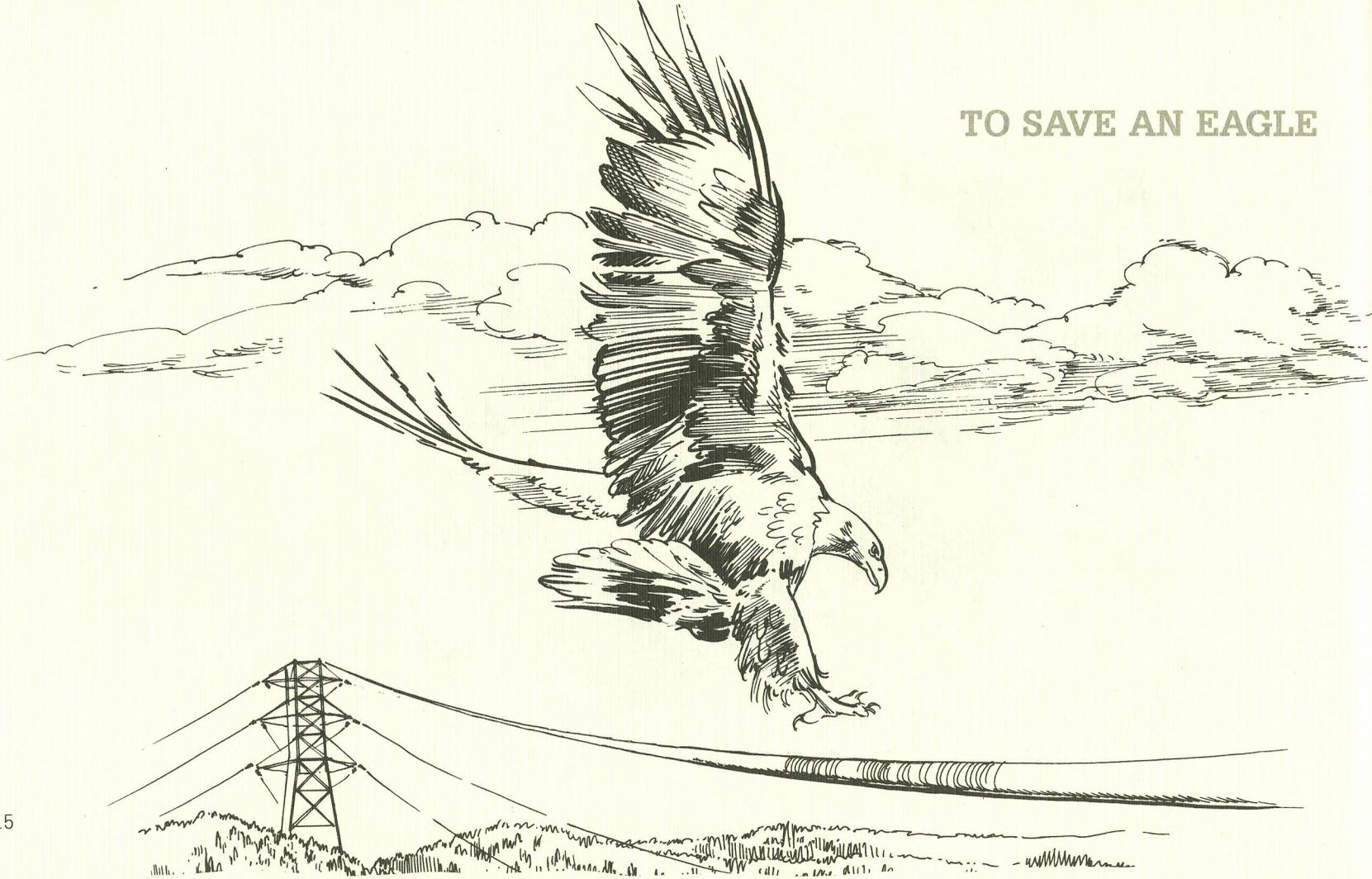


colonies could satisfy the demands of other zoos for bald eagles as well as provide additional birds to the wild.

Meanwhile, the Center's successful eagle restoration efforts are being significantly expanded. With major financial support from Du Pont and its subsidiaries Conoco, Consolidation Coal and Remington Arms, the scientists are modernizing and refurbishing a number of lofty (18 feet high) bald eagle enclosures, and adding personnel. As a result, the captive propagation colony has been enlarged to include up to 16 productive pairs of breeding birds. Such a colony could potentially supply as many as 40 eaglets to the wild each year—nearly tripling Patuxent's vital contribution to the bald eagle's recovery. Future efforts will include the use of artificial insemination to increase fertility, a technique which has been successful with peregrine falcons and whooping cranes.



# TO SAVE AN EAGLE



The bald eagle has a sometimes-fatal fondness for perching on towers that carry high tension power lines. With a wingspread that stretches six feet or more, a bird can electrocute itself by brushing against two of the hot wires. To reduce this threat, a number of utilities are spacing their power lines farther apart and redesigning towers with perches well out of harm's way.

This is only part of a nationwide mosaic of efforts to preserve and restore the bald eagle.

Although shooting remains one of the main causes of eagle mortality, tough law enforcement (coupled

with rewards for reporting these incidents) is helping the situation. Another solution is education—making the public more aware of the bald eagle's plight and the laws protecting it. A number of states and conservation groups have mounted such organized campaigns. The payoff can be seen in a state such as Arkansas where a "Save the Eagle" education drive cut the annual toll of eagle shootings from the high teens to only four within a few years.

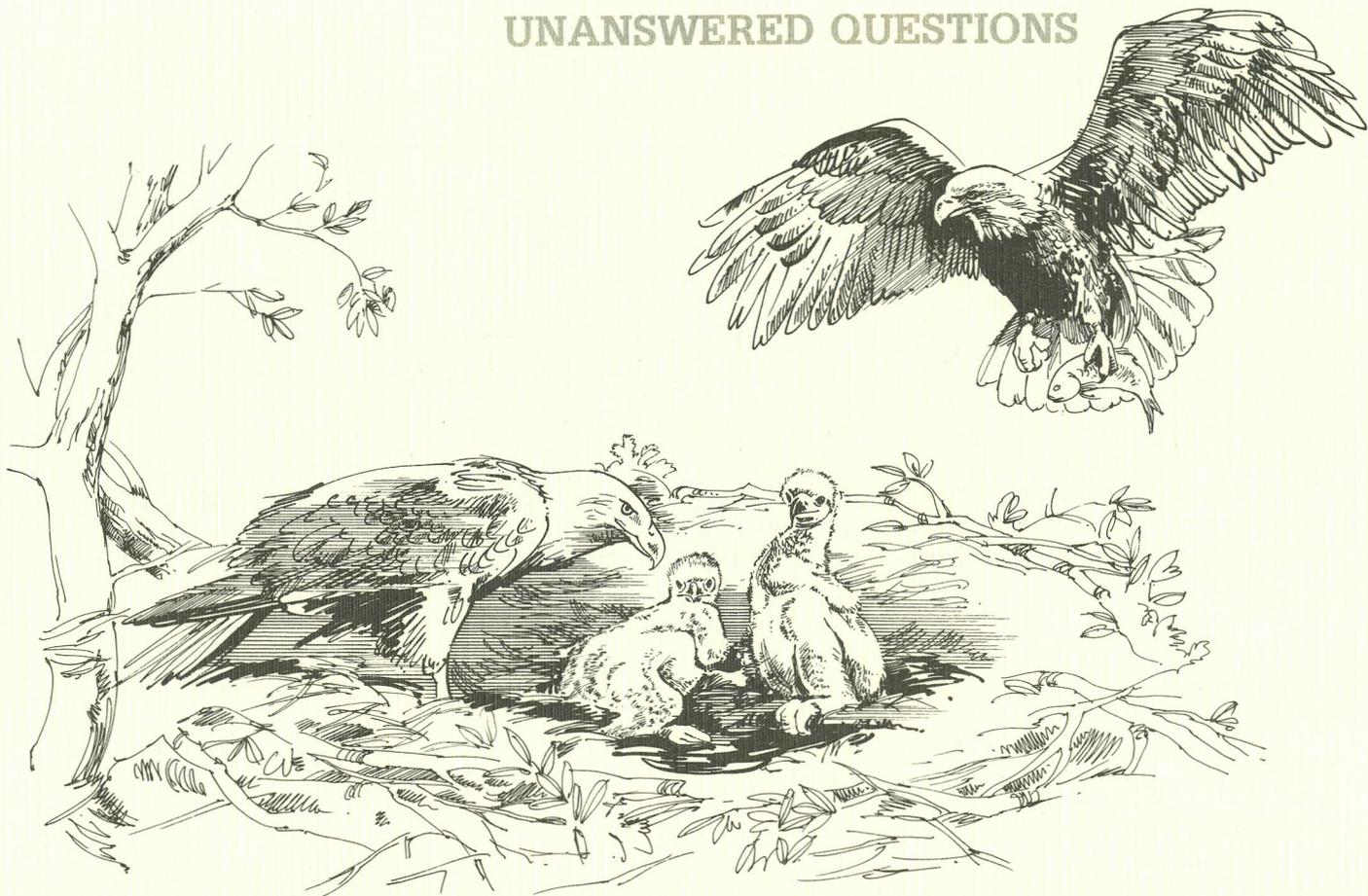
What happens to wounded or otherwise injured eagles? More than 200 raptor rehabilitation cen-



ters and clinics across the country are treating and nursing birds back to health—often to a point where they can be returned to the wild. Raptor research centers, like the one at the University of Minnesota, have pioneered new treatment methods such as the repair of wings and limbs with steel pins and lightweight casts or splints.

Many individual volunteers are also making an impact. Dozens of dedicated amateur bird experts are officially licensed to care for sick or injured eagles and other raptors following treatment. For such volunteers, each successful release is another victory for the eagle.

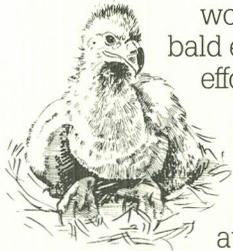
## UNANSWERED QUESTIONS



Even with all the knowledge gained over recent years, scientists still have a lot to learn about the American bald eagle. What percentage of young birds survive to adulthood after they leave the nest? How much undisturbed habitat do nesting eagles require? How long do bald eagles continue reproducing?

Researchers have a fix on these and other questions. But they don't know for certain. Because of the relative scarcity of eagles and the resulting lack of data, scientists can't yet provide all the definitive answers. They believe, though, that better understanding of the species would further speed bald eagle restoration efforts. The Du Pont contribution also is supporting these research efforts at Patuxent.

Some investigators, for example, are seeking more answers by equip-

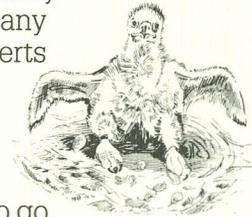


ping birds with tiny radio transmitters to track their migration routes and overall movements by telemetry. Others are studying winter roosting and foraging habits. A new bald eagle tagging scheme, using various colored markers for different regions, will help researchers get a better view of behavior, long-range dispersal patterns and population dynamics. And, of course, continued monitoring of eagle nests is critical to determine breeding success.

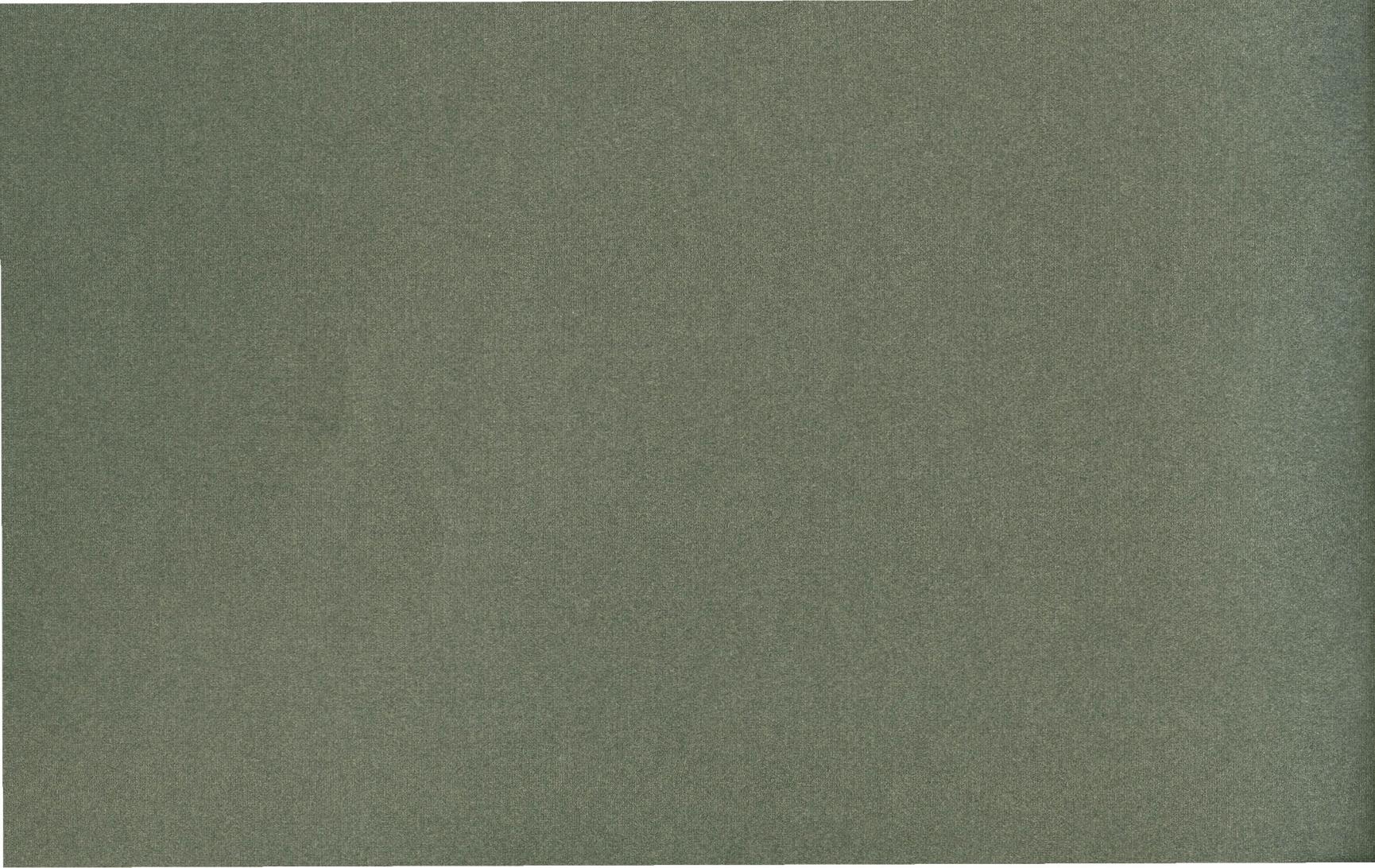
Researchers at the Patuxent Wildlife Research Center, meanwhile, are accumulating new knowledge from studies of their captive propagation colony. The scientists are seeking ways to gauge the compatibility of bald eagle pairs in order to improve breeding success. They are also working to refine artificial incubation procedures to insure that all fertile eggs hatch. A range of other behavioral and physiological studies promise to provide data

that will help better manage the birds in the wild as well as in captivity.

Even given the present state of knowledge, however, the bald eagle's long-term prospects look hopeful. Back in 1963 an Audubon Society survey recorded only 417 active nests in the continental United States. The number grew to about 700 breeding pairs by 1975. And by 1982 the total exceeded 1,200 pairs (in an overall population of around 5,000 birds—5 percent higher than the previous year). Indeed, Florida, Wisconsin, Michigan, Minnesota and Washington have substantial eagle populations. Yet, numbers are sparse or virtually nonexistent in many others. Most experts agree—the bald eagle is making encouraging progress but still has a long way to go.



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