

Reclamation of Pipeline Right-Of-Ways on Rangelands

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Introduction

In the mid 1990's a large diameter natural gas pipeline was constructed across western Nevada. Reclamation of such right-of-ways are challenging because of both the severity and the linear nature of the disturbance. During construction, pipelines and equipment (**Fig. 1**) are highly visible at a landscape level to the general public, therefore attracting concerns and reclamation suggestions from a host of interest groups. The construction contractor invited us to set up plots and conduct research concerning the reclamation of their pipeline disturbance.



Figure 1. Heavy equipment used in pipeline construction is very visible as well as the disturbance.



Figure 2. Pipeline site the first year after reclamation seeding effort.

Methods

We implemented drill and broadcast seeding (**Fig. 2**) with a variety of desirable native and non-native plant materials at two separate pipeline construction sites in northwestern Nevada. Both sites have soils derived from decomposing granite and well developed agrillic horizons. The pre-construction vegetation at both sites was basin big sagebrush (*Artemisia tridentata* ssp. *tridentata*) and desert needlegrass (*Achnatherum speciosum*) plant communities. The higher elevation site is at an elevation of 1750 m and receives an average of 30 cm of precipitation while the lower elevation site is at 1600 m and receives an average of 18 cm of precipitation annually. In the fall of 1997 we seeded 14 different plant species (**Table 1**) at both sites. Each species was planted at a density of 66 seeds per meter.

Table 1. Plant material used in the pipeline reclamation effort.

Common Name	Scientific Name
Antelope Bitterbrush	<i>Purshia tridentata</i>
Basin Big Sagebrush	<i>Artemisia tridentata</i>
Basin Wildrye	<i>Leymus cinereus</i>
Big Bluegrass	<i>Poa secunda</i>
Bluebunch Wheatgrass	<i>Pseudoroegneria spicata</i>
Bottlebrush Squirreltail	<i>Elymus elymoides</i>
Crested Wheatgrass	<i>Agropyron desertorum</i>
Desert Needlegrass	<i>Achnatherum speciosum</i>
Idaho Fescue	<i>Festuca idahoensis</i>
'Immigrant' Forage Kochia	<i>Kochia prostrata</i>
Indian Ricegrass	<i>Achnatherum hymenoides</i>
Needle-and-Threadgrass	<i>Hesperostipa comata</i>
Shadscale	<i>Atriplex confertifolia</i>
Thurber's Needlegrass	<i>Achnatherum thurberianum</i>



Figure 3. Lower pipeline site 6 years after the initial reclamation seeding.



Figure 4. Antelope bitterbrush, basin big sagebrush, 'Immigrant' forage kochia, and needle-and-thread grass were some of the planted species that successfully established.

Results and Discussion

It is a common practice to rest sites from livestock grazing for 2 years following such efforts, but this is hard to do following pipeline disturbances because the disturbances are so narrow and linear in nature. The upper site was in better ecological condition (good) than the lower site (poor to moderate) yet the reclamation of the upper site was for the most part a complete failure. Squirreltail and antelope bitterbrush did establish at the upper site, but the grazing pressure from domestic livestock as well as black-tailed jackrabbits, pronghorn antelope and mule deer played a major role in the failure of these seedings. When an exclosure was built to protect the site from grazing pressure, we experienced significantly more success. The lower pipeline site did experience good success of many of the seeded species. All the needle grasses as well as Indian ricegrass, antelope bitterbrush, basin big sagebrush, squirreltail, crested wheatgrass and "Immigrant" forage kochia all established in good densities (**Fig. 3 and 4**) It is very important when planning and applying reclamation seedings (or any restoration effort) on physically altered habitats such as pipelines to consider site potential, grazing management, and native animal communities. Obviously we expected much more success at the higher potential site at the upper location and continue to implement reclamation efforts at that site. The success experienced at the lower site was well past our expectations.