



# King Range Native Bunchgrass Program

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## INTRODUCTION

Limited stands of historically abundant native perennial bunchgrasses remain in California wild landscapes. Most of these wild landscapes have been subject to a century, often more, of livestock grazing and decades of fire suppression.

The Bureau of Land Management (BLM), in partnership with the Mattole Restoration Council (MRC) and Suzanne Isaacs of the Humboldt Fish Action Council Nursery, has inventoried, mapped, collected, and propagated seed of 12 native perennial bunchgrass species.

The BLM has locally developed and utilized native perennial bunchgrass material to:

- 1) Create an in situ seed bank to observe bunchgrass colony establishment success and to enable future, more accessible seed collections,
- 2) Apply seed of colonizer native perennials to four acres of dozer line disturbance on Paradise Ridge following the Paradise Fire (2008), and
- 3) Transplant 64,622 native bunchgrass plugs as part of post-fire recovery and general grassland enhancement efforts on the Spanish Flat Fire (2007) and Paradise and Prosper Ridge prairies (2009-2010).

The BLM continues to propagate even greater numbers of native perennial grasses for future projects in the King Range.



Blue wildrye (*Elymus glaucus*) – Johnny Jack Ridge, May 2007

*Photo by Clara Sander*

## NATIVE PERENNIAL GRASSES PROVIDE MORE ECOLOGICAL SERVICES

Perennial grasses:

- 1) increase soil stability and rooting depth
- 2) have greater capacity to stabilize surface and sub-soils once established
- 3) recapture nutrients and water which have leached or percolated below the shallow six to eight inch root zone of annuals
- 4) sequester atmospheric carbon and build soil organic matter, thereby decreasing greenhouse gases and increasing site fertility and sustained productivity
- 5) lengthen the available green forage grazing season for wildlife/livestock
- 6) lessen fire intensity because of their increased moisture content
- 7) increase floral biodiversity and associated fauna
- 8) are more aesthetically pleasing on the grassland landscape

## IN SITU SEED BANK DEVELOPMENT



Photo left: Suzanne Isaacs and BLM staff Clara Sander educate MRC staff John Isom and Hugh McGee about the who, what and wheres of native perennial grasses on Telegraph Ridge. Photo right: Mike Evenson, BLM grazing lessee, disks grassland for in situ seed bank site prep prior to native grass transplantation, November 2005.

*Photos by Jennifer Wheeler*

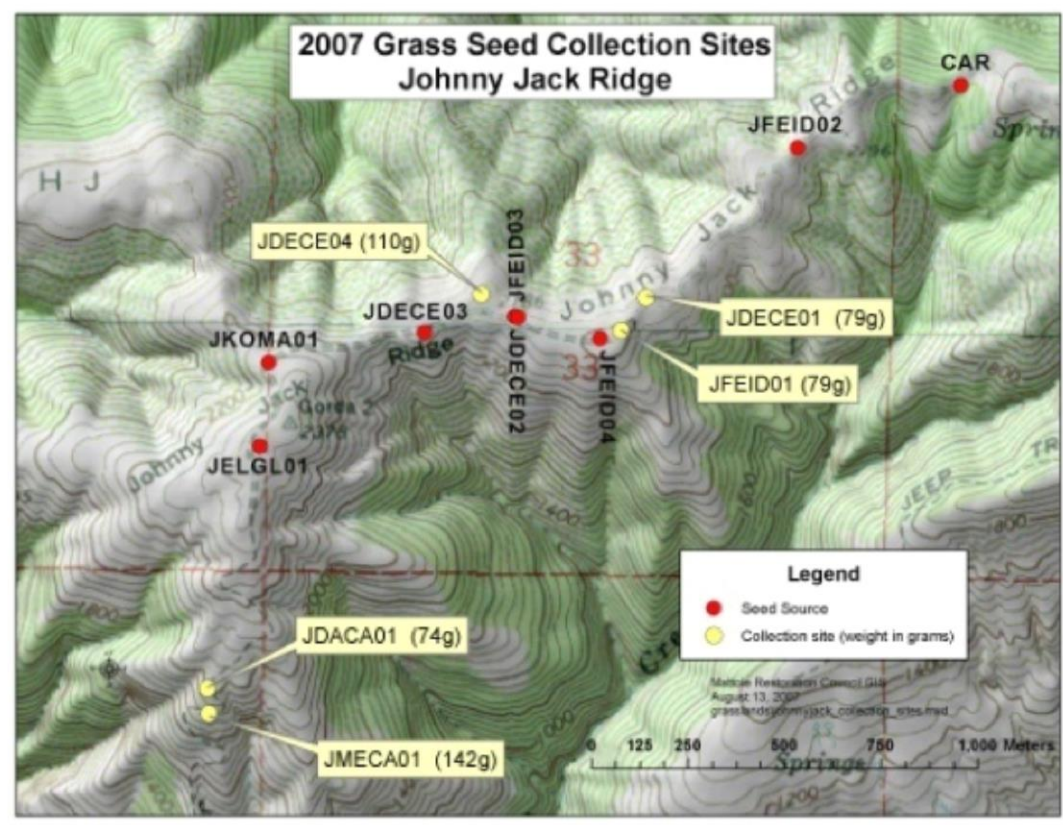
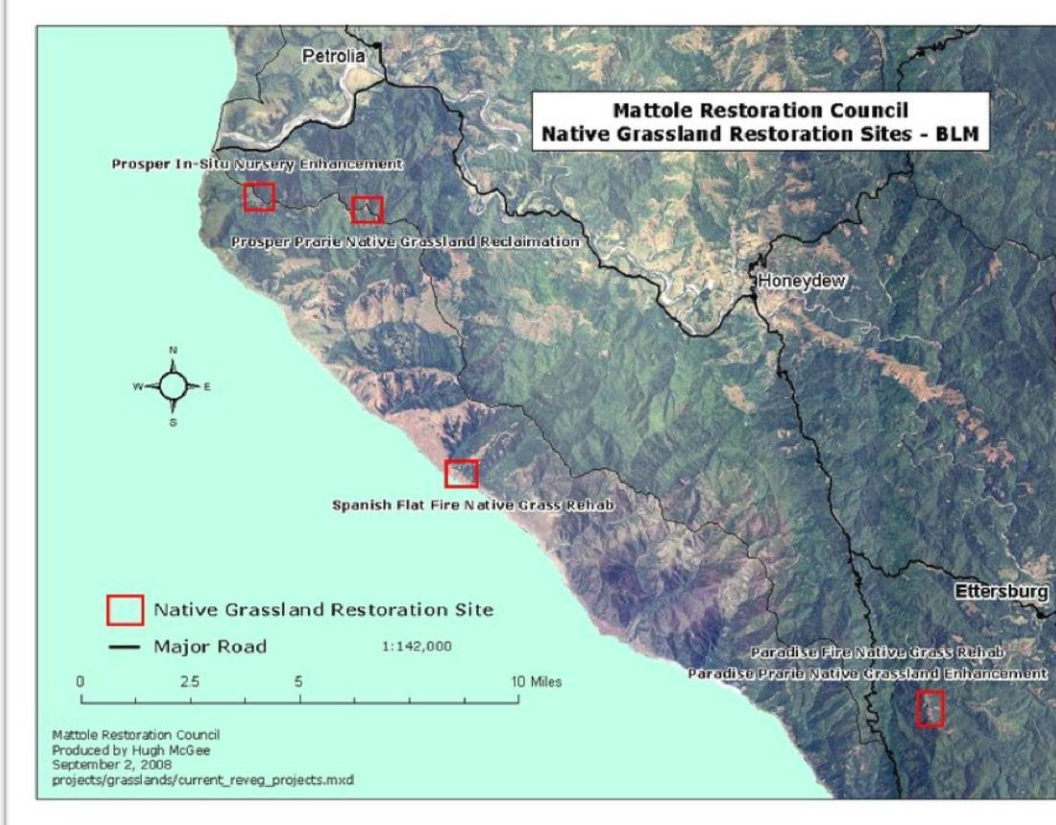


Photo left: Native grasses for in situ seed bank project propagating in nursery, spring 2005. Photo right: John Isom of MRC stands in Pacific hairgrass colony within the in situ seed bank, August 2007.

*Photos by Suzanne Isaacs and Jennifer Wheeler*

## SEED COLLECTION, PROPAGATION, TRANSPLANTATION

Twelve grass species were selected to form the original nursery collection based on the results of spring 2004 surveys. The initial seed collections for the nursery were carried out during the summer of 2004. Seeds were collected by hand with special consideration given to maximizing the genetic diversity of each collection. This was achieved by collecting from all known sub-populations and from a wide range of individuals within each population. Original and subsequent collections have all been recorded in GIS.



Nursery propagation began shortly after sufficient fresh seed was available for the 12 target grass species. Eventually all but one species (*A. lemmonii*) successfully germinated. Plugs were prepared for future transplantation efforts into the in situ seed bank.

## NATIVE PERENNIAL GRASS MATERIALS SUMMARY

Scientific Name	Common Name	Growth Habit	Plugs Transplanted to Date (Since Fall 2007)	Plugs under propagation for 2010/11 Planting	Total Pounds (lbs) Seed Collected Through 2009	Total Pounds (lbs) Seed Applied to 2008 Project Sites
<i>Achnatherum lemmonii</i>	Lemmon's needlegrass	bunchgrass	0	1,000	2.31 lbs	
<i>Bromus carinatus</i>	California brome	colonizer	1,400	0	31.02 lbs	29
<i>Calamagrostis foliosa</i>	leafy reed grass	bunchgrass	19,577	4,000	2.28 lbs	
<i>Danthonia californica</i>	California oatgrass	bunchgrass	1078	1,000	5.66 lbs	
<i>Deschampsia holciformis</i>	Pacific hairgrass	bunchgrass	17,161	2,000	1.42 lbs	
<i>Elymus glaucus</i>	blue wildrye	colonizer	500	0	32.87 lbs	32
<i>Elymus multisetus</i>	big squirreltail	colonizer	610	1,000	0.47 lbs	
<i>Festuca californica</i>	California fescue	bunchgrass	0	0	0.13 lbs	
<i>Festuca idahoensis</i>	Idaho fescue	bunchgrass	2,484	5,000	0.73 lbs	
<i>Koeleria macrantha</i>	prairie Junegrass	bunchgrass	7,856	8,000	0.43 lbs	
<i>Melica californica</i>	California melic	bunchgrass	13,452	8,000	2.40 lbs	
<i>Trisetum canescens</i>	tall trisetum	bunchgrass	504	0	0.10 lbs	
<b>TOTALS</b>			<b>64,622 plugs</b>	<b>30,000 plugs</b>	<b>79.85 lbs</b>	<b>61 lbs</b>



MRC native plant nursery with propagation manager Monica Scholey. Grass plugs are being sorted and stacked outside in preparation for delivery to Paradise Ridge.

*Photo by Jennifer Wheeler*

## MONITORING

Native perennial bunchgrass projects are monitored to assess pre- and post-implementation conditions to determine potential project impact. Three categories of monitoring include: implementation monitoring (immediate monitoring designed to assess implementation success), effectiveness monitoring (post-implementation monitoring designed to assess project effectiveness), and trend monitoring (ongoing monitoring assessing overall environmental conditions in the King Range).

### Implementation Monitoring

Prior to implementation, information is collected during plot establishment includes slope, aspect, soil type and quality as well as information on the plantings including species, seed or plug, amount, and average height. This information is important for considering site selection and identifying environmental variables that might impact project results. Post-implementation monitoring is also conducted to determine if projects were implemented according to their intended design. Modifications to original plans are recorded and considered in project outcome.

### Effectiveness Monitoring

Effectiveness monitoring information is collected for grassland expansion and re-vegetation projects to determine seedling survival and population distribution. Monitoring for these projects are scheduled for one month, six months, one year and two years after project implementation, dependent upon funding availability and access. Survival of Spanish Flat Post Fire plugs planted in 2008 and monitored in June of 2009 was 94.5%.

### Trend Monitoring

Grassland distribution and composition throughout the King Range is monitored via aerial photography, soil and vegetation maps, and visual observations by BLM and MRC staff and community members. This large scale trend monitoring provides a reasonable estimate as to the changes in grassland distribution, as well as the presence of invasive species and native grasses.

## SPANISH FLAT POST FIRE PLUG PLANTING



Photos left to right: Bob Anderson, MRC, planting Pacific hairgrass with a 'thin blade' hoedad (3"wide,15"long); A plug showing six inch root development; A Pacific hairgrass colony (500 plants/colony) settling in to its new home; An upslope crew planting leafy reedgrass and down slope crew planting prairie Junegrass, with two more colonies already planted in the foreground, November 2008.

*Photos by Jennifer Wheeler, BLM, and Hugh McGee, MRC.*

## PARADISE RIDGE PRAIRIE ENHANCEMENT



Figure left: Paradise Ridge Native Grass Planting plan. Figure right: Gully feature in grassland planted with leafy reed grass (*Calamagrostis foliosa*), (depicted as site PR15 on adjacent figure), November 2009.



The 2005 King Range National Conservation Area Resource Management Plan guides resource specialists to "maintain healthy productive grasslands to encourage native species abundance and diversity when feasible... Native grass enhancement projects will be pursued through an integrated approach including, but not limited to burning, grazing, reseeding, and transplanting with locally collected seed stock."

## CONSERVATION MESSAGE

The BLM is committed to actively managing events responsible for resuming successional processes that may foster colonial establishment of transplanted native perennial grasses.

The King Range Native Perennial Bunchgrass Program has demonstrated that successful establishment of new native perennial bunchgrass colonies can be accomplished through the propagation of locally collected seed followed by transplantation of plugs.



Lemmon's needlegrass (*Achnatherum lemmonii*), Telegraph Ridge, May 2007

*Photo by Jennifer Wheeler*

## ACKNOWLEDGEMENTS

This program has been made successful with benevolent and enthusiastic support from Hugh McGee, Monica Scholey, the Mattole Restoration Council staff and affiliates, Suzanne Isaacs, John Isom, HSU Natural Resource Club, California Conservation Corps, Redwood Community Action Agency, Mike Evenson, Clara Sander, and with financial support from the BLM Native Plant Materials Development program and the Mattole Restoration Council.

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