



2017 National Native Seed Conference

A California Seed Industry Perspective

David Gilpin, General Manager
Pacific Coast Seed, Inc.

History of California Native Seed Industry

1975 – 1985

Droughts, road building and development initiate wildland seed businesses. 85% Non-Native, 15% Native

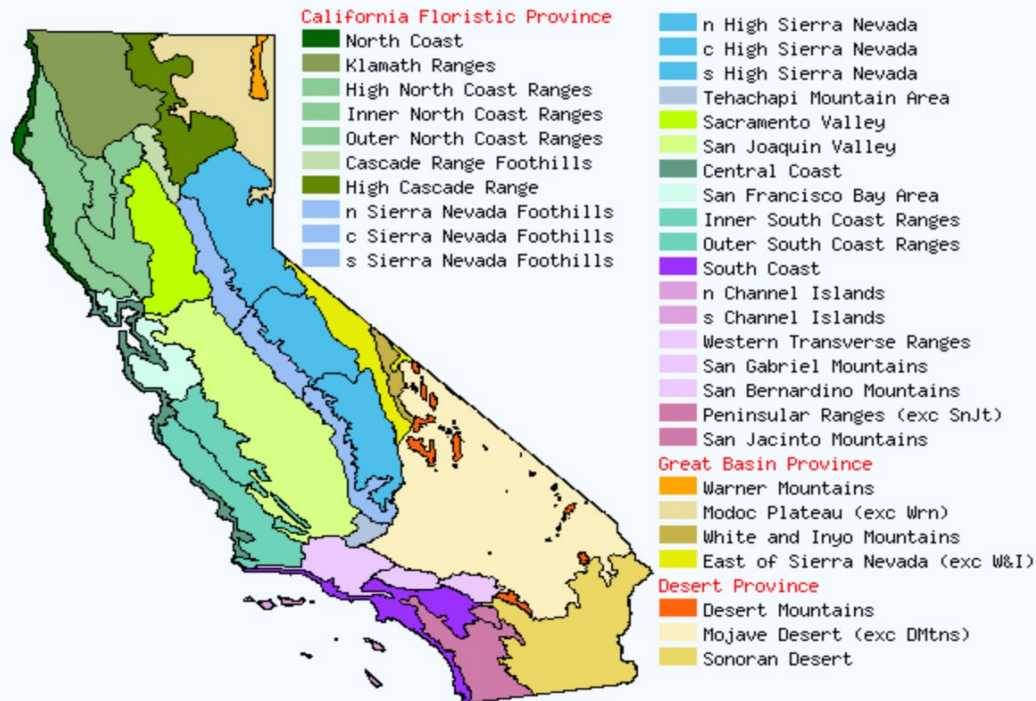
Clients

Hydroseeding Contractors
Cal-Trans
Residential
Other Gov't Infrastructure

Demand / Production

New Industry Established
Southern CA shrub and flowers – generic wild collected
Mostly Non-Native seed – Drought tolerant native and imported shrub and flower seeds
Mostly commercial - some shrub and flower seed

GEOGRAPHIC SUBDIVISIONS OF CALIFORNIA



History of California Native Seed Industry

1985 – 1995

Highway and private development help drive broader use of native seed up to 30% .

Clients

Cal-Trans Landscape Architecture
Other State and Local Agencies
CNPS, SERCAL
NRCS, BLM, USFS
State and National Parks
Residential Development
imported

Demand / Production

Directive – Seed natives statewide
Mixed engagement, TRPA
Development, Education, Restoration
Constructive Programs – Mixed use
Site specific internal programs
Drought drives seeding choices, native and



History of California Native Seed Industry

1995 – 2005

Agencies and private restoration embrace the use of native seed up 70%. Clients desire more regional seed.


<u>Clients</u>	<u>Demand / Production</u>
Cal-Trans	California generic grasses, shrubs and flowers
Cal-Fire	Grasses for Fire Rehabilitation
Conversation non-profits	Native grasses for land stewardship
BLM	Office emphasis on local native use.
US COE, Utilities, Parks, Mining	Adapted plants from generic or regional sources
Private & public Landscape Arch	CA generic grasses, shrubs and flowers. Imported seed declines.
NRCS	Conservation programs and Native Plant studies

2005 to Present

Agencies and private restoration embrace the use of native seed up 85%. Clients desire more site specific seed.

<u>Clients</u>	<u>Demand / Production</u>
Cal-Trans	Generic grasses, regional shrubs and flowers, special project site specific seed
Cal-Fire	Virtually 0 seed use
BLM	Special restoration – Large scale local collections.
NRCS / CCIA	Some native plant selection, Certification programs initiated and suspended
USACE, FEMA	Prefer regional, use generic grasses, forbs and shrubs

Current Status of Native Seed Available from the California Seed Industry – Current Status

- 
- 65 % of California native seed comes from generic sources and targeted to be broadly used in a variety of geographic regions
 - 25 % of California natives are produced for use on a regional basis
 - 10 % of California natives are produced for site specific local projects
 - Trending toward site specific seed

California has many of the same and some different issues from other Great Basin states

- How local is local?
- How do companies estimate future demand?
- How do we reliably identify seed with no Crop Improvement Certification program?
- How do we grow work horse species with no active Plant Development program?
- How do we engage broad agency communication and co-operation?
- How much does the industry speculate to provide seed to unidentified Fire Rehabilitation



How Could NSS Models Complement Existing California Restoration Efforts & Programs

- 
- Provide platform for internal/external communication.
 - Provide maps and guidance on seed selection and transfer.
 - Establish MOU's to allow contracting for work horse species.
 - Provide seed storage, testing and distribution of native seed.

Fire History of the Region

2013:

Total Acres Burned – 577,675

8/17/13 Rim Fire: 257,314 Acres

2014:

Total Acres Burned – 555,044

8/14/14 Happy Camp Fire: 134,056

Acres

9/13/14 King Fire: 97,717 Acres

2015:

Total Acres Burned – 893,362

9/9/15 Butte Fire: 70,868 Acres

9/12/15 Valley Fire: 76,067 Acres

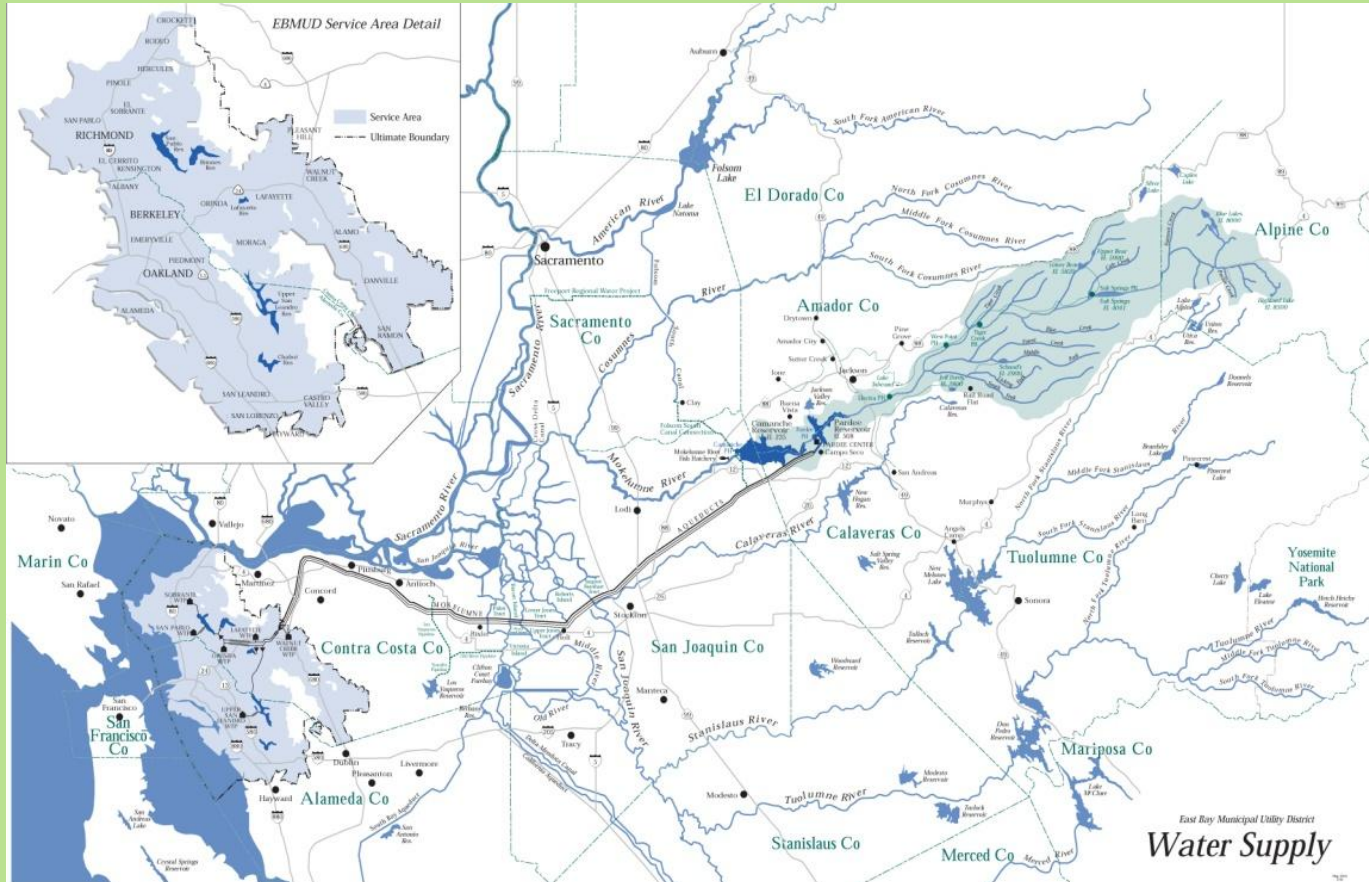
BLM, Cal-Trans, FEMA, Cal-Fire, Water Agencies/Water Quality Agencies, Local Counties and Cities

Reasons given for not seeding:

- Does not work
- No appropriate genetics
- Cost



Butte Fire: East Bay Municipal Utility District (EBMUD) Watershed and Service Area



- 375 million gallons of water provided daily
- 1.3 million people

Fire Growth

Report Date	Time	Acreage in time period	Total acreage	Acres per hour
9/9/2015	1425	Ignition		
9/9/2015	1630	50	50	25
9/9/2015	1930	950	1000	317
9/10/2015	600	3050	4000	226
9/10/2015	1800	10700	14700	892
9/11/2015	600	17274	31974	1440
9/11/2015	1800	32754	64728	2730

Operational Period Synopsis (0600-0600):	
Wednesday	4000 acres burned
Thursday	27974 acres burned
Friday	32754 acres burned
Optional Time Shift Synopsis (1800-1800):	
Wednesday	1000 acres burned
Thursday	13750 acres burned
Friday	50028 acres burned

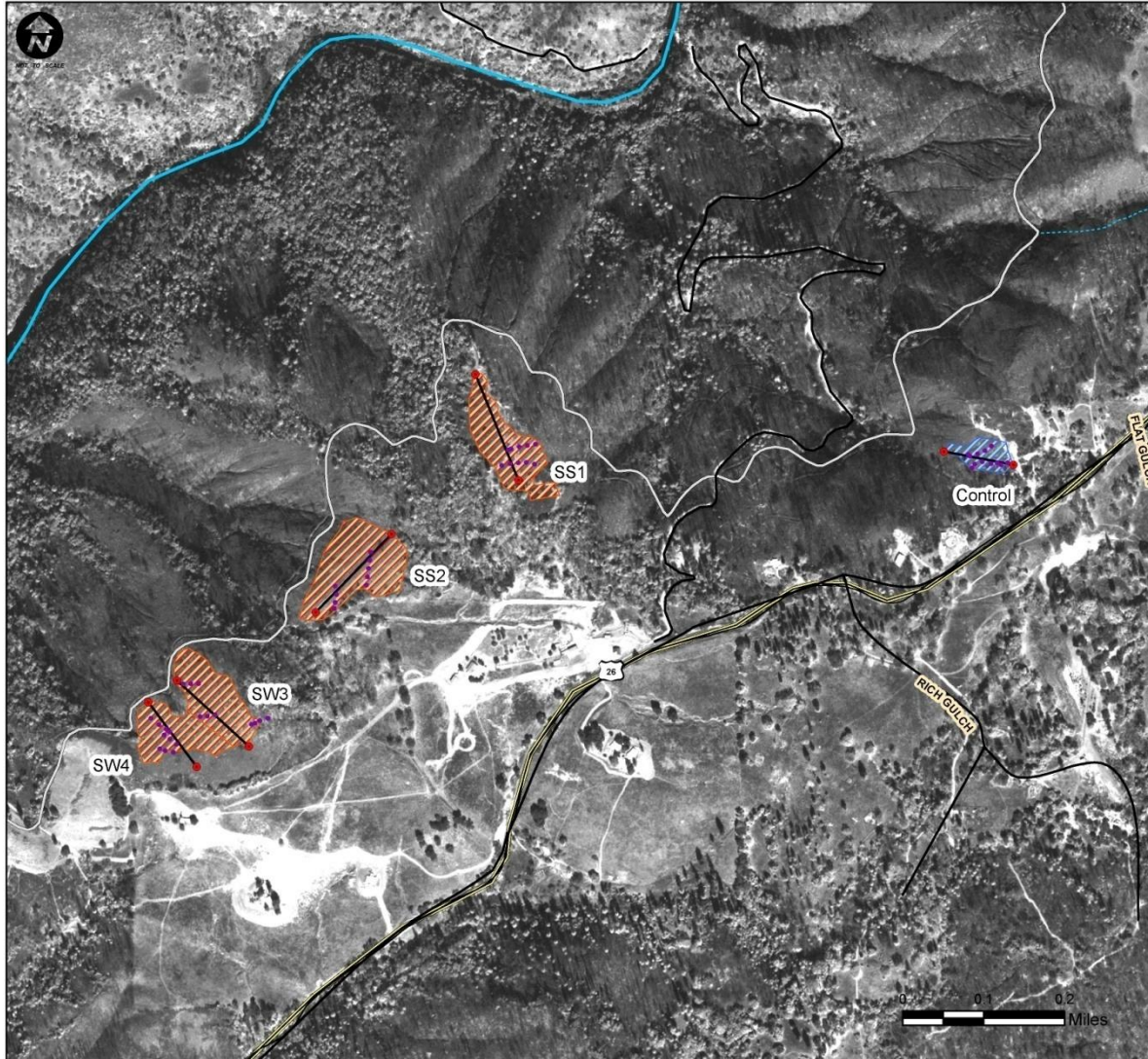


9/10/2015 1600 CALAVERAS CO 10,000 ACRES

Recovery Treatments: EBMUD & Inmate Crews

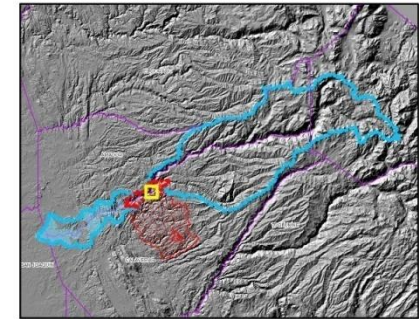


Butte Fire Seed Treatment Study Sites



Upper Mokelumne Watershed Fire Recovery Seed Treatment Study Sites

Prepared: February 2017



Location: Upper Mokelumne Watershed
Detailed View: Upper Mokelumne Watershed Fire Recovery Zone

- Slope Survey Points
 - Benchmarks
 - Baseline
 - Secondary Roads
 - Primary Roads
 - Highway
 - Utility Ditch / Canals
 - Mokelumne River
 - Creeks
- Study Sites**
- ▨ Control
 - ▨ Surface Treatments

- Mokelumne Watershed Fire Recovery
- Mokelumne Watershed
- ▨ Butte Fire
- ▨ EBMUD
- ▨ Counties

Absolute Scale: 1:8,000
Relative Scale: 1 inch equals 0.13 miles

Seed Mixes and Erosion Control Treatments

October 25, 2015

Seed Mix:

<u>% of Mix</u>	<u>Species/Source</u>
46.25	Bromus carinatus, Calaveras Co. 4,800' Elevation
18.53	Elymus glaucus, Stanislaus Forest 5,000' Elevation
11.12	Festuca microstachys, Yolo Co. 500' Elevation
7.40	Trifolium willdenovii, Yolo Co. 300' Elevation
8.34	Stipa pulchra, Solano Co. 100' Elevation
4.18	Lupinus nanus, Yolo Co. 100' Elevation
4.18	Achillea millefolium, Solano Co. 100' Elevation

Treatment:

<u>Lbs/Ac</u>	<u>Treatment</u>
3,250 – 3,650	Straw Mulch
13.00 – 15.00	Seed Mix

January 27, 2016

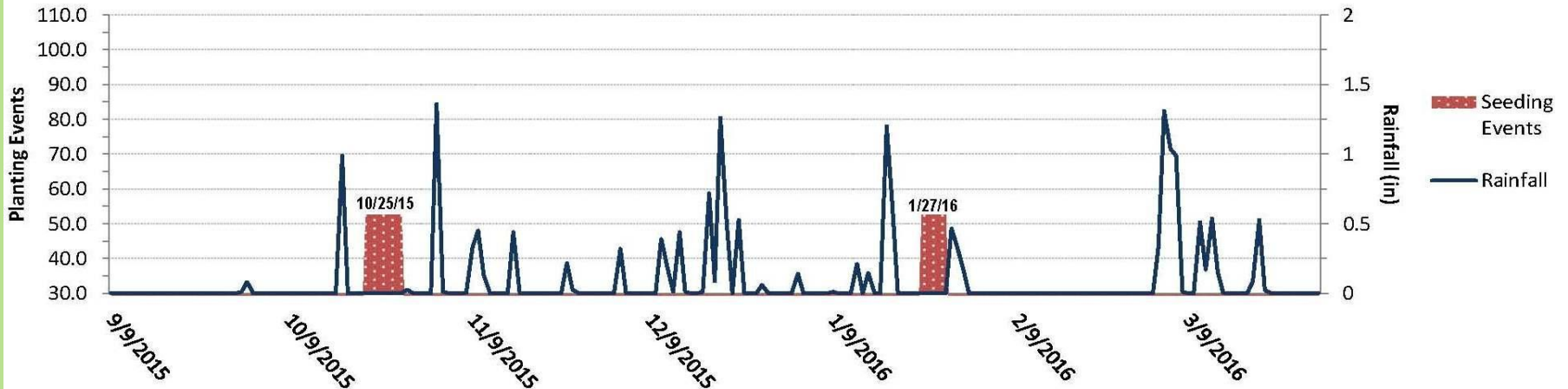
Seed Mix:

<u>% of Mix</u>	<u>Species/Source</u>
53.32	Bromus carinatus, Calaveras Co. 4,800' Elevation
20.00	Elymus glaucus, Stanislaus Forest 5,000' Elevation
13.32	Festuca microstachys, Yolo Co. 500' Elevation
8.88	Trifolium willdenovii, Yolo Co. 300' Elevation
4.48	Stipa pulchra, Solano Co. 100' Elevation

Treatment:

<u>Lbs/Ac</u>	<u>Treatment</u>
4,000	Wood Chips
20.00 – 22.00	Seed Mix

Weather Pardee Station



No Recovery Treatment Initiated – Visual Monitoring



**Butte Fire – October
23, 2015**



**Butte Fire – November
12, 2015**



**Butte Fire – April 8,
2016**

Recovery Treatment (Seed and Straw Mulch)



Butte Fire – October
23, 2015

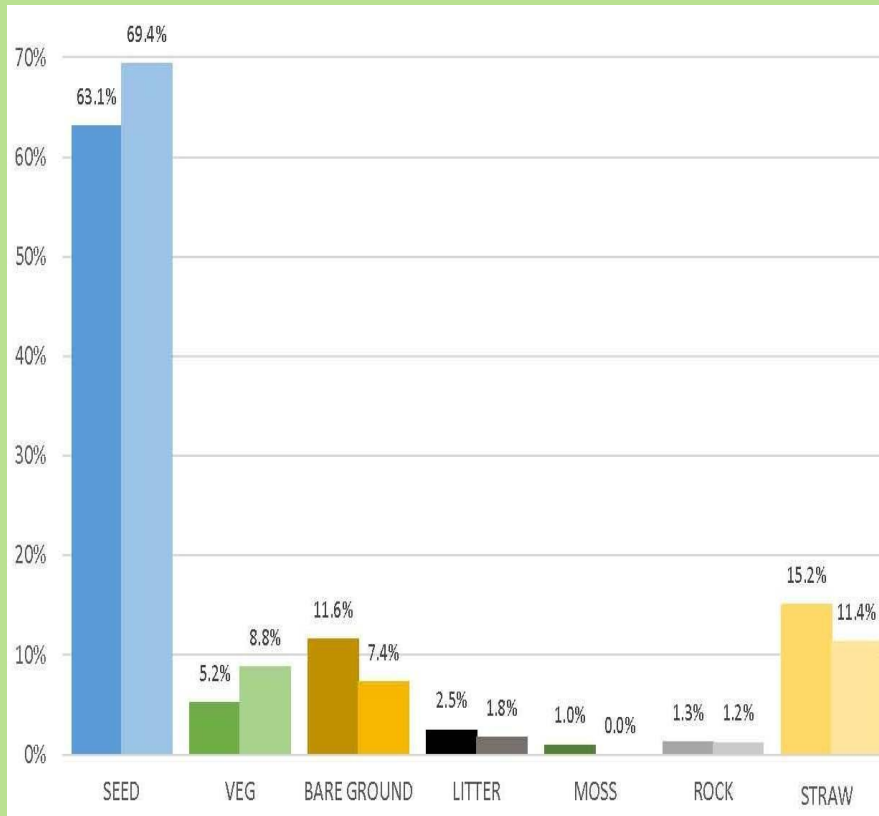


Butte Fire – November
12, 2015

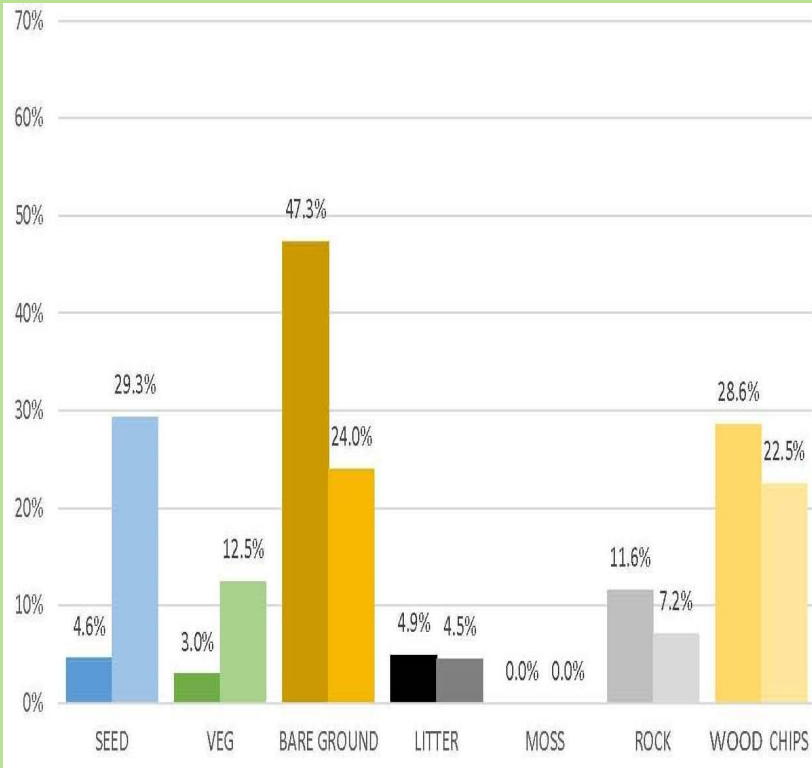


Butte Fire – April 8,
2016

Seed and Straw (SS) Seeded 10/25/15 % Cover 4/17/16 vs. 6/6/16

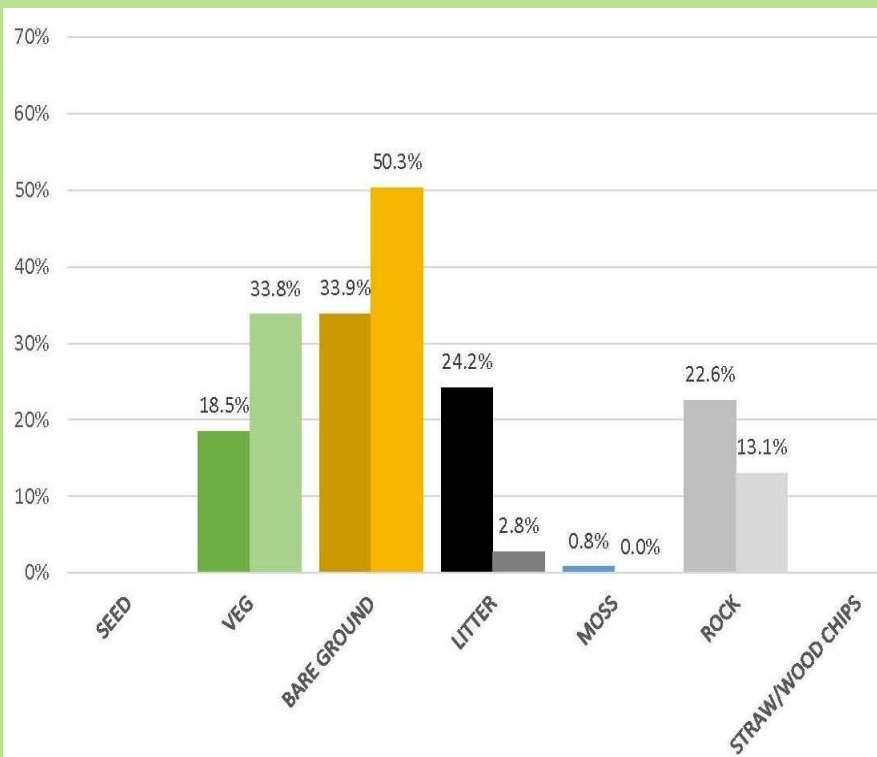


**Seed and Wood Chips (SW)
Seeded 1/27/16
% Cover 4/18/16 vs. 6/5/16**



Control

% Cover 4/23/16 vs. 6/7/16



Productivity & RDM

SEED & STRAW

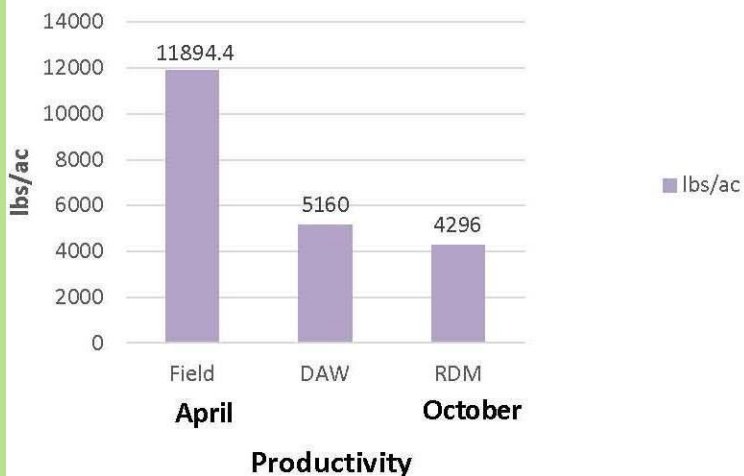
Treatment Date: 10/25/2015

Sample Date: 4/17/2016

Growth Period: 25 weeks

RDM date: 10/6/2016

**Recommended RDM for 0-30% Slopes: 600 lbs/ac*



SEED & WOOD CHIPS

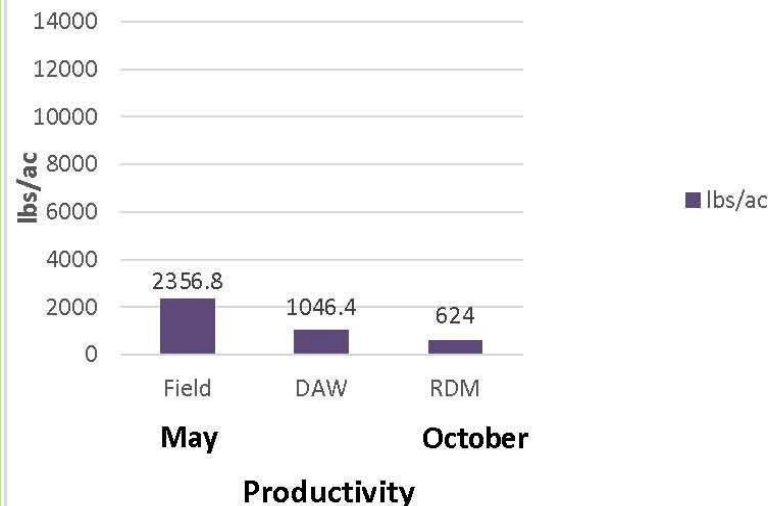
Treatment Date: 1/27/2016

Sample Date: 5/27/2016

Growth Period: 17 weeks

RDM date: 10/6/2016

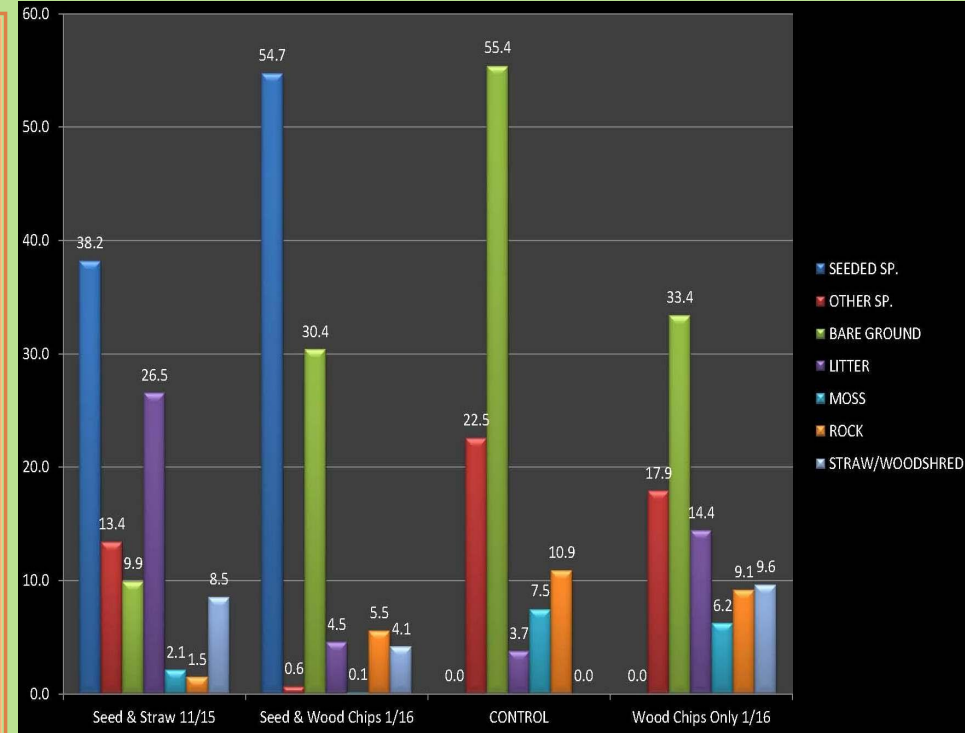
**Recommended RDM for 10-40% Slopes: 700 lbs/ac*



Winter Cover

1/30/17

- Early October rains and a warm November kick started growth of grass in region at large
- Control site depicting continued growth of resprouting shrub species and perennial forbs
- Seeded species are increasing cover in wood chip sites
- Last years standing crop of residual dry matter increased expression in straw treated sites



SS



SW



CONTROL

Vegetation Response Following Seeding and Erosion Control Applications

Sampling date:	Apr-16	Jun-16	Jan-17		Apr-16	Jun-16	Jan-17		Apr-16	Jun-16	Jan-17
Site ID:	SS	SS	SS		SW	SW	SW		Control	Control	Control
SEED (seeded live vegetation cover)	63.10%	69.20%	35.00%		4.70%	29.30%	54.50%		NA	NA	NA
VEG (volunteer live vegetation cover)	5.25%	8.90%	13.50%		2.95%	12.50%	0.50%		18.50%	33.80%	23.00%
LITTER	17.65%	13.20%	35.00%		33.65%	27.05%	8.00%		24.20%	2.80%	4.00%
Total % cover = SEED + VEG + LITTER	86.00%	91.30%	83.50%		41.30%	68.85%	63.00%		42.70%	36.60%	27.00%
RUSLE 2 Calculated Erosion Rate (Tons/Ac/Year)			3.75				12.59				46.78

Estimated 5 Year Erosion Rate

2015-2016			4.50				37.25				65.33
2016-2017			3.00				10.50				55.33
2017-2018			3.00				7.75				41.00
2018-2019			3.75				4.50				37.33
2019-2020			4.00				2.75				35.33

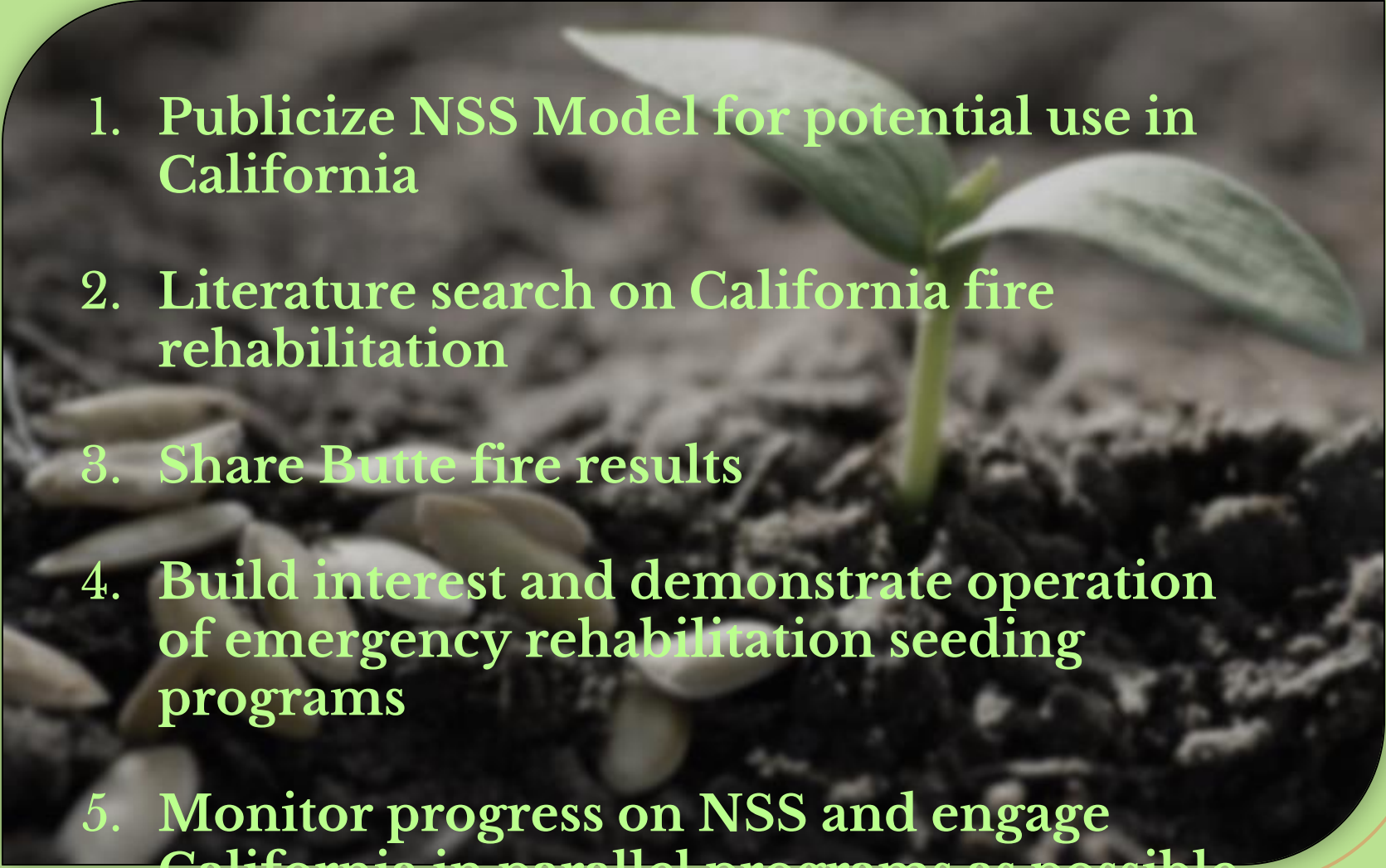
Butte Fire Study Summary

- **Timely seeding and mulching: Substantial cover, RDM and lower erosion control rates**
- **Delayed seeding and mulching: Provides some late season cover and lower long term soil erosion**
- **Untreated area: Lowest plant cover, highest soil erosion**
- **Agency and private company: Co-operative study on rehabilitation seeding**

Industry Perspective: Summary

- Focus on emergency seeding project
- Secondary focus large scale restoration project
- Work with the BLM as the lead agency
- Communication and establishment of some consensus on appropriate seed genetics
- Identification of “work horse” species
- Identify and commit to future seed needs
- Contracts for timely production of seed
- Seed storage and supply systems

Action Items

- 
1. Publicize NSS Model for potential use in California
 2. Literature search on California fire rehabilitation
 3. Share Butte fire results
 4. Build interest and demonstrate operation of emergency rehabilitation seeding programs
 5. Monitor progress on NSS and engage California in parallel programs as possible



Pacific Coast Seed is in the business of providing products that meet any needs including improved genetics and localized collections

The background of the slide is a soft-focus photograph of purple lupine flowers. The flowers are in various stages of bloom, with some showing their characteristic papilionaceous structure. The colors range from a deep purple to a lighter, almost white-purple hue. The background is a blurred green, suggesting a natural outdoor setting.

Special Thanks

**Chris Swann, EBMUD Environmental Programs
Manager**

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Bill Agnew, Agnew Environmental Consulting

David Lightle, Erosion Model Consultant



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This and additional presentations available at <http://nativeseed.info>

