Dear Editor:

Recently I ran across a bit of information concerning cheatgrass that I thought might be of interest to your readers. Beginning in 1979 there was a 14 year study done in Southeastern Oregon soon after scientist found two isolated areas deep within large lava flow areas where livestock grazing had never occured, nor had cheatgrass been introduced. Both of these areas were only accessible by helicopter or by arduous hiking across miles of lava.

During the study several important things were learned. First of all, contrary to popular belief, it was found that the frequency of plants (numbers of plants per sq. yard) was not what had been expected. At the "East "kipuka" (isolated study site), it was found that 59 percent of the ground was barren of vegetation, while at the west kipuka, ground barren of vegetation ranged from 84 percent in 1980, to 76 percent in 1991.

These findings support what the earliest explorers and trappers had to say about the country in its pristine state. Jedadia Smith, Peter Skeen Ogden, Fremont - nearly all of the earlyest trappers and explorers discribed the country as being nearly barron of productive vegitation.

Most significant was the increase in cheatgrass which occurred at the west kipuka beginning in 1980. Apparently, there was an unintended introduction of cheatgrass by the scientist themselves. Soil previously barren of vegetation became populated by cheatgrass, yet, no loss of perennial grasses, forbs, or shrubs was noted during the remainder of the study.

These finding present a clear challenge to much of the conventional thinking that has prevailed over the last 70 or so years. Unfortunately, it is the nature of mankind to be critical of effects of man. People for some reason want to believe that our rangelands have been degraded, and that all was wonderful before the coming of white man. In truth, the opposite has occurred. Our rangelands are not less productive than they were in their pristine state, they are more productive. Cheatgrass is not as bad as so many like to portray it. In fact, in most instances, cheatgrass has been complementary to the existing or native vegetation.

This is not to say that cheatgrass can't be a problem, for it can be. As was pointed out in your recent articles on cheatgrass, when wildfire occurs over much of the West, more often than not, it kills most native vegetation. In most instances it takes from 50 to 100 years for bitter brush, and many native grasses to

reestablish themselves. In the meantime, cheatgrass takes over; setting the stage for more wildfire.

That is why it is so important that burned over areas be seeded as soon as possible after a fire. Hot summer fire kills nearly all cheatgrass seed, creating an almost perfect seedbed for grasses which are conducive to the area.

But even more important, we need to understand why we're having so many more large fires than ever before. Cheatgrass has been with us for a long long time. The problem of increasing fire is not cheatgrass. The problem is reduced grazing. We need to be putting more livestock back on our rangelands. With little fuel, wildfire is at a disadvantage; its easier to put out. That's why there were so few bad wildfires in bygone years.

And Oh yes, don't listen to all the talk about cattle not eating cheatgrass. Over much of Nevada, if the cattle didn't eat cheatgrass, they would loss two thirds of their diet. Every year there are hundreds of thousands of cattle that get fat on cheatgrass throughout the western United States.

Cliff Gardner
Ruby Valley

Nov. 21, 2002

PRISTINE VEGETATION OF THE JORDAN CRATER KIPUKAS: 1978-91

Robert R. Kindschy

ABSTRACT

During the past 14 years, information has been gathered concerning the pristine vegetation of the two major kipukas within southeastern Oregon's Jordan Crater Research Natural Area. Such information is valuable when assessing the status of vegetation on comparable sites under management. Cheatgrass is present in minor amounts in all the plant communities. Variation in abundance is apparently related to the amount of timely precipitation in a given year. Cheatgrass awaits a disturbance, which reduces the competitiveness of native perennials, to establish temporary dominance.

INTRODUCTION

Approximately two to three thousand years ago (Mehringer 1987) a major eruption of basalt lava covered 6,880 ha (16,995 acres) of sagebrush steppe near Jordan Valley in southeastern Oregon (43°10' N. latitude and 117°20' W. longitude). Unusually nonviscous lava isolated two areas of land, forming islands or kipukas. Neither site has been influenced by human activities, including grazing by livestock. As such, they provide "benchmark" information about pristine plant communities within the Owyhee Upland Province (Franklin and Dyrness 1973). The entire lava flow was declared a Research Natural Area (RNA) in June 1975 (Kindschy and Maser 1978).

The eastern kipuka is 3.5 ha (8.6 acres) in area, while the western is smaller at 1.4 ha (3.4 acres). However, the more rugged west kipuka has a greater variety of habitats and, consequently, greater plant species richness. Elevations are similar, 1,335 m (4,380 ft) at the west kipuka and 1,274 m (4,180 ft) at the eastern. Soils differ between the kipukas (table 1).

METHODS

Both kipukas are accessible only by helicopter or by rather arduous hiking across the lavas. Each was visited on an irregular basis throughout the past 14 years of monitoring. Plant production was determined using standard plot clip and weight techniques with conversion to air dry weights employed. Line intercept transects were randomly run to measure frequency and density by plant species and land barren of vegetation. Foliar cover of sagebrush was determined using the variable plot method (Cooper 1957). Cryptogam frequency was measured both by line intercept and by systematic points taken at 1.5-m intervals.

Sagebrush height was directly measured on all plants within belt transects. Age class characterization of sagebrush was by consensus of three range scientists. Decadent plants exhibited >50 percent dead material.

Soils were described in 1983 by soil scientists Daniel E. Brown and James A. Pomerening, Bureau of Land Management, U.S. Department of the Interior.

RESULTS

Vegetative cover in rangeland communities is always of interest to biologists. In 1991, the east kipuka exhibited 59 percent of the ground barren of vegetation; 21.4 percent of this was rock. Figure 1 shows the percentage of ground cover. Bluebunch wheatgrass (Agsp) accounted for 24.6 percent of cover. Sandberg's bluegrass (Posa) represented 3.6 percent. More significant were the forbs, *Lomatium* (5.9 percent) and *Crepis* (1.7 percent). Such palatable forbs appear to diminish under grazing pressure by livestock. Wyoming big sagebrush comprised 5.2 percent of the intercept.

Plant frequency, determined in June 1978, documented the ratio of grasses:forbs:shrubs on the east kipuka. Figure 2 illustrates this relationship. Frequency of native, perennial forbs is of interest. At 30 to 45 percent of the vegetation, forbs within this pristine environment appear to be more prevalent than on similar sites subjected to domestic livestock use.

Figure 3 portrays percent composition of vegetation on the east kipuka in June 1978. Again, it is significant that the forb, *Lomatium,* comprised 25.5 percent of species. *Crepis* represented over 4 percent. Bluebunch wheatgrass (Agsp) approached half the vegetation present at 49.1 percent. Figure 4 depicts plant production during 1978. *Lomatium*, by far, was the maximum producer at 462 kg/ha. Bluebunch wheatgrass (Agsp) was second at 182 kg/ha.

Wyoming big sagebrush crown cover varied little between 1986 measurements and those of 1991 (fig. 5). The range was between 5 and 7.5 percent. Sagebrush height, which averaged 84.6 cm, was remarkably consistent (fig. 6). Of interest was the density of sagebrush by age class (fig. 7). It was apparent that this stand on the east kipuka was in trouble.

Whether this was due to the persistent drought is questionable, although stress may have contributed to the loss of older sagebrush plants. A lack of seedlings and young may be related to the competition from well-established perennial grasses and forbs. Sagebrush reproduction appears common on many grazed rangelands elsewhere in southeastern Oregon during the continuing drought.

Paper presented at the Symposium on Ecology, Management, and Restoration of Intermountain Annual Rangelands, Boise, ID, May 18-22, 1992.

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Table 1—Summary of soils data for Jordan Crater kipukas

	East kipuka	West kipuka
Soil type	Anawalt variant (mesic) silt loam.	Old camp very gravelly silt loam.
Classification	Clayey, montomorillonetic, mesic.	Loamy-skeletal, mixed mesic.
	Lithic Xerollic Haplargid.	Lithic Xerollic Haplargid.
Parent material	Residium from Pliocene olivine basalt. Basaltic residium results in a more clayey and a less sketetal soil than the rhyolitic residium of the west kipuka.	Residium from Miocene rhyolite.
Physiography	Slopes are 1 percent to 5 percent on the crest and about 20 percent to 30 percent around the outer margin. Rimrock common around outer margin.	Slopes are 3 percent to 8 percent. The edge of the surrounding lavas is about 2 m higher than the kipuka.
Stoniness	Stones are 0.7 to 1.5 m apart on the surface (Class 3). Rock outcrop is exposed on about 2 percent of area.	Stones are 0.2 to 9 m apart (Class 2). Rhyolite pebbles cover 50 percent of soil surface. Rock outcrop exposed on 10 percent to 15 percent of area.

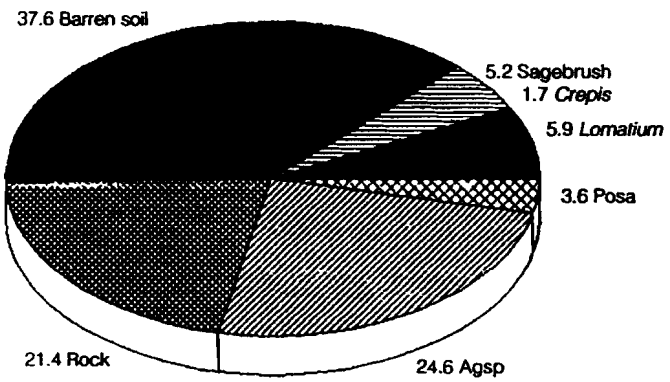

Figure 1—Ground cover percentages at east kipuka in 1991.

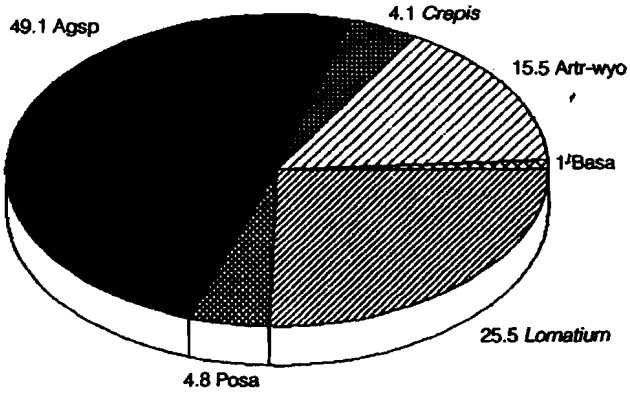

Figure 3—Percentage of species in vegetation of east kipuka, June 1978.

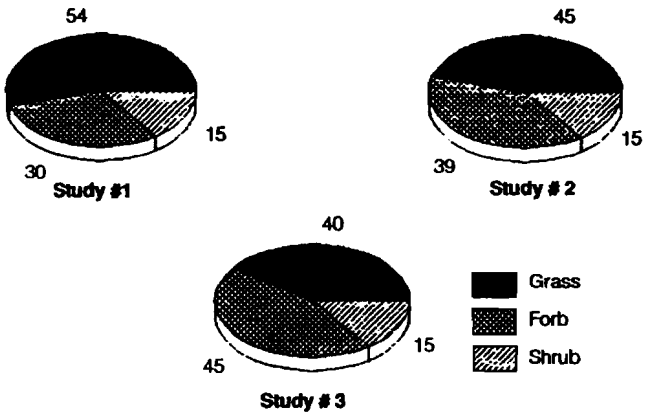

Figure 2—Percentage of grass, forb, and shrub vegetation on the east kipuka sites in June 1978.

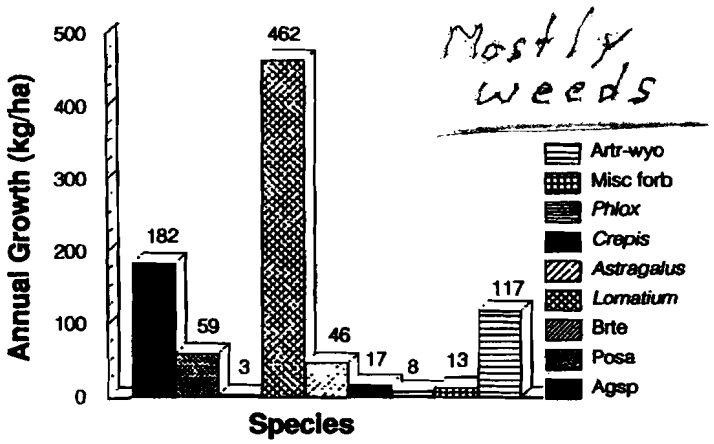

Figure 4—Annual plant growth (kg/ha) on east kipuka during 1978.

Vegetation on the west kipuka is favored by site diversity but restricted by a more-limiting soil. Interestingly, the vegetation within the Wyoming big sagebrush/ bluebunch wheatgrass community changed little between

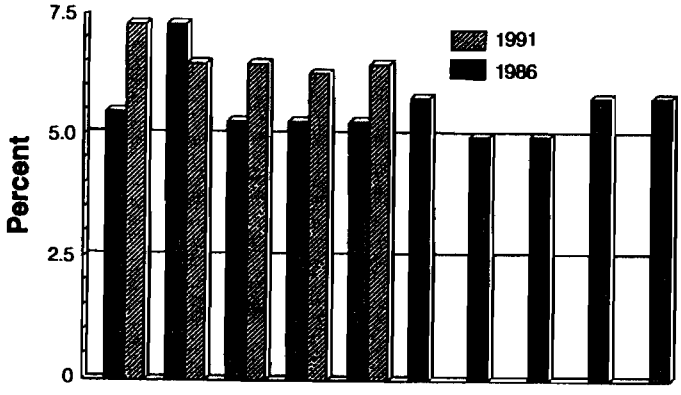

Figure 5—Wyoming big sagebrush crown cover (percent) at east kipuka, 1986 and 1991.

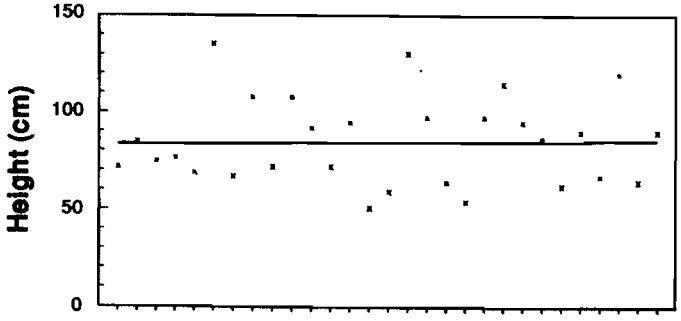

Figure 6—Height of Wyoming big sagebrush at east kipuka, June 1991. Average height for the sample was 84.6 cm.

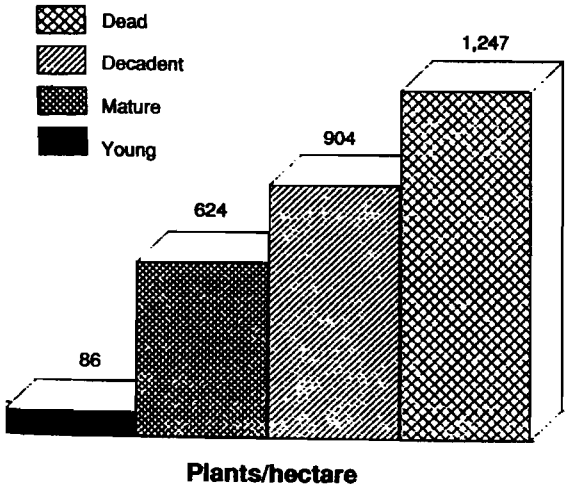

Figure 7—Density of sagebrush by age class at east kipuka, July 1991.

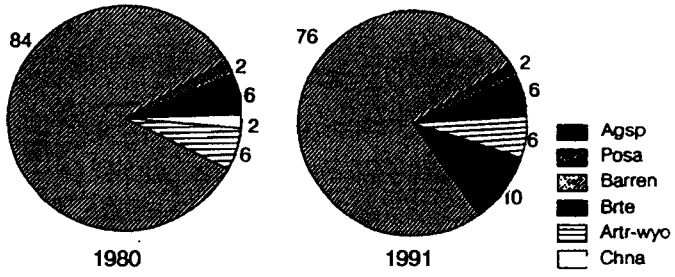

Figure 8—Transect vegetation components (percent), west kipuka, 1980 and 1991.

1980 and 1991 (fig. 8). Most significant was the increase in cheatgrass (*Bromus tectorum*) from undetected in 1980 to 10 percent of the foliar intercept in 1991. Soil previously barren of vegetation appeared to have been populated by cheatgrass. No loss in perennial grasses, forbs, or shrubs was noted. Unusually heavy spring rainfall in 1991 may have created an environment conducive to annuals, such as cheatgrass, in the interspaces between existing perennials.

Comparison of data among the various pristine communities on the west kipuka showed the differences in vegetation (fig. 9) among various communities. Frequency of occurrence data on the west kipuka illustrates the differences among the various communities (fig. 10).

Cryptogam occurrence on the west kipuka is shown in figure 11. Two samples in 1987 showed little difference between plant communities. Mosses and lichens comprised roughly 42 percent of the "hits" (frequency of occurrence) in pristine habitats. These soils were loose and fluffy.

Figure 12 illustrates the results of a study conducted during 1991 on the west kipuka. Cheatgrass was present in all the pristine plant communities, but was most abundant in the deeper soils of the basin big sagebrush site.

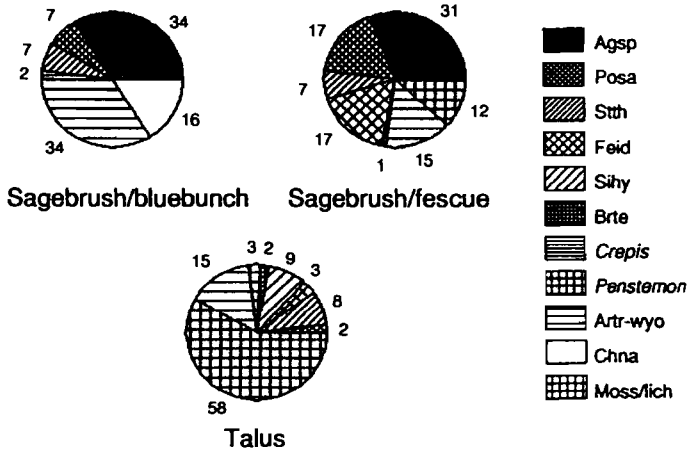

Figure 9—Canopy intercept if vegetation (percent), west kipuka, September 1980.

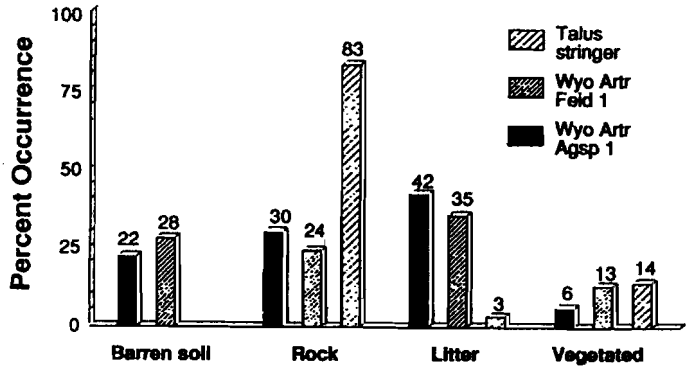

Figure 10—Frequency of ground cover occurrence (percent), west kipuka, September 1980.

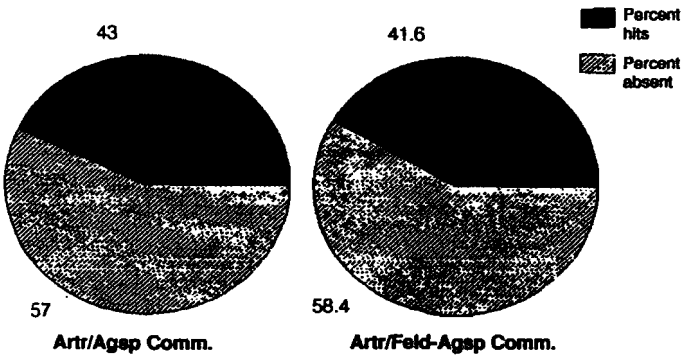

Figure 11—Frequency of moss and lichen occurrence (percent), west kipuka, 1987.

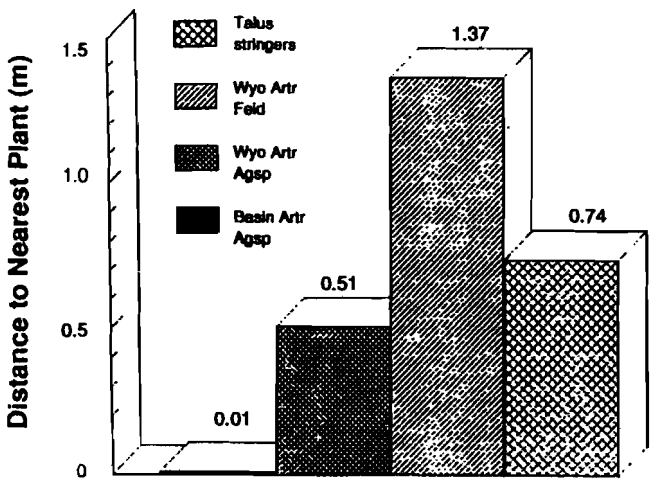

Figure 12—Cheatgrass occurrence in various plant communities, west kipuka, September 1991.

CONCLUSIONS

Pristine vegetation has been influenced through the introduction of flora from other areas over time. Such is the case with the kipukas of the Jordan Crater RNA. Cheatgrass is presently a component of the ecosystem. It will likely remain so for many millennia. Cheatgrass abundance appears to be governed by opportunity. Stress on perennial plants from drought, fire, or biological agents creates an opportunity for temporary abundance and perhaps dominance of annuals such as cheatgrass.

Future monitoring of the kipuka vegetation will determine plant species composition change. This paper documents the rather stable vegetative assemblage during the 1980's.

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