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Chapter

1

History of Range and Wildlife Habitat Restoration in the Intermountain West

Range, wildlife, watershed, and recreation research in the Intermountain region is a relatively young science. Most early research was initiated to rectify problems resulting from overgrazing that resulted in a deterioration of range and watershed resources. Thus, restoration measures were closely aligned to range and watershed disciplines.

Campbell and others (1944) characterized four broad periods of range research: (1) The exploratory period prior to 1905; (2) limited intensive studies, 1905 to 1909; (3) organized experiments undertaken throughout the mountainous West and the Great Plains, 1910 to 1927; and (4) expanded research accompanying aggressive public action on range problems, 1928 to present.



The real growth in range and wildland research began in response to Federal management policy for newly created Forest Reserves (later called the National Forest System). Unfortunately, the development of range research lagged far behind the need, and this lack of information has, in part, contributed to serious problems that still exist in many areas. Although some formal grazing studies were begun by 1910, comprehensive programs did not begin until 1935 (Campbell and others 1944).

The exploratory period described by Campbell and others (1944) consisted of observational and investigative works. The first was the discovery, collection, and description of many native plants (Nuttall 1818; Torrey and Gray 1838-43; Vasey 1889) (fig. 1). This work was aided by the creation of the Division of Botany established in 1868 within the Department of Agriculture. The assemblage of these collections ultimately lead to an understanding of plant distribution, community associations, species abundance, and ecotypic variation. A second area of work involved notations of western pastures and range problems. A third category consisted of exploratory investigations by Department of Agriculture personnel in which rangeland resources within the Forest Reserves were described. These surveys identified research needs.

The range-livestock industry greatly expanded by 1880 and created extremely serious land administrative problems (fig. 2). Development and implementation of realistic husbandry was made possible through the creation of Forest Reserves including the Cascade Range Forest Reserve developed in 1893, which restricted grazing, driving, or herding of livestock within any of the Reserves (Colville 1898). By 1905, an administrative proposal was developed by Potter



Figure 1—Early plant exploration and classification surveys helped to identify plant species and community types.



Figure 2—Livestock grazing seriously altered plant communities, particularly on the high summer ranges of central Utah.

and Colville (1905) that served as a guide to land use until passage of the Grazing Act of 1934.

In 1901, the Divisions of Agrostology and Botany were consolidated within the Bureau of Plant Industry. This led to studies relating to reseeding, grazing, and the development of forage plants for rangelands (Burtt-Davy 1902).

In 1905, the Forest Reserves were transferred from the Department of the Interior to the Department of Agriculture and then combined with the Bureau of Forests to form the Forest Service. Grazing problems were so acute that authority was given to control animal numbers, distribution, and grazing duration. Detailed grazing studies were organized. Initial efforts were made to seed mountain rangelands with

pasture forages. Work began in Oregon but soon included other areas in the West.

In 1910, the Office of Grazing Studies in the Forest Service was established, and formal range research efforts were developed. Most studies dealt with range surveys, grazing reconnaissance, natural revegetation, and the formulation of grazing practices to improve range and watershed conditions. Some State Agricultural Experiment Stations were established and developed supportive studies during this period (Cotton 1905).

Watershed problems, including flooding and erosion, were critical issues, particularly within the Intermountain States. Consequently, a research facility, initially known as the Utah Experiment Station, was established in central Utah on the Manti National Forest (fig. 3). This center, later renamed the Great Basin Experiment Station, initiated and conducted studies of range management and revegetation.

The Bureau of Plant Industry conducted numerous grazing studies that significantly influenced the selection and use of species for pasture grazing (Shantz 1911, 1924). Range research was transferred from the Bureau of Plant Industry to the Forest Service in 1915. This consolidated and strengthened range research in desert regions when the Santa Rita and Jornada Experimental Ranges, established in 1912, were added to the Forest Service base.

In 1926, the Office of Grazing Studies was transferred from the administrative branch of grazing and established as a division in the branch of research. The subsequent passage of McSweeney-McNary Forest Research Act of 1928 funded and expanded research in timber, range, and watershed at various experiment stations. The Act consolidated all Forest Service range research into regional units and experiment stations. It provided for increased cooperative research with State Agricultural Experiment Stations. It also expanded research activities to include artificial range

revegetation, wildlife, and other land values. Artificial revegetation studies included the selection of native species for future improvement and the adaptation of native and introduced species for site improvement (Forsling and Dayton 1931; Price 1938; Stewart and others 1939). The studies were primarily located at the Intermountain and Rocky Mountain Forest and Range Experiment Stations.

Establishment of the Great Basin Station quickly generated range and watershed research within the Intermountain region. The station's location in the Great Basin Province was representative of areas including most of the western half of Utah, nearly all of Nevada, California east of the summit of the Sierra Nevada, a large area in southeastern Oregon, portions of southeastern Idaho, and southwestern Wyoming (Keck 1972). Consequently, research efforts were expanded to coordinate with other field locations in Idaho, Nevada, Utah, and Wyoming.

By 1900, livestock grazing had seriously disrupted vegetation in many plant communities within the Great Basin. Extremely critical problems existed on high summer ranges of the Wasatch Mountains and Wasatch plateau. Serious flooding and erosion from high mountain ranges were critical problems. Initial research at the Great Basin Station dealt with assessment of watershed problems and development of measures to correct summer flooding. In 1913, researchers turned their attention to restoring sites by natural reestablishment of native species and direct seeding with natives and exotics. Field adaptability study sites were established in aspen and grass-forb communities, and additional species and field plantings were established in subsequent years. By 1930, considerable information had been accumulated relating to species performance and site adaptability. Many artificial seedings using both native and exotic species were highly successful (Forsling and Dayton 1931).

Beginning in the early 1930s, scientists from the Intermountain Forest and Range Experiment Station united to acquire and field test an extensive array of herbaceous and woody species for use on range and watershed sites in Utah, Nevada, Idaho, and Wyoming (fig. 4). Field testing centers were located at representative sites in the major plant communities in these States. Field plantings and evaluations were carefully maintained at most locations for approximately 20 years. New selections and plant materials were added to the program. Planting sites and environmental conditions were monitored, and plant performance was compared with growth response of adjacent native communities (Frischknecht and Plummer 1955; Pearse and others 1948; Plummer and others 1955).



Figure 3—The establishment of the Great Basin Station in Ephraim Canyon, Utah, facilitated extensive range and watershed research activities.



Figure 4—Three of the early species selection plots established at the Great Basin Station. The plots helped to identify plants for use in revegetation efforts.

Field studies included the assessment of species and the development of planting equipment, methods of seeding, and seedbed preparation (Plummer and others 1943; Stewart 1949). Various equipment and planting practices were developed to treat steep, rough terrain and rangelands (Pechanec and others 1965), but most methods and implements were developed for seeding grasses and broadleaf herbs (fig. 5).

The USDA Natural Resources Conservation Service Plant Materials Centers selected and tested herbaceous plants during this same period. Their efforts resulted in the release and use of many important cultivars (Hafenrichter and others 1949; Hanson 1965). Various State Agricultural Experiment Stations and universities were also conducting species selection and field planting procedures (Cook and others 1967).

In 1954, the testing and development of grasses and broadleaf herbs was transferred from the USDA Forest Service to the newly created USDA Agricultural Research Service. This agency has released numerous introduced, and more recently native cultivars and germplasms.

Problems with big game ranges, particularly winter ranges, became important issues during the 1940s and 1950s. State Game and Fish Departments recognized that game herds and livestock grazing had decimated many important game ranges in nearly all Intermountain States. Scientists and research organizations previously affiliated with range research were solicited for support. Big game habitat and improvement research was begun in Idaho, California, and Utah by Forest Service scientists, but it was funded in part by State agencies in Idaho, Oregon, and Washington. Many herbs previously developed for range purposes proved equally useful for wildlife, but a shift in emphasis from herbs to shrubs took place.

Cooperative shrub research between the Utah Division of Wildlife Resources and Intermountain Research Station began in 1957. This cooperative effort expanded over time, resulting in the establishment of the Forest Services' Shrubland Biology and Restoration Project. The project has contributed to the selection of many useful shrubs and herbs, including development of cultural techniques required to rear and plant these species.

The presence of testing sites, research facilities, and experience with the culture of forage plants developed by earlier researchers at the Great Basin Station aided initial progress in shrub research. In addition, considerable testing and culture of woody plants for conservation plantings (George 1953; Haynes and Garrison 1960; Horton 1949; Mirov and Krabel 1939; Van Dersal 1938) and upland gamebird habitat improvement (Miller and others 1948) provided



Figure 5—A major problem confronting range and wildlife seeding has been the lack of equipment suitable for operating on irregular terrain.

useful species and rearing techniques (Doran 1957) that were adapted to big game habitat improvement (Brown and Martinsen 1959; Plummer and others 1968).

Restoring wildlife habitat by artificial seeding of shrubs and broadleaf herbs has been hindered because of the erratic germination characteristics of various shrubs, the inability of shrub seedlings to compete with herbs, and the lack of equipment capable of operating on steep, mountainous terrain. Yet, considerable progress has been achieved in selecting and developing useful shrub species, ecotypes, and cultivars for game and range seedings. Selections have been advanced primarily through cooperative efforts by the USDA Forest Service, Intermountain Research Station and continue under the present Forest Service structure of the Rocky Mountain Research Station; USDA Soil Conservation Service; and the Utah Division of Wildlife Resources (McArthur and others 1985; Monsen and Davis 1985; Stevens and others 1985c; Stutz and Carlson 1985).

Numerous scientists, agencies, and universities have expanded the scope of shrub research since the 1970s. Although numerous studies have been completed, requirements for establishing many native species that have received little use in past seeding efforts remain largely unknown. Many shrub-dominated communities, particularly in semiarid and arid lands, are difficult to restore using current practices. Consequently, the challenge to enhance rangelands remains formidable.

