

2008 U. S. Fish and Wildlife Service Biological Opinion Annual Mitigation Monitoring Reports for the Rocky Flats Site



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

East Shooting Range Remediation Project Report

Programmatic Biological Assessment (PBA) Part II Report

2008 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
2008 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 compliance with the requirements outlined in a USFWS Biological Opinion (BO) for 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 in order to satisfy the conditions of the USFWS BO, number ES/LK-6-CO-04-032, dated September 17, 2004, and is due by the 1st of December following each growing season.

The summer of 2008 was the fourth growing season since completion of the project. After project completion in 2005, the area was seeded with mesic hillslope seed mix (Table 1) and erosion matting was installed. After the removal of the culvert used for access to the south side of the stream, a total of 40 peach leaf willow (*Salix amygdaloides*) stakes and 3 plains cottonwood (*Populus deltoides*) poles were planted along Woman Creek. A riparian seed mix was also planted along the stream (Table 1).

Methodology

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

Results and Discussion

In August of 2008, seven of the ten graminoid species that were seeded were observed growing in the revegetation area. Those growing included western wheatgrass (*Agropyron smithii*), slender wheatgrass (*Agropyron caninum* [syn. *A. trachycaulum*]), buffalo grass (*Buchloe dactyloides*), 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*).

In 2008, total vegetation cover was estimated to be approximately 50% on the hillside area south of Woman Creek. On the north side of the stream along the old access road, the road is almost indistinguishable from the surrounding vegetation (estimated vegetation cover = 85%). Although vegetation is well established, erosion matting and wattles continue to assist in protecting the area from erosion. Where 40 peach leaf willow stakes were installed along Woman Creek, the plants have grown together and are filling in along the north side of the stream. Although not all the planted willow have survived along the stream (probably due to competition), the surviving willow are larger now and filling in the stream edge. In time, a good solid stand of peach leaf willow should be present along this stretch of stream. A few coyote willow (*Salix exigua*) and wild indigo (*Amorpha fruticosa*; also known as leadplant) have also established and expanded in the revegetation area along the stream. In August 2008, only one of the three planted plains cottonwood poles was still alive.

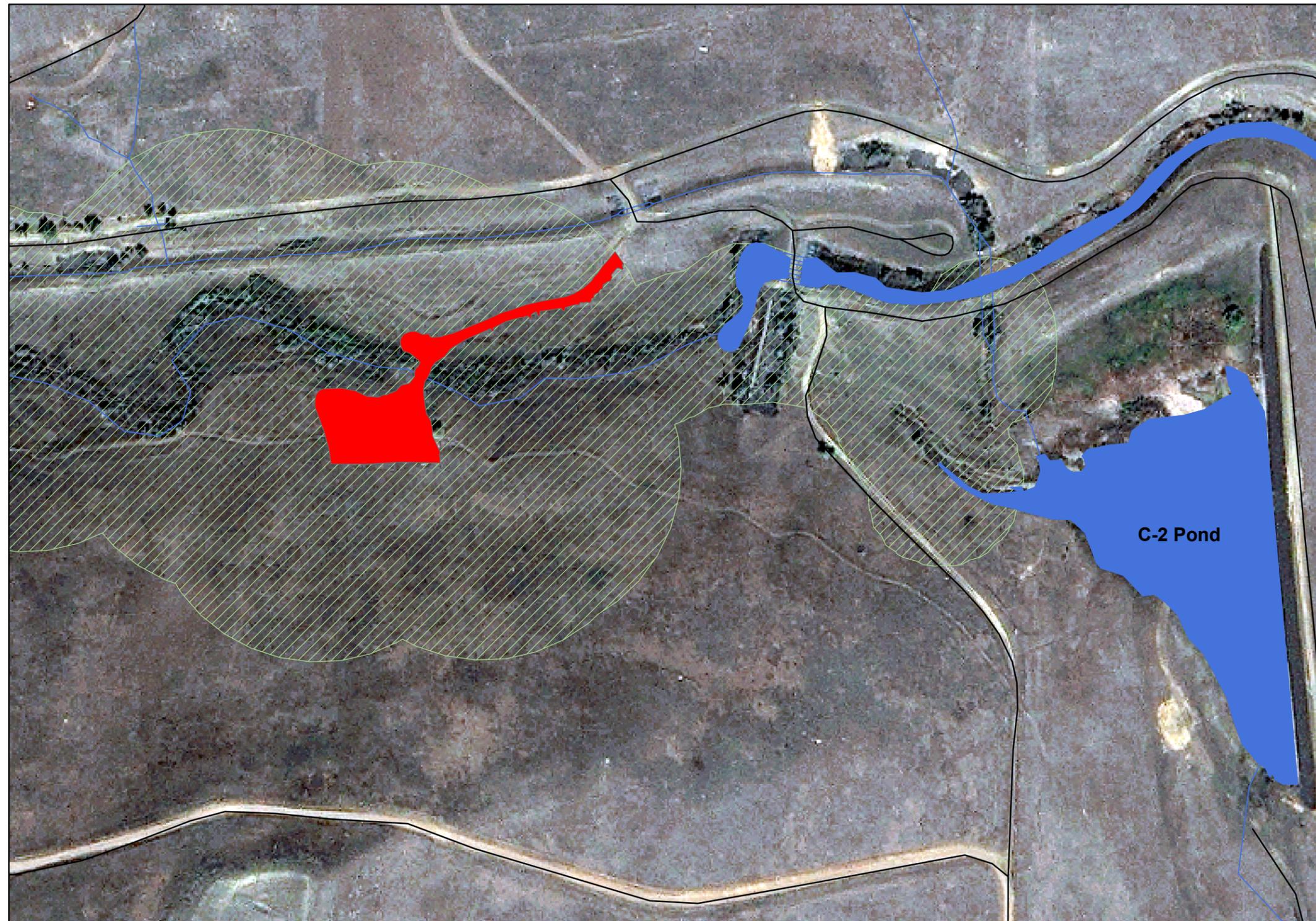
In general, the grasses are becoming well established and filling in across the revegetation area. The photo-monitoring results (provided in Appendix A for the ESSR Project on the DVD) show the increase in vegetation over time since project completion. With continued weed control, as needed, the entire area should be indistinguishable from the surrounding vicinity within the next year or two. On the south side of Woman Creek, the coconut matting erosion material continues to hide some of the grasses that are growing beneath it. The uneven ground surface has caused the matting to become elevated in some locations, thus causing the hillside to look unvegetated in spots from a distance. However, closer inspection reveals a good stand of grass becoming established beneath the matting. Hence, the area is doing quite well.

Conclusions

The vegetation at the ESRR Project area was monitored in 2008 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 2008 represented four growing seasons for the area. To summarize, seven of the ten seeded graminoid species were established in the revegetation area and total vegetation cover was approximately 50% on the large hillside area south of Woman Creek. The old access road on the north side of the stream was barely visible in 2008 because of the dense establishment of vegetation (approximately 85% vegetation cover). Erosion matting and wattles continued to protect the area from erosion. Weed management will be conducted as needed to control noxious weeds and assist with establishment of the graminoid species. The woody plant material installed along Woman Creek has become well established and continues to fill in along the stream. Overall, the vegetation at the ESRR Project area is doing very well in its fourth growing season. One more year of monitoring (in 2009) is expected and will document the re-establishment of the vegetation at the project location. At that time, it is expected that the vegetation will have matured to the point that the plant community will continue to develop on its own with little intervention or monitoring needed.

East Shooting Range Remediation Project Location

Figure 1



LEGEND

■ East Shooting Range Project Disturbance

 Preble's Protection Areas

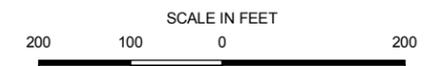
STANDARD FEATURES

— 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 Remediation Project 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)
Graminoids							
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)
Graminoids							
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



7/28/2008



East Shooting Range

Photopoint 204

6/23/2004

8/25/2005



8/08/2006

8/08/2007



7/28/2008



East Shooting Range

Photopoint 205

6/23/2004

8/25/2005



8/08/2006

8/08/2007



7/28/2008



East Shooting Range

Photopoint 206

6/23/2004

8/25/2005



8/08/2006

8/08/2007



7/28/2008



East Shooting Range

Photopoint 207

6/23/2004

8/25/2005



8/08/2006

8/08/2007



7/28/2008



East Shooting Range

Photopoint 208

6/23/2004

8/25/2005



8/08/2006

8/08/2007



7/28/2008



East Shooting Range

Photopoint 209

6/23/2004

8/25/2005



8/08/2006

8/08/2007



7/28/2008



East Shooting Range

Photopoint 210

6/23/2004

8/25/2005



8/08/2006

8/08/2007



7/28/2008



East Shooting Range

Photopoint 211

6/23/2004

8/25/2005



8/8/2006

8/8/2007



7/28/2008



East Shooting Range

Photopoint 212

6/23/2004

8/25/2005



8/8/2006

8/8/2007



7/28/2008



6/23/2004

8/25/2005





8/8/2006

8/8/2007





7/28/2008



6/23/2004

8/25/2005



8/8/2006



8/8/2007



7/28/2008



6/23/2004

8/25/2005





8/8/2006

8/8/2007





7/28/2008



East Shooting Range

Photopoint 213

6/23/2004

8/25/2005



8/8/2006

8/8/2007



7/28/2008



East Shooting Range

Photopoint 214

6/23/2004

8/25/2005



8/8/2006

8/8/2007



7/28/2008



East Shooting Range

Photopoint 215

6/23/2004

8/25/2005



8/8/2006

8/8/2007



7/28/2008



East Shooting Range

Photopoint 216

6/23/2004

8/25/2005



8/8/2006

8/8/2007



7/28/2008



East Shooting Range

Photopoint 217

6/23/2004

8/25/2005



8/8/2006

8/8/2007



7/28/2008



East Shooting Range

Photopoint 218

6/23/2004

8/25/2005



8/8/2006

8/8/2007



7/28/2008



East Shooting Range

Photopoint 219

6/23/2004

8/25/2005



8/8/2006

8/8/2007



7/28/2008



East Shooting Range

Photopoint 220

6/23/2004

8/25/2005



8/8/2006

8/8/2007



7/28/2008



East Shooting Range

Photopoint 221

6/23/2004

8/25/2005



8/8/2006

8/8/2007



7/28/2008



East Shooting Range

Photopoint 222

6/23/2004

8/25/2005



8/8/2006

8/8/2007



7/28/2008



6/23/2004

8/25/2005





8/8/2006

8/8/2007





7/28/2008



6/23/2004

8/25/2005



8/8/2006



8/8/2007



7/28/2008



6/23/2004

8/25/2005





8/8/2006

8/8/2007





7/28/2008



6/23/2004

8/25/2005



8/8/2006



8/8/2007



7/28/2008



6/23/2004

8/25/2005





8/8/2006

8/8/2007





7/28/2008



East Shooting Range

Photopoint 223

6/23/2004

8/25/2005



8/8/2006

8/8/2007



7/28/2008



East Shooting Range

Photopoint 224

6/23/2004

8/25/2005



8/8/2006

8/8/2007



7/28/2008



East Shooting Range

Photopoint 225

6/23/2004

8/25/2005



8/8/2006

8/8/2007



7/28/2008



East Shooting Range

Photopoint 226

6/23/2004

8/25/2005



8/8/2006

8/8/2007



7/28/2008



East Shooting Range

Photopoint 227

6/23/2004

8/25/2005



8/8/2006

8/8/2007



7/28/2008



East Shooting Range

Photopoint 228

6/23/2004

8/25/2005



8/8/2006

8/8/2007



7/28/2008



East Shooting Range

Photopoint 229

6/23/2004

8/25/2005



8/8/2006

8/8/2007



7/28/2008



East Shooting Range

Photopoint 230

6/23/2004

8/25/2005



8/8/2006

8/8/2007



7/28/2008



6/23/2004

8/25/2005





8/8/2006

8/8/2007





7/28/2008



East Shooting Range

Photopoint 231

6/23/2004

8/25/2005



8/8/2006

8/8/2007



7/28/2008



6/23/2004

8/25/2005





8/8/2006

8/8/2007





7/28/2008



6/23/2004

8/25/2005



8/8/2006



8/8/2007



7/28/2008



East Shooting Range

Photopoint 232

6/23/2004

8/25/2005



8/8/2006

8/8/2007



7/28/2008



East Shooting Range

Photopoint 233

6/23/2004

8/25/2005



8/8/2006

8/8/2007



7/28/2008



East Shooting Range

Photopoint 234

6/23/2004

8/25/2005



8/8/2006

8/8/2007



7/28/2008



East Shooting Range

Photopoint 235

6/23/2004

8/25/2005



8/8/2006

8/8/2007



7/28/2008



6/23/2004

8/25/2005





8/8/2006

8/8/2007





7/28/2008



6/23/2004

8/25/2005



8/8/2006



8/8/2007



7/28/2008



East Shooting Range

Photopoint 236

6/23/2004

8/25/2005



8/8/2006

8/8/2007



7/28/2008



6/23/2004

8/25/2005





8/8/2006

8/8/2007





7/28/2008



6/23/2004

8/25/2005



8/8/2006



8/8/2007



7/28/2008



6/23/2004

8/25/2005





8/8/2006

8/8/2007





7/28/2008



6/23/2004

8/25/2005



8/8/2006



8/8/2007



7/28/2008



Qualitative Revegetation Evaluation Form

Form # 00096

Date 8/13/08

Observer(s) JKN

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.

North Side of Creek	South Side of Creek
AGSM1 - 3	AGCA1 - 3
BOCU1 - 1	BOGR1 - 2
BOGR1 - 1	BOCU1 - 2
BUDAI - 1	STUH - 1
AGCA1 - 1	BUDAI - 1
	ELCA1 - 1

Any evidence of nutrient or water deficiencies? If so, describe. Some drought stress - both sides

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%).

CEDII - 1	CEDII - 2
	VEIH - 1
	LIAAI - 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%).

BRINI - 2	BRINI - 2
AGRI - 2	AGRI - 1
AGINI - 1	AGINI - 1

on surrounding land on surrounding land

Total Vegetation Cover (Estimate to nearest percent) N side = 85% , S side = 50%

Suggestions for management: Add additional seed. Still sparse - some
spots. Spring for weeds - 2009.

Other comments: Lots of seedbed spaces are present - still bit sparse at
some spots though.

Completed by: Jay K. Nelson Jay K. Nelson Date 8/13/08
Print Sign