

The last time Earth lost this large a share of its life was 65 million years ago when it may have collided with an asteroid; the impacts of humans on our planet today may have been last equaled by the collision of two heavenly bodies (Wilson 1992).

Scientists cannot honestly say that we need *all* species that exist today for humans to survive; but as a general rule, the more diversity is diminished, the less stable ecosystems become and the greater the fluctuations that occur in plant and animal populations. The more diversity we lose, the more our quality of life and economic potential are diminished, and the greater the risk that we will cause a critical part of the cycle of life to fail.

If humans were allowed to cause the extinction of other species, who would determine which species? If we had been asked 60 years ago what life we could let become extinct, who

among us would have insisted that we preserve the lowly mold that was penicillin, the first of the series of antibiotics that have today so changed the quality of our lives? And who, only 5 years ago, would have identified the need to preserve the Pacific yew, which today yields taxol, one of the greatest new hopes in our arsenal against cancer?

#### References

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A century separates the recent development of the National Biological Service (NBS) and an early predecessor, the Bureau of Biological Survey (BBS). Both organizations were established at critical crossroads for the conservation of the nation's living biological resources and are conservation landmarks of their times. The BBS of the 1920's was described as "a government Bureau of the first rank, handling affairs of great scientific, educational, social, and above all, economic importance throughout the United States and its outlying possessions" (Cameron 1929:144-145). This stature was achieved at a time of great social, economic, and ecological change. BBS had the vision to pioneer new approaches that led to enhanced understanding of the relation between people, other living things, and the environment. The NBS faces similar challenges to address the issues of the 1990's and beyond.

## Diminished Natural Resources in a World of Plenty

Early European colonists had an abundance of wildlife to serve subsistence needs. Seemingly endless flocks of ducks, geese, and swans; an abundance of wild turkeys, deer, and bison; green clouds of Carolina parakeets and millions of passenger pigeons; and a bounty of fish and shellfish. This abundance quickly established a viewpoint that the New World's wildlife resources were inexhaustible.

Habitat changes that disrupted the balance of nature soon resulted in economic losses and other hardships because of insect and rodent eruptions. Negative effects of exotic species

brought from the Old World further reduced the well-being of many colonists who had come to the New World for a better life. The nation's inexhaustible natural resources and returns from agriculture began to wane significantly. Decimation of previously vast wildlife resources greatly reduced opportunities for cultural and recreational uses of wildlife (Cameron 1929).

## Development of the BBS

Roots of the BBS can be traced to the 1883 founding of the American Ornithological Union (AOU) in New York City. Initially, the AOU focused on three subject areas—distribution, biological information and economic impact, and migratory behaviors of birds—all of which became major activities of the BBS. Collaborations and partnerships were developed with numerous ornithologists, field collectors, sportsmen, and observers of nature who were asked to report specific information relative to bird migration. Cooperation also was obtained from the United States Lighthouse Board and the Department of Marine and Fisheries of Canada (Cameron 1929).

Funds for government biological survey programs related to economic ornithology were allocated in 1885 to the Division of Entomology of the U.S. Department of Agriculture. These funds were provided for "the promotion of economic ornithology, or the study of the interrelation of birds and agriculture, an investigation of the food habits, and migration of birds in relation to both insects and plants." The following year additional funds were provided to include the study of mammals and expand the focus

# Conservation Landmarks: Bureau of Biological Survey and National Biological Service

by

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### Investigation and research

Study of life habits of wild animals  
 Classification of wild animals  
 Studies in geographic distribution of wild animals and plants  
 Life zone investigations of definite areas  
 Biological surveys of definite areas  
 Special big game investigations  
 Investigations for improvement of reindeer in Alaska  
 Investigations at reindeer experiment station  
 Investigations of problems of fur farmers  
 Studies in fur animal disease and parasites  
 Investigations of problems of rabbit raisers  
 Studies of rabbit diseases, etc.  
 Investigations in animal poisons  
 Studies in bird migration  
 Bird censuses (general)  
 Wild fowl censuses  
 Bird banding  
 Food habits studies by laboratory examinations of stomach contents of birds, mammals, reptiles, and amphibians  
 Studies in game bird propagation  
 Specific studies in covert restocking  
 Surveys of food resources for waterfowl  
 Investigations and experiments in predatory animal control  
 Investigations and experiments in control of injurious rodents  
 Investigations and experiments in control of other animal pests  
 Investigations and experiments in control of bird pests

## Activities of the Bureau of Biological Survey (Cameron 1929)

### Encouragement of useful forms of wildlife

Advice on game bird and animal propagation methods  
 Devising of methods for attracting birds about parks, homes, etc.  
 Encouragement of conservation of wild fur bearers  
 Advice on small animal production (for pets and laboratory use)  
 Maintenance and protection of game preserves and birds refuges  
 Restocking of reservations  
 Disposal of surplus animals on reservations  
 Issuance of permits for fur farming on certain Alaskan islands  
 Administration of Upper Mississippi Wild Life and Fish Refuge Act  
 Administration of act protecting wildlife on reservations

### Repression of undesirable forms of wildlife

Killing of predatory animals  
 Leadership and demonstration in cooperative effort against predatory animals

Leadership and demonstration in cooperative effort against injurious rodents  
 Leadership and demonstration in cooperative effort against other animal pests and injurious birds  
 Processing of poisons and food stuffs for use against predatory and noxious animals

### Protection of wildlife

Administration of Migratory Bird Treaty and Lacey acts by warden service and in cooperation with state law enforcement agencies  
 Issuance of permits for game propagation  
 Regulation of importation of wild birds and animals  
 Preparation of regulations under Alaska game law

### Dissemination of information

Preparation and editing of publications  
 Preparation of exhibits and photographs  
 Answering of inquiries  
 Addresses by officers (conventions, universities, etc.)

### Miscellaneous

Regulation of grazing of domestic stock in certain Alaskan islands

from agriculture and horticulture to the new subject of forestry. At the same time, the work was moved from the Division of Entomology to the new Division of Economic Ornithology and Mammalogy. Dr. C. Hart Merriam became the first division chief in July 1886 (Cameron 1929).

The new division continued to study wildlife food habits, migration, and species distribution. It placed considerable emphasis on educating farmers about birds and animals affecting their interests so that destruction of useful species might be prevented. Dr. Merriam pursued the development of an extensive biological survey, advancing the argument that mapping of faunal and floral areas would benefit farmers by identifying the boundaries of areas fit for the growth of certain crops and those hospitable for certain breeds of livestock. In 1890, the appropriation language for the Department of Agriculture provided for the investigation of "the geographic distribution of animals and plants," causing Dr. Merriam to note that "the division is now in effect a biological survey" (Cameron 1929:27).

The major part of the division's 1891 activities involved an extensive biological survey and

biogeographic mapping of the Death Valley region of southern California and southern Nevada. This was followed by additional biological surveys of various areas of the West. Biological surveys also were conducted beyond the continental borders of the United States into Alaska, Canada, and Mexico. In 1896 the Division of Ornithology and Mammalogy became the Division of Biological Survey (Cameron 1929).

Food habit studies, which were continued along with the survey work, emphasized transmitting information to those who could benefit from it. Popular bulletins were prepared on bird migration, the economic impacts of specific wildlife species on agriculture, and the introduction of exotic species. In 1889, the division initiated the more scientific *North American Fauna* series, which included that year a general paper discussing Dr. Merriam's concept of the life zones of North America (Cameron 1929).

The division was elevated to bureau status on July 1, 1905. During the next 34 years, activities expanded to serve the growing U.S. conservation movement. Diverse investigations and

research were carried out as well as technical assistance to the public and to game managers; animal damage control; regulatory functions including conservation law enforcement; administration of refuge lands; and public education through publications and exhibits (*see box*). Conservation problems included habitat loss, declining wildlife populations, species extinction, control of exotic species, control of predatory and injurious wildlife, pollution and disease control, and competition between wildlife, agriculture, and forestry.

The BBS was transferred to the Department of Interior on July 1, 1939, and was made part of the U.S. Fish and Wildlife Service (USFWS). In November 1993, the biological research components within the Department of Interior, including those from the USFWS, the National Park Service, the Bureau of Land Management, the Bureau of Reclamation, and the Minerals Management Service were reorganized to form the National Biological Survey. The name was changed to the National Biological Service on January 5, 1995, to more accurately reflect the agency's mission.

## Then and Now

Dr. Merriam noted that the chief work of the BBS was to obtain facts, for without a knowledge of facts there can be neither efficient administration nor intelligent regulation of wildlife to meet the needs of the nation (Cameron 1929). That same philosophy is

inherent in Secretary of the Interior Bruce Babbitt's remarks about the NBS:

The National Biological Survey will produce the map we need to avoid the economic and environmental "train wrecks" we see scattered across the country. NBS will provide the scientific knowledge America needs to balance the compatible goals of ecosystem protection and economic progress. . . . [The] National Biological Survey will unlock information about how we protect ecosystems and plan for the future. (National Research Council 1993:181-182).

Land management, regulatory, and law enforcement activities of the BBS remained with the USFWS and other parent bureaus within the Department of Interior when the NBS was formed. Only the biological research components of the department have become part of the NBS. This nonadvocacy biological science program will help the nation to resolve increasingly contentious and challenging issues in managing its biological resources.

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