Wildlife Study Guide

Modified from:
Tennessee Envirothon Wildlife Study Guide
Florida Envirothon Study Packet: Wildlife

Learning Objectives

Knowledge of Wild Birds, Mammals, and Herps
1. Identify wildlife species using mounted specimens, skins/pelts, pictures, skulls, silhouettes, decoys, wings (waterfowl), scats, tracks, animal sounds, or other common signs.
2. Use a key or field guide to identify wildlife species or signs. Wildlife species or signs may be presented in any form as described above.
3. Identify general food habits (herbivore, omnivore, carnivore), habitats (terrestrial, aquatic, fossorial), and habits (diurnal, nocturnal) using skull morphology and/or teeth.
Wildlife Ecology
1. Know the meaning of "habitat", and be able to name the habitat requirements for wildlife and the factors that affect wildlife suitability.
2. Know and understand basic ecological concepts and terminology.
3. Understand the difference between an ecosystem, community and population. Be able to explain how communities interact with their non-living surroundings to form ecosystems.
4. Understand wildlife population dynamics such as birth, mortality, age-structure, sex ratio, and mating systems. Understand the impact of limiting and decimating factors of common wildlife species on wildlife management.
5. Recognize that all living things must be well-adapted to their native environment in order to survive. Be able to identify, describe and explain the advantages of specific anatomical, physiological and/or behavioral adaptations of wildlife to their environment.
6. Know the meaning of the term "Biodiversity", and understand why biodiversity is important to people and wildlife.
7. Understand the importance of the 3 levels of biodiversity: genetics, species and ecosystem or community, and understand the implications of biodiversity loss at each level.
Conservation and Management of Wildlife
1. Know the preferred habitat types and specific habitat requirements of common wildlife species. Understand how this knowledge helps us to better protect both the land and the wildlife species that depend on it.
2. Understand the difference between biological and cultural carrying capacity, and be able to identify social and ecological considerations where human use of land conflicts with wildlife habitat needs
3. Identify common wildlife management practices and methods that are being used to manage and improve wildlife habitat
4. Understand the role of federal, state and provincial Fish and Wildlife Agencies in the management, conservation, protection, and enhancement of fish and wildlife and their habitats.
5. Know that all states and provinces have a hunting safety course and mandatory hunter education program developed specifically for each state or provincial government's hunting and wildlife agency.
Issues Involving Wildlife and Society
1. Understand how non-native (exotic), invasive species threaten our environment and the biodiversity of many wildlife species. Understand that non-native (exotic), invasive plants impact wildlife habitat and thus have a tremendous impact on native wildlife.
2. Learn about the complexities of decision-making in making land use decisions that affect wildlife, and understand that wildlife resources are under constant pressure caused by human population growth, environmental degradation, and habitat reduction.
3. Know that Wildlife species are subject to diseases resulting from exposure to microbes, parasites, toxins, and other biological and physical agents

4. Understand the terminology and factors that affect threatened and endangered wildlife species. Know the meaning of extinct, extirpated, endangered, threatened, candidate species and reintroduction.
5. Identify the characteristics that many extinct and endangered species possess, and be able to identify many species wildlife that are endangered and threatened.
6. Understand the role of the Endangered Species Act in helping to conserve endangered and threatened species. Know the organizations and agencies responsible for listing and protecting endangered species on global, federal, state and provincial levels.

Introduction

In preparing for the Oklahoma Envirothon you may want to reach out to Oklahoma Department of Wildlife and Conservation offices for additional information and assistance. The information contained within this study guide is intended to provide a preview of basic information for the competition. Numerous resources are available from a variety of sources online.

Identifying Wildlife Species Common to Oklahoma

While not a complete list of all wildlife common to Oklahoma, the following is a place to start while learning about the various wildlife species. More information can be obtained from the websites below the list.

Mammals

- American Bison
- Badger
- Black tailed Jack Rabbit
- Black-tailed Prairie Dog
- Beaver
- Bobcat
- Coyote
- Eastern Chipmunk
- Eastern Cottontail Rabbit
- Eastern Gray Squirrel
- Eastern Red Bat
- Elk
- Groundhog
- Long-Tailed Weasel
- Mink
- Mountain lion
- Porcupine
- Pronghorn antelope
- Raccoon
- Red fox
- River otter
- Southern flying squirrel
- Stripped skunk
- Swift fox
- White-tailed deer

Birds

- American Avocet
- American Kestrel
- American White Pelican
- Bald Eagle
- Barn Owl
- Burrowing owl
- Canada goose
- Cardinal
- Cedar waxwing
- Common loon
- Cooper's hawk
- Cormorant
- Dark eyed junco
- Eastern screech owl
- Goldfinch
- Great blue heron
- Greater roadrunner
- Mississippi kite
- Mourning dove
- Neotropical migrant songbird
- Osprey
- Purple marlin
- Red-headed woodpecker
- Ring-necked pheasant
- Ring-necked duck
- Ruby-throated hummingbird
- Ruddy duck
- Sandhill crane
- Whooping crane
- Scaled quail
- Scissortail flycatcher
- Swainson's warbler
- Trumpeter swan
- Turkey vulture
- Wood duck
- Bobwhite quail
- Wild turkey
- Lesser prairie chicken
- Scaled quail
- Woodcock

Reptiles

- American alligator
- Common snapping turtle
- Alligator snapping turtle
- Yellow mud turtle
- Mississippi mud turtle
- Razor-backed musk turtle
- Common musk turtle
- Ouachita Map turtle

- Common map turtle
- Painted turtle
- Eastern River cooter
- Red-eared slider
  Ornate box turtle
  Smooth softshell turtle
  Spiny softshell turtle
- Copperhead
- Eastern collard lizard
- Red-eared pond slider
- Texas horned lizard
- Three-toed box turtle
- Timber rattlesnake
- Western diamondback rattlesnakes
- Black rat snake
- Broad-banded water snake
- Bull snake
- Brown snake
- Coach whip snake
- Common garter snake
- Diamond-backed water snake
- Eastern hog-nosed snake
- Flat-headed snake
- Graham's crayfish snake
- Great plains rat snake
- Ground snake
- Kansas glossy snake
- Marcy's checkered garter snake
- Lined snake
- Milk snake
- New Mexico thread snake
- Northern red-bellied snake
- Northern rough green snake
- Northern water snake
- Northern scarlet snake
- Orange-stripped ribbon snake
- Plain-bellied water snake
- Prairie king snake
- Prairie rattlesnake
- Ring-necked snake
- Specked king snake
- Texas long-nosed snake
- Rough earth snake
- Racer
- Texas nigh snake
- Western black-necked garter snake
- Western cottonmouth
- Wester hog-nosed snake
- Western Massasauga rattle snake
- Western pygmy rattlesnake
- Western worm snake
- Western smooth earth snake
- Western mud snake

Fish

- Bluegill sunfish
- Crappie
- Longear sunfish
- Longnose darter
- Western mosquitofish
- Largemouth bass
- Smallmouth bass
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Amphibians

- Gray tree frog
- Leopard frog
- Wood frog
- Wood house toad

Invertebrates

- Black widow spider
- Brown recluse spider
- Butterflies
- Cicada
- Crayfish
- Freshwater mussels

Oklahoma Department of Wildlife Conservation Species Spotlight

- https://www.wildlifedepartment.com/wildlifemgmt/species.htm

Bats of Oklahoma

- https://www.wildlifedepartment.com/wildlifemgmt/Batfieldguide.pdf

Principles of Wildlife Management

Wildlife management is the science of managing wildlife and its habitats, including man, for the benefit of all the plants and animals in an environment. There are several important concepts basic to the wise management of wildlife.

1. The amount and condition of its habitat is the most important factor determining how many animals of a species survive in a particular area.
2. Normal populations can replenish themselves annually, replacing animals that die with new individuals born into the population.
3. Hunting and trapping are important activities, and when properly regulated, they can replace some or most of the natural deaths that would otherwise occur.
4. Management of habitat benefits all wildlife, even those not hunted.

Habitat

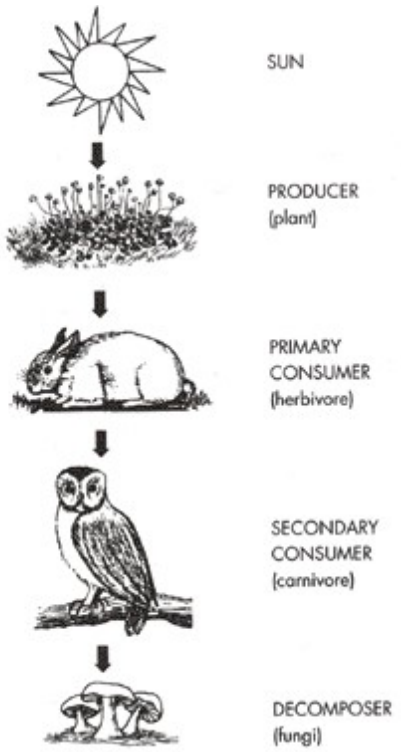
Habitat is the place where wildlife lives. It includes food, water, cover, space, and the arrangement of these componenets. When these habitat factors are in good supply, they contribute to the well-being of wildlife. If any of the habitat factors are in short supply, it limits the number and distribution of wildlife and is called a ***limiting factor***.

- **Food:** Each wildlife species eats specific foods, regardless of other foods that may be available. In addition, some plants have more nutritional value than others and this may vary according to the time of year. For this reason, both the quantity and the quality of the food are important.
- **Cover:** Wildlife needs cover to protect it while feeding, sleeping, loafing, breeding, roosting, nesting and traveling. Cover can take many forms, such as vegetation, burrows, rocks or other natural features.
- **Water:** All wildlife needs water. Sources of water are surface water, dew, snow and succulent (juicy) vegetation. Some animals can also use metabolic water (water produced by chemical processes in the body).
- **Space:** All wildlife need enough area to complete their life cycle. Some wildlife have larger area requirements than others.
- **Arrangement:** The arrangement of food, cover and water in an area determines the wildlife numbers and their distribution. The best arrangement is when these habitat factors occur in combinations of small blocks that are close together.

Many species of wildlife benefit when two important elements of habitat are brought together, such as a wooded area and a field. There is a tendency for wildlife to concentrate in the narrow overlap between these two types of vegetation, and the area created is commonly called *edge*. If there is good arrangement of food, cover, water, and space it creates more edge area for wildlife to live in.

Food Chains and Species Interactions

Within an ecosystem there are food chains and food webs. Both of these systems organize organisms based on a trophic level system. The basis of a food chain is a primary producer which is an organism that produces organic compounds from inorganic compounds. Plants undergoing photosynthesis by utilizing carbon dioxide and energy from the sun to produce oxygen and complex sugars are a good example of this. Primary consumers, also known as herbivores, are organisms which feed solely on these primary producers. An excellent example of an herbivore is the white-tailed deer (*Odocoileus virginianus*). Moving up the food-chain we have our secondary and tertiary consumers. Some of these consumers are carnivores, organisms which feed solely on other animals (e.g. wolves). Some carnivores are predators, as they hunt other animals as prey, while other carnivores are scavengers, feeding on the carcasses of dead animals. Lastly, omnivores are animals which feed on both plant and animal matter, for example, black bears (*Ursus americanus*). Omnivores can be secondary or tertiary consumers.



Species Interactions

Symbiosis is the close and long-term interaction between two different biological species. Mutualism, parasitism and commensalism are different examples of symbiotic relationships.

- **Mutualism** is the way two organisms of different species exist in a relationship in which each individual benefits from the activity of the other. These species work together which each benefiting from the overall relationship. A great example of a mutualistic relationship is the bee and flower. Bees fly from flower to flower gathering the nectar which they make into food. During this process they also pick up pollen from one flower and transfer it to the next one, helping to pollinate the plant.
- **Parasitism** is a non-mutual relationship where one organism's gains while the other suffers. The parasite (gain) attacks the host (sufferer), and may cause sickness but unlikely death. One such example is the deer tick, which feeds on deer blood and may cause sickness to the deer.
- **Commensalism** is where one species benefits while the other is neither helped nor harmed. The benefits for the one organism can be food, shelter, transportation or seed dispersal. One example are the barnacles found on whales, where the barnacles benefit from transportation and access to new resources while the whale is not impacted by the barnacles.

Carrying Capacity

Carrying capacity is the number of each wildlife species the habitat can support throughout the year without damage to either the animals or the habitat. When wildlife numbers exceed the carrying capacity of the habitat, the excess animals die from starvation or other causes. When wildlife are too numerous, competition for food and cover increases, sometimes destroying the vegetation that serves as a source of food and cover. If habitat is damaged or eliminated, it decreases the carrying capacity of the area. The only way to increase wildlife numbers in an area is to increase the carrying capacity. That can be done by improving existing habitat or by creating new habitat.

Indicator Species

An **indicator species** is an organism whose presence, absence and/or abundance reflect specific environmental conditions. Indicator species can show a change in a specific ecosystem through biological conditions. By studying indicator species you can assess the health of an ecosystem

Examples of indicator species include:

- **Insects:** Honeybees and butterflies are pollinators that indicate and strongly influence the health of plant populations. They are highly sensitivity to a plethora of factors, including temperature and weather, parasites, and air, water and soil quality. All of these factors can help assess the overall health of an ecosystem.
- **Frogs**: Their shell-less eggs, absorbent skin, moisture dependence, predatory feeding, and their amphibious life cycles make them vulnerable to changes on land and in water. They are often used to monitor and track changes in water quality, and overall environmental health.
- **Lichens:** They are indicator species for air quality due to different types of lichens being susceptible to different pollutants. Certain compounds can affect certain species differently when in an ecosystem. Some compounds can cause a certain species population to grow at exponential rates whereas that same compound could cause other species to die.

Succession

Each species of wildlife lives in habitat that best meets its needs. Some species may live in several types, others may spend their entire life on one type of habitat.
Habitat in an area is subject to gradual change due to the effects of weather, plant growth and other factors. This change is called *succession*. During each stage of succession, the plants and animals change, gradually replaced by other species of plants and animals that are better able to survive in the type of habitat that has developed.

A good example of succession is a pasture, which unmowed or ungrazed is allowed to progress to an overgrown field with tall grasses and shrubs. These plants give way to woodier vegetation such as cedar trees, pines and hardwood saplings. Eventually, as the pines and hardwoods grow to tall trees, the undergrowth is shaded out and a mature forest will stand where the open pasture once lay. This is not a quick change but happens over a number of years.

Of course, the animal life that occurs during each stage of succession will be compatible with the various types of habitat. The small rodents and some ground nesting birds found in the pasture will be replaced by rabbits, quail and various song birds when the denser vegetation is allowed to grow. The woody plants, such as cedar and pine, serve as nesting and escape cover for a variety of wildlife from small game to deer. The mature forest eventually will house turkey, deer and squirrel which depend on the mast (nuts) from various hardwoods. Many predatory animals, such as foxes, coyotes, hawks and owls, will also be found there.

Succession can be set back to earlier stages by disturbances such as prescribed burning, grazing, lumbering, drainage projects or brush removal. In fact, wildlife managers routinely alter succession to create habitat suitable for a particular species of wildlife.

Population Dynamics

A *population* is group of animals of the same species that occupy a particular area. *Dynamics* refers to motion or change. *Population dynamics*, therefore, means the changes that occur in a population over time.

Two major factors affect the population dynamics of wildlife - the birth rate and the death rate.

Birth rate: the number of animals born in a population per adult female each year. Many wildlife species have a high birth rate. The most important factors that affect birth rate are:

- the number of young per litter or clutch
- the number of litters or clutches per year
- the age at which breeding begins

Death rate: the percentage of animals in a population which die each year. Animals with high birth rates generally have correspondingly high death rates. The most important factors causing death are:

- starvation
- severe weather
- predation
- diseases and parasites
- accidents
- hunting

If the birth rate is greater than the death rate, wildlife numbers increase. If the death rate is greater than the birth rate, wildlife numbers decrease. When the birth and death rates are equal, population numbers do not change.

Population growth and decline: Some wildlife species have a tremendous capacity for reproduction and increasing their numbers, but this growth cannot continue indefinitely. There is always some factor, usually food or cover, that becomes limiting.

Let's look at a situation that occurs each year in wildlife populations.

In the spring, the breeding stock (animals needed for breeding to replenish the population) begin having their young. The population reaches its peak in the summer. At that time, the population numbers have become greater than the carrying capacity of the habitat. The population then begins to decline because the habitat cannot support the excess animals. The decline continues through the spring of the following year. This cycle occurs every year. It is in late spring, just before the first young of the year are produced, that habitat is most limited. It is the amount of habitat available at this time that determines the carrying capacity.

The wildlife manager's task is to control the numbers of animals at or below the carrying capacity so that no damage is done to the animals or their habitat.

MANAGEMENT TECHNIQUES

Mitigation

Mitigation is a concept used when negative impacts to the environment caused by development in a sensitive area cannot be avoided or minimized. Mitigation strives to offset the destructive nature of development on wildlife habitats by improving a degraded habitat or creating a new one to replace the habitat destroyed. Common areas that require mitigation from impacts are **wetlands** or habitat supporting listed species.

The success of a mitigation project is measured by comparing it to the initial function of the habitat (**community**) destroyed. Compensation is considered complete when the functions meet or exceed the initial habitat assessment.

Mitigation Banking

Mitigation banking means that landowners needing to **mitigate** for authorized impacts associated with development activities have the option of purchasing credits from an approved mitigation bank rather than restoring or creating habitat on or near the development site. Mitigation banking has the benefits of

providing potentially more cost-effective mitigation; being likely to preserve viable communities or **ecosystems**; limiting temporal losses associated with on-site mitigation initiated after or during development; and consolidating small, fragmented mitigation projects into a single large parcel with greater ecological benefits.

Minimization of Impacts

Careful planning and evaluating the design of facilities and activities can minimize development and recreational impacts on wildlife. Often a critical look at project design can reveal areas that can be used to reduce impacts to wildlife, for example, for relocating trails, planting vegetative buffers, and providing nesting structures. Landscaping with native plant species around buildings and other developed sites may create habitat islands that would facilitate the movement of individuals of some species between undeveloped areas.

Openings

Areas typically at earlier successional stages than the surrounding habitats. For example, areas where trees are expected to dominate the natural vegetative cover, but shrubs or herbaceous plants are the dominant species. Openings may occur naturally (e.g., when trees fall or are killed by disease or insects) or they may occur as unmaintained agricultural plots not yet reverted to closed stands of trees (old field). In an ecological sense, these openings are not permanent. Openings may be maintained by management activities in an early **seral** stage for a longer period of time than would be the case with normal **succession**. Openings created by silvicultural practices are more transient and are not considered in this classification.

Openings are important for wildlife species as they allow for forage production closer to the ground where there is more access for eating, and provide cover for nesting and refuge from predators. Opening sizes vary; however, the recommended size is between one and five acres. The U.S. Forest Service recommends 20 acres of opening for each 640 wooded acres where no major silvicultural cuts are occurring. Four common methods of maintaining these openings are burning, hand clearing, mowing, and bush hogging.

The overall management cost of maintaining openings is low to moderate with a high return on increased wildlife accessibility, forage quality and quantity, and wildlife cover.

Corridors

Wildlife corridors can connect isolated patches of habitat. Corridors linking fragmented patches of habitat will be important for the perpetuation of large-ranging wildlife species. These linkages are important to allow animals' access to additional habitats they may require for survival. Corridors may link otherwise isolated wildlife populations and thereby prevent genetic isolation of those groups of individuals.

One example of a corridor is the habitat along a river and the land immediately adjacent to the river. This may be land specifically set aside for wildlife or passive recreation. One aspect of corridors being researched in Florida is the use of highway underpasses specifically designed for panthers and bears to move more effectively among habitat patches.

Potential risks associated with corridors include the increased probability of transmitting diseases among populations and easier access for predators. Introduction of foreign **pathogens** to a species could alter long-term survival rates. Easier access for predators could also affect species survival.

Therefore, both the benefits and the risks that can result from corridors should be carefully examined during planning.

Restoration

This is a process whereby actions are taken to counter conditions in an altered community or ecosystem and return that area to a state as close as possible to its natural form. This may require extensive alterations including rebuilding the soil profile, land contouring, plantings, removal of domestic or **feral** species, and temporary exclusion of wildlife species, if feasible. Essential development components include mimicking historic soil, drainage, and foliage characteristics. Hopefully, natural processes in the ecosystem will act as a type of self-restoration process once the initial work is done (succession). It is common to require a maintenance program to eradicate **exotic** or weedy species until the desired plant community takes hold. As the habitat is restored, many wildlife species will migrate into the area without expensive relocation programs.

Restoration projects will vary in terms of the number and extent of activities that must be undertaken. Some restoration projects are low-key and may utilize management techniques like prescribed burning and timber harvesting to reduce stand basal area that would open the canopy and allow for understory restoration. As a result, the costs of restoration projects are vastly different. Restoration projects requiring soil alteration and contouring, projects where "immediate" results are required, and projects on steep slopes are all costly endeavors. Projects that deal with stimulating an existing seed source are less time-consuming and expensive, but still require maintenance practices to ensure site conversion.

One key to successful restoration is knowledge of the biology of organisms in the system and interactions among those organisms. Given the complexity of most systems, there are few (if any) systems that are fully understood. Consequently, it is difficult to restore a system to its original form or to guarantee the success of any project.

Exotic Species Control

Exotic refers to a species that is not **indigenous** to an area and whose introduction is usually caused by human activity, such as accidental release, intentional dumping, or being moved with agricultural products. Exotic species can be either plant or animal. The control of exotic species is very important to native wildlife prosperity. Exotic plants may out-compete native species while providing limited or no value to native wildlife species. Establishment of exotic plants can significantly alter the resources available in natural systems. Exotic animals introduce diseases to which native species have no immunity and compete with native wildlife for available, and often limited, resources. Exotic species may have no natural predators in the systems they invade, which can result in exponential growth patterns. Exponential growth rates are unsustainable and can initiate or accelerate declines in numbers of native species competing with or being preyed upon by the exotics.

Exotic species released into the wild need to be controlled or removed as quickly as possible to minimize damage. Control methods for animals include trapping, shooting, and sterilization (often effective with insect populations). Control methods for plants include herbicides, manual removal, and/or control burning. Treatment may require a combination of management techniques over time to achieve control or eradication. No method is cheap; however, left uncontrolled, the ecological and economic problem will only increase.

Prescribed Burning

Control burning (management-ignited fire) is an important management tool for wildlife managers because it helps maintain or improve the quality of habitat for wildlife species. All of Oklahoma's natural communities are fire-dependent. This means that the communities of plants and animals have adapted to and require fire.

Prescribed burning benefits wildlife by setting back succession and stimulating new plant growth. Generally, the yield and quality of herbage, legumes, and browse are increased. Openings may be created that are necessary for feeding, movements (migration), and maintenance and social behaviors.

The timing of a prescribed burn and the methods used to conduct the burn are dependent upon the present conditions of the habitat and the desired outcome. An area which has not undergone any burn for a long period of time should be burned to reduce fuel loads, then burned again later to begin to restore community integrity.

Population Estimates

Population estimation methods are important tools for understanding population growth and tracking population trends. There are a variety of techniques to estimate populations, most of which are species-specific. Each method is based on a set of assumptions. For an estimate to be valid, all assumptions of the method used to generate that estimate must be met.

Call Counts. Used to estimate dove and quail populations, call count estimates are based on a knowledge of home range size and the assumption that only male birds are calling. This method requires a set route to be monitored with listening points established for a set period of time. Some species of non-game birds can also be studied using their response to a taped call.

Track Counts. Track counts can be useful in following trends in deer and to a lesser degree, turkey. An established trail is cleared of all tracks, then left alone for a set period of time. The tracker then follows the trail, recording the number of times a particular animal species crosses the trail. A population estimate can then be calculated with factors such as known area covered, total area, and number viewed.

Aerial Surveys. A method used to count the number of eggs or chicks in eagle nests, this type of survey is also used during the winter for counting manatees. In areas where the overstory is not dense, deer, antelope, and other **herbivores** can be counted. Aerial surveillance of transect lines is also used in estimating waterfowl numbers.

Spotlight Counts. This is a technique using the eye shine of animals spotted with a light at night to estimate population trends with known coverage and total acreage. Spotlight counts are used primarily with deer and alligators.

Area estimates. Transects can be used to assess population trends and estimates, recording either the animal or the sign. This may include flushing number and distance from birds, and gopher tortoise burrow counts. Quadrats are generally used to count a specific type of sign, like pellet groups for deer or rabbits.

Bait Site Surveys and/or Scent Stations. These methods require baiting the desired species to a location and counting the number of individuals visiting the site. The counting can be done manually or with the use of cameras. This technique has been used with a variety of species including deer, bear, mink, bobcat, and turkey.

Sex and Age

This information can be gathered during either management or research activities and is very important to the management of wildlife populations. Certain cases can make it even more valuable, for example, if a population is isolated or a species is listed. The ability to perpetuate a wildlife species requires both sexes at a viable reproductive age, in numbers great enough to ensure genetic viability (effective population size).

There are a variety of ways to age wildlife species. Many require that the animals be captured; most work for only specific species.

Most birds can be aged until they obtain adult plumage through molt changes. Some species, like deer, can be aged by tooth replacement and wear. Gray squirrels can be aged by color variations in the tail. Bear can be aged by counting the annual growth rings in their eye teeth.

Fish can be aged by counting annual growth rings present in the **otolith**. The rings are caused by a protein buildup as growth slows for a year. When the bone is thin, the whole bone may be observed under a dissecting microscope; however, if the fish is older and the total fish growth has slowed, or if the otolith is thick, a thin slice from the nucleus of the bone can be mounted on a slide and the rings counted using an oil immersion lens. Fish in more northern climates are sometimes aged by counting the annual rings on their scales. This method is not as accurate, although it can be done without sacrificing the fish.

REGULATORY PROTECTION OF THE ENVIRONMENT

Degradation and destruction of the environment can be grouped into three major categories — physical destruction, contamination of habitat, and human disturbance of important impacts. Some of the laws created to protect the environment are briefly discussed below. As with any type of law, the law is only good if it is enforceable, and this has become an issue with several of the laws. Also, several of the laws are presently being considered for revision by Congress. Well-developed revisions may increase or improve the cooperation of private landowners concerned about governmental regulation of their lands. Any such revisions of these acts should not adversely affect elements critical to the effective preservation of wildlife.

Endangered Species Act — The intent of this act is to protect fish, wildlife, and plant species facing extinction by encouraging the development and maintenance of conservation programs designed to increase population numbers to a point where the species can be removed from the protected status. The law specifically makes it illegal to “take” listed species. To take means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct. However, there are provisions to take included under specific permits. Such provisions are important for some situations in which conflicts arise between wildlife and human populations.

Migratory Bird Treaty Act — This law makes it illegal to take non-game migratory birds or parts, including nests. There are provisions to take included under specific permits. This act covers almost all native bird species.

Bald Eagle Act — This law makes it illegal to take a bald or golden eagle.

Marine Mammal Protection Act — This law protects only the marine mammals. It contains minimal language for the protection of the mammal's habitat. The Secretary of Commerce may grant a permit to take a marine mammal.

Clean Water Act — The intent of this law is to require a permit for the discharge of pollutants into waterways. It also addresses providing funds for the development of wastewater treatment facilities. It was based on engineering principles and not on types of, amounts of, or ecosystem tolerance for the pollutants.

Clean Air Act — This law sets standards for air health, provides money for research, and protects clean areas against significant deterioration. The act sets new emission standards, but the regulation of existing pollutants is left up to the states. There are provisions for enforcement and compliance, although it is basically left up to the states.

U.S. Army Corps of Engineers Regulatory Program — This program is based on directives from the Clean Water Act and the River and Harbor Act that require permitting for anyone desiring to place dredge or fill material in waters of the United States or make any type of changes to navigable waters.

Pittman-Robertson Act — This law, established in 1937, placed an excise tax on firearms and associated equipment. This tax money is set aside specifically for the management, research, administration of, and acquisition of wildlife and their habitats. These funds were used to purchase many of the state and national wildlife refuges as well as to provide minimal staff to manage these areas.

Dingle-Johnson Act — This act, established in 1950, placed a similar excise tax on fishing equipment. These moneys are earmarked for fisheries management, purchase, administration, and research.

Wallop-Breaux Act — This 1984 act amends the Dingle-Johnson Act by broadening its scope to allow the taxing of other items used when fishing, such as boats, gas for marine use, depth finders, etc. Funds are still allotted as stated in the previous act.

There are notable differences in the response of wild animals to the sweeping changes in the environment caused by man. Some animals adjust very well to changes in vegetation and land use, and these animals, on the whole, persist or may even increase in abundance. Included in this group are many of the game species, raccoons, armadillos, and coyotes.

Some species are clearly associated with and dependent upon undisturbed climax situations, and these animals suffer the most from environmental change. They are designated as nonadaptive species. The list includes all the rare or endangered species and some that have become extinct.

There appears to be a direct correlation between the affinity subclimax with seral stages or biota and adaptability in the sense of the capacity to adjust to changing conditions. The ability to adapt seems to involve two distinct components: (1) genetic plasticity, or the capacity for segments of a population to evolve rapidly to fit local conditions, and (2) the capacity for individuals to learn new habits of survival under altered circumstances. These cannot readily be separated, since the capacity to learn is itself a genetic trait.

Many wildlife species that are declining in numbers prefer unique or narrowly distributed habitats. Many of those habitats are relatively stable and not subject to significant change. Disturbances can affect such habitats both directly and indirectly. Indirect effects may result from interactions among wildlife species. Indirect effects are the most difficult to understand and often the most difficult to correct. When humans alter the quality and abundance of available resources, the effects can be both numerous and widespread.

Public Education

Education is essential to gain public understanding and acceptance of wildlife management programs. When people know more about wildlife and its needs, they support management programs. For example, some people are strongly opposed to hunting. They mistakenly think that sport hunting is responsible for seriously endangering wildlife species. In reality, it is man's other activities that have destroyed valuable wildlife habitat resulting in the extinction of some wildlife species.