

FOCUS

on Renewable Natural Resources



SD
12
I2
U452
v.2
no. 1

Page 2 Number 1



University of Idaho
Forest, Wildlife and Range Experiment Station
College of Forestry, Wildlife and Range Sciences
Moscow, Idaho

America's Natural Renewable Resources: A Pause to Reflect

This issue of FOCUS is intended as a contribution to the United States Bicentennial. It has been designed to provide an opportunity to a small group of Americans who deal with or have interest in the way our renewable natural resources have served this nation. The collection of essays appearing in this special issue is a reflection by these citizens, which takes a brief look at the past, views the present and contemplates the future of our forests, our wildlife and fisheries, and our rangelands.

The festivities already concluded and those planned for the remaining segment of this special year in the United States have often been noted in our newspapers and heard and seen on radio and television. Such festivities are designed to draw attention to this country's past: her natural resources and people, and the struggle prior to and after the arrival of the white man to employ these resources so that human life could be sustained.

Without doubt, the life of America's Indians was intimately intertwined with the renewable natural resources. Coexistence characterized this life style in a natural context which kept human numbers in check and in balance with the available resources. The vast resources in fact also played a vital role in helping white settlers find a "home" and begin to lay the foundation for the mightiest nation in the history of mankind.

Occasions such as the Bicentennial have a special meaning to those of us who deal with this country's forests, wildlife, fisheries and range resources. We look back and find the enormous impact these resources have had on the nation's development. Many of us are convinced that the United States would not have been in the leading position in which she now finds herself, had it not been for the abundant resources of the land. The use and abuse of these resources have now become a part of the country's colorful—and not always happy—history. The ethics of land use were generally formed around only the economic necessity, and rarely took into consideration long-range objectives. It is easy to point accusing fingers at those who, by today's standards, abused the land, ravished wildlife, decimated forestlands and used water without any regard to the complex, and not yet fully understood, environmental considerations. Such accusers, however, are ignoring history and the development of knowledge, much of which has been generated only during the last decade. Forester Gifford Pinchot was clearly a man ahead of his time, advocating ideas and setting ideals in a land not yet ready for his dreams.

The abuses of the past have now evolved into an unprecedented cry for a new approach—one that

emphasizes partnership between man and nature to the benefit of both, one which advocates the stewardship of the land, and which suggests long-range planning beyond man's own life span. In short, the history of natural resources use has now evolved into a stable and sustained advance toward a wiser course. This not only has brought a productivity never experienced before, but it also has forged an environmental ethic of caring for the land, water, and air essential to man's survival.

In this bicentennial year, the United States finds itself with some 220 million people in a world surpassing the 4 billion mark in population. Coupled with an alarmingly increasing world population, the spectre of exhausting vital fossil energy and other essential raw materials looms menacingly. Can the United States resist interdependence with the rest of the world? The answer, I suggest, is an emphatic no. What then does this imply when projected upon resource use?

It is now imminently clear that forests and rangelands of this nation will be called upon to provide an increasing share of human needs—not only for this country but also in other lands. Extremism of one kind or another cannot be allowed to overshadow sound planning. Such planning put into action by knowledgeable resource managers must and, I suggest, shall be the pattern of the future. The pace of the acquisition of knowledge in resource use is quickening. Greater sophistication based on research results will be a reality as we attempt to put every acre of productive land to work while paying due attention to environmental constraints. With the advance of time, the pressures for greater productivity will force forest managers to go to shorter and shorter rotation. The industry is likely to accelerate the adaptation to smaller log sizes which it is already pursuing. In the long run, at least a portion of the forest biomass, including stems, branches and leaves, will probably be converted to a liquid base from which a host of man's material needs can be met. This will probably be in line with the pattern currently employed in the petroleum industry.

The next century is poised to bring an exciting age for forestry and natural resource husbandry. It will also pose monumental challenges to those of us charged with the responsibility of understanding and managing these indispensable resources—resources which will be vital not only for man's material needs but also his spiritual well-being.

A. A. Moslemi

FOCUS

Volume 2 Number 1

1976 BICENTENNIAL ISSUE

- 3 Partnership of Man and Nature — Conservation Writes a New Chapter *Dr. John McGuire*
- 6 The Changing Wildlife Picture of America *Dr. Paul D. Dalke*
- 10 The Forest Products Industry's Role in the Development and Use of Our Forest Heritage *Richard B. Madden*
- 13 The Nation and Its Forests *Charles A. Connaughton*
- 15 Some Thoughts on Planning for the Use of Forest Resources *Dr. Ernest W. Hartung*
- 18 Wilderness Studies in a Natural Resources College *Dr. John H. Ehrenreich*
- 20 Importance of the Range Resources in the Development of the United States *Dr. Lee A. Sharp*
- 23 Natural Renewable Resources Research at the University of Idaho *Dr. Ali A. Moslemi and Ernest W. Wohletz*

The views expressed by the contributors are their own, and do not necessarily reflect the opinions or policy of the Forest, Wildlife and Range Experiment Station.

FOREST, WILDLIFE AND RANGE
EXPERIMENT STATION

Dr. Ali A. Moslemi, associate director

Susan R. Hieb, editor
Trudi Peek, artist

Front Cover: An Early Idaho Logging Scene
Courtesy of Potlatch Corporation



If your issue of Focus was addressed incorrectly, please return the mailing label with your corrections to the editor, Forest, Wildlife and Range Experiment Station University of Idaho, Moscow, Idaho 83843.

Partnership of Man and Nature— Conservation Writes a New Chapter

Dr. John McGuire

No one can reasonably question that the abundance of America's renewable natural resources ranks among the most important elements in the development of this great nation.

It would perhaps rate second only to the intelligence, industriousness and resourcefulness of that other "resource," the people of the United States.

The celebration of the 200th birthday of the independence of this country is certainly a testimonial to the successful melding of man's talents and efforts with nature's bounty for benefit of both man and nature.

We can take great pride in the achievements of this partnership in developing history's most powerful and enlightened country, but a new chapter in the conservation and use of renewable resources is just now being written, as we will see later in this article. Our third century could very well be the "coming of age," when enlightened conservation management and the capacity of the renewable natural resources base are in perfect balance.

The great strides in this direction are particularly impressive when we consider that the partnership of man and nature began with very uneasy foundations. Fear of nature was followed by a destructive effort to conquer it. This was followed by conflicts among men over ways nature's offerings of goods and services should be used—conflicts which still continue today. But happily, the United States' first two hundred years were characterized by the birth and flowering of an ethic of conservation and wise use of renewable natural resources which will reach maturity by our next centennial celebration.

*Dr. John McGuire is Chief
of the Forest Service, U.S.
Department of Agriculture.*

Bachrach photo



Hardships and Dangers

When the first white settlers arrived on these shores, they were greeted by great, brooding forests which seemed to form a vast barrier against the plowing, seeding and cultivation required by the new settlements. They could not be certain what fearful dangers and enemies might be lurking in those gloomy blankets of trees which stretched far to the horizon.

The hardships and dangers did materialize. With almost superhuman effort, clearings had to be wrested from the forest.

Confrontations with the forest's creatures were often fatal. However, there were some consolations. The wood from the forest trees provided fuel for the hearth and lumber for houses and buildings. Wildlife, nuts and berries from the forest provided food. Man began to realize nature was not a completely merciless foe.

But these favors were not enough to overcome the feeling that nature generally was a recalcitrant opponent to be subdued. During the next three hundred years, it was an unequal contest.

This process of bringing nature under control was materially benefitting for immediate needs, but it was also, in most cases, profligate and shortsighted. Because the resources appeared inexhaustible, forests were cut and allowed to burn without thought of regeneration, farms were abandoned when the soil wore out, wildlife was slaughtered almost frivolously. Sheer abundance and the challenge to master engendered monumental waste.

As the nation expanded Westward throughout the 19th century, it grew in population, development and economic power, but the cost to renewable natural resources was more than any country could pay for long. The exploitation was gradual at first, but the forests of New England were mostly cut by 1830, those of New York State by 1850 and Pennsylvania's after the Civil War. It was abundance of land, forests, water and wildlife that assured the settlement of the nation, and it was the wasteful attacks on these resources that gave birth to the thought that man was conquering nature all right, but the triumphs might become Pyrrhic. Future generations might be impressed with the prodigious growth of a new country, but that could be small consolation if the natural resources which made growth possible had been destroyed.

SD
12
12
2452
v.2

By the end of the first century of the country's independent existence, the conservation movement began to take shape. With the advent of the 20th century, that movement reached its full flood tide.

By 1900, the United States, with its great wealth of renewable natural resources, had become one of the greatest economic powers in the world. Its population was now 75 million. The country took a look ahead. Just in time, it realized the natural resources base which had made this great growth possible would not take the abuse of the previous hundred years for very much longer. Many other past civilizations had failed to reach that conclusion in time.



With the same type of fine historical quirk which had brought together exceptional leaders at just the right time to establish the nation's independence in 1776, conservation was welded into a national policy. Two of its heroes were Roosevelt and Pinchot.

President Theodore Roosevelt, an ardent conservationist, contributed mightily to the movement. With his friend, Gifford Pinchot, the first technically trained forester in the U.S., Roosevelt made large additions to the nation's forest reserves and established the U.S. Forest Service as a means of assuring protection, use and regeneration of the resources on these lands. A prime purpose was to halt the massive destructive exploitation which had characterized the 19th century. But it was much more. It was recognition that management could go hand-in-hand with protection to allow the nation to continue to prosper without losing the resources which were making that prosperity possible.

In a span of less than four decades, the excesses of the past were brought under control. Federal government and the states established cooperative efforts to stop the disastrous forest fires which periodically swept across the landscape. Scientific agriculture, forest, range and

watershed management took hold. Unregulated logging and grazing on public lands was ended. Public and private land managers began working together to renew old forests and plant new ones. Management of wildlife and recreation appeared. Unique natural features of the land were brought under protection in national parks. A wilderness system was born.

By the time of the Great Depression, conservation had become so much a part of the fabric of the nation, it was used as a vehicle for counter-attacking the country's most severe economic crisis. President Franklin Roosevelt established the Civilian Conservation Corps primarily to provide jobs for young men who were part of the greatest body of unemployed in U. S. history. More than 2 million youths took part in the program, and many of the nation's leaders in this generation are still able to trace their work careers back to the CCC. Although considered a secondary benefit at the time, the conservation work accomplished by the CCC on public lands is still paying off. A vast amount of forest protection, tree planting, watershed restoration, erosion control, recreation area development and other improvement work was accomplished.

Because of its success both in the rehabilitation of the economy and the land, the suggestion of reestablishing a CCC is revived almost any time a downturn in the economy occurs. The currently popular Youth Conservation Corps reflects some of the characteristics of the CCC.

The steady growth of conservation as a national policy was mothballed by the more pressing demands of World War II, but it was revived with even greater strength in the years following.

Historians are certain to consider this post-war period one of the most significant for insuring the future of a mighty nation.

A New Ethic

Despite the great strides made in the first half of the 20th century to assure protection and continued high production of our renewable resource base, a growing segment of the population began urging a new ethic.

That ethic was that economic benefit from renewable resources should be only one of the considerations in determining their use—not *the* consideration. First, the land and its products should be renewed when used. The development work of man should leave fewer scars on the landscape, and in some cases, development should be banned altogether as a national policy to insure natural havens where those who wished could renew their spirits.

Ironically, it was the full-scale attack on nature in the previous century and a half to wrest the economic treasures from the land which allowed the United States to even consider such a new philosophy. No other country in the world had ever adopted such a singular insight while it was still riding the crest of abundance.

For the United States, it was not too late, and the changes came rapidly. The world's first national

wilderness system, as such, was established in the 1960's from National Forest wilderness lands created administratively during the previous 40 years. The "Conservation Congress" of 1965-1966 passed a total of 51 conservation measures to combat problems of water pollution, air pollution, the need for designated recreation land, urban sprawl and the withdrawal of land from public use.

Of course, as with any "revolution" of thought, the transition to a new order was not without its noisy confrontations. From the conflicts, however, came legislation—and more important, a public consensus—recognizing that economic gains were being bought at the unnecessarily high cost of increased deterioration of the environment, pollution of air and water, overcrowding, and too little consideration for the future.

The climax to the great debate was passage of the National Environmental Policy Act. Even the act's sponsors did not realize the far-reaching effects it would have. Though it has only been seven years since its passage, few would not agree the act will long be considered a landmark piece of law-making. It set up the machinery for full consideration of alternatives to any public land action which might seriously disturb the environment, and for an examination of all the adverse and beneficial aspects involved in such an action. Most important, it required a high level of public involvement in the decision making process. Nothing like it had been seen before.

It established a deliberative and analytical process which diminished the likelihood of hasty actions, yet one major ingredient was still missing, particularly where renewable natural resources were involved. It was the mechanism of long-range planning required for health and continued high production of grazing lands, forests, wildlife populations, water courses and most of the other renewable resources. That flaw has now been remedied by another piece of landmark legislation in this new age of environmental enlightenment.

Future Heritage

Americans now knew that man and nature could live in harmony. Man could use the land, the water, wood, outdoor recreation opportunities, the wildlife and the forage. But could greater future populations enjoy the same benefits? What steps, if necessary, could be taken to assure this? How much would they cost?

These Americans were willing to invest in their natural resources, but there were no specific answers to their questions about the future. Many people felt financing of natural resources protection and development was being given comparatively low priority because of its

long-term nature. And, ironically, resources management was being financed on a year-to-year basis, even though goals realistically must be long-term to be effective.

Congress decided it was time to find some answers and determine the rightful place of renewable resources management in the federal budget. The vehicle for accomplishing this task was the "Forest and Rangeland Renewable Resources Planning Act of 1974."

It recognizes the supreme but often overlooked law of resource management that it is a long-term proposition. If we are to have bigger and better benefits from these resources by 2076, or even 2000, we must begin preparing now. Usually, resource improvement is a step-by-step process. Each phase of the work must be carried out in sequence within a rather long time frame. Yet, with the present budget system, a project could begin with a financial flourish, only to die with the following year's budget cutbacks.

The Resources Planning Act was created to meet these needs. It required two basic documents:

1. An assessment of the renewable resource situation on all 1.6 billion acres of forest and range land in the United States in all ownerships. (This comprises two-thirds the surface area of the U.S.)
2. A long-range program of Forest Service activities to provide a fair share of the future needs expressed in the assessment. The first program will cover the period 1977 through 2020.

President Ford submitted the first set of these documents to Congress early this year. The next will be submitted in 1980. Thereafter, the assessment will be updated every 10 years and the program every 5 years.

Congress has expressed its intention to tie the Forest Service budget to these documents. Each time the President submits an assessment or program, he will also transmit a statement of policy to be used in framing budget requests for the Forest Service

For the first time, a long-term renewable resources planning policy will be spelled out clearly for all to see. Congress has indicated a willingness to place greater emphasis on renewable resources management. Only time, and the national events yet to transpire, will determine final appraisal of the Resources Planning Act's importance in the history of this nation.

If the act's potential is realized fully, long-range planning and an abiding concern for our renewable resources can make our second 200 years an heritage to those 2176 celebrants, perhaps as important as independence itself.

The Changing Wildlife Picture of America

Dr. Paul D. Dalke

The intent of this paper is to sketch in rather broad terms the influence of some wildlife resources in the fast unfolding occupancy drama of the land acquired by the new American nation from the time of the Revolutionary War. Only a few of the high points of this drama can be touched nationwide.

Wildlife played an important role in the early days of mining in Idaho, and the significance of such an abundant and varied resource can be seen in all parts of the state today. Some details of wildlife research within the past 35 years close out the paper.

The War of Independence released the pent-up energy, the desire to move west to settle the great land that stretched to the Mississippi River and beyond. The abundance of wildlife provided continual food, and no one in his right mind could envision ever making the slightest inroad into the myriads of passenger pigeons, waterfowl or prairie chickens. The hardships of the pioneers were eased by the overflowing plenty of the wildlife resources of the new nation. Audubon's America was this kind of a land.

Scarcely more than a quarter of a century elapsed from the Declaration of Independence to the culmination of Thomas Jefferson's dream of a nation stretching to the Pacific coast region. With incredible speed came exploratory expeditions, all attesting to the abundance of furbearers and game from the prairies to the Pacific coast. None were as prolific in recording the presence of bison, antelope, deer and elk as were Captains Meriwether Lewis and William Clark with their Corps of Discovery, as they ascended the Missouri River to its smallest tributary and found its source in the Beaverhead

Mountains. The marvel of the Lewis and Clark Expedition was not only that the Captains observed, recorded and described many new mammals, birds, fishes and plants, but also that the expedition actually completed the round-trip intact. The man on the street in St. Louis never expected the Corps of Discovery to return. When the Expedition did return 30 months later, the excitement was felt less in the frontier town of St. Louis than in the nation's capital. After four abortive attempts, Thomas Jefferson had succeeded. The Corps of Discovery was well named.

Early Unlimited Harvest

The word was spread that there was an unlimited supply of beaver up the Missouri. The competition to harvest the beaver produced an intense cut-throat rivalry among the American Fur Company, The Rocky Mountain Fur Company, and the Hudson's Bay Company. Even Captain Bonneville took a two year leave from the Army to join the mountain men in their quest for beaver pews. Stripping the small streams of their beaver was largely completed between 1810 and 1839. The years 1833 and 1834 were notable for the annual rendezvous at Pierre's Hole west of the Teton Mountains in southeastern Idaho. These trade fairs brought wealth to the owners and traders. Trappers and Indians exchanged their beaver pews for supplies for the next year in one grand annual debauchery. Traders regularly cleared 500 to 1,000 percent mark-up on supplies over St. Louis prices at these annual rendezvous.

The bribery, piracy, ruthless trade practices and general corruption brought down the major fur companies. Beaver was no longer the inexhaustible fur. Hardly a creek or stream had escaped during the hey-day of the fur trade. A quarter of a century before gold was discovered in the Idaho Territory, trappers had taken their "gold" from the streams or tributaries of the Snake and Bear rivers. A residual population of beaver would in time repopulate the innumerable little streams to provide a renewable cash crop for settlers who came to stay.

Dr. Paul D. Dalke is Professor Emeritus of Wildlife Management in the College of Forestry, Wildlife and Range Sciences, University of Idaho.



Buffalo by the Millions

A second and even greater wildlife resource, mainly in the mid-American continent from the Mississippi River to the Rocky Mountains, fed Indians, trappers and the steady stream of immigrants for 30 years. Unlike the beaver, the buffalo was doomed to near extinction, and it took only about 50 years to liquidate 40 to 50 million

head. From the Spanish explorers in southern Texas came the first description of the buffalo. Alvar Nunez Cabeza de Vaca in 1530-1535 was the first European to record and make an eye witness account of the American buffalo, some 275 years before Lewis and Clark first saw them along the Missouri River in what is now South Dakota. Colonel Dodge estimated that in 1872-1874, more than 3,700,000 buffalo were slaughtered in the area of southern Nebraska, western Kansas, eastern Colorado and Odlahoma. With the completion of the railroads across the prairies and plains, the southern herd was practically exterminated by 1879. The last stand of the northern herd followed in 1883, only 3 years after the Northern Pacific Railroad tracks pushed west from Bismarck, North Dakota. In 1882, the Northern Pacific shipped 200,000 hides, yet in only 2 years' time this business was reduced to two cars and 300 skins.

It was the end of an era for the plains buffalo hunters. For nearly two decades following the great buffalo slaughter, there was a profitable business in collecting and shipping buffalo bones by the millions of pounds to eastern sugar refineries or fertilizer plants.

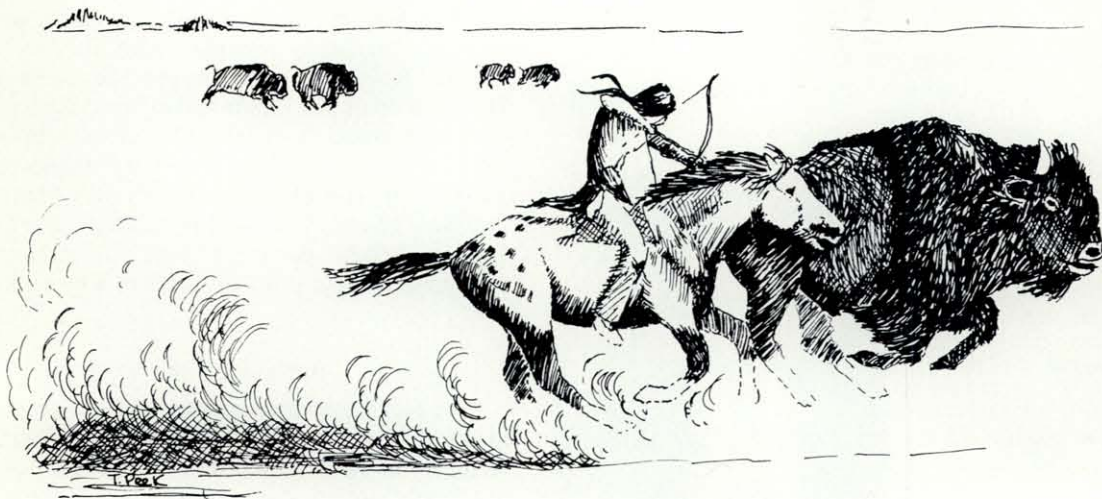
The first of the modern breeding herds was started in northwestern Montana as early as 1872. Publicity on mountain buffalo purchased for shipment to Canada sparked United States interest to establish herds in the West. In 1909, Congress set aside 20,000 acres in the Flathead Valley of western Montana for the National Bison Range. By 1915 the buffalo as a species had been saved; small herds can be seen in such places as Yellowstone National Park, Custer State Park, South Dakota, and The Wichita Mountains Wildlife Refuge in Oklahoma. In Canada 11 million buffalo range in Wood Buffalo National Park, near Great Slave Lake.

Game Birds by the Billions

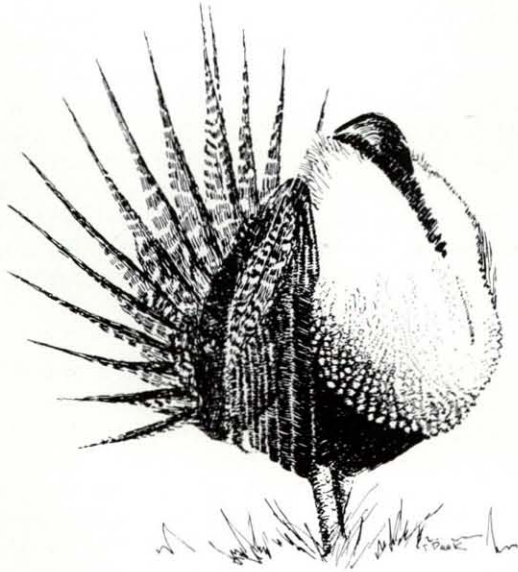
During the closing years of the great buffalo slaughter in the unlimited wildlife harvest era, a widespread market and hunting business was developing for upland game birds and waterfowl. The passenger pigeon alone provided for a well organized trade as the railroads began to offer more rapid transportation to city markets. Passenger pigeons were estimated to be in excess of 3 billion.

The constant drain on the pigeon population can be seen in just one operation, out of many, in Oceana County, Michigan in 1874: a hundred barrels per day were shipped for 30 days with 300 to 400 birds per barrel, plus 175,000 live birds. In 1874 alone, at least 1,075,000 pigeons were shipped from this one point. Three nesting sites in the same county furnished the market with 1000 tons of squabs. In 1878, shipments from Petosky, Michigan from 22 March to 12 August numbered 1,500,000 pigeons. In the 1870's and 1880's the market price varied from 50 cents to \$2 per dozen. The decline of the passenger pigeon was rapid and widespread. Fifty years of netting, trapping, clubbing and shooting doomed the species to extinction. The last wild passenger pigeon was shot in Pike County, Ohio on 24 March 1900.

It has been said that the "golden age of hunting" in the United States was confined to the 30 years from 1870-1900. Certainly the period can be characterized by an abundance of game and era of professional hunters. Market hunters measured their kill by the ton, barrel or wagonload, sometimes combining sport with business. At times, market hunters were energetic businessmen, combining the function of dealer and hunter. The products for sale ranged from venison, waterfowl and passenger pigeons to shore birds, prairie chickens and sharp-tails.



In Idaho, for example, some of the earliest accounts of commercial hunting for a specific product came out of Clark and Fremont Counties. Shortly after the turn of the century, elk were killed in large numbers on the upper Snake River Plains and adjoining foothills west of Yellowstone National Park. The tusk market hunters were busy killing bull elk for their upper canine teeth.



The rest of the carcasses were left where the animals fell. Many watch charm emblems came from the wapiti of Fremont County, Idaho. Elk hunters still prize the canines of elk, especially from large prime bulls.

There were feeble attempts to conserve what appeared to be an unlimited wildlife resource. What homesteaders would heed the words of the prophets when meat was free for the taking in prairie, forest or coastal and inland waters?

Development of Wildlife Management

The development of wildlife management in America has come about largely through the control of hunting. Even at the time of the Revolutionary War, most colonies had closed seasons on certain species, and state game laws were enacted as the frontier retreated into the west. Federal regulation of interstate game began with the Lacey Act of 1900. This Act prohibited interstate commerce in illegal game and was followed by the migratory bird act of 1913, and the migratory bird treaty with Canada in 1916. Twenty years were to elapse before a similar treaty was concluded with Mexico.

The idea of artificial propagation of upland game birds began with the first state game farm in Illinois, in 1905. State wildlife refuges as a device to maintain and increase game really began by 1910, although the first official wildlife refuge came into being by an act of the California Legislature in 1870. The impetus appeared to stop, and more than 35 years were to pass before states began to create refuges and game preserves. Idaho was among the first five states to create a wildlife refuge (1909). The initial effort of the federal government to preserve and restore wildlife (water birds) occurred 14 March of 1903, by efforts of the American Ornithologists' Union and the U.S. Biological Survey. Within five years, about 40 refuges had been established for the protection of nesting-colony birds. Of even greater significance was the extension of refuge protection to wildlife other than colony nesting species. Special protection for the Roosevelt elk began in 1909 with the creation of the Olympic National Monument. Today the National Wildlife Refuge system has grown to 378, comprising more than 33 million acres, of which two-thirds is contained within the State of Alaska.

Idaho is a state of great wildlife habitat diversity. Few states match its scope of mountains, plains and prairies. Completely free-flowing river systems add to this diversity. Because of the divergence of habitats, there is a considerable variety of wildlife. The recognition for the need of controls on the taking of wildlife came slowly. There were no game laws during the 26 years of territorial government or the first 9 years of state government. The original game laws were passed in 1899, in the fifth session of the State Legislature. The steps toward present day wildlife management have followed the broad national pattern. Idaho, with two-thirds of its area in federal forest and range land, still has vast hunting grounds upon which federal land management agencies hold the key to wildlife abundance. Residents of Idaho are making considerable use of wild animals profiting from the positive values and services they perform. These values can be summarized as being commercial, recreational and esthetic, as well as scientific, biological and social.

Wildlife Research in Idaho

In the 1930's, despite the great economic depression, there was a growing interest in restoring wildlife resources. The Federal Aid to Wildlife Restoration Act placed an 11 percent tax on sporting arms and ammunition. The act provided that the federal government match the states at a 3:1 ratio. Apportionments were made on the land area of the respective states and number of hunting licenses sold. No other single piece of federal legislation has had such a beneficial influence upon the states' wildlife management programs. The funds to expand state wildlife programs out-stripped the available trained personnel.

No one saw more clearly the need for technically trained wildlife biologists than "Ding" Darling, Chief of the U.S. Biological Survey in 1934 and 1935. He was the prime mover in establishing a cooperative wildlife research unit program supported by state universities, state fish and game departments, the U.S. Biological Survey (now the U.S. Fish and Wildlife Service), and the Wildlife Management Institute. The eight wildlife units begun in 1935, were given a chance to 1) train wildlife biologists, 2) conduct research to provide information for management of wildlife, 3) provide technical assistance to the states in solving their wildlife problems, and 4) provide conservation education through demonstrations, lectures and publications. Today, there are 20 wildlife units. Seven of the eight original units are still in existence. The worth of this 41-year old program is incalculable in terms of the impact upon the nation's wildlife resources and upon the lives and families of nearly 7,000 professionally trained people.

The Idaho Cooperative Wildlife Research Unit, organized in 1947, was the 12th addition to the program. There have been 97 advanced degrees granted in the 29 years since the establishment of the program in the College of Forestry, Wildlife and Range Sciences. The scope of investigations which have had useful applications for the management of Idaho's wildlife, covers the major species of big game, waterfowl and upland game birds. The results have been covered in innumerable publications. A very few of the research efforts which have yielded important results include such species as elk, mule deer, sage grouse, bighorn sheep, mountain goat, ruffed grouse, cougar and sandhill crane. Ecological studies of the influence of heavy metals upon waterfowl mortality in the Coeur d'Alene River valley provided supporting data for recent environmental impact evaluations.

The belief that supplemental salt is needed in the spring diet of deer and elk led to a large, expensive and burdensome program by the Idaho Fish and Game Department. Big game, in general, are attracted to natural salt licks in the spring, and will consume salt blocks when available. But there is no indication that they must have the supplemental salt to maintain vigor and health. Studies led to the conclusion that salt placed on the spring range did not induce elk to leave the winter range early. Departure out of low elevation canyons is governed by the onset of spring growth of grasses, forbs and shrubs. Natural salt licks are ignored until the elk have been on the diet of green plants for a week or more. Well worn trails radiate from natural licks, attesting to their drawing power for the elk in the vicinity during the spring months. From a high of 235 tons of salt distributed in 1947, a nominal annual 10 to 15 tons is now dropped by the Idaho Fish and Game Department.

A major continuing effort for the first 15 years of the Idaho Cooperative Wildlife Research Unit concerned the

ecology and management of America's largest plains grouse. In Fremont and Clark Counties, sage grouse found an ideal habitat in the sagebrush-grass plains and foothills. However, with the expansion of dry land and irrigation farming, together with the elimination of large tracts of sagebrush habitat, the sage grouse has been steadily declining. Interrelationships of strutting grounds to live-stock use, sexing and aging techniques, as well as determination of seasonal movements in relation to available food, were all a part of the sage grouse investigation. In view of the changes in the sage grouse habitat (both quantitatively and qualitatively), the concluding segment of the sage grouse studies involved a detailed analysis of nesting in sagebrush-grass rangeland subjected to different treatments. Sage grouse favored areas where bitterbrush and horse brush compensated for loss of sagebrush cover. Broods sought areas containing more forbs than found in sprayed areas. They did not use the most dense big sagebrush stands or those with little or no understory. Sprayed areas recovered more rapidly for broods than for nesting grouse.

The wilderness areas in Idaho have provided the locale for some of the significant research over the first 22 years. A study of predation on mule deer and elk by mountain lions in the Idaho Primitive Area showed that the prey species increased in the 4 years of the study with complete indifference to predation by both lions and hunters. Winter territories ranged from 5 to 20 square miles for females, to over 25 for males, as determined by radio-collared lions. In addition to the mountain lion study, the pristine mountain meadows of the Chamberlain Basin were the object of another 4-year study. More than 40 of these mountain meadows are key calving grounds and summer range for a large Rocky Mountain elk herd. The use and the quality of forage produced on five of these meadows indicate the importance of this ecosystem to the herbivores of the heart of the Idaho Primitive Area.

The advent of our Bicentennial year finds wildlife resources in Idaho with an ever-restricted or altered environment. Rapidly increasing human population reduces winter range for big game. Landfills often remove sequestered marsh lands or brushy habitat, and reduce or eliminate species with very specialized requirements. Aggressive species are often adaptable, and live and multiply to the discomfort of man's interests. Idaho's wild lands are to a large part best left to continue production of renewable resources of our forests and range lands. The future of the thriftiness of wildlands on our wild lands rests largely on how responsive land management agencies become to the needs of wildlife in the decades ahead.

The Forest Products Industry's Role in the Development and Use of our Forest Heritage

Richard B. Madden

This bicentennial year is a time for celebration and a time for contemplation. Americans have a unique opportunity to stage a band playing, banner raising birthday party recounting exciting national events and accomplishments. At a time when we are all too often bombarded with the conflicts and problems of our contemporary world, we have a chance for a reacquaintance with early American lifestyles and national heroes. This milestone year also provides an atmosphere conducive to a thoughtful pause—a time for serious reflection on the paths we have taken to the present, and the options before us for the future.

In examining industry's role in the development and use of our forest heritage, the temptation is to dwell on the past. Yet, the true spirit of our revolutionary forefathers was a dedication to the future. Perhaps the greatest tribute we can pay to these early Americans is to emulate their efforts to focus on the years ahead, to take this time to look critically at our goals and visualize and plan for the next 200 years. I have chosen to review the role of the forest products industry within this reflective framework, looking back far enough to put our present situation in its proper historical perspective, and then more closely scrutinizing where we are today in an attempt to more clearly see the possibilities for tomorrow.

Looking Back

Production of forest products was one of our country's earliest endeavors. Colonial forests were abundant, a ready source of material for shelter, fuel and other domestic products. The use of wood slowly expanded into simple extracting, manufacturing and exporting industries. Economic independence required items for barter or conversion to money to use in purchasing the

Richard B. Madden is President and Chief Executive officer of the Potlatch Corporation.



things colonists could not produce themselves. White pine boards, ship masts, staves for casks, tar, pitch and turpentine were among the young nation's earliest exports.

The Royal Navy sent its agents through the colonial woods in search of pines for ship masts. The tallest and straightest trees were marked with the Crown symbol, the Broad Arrow. The Crown's preemption of trees on public lands was one of the issues that helped touch off the Revolution.

The growth of the forest products industry nurtured that of the United States, furnishing many products demanded by new settlements and expanding transportation systems, jobs for a swelling population, and capital vital to national economic growth. Western expansion and the associated founding of new population centers quickened the industry's growth.

During most of the 19th century, economic conditions were not conducive to the conservation of timber; consequently, overcutting was common practice. As available timber declined in one part of the country, industry relocated closer to a new supply. The center of logging activity moved first from New England and the Mid-Atlantic States to the Lake States. Next it shifted to the pine and hardwood forests of the South, and finally by the early 1900's to the rich forests of the Far West.

The beginning of the 20th century saw a change in attitude toward America's timber supply. The myth of a boundless forest dissolved in the realization that there was indeed a limit to the national supply of wood. The newborn conservation movement gained momentum and, along with the industry's own recognition of a shrinking resource, changed the direction of forest use—from liquidation to management for continuing production based on timber growth.

The road from "cut and get out" to tree farming was neither rapidly traveled nor problem free. The early years of the companies that later became Potlatch Corporation coincide with this point in industry history and provide an interesting study of the financially precarious and painful transition experienced by the industry as a whole.

North Idaho held a strong attraction for lumbermen seeking new wood supplies—a rich supply of white pine. Long a preferred species in the market place, white pine was for many years the sole profitable species in the north Idaho wilderness. Potlatch Corporation had its beginnings in three companies, Potlatch Lumber Com-

pany, Clearwater Timber Company and Edward Rutledge Timber Company, each started in anticipation of large profits from the king of the pines and the strategic Idaho location, closer to the Eastern markets than Oregon and Washington timber.

Potlatch Lumber Company was the first to achieve production with a sawmill on the Palouse River. The other two companies owned extensive timberland. However, Rutledge did not operate a mill until 1916 and Clearwater's first mill startup was delayed until 1927.

Many physical difficulties and the financial plight of the three companies forced a merger in 1930. The new company, Potlatch Forests, Inc., possessed many acres of superb timberland, but PFI was further tested by the depressed lumber market of the 30's.

Fortunately, through these early years in Idaho, the company's investors were able to recognize changes in economic environment and shift the goals of operation from cutting out timber and liquidating land holdings to rational planning for full utilization of timber and for managing forests as a perpetual crop. Recognition of the limit to the resource, changes in property tax laws (providing for lower taxes on cutover and reproducing lands), as well as the local and national movement for cooperative fire protection, gave the people at Potlatch promise for a brighter future.

Business picked up for the company in the mid 1930's and the pressure to produce was on during the war years and postwar building boom. The span of time from World War II to the present has seen vast changes at Potlatch, as elsewhere in the forest products industry. Through growth, expansion, integration and diversification, Potlatch Corporation has grown into a large organization with land holdings of some 1.3 million acres in Idaho, Minnesota and Arkansas, and a dedication to the business of perpetual tree farming and wood conversion.

Looking at Today and the Future

What are the current trends in the forest products industry and where are we headed? Potlatch Corporation can again provide an example of the industry-wide picture. It will be helpful, however, to first review some of the patterns that give today's industry continuity with the past and to identify some of the changes that distinguish present day operations from those of our country's first 200 years.

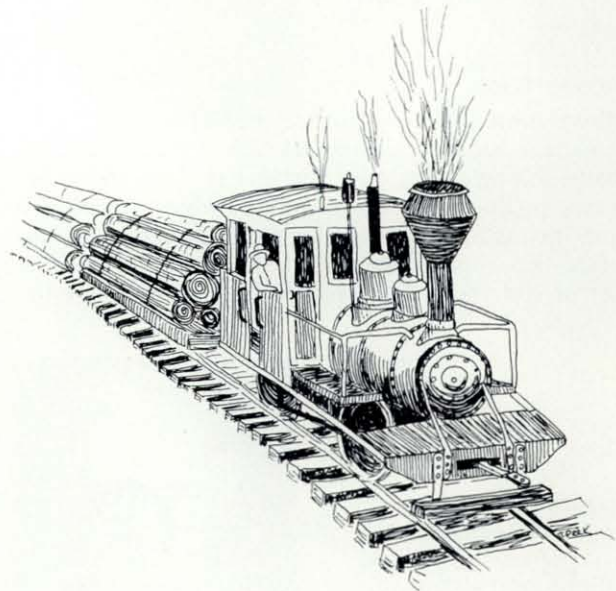
Our nation's economic system strongly links past years with the present and future. The basic functions, though increased in complexity and proportion, have

remained the same. The earliest lumber companies worked on the principle of conversion of wood to desired goods whose sale returned a profit to the producer. The type and quantity of goods were determined by wants and needs of consumers. The pattern is the same today. Profit supplies the life blood for economic growth, creating goods, jobs and capital.

An important function played by profits in today's forest products industry is making the best possible forest management practices a reality on industry lands. These practices include such activities as planting, thinning and fertilizing as well as a number of newer developments.

Reinvestment of profits into intensified forest management represents a new answer to the current timber supply problem. Today our nation is faced with a resource base limited in size and shrinking under the pressure of a growing population and government restrictions. Because of this shrinking forest, coupled with a rising demand for all kinds of forest products, (predicted to be double the 1970 level by the year 2000) we know we must produce more wood from less land.

The relative value of wood has changed radically from the days of Western expansion. The higher value of wood is a key to industry's meeting the demands of the future. Industry must be able to operate profitably in order to optimize fiber growth and utilization.



At Potlatch, our future as a successful corporation will also be affected by our ability to profitably grow and manage trees. Potlatch is taking giant strides in the area of intensified forest management. Potlatch forest managers are meeting the challenge of profitable tree growing through application of biological and economic principles, while maintaining a keen sense of social responsibility.



Forest economics are based on some important principles of tree growing: Young trees grow at a faster rate percentage-wise than old ones and often at a greater absolute rate. Trees grow better when they are properly spaced through thinning or planting, and when brush or unwanted trees are controlled. Better growth also can be anticipated when trees are genetically improved and properly fertilized. Mature trees are susceptible to attack by insects and diseases. Volume growth is not the same as value growth. The value difference between large and small trees is decreasing.

These principles point to a logical management goal of quickly establishing young, vigorous growing stands of trees on all of our lands. Younger trees growing faster make better use of growing space. They can be encouraged to grow even more rapidly by improving growing conditions and the genetic quality of the growing stock. Though the value of a given volume of wood added to a large tree may be higher than the value of the same amount of wood added to a small tree, conversion and utilization technology is reducing this value difference.

The point at which trees cease to add acceptable increments of value (when the trees are more valuable as harvested wood than as wood-producing factories) is now reached at an earlier age. The trend is toward shorter

rotation ages achieved through intensified management. Not many years ago industrial land owners thought of growing trees until they were 100 years old or more. Now 50 years or less often best meets the landowners' objectives.

Success in having our forests make an optimal contribution to corporate objectives is currently, and will continue to be, heavily dependent on the quality and effectiveness of our people. As we intensify forest management, professional foresters have an increasingly important role. In 1972 there were 44 graduate foresters employed by Potlatch in tree farming functions; in 1975 there were 76.

Foresters are also an indicator of our real feeling of responsibility to good stewardship. Good stewardship includes special awareness in planning and operations of potential impacts on soil, water and wildlife. We believe it also means opening virtually all our lands to the public for recreation. Our foresters are dedicated professionals and are trained to deal with the complexity of the forest ecosystem.

We are fundamentally both tree farmers and wood converters at Potlatch. Intensified forest management will help us bring our 1.3 million acres to their full potential for fiber growth.

The word for the future is fiber: fiber growth and utilization to meet the mushrooming demands for the thousands of forest products needed by society. Because of the long time lag in growing wood, it is essential to carefully plan ahead for many decades to insure constant supplies of wood fiber for our nation's next 200 years.

The Nation and its Forests

Charles A. Connaughton

It has been stated that no nation can flourish independently with less than 25 percent of its area in forest land. Whether or not this is precisely true, it is one way of saying that the sustained strength of a nation is geared to its renewable natural resources. The United States is no exception to this rule. In peace and in war our sustained strength throughout history has been associated to a marked degree with availability and husbandry of our renewable natural resource, including forests.

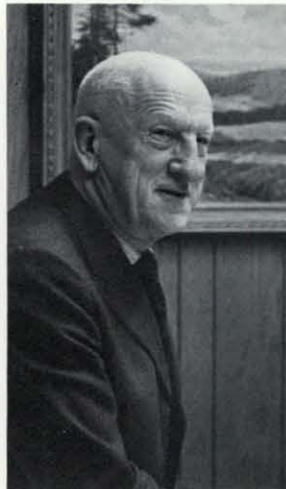
Ample Resources For Development

Since settlement began, man has drawn upon the forest for his shelter, food and much of his spiritual inspiration. In the process he has made a great impact upon the original forest cover, yet except where some higher use dictates otherwise, the forest always has been able to absorb man's activities and resiliently maintain its flow of needed goods and services.

There is no question that we have prospered as a nation, in a large part because a bountiful nature has provided repeated harvests from our forests. The expanding requirements of our developing nation have always been met from nature's vast stores, even though we were not always wise in the use of these forests. For many years we only needed to move on to new resources in virgin areas if we exhausted local supplies.

During our 200 year history, which includes one tragic civil war, two world wars, and other lesser conflicts, our need for forest products generally has been met fully. There always seemed to be enough to go around, and almost everyone was satisfied with the products.

Charles A. Connaughton, a forestry alumnus of the University of Idaho, is a former Pacific Northwest Regional Forester.



Recently, however, stresses on our forest base are being felt, or at least predicted, for the foreseeable future. This means the forest resource pressures will involve a different situation than in the past. It means limited supply. This means facing up to allocating land according to its best use, and calls for intensified management in the future. We must organize our forest properties so that man's managerial skills will complement our rich natural base of forest production. No longer can nature's vast endowment of forest riches be taken for granted as adequate to fulfill needs of a virile nation. The best planning and action of trained managers will be needed to insure an adequate supply of our renewable resources.

The fact that an adequate or even an over-abundant supply of forest products is being replaced by shortages is due to increased demands of an expanding population, and to a greater awareness of the forest's inspirational values arising from the environmental crusade. The reason for increased demands associated with an ever expanding population is obvious. More people need more fibre, recreation, water, forage, and wildlife from the forest. The demand for additional forest land to satisfy inspirational needs is less evident, but current public attitudes clearly indicate that this requirement must be satisfied as a future national requirement. Certainly our forest property, vast and resilient as it is, must be reorganized skillfully to satisfy present and anticipated needs, both tangible and intangible.

Land Classification and Intensive Management

When the place of the forests in the American economy over the past 200 years is examined, there is much to be learned. It has been an exciting and colorful past but it is questionable that the past period of virgin timber domination is a very sound guide for the future. New territorial frontiers which absorbed our expanding population no longer exist. Increased demands must be met by greater and more efficient use of the available areas where renewable crops of forests can be grown.

History alone does not offer good precedent for this venture. The first federal forestry around the year 1800 was directed at live oak culture in Florida, the primary production problem at the time. Today the same species has aesthetic value only; this first thrust of major concern at the beginning of our history no longer has real forestry significance. This demonstrates that history, by itself, has pitfalls in projecting the future for a resource such as forests.

Combining history with perspective, however, provides an opportunity to visualize possibilities in

forestry fairly realistically. Also these possibilities indicate certain actions which appear highly desirable if our forests' contribution to the national welfare is to be most effective.

Two major efforts at least appear essential. The first of these is the need for proper classification of forest land so that allocation of production potential can be understood and committed. We know now, and we will have an even sharper understanding in the future, that forest land must be designated to its highest and best use on a



plan-wise basis if we expect to organize management properly. The reason is obvious. This step is one of stratification which permits orderly grouping of relatively common circumstances for common treatment. Once classification is completed, all facilities pertinent to production can be most effectively organized on a priority basis to achieve optimum yields, whatever they may be. The classification process requires the utmost in technical skill, supplemented by social and political considerations of the kind that are supplied by public participation in decision making. The need for classification applies equally to public or privately owned lands, although the criteria used may be somewhat different in each case. Obviously the classification decisions will have great bearing on many matters other than production, such as taxation, business opportunities, transportation needs, community dependence and other items which relate to the resource base.

Following classification, the land must be scheduled for intensive management so that its full productive potential can be realized. Idle acres cannot be tolerated. In fact, even partially productive acres are becoming

more and more unacceptable with the passage of time. The charge that land must be productive is an attainable goal, not an idealistic dream. Our past has shown us how to do this job; now we must see that it is done. The necessary commitments must be made now to guarantee essential results in the future.

The details of intensive management will vary as local land requirements dictate. Where fibre production is primary, a given set of practices might prevail, whereas an entirely different set might be adapted to a forest where recreation use is primary. The process of selecting the proper prescription is a technical one, but not particularly difficult in the hands of trained managers. Usually the entire effort involves practical application of the multiple use concept of management.

Technical details for achieving land classification and intensive management can best be described elsewhere. However, one item of particular significance in the Intermountain area should receive special mention, that is the need for improved access to many forest lands. Exclusive of classified wilderness areas in which there will be no roads, there is currently a major forest potential being wasted through lack of access. The forest can and will be responsive to the needs of the nation in a much larger degree if accessibility is adequate. Forest managers cannot expect or receive results commensurate with potential in the absence of reasonable access. Incidentally, along with access there also must be a greater variety and versatility in markets available locally. Only with adequate markets can the productivity of the forests be realized and national and international competition met.

Man and the forest can meet the challenges ahead if they properly organize with vision and energy. Experience has shown that the forest will not fail—let us be certain that man will not be deficient in his obligations.

Some Thoughts on Planning for the Use of Forest Resources

Dr. Ernest W. Hartung

Having recently returned from a sabbatical leave devoted to a study of Idaho's resources, growth, and potential problems arising from growth and resource utilization, I am often asked to speculate concerning the possibilities of comprehensive long-range land-use and resource-use planning for the state. Implicit in any consideration of land-or resource-use planning, naturally, is a major concern for forests and range land.

Idaho is still in a relatively "ideal" situation to provide a milieu for the development of fairly uncomplicated long-range plans. Here, there is little urban sprawl; there is no large concentration of grossly polluting industry; population is not large or densely packed into a few areas; many natural or wilderness areas remain relatively unspoiled; water is relatively abundant and, granting a few notable exceptions, still relatively unpolluted; and the current economic base is healthily diversified. Still, I am not sure that much will actually be accomplished unless widespread efforts are first undertaken to reduce the diversity of perceptions which prevail among Idahoans regarding their state, its resources, and the utilization of these resources.

It is in some ways ironic that Idaho's close bond to the frontier past that provides its relatively uncomplicated planning base also makes for a social environment which places a high premium on "rugged individualism," and tends to create suspicion of any concept or plan for regulatory legislation impinging on the right of individuals to do what they please with their property, or which might be interpreted as encouraging broad-based state or regional uniformity and removal of local option in resource planning. This tendency to place high value on individualism, even in political matters, appears to encourage the diversity in perception noted above.

It is fair to suggest that in no area of resources or resource utilization is there a wider diversity of perception than prevails regarding forests and range. To some,

a forest is a source of paper, lumber, and a host of wood products. To others, a forest is a place for recreation, camping, hunting, or fishing. In some views, the forests are the invaluable conservers of natural precipitation and the prime element in maintaining soil moisture and effective watersheds, while in other views they constitute large, common, public areas for grazing and ranging of sheep and cattle. Many feel that forests constitute a national and/or state heritage to be preserved, guarded, and maintained in as close a state of being to that which existed prior to the coming of the white man as possible, while comparable numbers suggest that, as living entities, forests constitute in their entirety one of the nation's greatest usable, renewable resources which should be freely harvested, worked, and replanted.

Taken separately, the above listed perceptions may each be regarded, in a sense, as positive in outlook. Taken collectively, the same perceptions also evidence negatives and implicit conflict, depending on which perspective one holds. To those who see forests either from the preservationist or recreational point of view, the use of a forest for wood-product production via logging is clearly a dubious suggestion. To those who are interested in the use of public lands for food and animal ranging, the designation of forest reserves as heritage or wilderness areas to be essentially preserved against any but the most minimal encroachment by man and/or his domestic or semi-domestic animals, is a definite negative. To the potential explorer for, or exploiter of, mineral resources, a forest can be an inconvenience, or if it has been designated for recreational use or as a wildlife preserve, an expensive and frustrating obstacle.

The pervasive point in all of the above is that none of the perceptions alluded to, whether positive or negative, is incorrect or potentially generative of conflict, if taken in isolation. Obviously, however, they cannot be considered in isolation; hence, conflict of interest cannot be avoided. Our basic problem seems to lie in the fact that each interest or "perception group," while possibly even admitting that other points of view may exist, still regards its own perceptive outlook as primary above all others. This, in reality, is tantamount to ignoring the collective concept and considering the perception in isolation. No realistic approach to comprehensive planning can be expected to emerge under such circumstances.

If resolution is to be achieved and any sort of comprehensive planning for the future is to emerge, the conflict of interest in the "isolated perception approach" must first be reduced or ameliorated. In order to accomplish this, it appears that one approach might lie in



Dr. Ernest W. Hartung, President of the University of Idaho, has recently returned from a sabbatical supported by the George Frederick Jewett Foundation.

the introduction of some hitherto unstressed realities which may, if they can be exploited to the point of becoming new perceptions, become the key to reducing some of our present perceptual dilemmas.

Future Prospects

At the outset, it would appear that we have not stressed sufficiently the potential of forests as means or resources for dealing with many material and energy problems of the future in areas other than wood or paper products alone. For example, research is only now getting underway in the matter of chemical extraction from



bark for a wide range of products, from industrially important chemicals to insecticides. Relatively few people know this. Sawdust and pulp are also potentially valuable raw materials for chemical production of the alcohols and their derivatives necessary for certain plastics, synthetic fibers and other products that in today's production place major dependence on the petrochemical industry. Few people think of this.

The great mass of our present fossil fuels, whether gas, coal, or oil, are, in reality, forest products, if one considers their early origin. The chemistry of time, heat, pressure and other natural forces has converted them to their present form. In terms of matching present derivatives from these fossil sources, we certainly have the contemporary or potential technology to secure from our forests a similar range of derivatives, given the desire to do so. Part of that desire, obviously, must relate first to a general understanding that this potential lies in our forests as a value over and above our present concerns with lumber and paper products. In short, when we talk of forests as our greatest renewable resource, we must greatly expand our concepts of the nature of that renewable resource. To consider wood products or paper products, even in a wide sense, as the limits of potential harvest from the forest resource, does not serve the future adequately.

If we can accept the concept that our forests represent a far more diverse resource for the future than is presently understood or widely visualized, the next realization

will easily emerge. That is, we will have to maximize our forest productivity during the years ahead, or increasing demand, generated and enhanced by increasing uses, will rapidly lead to critical shortages. Many individuals in industry, in the U. S. Forest Service, in the Bureau of Land Management and other agencies are already predicting critical shortages shortly after the turn of the century if immediate steps are not taken to guarantee significantly increased future yields from our woodlands.

The plea for increased yields, unfortunately, at the present time, frequently stimulates an almost "knee-jerk reflex" of protest from some who fear that these pleas for greater productivity are merely a means to suggest a national return to the kind of rapacious and wasteful forest harvesting which blighted many parts of our nation in the middle to late 19th and early 20th centuries. Hopefully, a realistic and enlightened view of the *renewable* part of the term "renewable resource" can allay these apprehensions. We need to stress that what is needed right now is not more cutting, necessarily, but more planting and far more effective management in many of our forests now standing.

The real question in management, of course, is whether or not it is possible to realize all of the expectations from positive perceptions regarding forests suggested earlier in this paper, the while getting the fullest value from them which is implied in the term "renewable resource." Again, we come back to the matter of dealing with the isolated perception by the substitution of some different thinking about our forests.

In spite of what is probably a common view of trees as living entities, within our biotic world, all too few of the citizens of this nation actually think of forests as living. Again, lip service is given to the idea that trees, like people, go through life cycles and die, but somehow, as a people, we do not commonly project from the tree to the forest. Hence, all too frequently we fail to accept the concept that forests, too, have life cycles, are not static, and do not have to be in any particular stage in a life cycle to satisfy many of the expectations or perceptions suggested earlier.

Let me recount a personal experience in illustration. As a New York City native, upon entering Dartmouth College, I found untold wonder and pleasure in the forests adjacent to Hanover, New Hampshire. Hiking, particularly in the fall, when ascent of a bald knob or a high ridge afforded spectacular views of brightly colored maples, beeches, or birches contrasting with the dark green of conifers, became almost a passion. The woods were for me the ultimate in recreation, and the sight of a deer in an abandoned orchard at the edge of a pine forest made me, in my naivete, at one with Boone, Kenton, or the mountain men of the West about whom I had read.

As a junior, I enrolled in a course in forest botany, and on one of our field trips, was taken to a spot on a

wooded slope east of the campus. The land was private and posted; I had never been there before. The instructor led us to a grove of eight or ten white pines and hemlocks, which obviously had been part of the mature forest which Eleazor Wheelock had found when he first pushed into this part of New Hampshire to establish the college in 1769. Never had I seen such trees! A white pine with a trunk that three of us could barely encircle with our arms, which went up over 80 feet before giving off a branch, was indeed something for a city boy to encounter.

Second Growth Forests

Later in my hiking, the significance of those trees struck me in several ways. In the recorded history of New England, clearly, the woods in which I was then walking represented at least second or even third growth in terms of the size of trees represented. While I tried to imagine what it must have been like in 1769 in the "big" or primeval forest, I certainly had lost none of my capacity to enjoy the much younger growth around me. The deer, blue jays, and squirrels which greeted Wheelock still greeted me through their descendants, just as the descendants of the trees he found surrounded and greeted me in the mid 1930's. Forests, I concluded, were, in their own way, not unlike rivers. Excluding periods of flood or extreme low water, the river from a given view-point always looks pretty much the same, though the water is always different.

As if to emphasize the point, shortly after my graduation in 1938, a tropical hurricane of immense force struck the Connecticut and Rhode Island coasts of New England and moved north up the Connecticut River Valley into Canada. Its force destroyed many trees in the forests I had come to know around Hanover, including those in the "big tree grove" which dated back to Wheelock's time. I learned this some years later when I went back to look for the big trees and could not find them. Like any living entity, their life span had been concluded.

Forest Cycles

The concept of forest cycles, I suggest, is one which we now need to project and emphasize as a nationally, commonly accepted view of forests. Europeans, in a much older civilization than ours, have long since accepted the concept. Few Bavarians, I suggest, would ever wonder if their enjoyment of the Schwarzwald would be enhanced particularly if, in some way, they could be assured that this or that section were still made up of "original trees."

Our great problem in dealing with our concepts of forests is the dimension of time. The life cycle of a tree is so out of synchronization with the life cycle of a man or most of the plants or animals which man commonly uses or cultivates in the domestic sense, that we easily overlook the life rhythm of the forest. Fine, old, large trees grip us emotionally and delude us into the thought that they somehow can last forever if not cut down. How do we deal realistically with this perception?

Perhaps one good approach might lie in consideration of the life other than trees which relates to forests. As in the life cycle of man, the things of youth do not relate to old age nor do the sorts of relationships that go with middle age have meaning for childhood. A young forest emerging from a recent cutting or burn provides excellent browse and cover for deer and elk. On the other hand, the pileated woodpecker finds no habitat in such a forest, but requires a more mature forest with big trees and some accumulation of the products of a more extended life cycle—the trees that have died over the years, or are moribund and stand as snags or cripples. When we talk of forests as wildlife habitat then, which do we mean to favor, the elk or the woodpecker? Clearly, if we mean both, then we must have both kinds of forests. This is the sort of perception which has to be projected.

It is at this point that we logically come to the question of planning. If forests are to be many things to many interest groups, how is this to be achieved?

A first suggestion is that we seek agreement on the idea that management and planning probably can relate to all aspects of forests except those which we nationally have decided to declare as wilderness. Wilderness, I suggest, we define as that part of our land, forests and range which, by joint agreement, we will not designate as "renewable resource," except in the sense of having historical, limited recreational, research and aesthetic value. The big trees in Hanover, referred to earlier, in a miniscular way, were this kind of "wilderness." They had not been trammled by man. No one would have thought of cutting them for lumber, but in a sense, they also stood apart from the forests in which I enjoyed hiking. They were almost a living museum unto themselves. They were no longer a "forest resource." Our national parks probably may also be thought of in this sense. These areas will no more be thought of as potential sources of wood products than the Liberty Bell would be thought of as a potential source of metal for the auto industry.

But beyond the wilderness areas and the national park reservations lie the rest of our forests, all of which we, ultimately in our own self-interest, must come to regard as renewable resources. It is here that we must work most diligently in our planning. As crop rotation is common to field agriculture, so must "age rotation" become common to our forests. Our planning must ensure that, as a mature forest is cut, we have adjacent to it sub-mature or nearly mature areas into which displaced wildlife and recreationists can easily move and be accommodated with a minimum of distress. Newly seeded or planted areas naturally cannot be used as range without potentially excessive damage to young trees, but slightly older forests can supply good ranging areas. In plan, as these good ranging areas become displaced by more mature forests and offer little browse or open parkland, we should have new ranging areas coming on line. If properly handled, there should be no incompatibility in the use of our land, to supply sustenance both to livestock and to trees. But it has to be controlled as to time in the forest cycle to be optimally effective.

Planning Needed

No one reading the suggestions above would be deceived into thinking that such planning and the implementation of such plans would be easy—neither was putting a man on the moon. Our problem today, at least in the area of publicly held forest and range lands, is that we have little, if any, comprehensive planning at all and far less than adequate financing to carry forward on the plans we do have. Again, our problem is one of trying to synchronize our short life-span with the long life-span of trees. President Kennedy's goal of a man on the moon eight or ten years beyond the time of its delineation was something which the great majority of his readers or hearers could reasonably grasp and hope to see during the remainder of their lives. Moreover, it was a discrete goal with an end point. Gearing up now to meet a projected forest product shortage in 2025 to 2050 is not immediately fascinating to us since many, including the present writer, likely will not be around at that time. Further, dollars for spending on forests today to have impact in 50 years, do not have much political glamour and, hence, usually command a lower priority than those which will produce demonstrable effect within the incumbency of the average state or federal legislator.

If we can once bridge the time gap in terms of public-

ly held forests, as many private corporations have already done, and reach a level of management and planning which becomes continuous from planting to harvest, with a multiplicity of forest lands in different stages of the forest life cycle between, we shall be well along toward practical achievement of the promise of forests as a renewable resource.

We must, finally and as rapidly as possible, move away from any residual frontier thinking. When New England was essentially logged over, logging America moved westward to Michigan, Wisconsin, and Minnesota in the Paul Bunyan tradition, and thence on to the Pacific coast. Only in relatively recent years have we systematically begun to replant where we harvested instead of simply moving on to "the next area." We have finally been forced to this, somewhat reluctantly, only because the numbers of natural "next areas" are rapidly declining. Now is the time in which we must convince all of our citizens that, in terms of forest resources, all of the "next areas" will be those that have been planned. Before it is too late, we must bend every effort to the mission that the understanding of the forest resource and the planning and the financing of it are sufficient to make all of the planned "next areas" adequate to the country's future needs on a continuing basis.

Wilderness Studies in a Natural Resources College

Dr. John H. Ehrenreich

Not too many years ago it may have seemed incongruent to include—perhaps even to mention—wilderness studies in a forestry institution. However, a progressive institution is one responsive to the needs of society. It is increasingly clear that wilderness must be considered a need, or at very least a benefit, in urbanized America.

During the span of two centuries, our nation has come full circle in its attitude toward wilderness. From

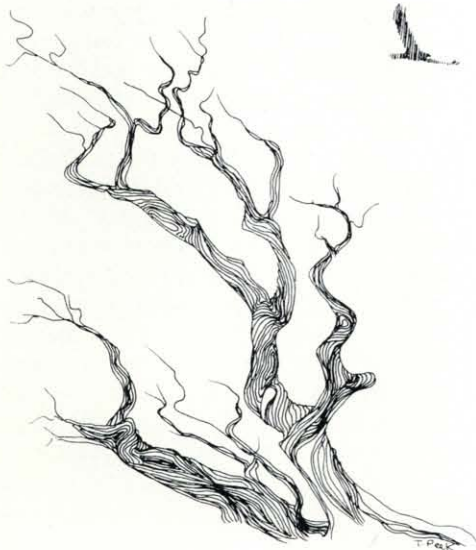
the Colonial fervor to conquer, there is now almost equal fervor to preserve portions of the wilderness remnant. And with today's interest in wilderness, new views are emerging that at first seem strange to some of us of the old school. Fire, for example, is no longer viewed as the dread enemy, but at times a useful tool or a natural component of the ecology. Predators, too, are viewed in new light, as are the chief predators - humans.

Not surprisingly some of the first proponents of a wilderness system were professional resource managers. Arthur H. Carhart, Aldo Leopold and Bob Marshall come quickly to mind, and scores more contributed to the eventual passage of The Wilderness Act in 1964. These visionaries saw wilderness not as a device to deny or stifle free enterprise, but instead as a way to prevent progress from engulfing all. They recognized what some of us have been slower to see, that wilderness, when properly designated, fits into the concept of multiple use. In short, they foresaw the need for what Congress declared as its policy in 1964, "to secure for the American people of present and future generations the benefits of an enduring resource of wilderness."

Dr. John H. Ehrenreich is Dean of the College of Forestry, Wildlife and Range Sciences at the University of Idaho.



Space on these pages does not allow a discussion of "why wilderness?" There is an analogy, however, that comes to mind when thinking centennials. As evidenced by the time capsules in cornerstones of buildings, an enlightened culture sees fit to preserve samples of nature "untouched" for the future. In wilderness, segments of undeveloped environment will serve immeasurably to



enrich the lives of future citizens. It will enrich our lives, too, serving both scientists and recreationists. Specifically, as stated in The Wilderness Act, these areas will be "administered for the use and enjoyment of the American people in such manner as will leave them unimpaired for future use and enjoyment as wilderness . . . and for the gathering and dissemination of information regarding their use and enjoyment as wilderness."

The concept of wilderness has always had special meaning to faculty professionals in forestry, wildlife and range management. Wilderness-related studies in the College of Forestry, Wildlife and Range Sciences, in fact, are on record dating back to the 1930's. However, the idea for special emphasis in this area in the College began to take shape in 1966 when Dr. Paul Dalke, now professor emeritus of wildlife resources, and some of his colleagues first suggested the development of a wilderness research center. At the same time, they successfully proposed the purchase of a 65-acre ranch located in the heart of the Idaho Primitive Area. Finally, in 1970, the Center was officially designated as an interdisciplinary unit of the University of Idaho, with responsibility for its administration housed in the College of Forestry, Wildlife and Range Sciences. The ranch, known as the Taylor Ranch Field Station, serves as one of the off-campus facilities used by researchers during the collection of data.

The center came under my directorship in the spring of 1975. In an effort to benefit from a broad base of wilderness expertise in the college, I appointed a technical board that is charged with the formulation of policies and with assisting in the planning and administration of activities through the center. During 1976, an advisory board will be added, consisting of leading citizens from across the nation who have demonstrated a concern for the future of wilderness studies.

The purpose of the Wilderness Research Center is to foster research and educational activities which will lead to a broader understanding of the structure and function of natural ecosystems, man's relationship to them, and their perpetual protection in the wilderness context. At present, more than a dozen research projects are identified with the center, ranging from the study of water quality to communication with wilderness recreationists. Educational efforts are also underway, including an undergraduate course in wilderness management and seminar speakers on a variety of wilderness topics.

Plans for this year include continued strengthening of the center's personnel structure, the stimulation of additional research campus-wide, solicitation of financial support from interested individuals, and several new educational activities.

Almost as a promise that America has not run out of horizons, the study of wilderness has come of age. The College of Forestry, Wildlife and Range Sciences has the opportunity for leadership in this field and The Wilderness Research Center is a large stride toward that end.

Importance of the Range Resources in the Development of the United States

Dr. Lee A. Sharp

Tarleton and his British forces are defeated by cowboys in 1781 in the battle of the "Cow Pens"! Range livestock production enterprises flourish in the eastern states during the Revolutionary War! You are skeptical, but it is true. Range resources played a prominent role in the development of the United States beginning even before the Revolutionary War.

Year-long grazing of domestic livestock occurred in Virginia, Georgia, the Carolinas and adjoining colonies in the mid 1700's (Barnes 1926). After invention of the cotton gin in 1795, cotton became king in the South, and livestock ranching in that area declined. Franciscan missionaries established ranching as the first industry in California when they brought cattle and horses from lower California to the San Diego mission in 1769 (Burcham 1956).

At the beginning of the 19th century, the land belonging to the United States was confined to the area east of the Mississippi River. France, Spain, England and Mexico had claims on the area west to the Pacific Ocean. The Louisiana Purchase in 1803, acquisition of Texas in 1845, the Oregon Compromise of 1846, the Mexican cession of 1848, and the Gadsden Purchase of 1853 increased the area of the United States by about 1.3 billion acres.

What to do with this vast territory? Settle it to provide homes for the homeless, the poor and the down-trodden? Let the vast resources contribute to building strength in the newly formed democracy?

Lewis and Clark completed their trek to the Pacific in September of 1806. Other expeditions penetrated the

wilderness, mapped its rivers and mountains and assessed its resources. Major Stephen H. Long wrote on his return from a trip across the Plains to the Colorado Rockies in 1819,

"In regard to this extensive section of country, I do not hesitate in giving the opinion, that it is almost wholly unfit for cultivation and of course, uninhabitable by a people depending on agriculture for their subsistence....the scarcity of wood and water, almost uniformly prevalent, will prove an insuperable obstacle in the way of settling the country....The buffalos, wild goats and other game...." (Lavendar 1965).

Thus, the term "Great American Desert" went down on maps to designate the area of the Great Plains.

Long was in essence classifying this vast area as rangeland and suggested that although uninhabitable by whites, the vast herds of wild game made it a fine home for nomads who lived by hunting (Lavendar 1965). What an ideal place to move the remaining Indian tribes of the eastern states!

The reports of the early explorers make it obvious that the environment of the acquired territory from west of the Mississippi to the Pacific Coast was strange and alien to the inhabitants of the eastern states. These early colonizers were, for the most part, from western Europe. They came from an environment with ample moisture, wooded and gently rolling topography. They found a similar physical environment in the eastern United States. Imagine their feelings when they emerged from the deciduous forest into the grasslands of the Plains. No wood with which to build shelters, and limited water except along the major streams. No wonder it was classified as a "desert."

There were some who were not convinced of Major Long's assessment of the Great Plains. The extensive grasslands of Texas, along with a land policy favorable to extensive types of agriculture—livestock ranching—promoted cattle raising in this southern part of the Plains. From Texas came the cattle herds and the people to prove the plains were habitable by white men.

Cattle Market Expands

Increasing population in the East, the westward movement, discovery of precious metals in the West, establishment of western military garrisons, confinement

Dr. Lee A. Sharp is professor and academic chairman of Range Resource Management in the College of Forestry, Wildlife and Range Sciences at the University of Idaho.



of Indians to reservations, and a growing foreign demand for American beef created markets for the rapid expansion of the range cattle business throughout the Great Plains and into the far western states in a little over a decade. The physical and economic environments were favorable, and there existed hardy adventuresome people who were not to be intimidated by the rigors of the plains environment or the native inhabitants. The richness of the plains' vast range resources stimulated expansion of the railroads, establishment of towns and cities and made "manifest destiny" possible.

While grazing as an agricultural enterprise in most civilized and well settled countries is considered an appropriate land use in areas too dry or too rough and unfertile for conventional cropland agriculture, this has not been the case in the United States (Dale 1930). Western European settlers of the eastern colonies tended to view livestock ranching as a transitory occupation, to be replaced in westward areas by the pioneer farmer. Thus, in the United States, livestock ranching was viewed as a frontier pursuit occurring as a stage in the settlement and development of the wilderness (Dale 1930). First the hunter and trapper, followed by the herder of livestock, and then the farmer, went the order of settlement expectations. This philosophy had a major impact on the subsequent settlement policies for the western areas of the United States.

The United States government developed a land policy to stimulate settlement of the western country based on the above philosophy, colored with geographic and environmental misconceptions of the semi-arid and arid country. This policy took the form of free grants of land to settlers. The Jeffersonian philosophy and belief that a causal relationship existed between family farming and the political system of democracy was probably responsible for this policy (Brewster 1963). The 160-acre tract as a free homestead to actual settlers was strongly advocated by the National Land Reform Association which formed in 1844, and was championed by Horace Greeley (Kollmorgen 1969). It was Horace Greeley, during a visit to California in 1859, who reflected a prevailing philosophy about cattle ranching as a gainful pursuit when he wrote:

"I fear this cattle-ranching, with long intervals between the ranches, is destined to half-barbarize many thousands of the next generation whom schools can scarcely reach, and to whom the sound of the church-going bell will be a stranger."

Kollmorgen (1969) refers to the early land policy and law makers of the eastern United States as "woodsmen," because of their environmental experience and background. The semi-arid and arid environments of the western range states were ideally suited to agricultural enterprises based on range livestock production. Such enterprises require extensive areas of land to support a viable economic unit. John Wesley Powell, in his report on the arid regions of the United States, recommended to Congress in 1878 that lands classified as pasturage units

should be granted in farm units of not less than 2,560 acres (Powell 1878). He recognized that even this acreage might be insufficient in some areas. Such a monstrous proposal was inconceivable to those who viewed 160-acre units as more than sufficient to support the small family farm unit.

When the limits to the conventional cropland agriculture of the East were reached at about the 98th meridian, "woodsmen's" solutions were advocated. Views that cultivating the soil would increase rainfall were widely held. A not uncommon view was that the planting of trees through the plains would induce a more favorable climate for cropland agriculture. The Timber Culture Act of 1873 provided settlers with an additional 160 acres if they would plant 40 acres in trees and cultivate them. Passage of this Act was advocated by those who believed strongly in weather modification through the planting of trees. When these attempts failed to produce the desired results, other means, somewhat more successful, were employed to make the small family farm in semi-arid and arid regions a valid concept. Some states were given grants of land under the Carey Act of 1894 to promote the development of irrigation projects. The Desert Land Act of 1877 was also for the purpose of promoting irrigation in moisture deficient areas.

Range Industry Survival

How was it that the range livestock industry survived in such an antagonistic social and political environment? Perhaps, the major factor in survival was that the resources used in such enterprises were more suited to this kind of agricultural activity than cropland agriculture. Although the land alienation laws were designed to be unfavorable to the "chaser of cattle," the range livestock producer found ways to use these acts to secure sufficient acreage for this enterprise. Filings and purchases under the Preemption Act, the original Homestead Act, the Timber Culture Act and the Desert Land Act permitted legal acquisition of 1,760 acres. The use of dummy entries, purchase of railroad and school grant lands, and the use of public land not taken up or allocated, made possible the development of viable units.

Many of the family units settling on western range lands with the intention of growing crops found their position impossible because of insufficient land area and an environment with frequent droughts, grasshopper outbreaks, and other plagues. They either defaulted on their land applications, abandoned their entries, or adapted by becoming range livestock producers.

The various attempts to replace or remove range livestock enterprises by cropland agriculture produced serious consequences. Overgrazing and deterioration of the resource base occurred as rangeland was diminished because of settlement and because many of the homesteaders turned to range livestock production as a means of survival. Stark testimony to the fact that more of the land area of the semi-arid and arid portions of the country should have remained as rangeland rather than being put to the plow, occurred in the 1930's. Disastrous

dust storms developed in the Plains and massive land repurchase programs were instituted to save the people who had homesteaded the drier areas.

In spite of all the attempts to replace the transitory range livestock production enterprises, livestock grazing is still a major land use in the United States. More than 885 million acres or about 46 percent of all land in the contiguous 48 states is used for range livestock produc-



tion. When one considers only the area of the 17 western states, range and pasture lands constitute 65 percent of the total area. The figure is nearly 70 percent (69.3) in the 11 far western states.

Looking back, what role have range resources played in the development of the United States? Their importance can only be assessed in terms of how they shaped people and societies. Settlement of the great interior of America was strongly influenced by those who sought to harvest the forage. Floods, drought, insect plagues and political opposition to their way of life forged a character that is resourceful, not easily discouraged, and that portrays the classic American formula of success for those with ambition and a willingness to work hard — characteristics that are fast disappearing from the people of the U. S.

Tall hats, high heeled boots, and western cut pants signify membership in the fraternity, an association with it, or a desire to be so identified. Our society is strengthened by subscribing to, or being at least in sympathy with the attributes characterizing those who make a living from range resources.

Unique facets of our culture stem from the development of the West by the range livestock industry and those who opposed or encouraged such development. Matt Dillon, Billy the Kid, the Wild Bunch, Wild Bill Hickok and many others form the bases for books, movies and television programs. Unique in the American culture are the paintings and sculpture of such men as Charles Russell and Frederic Remington.

As we look to the future with increasing world populations, declining reserves of energy, and limited quantities of mineral elements, the forage resources will play an increasingly important role in our economy and the quality of our lives.

The productivity and economic importance of the rangeland resources have long been grossly underestimated. Love (1970) pointed out that:

“...Its production of meat alone (not to speak of lumber and minerals) is impressive. The western rangelands constituting the major portion of the billion acres of range and pasture in the continental U. S., account for more than half of the natural production of livestock, which is estimated to total \$5 billion to \$10 billion a year (compared with \$14 billion for all other crops including forest products).”

Watershed, recreational, wildlife habitat, and wilderness values and uses of the rangeland resources make their role of extreme importance in the lives of all Americans.

Cook (1971), in assessing the potential importance of the public range lands for producing food, indicates that the forage resource on public lands is capable of furnishing enough energy to produce about 52 percent of the total beef consumed per capita in the United States at the present time.

Range resources can contribute substantially more in the way of food production than previously experienced. In addition, much of the life quality values associated with open space, clean air and clean water can be maintained or improved. Society is strengthened through having people that have experienced and survived the vicissitudes of nature, economics and political philosophies.

LITERATURE CITED

- Barnes, Will C. 1926. *The Story of Range*. Repr. 1926, from Part 6, Hearings before a Subcommittee of the Committee on Public Lands and Surveys, U.S. Senate, 69th Congr. 1st Sess. Pursuant to Senate Res. 347.
- Brewster, J.M. 1963. *The Relevance of the Jeffersonian Dream Today*. in *Land Use Policy and Problems of the United States*. Howard W. Ottosen, ed. Univ. of Nebraska Press. pp. 86-137.
- Burcham, L.T. 1956. *Historical Backgrounds of Rangeland Use in California*. *J. Range Manage.* 9(2):81-86.
- Cook, C.W. 1971. *Why Not Say It the Way it Is!* *J. Range Manage.* 24(4):320-321.
- Dale, E.E. 1930. *The Range Cattle Industry*. Univ. of Oklahoma Press, Norman, Okla. pp. 216.
- Lavendar, David. 1965. *The American Heritage History of the Great West*. American Heritage Publishing Co., Inc., New York. pp. 416.
- Love, M.R. 1970. *The Rangelands of the Western U.S.* *Scientific American*. 222(2):88-98.
- Kollmorgen, W.M. 1969. *The Woodsmen's Assaults on the Domain of the Cattleman*. *Annals of the Association of American Geographers*. 59(2):215-239.
- Powell, J.W. 1878. *Report on the Lands of the Arid Regions of the United States*. Ex. Doc. 45th Congr. 2d Sess. No. 73. pp. 195.

Natural Renewable Resources Research at the University of Idaho

Dr. A. A. Moslemi and E. W. Wohletz

The natural renewable resources in Idaho are world renowned. Forest, water, wildlife, fisheries and range resources are unquestionably Idaho's greatest natural heritage. These resources have had a gigantic impact on the well-being of the people and have molded a life-style uniquely characteristic of this largely wild and pristine mountainous land.

Over 90 percent of the state's 53 million acre land area is still covered by forests and range. Several million acres are essentially original wilderness largely untrammelled by man.

The "developed" forest areas of Douglas-fir, grand fir, western hemlock, white pine, ponderosa pine and western redcedar have now become a basic pillar for Idaho's economy. Over a third of all industrial establishments, and over a quarter of its industrial labor force directly or indirectly depend on the wood raw material grown in the state. It is without doubt that the wood using industry has now become a vital element in the economic well-being of the State of Idaho.

In recent years, a considerable amount of information has become available on the wildlife resources of Idaho. Idaho's forest and range resources provide food and habitat for deer, elk, antelope, mountain goats, bighorn sheep, moose and smaller game and non-game species of wildlife. Idaho's 21 million acres of forest land and 30 million acres of rangeland provide much of the food needed by this array of wildlife. In addition, these rangelands provide feed for over a million head of cattle and 650,000 head of sheep, which together comprise an important segment of the state's economy.

The fisheries resources in the state are no less renowned than its wildlife. Various varieties of salmon and trout have important spawning grounds in the state.

The fisheries activities in Idaho provide important recreational and industrial opportunities difficult to find elsewhere. Also, the management of this resource has a vital impact on fisheries over a major section of the Columbia Basin fisheries activities.

The vast beauty and serenity of Idaho's outdoors, shaped by the renewable natural resources, also provide outstanding recreational opportunities. In fact, tourism has now become one of the most important industries to the State of Idaho. Hunting, fishing and camping in the vast Idaho outdoors, and water-related recreational activities, underlie the strength of Idaho's tourism industry. The aesthetics and the relatively high quality of water in Idaho's lakes and streams provide excellent recreational opportunities as well as supplying vital and increasingly scarce water for agricultural and industrial activities.

Experiment Station

Greatly dependent on the renewable natural resources, Idahoans sensed a relatively early concern for the development of a scientific knowledge on which to base their use. This concern was responsible for introducing forestry education at the University of Idaho in the early 1900's. By 1909, a new Department of Forestry was chartered, headed by Professor Charles H. Shattuck. Some 300 varieties of trees were brought in from around the nation and trial plots established. This constituted the first recorded research project in forestry at the University of Idaho. Of the 300 species, approximately half proved well suited to Idaho, and many are now being widely used as windbreaks, farm woodlots and soil stabilizers, primarily in southern Idaho. With that modest beginning, activities in research gradually expanded to the extent that by 1929, some 19 separate projects were underway with budgets ranging from \$200



Dr. Ali A. Moslemi is associate director of the Forest, Wildlife and Range Experiment Station at the University of Idaho.



Ernest W. Wohletz is Dean Emeritus of the College of Forestry, Wildlife and Range Sciences.

to \$1900. These fundings were provided by state and private organizations including those allocated to the School of Forestry. The depression, followed by World War II, brought about a decline in research funding and thereby research activities. By the late 1930's, the need for a vigorous, sustained level of research was being felt.

To insure continuous budgeting support, the Idaho legislature created the Forest, Wildlife and Range Experiment Station in 1939. The Department of Forestry, meanwhile, had been upgraded to the School of Forestry in 1917, and its programs expanded. Thus, some 30 years of development work had occurred prior to the establishment of the Forest, Wildlife and Range Experiment Station.

Chapter 259 of the Idaho session of the 1939 legislature reflects the charter for the Forest, Wildlife and Range Experiment Station. This charter specifies the station's organization, functions, duties and authority. The charter sets forth a broad guideline on research responsibilities dealing with Idaho, and encompassing the entire natural renewable resource spectrum. The responsibilities include, in part, that the station shall be authorized to conduct research and investigation on ". . . the production, protection and management of the forest resources, . . . the conversion and utilization of timber products, . . . the propagation, protection and management of wildlife and game, . . . the production, protection, utilization and management of the forage and range resources, . . . the varied recreational resources of wild forest land, . . ." In addition, the charter gives the station research responsibility on ". . . the protection, perpetuation and management of wild forest land possessing a special value for watershed . . ." and ". . . declaring an emergency" whenever appropriate.

The law designates the position of a director who will have the administrative responsibility and provide leadership for the station. The "School of Forestry" at "State University of Idaho" has been specified as its home.

The enactment of the law establishing the Forest, Wildlife and Range Experiment Station began to institutionalize the conduct of research as a basic responsibility in the School of Forestry at the University of Idaho. The faculty were officially given teaching-research job responsibilities, even though no specific budget had been earmarked for the Forest, Wildlife and Range Experiment Station.

A major research effort in the 1940's was devoted to wood chemistry, range management and forest protection. Wood chemistry research consumed some 75 percent of the research budget, and was conducted under the direction of Drs. Edwin John and Edward White. Range research started in 1941 with a study of sheep grazing on cut-out forest lands in northern Idaho. The investigations on forest protection consumed the least effort at that time and started with an investigation in forest pathology.

The activities in range management facilitated

program expansion in the important wildlife area. Dr. Vernon A. Young, in addition to his range program responsibilities, initiated a wildlife management course in 1939. By 1942, a curriculum in wildlife management was in existence, bringing with it additional faculty. Research activities, however, maintained minor significance as the manpower strength was still woefully inadequate. With the establishment of the Idaho Cooperative Wildlife Unit



in 1947, research received a significant boost. (See a later section on Cooperative Units.)

Research began to claim a larger share of man hours, covering a wider range of activities. In 1951, Dr. Virgil Pratt was hired with teaching in fisheries as the primary responsibility. Following a development pattern similar to the wildlife program, fisheries resources were significantly assisted by the establishment of the "Cooperative Sport Fishery Unit" in 1963, described in a later section. Both the wildlife and fisheries programs have experienced modest growths with substantial activities in a wide range of research areas.

Outdoor Recreation

The potential in outdoor recreation was not realized for many years following the establishment of the Forest, Wildlife and Range Experiment Station. This area was basically forgotten as other disciplines were strengthened. This was due, in part, also to the late development of the outdoor recreation field nationally. Following national trends, the need for program development in this area was being increasingly felt in the early 1960's. A position specifically allocated to cover the field of outdoor recreation was finally authorized for the forest management program area in 1963. Dr. H. Alden first filled the post. His primary assignment was research, with additional responsibilities to the Idaho Governor's Office in connection with formulating a state recreation plan. Outdoor recreation remained a part of the forest management program until 1974. At that time, the Wildland Recreation Management program was established, with a separate curriculum. Research activities in this field are still in a developmental stage.

With its continued expansion, the School of Forestry was renamed the College of Forestry, Wildlife and Range Sciences in 1953, making it more consistent with the Forest, Wildlife and Range Experiment Station designation and compatible with the broad and integrated activities underway. Rapid expansion in the 1970's has made the station one of the major centers of research activities relating to natural renewable resources. In 1975, the Forest, Wildlife and Range Experiment Station listed 93 research scientists, 48 of whom also had faculty appointments in the College of Forestry, Wildlife and Range Sciences. Eighty-five research projects were active in calendar year 1975 on six major research areas namely a) resources inventory and analysis, b) resources protection, c) ecology of natural renewable resources, d) wood technology, e) fish and wildlife biology and f) resources management and use. Over 61 different public and private organizations, and the Idaho legislature, provided approximately \$2.7 million in funding the research work. Regular budgeting allocations are now received by the Forest, Wildlife and Range Experiment Station through three basic programs which provide vital and continuing support for research. Two of these programs, the basic station budget and the Forest Utilization Research, are funded by the State of Idaho, with the U.S. Department of Agriculture providing funds authorized by the McIntire-Stennis Act of 1962.

Field Stations

The establishment and the expansion of field stations for forestry and natural resources research date back to 1911, when the Priest River Experimental Forest was set up by the U.S. Forest Service in northern Idaho. This Experimental Forest not only served the Forest Service research personnel, but also constituted an integral element in the Department of Forestry's research and teaching programs. The Priest River Experimental Forest still continues to play a strong role in the college's forestry research, often in cooperation with the Intermountain Forest and Range Experiment Station of the U.S. Forest Service.

The need for expanding research and instructional field stations continued to be felt as the college's programs were being enhanced. This need was given an expression of support in 1928 when the University of Idaho's Board of Regents approved, in principle, the concept of a University Forest to provide a wholly university-owned field station. This action triggered a series of searches in federal, state and private lands for outright donations or contractual agreements of either short or long-term arrangements. These efforts culminated in a cooperative agreement between the U.S. Forest Service and the University of Idaho, whereby several thousand acres would become available for university research on the nearby St. Joe National Forest. In addition, several thousand acres of land were leased from the State of Idaho for research purposes by the college. However, due to the temporary nature of such arrangements and the lack of budgetary support by the

University of Idaho administration and the Board of Regents, no significant use of such research lands took place.

The need for an additional permanent field station (outside the Priest River Experimental Forest) was, in part, met by Potlatch Corporation (Potlatch Forests, Inc.) in 1932. Potlatch President C.R. Billings wrote to then President Neal of the University of Idaho: "This Company has decided to convey to the University of



Idaho by outright gift about 3600 acres of forest land on Moscow Mountain. And (it) is further our thought that the area should be used as an Experimental Forest as long as there is a forestry school at the University." Further gifts from Potlatch Corporation increased the size of the University Forest to about 6760 acres by 1935. Additional land donated by four individuals and the Northern Pacific Railroad further increased the size to a total of about 7060 acres by 1943. The University Forest continues to be the largest field station for the college up on the present time.

Additional field stations at McCall (approximately 100 acres), Taylor Ranch (65 acres) in the heart of the Idaho Primitive Area, and the Point Springs Experimental Area in southeast Idaho have become available since 1938.

The McCall field station, acquired in 1938, is endowed with an especially rich variety of ecosystems. This station is now being regularly used for summer training, and is available year-around for research purposes. Living quarters and other basic facilities are available. Its close proximity to the Idaho Primitive Area also makes it suitable for wilderness research activities. These pursuits were further strengthened by the purchase of the 65-acre Taylor Ranch by the University of Idaho, in 1969. This field station is located in westcentral Idaho, surrounded by several thousand acres of wilderness. The "Ranch" is regularly utilized by researchers as a staging area for a variety of research activities dealing with Idaho's wilderness heritage.

In southeast Idaho the college, in cooperation with the Bureau of Land Management, utilizes the Point Springs Experimental Area. This field station provides important access to Idaho rangelands. Research at this station dates back to 1955, with activities continuing through the present time.

Research on forest regeneration and nursery management has particularly benefited from the Forest Nursery, which is situated on two locations, one within the city of Moscow, and the other on the outskirts. This nursery was established with assistance provided by the federal Clarke-McNary Act in 1925. It has been utilized for a variety of research projects, particularly studies dealing with problems of hard-to-regenerate sites. The nursery has also provided seedlings for small landowners, and has participated in service functions. In 1975, the nursery provided nearly half a million seedlings to reforest idle lands.

In addition to use of permanent field stations noted above, researchers can make temporary arrangements for the accommodation of research activities in all parts of the state.

Cooperative Fisheries and Wildlife Units

The cooperative wildlife and fisheries units are the result of cooperative efforts between the federal government, the State of Idaho and the university. They were established in response to a national need for research and training in wildlife and fisheries fields. The Cooperative Wildlife Research Unit was established in 1947 to "... provide full active cooperation in the advancement, organization and operation of wildlife education, research, extension and demonstration programs" The Idaho Cooperative Sport Fishery Unit was established in 1963 to meet the same basic objectives as those outlined for the wildlife unit. Both units are governed by a coordinating committee consisting of a member of U.S. Fish and Wildlife Service, the Director of the Idaho Fish and Game Department, the Dean of the College of Forestry, Wildlife and Range Sciences and the cooperative unit leaders. The unit personnel and the research scientists at the college have traditionally worked together and have focused on a variety of research problems dealing with fisheries and wildlife resources. The budgeting support for both units is

provided by the three principal cooperators and by grants and contracts awarded by public and private agencies.

Wilderness Research Center

In response to a greater awareness and the need to learn from our wilderness heritage, the University of Idaho Wilderness Research Center was established in 1972. The objectives of the center are to promote interdisciplinary research concerning the nation's wilderness resources. This has been a logical development in light of the fact that Idaho has now a greater wilderness area than any other state with the exception of Alaska. Since the establishment of the center, a variety of research scientists and educators have been involved with research and teaching activities. The center is a university-wide concept accommodating a great variety of activities relevant to the wilderness areas. It is authorized to enter into contractual agreements with other institutions in this country and abroad.

The field stations at McCall and the Taylor Ranch are now regularly utilized in conjunction with the center's activities. It is hoped that the center will attract national and international interest as it strives to promote an understanding of the dynamic processes which operate in natural ecosystems. As America enters the third century in its history, the Wilderness Research Center intends to play a critical role in determining the value of natural ecosystems to humanity and man's ecological and social role on our planet.

Graduate Programs and Research

Participation of graduate students in research is an old concept. In Idaho, there has been no exception to this general trend. The offering of Master's degrees by the Department of Forestry first occurred in 1925. Since that time, graduate students have constituted an important element in the research program. However, budgetary support for graduate student stipend was lacking for many years. By 1950, two assistantships were available through the School of Forestry. Development of the graduate program was stimulated by enhanced research funding during the quarter century beginning in 1950. Growth of the research program in the 1970's has constituted a substantial element in building a graduate program of significant size and quality. The College of Forestry, Wildlife and Range Sciences had nearly 140 graduate students enrolled at the master's and doctoral levels by the spring of 1975. Of these students, 77 were recipients of graduate assistantships, instructional assistantships, and other fellowships. Many others participated in research activities as student workers.

The college's research strengths have made a major contribution to building the graduate program. On the average, the graduate program now accepts only one of twenty applicants. The role of graduate students in the research program has made it possible to fulfill research responsibilities at a reasonable cost while training a vitally important human resource critical to the wise use of our renewable resources.



**University
of Idaho**

Forest, Wildlife and Range Experiment Station
College of Forestry, Wildlife and Range Sciences
Moscow, Idaho