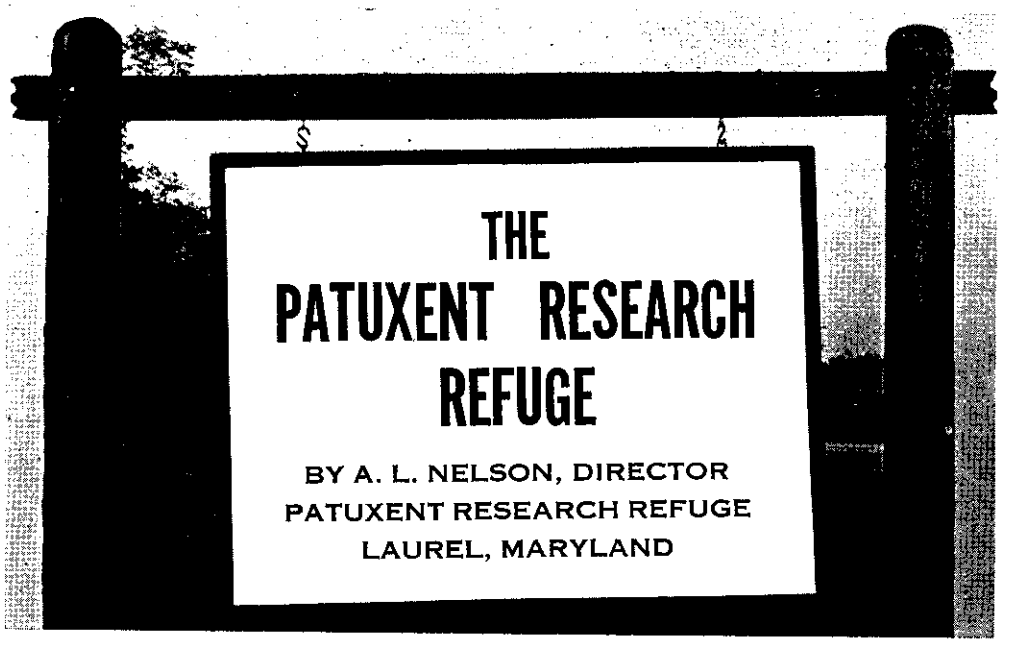

THE PATUXENT RESEARCH REFUGE

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PATUXENT RESEARCH REFUGE
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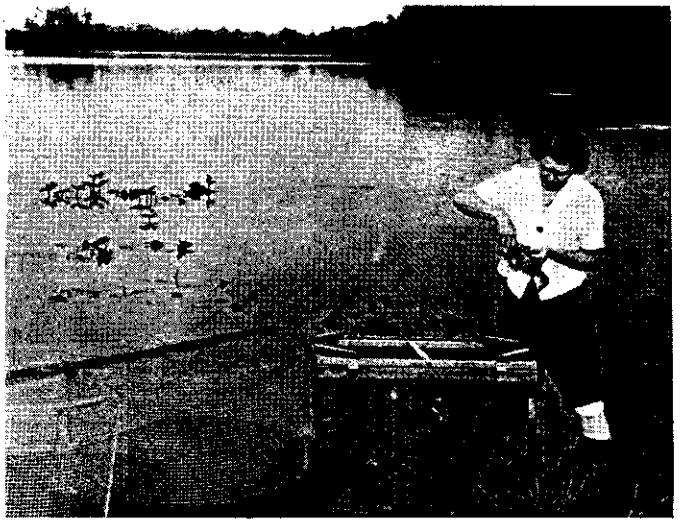
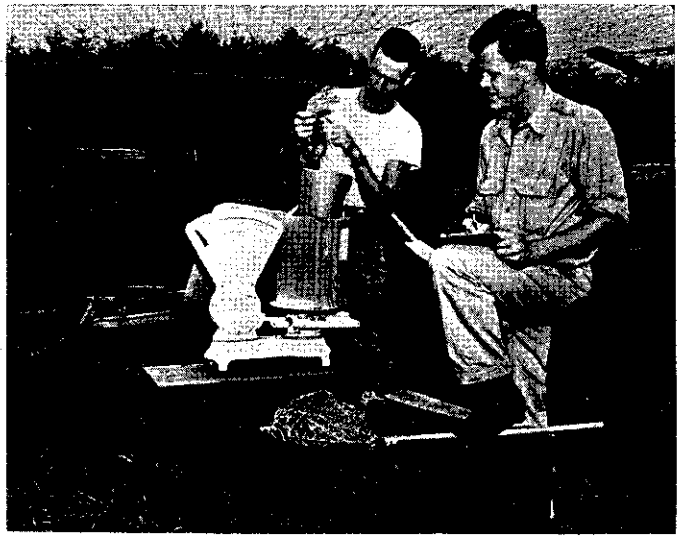


Above—The several waterfowl impoundments on the Refuge contribute equally with the laboratories in the unraveling of details on the life history of wildlife.

Center—A mallard duck is examined and banded for future identification in bird distribution studies.



Left—Careful records are maintained on the weight of pheasants in nutrition and insecticide studies.

LOCATED midway between Washington, D. C., and Baltimore, Maryland, the Patuxent Research Refuge takes its name from the Patuxent River which meanders through its lowland forest. The principal center for wildlife research conducted by the U. S. Bureau of Sport Fisheries and Wildlife in the eastern United States, its 2700 acres include two experimental farms, river bottomlands and terraces, wooded uplands and a series of waterfowl impoundments where ecological problems involved in wildlife management can be studied experimentally. Its sister station for attacking problems related to western wildlife is now located at Denver, Colorado.

This research center owes its origin in 1939 largely to the foresight and planning of two former chiefs of the U. S. Biological Survey, one of the antecedents of the Bureau of Sport Fisheries and Wildlife. "Ding" Darling and his successor, Ira N. Gabrielson. Both were convinced that sound wildlife management depends upon research for its factual bases of operation. They believed that wildlife research would be facilitated by organizing a team of scientists whose training and interest covered the major appropriate scientific disciplines and freeing these men from administrative demands so they could concentrate on basic research problems.

Facilities at Patuxent now include a Wildlife Pathology Laboratory with animal pens and aviary, a Biochemical Laboratory, a Bird Distribution Center equipped with IBM punchers, verifiers, sorters, and tabulation equipment for processing high volume data. An Ecological Laboratory contains reference collections of birds, mammals, fish, reptiles, and insects as well as office and laboratory space for a technical staff dedicated to the solution of a wide variety of national wildlife problems. Personnel of the station includes about one-hundred employees, approximately 40 of whom are professional biologists, chemists, or statisticians.

One of two experimental farms on the Refuge was designed by the Soil Conservation Service technicians to include almost every type of wildlife-management practice known. The other is a control farm using generally accepted farming practices. For

several years, ecologists of the Fish and Wildlife Service have studied wildlife populations on these farms. These studies may produce techniques that can be applied to farms throughout the country and greatly improve conditions for agricultural wildlife.

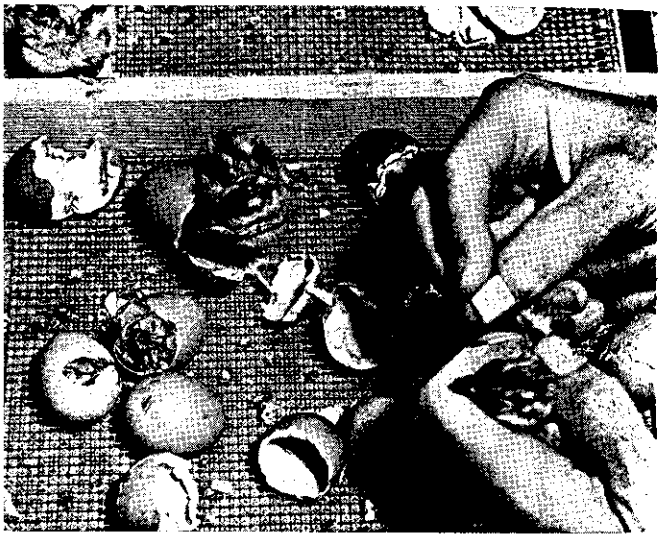
Agricultural wildlife plays a more important role in the picture of conservation than generally is realized. No less than 75% of the annual harvest of small game and fur in the United States is produced on agricultural land. Some species depend entirely upon agricultural land. The farmer, can be one of the most effective game managers of the country and the future of American wildlife depends much on what he does in his management of his land.

Over 80 percent of American farm land is now included in U. S. Soil Conservation Service Districts. Much of this land is being farmed according to plans prepared by technicians of the Soil Conservation Service. These plans include wildlife management; consequently, improved techniques of farm wildlife management that are developed at the Patuxent Research Refuge can be incorporated in farm plans and so reach the land.

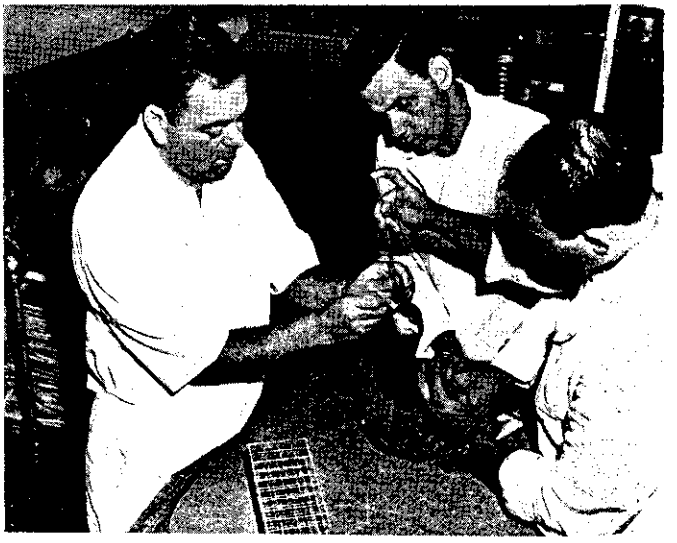
Not all animals on a farm are beneficial; some may be helpful to the farmer at times, but at other times seriously hamper his efforts. For example, redwinged blackbirds, cowbirds, and grackles have increased during the last several years and, in certain corn-growing sections, interfere with the economical production of corn crops. Biologists are engaged in research in an attempt to discover methods by which the crops can be protected without destroying the bird populations, and are developing frightening methods to deter the blackbirds from attacking the crops, repellents to prevent the birds from pulling seed corn or eating the maturing ears, indirect methods of population control through nesting studies, and finally, local population control by means of the newer contact poisons.

Waterfowl-habitat research is conducted on the station's twenty-one impoundments that are completed or nearing completion, and on waterfowl marshes along the Atlantic Coast. This research is designed to

Above—Biochemists have developed techniques for recovering minute quantities of pesticides from tissues of dead birds for diagnosis of cause of mortality.



Center—A flock of pheasants is maintained for studies on nutrition, wildlife diseases, and the effects of insecticides.



Right—A Canada goose is being inoculated in the Pathology Laboratory to study the course of disease organisms.

appraise the adequacy of existing waterfowl habitat and to discover methods to improve low quality waterfowl marshes by weed control, water level management, island construction, and the introduction of nesting sites and food-producing plants. Methods for flooding areas of low economic values and transforming them into good waterfowl-producing marshes and ponds also are being studied. These areas could compensate in part for millions of acres of natural waterfowl habitats that are lost through drainage, pollution or other deteriorating factors.

Aquatic-weed control is a critical problem and chemical methods of weed control and techniques for replacing several of the most serious marsh weeds with waterfowl-food-producing plants have been developed by research. A closely related problem is to find chemical and environmental methods by which mosquitos can be controlled without destroying the wetlands on which ducks and geese depend for their existence.

In early years, the biochemical laboratory was involved primarily in research on game bird nutrition and in the development of rodent toxicants and repellents. From this research came a number of significant findings on the potential importance of vitamins and minerals in the natural distribution and abundance of quail and pheasants. Early screening tests were made here on such rodenticides as sodium fluoroacetate, popularly known as "ten eighty", Tomarin, Fumarin and Diphacinone which were given wider field tests at the Denver Laboratory. In further research, literally thousands of chemicals were screened to ascertain their effectiveness as rodent repellents.

Attention of the biochemists has turned, in the last few years, to the effects of pesticide applications on wildlife. Basic studies have been made on the physiological effects of sub-lethal dosages of many of the chlorinated hydrocarbons. Methods for recovering minute quantities of the poisons from animal tissues have been refined and ecologists and chemists have collaborated in an attempt to discover which pesticides offer the least hazard to wildlife and to find methods and rates of application that will be acceptably safe for wildlife.

The many complexities of bird distribution and population research have only been realized in the last few years. In early studies, birds were banded with numbered metal rings and much information was obtained on migration, distribution, breeding success, and effects of hunter harvest.

Today, research is intensive, involving the use of increasingly more precise techniques of population sampling and analysis. The banding program has been continued and increased. Field studies on the ground correlated with aerial surveys on the breeding and wintering areas are used to evaluate the proportions of local populations that are banded, correlate banding reports with hunter kill statistics, and make ecological analyses and evaluations of breeding, hunting and wintering areas thus making the banding program a more effective tool in waterfowl management.

Research conducted in the Wildlife Pathology Laboratory attacks one of the least understood phases of wildlife management. Considerable effort has been expended in listing diseases and identifying the disease-causing agents that occur in wildlife. Little information exists however, on pathology, significance of disease-causing organisms on the welfare of the host, mechanisms of infection and spread, relationship between wildlife diseases and environmental stress and methods by which an effective attack can be launched to control disease.

Medical workers who deal with diseases of man, with the benefit of the accumulated research findings in physiology, nutrition, pathology, psychiatry and biochemistry can appreciate the problems facing the wildlife disease pathologist. He must work with many animal species, often under field conditions. When specimens are brought into the laboratory he must decide what conditions result from confinement rather than disease. Treatment, when possible, must in most instances be indirect since it is seldom that wild animals can be given individual attention. Yet, despite these handicaps, wildlife disease research offers promise of providing better techniques of wildlife management.

Studies on Canada goose mortality at the Pea Island Wildlife Refuge, in North Carolina, for example, indicated that gizzard worm infection was the prime factor, yet it was demonstrated that geese can withstand high intensity of infections of this

parasite when natural food sources are adequate. Aspergillosis, a usually fatal respiratory disease of waterfowl, seems to be related in part to environmental stress. Hence, one of the most promising methods of attack appears to be through improving the environment.

Currently disease research includes further studies on diseases of waterfowl, particularly aspergillosis. Studies are also in progress on the incidence, significance and modes of infection of diseases and parasites of icterid birds and the relation of stress factors to these infections. High priority is assigned to a study of mode of infection and immunity factors in trichomoniasis of mourning doves. This parasite which causes high mortality in doves, particularly in the southeastern States, also occurs in pigeons, domestic poultry, and birds of prey.

Research on mammal diseases is much more limited in its scope at present. A long range study of the incidence and intensity of parasites in the native mammals at Patuxent Research Refuge is continuing as animals come to hand. Investigations are also being conducted on the occurrence of distemper in wild mammals and its possible significance in relation to rabies in these animals.

In recognition of the increasing importance of statistics in wildlife research, the Station's research staff was rounded out in 1958 by the addition of a section of wildlife biometry. Improving the design of research projects, providing assistance in statistical interpretations of results, conducting hunter-kill surveys, and evaluating the status of waterfowl and other game species that are under the jurisdiction of the Federal Government fall under the responsibility of this still growing department.

The Patuxent Research Refuge also contributes to scientific research through collaboration with other institutions. The Walter Reed Army Institute of Research has a small staff conducting research on wildlife diseases particularly important to studies of human pathology and a number of research biologists from the States collaborate with members of the Refuge staff on cooperative research assignments.

Almost twenty years have passed since Darling and Gabrielson founded the Patuxent Research Refuge. As organizations go it is still young and growing. Many leaders of the U. S. Fish and Wildlife Service have contributed to its development in recent years and plans are even now going forward to further strengthen the station. Embodied in this planning is a faith that research and education are twin forces that must be increasingly depended upon to help provide for the needs of wildlife resources in this atomic age. ★★★