

# 2007 U. S. Fish and Wildlife Service Biological Opinion Annual Mitigation Monitoring Reports for the Rocky Flats Site



**CD 1**

(click on the title of the report below to access the report)

Located on CD 1:

[East Shooting Range Remediation Project Report](#)

[Incinerator Project Report](#)

[Phytoremediation Project Report](#)

[Programmatic Biological Assessment \(PBA\) Part II Report](#)

Located on CD 2:

**Programmatic Biological Assessment (PBA) Part II Report**

**Photomonitoring Projects:**

Pond Remediation A-Series

Pond Remediation B-Series

Walnut Creek Riparian Corridor Monitoring

# 2007 East Shooting Range Remediation Project Report for the Rocky Flats Site



(click below to access a particular section of the report)

[Report Text \(PDF Version\)](#)

[Appendix A: Photomonitoring](#)

[Appendix B: Qualitative Habitat Assessment Forms](#)

**Preble's Meadow Jumping Mouse Mitigation Monitoring Report for the  
East Shooting Range Remediation Project at the Rocky Flats Site  
2007 Annual Report  
Biological Opinion: ES/LK-6-CO-04-032 (September 17, 2004)**

**Introduction**

This report is being submitted to the U. S. Fish and Wildlife Service (USFWS) in order to comply with the requirements outlined in a USFWS's Biological Opinion (BO) on the East Shooting Range Remediation (ESRR) Project; (BO dated September 17, 2004). The ESRR Project was conducted to clean up soils contaminated with lead at the target location on the old East Shooting Range at the Rocky Flats Site (Site). The BO addresses impacts to the federally listed Preble's meadow jumping mouse (Preble's mouse, *Zapus hudsonius preblei*) from the ESRR Project at the Site. The Biological Assessment written for the project states that the revegetation monitoring would be conducted according to the guidance provided in Part II of the Programmatic Biological Assessment (PBA), Appendix B. This report is being submitted to satisfy the conditions of the USFWS BO for 2007 and is due by December 1 after each growing season.

**Methodology**

The location of the ESRR Project is shown on Figure 1. The methodology used for the monitoring was taken from Appendix B in Part II of the PBA, the Mitigation Monitoring Plan. In accordance with the plan, qualitative monitoring was used for the ESRR Project because the total area disturbed and revegetated was less than one acre in size. Qualitative monitoring consisted of retaking photographs of the area (see Appendix A on the CD-ROM) and conducting a qualitative assessment (see Appendix B on the CD-ROM) to evaluate and document the initial revegetation efforts.

The summer of 2007 was the third growing season since completion of the project. After project completion in 2005, the area was seeded with a mesic hillslope seed mix (Table 1) and erosion matting was installed. Along Woman Creek, after the culvert that had been used for access to the south side of the stream was removed, a total of 40 peach leaf willow (*Salix amygdaloides*) stakes and three plains cottonwood (*Populus deltoides*) poles were planted along the edge of the stream. A riparian seed mix was also planted along the stream. (Table 1).

**Results and Discussion**

Of the ten seeded graminoid species, six were observed growing in the revegetation area in August 2007. These included western wheatgrass (*Agropyron smithii*), slender wheatgrass (*Agropyron caninum* [=A. *trachycaulum*]), buffalo grass (*Buchloe dactyoides*), side oats grama (*Bouteloua curtipendula*), Canada wildrye (*Elymus canadensis*), green needle grass (*Stipa viridula*), and blue grama (*Bouteloua gracilis*). Weed control of the revegetation area was conducted in 2005 using spot applications of Roundup® applied with a backpack sprayer and again in 2006 using Milestone® applied with an ATV-mounted spray rig. The species treated included Canada thistle (*Cirsium arvense*), diffuse knapweed (*Centaurea diffusa*), musk thistle

(*Carduus nutans*), common mullein (*Verbascum thapsus*), and moth mullein (*Verbascum blattaria*).

Total vegetation cover in 2007 was estimated to be approximately 65% on the hillside area south of Woman Creek. This was an increase from the estimated 20 to 25% vegetation cover present in 2005 and 40% in 2006. On the north side of the stream along the old access road, the road was almost indistinguishable from the surrounding vegetation. Erosion matting and wattles continue to protect the area from erosion. Of the original 40 peach leaf willow stakes installed along Woman Creek, 11 (28%) were still alive in 2007. They have continued to expand and fill in the area along the stream. A few coyote willow (three; *Salix exigua*) and wild indigo (five; *Amorpha fruticosa*; also known as leadplant) have also begun to establish in the revegetation area along the stream, probably coming from nearby existing stands. Only one of the three planted plains cottonwood poles was still alive in August 2007. The 2006 drought and browsing deer killed the other cottonwood poles.

In general, the grasses are establishing very well and filling in across the revegetation area. With continued weed control (as needed) the area should be indistinguishable from the surrounding vicinity within the next few years. On the south side of Woman Creek, the coconut matting erosion material continues to hide some of the grasses that are growing in abundance below it. The uneven ground surface has caused the matting to be elevated at some locations and thus from a distance the hillside still looks unvegetated in some spots. However, closer inspection reveals a good stand of grass beneath the matting. Hence the area is doing quite well. Although fewer willow have survived along the stream (probably due to competition), the surviving willow are larger now and filling in the stream edge. The willow along the stream should continue to grow and expand, and in time will return the streamside to a wooded riparian corridor similar to that found upstream and downstream of the project area. Photomonitoring results are provided in Appendix A on the CD-ROM.

## Conclusions

The vegetation at the ESRR Project area was monitored in 2007 per the requirements of the USFWS BO dated September 17, 2004, to evaluate the status of the revegetation establishment and determine if management actions needed to be taken. The sampling conducted in 2007 represents three growing seasons for the area. To summarize, seven of the ten seeded graminoid species are established in the revegetation area and total vegetation cover was approximately 65% on the large hillside area south of Woman Creek. The old access road on the north side of the stream was barely visible in 2007 because of the dense establishment of vegetation. Erosion matting and wattles continue to protect the area from erosion. Weed management will be conducted as needed to control noxious weeds and provide for good establishment of the graminoid species. The woody plant material installed along Woman Creek has established and continues to fill in along the stream. Overall, the vegetation at the ESRR Project area is doing very well in its third growing season. Monitoring in 2008 will continue to document the re-establishment of the vegetation in this location.

# East Shooting Range Remediation Project Location

## Figure 1

### LEGEND

 East Shooting Range Project Disturbance

 Preble's Protection Areas

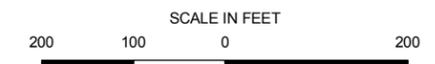
### STANDARD FEATURES

 Roads

 Streams, ditches, and other drainage features

 Lake or pond

DATA SOURCE BASE FEATURES:  
Buildings, fences hydrography, roads and other structures  
from 1994 aerial fly-over data captured by EG&G RSL, Las Vegas.  
Digitized from the orthophotographs, 1/95.



STATE PLANE COORDINATE SYSTEM  
COLORADO CENTRAL ZONE  
NORTH AMERICAN DATUM OF 1927

U.S. DEPARTMENT OF ENERGY  
GRAND JUNCTION, COLORADO

Work Performed by  
**S.M. Stoller Corporation**  
Under DOE Contract  
No. DE-AC01-02GJ79491

DATE PREPARED:  
October 24, 2006

FILENAME:  
S0275200

**Table 1. East Shooting Range Seed Mixes**

**Hillside Slope Areas (Hillside Areas Or Areas With Slopes Greater Than 10%) Revegetation Seed Mix  
(Based on 50 seeds/sq.ft.)**

Species	Common Name	Variety	% of Seed Mix	# Seeds Needed	# Seeds/Lb.	# Seeds/Sq. Ft.	Lbs./Acre (PLS)
<b>Graminoids</b>							
Agropyron dasystachyum	Thickspike Wheatgrass	Critana	5	108900	150000	2.5	0.73
Agropyron smithii	Western Wheatgrass	Arriba	23	500940	120000	11.5	4.17
Agropyron trachycaulum	Slender Wheatgrass	San Luis	15	326700	120000	7.5	2.72
Bouteloua curtipendula	Side-Oats Grama	Vaughn	13	283140	190000	6.5	1.49
Bouteloua gracilis	Blue Grama	Hachita	24	522720	710000	12.0	0.74
Buchloe dactyloides	Buffalo Grass	Texoka	10	217800	45000	5.0	4.84
Stipa viridula	Green Needle Grass	Lodorm	10	217800	180000	5.0	1.21
	Total		100	2178000		50.0	15.90

**Riparian Areas**

Scientific Name	Common Name	Variety	% of Seed Mix	# Seeds Needed	# Seeds/Lb.	# Seeds/Sq. Ft.	Lbs./Acre (PLS)
<b>Graminoids</b>							
Agropyron smithii	Western Wheatgrass	Arriba	15	326700	120000	7.5	2.72
Agropyron trachycaulum	Slender Wheatgrass	San Luis	20	435600	120000	10.0	3.63
Andropogon gerardii	Big Bluestem	Bonilla	15	326700	130000	7.5	2.51
Bouteloua gracilis	Blue Grama	Hachita	10	217800	710000	5.0	0.3
Elymus canadensis	Canada Wildrye	-	20	435600	115000	10.0	3.79
Panicum virgatum	Switchgrass	Nebraska 28	20	435600	390000	10.0	1.12
	Total		100	2178000		50.0	14.08

# East Shooting Range

(Clicking on any of the listed photopoints below, which correspond to the points on the map will take you to their respective monitoring photos, then clicking on any photo will enlarge that photo)

[Photopoint 203](#)

[Photopoint 204](#)

[Photopoint 205](#)

[Photopoint 206](#)

[Photopoint 207](#)

[Photopoint 208](#)

[Photopoint 209](#)

[Photopoint 210](#)

[Photopoint 211](#)

[Photopoint 212](#)

[Photopoint 213](#)

[Photopoint 214](#)

[Photopoint 215](#)

[Photopoint 216](#)

[Photopoint 217](#)

[Photopoint 218](#)

[Photopoint 219](#)

[Photopoint 220](#)

[Photopoint 221](#)

[Photopoint 222](#)

[Photopoint 223](#)

[Photopoint 224](#)

[Photopoint 225](#)

[Photopoint 226](#)

[Photopoint 227](#)

[Photopoint 228](#)

[Photopoint 229](#)

[Photopoint 230](#)

[Photopoint 231](#)

[Photopoint 232](#)

[Photopoint 233](#)

[Photopoint 234](#)

[Photopoint 235](#)

[Photopoint 236](#)



# East Shooting Range

## Photopoint 203

**6/23/2004**

**8/25/2005**



**8/08/2006**

**8/08/2007**



# East Shooting Range

## Photopoint 204

**6/23/2004**

**8/25/2005**



**8/08/2006**

**8/08/2007**



# East Shooting Range

## Photopoint 205

**6/23/2004**

**8/25/2005**



**8/08/2006**

**8/08/2007**



# East Shooting Range

## Photopoint 206

**6/23/2004**

**8/25/2005**



**8/08/2006**

**8/08/2007**



# East Shooting Range

## Photopoint 207

**6/23/2004**

**8/25/2005**



**8/08/2006**

**8/08/2007**



# East Shooting Range

## Photopoint 208

**6/23/2004**

**8/25/2005**



**8/08/2006**

**8/08/2007**



# East Shooting Range

## Photopoint 209

**6/23/2004**

**8/25/2005**



**8/08/2006**

**8/08/2007**



# East Shooting Range

## Photopoint 210

**6/23/2004**

**8/25/2005**



**8/08/2006**

**8/08/2007**



# East Shooting Range

## Photopoint 211

**6/23/2004**

**8/25/2005**



**8/8/2006**

**8/8/2007**



# East Shooting Range

## Photopoint 212

**6/23/2004**

**8/25/2005**



**8/8/2006**

**8/8/2007**



**6/23/2004**



**8/25/2005**



**8/8/2006**



**8/8/2007**



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**8/25/2005**



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**8/8/2007**



**6/23/2004**



**8/25/2005**



**8/8/2006**



**8/8/2007**



# East Shooting Range

## Photopoint 213

**6/23/2004**

**8/25/2005**



**8/8/2006**

**8/8/2007**



# East Shooting Range

## Photopoint 214

**6/23/2004**

**8/25/2005**



**8/8/2006**

**8/8/2007**



# East Shooting Range

## Photopoint 215

**6/23/2004**

**8/25/2005**



**8/8/2006**

**8/8/2007**



# East Shooting Range

## Photopoint 216

**6/23/2004**

**8/25/2005**



**8/8/2006**

**8/8/2007**



# East Shooting Range

## Photopoint 217

**6/23/2004**

**8/25/2005**



**8/8/2006**

**8/8/2007**



# East Shooting Range

## Photopoint 218

**6/23/2004**

**8/25/2005**



**8/8/2006**

**8/8/2007**



# East Shooting Range

## Photopoint 219

**6/23/2004**

**8/25/2005**



**8/8/2006**

**8/8/2007**



# East Shooting Range

## Photopoint 220

**6/23/2004**

**8/25/2005**



**8/8/2006**

**8/8/2007**



# East Shooting Range

## Photopoint 221

**6/23/2004**

**8/25/2005**



**8/8/2006**

**8/8/2007**



# East Shooting Range

## Photopoint 222

**6/23/2004**

**8/25/2005**



**8/8/2006**

**8/8/2007**



**6/23/2004**

**8/25/2005**



**8/8/2006**

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**6/23/2004**



**8/25/2005**



**8/8/2006**



**8/8/2007**



**6/23/2004**



**8/25/2005**



**8/8/2006**



**8/8/2007**



**6/23/2004**

**8/25/2005**



**8/8/2006**



**8/8/2007**



**6/23/2004**

**8/25/2005**



**8/8/2006**

**8/8/2007**



# East Shooting Range

## Photopoint 223

**6/23/2004**

**8/25/2005**



**8/8/2006**

**8/8/2007**



# East Shooting Range

## Photopoint 224

**6/23/2004**

**8/25/2005**



**8/8/2006**

**8/8/2007**



# East Shooting Range

## Photopoint 225

**6/23/2004**

**8/25/2005**



**8/8/2006**

**8/8/2007**



# East Shooting Range

## Photopoint 226

**6/23/2004**

**8/25/2005**



**8/8/2006**

**8/8/2007**



# East Shooting Range

## Photopoint 227

**6/23/2004**

**8/25/2005**



**8/8/2006**

**8/8/2007**



# East Shooting Range

## Photopoint 228

**6/23/2004**

**8/25/2005**



**8/8/2006**

**8/8/2007**



# East Shooting Range

## Photopoint 229

**6/23/2004**

**8/25/2005**



**8/8/2006**

**8/8/2007**



# East Shooting Range

## Photopoint 230

**6/23/2004**

**8/25/2005**



**8/8/2006**

**8/8/2007**



**6/23/2004**

**8/25/2005**



**8/8/2006**



**8/8/2007**



# East Shooting Range

## Photopoint 231

**6/23/2004**

**8/25/2005**



**8/8/2006**

**8/8/2007**



**6/23/2004**

**8/25/2005**



**8/8/2006**



**8/8/2007**



**6/23/2004**

**8/25/2005**



**8/8/2006**



**8/8/2007**



# East Shooting Range

## Photopoint 232

**6/23/2004**

**8/25/2005**



**8/8/2006**

**8/8/2007**



# East Shooting Range

## Photopoint 233

**6/23/2004**

**8/25/2005**



**8/8/2006**

**8/8/2007**



# East Shooting Range

## Photopoint 234

**6/23/2004**

**8/25/2005**



**8/8/2006**

**8/8/2007**



# East Shooting Range

## Photopoint 235

**6/23/2004**

**8/25/2005**



**8/8/2006**

**8/8/2007**



**6/23/2004**

**8/25/2005**



**8/8/2006**



**8/8/2007**



**6/23/2004**

**8/25/2005**



**8/8/2006**



**8/8/2007**



# East Shooting Range

## Photopoint 236

**6/23/2004**

**8/25/2005**



**8/8/2006**

**8/8/2007**



**6/23/2004**

**8/25/2005**



**8/8/2006**



**8/8/2007**



**6/23/2004**

**8/25/2005**



**8/8/2006**



**8/8/2007**



**6/23/2004**

**8/25/2005**



**8/8/2006**



**8/8/2007**



**6/23/2004**

**8/25/2005**



**8/8/2006**



**8/8/2007**



Qualitative Revegetation Evaluation Form

Form # \_\_\_\_\_

Date 8/19/07

Observer(s) JEN

Location ID East Shooting Range

GIS # M

Photographs taken today? Y  N - taken earlier

Are seeded plant species present?  Y N

Which seeded species are present? How abundant are the seeded species? Estimate overall cover of each seeded species using the following cover class system (1 = <5%; 2 = 6-25%; 3 = 26-50%; 4 = 51-75%; 5 = >75%). Comments on their condition.

- BuDAI - 1 AGCAT - 2
- BOGRI - 2
- AGINT - 1 8/19/07
- BOCUI - 1
- AGSMI - 2
- ELCAI - 1
- STVII - 1

Any evidence of nutrient or water deficiencies? If so, describe. no

Are noxious weeds present?  Y N

If yes, what species of noxious weeds are present? How abundant are the noxious weed species? Estimate overall cover of each noxious species using the following cover class system (1 = <5%; 2 = 6-25%; 3 = 26-50%; 4 = 51-75%; 5 = >75%).

- COARI - 1
- VERLI - 1
- VET#1 - 1
- LLOAI - 1
- CEOII - 1
- CIARI - 1

Are other weedy species present?  Y N

If so, what species and how abundant are they? Estimate overall cover of each weedy species using the following cover class system (1 = <5%; 2 = 6-25%; 3 = 26-50%; 4 = 51-75%; 5 = >75%).

- BRIAI - 1
- BRINI - 2
- AGIMI - 1
- AGCRI - 1
- ALMI - 1

Total Vegetation Cover (Estimate to nearest percent) 65%

Suggestions for management: Spray for CIARI, reseed few bare spots

Other comments: Old road is almost completely filled in - lots pretty good - although mostly BRINI + AGINI  
S. hillside looking very good - lots of seedling species present - some CIARI too.

Completed by: Jody K. Nels- [Signature] Date 8/19/07  
Print Sign