

**National Park Service
Plant Materials
Year 2004 Annual Report**

Prepared by

**USDA Natural Resources Conservation Service
Los Lunas Plant Materials Center
Los Lunas, New Mexico
February 2005**

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Grand Canyon National Park

Background

In July 1990, an agreement among the US Department of Interior (DOI), the National Park Service (NPS), the Grand Canyon National Park (GCNP), and the USDA-NRCS Los Lunas Plant Materials Center (LLPMC) was made for the collection, propagation, and increase of native grasses, forbs, shrubs, and trees.

The agreement states that the LLPMC will produce the plant materials for the GCNP for the purpose of revegetating disturbed areas and native landscaping projects in the park. The agreement includes both the north and south rim areas of the park. Amendment No. 1 of 1999 and Amendment No. 2 of 2001 states that the LLPMC will produce foundation seed of two native species (Blue grama and Muttongrass), and will grow transplants started from native tree and shrub seed collected at the park.

Accessions Involved

Table 1 lists the accessions involved in the GCNP project.

Table 1: Accessions Involved

Common Name	Scientific Name	Plant Symbol	Accession Number	Vegetation Association
Apache plume	<i>Fallugia paradoxa</i>	FAPA	9062865	122.3233
Big sagebrush	<i>Artemisia tridentata</i>	ARTR	9066056	122.3233
Blue grama	<i>Bouteloua gracilis</i>	BOGR	9062875	122.4149
Century plant	<i>Agave utahensis</i>	AGUT	9062874	122.4149
Cliffrose	<i>Purshia mexicana</i>	COME	9062876	122.4149
Curl-leaf mountain mahogany	<i>Cercocarpus ledifolius</i>	CELE	9062867	122.3233
Currant	<i>Ribes spp.</i>	RI SPP.	9066057	122.3233
Datil yucca	<i>Yucca baccata</i>	YUBA	9066058	122.3233
Desert barberry	<i>Berberis fremonti</i>	BEFE	9066059	122.3233
Elderberry	<i>Sambucus spp.</i>	SA SPP.	9066047	122.3233
Fernbush	<i>Chamaebatiaria millifolium</i>	CHMI	9062866	122.3233
Fourwing saltbush	<i>Atriplex canescens</i>	ATCA	9062873	122.4149
Gambels oak	<i>Quercus gambelii</i>	QUGA	9062872	122.3233
Indian ricegrass	<i>Oryzopsis hymenoides</i>	ORHY	9062857	122.3233
Lupine	<i>Lupinus spp.</i>	LU SPP.	9062863	122.3233
Muttongrass	<i>Poa fendleriana</i>	POFE	9062861	122.3233
Needle and thread	<i>Stipa comata</i>	STCO	9062859	122.3233
Penstemon (blue)	<i>Penstemon spp.</i>	PE SPP.	9062862	122.3233
Penstemon (red)	<i>Penstemon spp.</i>	PE SPP.	9066054	122.3233
Pinon pine	<i>Pinus edulis</i>	PIED	9066467	122.3233
Ponderosa pine	<i>Pinus ponderosa</i>	PIPO	9066466	122.3233
Rabbitbrush	<i>Chrysothamnus nauseosus</i>	CHNA	9062877	122.4149
Squirreltail	<i>Sitanion hystrix</i>	SIHY	9062858	122.3233
Utah juniper	<i>Juniperus osteosperma</i>	JUOS	9066055	122.3233
Utah serviceberry	<i>Amelanchier utahensis</i>	AMUT	9062869	122.3233

Table 1: Accessions Involved

Common Name	Scientific Name	Plant Symbol	Accession Number	Vegetation Association
Western wheatgrass	<i>Agropyron smithii</i>	AGSM	9062860	122.3233
Wolfberry	<i>Lycium spp.</i>	LY SPP.	9062870	122.3233

Collection Information

There was no seed collection in 2004.

Seed Condition Information

See previous Grand Canyon Park reports for information.

Seed Production Establishment

No new seed production fields were established in 2004.

Seed Production

Field Management

9062875 Blue grama	Field 20 – 0.5 Acre	Date
Fertilization		
160 lbs. Nitrogen		3/24, 4/30, 5/17, 7/1, 9/29
140 lbs. Phosphorous		4/30, 7/1, 9/29, 12/21
20 lbs. Potassium		5/19
Irrigation		
3" water application		2/23, 3/31, 5/3, 5/18, 6/14, 7/14, 8/26, 10/5
Herbicide Application		
Pendulum Pre-emergent		3/9
Insecticide		
Orthene @ 1.33 pounds per acre		7/7, 7/20, 8/5, 8/20
Cultural Weed Control		
Hand Hoeing		As needed
Mechanical Cultivation		3/8
Harvest		
Combine		9/24
9062861 Muttongrass	Field 20 – 1.0 Acre	Date
Fertilization		
120 lbs. Nitrogen		3/24, 4/30, 7/1, 8/11, 8/17, 12/29, 12/30
140 lbs. Phosphorous		4/30, 7/1, 8/17, 12/29
Irrigation		
3" water application		1/2, 2/18, 3/26, 4/20, 4/30, 5/11, 5/21,

	6/5, 6/23, 7/14, 8/26, 9/15, 10/19
Herbicide Application	
2,4-D	7/8
Pendulum Preemergent	3/9, 8/19
Cultural Weed Control	
Hand Hoeing	As needed
Mechanical Cultivation	8/11
Harvest	
Combine	5/6

9062861 Muttongrass	Field 25S – 0.9 Acre	Date
Fertilization		
200 lbs. Nitrogen		3/24, 4/16, 5/17, 7/7, 8/11, 8/11, 9/16
180 lbs. Phosphorous		4/16, 7/7, 8/17, 9/6, 12/14
20 lbs. Potassium		4/16
Irrigation		
3” water application		1/2, 2/18, 3/26, 4/20, 5/3, 5/24, 6/10, 6/23, 7/20, 8/23, 9/16, 10/22
Herbicide Application		
2,4-D		7/20
Pendulum Preemergent		8/19
Pepperwax		3/19
Cultural Weed Control		
Hand Hoeing		As needed

Seed Produced

Table 2 describes the seed production for the year 2004.

Table 2: 2004 Seed Production

Common Name	Scientific Name	Pounds
Blue grama	<i>Bouteloua gracilis</i>	9.22 PLS
Muttongrass	<i>Poa fendleriana</i>	14.18 PLS

Climatological Data

See the attachment *Climatological Data* for the climatological data for 2004 at the Los Lunas Plant Materials Center.

Transplant Production

No transplants were delivered to GCNP in 2004.

Specialized Treatments

See previous Grand Canyon National Park reports for information on specialized treatments.

Observations

The blue grama and muttongrass fields showed vigorous growth during the 2004 growing season. The production of a good, viable seed crop from these fields continues to be the goal of the LLPMC. The use of increased irrigation applications along with higher rates of fertilizer has led to improved amounts of both forage and seed production of both species since installing the plantings. Increasing the irrigation applications on the muttongrass has allowed the plants to produce abundant forage and has kept the plants from being damaged during the warmest time of the season. The use of pepperwax on young plants of muttongrass to repel rabbits has also prevented damage to young tender growth.

In 2004, irrigation rates on the muttongrass and blue grama remained the same as in 2003. The fertilization rates for the blue grama were the same as in 2003. The muttongrass fertilization was decreased in 2004. Seed harvest on both species was lower in 2004 than in 2003. The decrease in muttongrass seed production in 2004 could be attributed to the decrease in fertilizer application; the decrease in the blue grama seed production could be attributed to some hail damage prior to harvesting the seed.

To evaluate the relationship between fertility rates and seed production, in 2005 the muttongrass fields will be fertilized at a higher rate. The blue grama field will have its fertilizer application increased in 2005 to determine if a corresponding increase in seed production occurs.

The blue grama field will continue to have insecticide applications to control insects that can lower seed yields. Also in 2005, the blue grama field will have the stubble burned off. The management technique of burning stubble during the dormant winter season has been demonstrated to increase seed production at the LLPMC. This process of burning will be evaluated on the GCNP blue grama and will only continue if an appreciable seed increase is noted.

The LLPMC continues to run soil tests on the muttongrass in field 20N and in field 25S to determine the nutrients levels of both fields and to monitor the effectiveness of the fertilizer applications (see Tables 3 through 7). These tests are meant to provide useful data for the continued yield of abundant seed from the GCNP fields.

Table 3: Soil Test Results for Muttongrass, Field 20

Collector: Joe Aragon Collected on: January 12, 2001 Submitted on: January 16, 2001			
Test Parameter	Units	Test Result	Detection Limit
PH of Soil Saturation Test		7.69	
Elect. Cond. Of Soil Paste Extr.	mmhos/cm	0.44	0.01
Magnesium (for SAR) -	meq/L	0.54	0.01
Calcium (for SAR) -	meg/L	2.68	0.01
Sodium (for SAR) -	meg/L	1.43	0.01
Sodium Adsorption Ratio (SAR)		1.13	0.01
Calculated Exchangeable Na %-ESP		.04	0.1
Organic Matter	percent	0.49	0.01
NO ₃ -N 1:5 (soil:water) extract	ppm	3.6	0.1
Phosphorus (NaHCO ₃ extracted)	ppm	6.9	0.1

Table 3: Soil Test Results for Muttongrass, Field 20

Collector: Joe Aragon Collected on: January 12, 2001 Submitted on: January 16, 2001			
Test Parameter	Units	Test Result	Detection Limit
K 1:5 (soil:water) extract	ppm	16	1
Texture of soil by feel		Loamy Sand	

Table 4: Soil Test Results for Muttongrass, Field 20

Collector: Joe Aragon Collected on: April 15, 2002 Submitted on: April 15, 2002			
Test Parameter	Units	Test Result	Detection Limit
PH of Soil Saturation Test		7.88	
Elect. Cond. Of Soil Paste Extr.	mmhos/cm	0.53	0.01
Magnesium (for SAR) -	meq/L	0.56	0.01
Calcium (for SAR) -	meg/L	3.53	0.01
Sodium (for SAR) -	meg/L	2.25	0.01
Sodium Adsorption Ratio (SAR)		1.57	0.01
Calculated Exchangeable Na %-ESP		1.0	0.1
Organic Matter	percent	0.42	0.01
NO ₃ -N 1:5 (soil:water) extract	ppm	3.1	0.1
Phosphorus (NaHCO ₃ extracted)	ppm	16.8	0.1
K 1:5 (soil:water) extract	ppm	8	1
Texture of soil by feel		Loamy Sand	

Table 5: Standard Soil Test for Muttongrass, Field 20

Collector: Danny Goodson Collected on: March 20, 2003 Submitted on: March 21, 2003			
Test Parameter	Units	Test Result	Detection Limit
PH of Soil Saturation Test		8.07	
Elect. Cond. Of Soil Paste Extr.	mmhos/cm	0.62	0.01
Magnesium (for SAR) -	meq/L	0.45	0.01
Calcium (for SAR) -	meg/L	2.00	0.01
Sodium (for SAR) -	meg/L	4.10	0.01
Sodium Adsorption Ratio (SAR)		3.70	0.01
Calculated Exchangeable Na %-ESP		4.0	0.1
Organic Matter	percent	0.41	0.01
NO ₃ -N 1:5 (soil:water) extract	ppm	3.3	0.1
Phosphorus (NaHCO ₃ extracted)	ppm	12.4	0.1
K 1:5 (soil:water) extract	ppm	20	1
Texture of soil by feel		Sand	
Zinc by DTPA extraction	ppm	0.41	0.02
Manganese by DTPA extraction	ppm	1.33	0.04
Iron by DTPA extraction	ppm	2.16	0.10
Copper by DTPA extraction	ppm	0.87	0.01

Table 6: Standard Soil Test for Muttongrass, Field 20

Collector: Danny Goodson Collected on: February 3, 2004 Submitted on: April 7, 2004			
Test Parameter	Units	Test Result	Detection Limit
PH of Soil Saturation Test		8.05	
Elect. Cond. Of Soil Paste Extr.	mmhos/cm	0.43	0.01
Magnesium (for SAR) -	meq/L	0.49	0.01
Calcium (for SAR) -	meg/L	2.08	0.01
Sodium (for SAR) -	meg/L	3.20	0.01
Sodium Adsorption Ratio (SAR)		2.82	0.01
Calculated Exchangeable Na %-ESP		2.8	0.1
Organic Matter	percent	0.17	0.01
NO ₃ -N 1:5 (soil:water) extract	ppm	2.4	0.1
Phosphorus (NaHCO ₃ extracted)	ppm	5.0	0.1
K 1:5 (soil:water) extract	ppm	24	1
Texture of soil by feel		Loamy Sand	

Table 7: Standard Soil Test for Muttongrass, Field 25S

Collector: Danny Goodson Collected on: February 3, 2004 Submitted on: April 7, 2004			
Test Parameter	Units	Test Result	Detection Limit
PH of Soil Saturation Test		7.95	
Elect. Cond. Of Soil Paste Extr.	mmhos/cm	0.59	0.01
Magnesium (for SAR) -	meq/L	0.53	0.01
Calcium (for SAR) -	meg/L	2.69	0.01
Sodium (for SAR) -	meg/L	4.59	0.01
Sodium Adsorption Ratio (SAR)		3.62	0.01
Calculated Exchangeable Na %-ESP		3.9	0.1
Organic Matter	percent	0.65	0.01
NO ₃ -N 1:5 (soil:water) extract	ppm	3.5	0.1
Phosphorus (NaHCO ₃ extracted)	ppm	6.0	0.1
K 1:5 (soil:water) extract	ppm	20	1
Texture of soil by feel		Loamy Sand	



Figure 1: Field 20N, Grand Canyon National Park muttongrass

Pipe Spring National Monument

Background

On September 12, 2002, an agreement among the US Department of Interior (DOI), the National Park Service (NPS), the Pipe Spring National Monument (PSNM), and the USDA-NRCS Los Lunas Plant Materials Center (LLPMC) was made for propagating and harvesting native seed collected from the PSNM for the purpose of revegetation projects.

Accessions Involved

Table 1 lists the accessions involved in the 2004 PSNM agreement.

Table 1: Accessions Involved

Common Name	Scientific Name	Plant Symbol	Accession Number
Blue grama	<i>Bouteloua gracilis</i>	BOGR	9066558
Galleta	<i>Pleuraphis jamesii</i>	PLJA	9066559
Indian ricegrass	<i>Achnatherum hymenoides</i>	ACHY	9066587

Collection Information

Indian ricegrass seed was collected at the Monument in 2003 and sent to the LLPMC. PSNM Galleta grass seed was collected in 2004 and sent to the LLPCM for processing. No blue grama seed was collected in 2004.

Seed Condition Information

In 2004, the LLPMNC received 7.8 grams of galleta grass seed. The seed was in very good condition and will be used to start transplants for the purpose of establishing a 0.5 acre seed production field.

The LLPMC received 1.5 lbs of indian ricegrass seed in 2003. The Indian ricegrass seed was in good condition and will be used to establish a 0.25 acre seed production field.

See the previous Pipe Spring National Monument reports for seed condition information collected from the Monument.

Seed Production Establishment

- Galleta –Galleta grass seed was used to start a small number of transplants for the purpose of establishing a seed increase block at the LLPMC. The transplants were planted by hand into a 0.10 acre field on June 10, 2004.
- Indian ricesgrass –Indian ricegrass seed was direct-seeded into a 0.25 acre block in Field 8 on December 21, 2004.

- Blue grama – No blue grama seed was available in 2004 to establish a seed production field.

Seed Production

Field Management

9066559 Galleta	Field 26S – 0.10 Acre	Date
Fertilization		
40 lbs. Nitrogen		9/16
40 lbs. Phosphorous		9/16
Irrigation		
3” water application		6/10, 6/14, 6/18, 6/25, 7/8, 7/15, 7/21, 8/6, 8/16, 8/24, 9/1, 9/24, 10/19
Cultural Weed Control		
Hand Hoeing		As needed

Seed Produced

No seed was harvested from the indian ricegrass or galleta production fields in 2004.

Climatological Data

See the attachment *Climatological Data* for the 2004 climatological data at the Los Lunas Plant Materials Center.

Transplant Production

Transplant production is not part of this agreement.

Specialized Treatments

See the previous Pipe Spring National Monument report for information on specialized treatments.

Observations

On December 21, 2004, a dormant seeding of the PSNM indian ricegrass was completed. To promote seed germination, a dormant seeding allows the seed to go through a cold stratification process. Because of the hard-seed coat found on the ricegrass seed, this cold-stratification process has been proven necessary for good seed germination. Seed germination will be monitored in 2005, and it may take as much as two years to complete the germination process. The galleta grass seed production field will be closely monitored in 2005 for seed production. The harvested galleta seed will be used to start a larger seed increase field at the LLPMC in 2006.

Blue grama seed must be collected by PSNM in 2005 in order for the LLPMC to plant the 0.5 acre seed production field specified in the agreement.

Zion National Park

Background

On September 12, 2002, an agreement among the US Department of Interior (DOI), the National Park Service (NPS), Zion National Park (ZNP), and the USDA-NRCS Los Lunas Plant Materials Center (LLPMC) was made for the collection of native seed from the ZNP, the propagation of those seeds at the LLPMC, and the increase of native grass species.

The agreement states that ZNP will use the plant materials produced by the LLPMC to revegetate disturbed areas at the park. The seed will be collected by the park staff and sent to the LLPMC for conditioning. The seed then will be used to establish production fields to satisfy the agreement.

Accessions Involved

Table 1 lists the accessions involved in the ZNP project.

Table 1: Accessions Involved

Common Name	Scientific Name	Plant Symbol	Accession Number
Blue grama	<i>Bouteloua gracilis</i>	BOGR	9066530
Bottlebrush squirreltail	<i>Elymus elymoides</i>	ELEL5	9066532
Cane bluestem	<i>Bothriochloa barbinodis</i>	BOBA	9066543
Galleta	<i>Pleuraphis jamesii</i>	PLJA	9066528
Indian ricegrass	<i>Acnatherum hymenoides</i>	ACHY	9066528
Muttongrass	<i>Poa fendleriana</i>	POFE	9066531
Sand bluestem	<i>Andropogon hallii</i>	ANHA	9066529

Collection Information

In 2004, 372 grams of indian ricegrass seed, 21 grams of muttongrass seed, and 28 grams of galleta seed was collected at ZNP and sent to the LLPMC.

Seed Condition Information

The seed sent from the ZNP in 2004 was in good condition; it will be used to start or increase seed production fields at the LLPMC.

See previous Zion National Park reports for the seed condition information prior to 2004.

Seed Production Establishment

The LLPMC established the following seed production fields:

- May 27, 2004 – ZNP cane bluestem seedling transplants started and grown at the LLPMC were planted in Field 21S, increasing the production field size from 0.25 to 1.1 acres.
- June 15, 2004 – ZNP galleta seedling transplants started and grown at the LLPMC were planted in Field 35, totaling 0.10 acres.
- September 30, 2004 – ZNP bottlebrush squirreltail transplants were planted in Field 10, totaling 0.41 acres.
- December 17, 2004 – 0.25 acres of ZNP indian ricegrass was direct-seeded into a new plot in Field 35.

Seed Production

Field Management

9066543 cane bluestem	Field 21S – 0.25 Acre	Date
Transplanted		5/27
Fertilization		
160 lbs Nitrogen		3/24, 5/5, 7/7, 8/11, 9/16
140 lbs. Phosphorous		5/5, 7/7, 8/17, 9/16
Irrigation		
3” water application		3/30, 5/11, 5/28, 6/4, 7/9, 7/28, 8/26, 9/23, 10/29
Cultural Weed Control		
Hand Hoeing		As needed
Mechanical Cultivation		3/8, 8/11
Harvest		
Flail-Vac		7/12, 8/30
9066529 sand bluestem	Field 25S – 0.06 Acre	Date
Fertilization		
40 lbs. Nitrogen		5/5, 7/7
60 lbs. Phosphorus		5/5, 7/7
20 lbs. Potassium		5/5
Irrigation		
3” water application		1/8, 3/26, 5/24, 6/10, 6/23, 7/19, 8/16, 9/1, 10/19
Herbicide Application		
2,4-D		4/23
Cultural Weed Control		
Hand Hoeing		As needed

Harvest		
Flail-Vac		9/17
<hr/>		
9066532 bottlebrush squirreltail	Field 19 – 0.39 Acre	Date
Transplanted		9/30
Irrigation		
3” water application		9/30, 10/8, 10/18
Cultural Weed Control		
Hand Hoeing		As needed
Harvest		
<hr/>		
9066528 galleta	Field 35N – 0.10 Acre	Date
Transplanted		6/15
Fertilization		
40 lbs. Nitrogen		9/16
40 lbs. Phosphorus		9/16
Irrigation		
3” water application		6/15, 6/18, 6/21, 7/1, 7/8, 7/15, 7/22, 8/8, 8/16, 8/26, 9/9, 9/23, 10/18
Cultural Weed Control		
Hand Hoeing		As needed

Climatological Data

See the attachment *Climatological Data* for the 2004 climatological data at the Los Lunas Plant Materials Center.

Transplant Production

Transplants are not part of this agreement.

Specialized Treatments

See previous Zion National Park reports for information on specialized treatments.

Observations

During the 2004 season, the following observations were made for the ZNP agreement:

- **Blue grama** – There was not any blue grama seed produced in 2004.
- **Bluestem** –The LLPMC was having difficulty identifying the species of bluestem growing in Field 25S. This problem was solved by a taxonomist in Oregon. Bluestem species collected by ZNP and sent to the LLPMC included Big, Sand, Cane and Yellow. The majority of the seed grown by the LLPMC and transplanted into field 25S was identified as Sand bluestem. All other species of bluestem found in field 25S were rogued out, leaving the field with a complete stand of Sand bluestem. Sand bluestem seed was harvested in 2004 and will be available to start transplants for a larger planting at the LLPMC in 2005.

- **Bottlebrush squirreltail** – If seed is available, the bottlebrush squirreltail field established by transplants in 2004 will be expanded to a full 0.50 acres in 2005. If seed is not available in 2005, then the planting will have to be postponed until 2006.
- **Galleta** – The 0.10 acre galleta production block was established using transplants in Field 35 and will be ready for harvest in 2005. The seed taken from this field will be used to expand the planting to a full 0.50 acre in 2006 to meet the requirements of the agreement. At this time it is hard to predict if the seed harvested from this galleta field will yield enough seed in 2005 for this expansion.
- **Indian ricegrass** – A dormant seeding of ZNP indian ricegrass was planted December 17, 2004 in Field 35. Good germination of indian ricegrass seed has been documented using cold stratification of seed. Planting the seed directly into the soil in December should give the desired germ results. The 0.25 acre field of Indian ricegrass will be monitored for seed germination throughout 2005.
- **Muttongrass** – The ZNP muttongrass seedling transplants are being grown at the LLPMC and in 2005 the seed production field will be planted.



Figure 1: Field 21S, Zion National Park cane bluestem



Figure 2: Field 19, Zion National Park bottlebrush squirreltail

Hubbell Trading Post National Historic Site

Background

On August, 13, 2002 an agreement among the US Department of Interior (DOI), the National Park Services (NPS), the Hubbell Trading Post National Historic Site (HTPNHS), and the USDA-NRCS Los Lunas Plant Materials Center (LLPMC) was made to produce plants and cuttings of native species for the HTPNHS.

Accessions Involved

Table 1 lists the accessions involved in the HTPNHS project.

Table 1: Accessions Involved

Common Name	Scientific Name	Plant Symbol	Accession Number
Banana yucca	<i>Yucca baccata</i>	YUBA	9066409
Boxelder	<i>Acer negundo</i>	ACNE2	9066468
Desert false indigo	<i>Amorpha fruticosa</i>	AMFR	9066114
Fourwing saltbush	<i>Atriplex canescens</i>	ATCA2	478838
Fremont cottonwood	<i>Populus fremontii</i>	POFR2	9066457
Fremonts mahonia	<i>Mahonia fremontii</i>	MAFR3	9066439
Golden currant	<i>Ribes aureum</i>	RIAU	9066545
New Mexico locust	<i>Robinia neomexicana</i>	RONE	9066428
Prairie sagewort	<i>Artemisia frigida</i>	ARFR4	9066234
	<i>Quercus pauciloba</i>	QUPA4	9066437
Sacahuista	<i>Nolina microcarpa</i>	NOMI	9066469
Skunkbush sumac	<i>Rhus trilobata</i>	RHTR	483445
Squawapple	<i>Peraphyllum ramosissimum</i>	PERA4	9066549
Squawthorn	<i>Lycium torreyi</i>	LYTO	9066430
Stretchberry	<i>Forestiera pubescens</i>	FOPUP	9004570
Utah agave	<i>Agave utahensis</i>	AGUT	9066408
Utah serviceberry	<i>Amelanchier utahensis</i>	ANTUT	9066397
Winterfat	<i>Krascheninnikovia lanata</i>	KRLA2	9066471
Woods' rose	<i>Rosa woodsii</i>	ROWO	9066421

Collection Information

In 2004, no seed was received from the HTPNHS. Seed received in previous years was in fair-to-good condition, and it was used to start transplants as per the agreement.

Seed Condition Information

No 2004 seed condition information to report.

Seed Production Establishment

Seed production is not part of this agreement.

Seed Production

Seed production is not part of this agreement.

Transplant Production

Table 2 describes the transplant production and delivery to HTPNHS in 2004

Table 2: 2004 Transplant Production and Delivery

Common Name	Delivered July 1, 2004
Fremont cottonwood	59 1-gallon treepots
Fremont cottonwood	16 2-gallon treepots
Total	75 treepots
	Delivered September 16, 2004 – 1-Gallon Treepots
Banana yucca	7
Boxelder	6
Desert false indigo	6
Fourwing saltbush	10
Fremonts mahonia	66
Golden currant	6
Netleaf hackberry	51
New Mexico locust	15
Prairie sagewort	5
Quercus pauciloba	15
Sacahuista	10
Skunkbush sumac	50
Squawapple	6
Squawthorn	6
Stretchberry	84
Utah agave	4
Utah serviceberry	20
Winterfat	2

Table 2: 2004 Transplant Production and Delivery

Common Name	Delivered July 1, 2004
Woods' rose	30
Total	399 treepots
Grand Total	474 treepots

Specialized Treatments

No specialized treatments are reported for 2004.

Observations

Native plant species collected as seed on the HTPNHS were started and grown as transplants at the LLPMC and have been shipped to HTPNHS as per the 2002 agreement.

This agreement has expired.

Capulin Volcano National Monument

Background

On August 30, 2004 an agreement among the US Department of Interior (DOI), the National Park Service (NPS), the Capulin Volcano National Monument (CVNM), and the USDA-NRCS Los Lunas Plant Materials Center (LLPMC) was made to propagate and increase native grass species found on CVNM. CVNM will be responsible for the collection of native seed. The LLPMC will propagate the seed for the purpose of establishing seed production fields.

Accessions Involved

Table 1 lists the accessions involved in the CVNM project.

Table 1: Accessions Involved

Common Name	Scientific Name	Plant Symbol	Accession Number
Blue grama	<i>Bouteloua gracilis</i>	BOGR	9066609
Little bluestem	<i>Schizacharium scoparium</i>	SCSC	9066612
Mountain muhly	<i>Muhlenbergia Montana</i>	MUMO	9066611
Western wheatgrass	<i>Pascopyrum smithii</i>	PASM	9066610

Collection Information

In September 2004, staff from the LLPMC met with CVNM biologists to identify grass species and to check for seed fill. Species to be harvested and shipped to the LLPMC were determined by using current and potential seed fill during this visit. In late fall of 2004, seed of the agreement species was collected and shipped to the LLPMC.

Seed Condition Information

The 2004 grass species collections received from CVNM have been cleaned for use in establishing seed production fields. See Table 2 for seed amounts and condition of the 2004 harvested seed.

Table 2: CVNM 2004 Seed Collection Condition

Common Name	Scientific Name	Amount (grams)	Seed Fill Condition
Blue grama	<i>Bouteloua gracilis</i>	200	Fair
Little bluestem	<i>Schizacharium scoparium</i>	120	Fair
Mountain muhly	<i>Muhlenbergia Montana</i>	130	Fair-to-good
Western wheatgrass	<i>Pascopyrum smithii</i>	65	Good

Seed Production Establishment

The LLPMC did not establish any CVNM seed fields in 2004.

Seed Production

There was no seed production of CVNM species at the LLPMC in 2004.

See the attachment *Climatological Data* for the climatological data for 2004 at the Los Lunas Plant Materials Center.

Transplant Production

Transplant production is not part of this agreement.

Specialized Treatments

There was no specialized treatment in 2004.

Observations

In 2004, CVNM collected and shipped western wheatgrass, mountain muhly, blue grama and little bluestem seed to the LLPMC. The seed was in fair-to-good condition. It will be cleaned and stored at the LLPMC for use in establishing seed production fields in 2005. The amount of seed received by the LLPMC will determine the size of fields to be planted. The amount of seed may not be adequate to plant the 2.0 acres of seed production fields required by the agreement. It may be necessary to harvest additional seed at the CVNM again in 2005.

Carlsbad Caverns National Park

Background

On August 23, 2004, an agreement among the US Department of Interior (DOI), the National Park Service (NPS), Carlsbad Caverns National Park (CCNP), and the USDA-NRCS Los Lunas Plant Materials Center (LLPMC) was made for the collection, propagation, and increase of native grass species.

Accessions Involved

Table 1 lists the accessions involved in the CCNP project.

Table 1: Accessions Involved

Common Name	Scientific Name	Plant Symbol	Accession Number
Blue grama	<i>Bouteloua gracilis</i>	BOGR	9066604
Curlyleaf muhly	<i>Muhlenbergia setifolia</i>	MUSE	9066608
Plains bristlegrass	<i>Setaria vulpiseta</i>	SEVU2	9066606
Purple threeawn	<i>Aristida purpurea</i>	ARPU9	9066607
Sideoats grama	<i>Bouteloua curtipendula</i>	BOCU	9066605

Collection Information

In April 2004, staff from the LLPMC met with CCNP biologists to identify grass species and to check for seed fill. Species selection was decided upon, dependent upon the current status of seed fill and the potential for seed fill of some common native grass species at CCNP. Seed of the agreement species was collected at the park in 2004 and shipped to the LLPMC for processing. The CCNP hired a seed harvesting company to do the collecting of the agreement species in 2004.

Seed Condition Information

The 2004 grass species collections received from CCNP have been cleaned for use in establishing seed production fields. See Table 2 for seed amounts and condition of the 2004 harvested seed.

Table 2: CCNP 2004 Seed Collection Condition

Common Name	Scientific Name	Amount (grams)	Seed Fill Condition
Blue grama	<i>Bouteloua gracilis</i>	28	Poor-to-fair
Curlyleaf muhly	<i>Muhlenbergia setifolia</i>	67	Good
Plains bristlegrass	<i>Setaria vulpiseta</i>	127	Green seed
Purple threeawn	<i>Aristida purpurea</i>	30	Good
Sideoats grama	<i>Bouteloua curtipendula</i>	3	Poor

The CCNP also requested that the LLPMC clean the seed of grass, shrub, and tree species collected at the park that are not part of the agreed upon accessions. The LLPMC agreed to clean and process the seed, and to make it available to CCNP after processing. See Table 3 for seed amounts of these grass, shrub, and tree species that were collected.

Table 3: 2004 CCNP Non-Agreement Grass, Shrub, and Tree Collections

Common Name	Scientific Name	Seed Amount (grams)	Estimated Total Number of Seed	Seed Fill Condition
Acacia species	<i>Acacia spp.</i>	16.9	70	Good, insect damage
Apache plume	<i>Fallugia paradoxa</i>	1.3	1600	Unknown
Arizona cottontop	<i>Digitaria California</i>	2.5	2500	Good
Beargrass	<i>Notina species</i>	10.3	3100	Good, green seed
Catclaw acacia	<i>Acacia greggii</i>	20.5	120	Good
	<i>Condalia exicoides</i>	16.4	200	Unknown, insect damage
Creosotebush	<i>Larrea tridentate</i>	49	6000	Good
Desert willow	<i>Chilopsis linearis</i>	53	6600	Unknown
Globeberry	<i>Ibervillea species</i>	2.9	200	Good
Golden crownbeard	<i>Verbesina encelioides</i>	1.5	1050	Good
Lechuguilla	<i>Azave lechuguilla</i>	16.1	2400	Good
Littleleaf sumac	<i>Rhus microphylla</i>	171	8500	Unknown
Mescal bean	<i>Sophora secundiflora</i>	400	600	Good
Mexican buckeye	<i>Ungnadia speciosa</i>	113	160	Good
Milkweed	<i>Asclepias L.</i>	0.7	245	Good
Naked mexicanhat	<i>Ratibida peduncularis</i>	21	30,000	Good
Pinchot's juniper	<i>Juniperus pinchotii</i>	25	550	Unknown
Roundflower catclaw	<i>Acacia roemeriana</i>	27	160	Good, insect damage
Skeleton leaf goldeneye		1.43	1000	Good
Soapberry	<i>Savindus saponaria</i>	103	500	Good
Sotol	<i>Dasyilirion spp.</i>	600	60,000	Good
Viscida acacia	<i>Acacia neovericosa</i>	45.7	3600	Good, insect damage
Walnut	<i>Juglans L.</i>	78	45	Unknown
Yellow Indian	<i>Abutilon malacum</i>	4.5	1300	Good, insect damage

Seed Production Establishment

The LLPMC did not establish any CCNP seed fields in 2004.

Seed Production

There was no seed production of CCNP species at the LLPMC in 2004.

See the attachment *Climatological Data* for the climatological data for 2004 at the Los Lunas Plant Materials Center.

Transplant Production

Transplant production is not part of this agreement.

Specialized Treatments

There was no specialized treatment in 2004.

Observations

CCNP hired a private company to collect the seed of the agreement species. CCNP shipped the seed to the LLPMC in 2004. The seed will be processed by the LLPMC in order to obtain quantities of good, clean, viable seed to be used in establishing the seed production fields. If after cleaning there is not a sufficient quantity of seed available to establish the 2.5 acres of seed production field, the CCNP will be notified and those species with inadequate quantities will need to be harvested again in 2005.

Attachment Climatological Data

The following table shows the 2004 climatological data at the Los Lunas Plant Materials Center.

2004 Climatological Data – Los Lunas Plant Materials Center

Month	Average Temperatures Fahrenheit			Monthly Precipitation/Inches
	High	Low	Monthly Average	
January	53.7	19.0	36.4	0.45
February	53.7	18.9	36.3	0.62
March	69.7	34.2	52.0	0.81
April	71.6	37.9	54.8	2.98
May	85.4	44.6	65.0	0.04
June	93.1	51.6	72.4	1.54
July	93.7	58.3	76.0	1.98
August	90.6	56.1	73.4	0.92
September	85.2	47.1	66.2	0.94
October	73.7	38.3	56.0	0.73
November	59.2	24.4	43.3	1.05
December	51.5	17.7	34.6	0.46
	Avg. High 73.4	Avg.Low 37.0	Mean Temp. 55.53	Yearly Total 12.52