

# First 10 Years of the Office of Grazing Studies



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In an historical consideration of the first 10 years of the Office of Grazing Studies in the Forest Service of the U.S. Department of Agriculture, it is good to consider the situation that led to its establishment.

The tremendous increase in cattle and sheep numbers the last two decades of the past century caused severe overgrazing and depletion of many forest ranges in the western states. They were producing only 1 to 10 percent of their forage potential. Such grazing caused damage to timber reproduction, which was serious, especially if overgrazed by sheep.

The Department of Interior's General Land Office, responsible for Forest Reserve administration, proposed elimination of sheep. Dr. F.V. Coville of the Bureau of Plant Industry, after inspection, recommended in 1897 regulation and management of sheep in the Cascades of Washington and Oregon—not exclusion. After a northern Arizona inspection trip in 1900 with Albert Potter and other stockmen, he and Gifford Pinchot, Chief of the Bureau of Forestry, recommended grazing sheep under control. Pinchot, impressed with Potter's ability, brought him into the Bureau of Forestry. At the time, the Salt River Valley water users of Central Arizona did not agree to sheep grazing on the watershed. So Interior Secretary E.A. Hitchcock approved their elimination. However, President Theodore Roosevelt, after a meeting with Pinchot, armed with a 1-page statement from Potter, requested the Secretary to rescind the order. He did, but recommended transfer of the Forest Reserves to the Department of Agriculture.

The Act of February 1, 1905, transferring the Forest Reserves to the Department of Agriculture, was passed and approved by President Roosevelt on that day. The Bureau of Forestry became the Forest Service and took over the admin-

istration of the 63 million acres of Forest Reserves which were renamed National Forests. Potter developed the Forest Service Grazing Use Book. Permittees grazing their livestock on the National Forests had to have privately owned commensurate ranch property used in connection with their Forest grazing. Small local outfits were given preference. Itinerant cattle and sheep outfits without commensurate property were eliminated, thus resulting in a drastic reduction of livestock on the National Forests. In addition, when overgrazing was recognized, reductions in permitted stock were made.

By 1907 President Roosevelt had established new Forests and expanded old ones to total 150 million acres. By 1909 there were nearly 180 million acres in National Forests.

Also in 1907, Potter and Coville selected two researchers, James T. Jardine of Utah State Agricultural College and the University of Chicago, and Arthur W. Sampson of the University of Nebraska. Jardine studied sheep grazing in coyote-proof pastures on the Wallowa National Forest in eastern Oregon till 1910. There he developed the open-herding bedding-out system. Sampson studied life histories of range plants and revegetation of depleted ranges on the Wallowa. He developed the deferred and rotation system of grazing.

The Forest Service Office of Grazing Studies was established in 1910 in the Branch of Grazing in cooperation with Dr. Coville, with Jardine as Chief. His main effort that year was inspecting the forest range situation throughout the West and trying to teach a number of forest rangers how to make range reconnaissance on their forests, but this did not



Band of ewes and lambs under open-herding and bedding-out system on National Forest range in Idaho, 1918.

*About the Author:* "Chappie" is 89 years old and a Charter and Life Member of SRM. He first worked for the Forest Service in March 1910 on the Nebraska National Forest, while a freshman in forestry at the University of Nebraska. He was on the Coconino reconnaissance party in 1911 and was Hill's assistant on his grazing and reproduction study, summer of 1912.

He graduated from the University of Nebraska (Lincoln) in 1913 with majors in forestry and botany. He is also classed as a graduate in agronomy. He went to work immediately for the Forest Service under Arthur Sampson at the Great Basin Station.

In 1920 he became chief, Office of Grazing Studies in the Branch of Grazing, Washington, D.C., office, which he headed to 1925. He transferred to the Branch of Research with title of senior inspector of grazing in 1926. His title was changed to chief, Division of Range Research, in 1935. He retired in 1952 after more than 40 years of Forest Service work.

Since then he set up the Section of Forest Conservation in the Forestry Division of FAO of the UN in Rome, taught a graduate course for a unit of OAS in South America, and served as consultant on many assignments for AID, FAO, and other organizations. He has visited 78 countries in connection with his work, and still serves as a volunteer with Volunteers in Technical Assistance.

This article is adapted from the author's talk at the 1980 annual SRM meeting in San Diego. The author is retired chief Division of Range Research, Forest Service, U.S.D.A.



(U.S. Forest Service photo).

Grazing reconnaissance party on the Coconino National Forest in Arizona, 1911. R.R. Hill, party chief, on the left with W.R. Chapline standing next to him.

prove out. He also initiated a study of coyote-proof pastures for lambing on the Cochetopa National Forest in Colorado. Sampson continued his Wallowa studies and tested reseeding mountain meadows in other parts of the West. W.A. Dayton, a botanist from Williams College, was appointed especially to handle the range plant collections from the field, develop the Forest Service range Plant Herbarium, and have plants identified by Smithsonian Institution botanists.

The Office of Grazing Studies really got under way in 1911. That spring, Jardine spent some time on the Coconino National Forest in Arizona teaching his four new grazing assistants—Lynn Douglas and Bob Hill, of the University of Nebraska, A.E. Aldous, Utah State Agricultural College, and Charles Fleming, University of Minnesota—procedures for conducting range reconnaissance, analyzing data collected, and developing sound range management plans. Plant col-

lection and critical observation of plant use were emphasized as well as accuracy of range type areas, their composition, evidence of degree of grazing on specific areas, influence of topography on use, and other essentials. Undoubtedly, Jardine discussed other features necessary in their serving as Regional Chiefs of Offices of Grazing Studies, in the Branches of Grazing in the four Regions to which they were assigned to help improve range administration on Forests other than those being covered by the reconnaissance.

The rest of that summer each of the four new men led a party of three or four, usually field assistants, on range reconnaissance on a Forest in their respective Regions. It required about two field seasons to complete the field work on a Forest and sometimes longer for the development of the management plan. The plans included a colored map showing the range types and their condition. Tabulations covered each allotment, the forage acres on the different types, and as a whole, the range condition, grazing capacity, recommended grazing season and number of cattle or sheep, or both to be permitted. These data were also summarized for the forest as a whole. By 1920, at least ten such comprehensive Forest grazing plans were in successful operation and others were in process of completion.

Offices of Grazing Studies were established and men were assigned as follows: Lynn Douglas, 1911, Region 2 at Denver, Colorado; Bob Hill, 1911, Region 3 at Albuquerque, New Mexico; A.E. Aldous, 1911, Region 4 at Ogden, Utah; Charles Fleming, 1911, Region 6 at Portland, Oregon. In 1913 Fleming left Portland to establish the Office in Region 1 at Missoula, Montana, and J.L. Peterson replaced at Portland; and finally, in 1915 Fred Douthitt established the Office in Region 5 at San Francisco, California.

Jardine, Coville, and Sampson selected the location for the Utah (later Great Basin) Experiment Station on the Manti National Forest in the mountains out of Ephraim, Utah. With Sampson in charge as Director, it was established in 1912 mainly for fundamental range studies. These studies, up to



(U.S. Forest Service photo).

Charles Fleming, left, and James T. Jardine on a research planning trip over the Jornada Experimental Range, New Mexico, July, 1915.

1920, included life histories of plants, growth requirements and forage value of range plants, range reseeding, climate and plant growth, plant succession, effect of range depletion and grazing on runoff and erosion, and the effect of grazing on aspen tree reproduction. Sampson proved an able researcher and published on each of these projects, sometimes with a co-author.

Many foresters assumed the excessive damage to timber reproduction of the late years of the last century was continuing even after the Forests came under Forest Service administration. Accordingly, a series of intensive studies concerning the effect of sheep and cattle grazing on timber reproduction were conducted. These included Sampson and Dayton's on the Shasta in California, Hill's on the Coconino in Arizona, and W.N. Sparhawk's on the Payette in Idaho. All these studies revealed that where proper grazing prevailed, damage to young trees was minor, but serious under overgrazing.

The Jornada Range Reserve in New Mexico and the Santa Rita Range Reserve in Arizona were transferred from the Bureau of Plant Industry to the Forest Service on July 1, 1915. (The Jornada was again transferred in 1954 to the Agriculture Research Service, now Science and Education Administration.) Fleming was the first Director of the two Reserves. He was followed the following spring by Leon Hurr, who had been his assistant, and in 1917 by his assistant, C.L. Forsling, both of the University of Nebraska. Intensive studies of range production and use, and cattle management were immediately initiated on the Jornada and came about 2 years later to the Santa Rita, when R.L. Hensel became its Director, although planned comparative deferred pasture grazing began on the Santa Rita in 1915. Earlier cattle production on the Jornada was similar to that on comparable public domain ranges nearby, which produced about a 50 percent calf crop with average annual losses of ten percent with calves weighing about 250 pounds when sold. Production on the Jornada, even with three years of drought, doubled as a result of more conservative grazing, approximating grazing capacity, thus keeping the herd more nearly in balance with native forage production and available supplemental feed in drought years, reserving a good pasture for winter and spring grazing, prompt disposal of steers and early sale of calves during drought years, as well as the use of better bulls. Calf crops became much higher, calves were much heavier, and death losses were much less. The studies clearly showed the importance of grazing in accordance with grazing capacity, having in the herd steers which could be sold promptly, and of providing supplemental feed, even if nothing more than crushed yucca stems, for cows during drought periods.

I initiated a goat study in 1915 on four materially different ranges on the Gila and Lincoln Forests in New Mexico. Through open herding, bedding-out on the range and effective seasonal use of various range types, depleted range was improved and far better returns were obtained from mohair production and animals produced. A previously overgrazed, badly depleted range, near a long-used ranch headquarters, improved in grass and palatable shrubs from 5 to 30 percent of potential in four years, three of which were considered drought. That improvement resulted when the area was properly grazed only at kidding and shearing times. The seed which helped in that increase was brought to the area in the mohair, from other areas grazed by the goats. On a properly grazed goat allotment in the ponderosa pine type of the



(U.S. Forest Service photo).  
*Purebred Hereford cattle grazing a sagebrush-grass type on the Uinta National Forest, Utah, 1918.*

Lincoln National Forest, 90% of each year's pine seedlings died of natural causes. Damage to older pine reproduction from grazing was minor even in the three drought years of that study.

Simple practical studies were initiated in all western Forest Service Regions within a year or so of the establishment of each Regional Office of Grazing Studies to aid in obtaining better range management. These early studies included in several regions 2 or 3 years of comparative grazing of openherding and bedding-out of sheep in contrast to the practice of using establishment bedgrounds for a week or more. These showed the value of the new system in greater grazing capacity and sheep production. The grazing regulations were changed to limit the use of any bedground to 3 nights in a year. Most sheep permittees readily accepted the new system after testing it.

Minor modifications resulted from application studies of the deferred and rotation system. One such was changing from five consecutively used equal units to four, when



(Photo by Matt Culley, U.S. Forest Service).  
*Salting cattle on the Santa Rita Experimental Range, Arizona, during the drought year of 1921.*



appropriate, and to specify avoiding over-grazing the unit grazed first each year. Also, in a test on the Manti, started in 1913, a seriously depleted area was deferred for two consecutive years, rather than a single year, at the start and in the 5th and 6th year of the 10-year period. In that unit, production came up from 1 or 2 percent of potential to about 40 percent, largely due to sheep trampling in seed brought in by their wool. The rest of the range improved from about 40 to 60 percent or more of potential.

There was also great improvement on many spring ranges through delaying the opening date of the grazing season. Studies were also made on fences for cattle, water development, and similar other practical features, as well as on poisonous plant control. Cooperation on poisonous plant investigations was arranged with the Bureaus of Plant and Animal Industries in order to reduce livestock losses.

A new appropriation of \$25,000, termed "Technical Range Administration" was received in 1916. Its main purpose was to provide funds to finance an assistant on each Forest for which a range management plan had been completed, to help guide and assure application of that plan. The Chiefs of the parties which conducted the reconnaissance and developed the plans for the Forests were logically the persons to fill those new positions.

The Hoover Commission of the War Production Board, headed by Herbert Hoover, (later President) requested the Forest Service to increase livestock numbers as a World War I measure in 1917 in an effort to produce more meat, wool, and mohair. Most of the National Forest ranges were already fully stocked and Jardine questioned the request. He said we should open up unused areas but advised against overstocking other Forest areas. Nevertheless, the word went out and most forest supervisors, not realizing the danger, allowed livestock increases. Damage was done throughout the West, but it was especially serious in the drought-stricken Southwest. It took 30 years or more to overcome that overgrazing damage. One good cattle allotment on the Gila Forest was practically destroyed.

The War also disrupted much of the work underway. Many Forest Service technical range men left to enter the military. All regular range reconnaissance and management plan

development was stopped, although less intensive inspections were made to help find areas which might support more livestock. All research was terminated except at the Great Basin Station, Jornada, and Santa Rita Range Reserves. Even at those it was curtailed.

The main effort after the War was to get all essential work functioning again. The Regional Offices of Grazing Studies went ahead with uncompleted reconnaissance and management plan development, technical range men assigned to forests returned, and the Great Basin Station and Jornada and Santa Rita Range Reserves replaced permanent assistants who failed to return and took on field assistants again. Any practical Regional range studies that were underway before the war were revitalized to assure completion and publication.

Training of personnel was especially important in these early years. There was very little range management being taught in the universities and colleges. Some lectures were given by Forest Service range men and in a few instances several took leave in order to teach a course. The University of Nebraska had a strong botanical curriculum which all its foresters took. It was during the summer of 1910 that I first met Jardine while I was working on the Helena National Forest in Montana. That was after my freshman year at the University of Nebraska. I encouraged capable Nebraska students to apply as range field assistants during the next 3 summers. Nebraska and Utah graduates dominated the 1913 and 1915 grazing assistant Civil Service registers. All were appointed. Range reconnaissance and management plan development proved to be major and valuable factors in developing range administrative personnel. The Chiefs of Grazing Studies in all Forest Service Regions, accordingly, encouraged capable young foresters from many schools, especially those working as rangers, to transfer to range reconnaissance which taught them essentials so they could pass the grazing assistant examination. Through that procedure, many schools finally became represented in the technical range work. The Great Basin Station and Jornada also had field assistants each summer, excellent training.

Jardine put great emphasis on making important information promptly available. He, as co-author and guiding hand,



(Photo by Matt Culley, U.S. Forest Service).

*Cattle grazing abundant forage on the Santa Rita Experimental Range, Arizona, in a good year, September, 1939.*

turned out a number of publications, of which U.S.D.A. Bulletin 790, "Range Management on the National Forests" by him and Mark Andersons in 1919, was the first comprehensive report on range management. Sampson also turned out many. The first "publication" on range plants, "National Forest Range Plants: Part I, Grasses," was written largely by Bill Dayton and me with some help from Sampson, who was busy working for a doctorate at the time. It was printed in Ogden, Utah, in June 1914. There appeared, of course, many other bulletins, circulars, and articles, especially in livestock journals.

By 1920, the Office of Grazing Studies received a total appropriation of only \$75,000, divided equally for its three lines of work. Thus there was \$25,000 each for the two technical administrative phases: management plan development on Forests and facilitating application of approved plans. *Research had only \$25,000 for the studies at the Great Basin Station and the Jornada and Santa Rita Range Reserves and the practical regional studies related to the application of improved range use and management.*

Practically all of the early workers went on to effectively handle other important positions. Dr. Jardine became Director of the Oregon State Agricultural Experiment Station in 1920 and later returned to the Department of Agriculture as Director of Research. Dr. Sampson who established the Range Unit at the University of California in 1922 after teaching there earlier, was recognized as a range leader. He had three comprehensive books published: *Range and Pasture Management*, *Native American Forage Plants*, and *Livestock Husbandry on Range and Pasture*. Fleming, who left in 1916 to teach at the University of Nevada, was highly recognized for his work on poisonous plants and range management, later becoming Dean of Agriculture and Director of the Agricultural Experiment Station there. Aldous transferred to the Department of Interior to direct the 640-acre homestead program and later to teach at Kansas State Agriculture College. Hill was brought in to the Washington Office of Grazing Studies, in the Branch of Grazing, and later transferred to *Region 9 at Milwaukee, Wisconsin, in charge of several units of that important Lake States Region.*

In 1920 Forsling became my Assistant Chief in the Office of Grazing Studies; then he followed Sampson as Director of

the Great Basin Station in 1922. He became Director of the Intermountain Forest and Range Experiment Station when it was established in 1929 at Ogden, Utah. From there he went as Director to the Appalachian Station in the East and then back to Washington, D.C. as assistant chief of the Forest Service in charge of All Forest Service research. About the end of World War II, he transferred to the Department of the Interior to become Chief of the Grazing Service and later to become Assistant to the Secretary of Interior.

The list of advancements in the Forest Service, to other Bureaus and as professors or heads of Departments at universities and colleges and in ranching, is too long to go further, but I should like to mention three more, all deceased. M.W. Talbot of the University of Missouri transferred from Chief of the Office of Grazing Studies in Region 3 about 1925 to the Bureau of Plant Industry to be in charge of weed investigations. Later he returned to the Forest Service California Forest and Range Experiment Station in charge of and to greatly develop range research there. In 1965 he served as president of the Society for Range Management.

Paul Roberts of Nebraska, who was active in range work and supervisor of Sitgreaves National Forest in Arizona, transferred to the Washington Office, gave range lectures at many forestry schools, and later became director of President Franklin D. Roosevelt's pet, the Shelter Belt Project, during the Dust Bowl days in the 1930's. He also wrote two books on early Forest Service range experience, *Hoof Prints on Forest Ranges* and *Them Were the Days*.

Walt Dutton graduated from Oregon State University in 1913 and became active in range work for the Forest Service. Later, he served as supervisor on the Malheur and Whitman National Forests in eastern Oregon then on to chief of grazing in the Portland Regional Office until 1936, when he went to Washington, D.C., as Chief, National Forest Range Administration. He proved a fine supporter of range research and stressed application of its results, especially in overcoming adverse effects of the western droughts and depression of the 1930's.

*I think this will give you a pretty good idea of how it was in the early days of developing technical range work in the U.S. Forest Service. Jardine's guidance and encouragement was always at hand. He appreciated effective accomplishments.*

## Mediterranean-type Ecosystems

New information that may lead to better management of brushlands will be presented at the forthcoming conference, "Dynamics and Management of Mediterranean-type Ecosystems: An International Symposium." The conference, June 22-26, 1981, in San Diego, California, will present examples of brushland management programs and recent advances in research. Sessions should be of interest and of value to wildland managers, researchers, and others concerned with management of the brushlands of California and the southwestern U.S., the Mediterranean Basin, central Chile, southern Australia, and southern Africa.

For additional information contact: Chairman, Dynamics and Management of Mediterranean-type Ecosystems: An International Symposium, Pacific Southwest Forest and Range Experiment Station, Forest Service, U.S. Department of Agriculture, 4955 Canyon Crest Drive, Riverside, California 92507 U.S.A.

## Weather Data Workshop

A workshop on "Applications of Weather Data to Agriculture and Forest Production" will be held March 30-31, 1980, in Anaheim, California.

This workshop is part of the 15th Conference on Agriculture and Forest Meteorology and the 5th Conference on Biometeorology sponsored by the American Meteorological Society and cosponsored by the American Society of Agronomy and the American Society of Agricultural Engineers.

Specific information regarding registration fees and accommodations will be available at a later date. For further information about this workshop please contact: Albert Weiss, University of Nebraska Panhandle Station, 4502 Avenue I, Scottsbluff, Nebraska 69361 (308) 632-2711.

