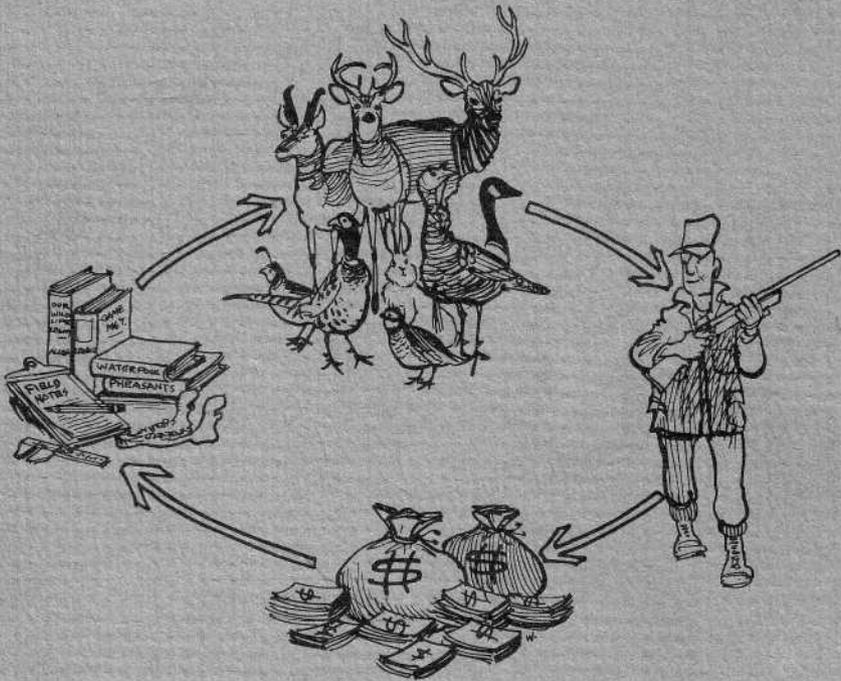


GAME, GUNNERS

AND

BIOLOGY

*the scientific approach
to wildlife management*



Olin

CONSERVATION DEPARTMENT / WINCHESTER-WESTERN DIVISION / EAST ALTON, ILLINOIS

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GAME, GUNNERS AND **BIOLOGY**

*the scientific approach
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by

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and

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WINCHESTER-WESTERN DIVISION

OLIN

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Dedicated to
CHARLES E. "WILDLIFE" GILLHAM
1898-1970

Government Hunter, U.S. Biological Survey

Flyway Biologist, U.S. Fish and Wildlife Service

Associate Editor, *Field & Stream*

*Gifted storyteller, loyal friend, and one
of the pioneer field men who helped bring
back the game.*

CHAPTER I



THE LOW EBB

From the beginning it was hunters' country. There seemed to be no end to the game; it sprang from the earth as fast as it was shot, and for over three hundred years rural Americans fed themselves with their guns.

A hard-working, freedom-famished, meat-hungry people, equipped with steel and gunpowder, had plunged into a Stone Age continent that was the richest game range on earth. The trailbreakers found primitive abundances of game, and later, when the landbreakers and their families came, those primeval abundances were often enhanced as the ancient forests were opened and the sunlight let in. And during all stages of our national growth—from Myles Standish to Paw Cartright—we ate wild meat whenever we could.

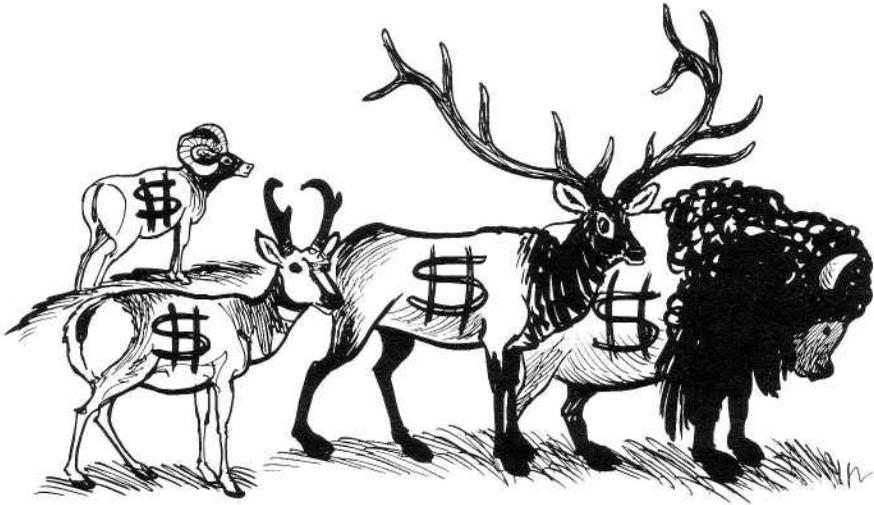
The meat was abundant, and it was free. The title to wild game was originally held in trust for the people by the Crown colonies under English common law. Later, this title was transferred to the States.⁷ But either way, title was held loosely in the early days and wild game was public domain almost like air or sunshine, and belonged to no man until he had trapped or shot it. In many of the Old Countries, game had been the property of the king or feudal landholder, and hunting was a privilege of rank not shared with lower forms of humanity. And so, when we lower forms of humanity quit Europe and came to the New World, hunting meant not only food and clothing but was America's official, bona fide stamp of freedom. Wild game was public property to use as the people chose—and they chose to use it prodigiously.

Yet, the bulk of our wildlife wealth was not wasted; it was spent. Frontier families were large and they had mighty labors to perform, and you can't tame a wild continent on a diet of nuts and berries. That takes protein. Wild meat was staple in all seasons, and must have been eaten in vast quantities by settlers.



Later, as roads improved and cities grew, wild game became a cash crop for small farmers and ranchers. Although we had done some market-hunting ever since the Pilgrims, it was during the last half of the 19th Century that we began to have the markets, the railroads, the manpower and the guns to really exploit game supplies.

During this time, all big game wore a dollar sign. Pioneer miners, lumbermen and railroaders were too busy to hunt, so professional hunters like Bill Cody fed them. Not just buffalo were shot to feed working frontiersmen—the work camps consumed elk, bighorn sheep, deer, bear and antelope. One professional hunter, shooting for the Leadville, Colorado market, sold 35,000 pounds of elk meat in less than three months.¹⁶ In November and December of 1877, a total of 7,490 deer saddles and carcasses and two tons of venison hams were shipped out of Minnesota. In 1880, a hundred thousand deer were sold from



Michigan.¹⁹ An early Texas trader built his fortune on the 75,000 deer-skins that he shipped from near Waco.⁵ Buffalo, of course, were shot more for their robes and tongues than for their meat. Elk were killed for their hides, meat, and the ivory canine teeth that were worn as watch fobs.

It wasn't all big game. Wild turkeys were sold from the first; diamond-back terrapin, ruffed grouse, waterfowl, prairie chicken, and other small game were prime market items. In 1878, a New York trapper sold more than 3,500 ruffed grouse to one hotel. At this time, the heaviest commercial pressure was probably on waterfowl. Ducks and geese were marketable commodities as casually traded as beef and pork. During the winter of 1893-94, a single market gunner in Arkansas' Big Lake area sold 8,000 ducks.³ In the mid-1890s, an agent in one tiny northwest Iowa town shipped 75,000 ducks in a single season.⁷

Except in the case of buffalo, we'll never know what part commercial hunters played in shooting American wildlife to the vanishing point. They were undoubtedly a crucial factor and finally broke the backs of many game populations. However, we may magnify the professional hunter's importance because he left such spectacular statistics. We don't have comparable figures for farm boys, and far more game probably passed through frontier kitchens than through all of the city markets.

The passing of the bison was the most spectacular. In 1887 we awoke to silent plains; the wind was empty of hoof thunder, and something majestic had faded. It was like having a mountain range vanish before

our eyes; we stood blinking and unbelieving. The Sioux knew that it couldn't be, and their medicine men promised them a messiah and the return of Father Buffalo, but neither came, and the braves danced their Ghost Dance and died in their cotton Ghost Shirts that weren't bulletproof after all, and went to join their buffalo.⁸



In 1887, the year the bison vanished, there were no white-tailed deer left in Pennsylvania; by 1900 there were only 500,000 deer left in all the United States of the incalculable millions that had once existed.¹⁷ By 1907, wild turkeys had been cut back to ten percent of their original range.¹⁷ Elk had dwindled from about ten million animals and a coast-to-coast distribution to some 50,000 wapiti that clung to a few pockets of wilderness in seven western states.¹⁴

In the following year, 1908, there were less than 25,000 pronghorn antelope in North America.²⁰ At one time they may have been more numerous than the buffalo; but with the bison gone, hungry Indians and plainsmen had turned their attention to the pronghorn.

Between 1885 and 1910, our original big game supplies had faded by more than 80 percent. Although most small game was still abundant, there were bad times ahead, and waterfowl were taking a fearful beating

from market gunners who were as efficient as the buffalo hunters had been.

Our major game species were decimated because they were wanted; many other species were decimated because they weren't wanted. By 1900, grizzlies and timber wolves were being systematically wiped out of their last western strongholds, and federal efforts seemed bent on the extermination of coyotes, cougars, prairie dogs, and other "varmints." In one way or another, every major species of American wildlife was being subjected to relentless domestic, commercial and political pressures.

We are quick to condemn the 19th Century hunters and hewers today, but for their time and place they were right. They were men with herculean labors to perform; most were convinced of their manifest destiny, and some believed, like Boone, that they had been "ordained by God to conquer the wilderness." They spent prodigally, for their labors required titanic energies and supplies. They didn't have the time, desire, knowledge nor technology to manage resources wisely and well, and most regarded wilderness as an enemy. They were builders that had to wreck one thing to create another. They wrecked and built with greater zeal and efficiency than the world had ever known before.

The sudden realization that the great adventure was ending, and that we could see the bottom of our treasure chest, came as a fearful shock to many people who believed that our natural wealth was boundless. It was like a billionaire being reduced to panhandling. Yet, in spite of the alarm that was felt at the disappearance of wildlife, the momentum of use was hard to check. It ground powerfully on, continuing to crush the remnants of major wildlife. It seemed impossible to control the old traditions of free and unlimited hunting. And to make it worse, the land was filling up with a swiftly growing population. Game range was being cut, fenced, plowed, towned, and skinned with roads and rails.

The Great Hunt had ended. The game was gone or going, and there was no good reason to hope for its return.

CHAPTER II

THE MORNING AFTER

When you've squandered an inheritance and face dire poverty, you quit spending.

This was our national position at the turn of the century; we either stopped spending our major wildlife at once, or there would simply be nothing left. Our big game was just about one trigger-pull away from extinction, and danger signs were appearing in some small game populations.

And then in our darkest resource crisis, a young Vice President named Theodore Roosevelt assumed leadership of the nation.

It was one of those eleventh hour rescues that have come at other times in American history. When a crisis develops, it always seems that a strong man stands to meet it, and charts the national course. Any one of a hundred machine politicians might have been Vice President instead of Teddy Roosevelt, all schooled in the politics of boodle, pork barrel, and spoils—and none with the slightest interest in national





resources except how they could be converted to cash and/or votes.

The new President would have been unusual in any time. In 1901 he was unique. He was a seasoned outdoorsman with a lot of personal mileage in wild country, and a man of vision and imagination as well. Above all, the Rough Rider was a man of action.

During his eight years in office, Roosevelt introduced the nation to an entirely new concept of the Presidency—as well as new concepts of resource management. Believing that he was a servant of the people instead of the Congress, he acted swiftly and strongly to protect the land and its wildlife from the spoilers who, up until that time, had devoured public resources with little or no opposition. Teddy Roosevelt's administration saw the establishment of the U.S. Forest Service, and increased the national forests from about 33 million acres to 148 million acres. In 1904 alone, Roosevelt created 51 new national wildlife refuges.²⁰

He made many vital and decisive moves. But just as important, though less spectacular, was Roosevelt's idea of "conservation through wise use." Teddy and his chief forester, Gifford Pinchot, shared a belief that such things as wildlife and forests were renewable resources that might last indefinitely if they were harvested *scientifically*—and not faster than they reproduced themselves.¹¹

At the turn of the century, hunting was being officially closed for wild turkey, deer, elk, bighorn sheep, antelope, and other seriously declining game. But unofficially, hunting continued wherever there was any game left to hunt—and especially if it had market value. This was of deep concern to the budding conservationists who were still stunned at the disappearance of the buffalo, and who feared that all other big game might follow. There was still time to act, and the Lacey Act of 1900 was a solid beginning.

This federal law was intended to end market hunting, not just of game species, but also of plumes and feathers of game and non-game birds. It also prohibited the importation of exotic birds and mammals known to be harmful. Enforcement of the new Lacey Act was delegated to the Biological Survey of the Department of Agriculture.

The Lacey Act was solidly rooted in the powerful interstate commerce clause of the Constitution. Under the new law, no game taken illegally in one state could be transported across state lines. It was to be the cornerstone of American wildlife legislation; for the first time, wildlife had been recognized in a realistic and potentially powerful law.

However, it worked no overnight miracles. Market hunting was a big and profitable business, enforcement of the Lacey Act was weak, and illegal game—particularly waterfowl—continued to pour into the eastern markets.

There was an attempt to check this in 1904 with the Shiras Bill, which was intended to protect migratory game birds by granting the federal government more authority over them, but the bill failed. Even so, it caused a lot of waves. Some features of the Shiras Bill survived in the Weeks-McLean Law, which became effective in 1913. This law simply and explicitly placed all migratory birds under the direct custody and protection of the United States Government. Songbirds and waterfowl could be shot only if and when federal law permitted them to be shot.

Countless hunters and market gunners screamed like banshees at this, and opposition began to build to repeal the new law. There was reason to feel that a repeal move would carry, for the law had certain weaknesses that may have made it unconstitutional. Knowing this, and not wanting the issue to reach the Supreme Court, the backers of the Weeks-McLean Law made a shrewd move. The law was drafted in the form of a treaty that was signed by Canada and the United States in

1916. This was the foundation of the Migratory Bird Treaty Act which became law in 1918.⁶

Sure enough, the old Weeks-McLean Law was attacked on the grounds of unconstitutionality. But it made no difference—the Migratory Bird Treaty Act, based as it was on international treaty, was rock solid. The new law was not only stronger, but broader than the original Weeks-McLean Law. Under the latter, migratory game and birds were under the custody of the federal government and could not be taken contrary to regulations. The wording of the Migratory Bird Treaty Act went further, stating that *unless* and *except* as permitted, it would be entirely unlawful to hunt, take, capture, kill, possess, sell, etc. any migratory bird or any part, nest or egg of any such bird! The



new law also prohibited spring shooting, closing the season on almost all migratory game birds between March 10 and September 1. Later on, this law would be invoked to prohibit baiting and unplugged guns in waterfowl hunting.⁶

This, and the old Lacey Act, began to slow the headlong destruction of waterfowl. It established the principle that waterfowl hunting was no longer the unregulated right of the citizen, but a privilege to be enjoyed only as the law permitted.

The Era of Protection really began with the advent of the Lacey Act and Teddy Roosevelt. Although state game laws were still generally weak or nonexistent (as were state game agencies) the situation brightened tremendously between 1900 and the end of World War I. The public and its lawmakers had begun to grasp the magnitude of the problem and started to act. The word "conservation" had been coined, and Teddy Roosevelt had shown the world that it had political clout. We had some key laws, a growing number of effective citizen groups, and a few state and federal conservation agencies were emerging from the Dark Ages of resource politics.

We were getting our feet under us, and beginning to move.

CHAPTER III

THE FALLACY OF PROTECTION

Wildlife in the 1920s was a strange mixture of feast and famine.

New laws and the growing momentum of conservation still hadn't overcome the old momentum of resource waste, and there were states in which the 1920s may have marked all-time wildlife lows and presented the grimmest outlook for the future of hunting.

Besides, World War I had drained many marshes and plowed many prairies. The wildlife of prairies and plains was still in desperate straits; deer were missing in most farm states, pheasants had not yet been established in their prime range, prairie chickens were almost gone, and the passenger pigeon had vanished forever.

Yet, there were the bright spots.

From 1923 on, the increase of elk in the northern Rockies was almost continuous. This was partly due to broad restocking programs—but mostly to the facts that elk hunting had been restricted and that



some elk range was better than it had ever been. Great fires, incessant logging, and the Englemann spruce beetle had opened up the vast mountain forests. Second growth such as willow, aspen and serviceberry thrived, and so did the western elk and deer that lived there.

Back East, almost all of the original forests had been cut and were now browse-rich second growth. Frontier “stump farms” in eastern and northern forests had failed or were failing, and their orchards, fields and pastures were reverting to the wild. All in all, it was ideal deer range, and the protected deer flourished in this lush environment. This is not to say that deer weren’t being hunted. They were, but in those states where hunting was allowed in the 1920s, the “buck law” usually prevailed. And from the standpoint of deer, that’s a population increaser almost as effective as total protection.



The philosophy of protection had apparently saved the day. We were no longer facing big game bankruptcy, although we were still desperately game-poor. But while bankruptcy may be prevented by retrenchment and a strict savings program, prosperity can be achieved only through wise management and investment. This is as true in game management as in money management—and some tragic events drove the fact home in the 1920s.

In northern Arizona, a herd of about 3,000 Rocky Mountain mule deer had managed to survive the turn of the century on the

Kaibab Plateau on the north rim of the Grand Canyon. To protect this herd of mulies, Teddy Roosevelt in 1906 set up the Grand Canyon National Game Preserve—a sanctuary totaling about one million acres.

The sanctity of this refuge was rigidly enforced by both officialdom and terrain. The remoteness of the region, and the fact that it was bordered on one side by the abyss of the Grand Canyon and on other sides by empty sagebrush deserts, served to keep the deer in the preserve and most poachers out of it. Government hunters took stern measures against all deer predators; in 25 years they killed 781 mountain lions, nearly 5,000 coyotes, and eradicated the timber wolf.²⁰ It all paid off. When the area had been made a refuge, it supported about 4,000 mule deer. With complete protection and no predators, this herd mushroomed. In 1924 there were about 100,000 mule deer on the Kaibab, and over a thousand might be seen in a single meadow in the summer dusk.¹⁹

Something had to give. The deer browse was being badly overeaten, and worried study teams began recommending a drastic reduction of the deer by *some* means—regulated hunting, livetrapping, slaughter by federal employees. But the public was now thoroughly conditioned to protectionism, and bitterly protested the idea of killing any of the deer. Some well-meaning naturalists insisted that nature “be allowed to take its course”—not realizing how harsh that course would be.

The bubble burst during the winter of 1924. In some places ninety percent of the deer forage had vanished; Kaibab deer died by the thousands, by the tens of thousands, and the range was no longer capable of supporting a major herd. Within six years only about 30,000 deer remained, and these had suffered great physical decline. Drastic dieoffs continued each winter until 1930, when annual hunting seasons were finally opened under a new agreement between the federal government and the State of Arizona. Still the deterioration of the herd went



on, for the overbrowsed range could not recover fast enough to feed the deer. Eventually, the herd would sink to about 15,000 animals.

Much the same thing was happening in Pennsylvania's white-tailed deer herd.

In about 1900 the Pennsylvania Game Commission began to buy deer that had been livetrapped elsewhere, and released them in state forests. By 1905, new units of a deer refuge system were being stocked with deer livetrapped in those state forests, and Keystone whitetails had begun to wax abundant. By the mid-1920s, Pennsylvania was swarming with deer. There was a buck season for deer with at least one forked antler, and many were killed. However, white-tailed deer are polygamous and one buck is capable of mating with as many as twenty does in one season—and a buck season rarely controls a herd.

Pennsylvania hunters were seeing plenty of deer, all right, but few had antlers large enough to be legal game. The range was overstocked, the deer were stunted, and game biologists found that winter range was badly overbrowsed. The crash of Pennsylvania's herds began in the same winter that the specter of starvation had stalked the Kaibab. Pennsylvania deer died by the thousands during the winter of 1926-27; a game biologist found more than a thousand dead whitetails in four townships of one Pennsylvania county.²²



These were two prime lessons in a basic fact of wildlife: that protection itself isn't enough—that wildlife needs management as well. Protectionism had been carried too far in Arizona and Pennsylvania, and thousands of deer had literally been guarded to death.

Out in New Mexico, a federal forester was watching the Kaibab deer disaster and changing his mind about the need to protect game from predators. He was full of ideas, one of which concerned "managing" game rather than just preserving and protecting it. That forester was Aldo Leopold, and in a 1925 bulletin

of the American Game Protective Association he wrote:

*“ . . . we have learned that game, to be successfully conserved, must be positively produced rather than negatively protected . . . we have learned that game is a crop, which Nature will grow and grow abundantly, provided only that we furnish the seed and a suitable environment.”*²⁰

One of the new breed was speaking.



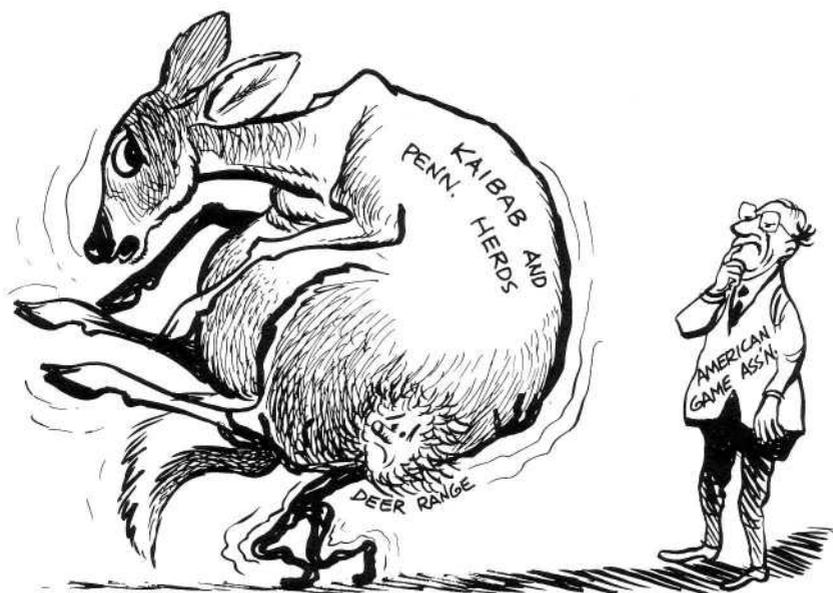
CHAPTER IV

AN AMERICAN GAME POLICY

In all great causes there is a single turning point, a pivot on which the old becomes the new. In the American conservation crusade, this occurred during the late 1920s with several remarkable events.

Before World War I, conservation action was the aftermath of alarm and fear that many Americans felt at the disappearance of their wildlife resources. The watchword was "protection," which is a part of conservation and indeed an important part, but not the whole. The unique new age of American wildlife management began to dawn during the deer crashes of the mid-1920s when it became apparent that there was something badly haywire in the protectionist philosophy of wildlife conservation. It just wasn't working the way it should.

A pioneer conservation group of the early 1900s was the American Game Protective and Propagation Association. With the Boone and Crockett Club and other key organizations, it was one of the potent citizen forces behind some of the early conservation legislation. It was also a progressive group, and by the 1920s it had shed the "Protective" and "Propagation" parts of its name to become simply "The American



Game Association.” As such, it generated the American Game Conference—the first annual public meeting to deal with wildlife problems and report conservation progress.

It was at the 1928 American Game Conference that a Committee on Game Policy was formed. The committee chairman was that forester named Leopold, who had moved from New Mexico to Wisconsin. The committee was a powerhouse of creative thinking, including such conservation greats as Seth Gordon, John C. Phillips and A. Willis Robertson.

The committee’s report, which was submitted in December, 1930, was a dynamic step in revamping American game management and shaping it into a positive effort. The new American Game Policy recognized the urgent need for scientific facts concerning game species, and for reorganization of state game departments. As a guideline for wildlife conservation action, the policy was a clear-eyed vision of what would be and must be, and the ideas in the little twenty-three-page report are as relevant today as when Aldo Leopold presented them forty years ago.²

The Policy asserted that seven things must be done to assure the success of wildlife management:

- 1) Extend public ownership and management of game lands.
- 2) Recognize the landowner as custodian of public game on all other lands, and protect him and compensate him accordingly.
- 3) Determine ways to bring the landowner, the sportsman, and the public into productive relationship with each other.
- 4) Train men for skillful game administration, management and fact-finding, and make game management a profession.
- 5) Recognize the non-shooting protectionist and the scientist as sharing with the sportsman and landowners the responsibility for wildlife conservation and to insist on a joint conservation program, jointly formulated and jointly financed.
- 6) Find facts on what to do on the land to make game abundant.
- 7) Provide funds—with public funds from general taxation to better wildlife as a whole, and with sportsmen paying for all betterments serving game alone, and private funds to help carry costs of education and research.

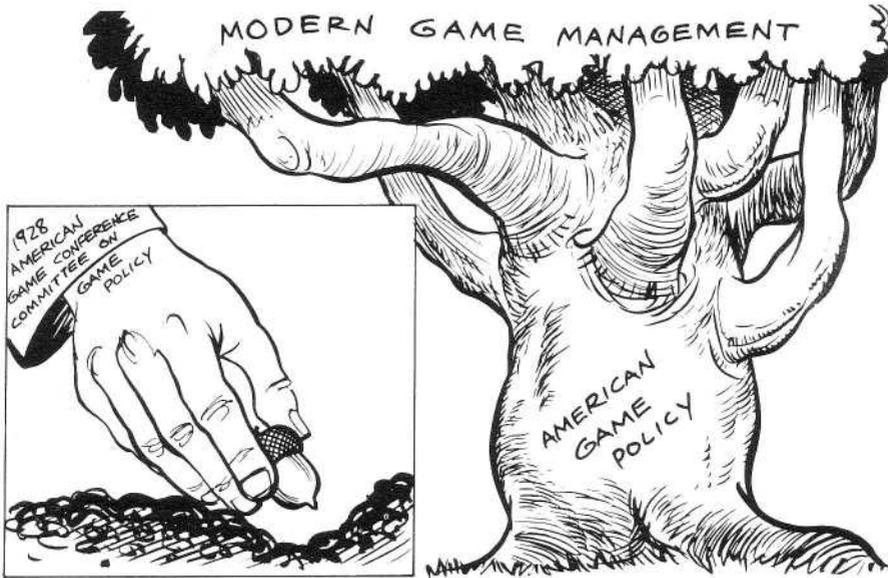
The report strongly urged that conservation be taken out of politics, that fish and game funds be earmarked for fish and game programs, and that every effort be made to build competent, stable, adequately-financed conservation departments.

It was revolutionary thinking at the time; there had been nothing like it before. Yet, it was essentially just common sense, shaped by the realization that the old systems were badly flawed. It was a crisp, succinct statement developed from an amorphous mass of ideas and needs.

This was the beginning of the Second Age of American wildlife conservation.

The first, the *restrictive phase*, had sought to increase game supplies by restricting hunting by both men and natural predators. It was a generally negative approach, a "Thou Shalt Not" way of thinking that did not seek to produce new game supplies but rather to save the original remnants as long as possible.

The American Game Policy was the real beginning of the *productive phase* of game management in which efforts were begun to improve



game supplies by making their habitats more productive. It was a “Thou Shalt, And In This Way” approach, a positive approach. It wasn’t a simple way; it demanded scientific knowledge of game species and their needs, and of the lands that produce game. This was the turning point, when we began a biological approach to wildlife management. By contrast, the older form of restrictive conservation required little special knowledge beyond the ability to see that game supplies were declining—and any kid with a plinker .22 could see *that*. But positive, productive game management demands trained men working in long-range programs.

The old restrictive systems were defeatist, based on the premise that game and hunting were dying out, and the hope was to stall this as long as possible by carefully protecting and rationing the remaining game supplies. Under the new philosophy of positive production, sportsmen began to realize that they could hunt game almost indefinitely if they helped the land produce game.

This philosophy had ancient roots, and was given some modern emphasis by Teddy Roosevelt. But it was Aldo Leopold, in the last half of the Roaring Twenties, who clearly expressed the need for positive wildlife conservation rather than negative protectionism. His early

ideas endure in the American Game Policy, the Game Survey of the North Central States,¹² and his classic *Game Management*—a book published in 1933.



And in the meantime, while Aldo Leopold was charting the course of modern conservation, a peppery newspaper cartoonist nicknamed “Ding” was doing some strong thinking of his own.

CHAPTER V

DARLING AND THE COLLEGES

Jay N. "Ding" Darling was a cartoonist who spent most of his career on Iowa newspapers—with the exception of a two-year hitch on the old *New York Herald Tribune*, which he happily chucked to return to the bucolic calm of Des Moines.

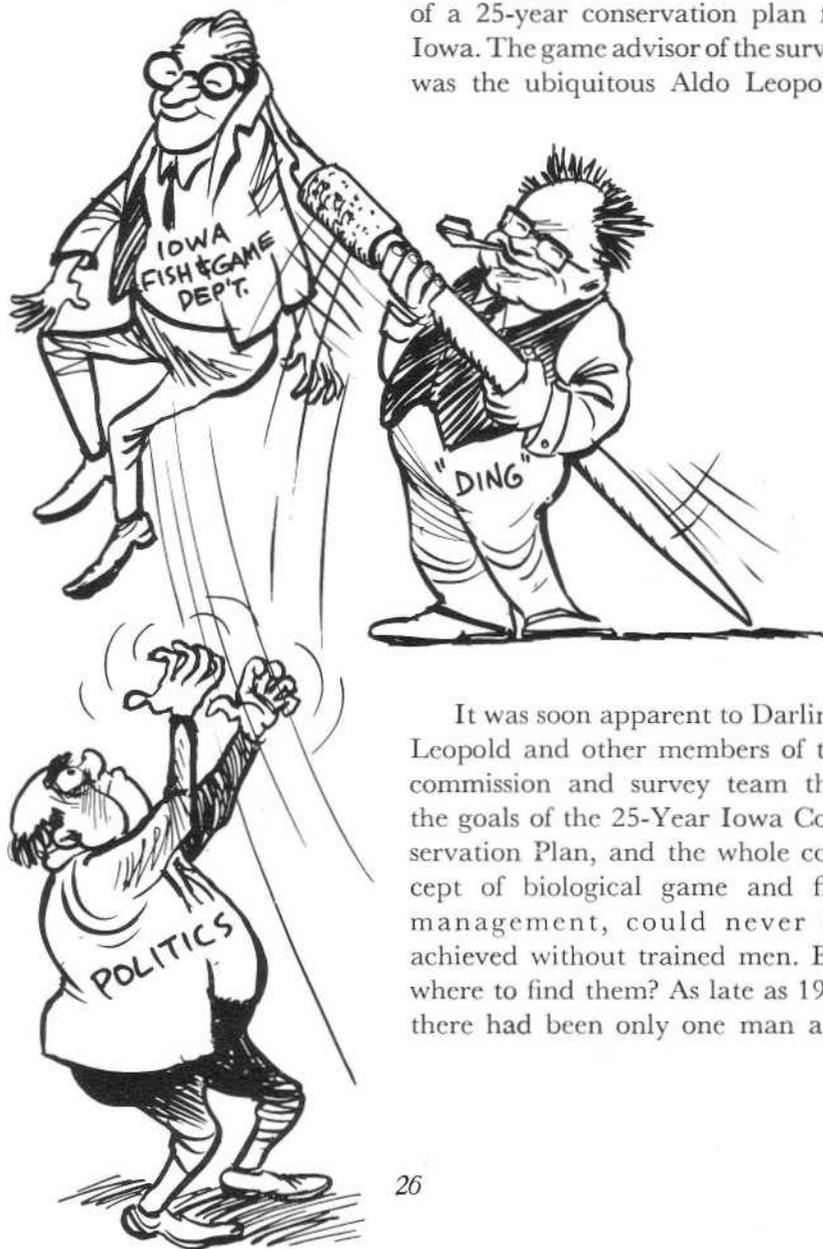
He was an avid hunter from the marsh-strewn prairies of northwestern Iowa, and he never really got over ducks and duck hunting. Early in his life he had known Theodore Roosevelt and been deeply impressed by him, and through a long career he drew perceptive, brilliant cartoons of resource waste and pollution, earning two Pulitzer Prizes along the way.

During the late 1920s Ding was a powerful voice (and pen) in midwestern conservation, and in 1931 he led Iowa sportsmen in backing a new law that took the Iowa game and fish department out of politics and set it up under a bipartisan conservation commission. It was the first such law in the United States.

The key to Iowa's game management hopes was the state's new "biological balance" law. This was defined as that condition in which all losses to a population are compensated by natural reproduction, and

the law required that game and fish be managed to maintain such a balance. The Conservation Commission was designated as the sole agency to determine whether or not a biological balance existed—and you don't do that with a crystal ball. It means trained professionals in the field, finding newer and better ways to inventory game and fish and to increase harvestable surpluses.

Darling was a member of the new commission, and one of the board's first acts was to sponsor a state survey that would be the basis of a 25-year conservation plan for Iowa. The game advisor of the survey was the ubiquitous Aldo Leopold.



It was soon apparent to Darling, Leopold and other members of the commission and survey team that the goals of the 25-Year Iowa Conservation Plan, and the whole concept of biological game and fish management, could never be achieved without trained men. But where to find them? As late as 1927 there had been only one man and

one college doing research that applied directly to game management. Most research on animals and birds at the time dealt with pest species, or was in the ethereal realm of pure science.

The situation wasn't much better by 1931. Something had to be done—and Iowa seemed a good place to begin.

Leopold had already pointed out that the essential ingredients of game research were a skillful investigator, money to pay him, land on which to work, and a place to contact scientists in related fields.

Since most of these components already existed at state agricultural colleges, it was now a question of taking the initiative, finding the money, and getting research training into gear.

It was proposed that a fish and game management training program be set up at Iowa State College at Ames. The program's cost for the first year were to be split three ways: the Iowa Conservation Commission would pay one third from hunting and fishing fees, the college would provide the same amount in services and materials, and Ding Darling volunteered the remainder from his own pocket!²⁰

The program began to pay off almost immediately with badly-needed information on game animals and their habitat. This was vital to the new Iowa conservation program; running a game agency without such information is like running a store without knowing the inventory. The long-term value of the program was the training of men at the graduate levels; these would be the leaders in the new era of wildlife research, management and administration.

The program at Iowa State College was almost three years old, and a resounding success, when Republican Ding Darling received an unexpected request from a Democrat named Franklin Delano Roosevelt. F. D. R. named Ding as Chief of the Bureau of Biological Survey, and Darling headed for his new job in Washington in March, 1934.²⁰

He brought with him the idea of expanding the model Iowa wildlife



training program to other states. His plan was to set up wildlife study programs in nine land-grant colleges at a total cost of \$243,000 for three years. As in Iowa, two-thirds of the bill would be paid by the state conservation agencies and the colleges themselves. But how about the remaining \$81,000? Unfortunately, there weren't many well-heeled conservation cartoonists who were willing to dig into their own pockets to finance wildlife research. Ding tried to obtain the money from the Administration without success. Half a dozen New Deal bureaus were spending a score of millions on various wildlife projects, but not a dime for research.



Undaunted, Darling turned to industry. In April, 1935, he made a powerful appeal to members of the Sporting Arms and Ammunition Manufacturers' Institute, and the group agreed to help underwrite the proposed wildlife training at the land-grant colleges. This pledge carried the day for the new research training program, and put the plan into action. Later that year, Cooperative Wildlife Research Units were established in Virginia, Oregon, Iowa, Connecticut, Alabama, Texas, Maine, Utah, and Ohio.

The following year, in 1936, the federal government gave the program an official blessing and it has been a state-federal function ever since. Each of the nine land-grant colleges was to furnish money, services or equipment, and this would be matched at each school by equal contributions from the American Wildlife Institute (successor to the American Game Association), the U.S. Biological Survey, and the state game department.

The goals of the Unit program have always been to:

- 1) Train professionals to staff game and fish agencies.
- 2) Conduct research and provide information of immediate use to game and fish management.

- 3) Provide technical help to the states in solving their wildlife problems.
- 4) Educate the public through demonstrations, lectures and publications.

Today, each Unit is run by its coordinating committee—representatives of the state land-grant college, and the federal Bureau of Sport Fisheries and Wildlife. The Unit Leader is a biologist employed by the Bureau, and he directs a research program set up by the coordinating committee.

There are eighteen Units today. These have produced most of the wildlife management knowledge that we have, and over 4,500 students have earned degrees in wildlife management, teaching and administration. Their influence extends into all fields of ecology and the conservation of nongame species, forests, soils and waters. Many are with public agencies, some are in industry, others are with private conservation organizations.

The impact of this Cooperative Wildlife Research Unit program on modern conservation is incalculable. It has lent the disciplines of science to the deep emotional dedication of sportsmen, and established American leadership in world wildlife conservation.

The success of the program was summarized by our old friend, the late Charlie "Wildlife" Gillham, former associate editor of *Field & Stream*. Charlie's observations on game management spanned more than fifty years, and he watched the concept change from a political football to a modern art-science. He wrote:

"The great renaissance in game management really began when certain land-grant colleges started teaching the subject and giving degrees to students for



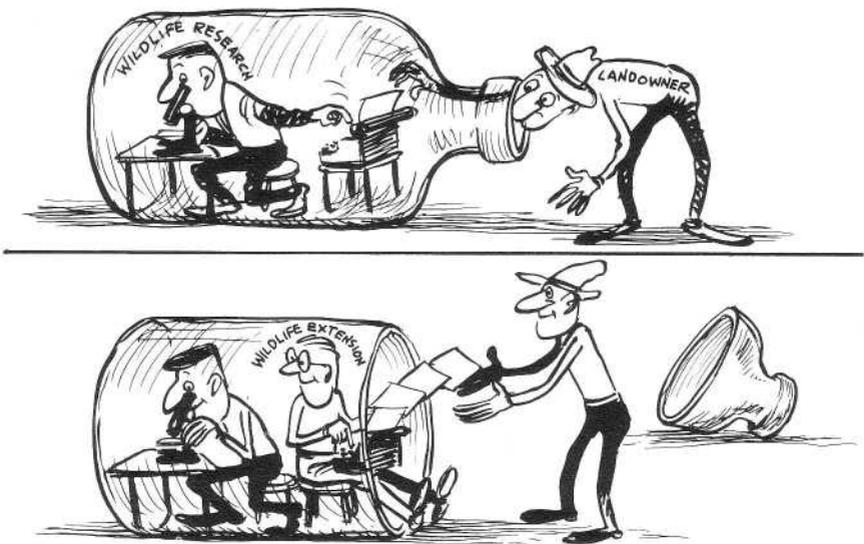
detailed studies of various wildlife species. Any critter, from an earthworm to a polar bear, was analyzed from A to izzard. Data on food habits, reproduction, abundance and distribution, and relationship to other species, were assembled. Years were consumed in the training of biologists, and still more years were required for studies to be made. Finally, however, state and federal game departments had good basic information to be used in the setting of seasons and bag limits on practically all species of game birds and mammals.”⁹

Charlie was right. The information was good and basic. But it would be really useful only if it could be spread around—especially among landowners.

Researchers themselves seldom have time to do this, and usually lack ability to reduce technical information into language that the layman will accept. This is a bottleneck that chokes the flow of information out into the land where it needs to be applied.

Agriculture had the same problem earlier, but had bridged the gap between the university and the farmer with the Cooperative Extension Services. With this highly successful example, a similar program was begun with wildlife.

At first, the extension wildlife programs were mainly concerned with rodent and predator control. But in 1946 a cooperative agreement was signed between the Federal Extension Service and the U.S. Fish and



Wildlife Service, resulting in more extension work with game and nongame species, and not just with predators and pests.¹

Today there are 50 extension fish and wildlife specialists in 24 states. Generally, these men train county extension workers in fish and wildlife, provide leadership in wildlife programs for 4-H and other youth groups, serve as liaison between various wildlife-related groups, train landowners to cut losses from pest wildlife, and give training and advice for income-producing enterprises that are related to land and wildlife.

Wildlife extension is at the grass roots of game management, for the specialists work directly with the landowners upon whom wildlife habitat depends. It's a tough job. Unlike agricultural extension, it's hard for the wildlife extension agent to show the average landowner any solid economic reasons for having wildlife habitat. Yet, the landowner must be sold on the idea of conserving wildlife if our wealth of new knowledge is to be put to work on the land—where it counts.

CHAPTER VI

THE THIRD STROKE

Obviously, all this brave new conservation couldn't be paid for with just hunting license fees and poaching fines. Big new sources of revenue were needed, and in the depths of the Depression revenue was either dried up or tied up.

But in their search for new money, conservationists noted that the federal government had imposed a 10 per cent excise tax in 1933 on the sales of sporting arms and ammunition. This tax was paid by the manufacturer, who passed it on to sportsmen in the purchase price of guns and ammo. The revenue was placed in the federal Treasury and was not earmarked for any specific purpose.

The U.S. Senate Committee on Conservation of Wildlife Resources, with Senator Key Pittman of Nevada as chairman and Carl D. Shoemaker as secretary, was aware of the benefits of federal aid to state highway programs. If gasoline taxes could be assigned to roadbuilding, certain gun taxes might be assigned to game habitat building, and the committee came up with the idea of spending the sporting arms and ammo excise tax for a broad wildlife restoration program. But they also knew that the Congress took a dim view of earmarking specific tax revenue, and they realized that they would need a lot of grass-roots support. They proceeded to generate it.²⁰

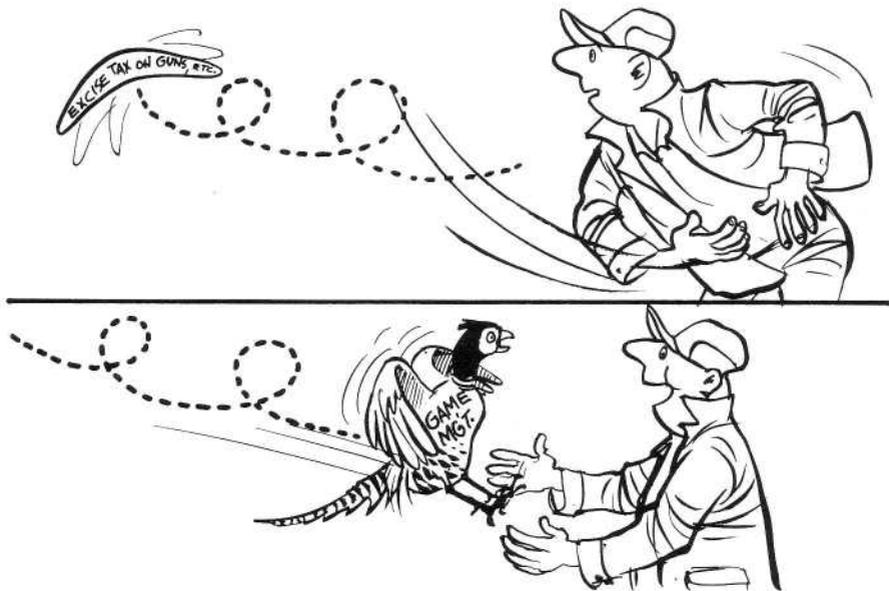
Supporters of the plan drummed up the enthusiasm and backing of fish and game officials as well as sportsmen and conservationists throughout the nation, and there was a public clamor to designate the gun and

ammunition tax for wildlife restoration within the states. Key Pittman introduced a bill in the Senate, and Representative A. Willis Robertson of Virginia sponsored a similar measure in the House. The Pittman-Robertson Federal Aid in Wildlife Restoration Act became a law of the land in 1937.

This crucial Act specified that the ten percent excise tax on sporting arms and ammunition must be maintained in a separate fund in the Treasury, and allocated annually to the states.

After deductions for administering the Act, the money was to be distributed on the basis of the land area of each state in relation to the total area of all states, and on the basis of the number of paid hunting license holders in each state during the preceding fiscal year as compared to the total number of paid hunting license holders in all the states. Such states as Texas, Pennsylvania, and California—with large land areas and many hunters—receive the biggest allocations.

The act was a bench mark of modern wildlife conservation. In order to participate in the Pittman-Robertson Program, each state was required to pass enabling legislation and consent to the provisions of the Act. One of these prohibited a state from diverting its hunting license fees to any use other than running the game department—at the



risk of losing its P-R funds. This threatened loss of Pittman-Robertson money was a steel trap that kept sticky political fingers out of state game and fish funds.

Not only was P-R money to be spent only on federally approved wildlife restoration projects, but persons employed on those projects were to be chosen on the basis of their competency. This enabled state game departments to develop permanent staffs that were qualified by training and experience to develop and conduct projects with a high degree of efficiency.

P-R projects fall into four general classes:

- 1) land purchases for wildlife,
- 2) land development for wildlife,
- 3) investigations and surveys to improve administration of wildlife resources,
- 4) coordination of projects necessary to efficient management of wildlife resources.



Generally, P-R funds were not to be spent on such practices as state game farms and bounties. Most of the program's first projects were surveys and investigations—and this is still one of the most important uses of R-P money.



A wildlife restoration project begins when the state submits a detailed plan to the Secretary of the Interior. Upon approval, the state game department then surveys such details as estimates and specifications. When these are also approved, a project agreement is prepared and signed by the state game department and Interior.

When the project is completed (or at some point during its progress) the state submits a claim for seventy-five percent of the actual costs. This is paid from the state's share of federal P-R funds. The remaining twenty-five percent is paid from state funds—usually from hunting license revenue at no cost to the taxpayer.

During World War II all excise taxes were hiked 10 per cent, increasing the tax on which the Pittman-Robertson Program depended from 10 per cent to 11 per cent. All excise taxes were rescinded after the war, but the sporting arms and ammunition industry requested that the full 11 per cent excise tax on their products remain in effect.²¹ Such voluntary taxation was unique, and eloquent testimony by industrialists that professional wildlife conservation was worth investing in.

The first P-R authorization was for the fiscal year 1939, and the Congress appropriated \$1,000,000 so that the program could begin on July 1, 1938. Thirty-three years later, in fiscal 1970, \$31,675,000 in P-R funds was available for state wildlife restoration—the largest yearly amount in the history of the Pittman-Robertson Program. By that time, a total of \$350 million in P-R funds had been collected.

The Act has provided a steady source of money when it was needed most. But just as important, it advanced professionalism and the biological approach to wildlife conservation. It helped block political raids on the conservation till, it financed solid wildlife restoration projects and foiled pork barrel schemes, and it greatly reduced political patronage by requiring that wildlife conservation programs be designed, approved and conducted by qualified professionals.

Technically, the P-R Program is called "federal aid." Actually, it's not. It's the hunter aiding himself. No P-R money is drawn from any general tax revenue; Pittman-Robertson Wildlife Restoration is financed entirely by the hunter and shooter through a self-imposed tax on arms and ammunition and the sale of hunting licenses.

It was the third powerful stroke in forging modern wildlife conservation during the 1930s.

First came a plan, in the form of the 1930 American Game Policy. Then came trained manpower and research via the 1935-36 Cooperative Research Unit Program.

And finally, welding these together with money and purpose and carefully shielding the tender new programs from political raids, came the Pittman-Robertson Act of 1937.



CHAPTER VII

DIVIDENDS

The sweat, study and vision of modern wildlife management is paying off.

One of its greatest dividends, of course, has been wildlife abundance. But just as important is the proof that the only way to that wildlife abundance is by improving the quality of the habitat. It seems simple now, but this great basic has been really understood only in the past few decades.

Protection was our earliest management method, and it halted the terrible declines of game. But protection alone was not enough, and failed to solve the real problems. It was only after biologists began studying the lives and times of game species in the field that we began understanding the reasons for the ebb and flow of game populations. When this new knowledge was put to work—with the judicious use of protection, refuges, trapping and transplanting—the science of modern game management was born.

The resurgence of American game herds has been as dramatic as their virtual disappearance.

At one time there were fewer than 50,000 elk remaining in the United States; today there are nearly five times that many. During the 1968 hunting season 88,000 elk were killed³ in the western states as part of a carefully planned harvest, and this was less than the surplus that could have been safely taken.

From a low of 25,000 pronghorns, our antelope population has increased to about 175,000. Over 50,000 a year may be taken by hunters,³ and Wyoming alone may shoot more antelope in one hunting season than existed in the world in 1920.



Deer have shown the most phenomenal increases. Once virtually extinct in most eastern and midwestern states, American deer have surged back in vast numbers. We have nearly 9,000,000 white-tails today, and over 1,500,000 mule deer. All of the states now allow some deer hunting, and the annual kill is well over 2,000,000 deer of all species.³

The comeback of the lordly wild turkey is a classic success story of modern game management.

Uncontrolled hunting and clearing of virgin forests had wiped out the wild turkey in most of its original range. But as forests came back, growing from abandoned stump farms to second-growth to mature forests again, and as new game laws were enacted and supported, the stage was set for the turkey's return. As the time grew ripe, wildlife biologists and game managers began trapping turkeys and transplanting them into suitable but empty turkey range, and the world's largest game bird was rescued from near-oblivion. Turkeys rose from a desperate low to more than a million birds by the spring of 1970. Turkey hunting prospered accordingly; in 1968 more than 128,000 were brought to bag. Even so, hunting has not kept pace with the general increase of the huge birds, and some game managers think that a quarter-million turkeys could be safely added to the 1968 figure without endangering the resource.

Another success story, but with a different twist, is of chukar partridge. The first North American releases of this Asiatic bird were in 1893,



and chukars were eventually stocked in 42 states. Most failed, but the chukar succeeded in regions that resembled its original range—the high deserts of our West. Even there, success came slowly. But the game people were learning, and the chukar has bloomed in our desert states. In 1954, four western states had hunting seasons for chukars; today they are being hunted in 10 states and British Columbia. One of the great values of the chukar is that it has filled a vacuum and now occupies many desert areas that

are devoid of other upland game birds.

The best-managed wildlife species are those of rather static, unchanging habitats such as desert, forests and wilderness.

In shocking contrast are most species of “farm game”—the pheasants, bobwhite quail, cottontails and waterfowl that suffer from violent changes in land use. Since the 1930s there has been an agricultural revolution. Potholes and sloughs have been drained, streams straightened, shelterbelts and hedgerows torn away, and small family farms combined into huge holdings that may specialize in a single crop. Great self-propelled machines, some costing as much as a family farm once did, now plant wonder seed, spray wonder chemicals, and reap wonder harvests—for the time being. In practice and principle, modern farming is an industry that suppresses all life on the land except cash crops.

If this is so, then doesn't farm game have enough trouble without being hunted in the bargain? Of all the machines threatening wildlife, isn't the hunter's gun the deadliest? No—because hunting only gleans part of a surplus that will vanish whether it is hunted or not. Small game cannot be stockpiled. Nature lavishly overproduces wildlife in spring and summer, but much of that wildlife will perish trying to pass through the bottleneck of late winter, when food and cover are at a minimum.

The wildlife biologist is making a desperate effort to evaluate the effects of the New Farming, and soften their blows. The effects of some

practices, such as land drainage, are obvious. Others, such as the use of farm chemicals, may be much less obvious but no less important.

As land changes, so do the kinds and numbers of wildlife. Changing land use has put some wildlife on the pest list, and others on the endangered list, and the game biologist is responding to both problems. He is trying to integrate wildlife practices with cropland retirement programs, and to reduce subsidized drainage of wetlands. And where habitat cannot meet the needs of native wildlife, efforts are being made to find substitute species. Such exotic wildlife, and the range that it is expected to fill, are carefully studied before any introductions or transplants are made. Even then, like some medical transplants in the human body, alien wildlife transplants are often rejected by the land—and for parallel reasons. But we're beginning to learn why this happens, and we are no longer playing blind man's buff with indiscriminate stocking programs.



There have been some sharp setbacks in game management, and we are faced with a host of new problems that are linked with population, land and pollution.

Yet, the gains have been phenomenal. There is simply nothing like

the North American system of game management anywhere else in the world. We have drawn dozens of our wildlife species back from the brink of doom, and that is impressive enough. But even more impressive is the continuing management of wildlife on such a high level of sustained production. We've not only preserved American game (which could have been done in zoos) but have maintained it in such numbers that millions of ordinary Americans can harvest several million big game animals each year, and countless small game animals. No other nation on earth has had so much hunting for so many hunters, for so long.

This doesn't just happen—it has been carefully planned.

Whenever possible, biological savvy is put to work on public and private lands to improve them for game. Today's hunter is governed by hunting regulations that have teeth and are enforced by trained officers. Those regulations are flexible, and result from continuous game inventory techniques developed by biologists. Finally, the game harvest is regulated by the annual production of game, and must not exceed the annual surplus of a game species—or the ability of the habitat to support wildlife. Since wildlife populations have been managed with biological balance, we have had no more Kaibabs.

It's all deceptively simple: the game biologist finds facts, the game warden polices the operation, and the hunter foots the bill. Hunttable wildlife needs little more than that, but can thrive with nothing less.

CHAPTER VIII

YESTERDAY, TODAY, ... TOMORROW

By 1939, the new conservation programs were gathering steam. The people had learned a bitter lesson from the Dust Bowl, and as the Depression eased they began to take new hope and new action. State conservation departments were being reorganized and strengthened, and federal conservation agencies were being expanded. Then a man named Adolph Hitler did some expanding of his own.

From then until 1945, the world had little interest in conservation. Quite the opposite: the war years were a desperate exercise in unlimited spending—the most costly audit of natural resources that the world had ever seen. Our superior resources won in the end, but the war was a heavy drain on America.

Our heavy resource spending didn't end with Japan's defeat. War's end found Americans starved for consumer products. We had worked hard, fought hard and denied ourselves for years, and we were starved for the "good things." We especially wanted millions of new cars and unlimited gas and rubber. We got the cars and began to build huge new highway systems on which to drive them, and we took to the road. We haven't stopped since.

There had been a great spurt of interest in hunting after World War I, and the same mood prevailed after World War II. A returning veteran usually wanted to get married, buy a car, and go hunting—although not necessarily in that order. It wasn't just because he had learned to use a gun in the army, and needed a new outlet for his killer instincts. It was because he had just undergone several years of rigid



wartime military discipline, and had an intense longing to be free and on his own and doing his own thing in his own way. For the soldier, that meant a blue suit; for the sailor, it meant a brown suit. To both, it meant going hunting, for hunting is a classic exercise in freedom. And so, with their new freedom and their new cars and unrationed gasoline, hunting is exactly where they went.

Great new pressures were being suddenly exerted on wildlife and game ranges. Rising demands were being made of conservation agencies by millions of active, restless young veterans who wanted quality outdoors. It was obvious that a big expansion in game management programs was needed, which meant more trained men and more money, and some of the same young men who created the problems now began to create solutions.

One of the few good things to emerge from World War II was the G.I. Bill of Rights. Millions of veterans went to college, flooding the campuses with a new breed of student. Fresh-faced high school grads were leavened with seasoned veterans of Normandy, Iwo Jima, and the prisoner-of-war camps. Many of these vets entered college as biology majors studying wildlife and fisheries management. The G.I. Bill trained thousands of young men who would otherwise never have attended college. Furthermore, many pre-war graduates used the G.I. Bill to finish their advanced degrees in wildlife management, not only rounding out their educations but also providing new and important research findings.

Post-war hunting pressure, and the growing number of new wildlife technicians, began to expand game management efforts beyond the wildest dreams of the old-timers. There were more hunters than ever, they were more mobile than they had ever been, they were buying more costly nonresident hunting licenses, and they swelled the Pittman-Robertson coffers with a post-war buying spree of new guns and sporting ammo. By 1950 it was apparent to everyone that we were entering a great new era of outdoor recreation, and it was about then that the new corps of game biologists and managers had begun to swell the ranks of state and federal conservation agencies.

It was a time of national expansion and stimulus. The war had been a transition between the economic stagnation of the 1930s and the burst of economic stimulation of the 1950s and 1960s. Great new advances were being made: plastics, transistors, antibiotics, antihistamines, fiber glass. Television and moon rockets were being perfected. Computers appeared, enabling engineers to speed their calculations beyond belief. Breakthrough engendered breakthrough, compounding technical information and knowledge overnight.

Wildlife conservation, however, had struck a ceiling. Instead of sharing the lightning growth of other sciences, conservation was simply holding the line—or trying to.

It wasn't for lack of knowledge or trained men. The field was brimming with professional energy and an urge to get on with new programs. But although the towering growth of technology had aided game management in many ways, the losses to conservation outweighed the gains. This is especially true with small game that is an incidental by-product of intensive farming, for the changes brought by farm technology have come too swiftly for either game or game managers to adapt to them.

The greatest obstacle faced by a wildlifer today is not nature's reluctance to reveal secrets, but man's reluctance to work and live in harmony with nature. A swiftly growing population is being carried on a technological tidal wave and seems consumed with an insatiable demand for consumer goods. But for some time now, the natural world that finances this colossal spending spree has shown deep stress. Our spiraling economy is beginning to gag on its own Gross National Product, and we are learning that there are dire penalties for irresponsible growth in consumption and population. We've done the easy things first, like



going to the moon and perfecting jet travel. The tough problems, like living in harmony with the land and getting along with our own children, have been postponed. We know what we like but we ignore what's good for us. We're kids who eat pie before spinach.

But with the danger signs of a rampant technology all around us, a new sense of caution is being felt. Words like "ecology" and "viable habitat" have crept into the idiom. There are the first faint signs of public revulsion (especially among the young) to a system that seems so eager to squander and befoul, and is so superbly equipped to do both.

The 1950s was the Decade of the Physicist; its symbol was the nuclear reactor. The 1960s was the Decade of the Engineer, symbolized by computers and space vehicles. The 1970s will be the Decade of the Ecologist, when men will demand better environments.

But if we are to have those environments, the landowner must become a steward instead of a miner. He must manage land on the basis of its capabilities and best uses, and not just for immediate economic gains which tend to eliminate elements in the land community that lack commercial value. All of us must realize that misuse of land resources not only depletes our greatest capital asset, but creates a cash liability against the taxpayer.

When Aldo Leopold defined conservation as a state of harmony between man and land, and called for a Land Ethic, he pointed out that such an ethic must embrace animals and plants that grow on the land. This is coming. And as modern man finds his Land Ethic and learns to live in harmony with the land and all its elements, the wildlife biologist is prepared to help develop tomorrow's quality environment. Wildlife specialists today know basic natural habitat better than anyone

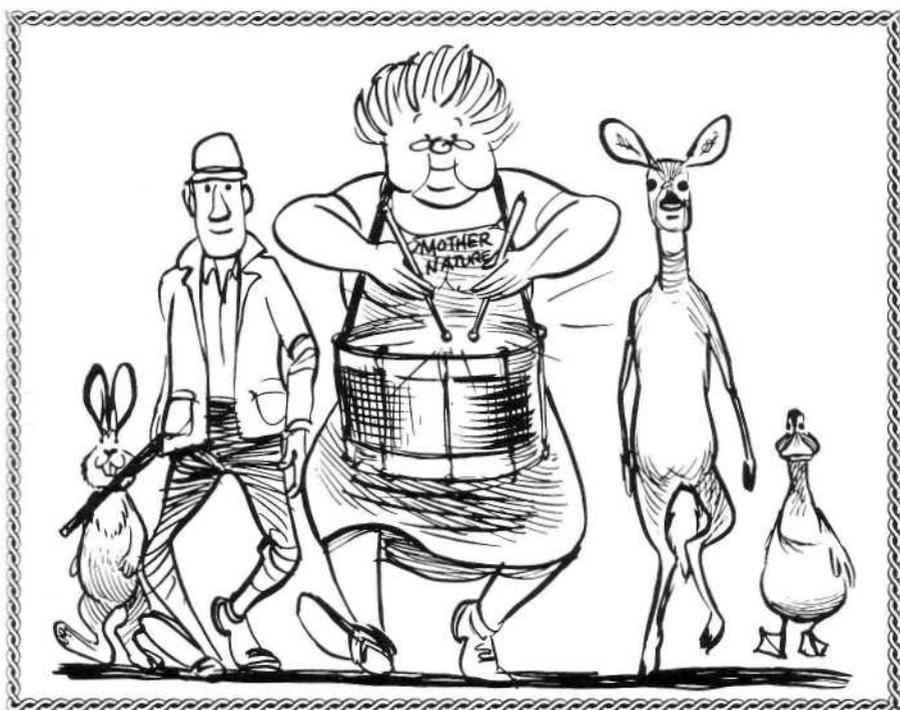


else. They are authorities on game animals and game fish—the organic indicators of highest environmental quality. They know what sickens natural populations and what strengthens them, and what enhances environment to the benefit of all its occupants.

Part of our current environmental surge is a growing interest and concern for wildlife of all types. Little is known of the biology and management of most nongame species, but this is an area of research that could be (and should be) occupied quickly and effectively by the modern game biologist. All he needs is a mandate from the public—and the sincerest mandate would be in the form of financing for nongame research and management. The game biologist is eager to direct his professional skills and knowledge into nongame wildlife management whenever the public decides to provide backing.

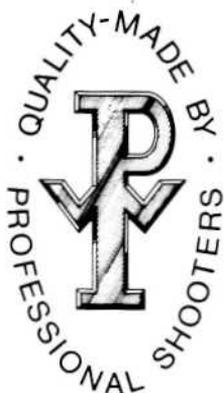
The biological approach to game management has succeeded in its early goals of saving endangered game species, and providing continuing supplies of huntable game.

But now there are new goals to be attained, and the professional wildlife biologist-ecologist can help attain them: the conservation of nongame wildlife and our best remaining natural environments, and even the conservation of man himself.



LITERATURE CITED

7. Almand, David J. and Dwight R. Smith. WILDLIFE EXTENSION AND ITS SPECIAL AUDIENCES. Presented at 6th Annual Short Course in Game and Fish Management, Colorado State University, Feb. 12, 1970.
2. AMERICAN GAME POLICY (A PROPOSED). Seventeenth Annual American Game Conference. New York. Dec. 1-2, 1930.
3. Bent, Arthur Cleveland. LIFE HISTORIES OF NORTH AMERICAN WATER-FOWL. Dover Publications, Inc. 1951.
4. BIG GAME INVENTORY FOR 1968. Bureau of Sport Fisheries and Wildlife, U.S. Fish and Wildlife Service. Washington, D.C.
5. Bump, Gardiner, Robert W. Darrow, Frank C. Edminster, and Walter F. Crissey. THE RUFFED GROUSE. New York State Conservation Dept. 1947.
6. Cahalane, Victor. MAMMALS OF NORTH AMERICA. MacMillan. 1954.
7. Connett, Eugene. (Editor). WILDFOWLING IN THE MISSISSIPPI FLYWAY. D. Van Nostrand Co. 1949.
8. Day, Albert M. NORTH AMERICAN WATERFOWL. Stackpole and Heck, Inc. 1949.
9. du Pont de Nemours & Company. WILD GAME—ITS LEGAL STATUS. Wilmington, Delaware. 1931.
10. Farb, Peter. MAN'S RISE TO CIVILIZATION. E. P. Dutton. 1968.
11. Gillham, Charles E. DOVES ARE INDESTRUCTIBLE. *Field & Stream*. Sept. 1965.
12. IOWA TWENTY-FIVE YEAR CONSERVATION PLAN (A REPORT ON). Iowa Board of Conservation and the Iowa Fish and Game Commission. Des Moines. 1933.
13. Leopold, Aldo. GAME MANAGEMENT. Charles Scribners' Sons, New York. 1933.
14. Leopold, Aldo. A GAME SURVEY OF THE NORTH CENTRAL STATES. Sporting Arms and Ammunition Manufacturers' Institute. Madison, Wisconsin. 1931.
15. Leopold, Aldo. A SAND COUNTY ALMANAC. Oxford University Press. 1949.
16. Murie, Olaus. THE ELK OF NORTH AMERICA. The Stackpole Co., Harrisburg, Pa., and the Wildlife Management Institute, Washington, D.C. 1951.
17. Popowski, Bert. HUNTING PRONGHORN ANTELOPE. The Stackpole Co., Harrisburg, Pa. 1959.
18. Roth, Charles. DIARY OF A MARKET HUNTER. *Colorado Outdoors*. Nov.-Dec. 1963.
19. Seton, Ernest Thompson. LIVES OF GAME ANIMALS, VOL. III. Literary Guild of America. New York. 1937.
20. STATUS OF WILDLIFE IN THE UNITED STATES. Report of the Special Committee on the Conservation of Wildlife Resources, United States Senate. Government Printing Office. 1940.
21. Taylor, Walter P. (Editor). THE DEER OF NORTH AMERICA. The Stackpole Co., Harrisburg, Pa., and the Wildlife Management Institute, Washington, D.C. 1956.
22. Trefethen, James B. CRUSADE FOR WILDLIFE. The Stackpole Co., Harrisburg, Pa., and the Boone and Crockett Club, New York. 1961.
23. Trefethen, James B. Personal Correspondence. Aug. 17, 1970.
24. Trefethen, James B. RETURN OF THE WHITE-TAILED DEER. *American Heritage*, New York. Feb. 1970.



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