Project COPMC-S-0402-WL
Project Report 2006
By Steve Parr

Seed Increase for Uncompahgre Restoration Project

INTRODUCTION

Years of noticeable mule deer declines in areas that once held healthy populations prompted a series of studies by Colorado Division of Wildlife to determine the cause(s) for these dramatic population declines. What was discovered was not specific to mule deer, but rather was much more widespread. It was apparent that many of the problems related to mule deer declines were shared by other species, including plants. Because of the recognition of declining habitat on the Uncompahgre Plateau, and the ramifications that unchecked decline would have on mule deer and other species, a collaborative, community based effort was formulated to address the concerns. As a result, the Public Lands Partnership was created. Upper Colorado Environmental Plant Center (UCEPC) was contacted by Rick Sherman. A summary of this partnership and the Uncompahgre Plateau Project is provided below.

EXECUTIVE SUMMARY

The Uncompahgre Plateau Project (UP) was formalized in a 2001 MOU by the Public Lands Partnership (PLP), Bureau of Land Management (BLM), Colorado Division of Wildlife (CDOW), and U.S. Forest Service (USFS). These organizations formed a partnership to work collaboratively to restore and sustain the ecological, social, cultural, and economic values of the Uncompahgre Plateau. The UP area, located in southwest Colorado, comprises over 1.5 million acres of private, state, and federal lands. Approximately 75 percent of the area is public land.

Native plant communities on the Plateau are maturing and becoming less diverse and productive. As a result, water quality, wildlife habitat, and forage yields have declined while soil erosion and noxious weed invasion have increased. Changes on the Plateau have resulted due to natural processes and past management practices including fire suppression and historic overgrazing. A decline in landscape health is particularly evident in the pinyon-juniper zone. A number of agency management plans and studies document these concerns. UP is assisting in the coordination of management across jurisdictional boundaries to address ecosystem needs.

The overarching goal of the project is to improve the ecosystem health and natural functions of the Uncompahgre Plateau through active restoration projects. Sustaining social, cultural, and economic values to the local communities are also important goals. The primary role of UP is to help coordinate and facilitate restoration activities on the Plateau. UP does not supercede management authority on any federal, state, or private lands.

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METHODS

Collections

No seed collections were conducted by UCEPC in 2005 or 2006. To date, UCEPC has collected four grass species, three shrubs, and two forbs that can be utilized for seed increase or containerized production. Table 1 outlines the clean seed quantities collected during the 2002, 2003, and 2004 field seasons. A total of five collection days were used to obtain the seed. The six materials collected in 2002 were from two trips. The first trip on July 1 was conducted south and east of Montrose and the second trip, July 19, was done on the Uncompahgre Plateau. In 2003, a collection was conducted June 23 on Sims Mesa and on July 30, the entire staff again collected on the Plateau. A single trip, August 12, was taken to the Uncompahgre Plateau in 2004. All of these materials remain on inventory at the Plant Center.

Table 1
Uncompahgre Restoration Project
UCEPC Collections

Species	Scientific name	2002	2003	2004
Blue wildrye	*Elymus glaucus*	---	---	308 g
Bluestem penstemon*	*Penstemon cyanocaulis*	11 g	76 g	
Bottlebrush squirreltail	*Elymus elymoides*	47 g	361 g	
Indian ricegrass	*Achnatherum hymenoides*	---	361 g	
Lewis flax*	*Linum lewisii*	23 g	---	
Mexican cliffrose	*Cowania mexicana*	2 g	---	
Mountain mahogany	*Cercocarpus montanus*	18 g	566 g	
Needle and thread	*Hesperostipa comata*	---	169 g	
Utah serviceberry*	*Amelanchier utahensis*	13 g	87 g (rust)	
Utah serviceberry*	*Amelanchier utahensis*		120 g	

* Positive identification pending

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Plantings
The project plans had originally called for the use of seed from collections rather than greenhouse grown stock. However, region wide drought conditions did not provide good collectible populations of target materials. Steve Monsen, Native Plant Coordinator for the UP Project, provided seed to greenhouses for container production. In 2004, three species were provided to UCPEC for field increase as containerized stock. These materials were placed in production fields with the use of two Holland Old Faithful model transplanters. On June 16, 2004, a crew of eight people planted six rows (0.2 acre) of yarrow plugs that were grown in cone type containers. The crew started preparing the plugs for planting at 10:30 a.m. and by 3:30 p.m. the yarrow transplanting was done. The following day, 0.27 acre of muttongrass was transplanted by 12:30 p.m. and on June 18, 0.27 acre of Junegrass was done. A crew of seven transplanted the muttongrass and six people transplanted the Junegrass.

Two transplanters were placed on a toolbar, each with seating for two. This allowed four people to transplant into two rows, alternating the placement of plugs. Depth adjustments were made on the planting shoe for the size of the rooted stock. As the shoe opened the furrow, the plugs were placed at a slight angle in the furrow, held in place until the packer wheels approached the planting spot, and then released as the packer wheels pressed the soil around the plug. The second person would have the next plug in place while the first person closely observed and adjusted the placement of the plug being planted. Alternating in this way with two people planting per row provided excellent placement. Two people followed on foot, one for each row, to adjust planting depths on the transplants as necessary. Hand move sprinklers were set immediately after the plantings were completed each day. Survival and stand establishment were excellent on all three products utilizing these methods. In 2005, an additional material was planted in UCEPC Field 3A. Approximately 1800 "Conetainer" type transplants of *Senecio multilobatus* were planted the first of July in the same manner the other materials were planted.

Harvests
Each product was harvested with the Hege plot combine in 2005 and 2006. In addition to direct combining, a tarp was attached to the back of the combine such that the straw and chaff that exited off the straw walkers would be captured. This material was then transported to a straw/seed drying area for further seed recovery. After the material was dry, it was run through the Hege combine repeatedly until no additional appreciable seed recovery was obtained.

RESULTS

On November 2, 2004, forty-three clean grams of UP yarrow were hand collected. This represents the first field produced seed by UCEPC for this project. Each field established in 2004 produced seed in 2005 and 2006. The Senecio field, established in 2005, also produced seed in 2006.

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Below, a summary of planting dates, acreage, harvest dates and harvest amounts is provided as a table.

Species	Accession	Year Established	Acreage	Harvest Amount	Harvest Date
Junegrass	9092273	6/18/2004	0.27 acre	-0-	NA
				15 lb	7/26/2005
				10.4 lb	7/12/2006
Muttongrass	9092272	6/17/2004	0.27 acre	-0-	NA
				2 lb	6/8/2005
				16.5 lb	5/30/2006
Senecio	9092280	7/1/2005	0.13 acre	-0-	NA
				15 lb	6/21/2006
Yarrow	9092271	6/16/2004	0.20 acre	43 g	11/2/2004
				17.5 lb	8/6/2005
				14 lb	8/02/2006

After harvest, the Senecio plants went dormant, which is not unusual for cool season materials. However, with time, even the leaves dried up and became decadent. Upon further observation, it was apparent that many of the plants were dead or dying. Bob Hammon, Colorado State University Extension Agent and area entomologist, was summoned for assistance with diagnosis of any insect or fungal pest problems that may have had an effect on plant mortality.

With further assistance from Laura Pottorff, three fungal pathogens were isolated from the Senecio samples Bob provided and could be the cause of both root rot and crown rot. The two species, *Colletotrichum spp*. and *Pythium spp*., were considered most suspect for causing harm to the plants while the third isolated pathogen, *Fusarium,* was largely disregarded as being a primary concern.

It appeared that over 70 percent of the field was dead from an observation made in September. However, there were some "volunteer" plants showing up that may warrant further observation before removing the field.

One reference indicated that the species may be a "short lived perennial, or a biennial or winter annual". This characteristic could further explain the behavior of the plant after seed harvest. Although the plugs were planted in 2005, they did not produce flowers until 2006. In this regard, the plants behaved at UCEPC much like a biennial. The identified pathogens may have infected already weak or dying plants.

Another disturbing result this year was the very low Pure Live Seed component in each of the four harvests, (see included seed test results). The muttongrass, for example, had a purity analysis of 93.63 percent, but only 20 percent germination.

		2006 Harvest Results		
Species	**Clean Weight**	**Purity %**	**Germination %**	**PLS Pounds**
Muttongrass	16.5 lb	93.63	20	3.09
Prairie Junegrass	10.4 lb	83.25	75	6.49
Senecio	15 lb	40.94	20	1.23
Yarrow	14 lb	26.79	66	2.48

CONCLUSION

UCEPC will continue to produce seed through 2007 of the fields established in 2004 if this is agreeable with the Uncompahgre Technical Committee. At this time, it has not been determined by the committee which, if any, of the materials will continue to be produced through time. However, it is anticipated that other materials will be planted and the size of the established fields may be expanded to increase the amount of seed produced and delivered to UP growers.

Verbally, it has been noted that a formal agreement between UCEPC and the PLP will be drafted. In 2002, UCEPC received a $50,000 contribution from the UP committee for the initiation of work on the project. After two years of collections and three years of production, a new agreement is necessary to extend the project. In 2006, there was $2085 of the original amount remaining from which UCEPC drew funds, with a balance of $9898. This was invoiced in December 2006.