Grazing Lands of Washington State

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Washington is the smallest of all western states and is widely known as the "Evergreen State", with reference to its beautiful forests of the west coast. Less well known is the eastern two thirds where livestock, apples, and wheat are equally famous. The value of Washington grazing lands is reflected in the value of livestock products (cattle and calves, including dairy for meat), which ranked fourth among agricultural products in 1989, producing more income than potatoes or hay, but less than milk, wheat, or apples. There were 1.33 million head of cattle, 83 thousand sheep, and 50 thousand horses in the state in 1989.

Several other uses of rangeland, grazeable woodland, and pasture add significant value to the grazing land resource, including wildlife, big game, water, recreation, open space, and aesthetic enhancement. Taken together, grazing land resources are of major importance to the state's social and economic welfare.

Ancient Drama

Geologists have unveiled an astonishing story of the origin of Washington's unique topography, and its influence on present range plant environment. Twenty million years ago the Pacific Northwest area was moderately level plain covered with a hardwood forest (as evidenced in Ginko Petrified Forest State Park).

The Cascade mountain chain with its volcanic peaks, reared up under pressure of colliding "plates" of the earth's crust, and grew to form the western rim of the Columbia Basin. Over eons of time prevailing southwesterly winds stripped desert soils from the deep rain-shadow east of the Cascade Mountains and deposited it, with volcanic ash, eastward across the Basin. Basalt flows in the Basin were thus buried under a fertile mantle to depths of as much as 300 feet in the Palouse Hills (Fig. 1).

Meantime, the Columbia River, gathered in the Canadian Rockies and western Montana, cut a deep canyon around the western edge of the Basin in a huge arc (now called the "Big Bend"). There it met the Snake River, flowing north westward from the continental divide in Wyoming. Together they maintained a drainage way westward to the Pacific as the Cascade Mountains grew.

Twelve to 20,000 years ago, during the "ice age", glaciers invaded the Basin and adjacent Idaho-Montana mountain valleys damming the swollen "grandfather" of the Columbia River and its tributaries. Huge impoundments formed behind glacial fingers advancing from northern valleys across westward flowing rivers.

Fig. 1. *Major geologic provinces of Washington, and Columbia/Snake drainage system.*

In successive periods of glacial advance and recession, the dams were repeatedly broken (perhaps 7–8 times!), bringing floods rushing from headwater lakes down deep mountain gorges, gathering volume from lower impoundments along the way. As this tide poured out into the Basin, it overflowed the rim of the Columbia River Canyon at its northeast corner in an unimaginable flood, southwestward across its floor. Gushing through the low-lying drainages, it stripped the fertile wind-laid soil mantle to basalt bedrock in the channels, leaving gravel deposits, sand bars, and pothole lakes scattered across the landscape.

Today, flying over the Washington part of the Basin, one gets a view of a broad, low profile plain, surrounded by mountains on the three sides. The floor of the Basin is a 50/50 mosaic of "Channel Scablands", scoured by the floods, interspersed with low hills that escaped and are presently in cropland agriculture. The Channel Scablands, with surrounding valleys and forested mountains, are the grazing lands of Washington.

Grazing Resources

The Columbia Basin is a plateau when viewed from canyons 1,500 to 2,000 feet below. The plateau slopes gently upward from the southwest corner for a hundred and fifty miles in a northeasterly direction; increased elevation is accompanied by increases in precipitation (approximately 1 inch per 10 miles, from 5 to 20 inches) and by decreases in temperature. Plant community char-

Adapted from "Washington State Grazing Land Assessment" 1984. by Grant A. Harris and Martha Chaney. Washington Rangeland Committee and Washington Conservation Commission. Available from U.S. Soil Conservation Service, W. 316 Boone Ave., Spokane, WA 99201.

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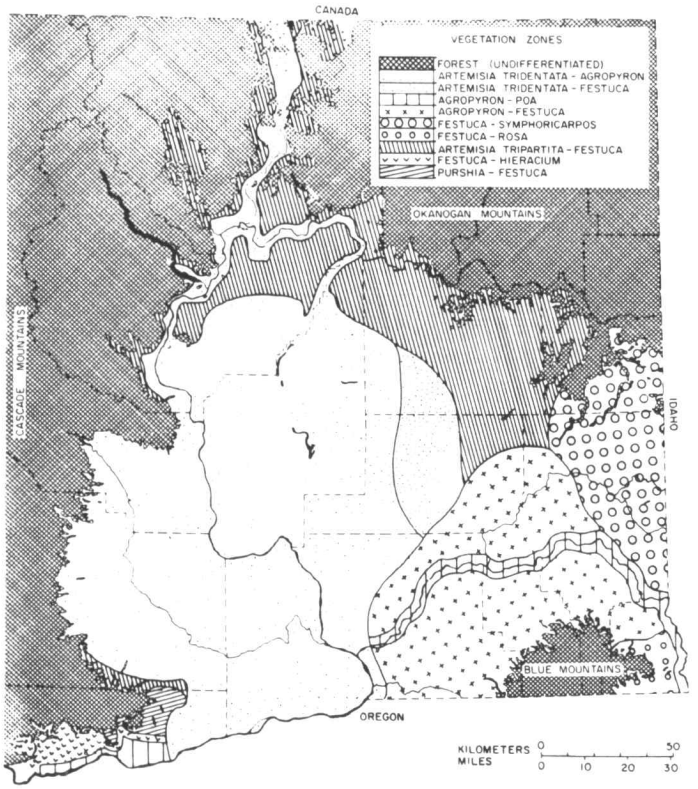

Fig. 2. *Vegetation zones of eastern Washington Steppe region. (after Daubenmire).*

acteristics change drastically in response to this gradient, from desert to droughty forest. This region is almost entirely in ranch and farm ownership, about half in each land use. The grazing part comprises about 7.5 million acres.

Similar, but steeper, precipitation and temperature gradients are found extending from foothills of the mountains surrounding the Basin to their summits. Again, plant communities on low elevation foothills share the desertic environment of the contiguous Basin, but at higher elevations the aspect changes rapidly through moist forest vegetation to alpine parks and glaciated peaks at the highest extremes. Strongly incised mountain topography gives rise to highly diverse ecological environments, resulting in a patchwork of vegetation patterns.

Together, grazed forest types in eastern Washington comprise about 5 million acres. Ponderosa pine, the most extensive and productive forest grazing type here, covers almost half of the forest grazing land area in this region. Abundant understory forage is found in this forest type.

Native and improved pastures are commonly found on productive soils in canyons and drainage ways throughout the region. Hay fields are often grazed early in spring, or for aftermath late. These provide a significant proportion of the total forage crop.

Livestock operation headquarters are based primarily around the edges of Columbia Basin in low elevation mountain valleys or along small streams in scablands, with access to seasonal grazing grounds in the scablands, foothills, and high mountains.

Most operations are cow-calf, running on range or harvested fields 8 to 9 months, feeding hay in the winter, and calving in the early spring. It is common in the Scabland areas for a rancher/farmer to control a large block of land that includes intermingled ridge-top high-producing wheat land and Scabland range. These ranchers often keep their herds at home yearlong, providing summer grazing on seeded range, pasture grasses on better scabland sites, or native saltgrass along small streams and banks of potholes in summer, and fall grazing on harvested wheat fields.

The Palouse Hills bordering Idaho are world famous for wheat production, yielding 60 to 100 bushels per acre (20 inches precipitation) on an annual cropping schedule. Westward, with clinally decreasing precipitation, practices change gradually to alternate year or two-year fallow (8 inches precip.). Irrigation under the Grand Coulee Dam project has brought more than a million acres of sagebrush zone into intense cultivation producing potatoes, wine grapes, alfalfa, orchards, and other crops.

Original Vegetation Associations

Vegetation in Eastern Washington has been classified and described at several different intensities. R.F. Daubenmire published classifications for the forest zones in 1968, and the steppe, or open grassland zones, in 1970.

Daubenmire's "climatic climax" zones are areas of the landscape where stable plant associations have developed on sites under unrestricted climatic influence. These sites have deep, moderately drained, medium textured soils on gently undulating topography. His map showing the extent of these zones in eastern Washington steppe region is reproduced in Figure 2, and characteristics summarized in Table 2.

Table 1. Some characteristics of major Eastern Washington steppe zonal vegetation.

Zone	Precip. ave. annual (inches) total		Yield (lbs./acre) grasses	
Big Sagebrush/Bluebunch Wheatgrass	5–10		825	400
Big Sagebrush/Idaho Fescue	9–12		---	---
Bluebunch Wheatgrass/Little Bluegrass	9–12	(low elev)	975	850
Bluebunch Wheatgrass/Idaho Fescue	10–15		1300	780
Idaho Fescue/Snowberry	12–22		3000	950
Idaho Fescue/Rose	20–28		---	---
Threetip Sagebrush/Idaho Fescue	10–15		1300	1100

[1]Adapted from R.F. Daubenmire, 1970.

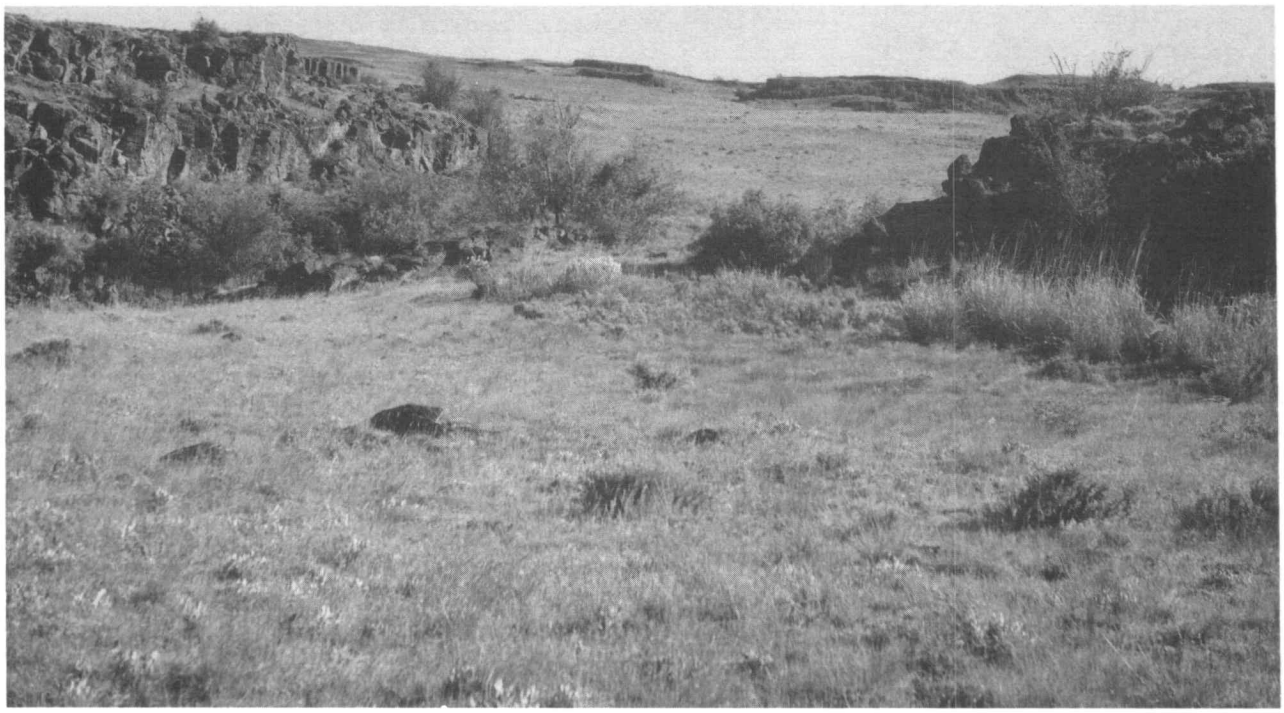

Fig. 3. *Channel scablands of Columbia Basin.*

Table 2. Range condition by ecological site.

Ecological Site	Condition (% of all sample points) Excellent	Good	Fair	Poor
50% Loamy	7	35	38	38
30% Shallow	11	31	31	27
8% Very Shallow	24	38	21	17
12% Sandy/Sandy loam	2	10	33	55

Source: Original data, compiled from SCS National Resource Inventory, 1981.

Before European influence was felt in the Washington region, grazing by large ungulates was unknown. Natives depended primarily on fish as their source of food, and their populations were centered along rivers and coasts where salmon were available in large numbers. Coastal Indians added sea otter and whales to their fare, while interior tribes found diversity in venison, berries, and roots. Bison reportedly became extinct in eastern Washington 2,000 years ago. Horses, brought from Catholic missions in New Mexico in about 1730, changed the lives of the Indians and provided the first intensive grazing pressure known to have been applied to Washington ranges in recent history.

Dr. John McLaughlin, Procurator of the Hudson's Bay Company at Fort Vancouver, introduced the first livestock of consequence in 1824. He sold a few head of cattle in 1840 to Chief Kamiaken of the Yakima Tribe, who soon filled the forests and valleys of the southeastern slopes of the Cascades with innumerable herds. Unlike Texas Longhorns stocking southwestern U.S. ranges, these were quality English breeds. American stockmen, seeing the opportunity, also went into the cattle business. Soon the ranges were overstocked.

Many weary pioneers following the Oregon Trail found respite at Fort Walla Walla in southeastern Washington, and stayed rather than continuing on to their western Oregon goal. During the 1850s these adventurers found success in the cattle business. All that was needed was "a $10 horse and a rope."

A.J. Splawn, Ben Snipes, and T.M. Thorpe became legendary cattlemen of that era. In a reflective mood, Mr. Splawn later recorded his memories of the way it was when he arrived, describing it as "a perfect carpet of grass.....it was a beautiful sight to behold, a paradise for stock." Others gave similar reports.

Excellent markets for the quality cattle raised in the region encouraged rash investments and rapid increases in livestock numbers. Herds were trailed to Canadian mining camps, and eastward to stock the Northern Great Plains ranges and farms. Financial booms and busts were a common feature of the local economy and promoted bad land management practices.

Despite the general abundance of forage in the beginning, it did not take long for major changes to occur. Ranges became fully stocked in early 1870s. Forage cover destruction occurred when itinerant bands of sheep arrived from California, causing consternation among cattlemen who were trying to reserve forage for their operations. Basic to all this mismanagement was the inability of the stockmen to understand the fragile nature of the local vegetation. Forage grasses here had developed over the ages without grazing pressure, and thus were not prepared to stand up to intensive grazing.

Fig. 4. *Ranch headquarters in Columbia Basin channel scablands of Washington.*

By 1900 the damage had been done. Fortunately, two trained range scientists came to the state and recorded what they saw. David Griffiths entered the region from northern Nevada and later published his findings (1903), calling national attention to the situation. J.S. Cotton, a USDA employee, and graduate student at Washington Agricultural College, Pullman, examined range conditions in all parts of eastern Washington and recorded extensive observations of his findings in his thesis (Cotton, 1904). Describing the Prosser area, he said the range "is at present in a very bad state of depletion. Nearly all of the better portions are now under fence and being culti-

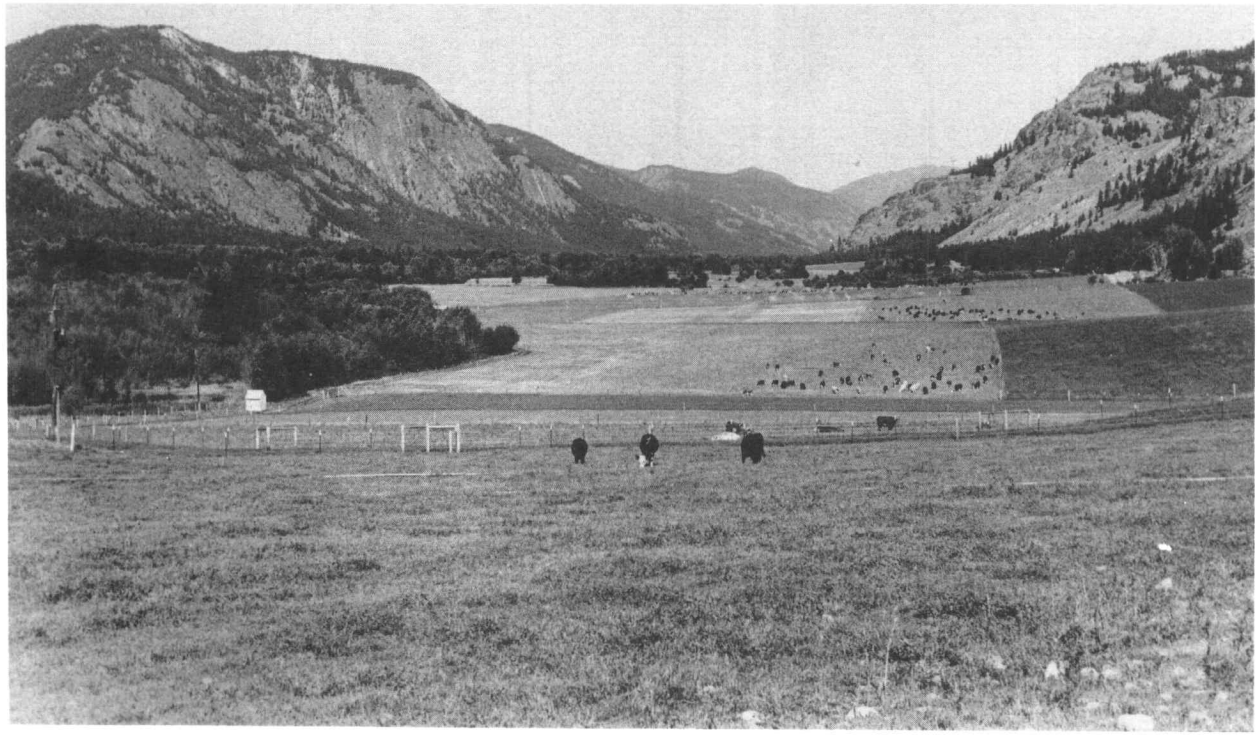

Fig. 5. *Livestock pasture in eastern foothill valley of Cascade Mountains.*

vated, while the poorer parts have been grazed to a point where it is almost impossible for cattle to make a living, and sheep can find but a few weeks of good grazing."

Speaking of the southwest corner of the Basin he said "This entire country has been badly overgrazed, and at the present time the greater part of the free range is so destitute of food that cattle can hardly make a living on it. ....the range problem is very serious, all the free range in the neighborhood has been so severly overgrazed by numerous bands of sheep on their way to the forest reserve that the cattle belonging there can hardly get any grazing". He found this condition wherever he looked. This appears to be the period of lowest range condition in Washington's history. Subsequent generations of graziers have inherited these problems.

Cheatgrass was accidentally introduced into the west, and was first reported in Washington in 1893. It found a ready home, and "spread like wildfire". Much concern was expressed among stockmen as well as professional biologists. Some thought it a saving grace, others an undependable substitute and a dangerous fire hazard, and it proved to be all of those. Within a few short years it became the dominant plant on millions of acres of disturbed grazing land. Its presence marked a major change in range management history.

Fig. 6. *Grazed Douglas Fir zone woodland, in excellent condition, Cascade Mountains.*

Although U.S. Forest Service officers began applying good range management practices on National Forests as early as 1905, range conditions in general continued with little improvement until the early 1930s. The Great Depression and concurrent Great Drought focused attention on conservation issues. Range research and range education were stimulated to meet the need. Soon "range surveys" were in progress throughout the west. U.S. Soil Conservation Service technicians offered free grazing plans to Washington ranchers.

Subsequent surveys have revealed continuing range condition improvement over the years. John Chohlis (1952) reported strong evidence of improved grazing capacity on a number of representative Washington ranches where records from previous and current evaluations were compared. He attributed the changes to (1) fencing to bring livestock control (2) mechanization of farming (farm horses removed from winter ranges), and (3) improved attitudes of ranchers toward conservation.

Grazing Land Condition — 1981/82

A 1981 Soil Conservation Service National Resources Inventory shows that the percentage of range land (as differentiated from "grazing land", which includes grazed woodland) in excellent, good, fair and poor condition averages approximately 10%, 20%, 30% and 40% respectively. Poor and fair condition ranges tend to be concentrated in the Basin as well as along major canyons while good and excellent conditions are found more in the foothills, and valleys of mountain streams.

Fig. 7. *Poor condition Big sagebrush/Bluebunch wheatgrass rangeland, Cascade Mountains foothills.*

About 30% of the state's rangeland is reported to be in satisfactory (good to excellent) condition, requiring no further treatment than continued careful grazing management. Another 15%, the better part of fair condition, can recover under careful grazing management.

Usually, poor condition sites, and the lower end of fair condition sites, must be seeded to reestablish suitable plant cover in a reasonable time period. Fortunately, a large proportion of the area of these classes is located on sites suitable for range seeding. The deep sites (loamy and sandy/sandy loam) together make up an estimated 62 percent, or almost two thirds of total rangeland area, thus there are large acreages of poor/fair condition range that may be effectively treated for recovery by direct seeding (Table 2).

Cheatgrass has been a significant player on rangelands in the Basin as noted above for more than 50 years, and has become a serious weed in dryland crops, particularly in wheat. All plans for range renovation have had to, and still must, include special considerations for cheatgrass control.

Several exotic noxious perennial weeds, including spotted, diffuse, and Russian knapweeds, leafy spurge, and yellow starthistle, are replacing cheatgrass on many disturbed sites. The worst of the bad news is that these are not restricted to displacing cheatgrass, but once established there, are even moving into excellent condition stands of native vegetation. This is becoming our number one vegetation management problem, and remains without an evident solution.

What to do About it All?

General attitudes and goals of private as well as public land managers are strongly supportive of actions leading to the restoration and maintenance of the ecological integrity of the state's rangeland resource. The big problem at present is finding economic ways of doing something to accomplish these goals.

Early cattlemen knew they were damaging the range. They, along with horse farmers of eastern Washington and itinerant sheep bands "mined" the pristine range resources in their enthusiasm to develop the state in the late 1800s. They were all caught in the economic necessity of competing for their share. The United States Congress and Executive Branch claimed land ownership but failed to provide regulation of use. When government did finally act by passing the various homestead legislations, they increased the likelihood of range deterioration by making allocations too small (160 and finally 640 acres) to sustain economic livestock operations.

Today's generation of ranchers have inherited these problems. In aggregate, the production of Washington's range livestock industry is impressive. Individually, ranch income is marginal, with little free capital for investment in range improvements. Range renovation programs dependent on private resources will continue to be slow and incomplete.

What About the Future?

Even our best condition ranges will not likely be duplicates of the pristine plant associations present in the 1880's. There have been too many introductions of plant and animal species, both good and bad, and too many changes in social and economic realities to ever return to that condition.

However there is no justification for complacency. A large proportion of rangeland is in poor condition, locked in an ecologic stalemate by the presence of established undesirable competing vegetation, and in an economic stalemate of low productivity which limits rehabilitation. There is an immediate need for strengthening corrective programs. Continuing establishment of noxious weeds, loss of valuable forage species, and loss of irreplaceable soil are sufficient reasons for deep concern. But economic loss to ranch operations on poor condition ranges adds an often ignored social problem that should also be of public concern.

Many of the rehabilitation problems outlined can be partially solved with present knowledge and programs in place. In addition, the following needs are evident:

1. A unified state and federal program to focus economic assitance on local rehabilitation, education and coordination problems.
2. Extension programs expanded to bring the good news that rangelands are more productive in excellent condition.
3. Technical help available with financial assistance.
4. Research programs expanded for Washington's specific needs.

Ranchers are the most dedicated and practical environmentalists available. It is fortunate, then, that a large proportion of Washington's rangelands are in private ownership. Income and success are reflected in pride of good management and willingness to blend on-the-ground experience with best biological and technical wisdom.

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