

NEVADA NATIVE SEED FORUM

THE FUTURE IS GROWING (literally)

ED S KLEINER
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GARDNERVILLE, NV 89460
775-265-0090
ed@comstockseed.com

INTRODUCTION

COMSTOCK SEED'S VIEW ON COLLECTING, GROWING, AND MARKETING NATIVE SEED

THE RESTORATION SEED INDUSTRY IS TRENDING TOWARDS LOCAL SOURCE GENETICS

THE NATIONAL SEED STRATEGY IS INFLUENCING THIS TREND

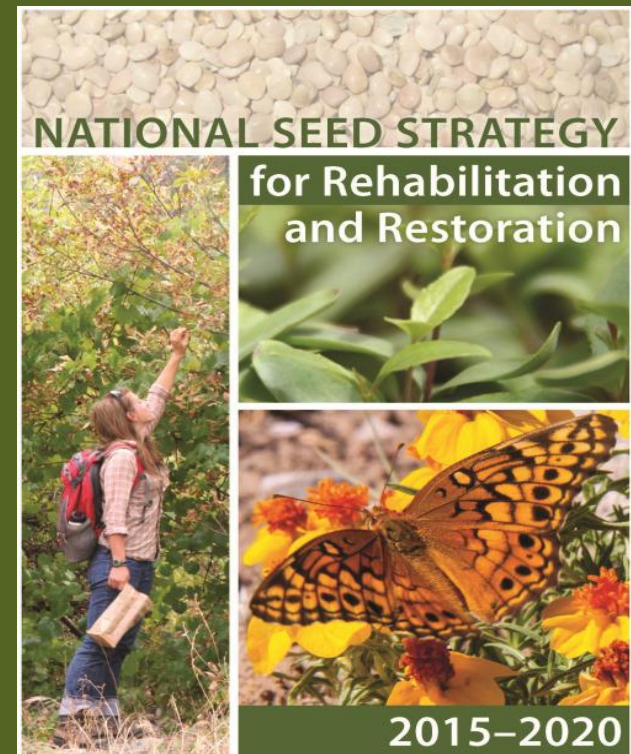
PRIVATE SECTOR CONTRACTING IS REQUIRING MORE LOCAL SOURCE SEED

SO, LETS COLLECT AND GROW MORE LOCAL NATIVE SEED

MARKETING LOCAL SEED

https://www.fs.fed.us/wildflowers/Native_Plant_Materials/documents/SeedStrategy081215.pdf

“THE RIGHT SEED IN THE RIGHT PLACE AT THE RIGHT TIME”



Regional analysis of Bluebunch wheatgrass across the intermountain west has yielded three distinct varieties with differing morphological and temporal qualities. These qualities reflect evolution under varying microhabitat conditions

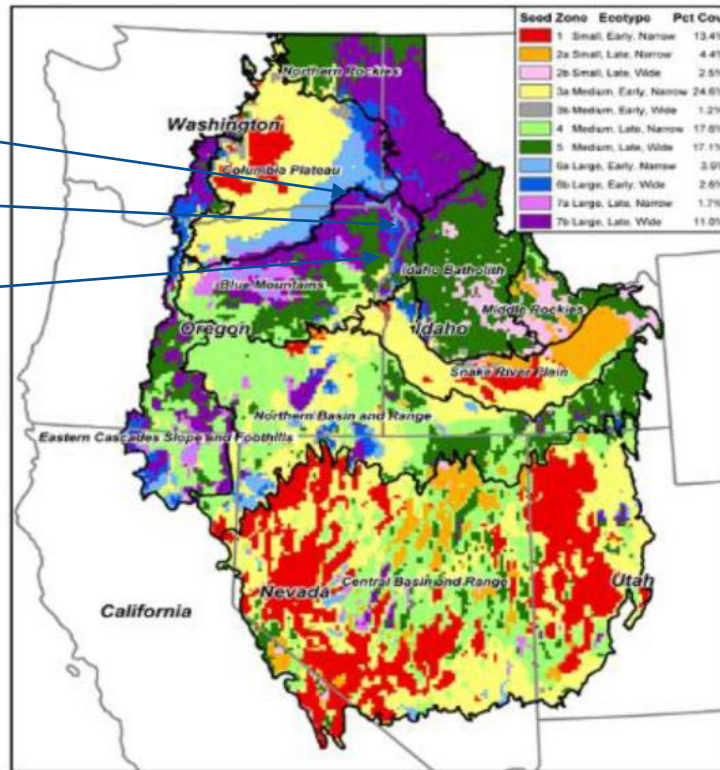
Genetic variation in adaptive traits and seed transfer zones for *Pseudoroegneria spicata* (bluebunch wheatgrass) in the northwestern United States

Existing traditional varieties

Secar

Goldar

Anatone



The central Great Basin needs a variety to reflect the red regions

Somerset Reno Goldar Bluebunch Wheatgrass

11-18

11-02



WILDLAND NATIVE SEED COLLECTION



Handmade collection tools



Various appropriate technologies



Hanging out waiting for seed to ripen



HOME MADE MACHINERY



PERMITS AND PERMISSION

Private land permit



FS Form 1
015-589-21
(4/2012)

FOREST PRODUCTS REMOVAL PERMIT and CASH RECEIPT
(Auth: 16 USC 472a, 551; 32 USC 621, 602-43 USC 1201-56 CFR 223, & 43 CFR 5420)
U.S. DEPARTMENT OF AGRICULTURE - FOREST SERVICE
U.S. DEPARTMENT OF THE INTERIOR - BUREAU OF LAND MANAGEMENT

OWB No. 0896-0085

FS Regional State: Montana
FS National Forest System: Humboldt & Toiyabe
FS Manager: Deborah M. Clark
Carson

Permittee's Name and Complete Address		Permit No.	Preparation Date	Payment Method
Name: ED KLEINER Address: Comstock Seed 917 Highway 88 City/State: Gardnerville, NV Zip Code: 89410		028875	07/22/2016	CHECK
Permittee Identification		Type	Product Plan	
0102272499		114 CARSON COMMERCIAL MSC NON CONVERTIBLE		
Drivers License		Public Land Type	County	
			Washoe County, NV	
Vehicle(s) Information		Associated Charges		Permit Area Description:
Year:	Year:	Fund:	Amount:	Carson Ranger District - Refer to Attached Maps, ensure you are not on private lands or other non-Humboldt-Toiyabe National Forest, Carson District
Make:	Make:			
Model:	Model:			
Color:	Color:			
License:	License:			
State:	State:			

Lead Ticket Numbers:

Remarks: Samuel Diaz and Ricardo Sanchez will be collecting the seed. Location is in Alpha County T10N R18E Sec. 6, 7, & T11N R18E Sec 25, 28.

0896-0085

Hugel Valley

PRODUCT DESIGNATION						
Product	Species	Unit of Measure (UOM)	Quantity Sold	Rate Per Product (UOM)	Assoc. Charges \$ per UOM	Total Cost of Product (\$)
Other Plant	Plant Other	Lbs	100.00	\$0.50	\$ 0.00	\$50.00
Total Permit Costs:						\$50.00
Total Purchase Price:						\$50.00

PRODUCT QUANTITY REMOVAL RECORD											
Date	Time	Quantity Removed	Date	Time	Quantity Removed	Date	Time	Quantity Removed	Date	Time	Quantity Removed

For 8.M land only, Permittee certifies that they are of the age of majority in the state they seek a permit, if purchasing timber, are a United States citizen.

SIGNATURES

Ed Kleiner 7/20/16 PERMITTEE Date

J. Pulliam 7/20/16 AUTHORIZED AGENCY VENDOR Date

PRIVACY ACT NOTICE

The following information is provided to comply with the Privacy Act of 1974 (PL 579). 5 U.S.C. 552a authorizes acceptance of the information requested on this form. The Forest Service and Bureau of Land Management use this information to maintain an inventory of forest product information and to adjudicate your rights to forest products. The information required by this form may be disclosed pursuant to the regulations in 7 CFR 1.5 or 43 CFR 2.56. If you do not furnish all the information required by this form, your application may be rejected.

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Department of Water and Power the City of Los Angeles

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Commissioner
THOMAS S. SAYLES, President
ERIC BOLOMAN, Vice President
RICHARD F. MOSS
CHRISTINA E. NOONAN
JONATHAN PARKREY
BARBARA E. MOSEBOS, Executive

RONALD O. NICHOLS
General Manager

June 19, 2013

Mr. Ed Kleiner
Comstock Seed
917 U.S. Highway 88
Minden, NV 89460

Dear Mr. Kleiner:

Subject: Native Seed Collection

This is in response to your e-mail dated May 31, 2013, to Ms. Lori Gillem of my staff, requesting permission to collect the following native seeds on City of Los Angeles (City) lands in the following areas:

<i>Purshia tridentata</i>	T1S, R26E, Sections 16, 21 T4S, R28E, Sections 4, 5, and 6	Grant Lake Area Sherwin Creek Area
<i>Wyethia mollis</i>	T4S, R28E, Sections 7 and 8	Sherwin Creek Area

Permission is contingent on the Los Angeles Department of Water and Power (LADWP) receiving a signed copy of this letter indicating your acceptance of the terms and conditions listed below. Please return the signed copy of this letter to 300 Mandich Street, Bishop, California 93514-3449, attention Ms. Gillem. If the signed copy of this letter and verification of insurance coverage have not been returned within 30 days, we will assume that you no longer plan to do this work and this permission shall be considered null and void.

This permission is subject to the following terms and conditions:

1. This permission will expire at the end of the day on December 31, 2013. If additional time is needed for seed collection, it will be necessary for you to contact Ms. Gillem at (760) 873-0407 and request an extension.
2. Please notify Ms. Gillem at the above-noted number when you have completed your harvesting.

Water and Power Conservation ... a way of life

3 Bishop, California mailing address: 300 Mandich Street • Bishop, CA 93514-3449 • Telephone: (760) 873-0208 • Fax: (760) 873-0266
111 North Hope Street, Los Angeles, CA 90012-2607 • Mailing address: Box 51111 • Los Angeles, CA 90051-0000
Telephone: (213) 567-4211 • Cable address: DEWAPOLA

Private sector seed collection contract with regional source requirements

Treatment A: 1.92 acres (59.52 LBS)
 Treatment B: 18.45 acres (286 LBS)
 Total: 345.52 PLS/LBS

NATIVE SEED MIX					
SCIENTIFIC AND COMMON NAME	POUNDS PURE LIVE SEED PER ACRE	POUNDS PURE LIVE SEED NEEDED FOR 20 ACRES	ESTIMATED NUMBER OF SEEDS IN ONE POUND	ESTIMATED NUMBER PLS FOR 20 ACRES	ESTIMATED NUMBER OF LIVE SEEDS PER SQ FOOT
<i>Achnatherum hymenoides</i> (INDIAN RICEGRASS)	3	60	141,000	2,820,000	10
<i>Sphaeralcea ambigua</i> (desert globemallow)	2	40	500,000	10,000,000	23
<i>Ambrosia dumosa</i> (white bursage)	5	100	38,400	768,000	4
<i>Larrea tridentata</i> (Creosote bush)	4	80	80,000	1,600,000	7
<i>Ephedra nevadensis</i> (Nevada ephedra)	1.5	30	19,900	398,000	1
Total	15.5	310	779,300	15,586,000	45

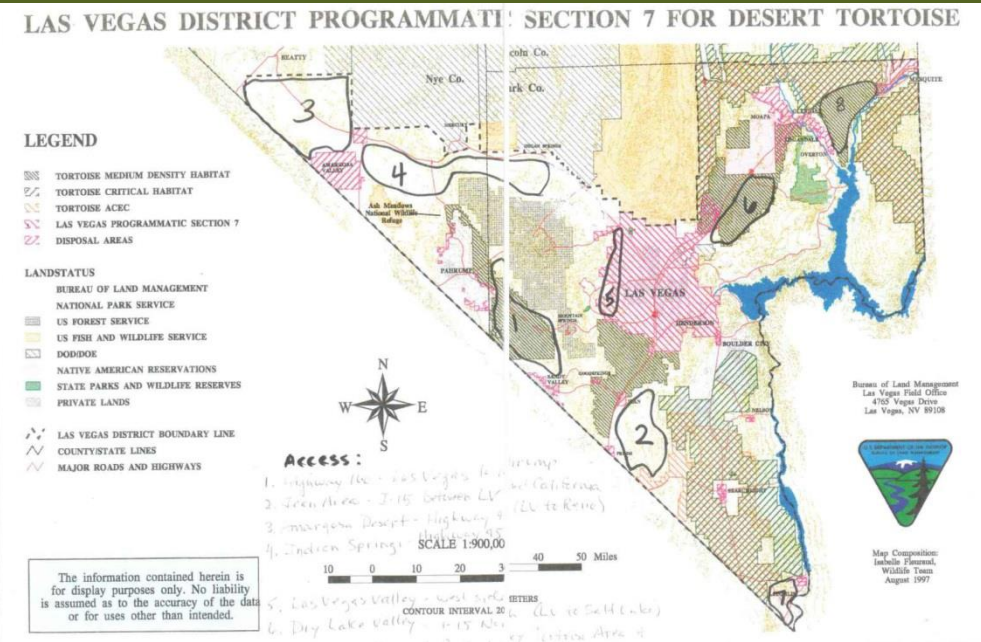
THIS TABLE INDICATES RATES FOR DRILL SEEDING FOR TREATMENT "B". TREATMENT "A" WILL REQUIRE DOUBLE THIS AMOUNT FOR BROADCAST APPLICATION.

SEED MUST BE COLLECTED FROM THE EASTERN MOJAVE-SOUTHERN NEVADA OR EASTERN SAN BERNARDINO COUNTY. NO SEED FROM THE SONORAN DESERT.

NO STRAW MATS WITH NETTING WILL BE ALLOWED

Seeding will happen January to March of 2015

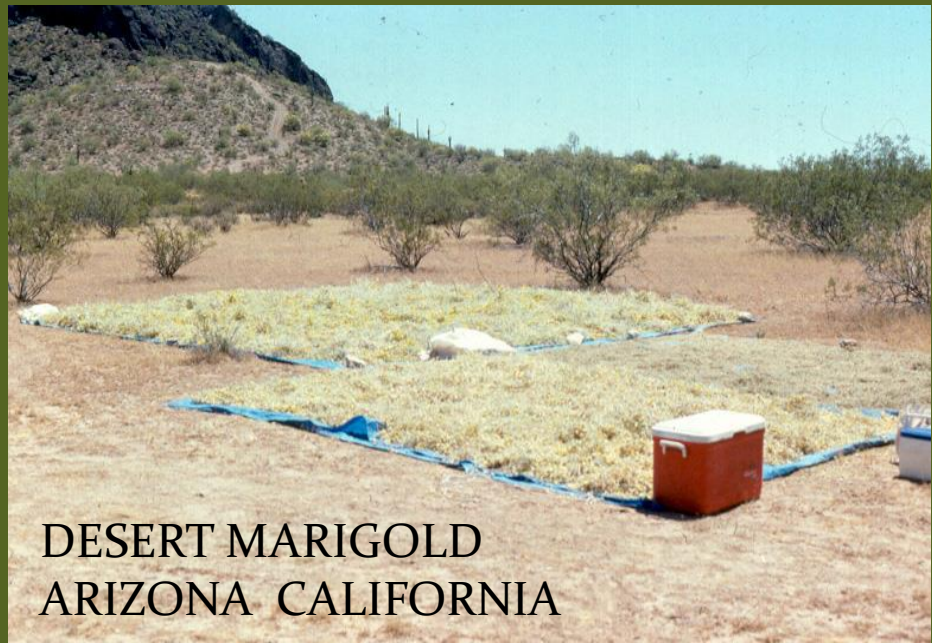
BLM permitted collection regions within Clark Co, NV



SEED DRYING



WINTERFAT NEW MEXICO



DESERT MARIGOLD
ARIZONA CALIFORNIA



LUPINE ARIZONA



BURSAGE SAND VERBENA LUPINE

CALIFORNIA

Some clients request verification of seed source
Theodolite GPS application
used for source confirmation of native seed collections



Certified seed sourcing from state departments of agriculture

FIGURE 2. AOSCA Pre-Variety Germplasm and Variety/Cultivar tag examples.

SOURCE IDENTIFIED SEED		
Agency logo here	Species Name	<i>Sporobolus heterolepis</i>
	Common Name	Prairie Dropseed
	Germplasm ID, Gen.	G3/5
	G3 State, County, Elev.	WI, Dane, 800 ft.
	G0 State, Region, Elev.	WI, Southwest, 790 ft.
	G0 Indigenous?	Yes
	Natural-Track?	Yes
Lot:	2999-SPOHET-3-SE; 03346	
MEMBER OF ASSOCIATION OF OFFICIAL SEED CERTIFYING AGENCIES		

SELECTED CLASS SEED		
Agency logo here	Species Name	<i>Krascheninnikovia lanata</i>
	Common Name	Winterfat
	Germplasm ID, Gen.	Northern Cold Desert, G2/3
	G2 State, County, Elev.	OR, Malheur, 2300 ft.
	G0 State, County, Elev.	ID, Bingham, 4100 ft.
	G0 Indigenous?	No
	Natural-Track?	No
	Cert. #:	00497
	Lot #:	KL203
MEMBER OF ASSOCIATION OF OFFICIAL SEED CERTIFYING AGENCIES		

TESTED CLASS SEED		
Agency logo here	Species Name	<i>Dalea candida</i>
	Common Name	White Prairie Clover
	Germplasm ID, Gen.	Antelope, G2/5
	G2 State, County, Elev.	MT, Carbon, 3350 ft.
	G0 State, County, Elev.	ND, Stark, 2400 ft.
	G0 Indigenous? Yes	Cert. #: 026962
	Natural-Track? Yes	Lot #: SFD-02-FLD20-1
MEMBER OF ASSOCIATION OF OFFICIAL SEED CERTIFYING AGENCIES		

CERTIFIED CLASS SEED		
Agency logo here	KIND:	Mountain Big Sagebrush
	VARIETY:	Hobble Creek; "Natural-track"
	CERT. #:	WC-1852
	LOT #:	ArTrVaHC-02001
MEMBER OF ASSOCIATION OF OFFICIAL SEED CERTIFYING AGENCIES		

USFS Seed Extractory Bend, OR



Seed
Cleaning
Testing



Small quantity cleaning tools

Farming challenge: Grow quality seed

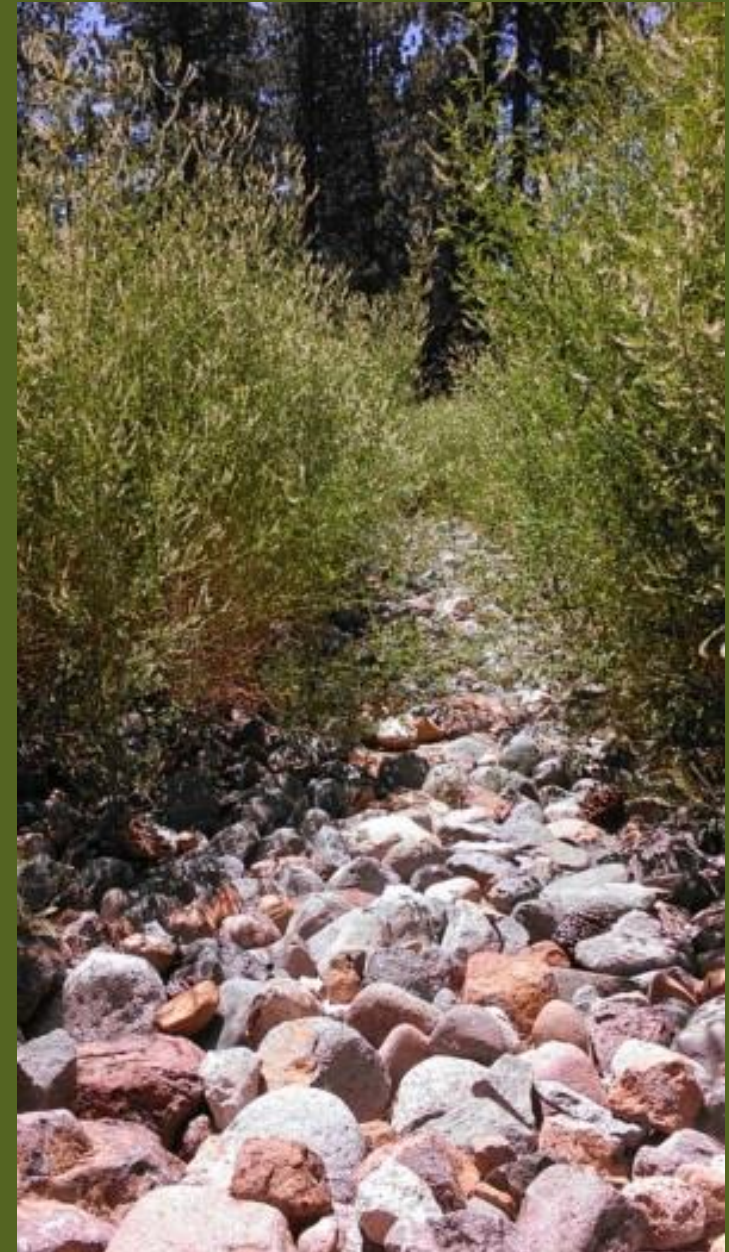
Enhanced weed and crop specifications are now common

MATERIALS

NDOT Seed Specification

A. Seed 12 month testing, sagebrush 6 months

1. All seed shall conform to all laws and regulations pertaining to the sale and shipment of seed required by the Nevada Department of Agriculture and the Federal Seed Act. For sagebrush, test seed within six (6) months prior to seeding, unless otherwise directed. All other seed must be tested within 12 months of application date. Seed tags must reflect the most recent test date. **Submit original seed tests by lot number at a minimum of 30 days prior to application for approval.** Following approval, seed may be mixed and delivered to the site. Deliver all seed to the project site in sealed bags with proper labeling. Weed seed shall not exceed 0.25% of the pure live seed specified and shall not include any seed of cheatgrass (*Bromus tectorum*), sweet clovers (*Melilotus officinalis*, *M. alba*), and Russian thistle (*Salsola kali*). Crop seed shall not exceed 0.25%. Requests for substitute species and/or varieties must be submitted in writing. Written approval is required for all requested substitutions.



Yellow sweet clover
King's Beach Lake Tahoe

BLM seed warehouse Ely, NV



Storage
Testing
Blending
Labeling



Wyoming Seed Analysis Laboratory
749 Road 9
Powell, WY 82435
Laboratory Report of Analysis

Account No. 754 Date Received 09/21/09 Date Completed 10/17/09 Lab Number 09-0679

Client: Comstock Seed 917 Highway 88 Gardnersville NV 89460

Seed's Information:
Brand: VNS
Seed: Buckhorn, sulphur flower
State: Nevada
Lot #: 1657
Seed Lot: 22296

Parity Analysis

Component	Parity
Blackhead, sulphur flower	75.05%
Purity Germ. Moisture	3.0
Wheat Seed	0.05%
Wheat Germ. Moisture	3.05
Crop Seed	0.05%
Grain Subst.	67.78
Inert Matter	24.89%

Viability Analysis

Germination Date	Germination %	Dormant %	Hard %	Total Viable
10/23/09	7	39	54	46

Other Crop Seeds: None Found
Nevada Seed: None Found
Other Determinations: Buckhorn, Sulphur Flower 12% 79%
Inert Matter 39% per lb

Signature: [Handwritten Signature] Page 1 of 1 Printed: 06.12.09 12:00:22

Comstock Seed
917 Highway 88
Gardnersville, NV 89460
(775) 265-0090

Order Date: 09/23/16
Order Number: 25228
Project Name: D'ANDREA LOTS
Project Number:
Blend Name: D'ANDREA LOTS

Species & Variety	Pure Seed %	Total Viable	Tested	Origin
INDIAN RICEGRASS NEZPAR	5.31	81	06/07/16	MT
WHEATGRASS SIBERIAN VAVILOV	9.06	95	04/29/16	ID
WHEATGRASS CRESTED EPHRAIM	12.66	68	04/27/16	WY
SAGEBRUSH BIG WYOMING	2.47	72	05/18/16	CA
SALTBUSH FOURMING	10.76	40	11/19/15	NV
RABBITBRUSH RUBBER	2.59	83	03/29/16	UT
SQUIRRELTAIL	6.72	64	10/02/15	UT
MORMON TEA GREEN	4.95	87	09/18/16	UT
FESCUE SHEEP VNS	2.24	96	04/07/16	MT
KOCHIA PROSTRATE	3.53	61	04/27/16	UT
RYEGRASS ANNUAL GULF	6.52	99	01/05/16	OR
PENSTEMON PALMER	2.22	97	08/16/16	UT
BLUEGRASS BIG SHERMAN	5.52	78	06/21/16	MT
BITTERBRUSH	2.56	84	09/02/16	CA
WHEATGRASS BLUEBUNCH SECAR	6.80	95	08/10/15	WA

Bulk Lbs: 32.07 PLS Lbs: 20.70

Other Crop: 0.05 Hard Seed: 0.00
Weed Seed: 0.03 Dormant: 3.77
Inert Matter: 16.00

Restricted:
Noxious:

FARMING NATIVE SEED

Marketing challenge

Why farming is important? Custom collections are expensive

COMPARATIVE PRICE LIST LOCAL VS COMMERCIAL SOURCE*		
	COMMERCIAL \$/PLS LB	LOCAL COLLECTION \$/PLS LB
INDIAN RICEGRASS	8 RIMROCK	85
SANDBERG BLUEGRASS	11 VNS	55
SQUIRRELTAIL	15 TOE JAM	50 weed issues USFS Truc
GREAT BASIN WILDRYE	13 TRAILHEAD	30
CREEPING WILDRYE	SHOSHONIE	50
DESERT NEEDLEGRASS	NA	125
WESTERN NEEDLEGRASS	NA	190
SLENDER WHEATGRASS	5 PRYOR	26
TUFTED HAIRGRASS	22 NORTRAN	75
YARROW	50 YAKIMA	75
MEADOW BARLEY	26 VNS	85
BLUEBUNCH WHEATGRASS	6 GOLDAR	35-140

Farming natives is not necessarily less expensive but costs are decreasing

Farming reduces the impact on public lands

Farming will improve availability, stabilize markets, help to reduce costs

THE SUPPLY SIDE

FARM PRODUCTION NATIVE SEED

Sulfur buckwheat

Comstock Seed



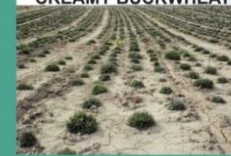
YARROW



BENSON FARMS
WASHINGTON



CREAMY BUCKWHEAT



IDAHO
FESCUE



SQUIRRELTAIL

BLUEBUNCH WHEATGRASS



SANDERG BLUEGRASS



SHOWY GOLDENEYE



WIND RIVER SEED
WHOLESALE

PENSTEMON PROCERUS



ASTER CHILENSIS



SQUIRRELTAIL



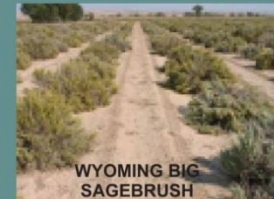
Northern sweetvetch



PENSTEMON PROCERUS



WYOMING BIG
SAGEBRUSH



FIRECRACKER PENSTEMON



S&S Seed farms

Los Alamos, CA

Constantia Farm Doyle CA



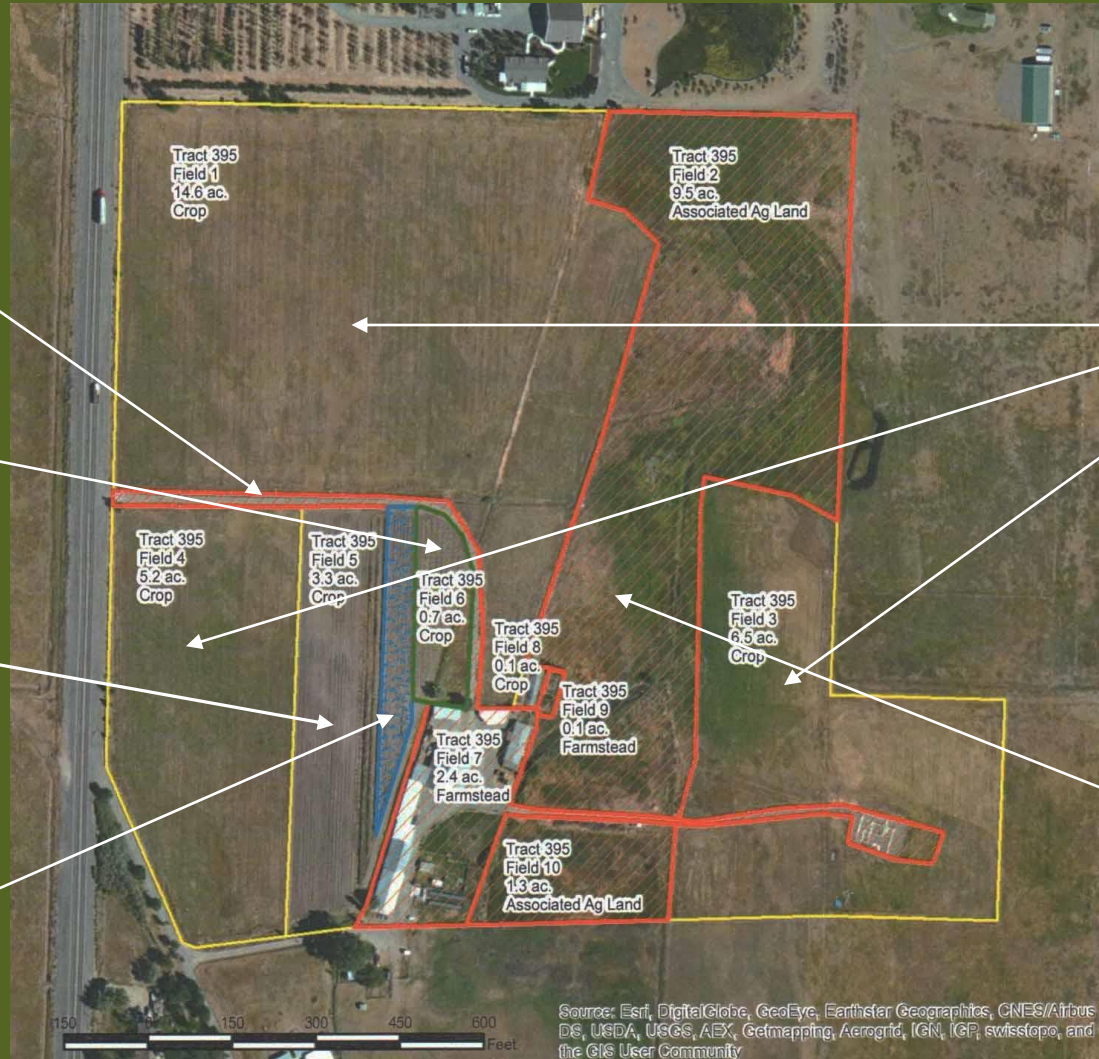
**Constantia Farm
Doyle, CA**

Test plots



Beware of sandy soils

Comstock Farm sales Hay and Seed 2018



Roadside Sagebrush
\$674

Vineyard
300 Frontenac Vines .6 acres

Hay production
26 acres
\$6600

Alternative crop experimental field
3.3 acres
\$7675 sales

Wetland seed
\$339

Experimental Green manure crop .6 acres

Many natives do not like heavy bottomland clay soils

Great Basin Wildrye establishment



10-11
with
weeds
1st year
growth

Witchgrass Panicum



11-11
burnt



3-12



5-14



Level your fields before seeding perennials

2018 *Leymus cinereus* harvest



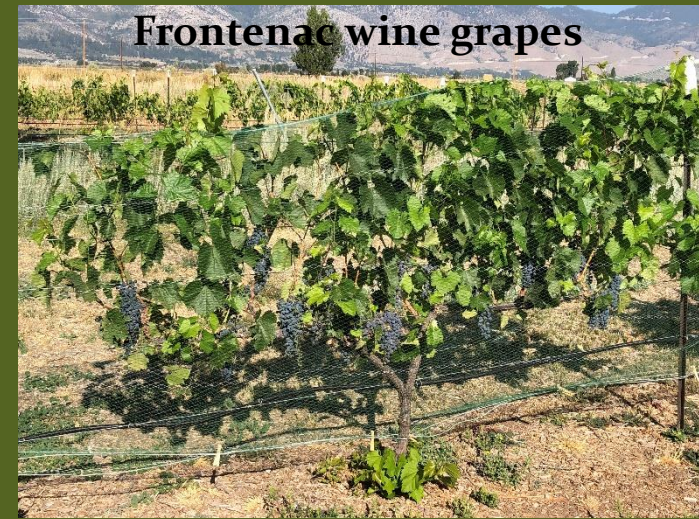
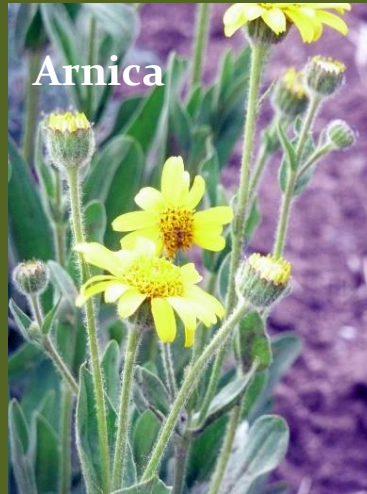
7-12 harvest

Leaving plants standing through the winter
Flail mowing each spring recycles residual carbon



1-18-19

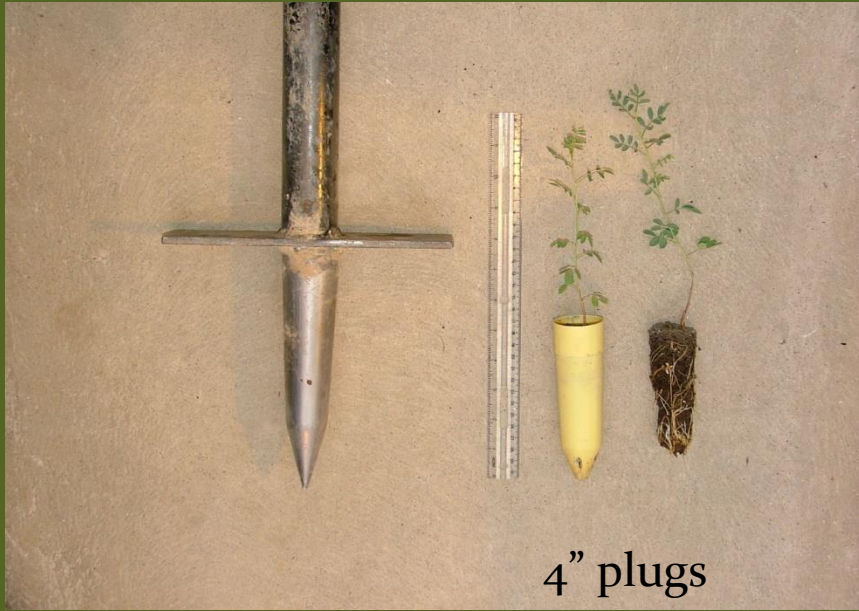
Do not put all your eggs in one basket



Leymus triticoides Creeping wildrye (see Pine Creek project)



Farming natives has a steep learning curve Planting 2500 Astragalus and Dalea



Sprayed with Pendulum pre-emergent two weeks later; killed every plant

Cleome lutea
1 lb seed collected nw NV 2014
Seeded 1 lb 11-14
Germinated late spring 2015
Late freeze killed 70%
Collected 1.5 lbs seed from plants
6-16 collected 300 lbs
throughout NV



**On the other hand
Cleome serrulata did not freeze**



SURVEY OF NATIVE SEED MARKETS

SEED MARKETS ARE DIVERSE AND GROWING

FEDERAL AGENCIES

INDEFINITE DELIVERY INDEFINITE QUANTITY CONTRACTS IDIQ

<https://www.fedconnect.net/FedConnect/default.aspx?ReturnUrl=%2ffedconnect%2f%3fdoc%3d14010618r0045%26agency%3ddoi&doc=14010618r0045&agency=doi>

BLM REGIONAL PURCHASING

USFS, USFWS, NRCS, USGS

MINING

UTILITY CORRIDORS

GEOHERMAL ENERGY

SOLAR ENERGY

SEED COMPANIES

STATE AGENCIES HIGHWAY DEPARTMENTS

CITIES, COUNTIES

NGO'S NATURE CONSERVANCY

REGIONAL AGENCIES TRPA LADWP

SKI RESORTS

GOLF COURSES

HOME OWNERS

LANDSCAPE CONTRACTORS

BUILDERS

ENGINEERING FIRMS CH₂MHILL, Q&D, AECOM

PARKS RECREATION AREAS

AGRICULTURE TRADITIONAL AND DRYLAND PASTURE ALTERNATIVES HEDGEROWS

WILDLIFE REFUGES

XERISCAPING GOALS TRANSCEND

RESIDENTIAL AND RECLAMATION

MARKETS

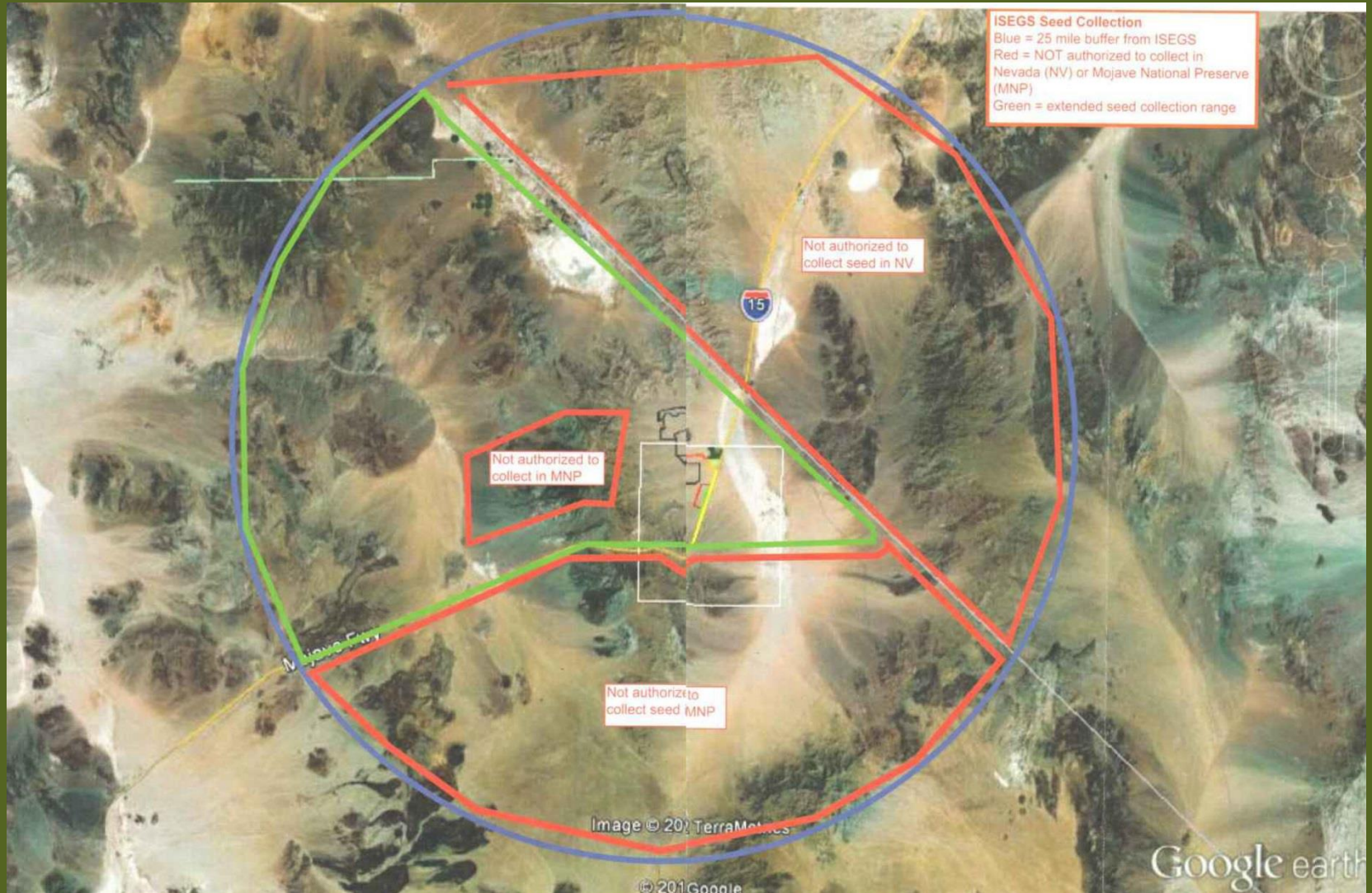
MARKETING

Fed biz ops; local and regional marketing

Wholesale vs. Retail opportunities

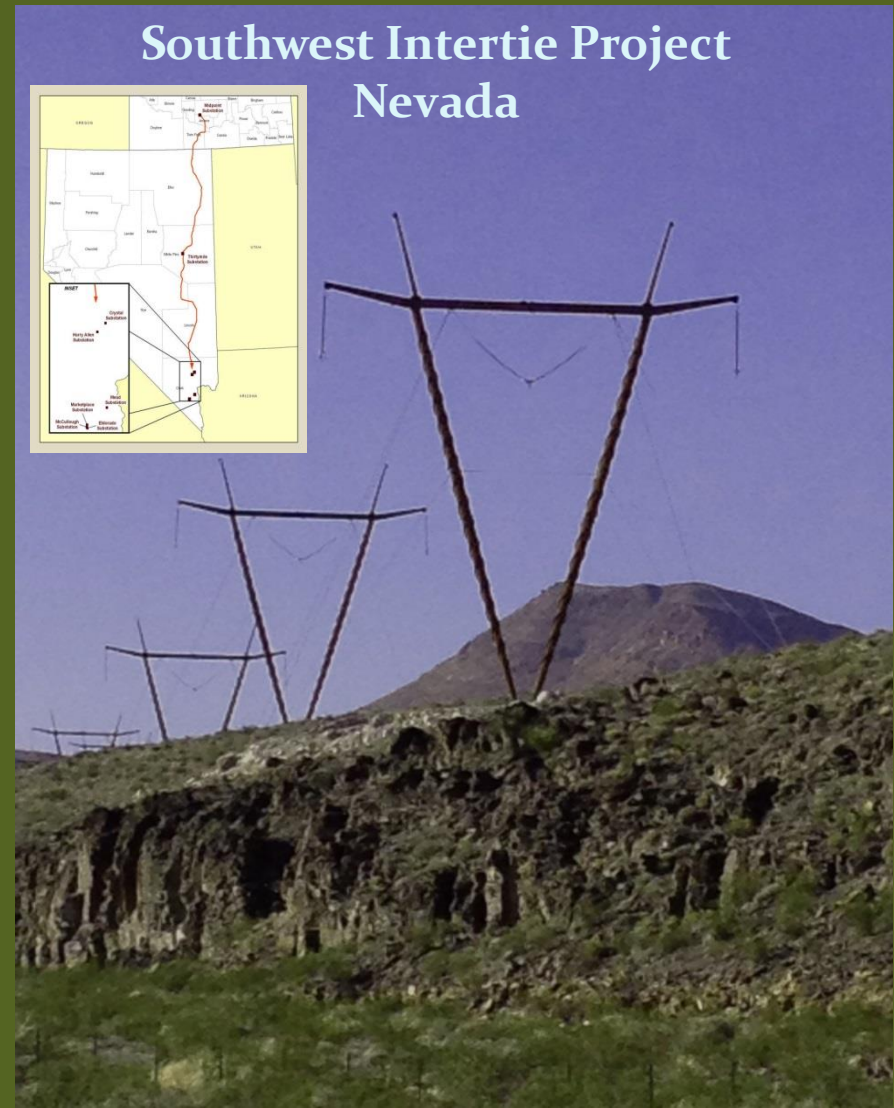
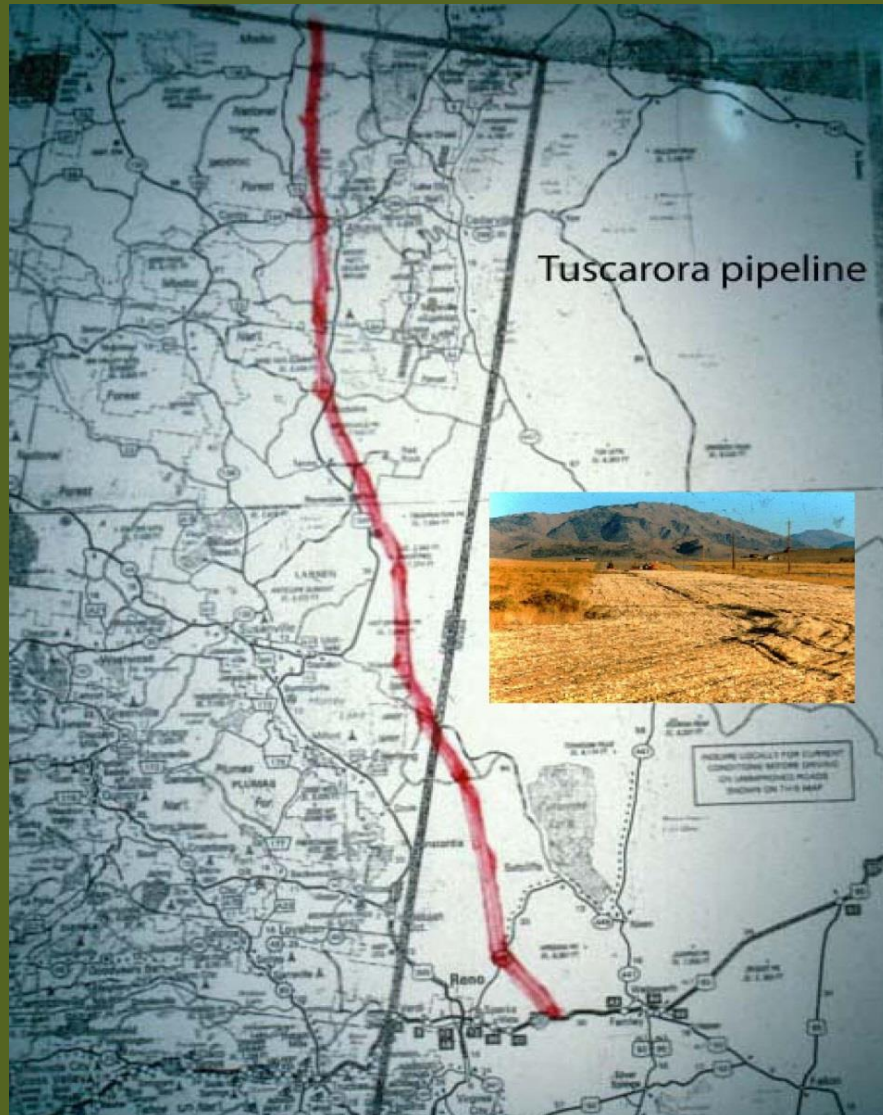
SOLAR

“Seed will be collected within the Ivanpah Valley and at similar elevations and conditions as those found at the Ivanpah SEGS project area.”
Resulting seed blends were greatly expanded from original target list.



ENERGY DISTRIBUTION electrical, natural gas, oil,

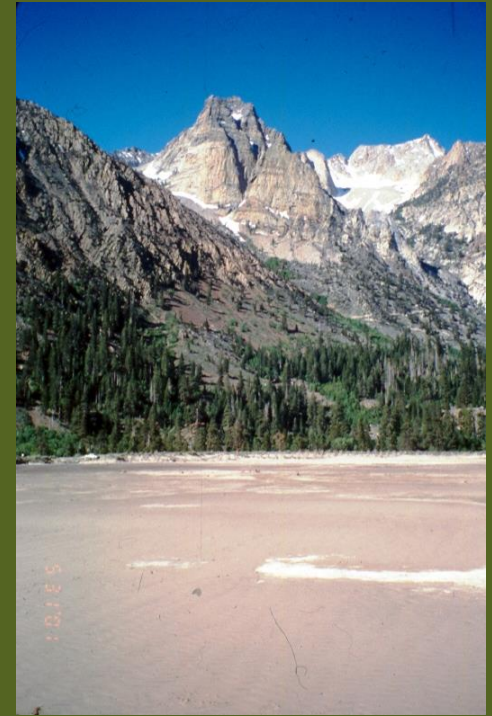
Utility corridors > multiple jurisdictions > multiple ecotypes > variable requirements



MINING

USFS requested seed collection for season in advance of project 1710 PLS lbs

PINE CREEK CA 2001 BEFORE RESTORATION



Mentzelia laevicaulis
(velcro on steroids)





**PINE CREEK
2014**



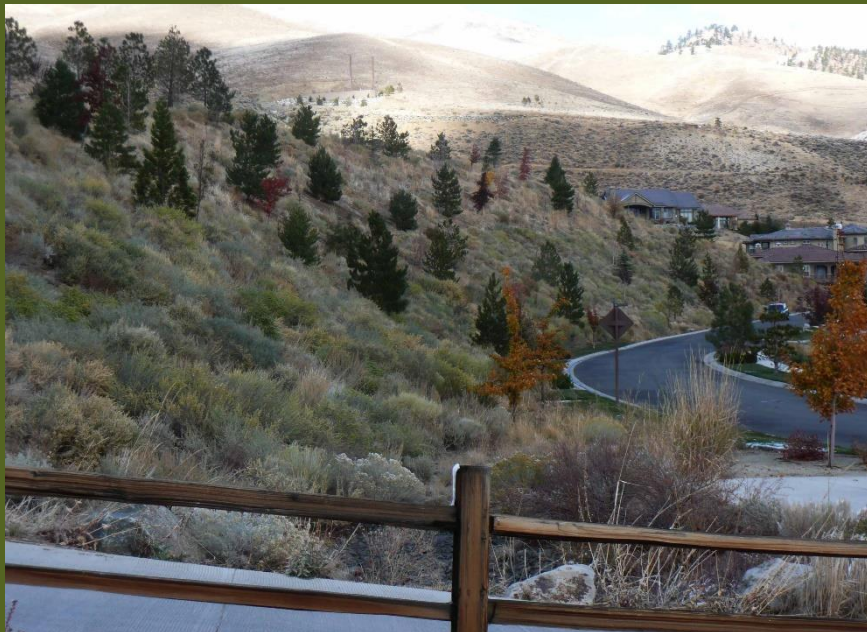
Creeping wildrye colonized the dunes

HIGHWAYS Urban native landscapes are now common; low maintenance; no irrigation



Fairview freeway exit Carson City

Sommerset Reno



BIG JOBS BIG TOYS



QUESTIONS?

COMSTOCK SEED LLC ed@comstockseed.com