応用動物生態学特論 2015 年度レポート課題

次ページ以降は Principles of Wildlife Management (J. A. Bailey 1984)の第 1 章からの抜粋です。以下の指示に従ってレポートを作成してください。p.5 は章の冒頭部分として、p.14 は実際例を説明する p.15 以降の前段階の文章として、参考までに付けてありますが、無視していただいて結構です。

① p.15 から p.21 までの本文を全訳
② 図はキャプションのみ和訳。本文の最後に続けて、それぞれの図について「Fig.1.3　ミシガンの･･･」のように訳したものを付してください。
③ 最後にこの部分を訳してのあなたの感想、コメントを述べてください。長さは 1 ページ以上。

レポートは印刷物とファイルの両方で提出（ファイルは e-mail に添付）。

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成績は小テスト 30%、レポート 40%、授業中のディスカッションへの参加 30%の比率で評価します。

CHAPTER 1

AN INTRODUCTION TO WILDLIFE MANAGEMENT AND CONSERVATION

Just when you think "you've got it," good teachers will sometimes seem to take an almost sadistic pleasure in proving to you that you are wrong. Education, not indoctrination, is their task.

Kingman Brewster, Jr.

DEFINITIONS
WILDLIFE CONSERVATION
PRINCIPLES

This chapter presents a few basic definitions and describes the role of wildlife management as a part of wildlife conservation.

DEFINITIONS

Wildlife includes all free-ranging vertebrates in their naturally associated environments. Other definitions of wildlife are much broader and may include all plants and animals in wild ecosystems. Certainly, wildlife managers are concerned with managing habitats, including vegetation and invertebrates that are foods or disease vectors for vertebrates. But the objectives of most wildlife management programs are to favor or control the abundance or distribution of vertebrate species. Thus, for purposes of this text, our definition of wildlife is limited to vertebrates.

In years past, working definitions of wildlife have been narrower. The emphasis has been on game species, those harvested by recreational hunting. For example, management of wildlife in the United States was for many years based mostly on a text titled *Game Management* (Leopold 1933). With the gradual realization that all wild vertebrates possess important values, including negative values, the narrow definition of wildlife as game was abandoned. Today, biologists are called on to manage predators, song birds, furbearers, and vertebrate pests, as well as game species.

Most wildlife management is directed toward birds and mammals. Fish management has developed quite separately, and amphibians and reptiles have received little attention in wildlife management until the recently increased concern for endangered species. Although most examples in this book concern birds and mammals, the principles illustrated apply to all vertebrate classes, including amphibians, reptiles, and fish.

Free-ranging vertebrates must be unfenced or at least in a very large enclosure. Animals in a zoo are certainly not wildlife, as the term is used here. Animals in a square-mile enclosure might be considered free ranging. If the enclosure is vegetated so that one can enter beyond sight of the fence and the animals may avoid being seen, the inclination is to consider the animals free ranging.

The *naturally associated environment* of a species is the kind of environment in which the species evolved. It is the environment that permits the species to use all its adaptations.

Place white-tailed deer in a square-mile forested enclosure in Michigan, and most people would classify them as wildlife. Put chamois, a goatlike antelope from the mountains of Europe, into the same enclosure to provide exotic trophies for hunting, and the enclosure suddenly seems more zoolike. The chamois are not wildlife, because they are not in their naturally associated environment. The animals are structurally and behaviorally adapted to negotiating narrow ledges and climbing steep cliffs. Without mountains, they cannot use these

sionals, administrators need to communicate with other participants in the process—the public, research biologists, wildlife managers, educators, enforcement personnel, and people in agencies responsible for resources other than wildlife. Administrators continuously evaluate public sentiments and needs, arrange priorities, and plan for achieving publicly defined goals. They set broad goals and budgets for wildlife managers.

The art of wildlife management is practiced in the third sector (Fig. 1.2). Given a set of goals, wildlife managers strive to attain them. They use knowledge that is obtained by research yet they are limited by budgets and because knowledge of wildlife ecology is incomplete in areas and subjects needing further research. Wildlife managers must communicate their needs for more knowledge to the researchers and their needs for more financial support to the administrators. They may succeed in gaining what they need, or they may have to adjust their practices to the realities of these limitations.

Law enforcement exists on the boundary between the management and socioeconomic sectors of conservation (Fig. 1.2). Enforcement of laws to protect wildlife populations is a management-type function. But prevention of wildlife-law violations is also largely an educational process. Potential violators should be informed about wildlife laws and their purposes. An informed public may develop attitudes favorable to wildlife, and this can be the most important deterrent to violations.

This description of professional activities in the wildlife conservation process is simplified and may seem obvious. I have presented it to emphasize the dynamics of priorities and practices and to show how these changes occur. I have seen too many wildlife managers doing what they have always done, only because they have never thought of doing anything different. I have also emphasized the need for communication among participants in wildlife conservation. Professionals have often neglected their constituency. They have not explained their agencies' goals to the public, and they have not assured themselves that agency goals were in fact public goals. A well-informed and interested public is necessary, if professionals are to make their maximum contribution to society. Professionals have often neglected each other. They have not communicated with other agencies, and redundant or conflicting agency programs have resulted. They have not communicated within their own agencies. Researchers have published results in esoteric journals, expecting managers to find them; and managers have made no effort to seek new information or to communicate their research needs. I hope the above description of wildlife conservation will help the professional—be he or she a manager, enforcement officer, or whatever—realize that wildlife conservation is a team effort. A failure anywhere in the scheme presented in Fig. 1.2 will limit performance elsewhere. Communication is one key to overall performance. This includes reading scientific and management-related journals, participation in professional societies, especially The Wildlife Society, and attendance at workshops and short courses.

EXAMPLE 1.1 Conservation of White-tailed Deer in Region II, Michigan

A brief history of white-tailed deer in the northern half of the lower peninsula of Michigan illustrates the conservation process (Bartlett 1950; Jenkins and Bartlett 1959). The example clarifies the role of management in the larger conservation process. It illustrates the complexity of wildlife conservation and the diversity of opinions and motivations of professionals and laymen who participate in determining the fate of wildlife resources. Similar histories of any wildlife resource can be valuable to management biologists who need to understand the causes of their current management problems. A knowledge of history can be useful in finding solutions to current problems.

Pristine Conditions Before 1850, forests of pine and hardwoods dominated northern lower Michigan. In the shade of these tall old trees, there probably was little food within reach of deer. Fires occasionally and locally destroyed the forests, initiating temporary communities of herbs, shrubs, and young trees that fed deer and caused their temporary and local abundance. These areas were no doubt favorite hunting grounds of Indians, fur trappers, and wolves and puma. But much of the land supported few deer, being stocked with tall white pines and hardwoods that attracted lumbermen.

Exploitation Early logging replaced the occasional natural fires of pristine times and created many areas of low-growing food and cover. By 1870, deer had become plentiful and were hunted for meat and hides during a five-month-long season, August through December. Market hunting peaked around 1880, when more than 100,000 carcasses were shipped by rail. The herds could not withstand such exploitation and declined despite increasing restrictions on the taking of deer. In 1881, the season was limited to two months, and deer could no longer be taken in water or with traps. Deer were to be used for food, not for hides alone, and carcasses were not to be shipped out of state. In 1883, the season was reduced to one month, and in 1887, hunting with dogs was outlawed. In 1895, the first bag limit—five deer—was imposed. The number was reduced to three deer in 1901, when market hunting was banned. In addition to excessive harvests, forest fires caused by carelessness became so frequent and widespread that the previously beneficial effect of fire on deer habitat became a destructive force. The deer population declined to a low around 1900 to 1910. The wolf and puma appear to have been extirpated from lower Michigan by this time.

In 1884, a group of wealthy businessmen established the Turtle Lake Club on 25,000 acres of Alpena County. Most members were from Detroit, and a visit to the club included a boat trip on Lake Huron and a wagon ride to the area. This seemingly unrelated event was to have much influence on deer management in Region II.

Public Reaction Exploitation similar to that in Michigan occurred throughout the eastern United States before 1900. Public reaction to denuded forests, devastating fires, and extirpated or scarce game resulted in laws, programs, and attitudes that persist today. Major changes occurred during 1900 to 1925. In northern lower Michigan, some of the ravaged land came under public ownership. Quite successful control of forest fires was achieved by 1915. Whereas about 2 million acres burned annually in

Michigan in the late 1800s, only about 200,000 acres burned each year in the 1920s, and the figure was further reduced to about 5000 acres per year in the 1950s. The "buck law," restricting harvesting to deer having at least 3-inch antlers, was instituted in 1921. In that year, only 4 out of 27 counties in northern lower Michigan were open to deer hunting.

The Deer "Explosion" Events prior to 1925 created a utopia for deer in the northern lower peninsula during the 1920s. Major predators were gone. Harvest was limited to males, having no effect on that part of the herd producing annual crops of fawns. Fires had created vast areas of low vegetation, ideal habitat for deer, and fire control was permitting these habitats to persist as long as young trees remained within reach of hungry deer. By 1925, deer numbers and deer hunting had improved greatly. There seemed to be deer everywhere. The success of Turtle Lake Club as a deer-hunting preserve for its limited membership attracted others to establish private clubs nearby. Eventually, 90 percent of a 500-square-mile area in northeastern lower Michigan became privately owned "club land." Club members limited access to these lands and thus limited possibilities for harvesting more than very few deer.

In 1928, Felix Salton published a book having as much influence on deer management in Michigan as any previous or subsequent text. The book was *Bambi*.

The club lands were first to show evidence of too many deer for the forage resources—as early as 1930 (Fig. 1.3). Some forage plants appeared heavily used and damaged. Deer starved to death in severe winters. The problem area spread during the

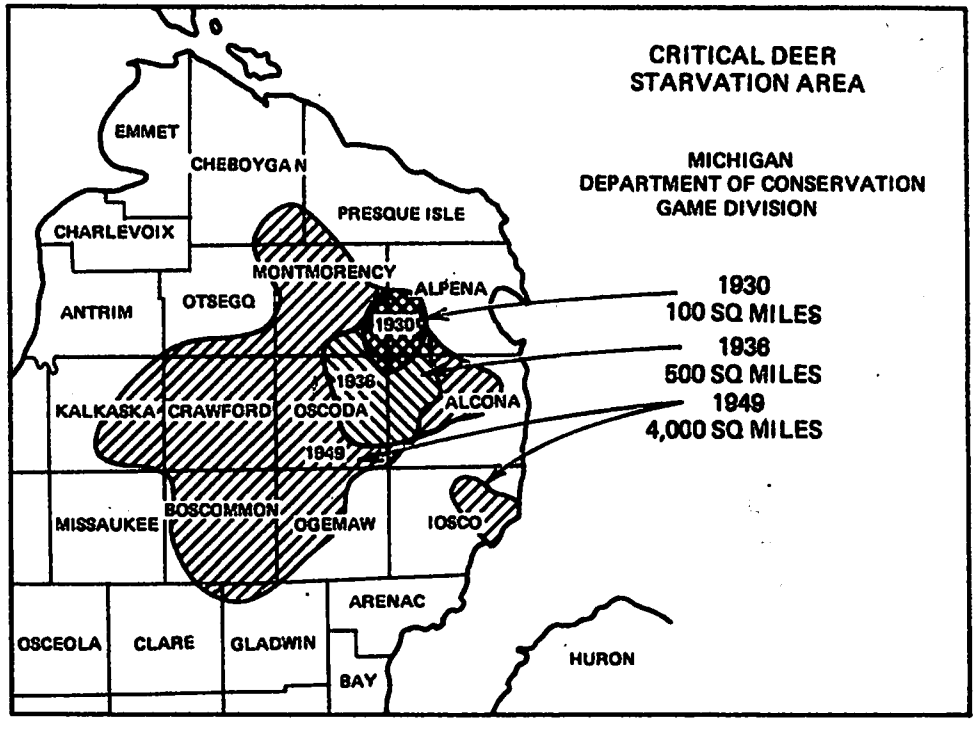

Fig. 1.3 Losses of Michigan deer to malnutrition began in the 1930s in the "club lands" area where few deer were harvested because of abundant private ownership and limited public access. From Bartlett 1950, courtesy of Michigan Department of Natural Resources.

1930s and 1940s. Not only was the loss of deer a problem, the abundant, foraging deer damaged orchards, agricultural crops, and tree plantations. The conservation of deer became intimately related to the conservation of other natural resources.

Early management of the deer problem proved unsuccessful. As early as 1927, trees and shrubs were planted to replace browsed-out food supplies. Poor planting sites limited their survival, and the abundant deer consumed the remaining plants. Feeding deer with hay proved impractical. Most wintering areas were inaccessible, preventing feeding at reasonable costs. Where feeding was possible, it did not eliminate starvation. If feeding did carry more deer through some winters, these animals merely added to the already serious damage being done to the natural forage plants. Cutting timber in overbrowsed wintering areas to stimulate new growth within reach of deer produced limited results. In Region II, there was little commercially valuable timber at this time. Harvest areas were small and scattered. Deer nibbled off the new growth before it could produce much food.

The deer problem led the Michigan Department of Conservation into deer research in the 1930s. A study of deer food habits began in the Cusino wintering area of the upper peninsula at this time. Simple but important concepts of deer biology were learned. White-tailed deer have traditionally used wintering areas, called yards, and will return to them annually despite the scarcity of suitable forage. Not all vegetation is suitable forage. Preferred forages are nutritious to deer, but many plants are eaten only if necessary, and deer cannot survive on them. It became clear from the study that habitat management must be directed at a certain few of the many species of plants in deer yards. Fire control was permitting reforestation of vast areas where forage was growing out of the reach of deer. Thus, the abundant deer herds of the 1930s and 1940s were existing on a declining forage resource. the most malnourished deer produced the fewest fawns (Fig. 1.4). Studies of deer hunting showed that, with a bucks-only hunt, many unantlered deer were shot and left in the woods, a wasted resource. However, conservation department budgets could not provide adequate law enforcement to alleviate this waste.

These concepts were the basis for new proposals for managing deer. It was becoming increasingly evident that herds should be reduced to a level in balance with food supplies. Experience showed that the herds could not be reduced with bucks-only harvests.

In 1941, Felix Salton's *Bambi* was made into a children's movie. Meanwhile, Michigan had become an urban state. Most of its people lived in cities and had little contact with the land. They were unaware of what every farmer knows: Too many cattle in a pasture will destroy the pasture and soon become an unproductive, sickly herd. Urbanites seldom saw Michigan's deer in winter. They did not know the ugliness of malnutrition, the barrenness of the deer yards, the destruction of trees, crops, and deer forage. Their views were easily influenced, mostly by unrealistic and sometimes anthropomorphic presentations of wildlife in books and movies such as *Bambi*. Sentimentalist attitudes grew, and opposition to harvest of antlerless deer resulted.

In 1941, each camp of four hunters was allowed to harvest one unantlered deer. This was a token approach to controlling the herd. The citizens of Michigan opposed the harvest of does; some opposed hunting of any kind. The most vocal accused the Department of Conservation of lying about the condition of the herds; a sellout to the timber companies was sometimes implied. Memories of the era of exploitation lingered. However, one ecologist suggested that if the herds could not be controlled by

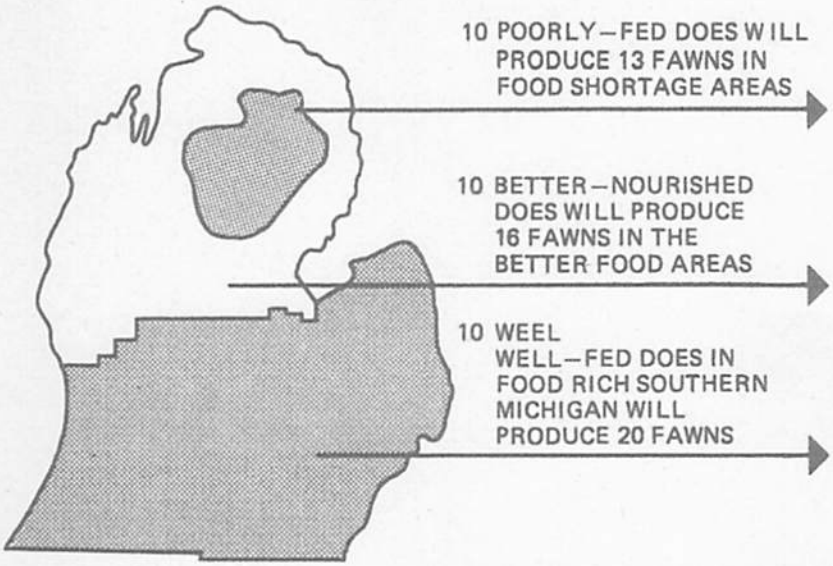

Fig. 1.4 Malnourished deer produce comparatively few fawns. A hundred poorly fed does from the food-shortage areas would produce as many fawns as would 65 well-fed does from southern Michigan. Reducing deer numbers to levels balanced with supplies of good forage can result in increased rates of reproduction. This increase could support larger annual harvests. From Jenkins and Bartlett 1959, courtesy of Michigan Department of Natural Resources.

hunting, timber industries could control deer by cutting the conifer forests needed by deer for winter cover.

The Department of Conservation took its case to the people. As early as 1939, the extension division of Michigan State College sponsored 4-H Club studies of winter deer yards (Welch and Kettunen 1939). Department personnel led "show-me" trips to expose sportsmen to the realities of deer ecology in winter. Teachers and community leaders were told of the deer situation at club meetings and at the Higgens Lake Training School. The history of Michigan's deer and their habitat was presented in booklets in 1950 (Bartlett) and again in 1959 (Jenkins and Bartlett). The latter publication, illustrated by Oscar Warbach's clever cartoons, was especially designed to reach the public (Fig. 1.5).

In the late 1950s American Boxboard Company, in need of wood for its paper mill at Manistee, contracted with landowners in the club lands, Turtle Lake Club included, to manage their forests and wildlife. By mutual agreement, American Boxboard would buy and harvest aspen from the club lands, would manage aspen on a sustained-yield basis, and would improve habitat for deer and other wildlife. The program was soon in serious jeopardy, however. Deer on the club lands were consuming so much aspen reproduction that the possibility of managing aspen on a sustained-yield basis was in doubt, unless the deer herds could be reduced at least locally and temporarily. Reducing the herds would be difficult. First, there was public opposition to harvesting doe deer. Then, there were club traditions for limited memberships. Last, there was the legal question of the liability of club members if nonmembers who might be allowed to harvest deer on club lands were to be injured while hunting. Legal matters had entered wildlife conservation from an unexpected direction.

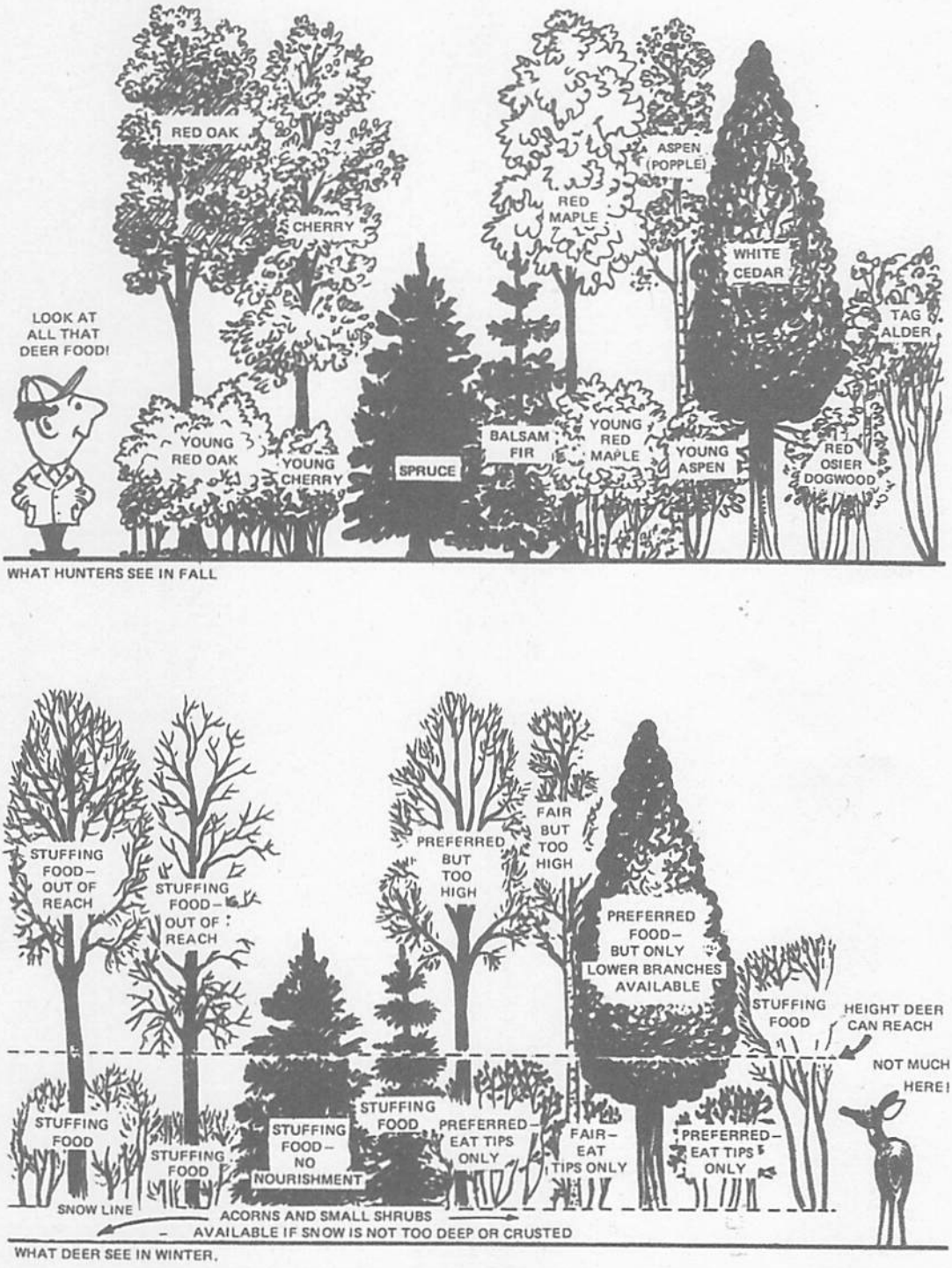

Fig. 1.5 Not all plants are good deer forage and not all forage is available to deer during Michigan winters. Evaluation of deer food resources requires knowledge of deer food habits and of winter snow conditions From Jenkins and Bartlett 1959, courtesy of Michigan Department of Natural Resources.

During a 110-year period, public conceptions of goals for managing Michigan's deer changed and diversified. At first, deer were a resource to be taken for meat and hides. When deer became scarce around 1900 to 1910, most everyone wanted more deer again—this time for meat and recreation to be enjoyed by Michigan's now numerous citizens, not by a few commercial hunters. As deer numbers grew, some people wanted sufficient herd control to reduce damage to crops and trees. Others wanted only to maximize harvestable surpluses. Still others wanted to increase hunting recreation hours, not necessarily the harvest. Tourism grew as highways and cars improved, and seeing deer during summer became a new goal. However, deer auto accidents also increased, and highway safety became another goal of deer management. For many people, management methods became intricately involved with management goals—they opposed harvesting doe deer.

The example ends about 1960, for I am not familiar with Michigan deer problems since then. But further description is unnecessary. The interplay of many factors in the conservation process has been illustrated. Consider how public policy was influenced by history (the lasting reaction to the era of exploitation), by culture (*Bambi*, city living), by economics (deer competition with other resources), and by education (extension programs, publications). Consider how management was once limited by a lack of research (for example, of deer food habits), by legal restraints (the bucks-only law, liability laws), and by land ownership patterns (club lands). Actually, the process has been more complex than described, just as Fig. 1.2 was a simplified representation.

Wildlife management is not practiced in a vacuum. It is a part of the complex conservation process that places many constraints on the wildlife manager. Young wildlife managers are often frustrated because problems such as resistance to change, ignorance, or poor professional performance elsewhere in the conservation process hinder their efforts to manage according to their personal goals and convictions. But wildlife managers are not hired to make public wildlife resources into private hobbies. They are hired to produce public benefits, however clearly or unclearly the public has defined its intentions. The conservation process is no more cumbersome than any other democratic process. Wildlife managers must work within this process, must recognize the limitations placed on management, and should encourage and participate in efforts elsewhere in the process. They may become involved in public education, in law enforcement, or in determining and publicizing the economic values of wildlife resources. Their efforts in these areas may be necessary before they can improve their contributions within the management sector of the conservation process.

PRINCIPLES

Pl.1 Wildlife includes all free-ranging vertebrate animals in the naturally associated environments that have determined their evolution.

Pl.2 Wildlife conservation is a dynamic social process that defines and seeks to attain wise use of wildlife resources, while maintaining the productivities

of wildlife habitats. This process is strongly influenced by practices and attitudes of the past. It includes the professional activities of management, research, education, administration, and law enforcement. Laymen, especially organized groups, participate in wildlife conservation through a continuous political process that defines and redefines *wise use*.