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"North America's biggest little non-profit."

OUR MISSION

To promote the conservation
of migratory species through
innovative research, education,
and partnership.

OUR WORK

Preserving and safeguarding threatened and
endangered wildlife...one species at a time.

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*"I think the environment should be put in the category of our national
security. Defense of our resources is just as important as defense
abroad. Otherwise, what is there to defend?" — ROBERT REDFORD*

THE EVOLUTION OF WILDLIFE CONSERVATION

The science that supported the conservation movement

CONSERVATION HAS BEEN MOST-COMMONLY DESCRIBED AS THE WISE USE OF OUR NATURAL RESOURCES. COMMENCEMENT OF THE CONSERVATION MOVEMENT IN THIS COUNTRY HAS BEEN ATTRIBUTED TO VARIOUS KEY ACTIVITIES THAT OCCURRED DURING THE 1900s. HOWEVER, THE RECOGNITION OF THE NEED TO BE CONCERNED ABOUT OUR WILDLIFE RESOURCES CAN BE TRACED TO SOME OF THE FIRST EXPLORERS THAT VISITED THIS GREAT LAND WE NOW CALL THE UNITED STATES.

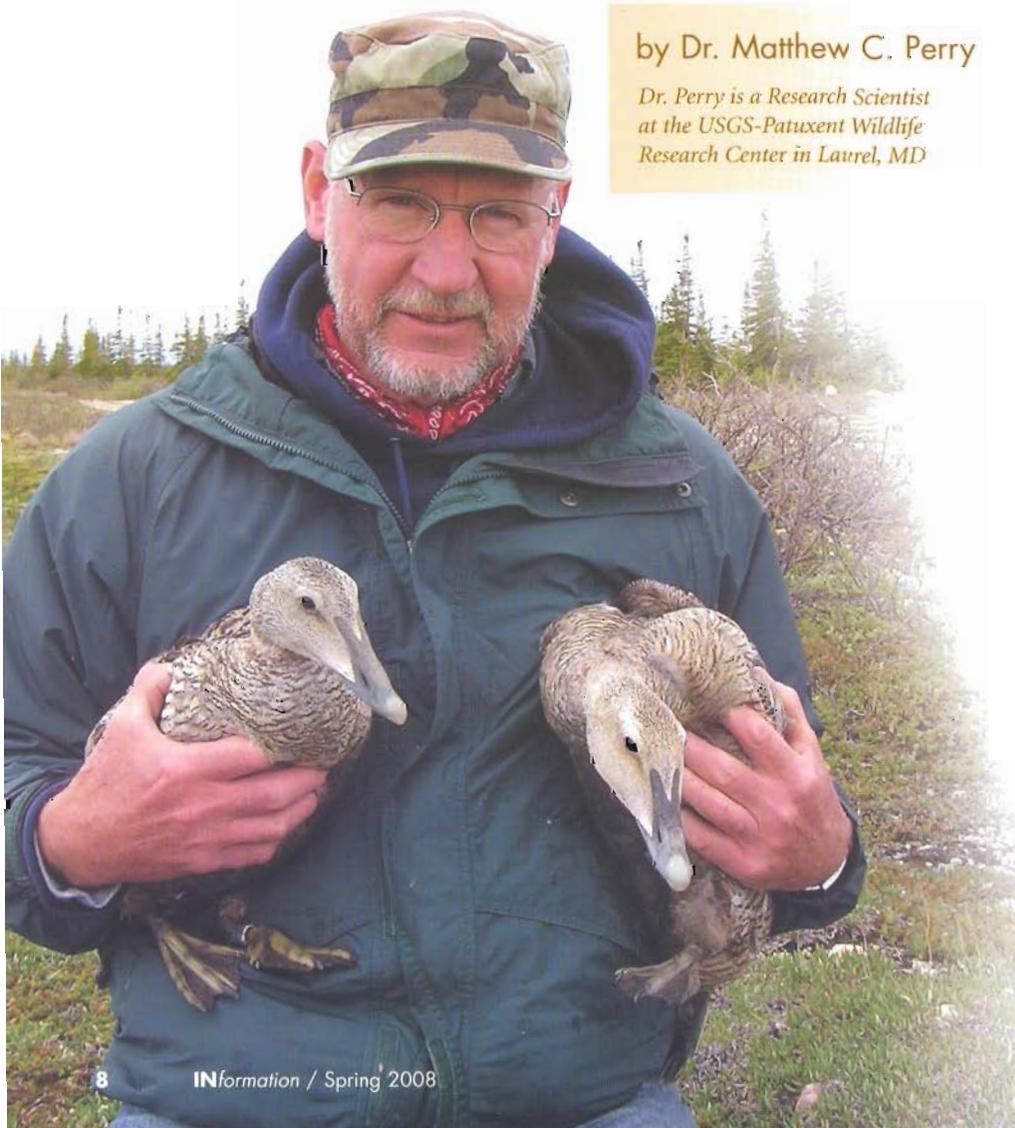
by Dr. Matthew C. Perry

Dr. Perry is a Research Scientist at the USGS-Patuxent Wildlife Research Center in Laurel, MD

The expeditions of Captain John Smith to the new world between 1580 and 1631 provide some of the earliest reports on the number and types of wildlife species that inhabited the new world. Unfortunately, early explorers and naturalists during the first three centuries of activities did not provide accurate quantified information. The early reports, however, do provide anecdotal information on the vast numbers of wildlife that obviously existed here. All reports seem to be in agreement that some wildlife populations seemed inexhaustible, but then sadly many were exhausted due to exploitation by humans.

Captain John Smith reported, "In winter there are great plenty of swans, geese, brants, ducks, wigeon." The success or failure of the early colonists seemed to be dependent on their abilities to take advantage of the vast natural resources. Although the killing of wildlife was most commonly associated with subsistence, some species also were killed for sport by the colonists, especially the wealthy. The shooting of waterfowl for sport started most likely in the Chesapeake Bay region in the early 1600s.

The first concern of wildlife conservation in the colonies was given in the mid-1600s by William Bradford, governor of



the Plymouth Colony, who foresaw a waterfowl decline. Governor Bradford was a strong advocate of the need to live off the land, but recognized that doing so required maintaining productive habitat. In 1710, Massachusetts banned the use of boats, sailing canoes, or camouflaged canoes in the taking of waterfowl. In 1730, Maryland prohibited the taking of waterfowl and other game at night with a gunning light (a practice called 'firelighting') and Virginia outlawed the practice in 1792. Firelighting was a commonly used hunting technique through the late 1800s.

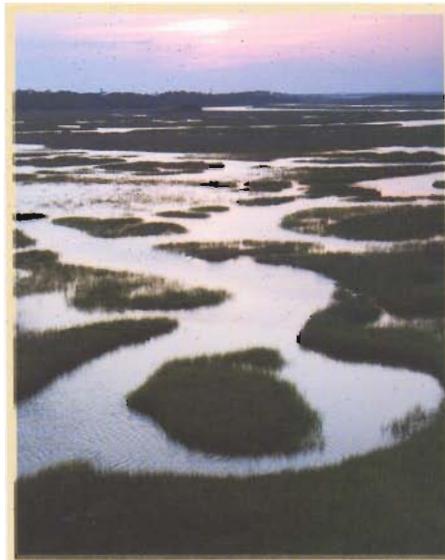
The explorations and writings of John James Audubon in the early 1800s provided a fairly good description of wildlife in the newly-formed United States during this period. In his book, *The Canvass Back Duck*, Audubon quoted Dr. J.J. Sharpless, "...innumerable ducks feeding in beds of thousands, or filling the air [of Chesapeake Bay] with their careening, and that great flocks of swans, looking like banks of snow, rested near the shores."

Some authors wrote that up to 1860 wildfowl had not been hunted much, and were unmolested during the Civil War. But they reported that "from 1865-90 the greatest natural home in the world for wild ducks has been nearly devastated of its tenants." Although some writers disagreed on when the decline began, there are numerous examples that indicate that mortality of wildlife before the Civil War was excessive.

Increasing human populations in the 1800s resulted in agricultural expansion in the central part of the country. The first Swamp Act of 1849 resulted in the drainage of 70,000,000 acres of breeding habitat for ducks so these areas could be farmed. Timber cutting along rivers and

lakes in the east decimated habitat needed for species inhabiting the woodlands of the country, especially deer and wood ducks.

The market hunting period in the country extended from 1865 to 1900 and was responsible for untold numbers of wildlife that were killed and sent to the



The Swamp act of 1849 resulted in the drainage of 70 million acres of wetland for agricultural use. An additional 100 million acres were drained in the early 1900s.

major cities for food. Losses of waterfowl and other wildlife to market hunting did not occur only in the east.

Edward Preble reported that thousands of whistling (now tundra) swans were killed on the breeding grounds for their down feathers. Eggs were removed from nests for food and for use in making chemicals for the developing photographic industry, although the effect of egg

removal on waterfowl numbers is not totally understood. Early in the 1900s, Theodore Roosevelt and John Muir expressed concern for our resources, but differed in the approach, with Roosevelt being an avid consumer and Muir being a total protector of resources.

The great decline in waterfowl populations from over-harvest and loss of habitat essentially resulted in the end of market hunting, which was outlawed in 1918 by the Migratory Bird Treaty Act. This did not end the plight of waterfowl. During the early years of the 1900s, an additional 100,000,000 acres of wetlands in nesting areas were drained to make way for farming. Drainage of salt marshes along the coast for mosquito control also had devastating effects on wintering waterfowl habitat. The continental drought of the 1930s was the final assault on waterfowl populations.

In the mid-1930s, new regulations, organizations, and surveys were established to protect, support, and appraise waterfowl populations. Aerial surveys, which had begun in the 1930s, were expanded to include all waterfowl species nationwide after World War II, when planes became more available, to better document population status.

Although several conservation activities took place in the early 1900s, it was not until the 1930s that federal and state agencies initiated scientific wildlife management and research to support it. An interesting change in the relationship of humans and wildlife took place during the 1930s. Past emphasis of wildlife investigations in the USDA had focused on the adverse impact of wildlife on activities of humans. However, the long drought of the 1930s, coupled with decades of wet-



Captain John Smith reported "in winter there are great plenty of swans, geese, brants, ducks, wigeon."

The shooting of waterfowl for sport started in the Chesapeake Bay region.



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Maryland banned the taking of waterfowl and other game at night with a gunning light.

THE EVOLUTION OF WILDLIFE CONSERVATION

land drainage by humans, devastated North America's waterfowl and other wildlife populations. Thus, Americans were becoming more aware of the negative impact their activities were having on wildlife. It was appropriate, therefore, that in 1939 the Bureau of Biological Survey was transferred from the Department of Agriculture to the Department of the Interior. In 1940, the Bureau of Biological Survey was replaced with the Fish and Wildlife Service (later re-named the U.S. Fish and Wildlife Service).

During the 1930s, many new programs and organizations were initiated as a result of increasing concern over the status of wildlife, especially waterfowl. Ducks Unlimited was formed, and money was raised by enthusiastic supporters to buy and protect valuable production areas in Canada. The National Wildlife Federation was also formed during this period; a coalition of hunters and non-hunters who continue to support this organization today. Although many biologists worked on wildlife in the early 1900s, the publication of Aldo Leopold's book entitled *Game Management* in 1933 essentially established the wildlife management profession, and Aldo Leopold became known as the 'father of wildlife conservation'.

The formation of the nation's first wildlife research facility was one of many wildlife conservation activities of the mid-1930s. In 1936 President Franklin D. Roosevelt signed Executive Order 7514, which transferred 2,670 acres of land that had been acquired (or would be acquired) by the United States, to the Department of Agriculture as a wildlife experiment and research refuge. The area, located in Maryland, was created "to effectuate further the purposes of the Migratory Bird Conserva-

tion Act," and became known as the "Patuxent Research Refuge."

Secretary of Agriculture Henry A. Wallace dedicated the Refuge on June 3, 1939, and stated, "the chief purpose of this refuge is to assist in the restoration of wildlife – one of our greatest natural resources." Secretary Wallace recognized



The first Whooping crane used in captive propagation was a bird injured on its migration south. It was named 'Canus', to represent the close cooperation between Canada and the United States.

"the vision and foresight of Dr. Ira N. Gabrielson, Chief of the Biological Survey." He further stated that the nation's first wildlife research station was "the manifestation of a national determination and a national ability to conserve and administer wisely the organic resources and products of the soil – a priceless heritage to the generations of Americans yet to come." Although Mr. Jay N. 'Ding' Darling, former Chief of the Bureau of Biological Survey, was not mentioned in Secretary Wallace's address, many persons also

credit his interest and support for the formation of the Patuxent Research Refuge.

According to Wallace, the location of the Patuxent Research Refuge adjacent to the National Agriculture Research Center at Beltsville, Maryland, made it appropriate for conducting, "long-time studies on the inter-relationships of wildlife with agriculture and forestry." Wallace and Gabrielson envisioned an area where wildlife could be studied in relation to the production of agricultural crops, and where lands poorly suited for agriculture could be turned back into forests, fields, and meadows, thus again becoming productive for wildlife.

The first wetland area, Cash Lake, was built by the Civilian Conservation Corps (CCC) and flooded in 1939 as a recreational area for fishing. The CCC was also responsible for many other conservation efforts that took place throughout the country. They were involved with the construction of trails and shelters that still exist and are used in many of our public lands to this day. With the outbreak of World War II, many of the men were called for military service, but older staff members and women continued the wildlife conservation work, assisted beginning in 1943, by the Civilian Public Service, an organization for conscientious objectors, who did public service work in lieu of serving in the military. Farm game research, which compared the diversity and numbers of wildlife under various farming practices, began in the 1940s and this program tried to establish a common bond between the farmer and the wildlife that existed on the land.

Many waterfowl impoundments that exist throughout the country today were developed during the 1940-50s, and stud-

1800s

Dr. J. J. Sharpless observed "innumerable ducks feeding in beds of thousands at Chesapeake Bay."



The Swamp Act of 1849 resulted in the drainage of 70 million acres of breeding habitat of ducks for farmland.

From 1865–1890 the greatest natural home in the world for wild ducks had been nearly devastated.

The market hunting period, 1865 to 1900, was responsible for the loss of untold numbers of wildlife.



The Migratory Bird Treaty Act of 1918 outlawed market hunting.

During the same period, an additional 100 million acres of wetlands were drained to make way for farming.

THE EVOLUTION OF **WILDLIFE CONSERVATION**

ies to determine how best to manage those areas for wildlife were begun. Improved nest boxes were designed for wood ducks and mallards, which greatly aided the nesting success of these species. Drawdown techniques for impoundments were perfected to optimize moist-soil management for waterfowl. Seeds of annual plants found in the mud grew in great abundance, attracting migrating ducks to the re-flooded impoundments. These techniques were then employed in many other states and countries. Extensive banding data for mallards was the basis for a series of reports, which discussed the role of additive and compensatory mortality with waterfowl.

Endangered species research began in the 1960s with Bald eagles and Whooping cranes and captive propagation programs attained international prominence. Bald eagles were raised and many hatchlings were transferred to nests in the wild to replace nonviable eggs, helping many states with bald eagle restoration projects. The first Whooping crane used in captive propagation was a bird injured on its migration south. It was named 'Canus,' to represent the close cooperation between Canada and the United States.

Pesticide research with DDT which began in the 1940s, was broadened to include studies with other persistent chemicals. Rachel Carson's 1962 publication, *Silent Spring*, created great concern regarding chemicals and the effects their use was having on wildlife and humans. A major breakthrough in DDT research occurred in 1969 when researchers at Patuxent Wildlife Research Center published results of research linking eggshell thinning with DDT in the food of birds.

Research clearly indicated that DDT

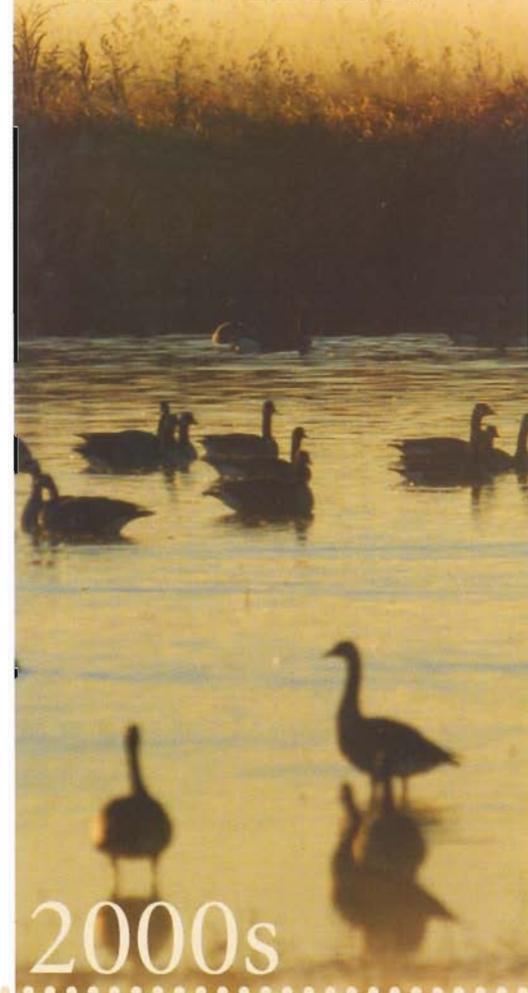
obtained in the food eaten by birds changed to DDE, and then physiologically affected the process of calcium deposition on the eggshell of the birds' eggs. Although initial eggshell thinning studies were conducted with mallards and black ducks, the findings had major implications with other species, especially fish-eating birds such as the brown pelican, osprey, and Bald eagle. Researchers played influential roles by testifying during Congressional hearings on pesticides that eventually led to the 1972 nationwide ban of DDT and other persistent organochlorine pesticides.

Research was expanded on the very controversial subject of lead poisoning in waterfowl, and studies with captive ducks showed how ingested lead shot from shotgun shells of hunters could easily become lethal to ducks. In addition, extensive tests were conducted comparing the killing efficiencies of lead and steel shot with ducks. These studies were the basis for the 1991 ban of lead shot for waterfowl hunting.

The wildlife conservation period in the United States has been marked by long series of activities and events that have been both disheartening and uplifting. The fact that wildlife is a renewable resource helps alleviate humans' past mistakes. The knowledge and passion that humans have for wildlife has aided in the pursuit of programs that eventually have shown success.

Humans can be proud of their conservation efforts, but must not lose sight of the fact that our renewable wildlife resources need habitat that is not renewable. Increasing human populations that continue to degrade or destroy habitats needed by wildlife populations will continually exacerbate the problems facing wildlife in the future. ■

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2000s

Aldo Leopold's book *Game Management* was published in 1933, and essentially established the wildlife management profession.

Patuxent Research Refuge was formed in 1936 by executive order of President Franklin D. Roosevelt.



Endangered species research began in the 1960s with Bald eagles and Whooping cranes.

Rachel Carson's 1962 book, *Silent Spring*, created concern about the effects of chemicals on wildlife and humans. DDT was banned in 1972.

Lead shot was banned in 1991 for waterfowl hunting.



Operation Migration completed the first ultralight-led migration with reintroduced Whooping cranes in 2001.