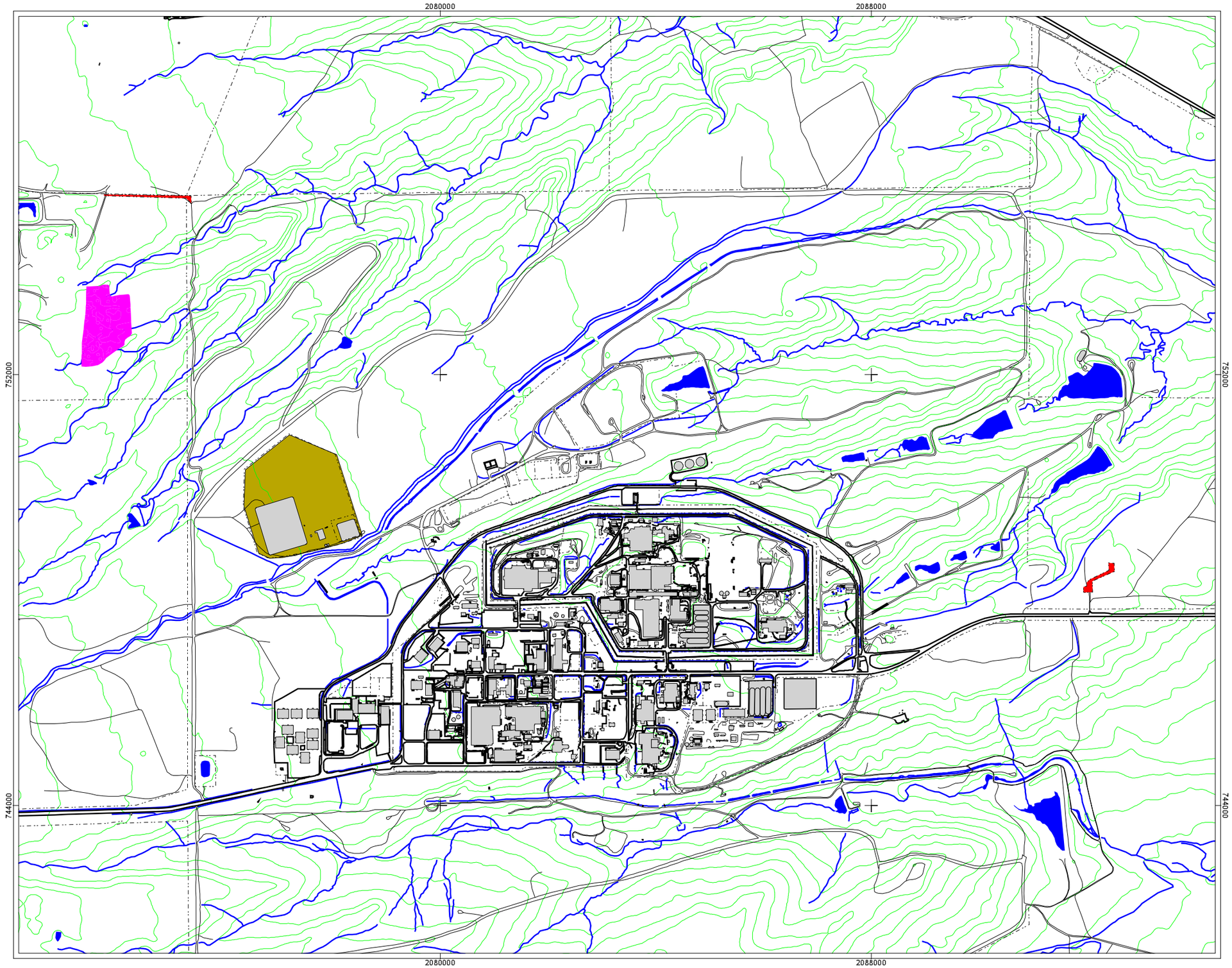


2001 Ecological Disturbances in the Buffer Zone

Figure 3-1

LEGEND

- Project Disturbance Locations
- Windblown Sand Deposition

Standard Features

- Buildings
- Lakes & ponds
- New Landfill
- Streams & ditches
- Fences
- Paved roads
- Dirt roads
- Contours (20 ft)

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
Hypsography derived from digital elevation model (DEM) data by Morrison Knudsen (MK) using ESRI Arc TIN and LATTICE to process the DEM data to create 5-foot contours.
The DEM data was captured by the Remote Sensing Lab, Las Vegas, NV, 1994 Aerial Flyover at ~10 meter resolution.
The DEM post-processing performed by MK, Winter 1997.

Data Source Ecology Features:
Location data provided by Exponent.
K-H Ecology Group POC; Karan North 303-966-9876.

N

1:15870

1000 0 1000 Feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: Exponent®

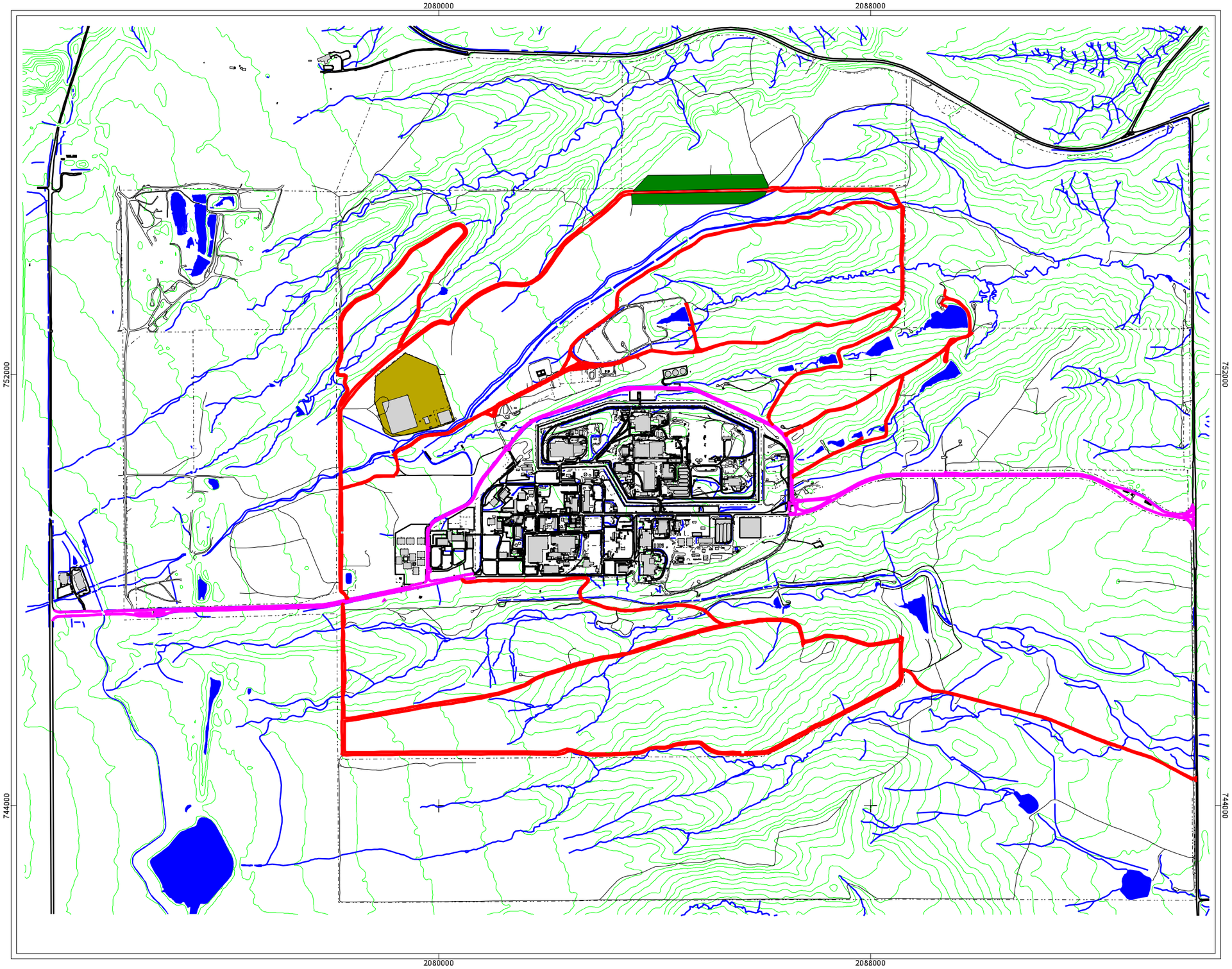
For: Kaiser-Hill Company, LLC

RFETS GIS Dept. 303-966-7707

MAP ID: 02-0168

December 3, 2001

\\Gisrv\GIS\ECO-projects\projects\02-0168\2001 disturbances.apr



2001 Road Grading and Mowing Areas

Figure 3-2

MAP LEGEND

- Annual Rye Mowing Locations
- Roadside Grading and Roadside Mowing Locations
- Roadside Mowing

Standard Features

- Buildings
- Lakes & ponds
- Landfill
- Streams & ditches
- Fences
- Paved roads
- Dirt roads
- Contours

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
Hypsography derived from digital elevation model (DEM) data by Morrison Knudsen (MK) using ESRI Arc TIN and LATTICE to process the DEM data to create 5-foot contours.
The DEM data was captured by the Remote Sensing Lab, Las Vegas, NV, 1994 Aerial Flyover at ~10 meter resolution.
The DEM post-processing performed by MK, Winter 1997.

Data Source Ecology Features:
Location data provided by Exponent.
K-H Ecology Group POC; Karan North 303-966-9876.
All locations are approximate.

N

1:23552

1000 0 1000 2000 Feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: Exponent®

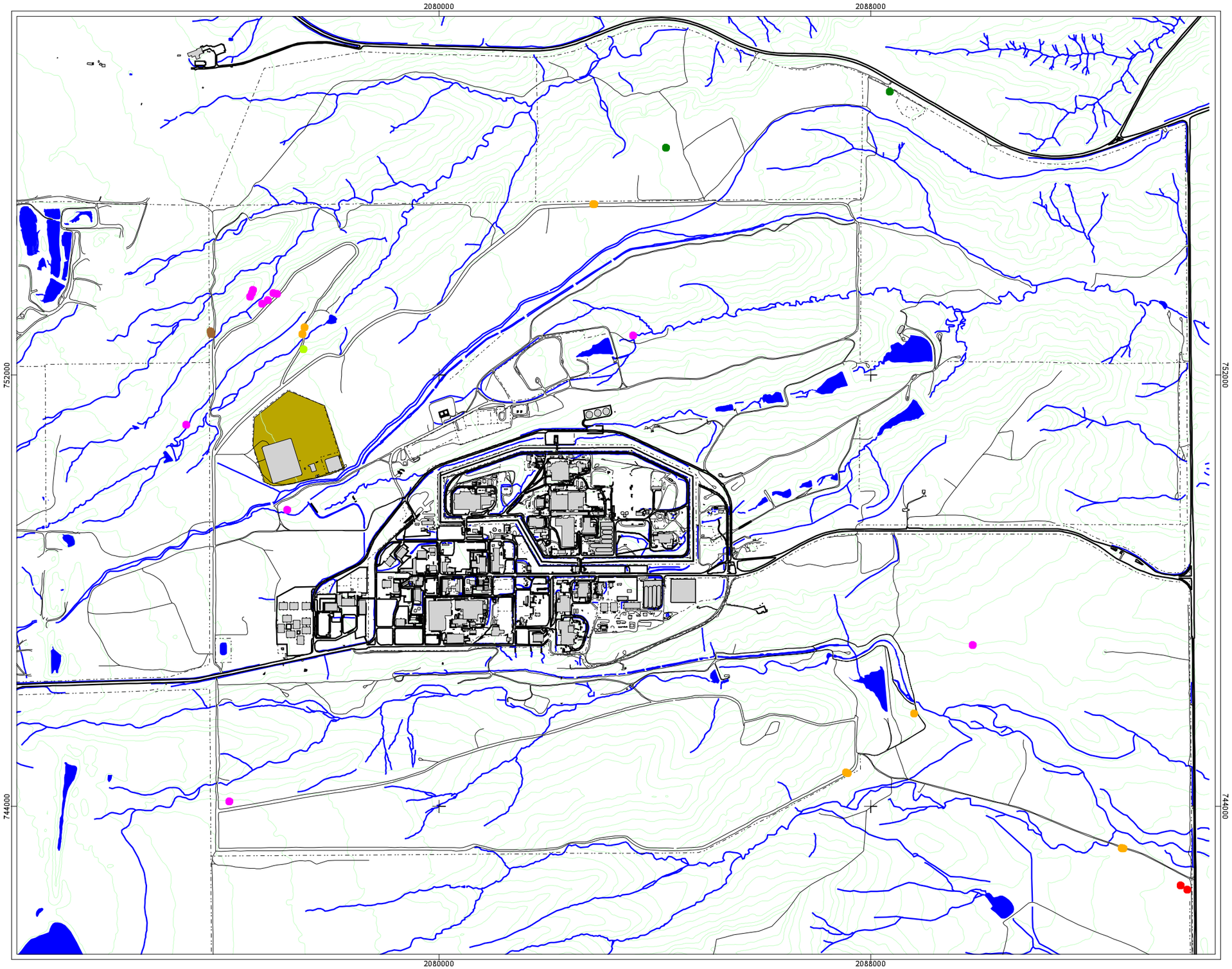
For: Kaiser-Hill Company, LLC

RFETS GIS Dept. 303-966-7707

MAP ID: 02-0174

December 4, 2001

\\Gisrv\GIS\ECO-projects\projects\02-0174\2001\Veg\ManRpt.apr\2001 grading and mowing



2001 Biocontrol Release Locations

Figure 3-3

LEGEND

- Larinus minutus
- Sphenoptera jugoslavica
- Mecinus janthinus
- Trichosirocalus horridus
- Cassida rubinginosa
- Aceria malherbae

Standard Features

- Buildings
- Lakes & ponds
- New Landfill
- Streams & ditches
- Fences
- Paved roads
- Dirt roads
- Contours (20 ft)

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
Hypsography derived from digital elevation model (DEM) data by Morrison Knudsen (MK) using ESRI Arc TIN and LATTICE to process the DEM data to create 5-foot contours.
The DEM data was captured by the Remote Sensing Lab, Las Vegas, NV, 1994 Aerial Flyover at ~10 meter resolution.
The DEM post-processing performed by MK, Winter 1997.

Data Source Ecology Features:
Location data provided by Exponent.
K-H Ecology Group POC; Karan North 303-966-9876.

N

1:20555

1000 0 1000 2000 Feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: Exponent®

For: Kaiser-Hill Company, LLC

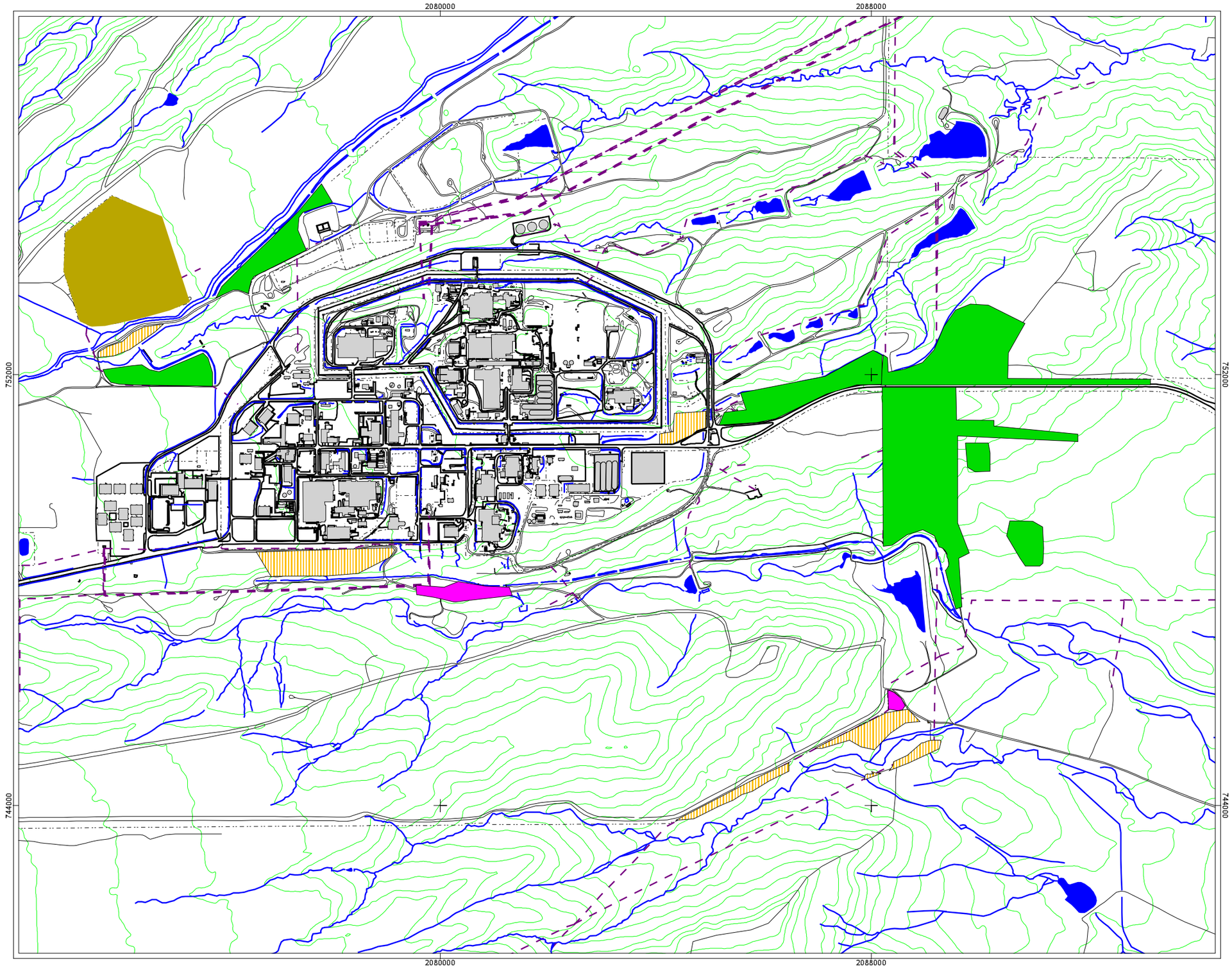
RFETS GIS Dept. 303-966-7707

MAP ID: 02-0167

December 3, 2001

\\Gisrv\GIS\ECO-projects\projects\02-0167\2001 biocontrol release locations.apr

Figure 3-4. Gall formed on a Canada thistle plant from the biocontrol agent, *Urophora carduii*, that was released at the Site during 2000. Monitoring in 2001 only found this single gall at the two release locations. However, continued monitoring in 2002 will determine whether more of the population survived.



2001 Ground Herbicide Application Locations (Broadcast)

Figure 3-5

MAP LEGEND

- Tordon 22K Locations
- Transline Locations
- Telar Locations

Standard Features

- Buildings
- Lakes & ponds
- Landfill
- Streams & ditches
- Fences
- Paved roads
- Dirt roads
- Contours

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
Hypsography derived from digital elevation model (DEM) data by Morrison Knudsen (MK) using ESRI Arc TIN and LATTICE to process the DEM data to create 5-foot contours. The DEM data was captured by the Remote Sensing Lab, Las Vegas, NV, 1994 Aerial Flyover at ~10 meter resolution. The DEM post-processing performed by MK, Winter 1997.

Data Source Ecology Features:
Location data provided by Exponent.
K-H Ecology Group POC; Karan North 303-966-9876.
All locations are approximate.

N

1:15125

1000 0 1000 Feet

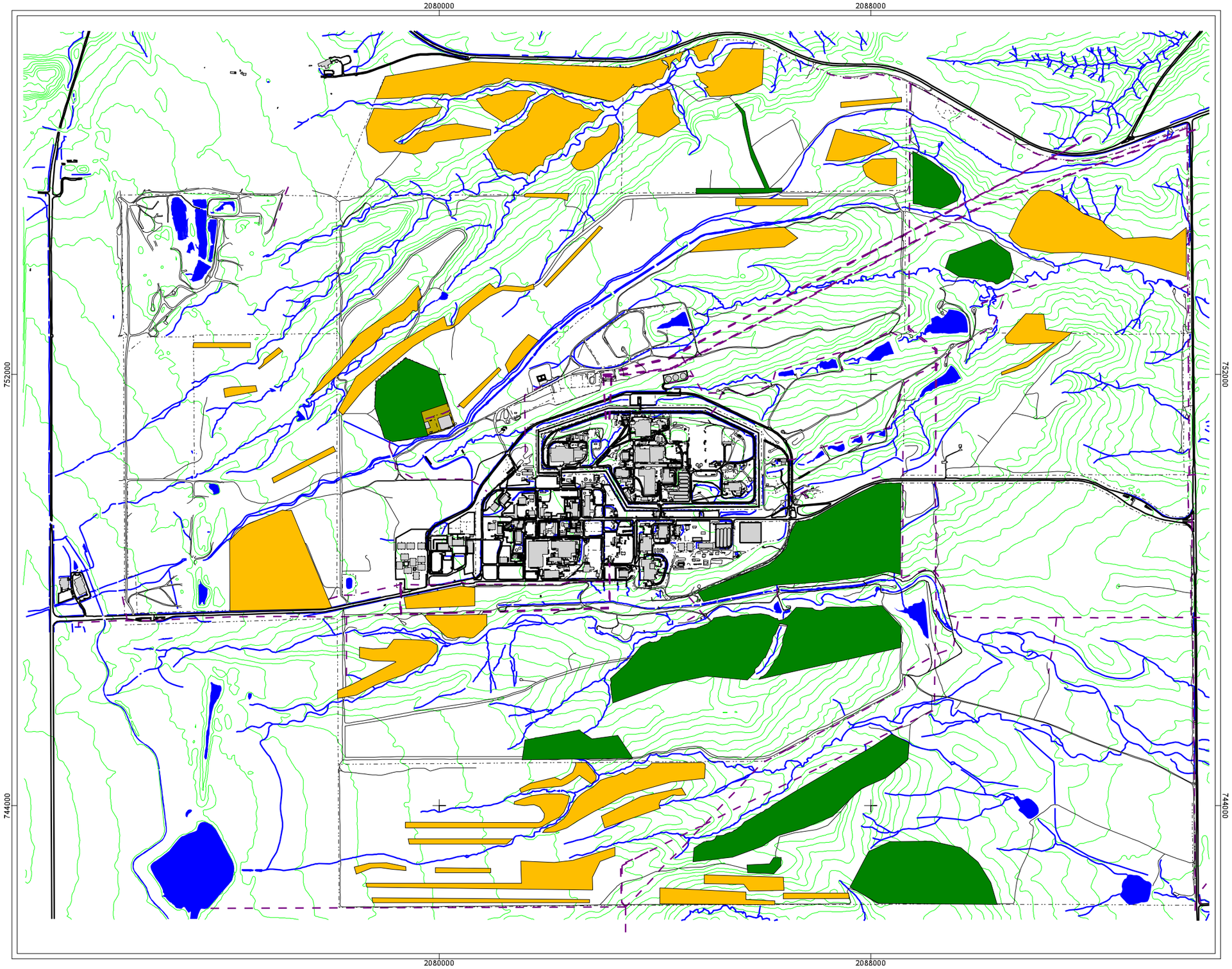
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: Exponent®
For: Kaiser-Hill Company, LLC
RFETS GIS Dept. 303-966-7707

MAP ID: 02-0174
December 4, 2001

\\Sisrv\GIS\ECO-projects\projects\02-0174\2001\VegMan\Rpt.apr\2001 Ground Herbicide Application



2001 Aerial Herbicide Application Locations (Broadcast)

Figure 3-6

MAP LEGEND

- Tordon 22K Locations
- Transline Locations

Standard Features

- Buildings
- Lakes & ponds
- Landfill
- Streams & ditches
- Fences
- Paved roads
- Dirt roads
- Contours

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
Hypsography derived from digital elevation model (DEM) data by Morrison Knudsen (MK) using ESRI Arc TIN and LATTICE to process the DEM data to create 5-foot contours.
The DEM data was captured by the Remote Sensing Lab, Las Vegas, NV, 1994 Aerial Flyover at ~10 meter resolution.
The DEM post-processing performed by MK, Winter 1997.

Data Source Ecology Features:
Location data provided by Exponent.
K-H Ecology Group POC; Karan North 303-966-9876.
All locations are approximate.

N

1:23552

1000 0 1000 2000 Feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

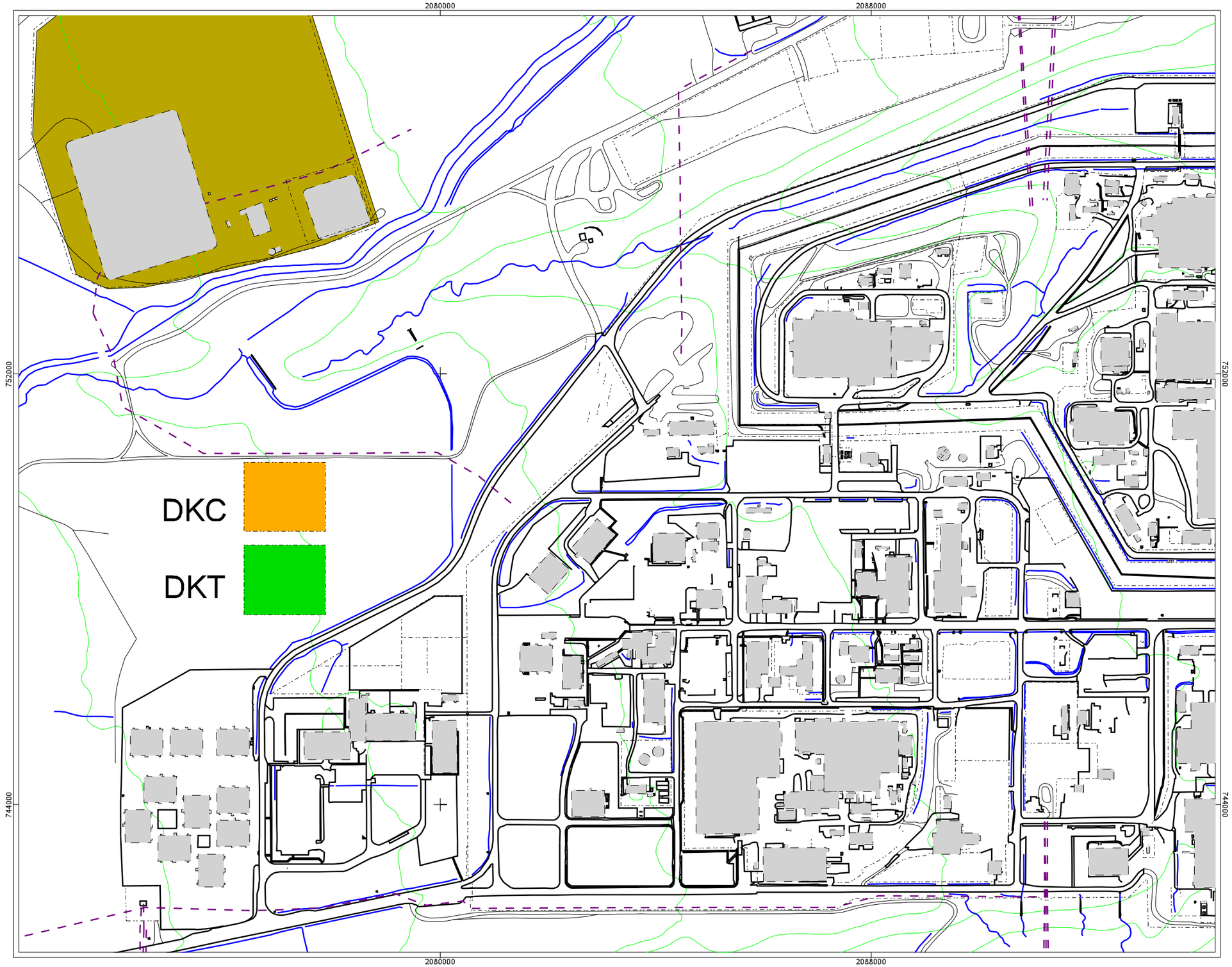
Prepared by: Exponent®
For: Kaiser-Hill Company, LLC

RFETS GIS Dept. 303-966-7707

MAP ID: 02-0174

December 4, 2001

\\Gisserv\GIS\ECO-projects\projects\02-0174\2001\VegMan\Rpt.apr\2001 Aerial Herbicide Locations



Diffuse Knapweed Herbicide Monitoring Plot Locations

Figure 4-1

LEGEND

- Control Plot
- Treatment Plot

Standard Features

- Buildings
- Lakes & ponds
- New Landfill
- Streams & ditches
- Fences
- Paved roads
- Dirt roads
- Contours (20 ft)
- Power Lines

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
Hypsography derived from digital elevation model (DEM) data by Morrison Knudsen (MK) using ESRI Arc TIN and LATTICE to process the DEM data to create 5-foot contours.
The DEM data was captured by the Remote Sensing Lab, Las Vegas, NV, 1994 Aerial Flyover at ~10 meter resolution.
The DEM post-processing performed by MK, Winter 1997.

Data Source Ecology Features:
Location data provided by Exponent.
K-H Ecology Group POC; Karan North 303-966-9876.

N

1:5441

200 0 200 400 Feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: Exponent®

For: Kaiser-Hill Company, LLC

RFETS GIS Dept. 303-966-7707

MAP ID: 2k-0038

February 14, 2002

\\Gissrv\GIS\ECO-projects\projects\2k-0038\veg monitoring locations 2001.apr/CEDI plots

Figure 4-2. Total Number of Species - Diffuse Knapweed Monitoring Study

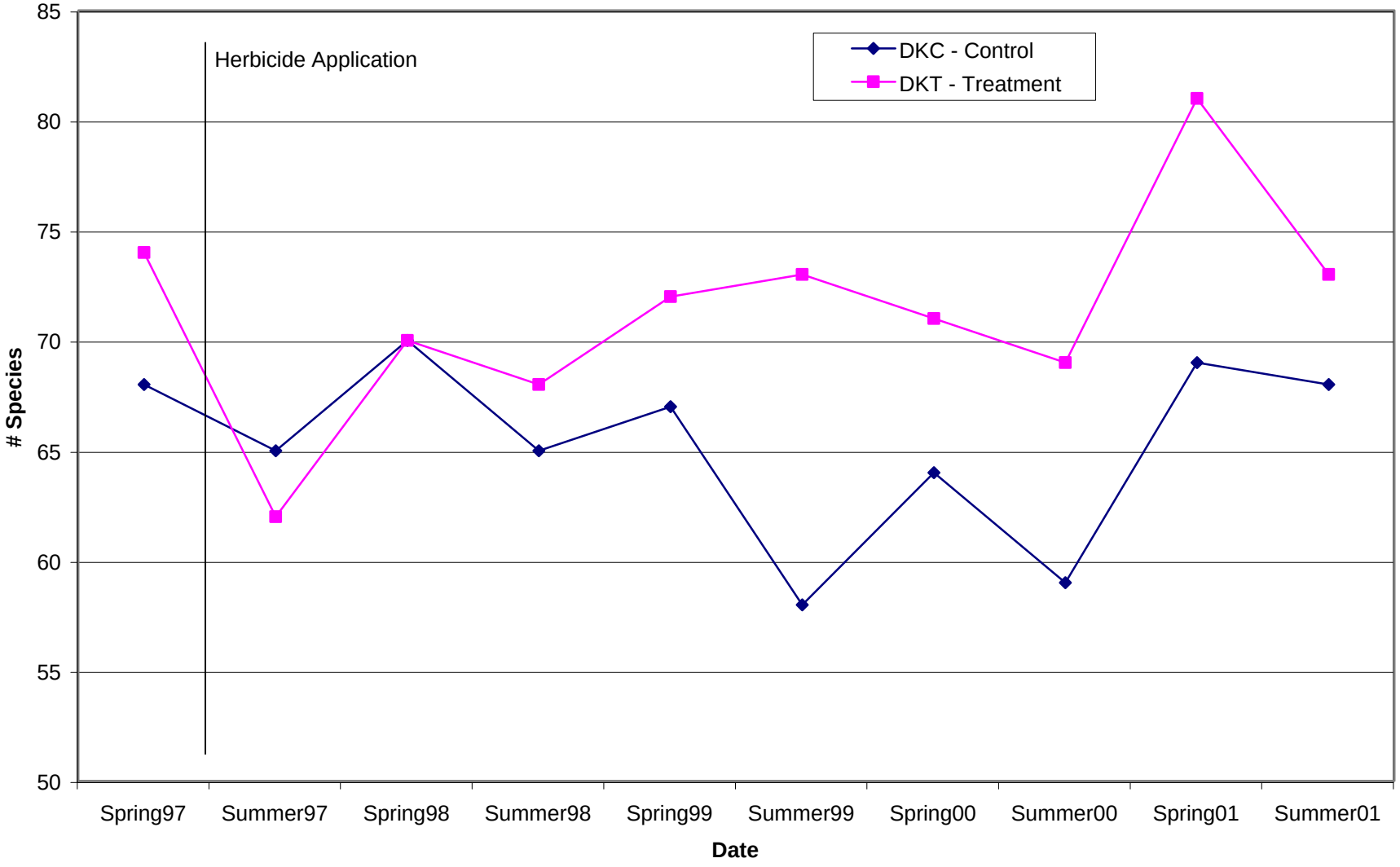


Figure 4-3. Diffuse Knapweed Density Summary

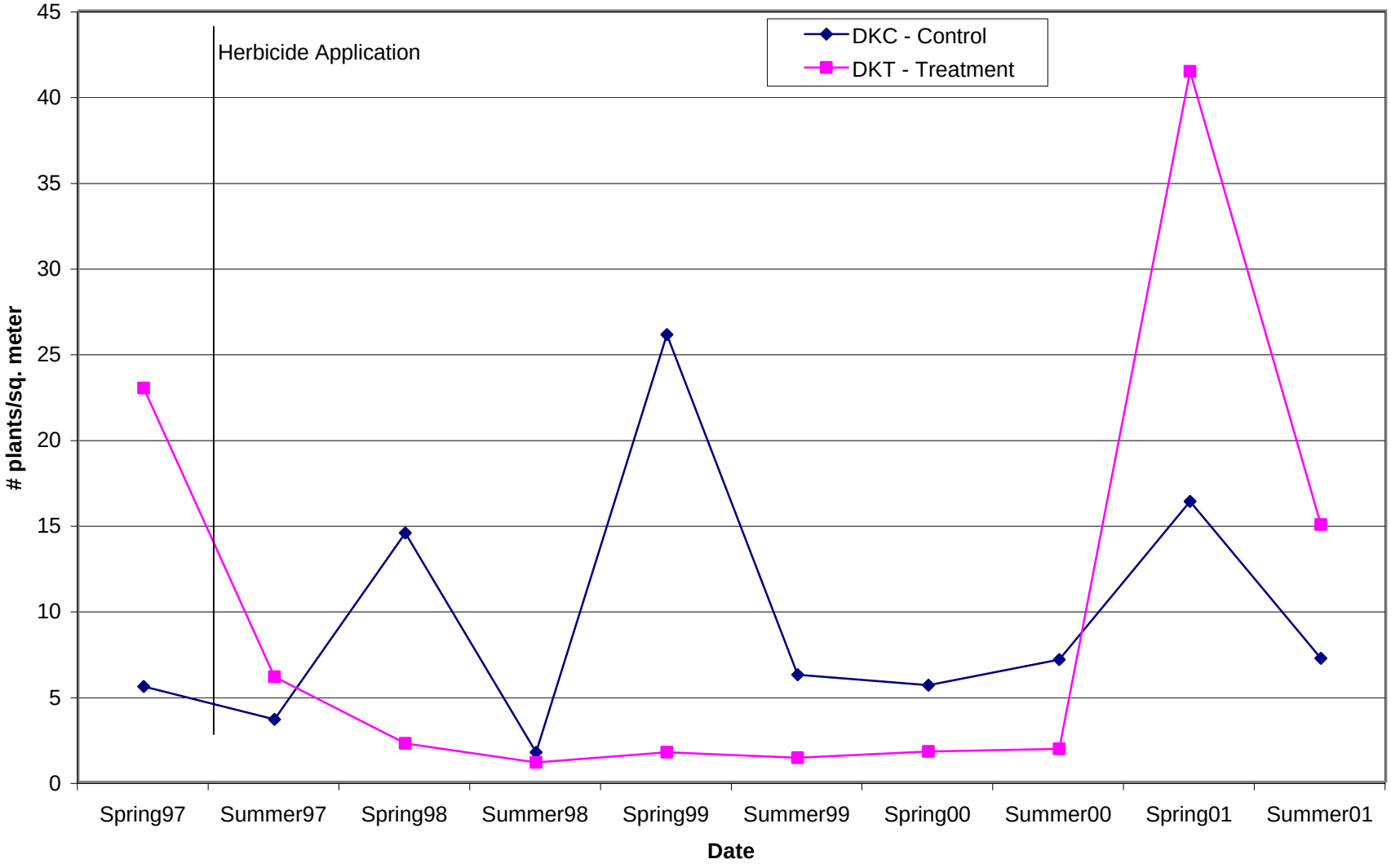


Figure 4-4. Diffuse Knapweed Frequency - Diffuse Knapweed Monitoring Study

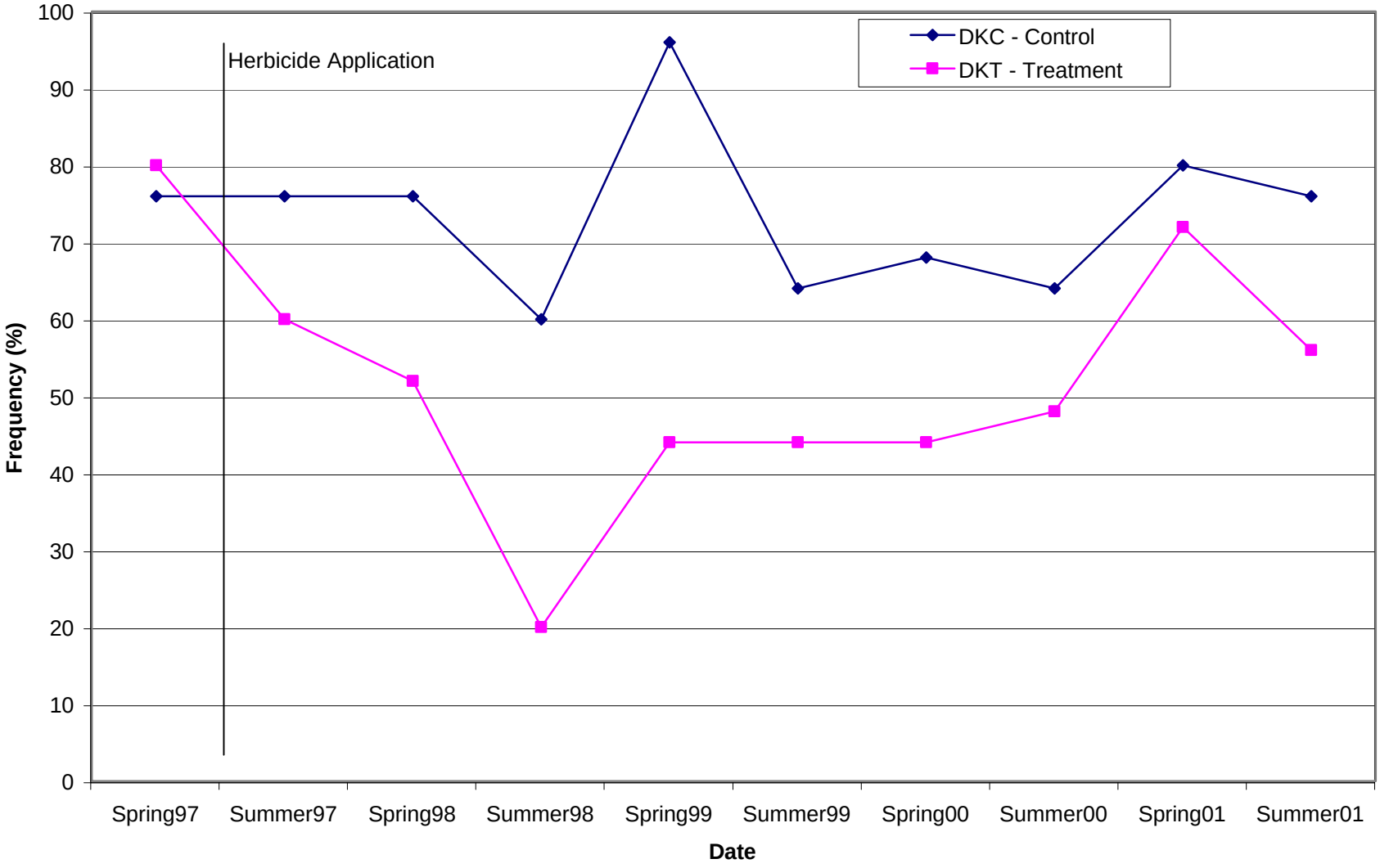


Figure 4-5. Absolute Diffuse Knapweed Cover - Diffuse Knapweed Monitoring Study

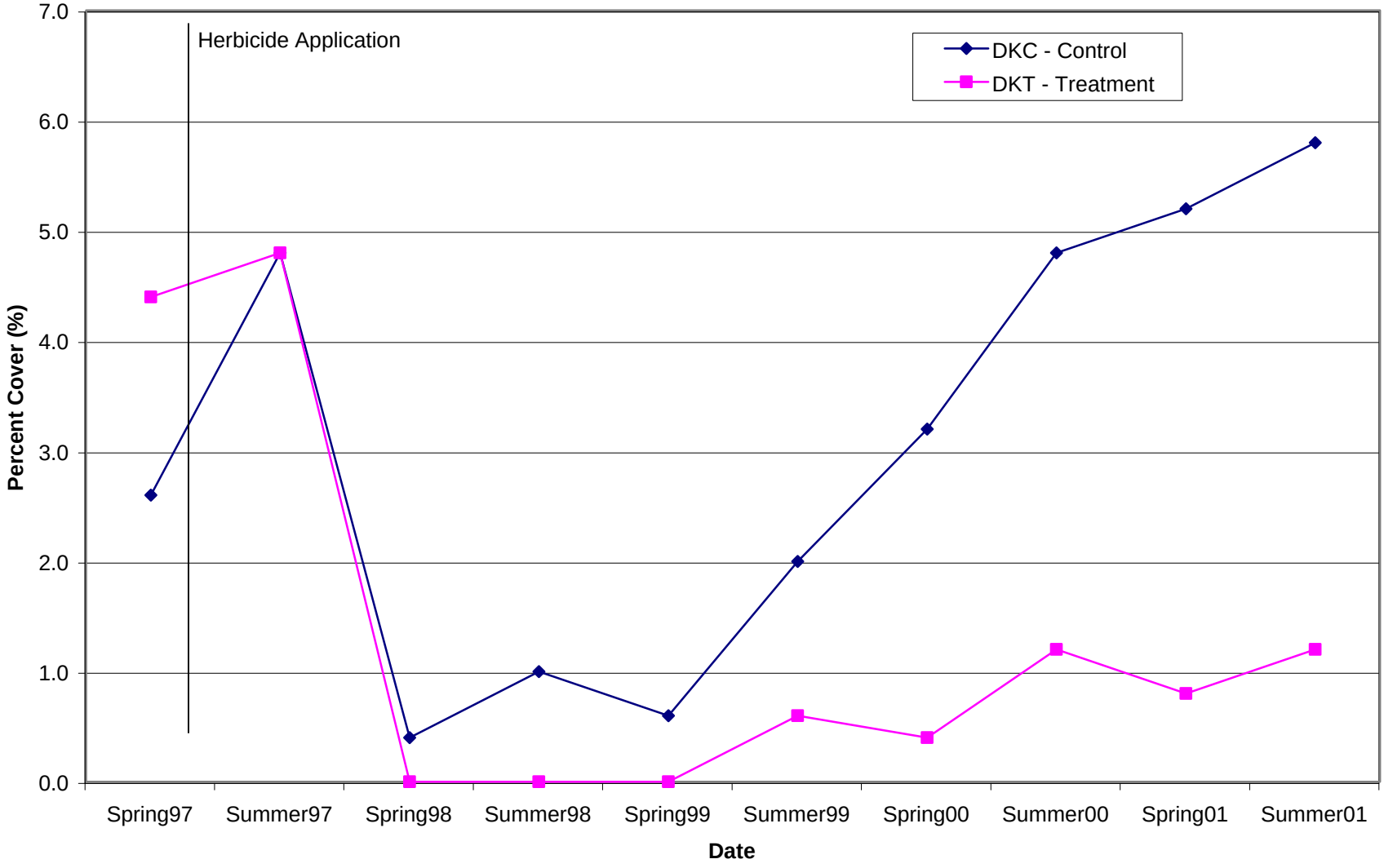


Figure 4-6. *Opuntia macorhiza* Density Summary

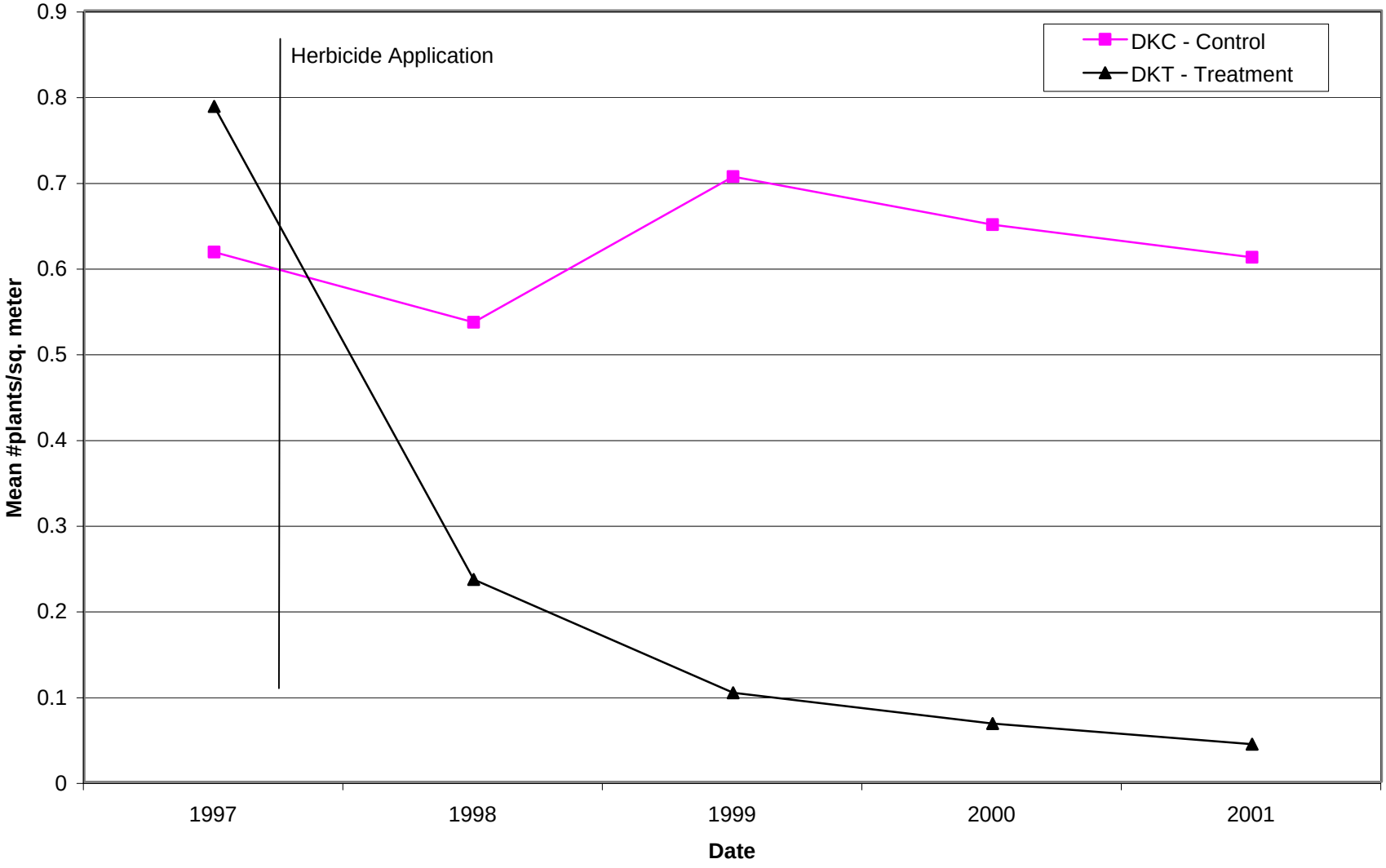


Figure 4-7. *Echinocereus viridiflorus* Density Summary

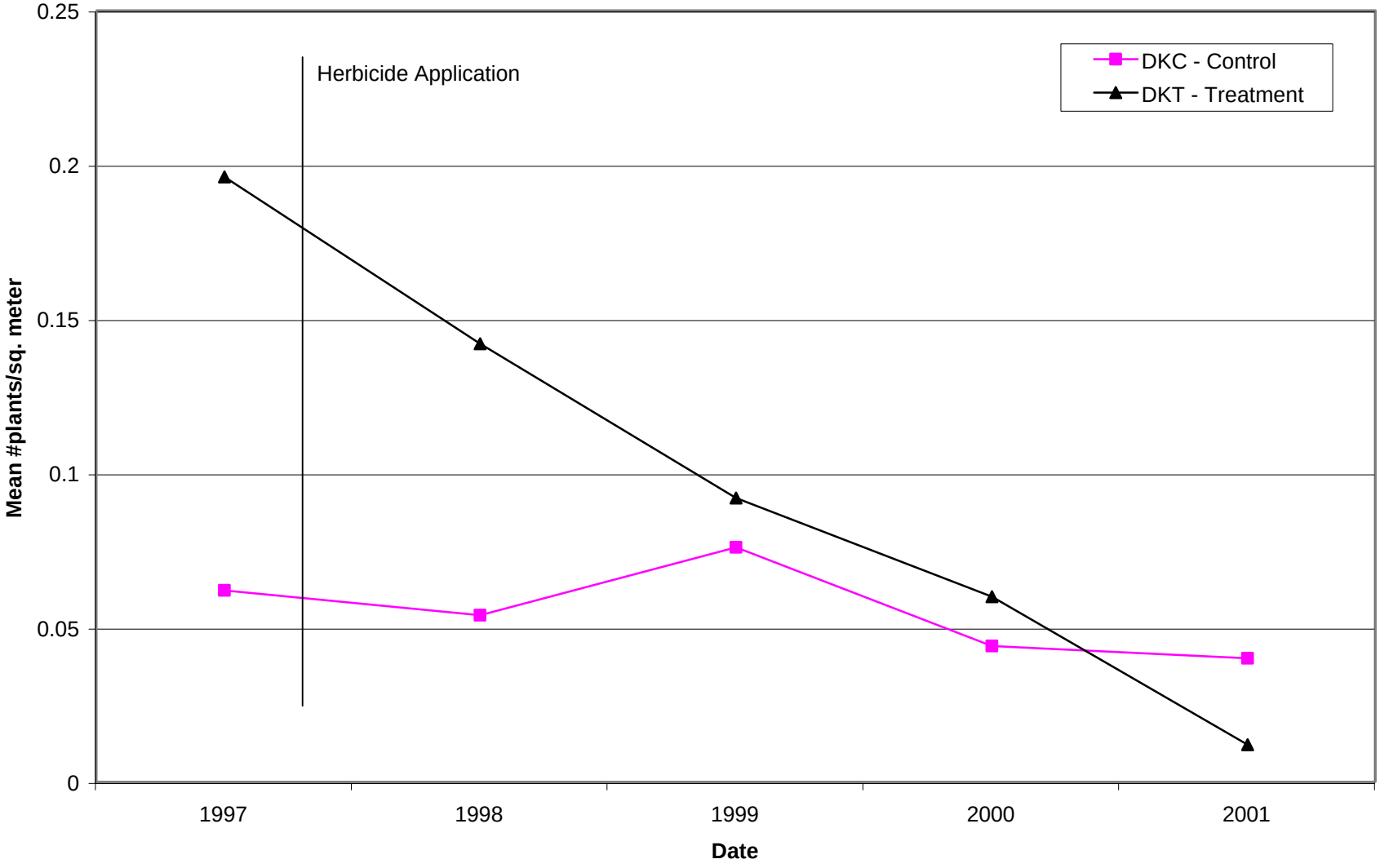


Figure 4-8. Shannon-Weaver Index Summary - Diffuse Knapweed Monitoring

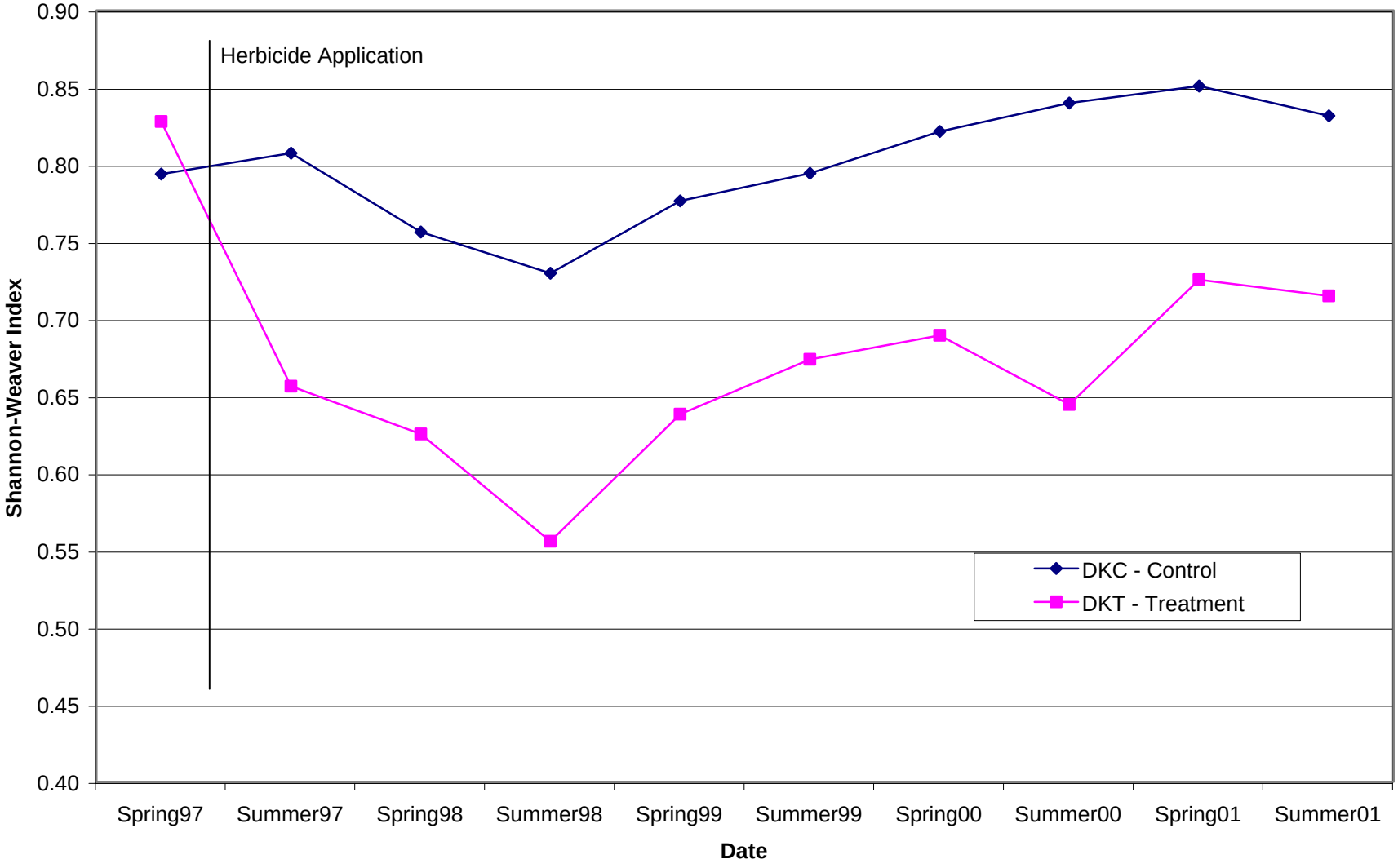


Figure 4-9. Total Foliar Cover - Diffuse Knapweed Monitoring Study

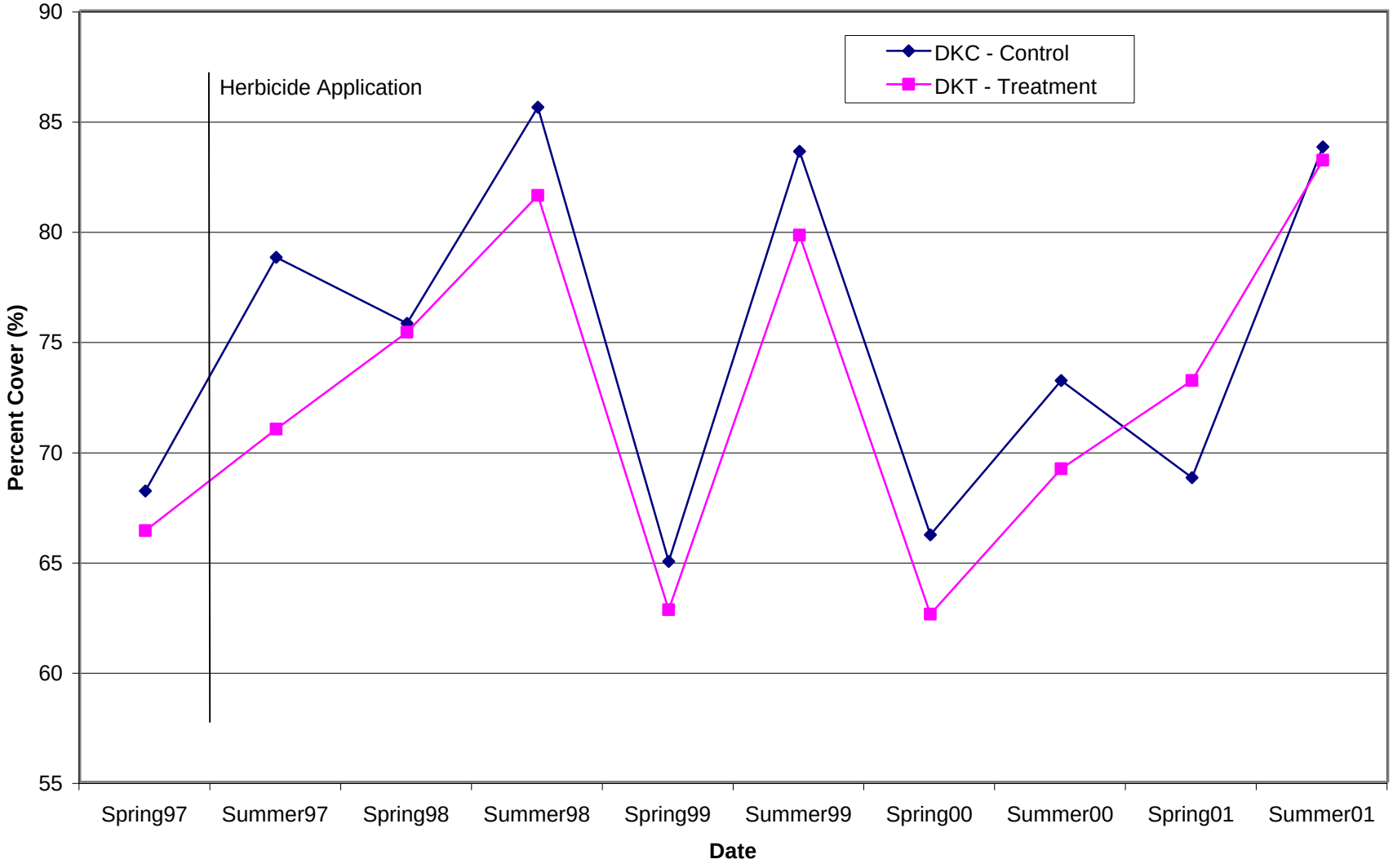


Figure 4-10. Absolute Forb Cover - Diffuse Knapweed Monitoring Study

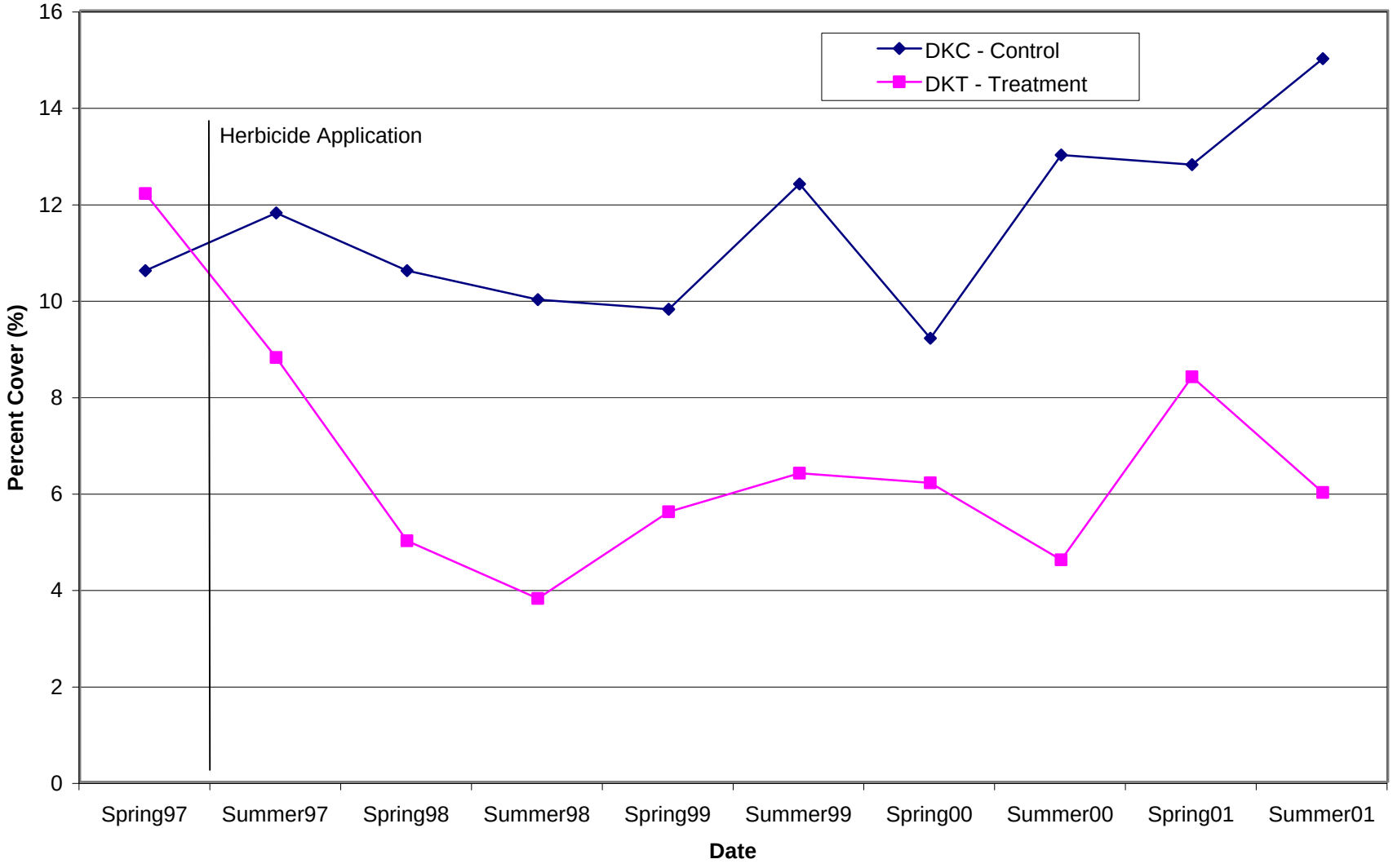


Figure 4-11. Absolute Native vs. Non-Native Forb Cover - Diffuse Knapweed Monitoring Study

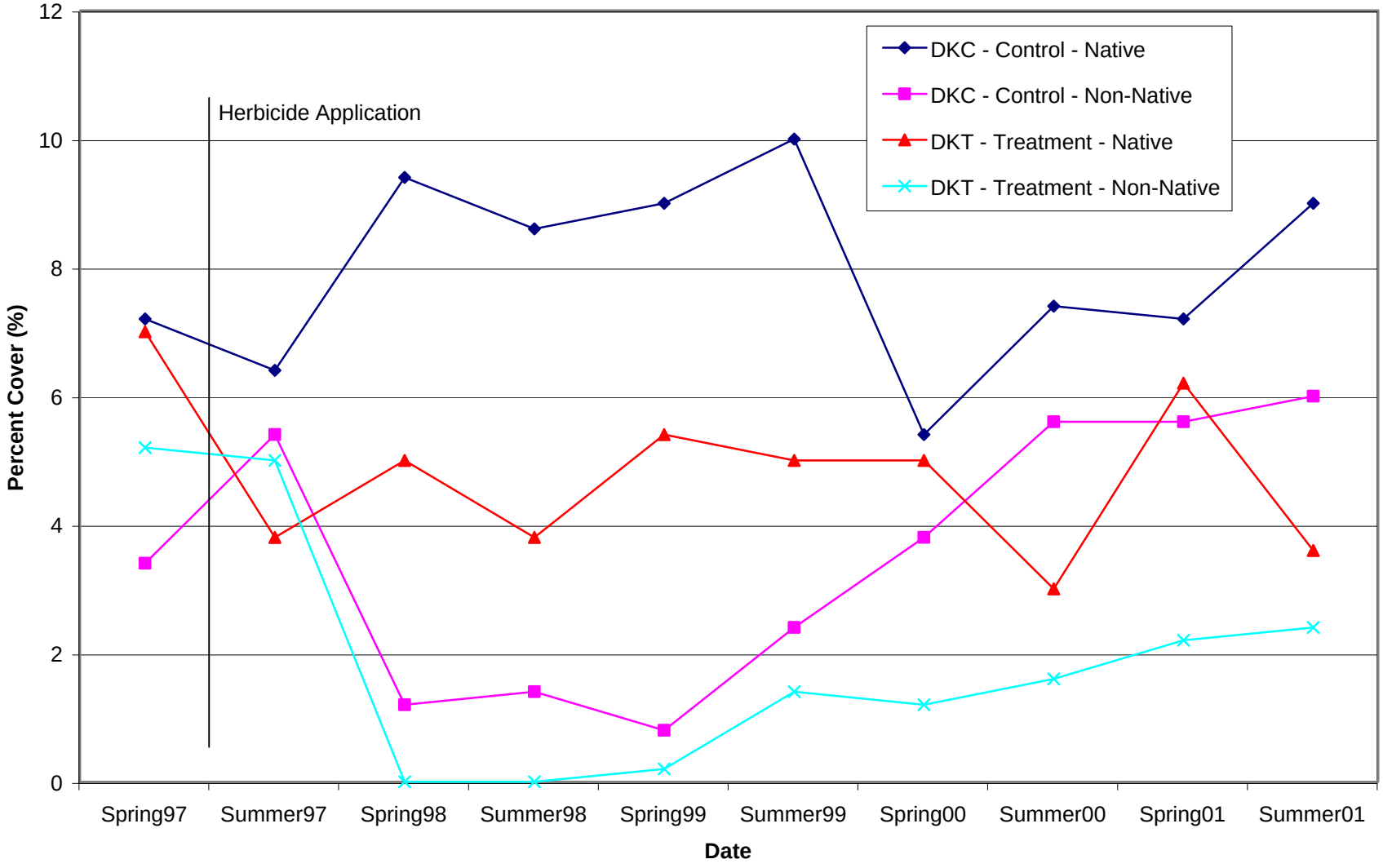


Figure 4-12. Absolute Graminoid Cover - Diffuse Knapweed Monitoring Study

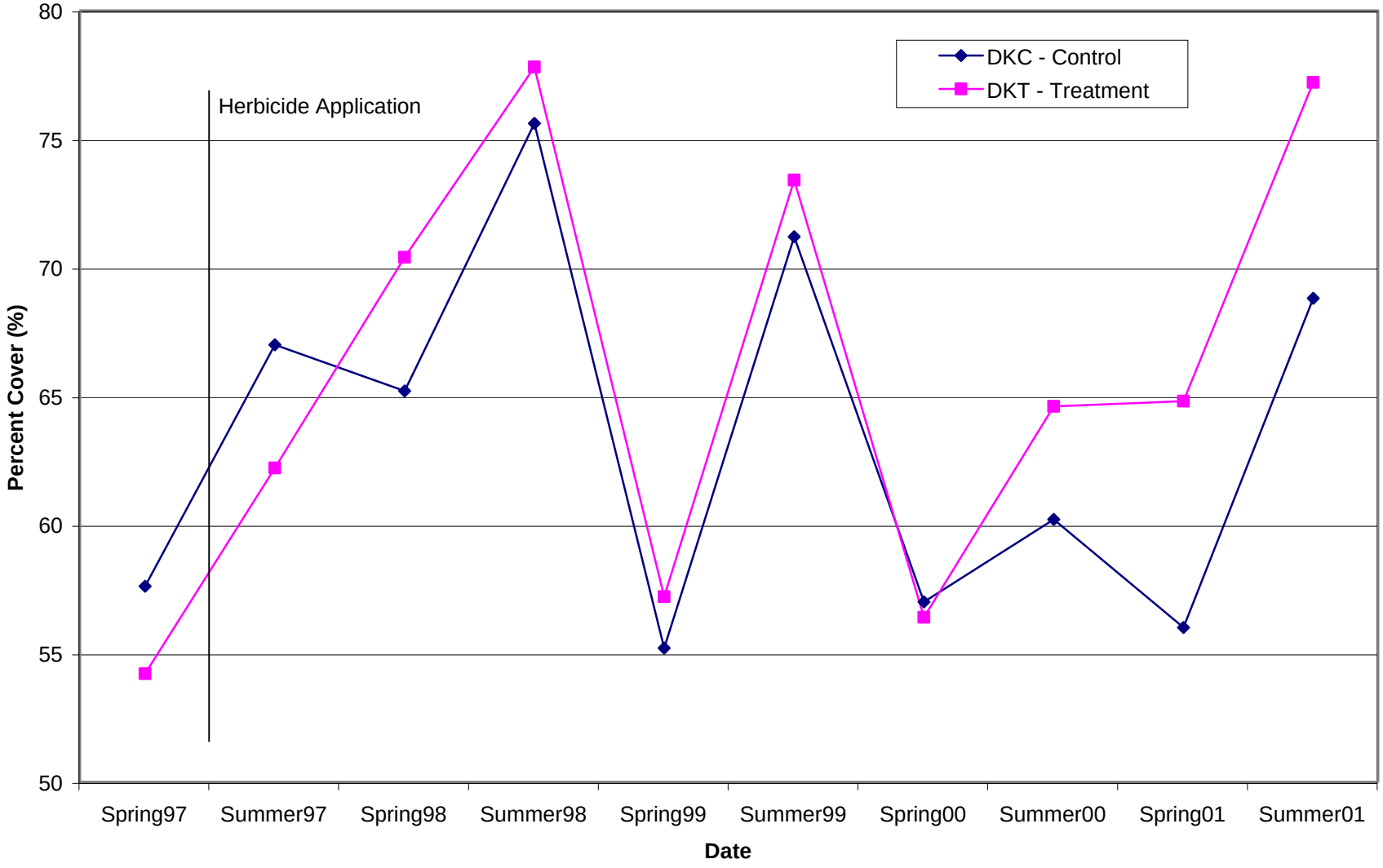
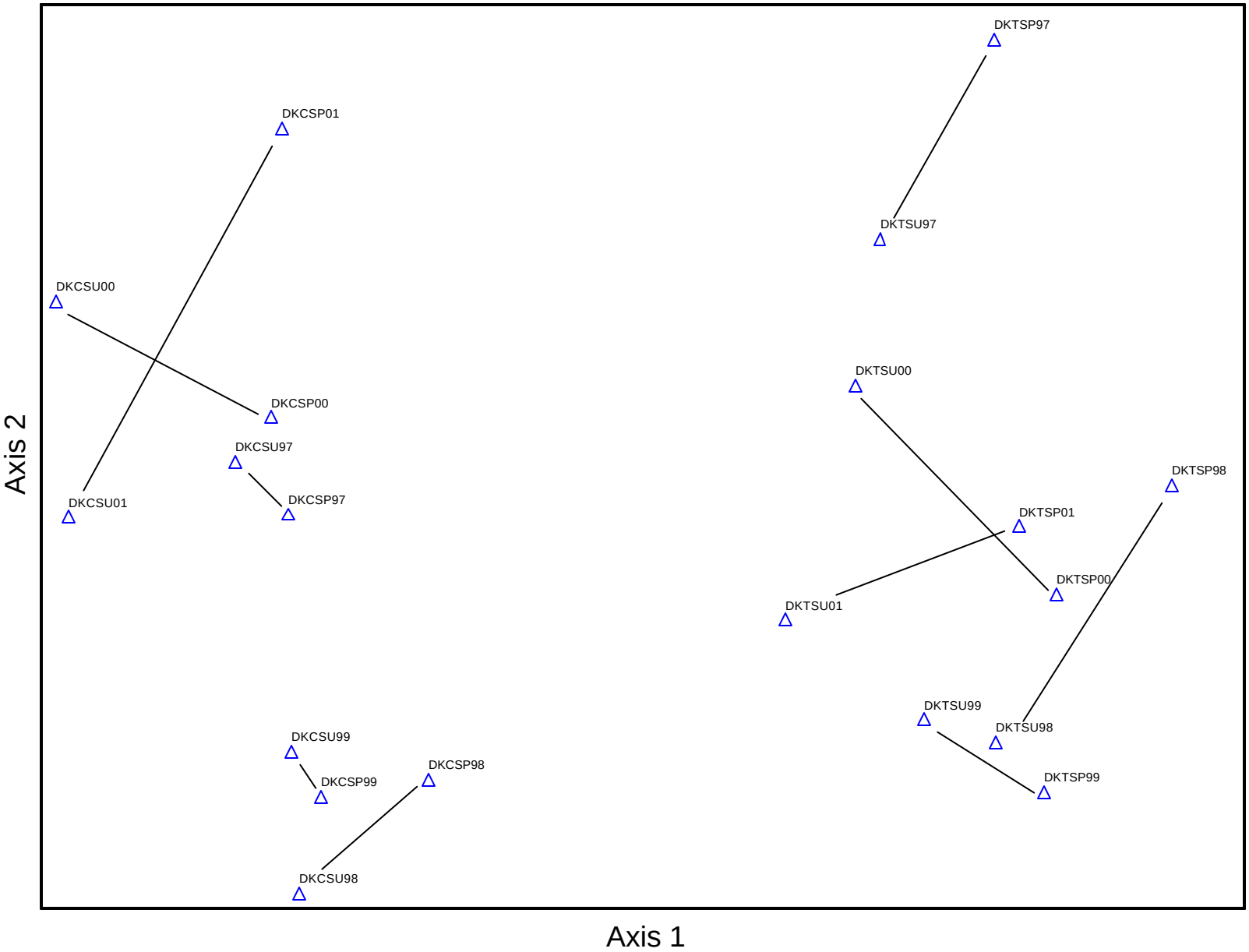
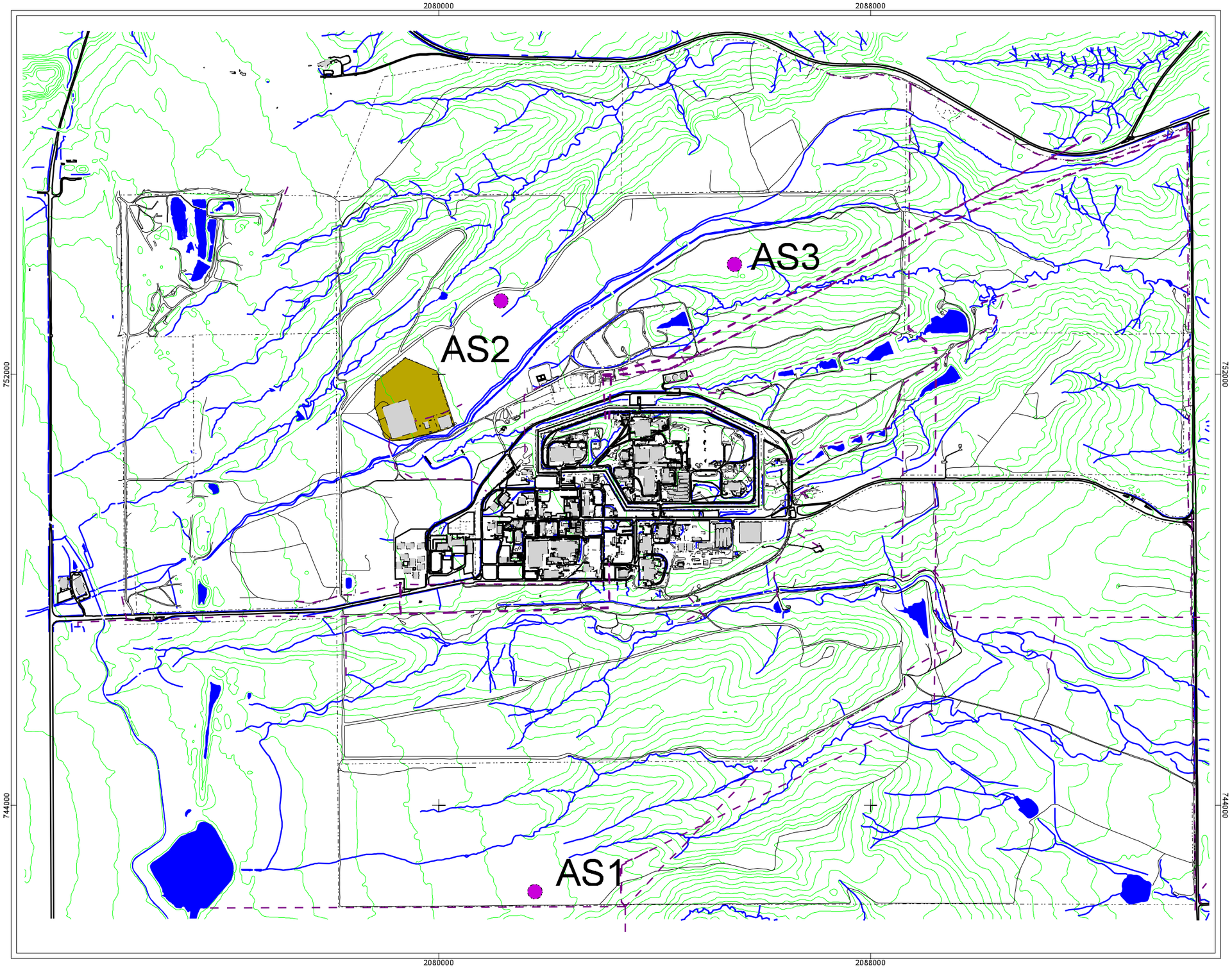


Figure 4-13. Detrended Correspondence Analysis (DCA) Results – Species Cover Data



Note: Code represent the site, season, and year of sampling. DKC = Control plot, DKT = Treatment plot, SP = Spring, SU = Summer, Numbers at end of code are the year of sampling. For example: DKTSU01 = Site:DKT (treatment plot), SU = Summer, 01 = 2001.



Aerial Herbicide Monitoring Plot Locations

Figure 5-1

LEGEND

Control Plot

Standard Features

- Buildings
- Lakes & ponds
- New Landfill
- Streams & ditches
- Fences
- Paved roads
- Dirt roads
- Contours (20 ft)
- Power Lines

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
Hypsography derived from digital elevation model (DEM) data by Morrison Knudsen (MK) using ESRI Arc TIN and LATTICE to process the DEM data to create 5-foot contours.
The DEM data was captured by the Remote Sensing Lab, Las Vegas, NV, 1994 Aerial Flyover at ~10 meter resolution.
The DEM post-processing performed by MK, Winter 1997.

Data Source Ecology Features:
Location data provided by Exponent.
K-H Ecology Group POC; Karan North 303-966-9876.

N

1:23552

1000 0 1000 Feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: Exponent®

For: Kaiser-Hill Company, LLC

RFETS GIS Dept. 303-966-7707

MAP ID: 2k-0038

February 14, 2002

\\Disrv\GIS\ECO-projects\projects\2k-0038\veg monitoring locations 2001.apr/Aerial plots

Figure 5-2. Diffuse Knapweed Foliar Cover

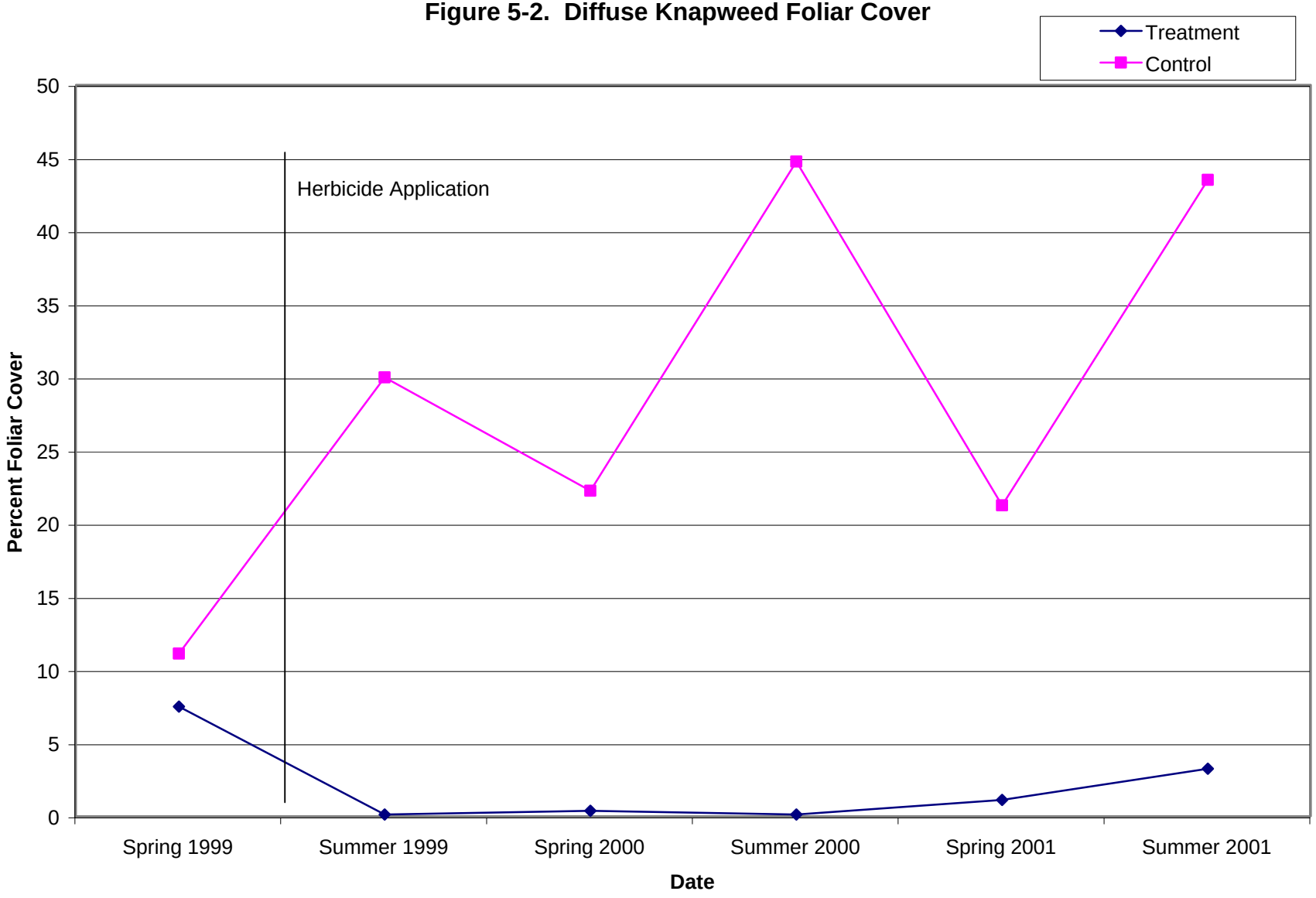
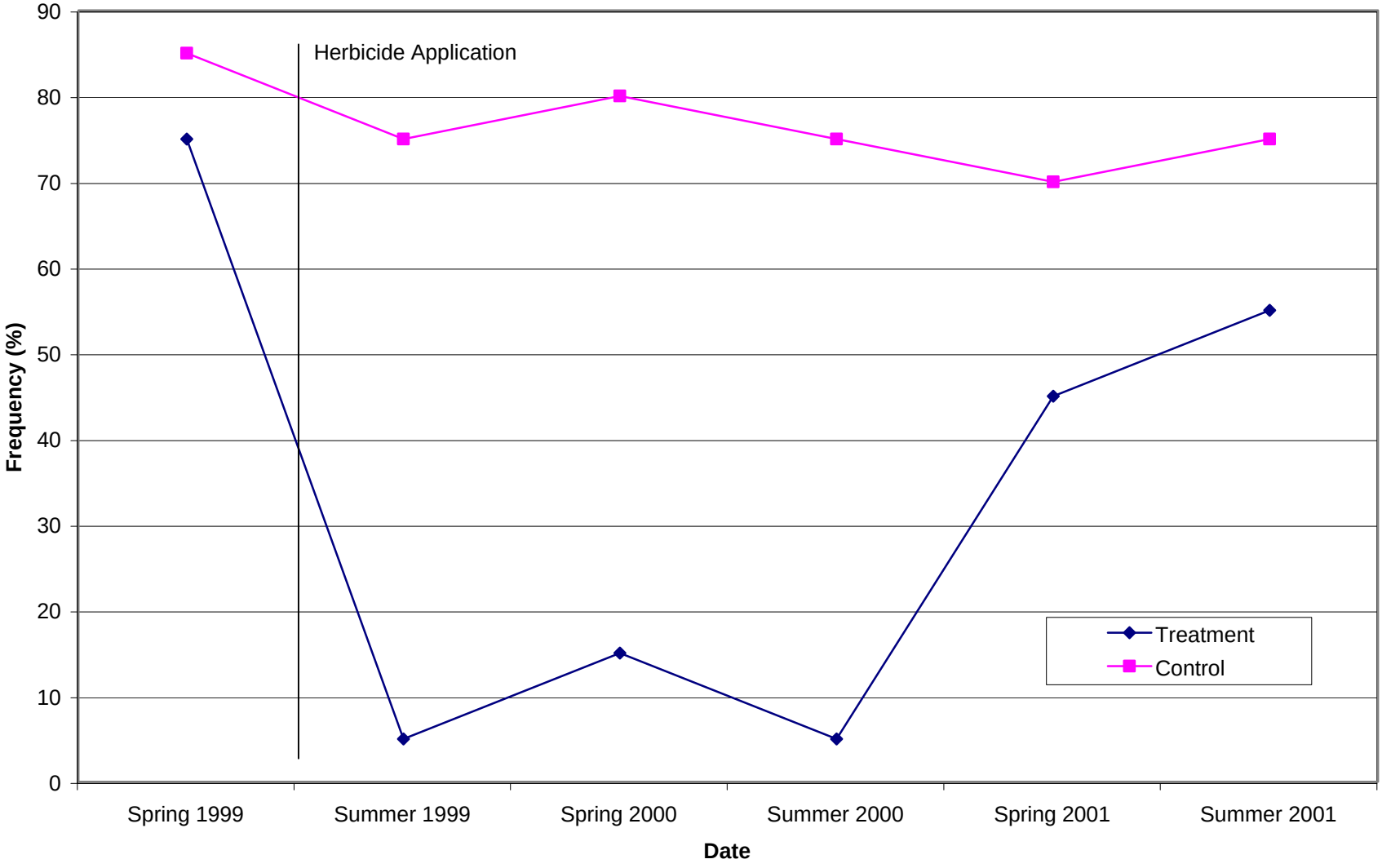
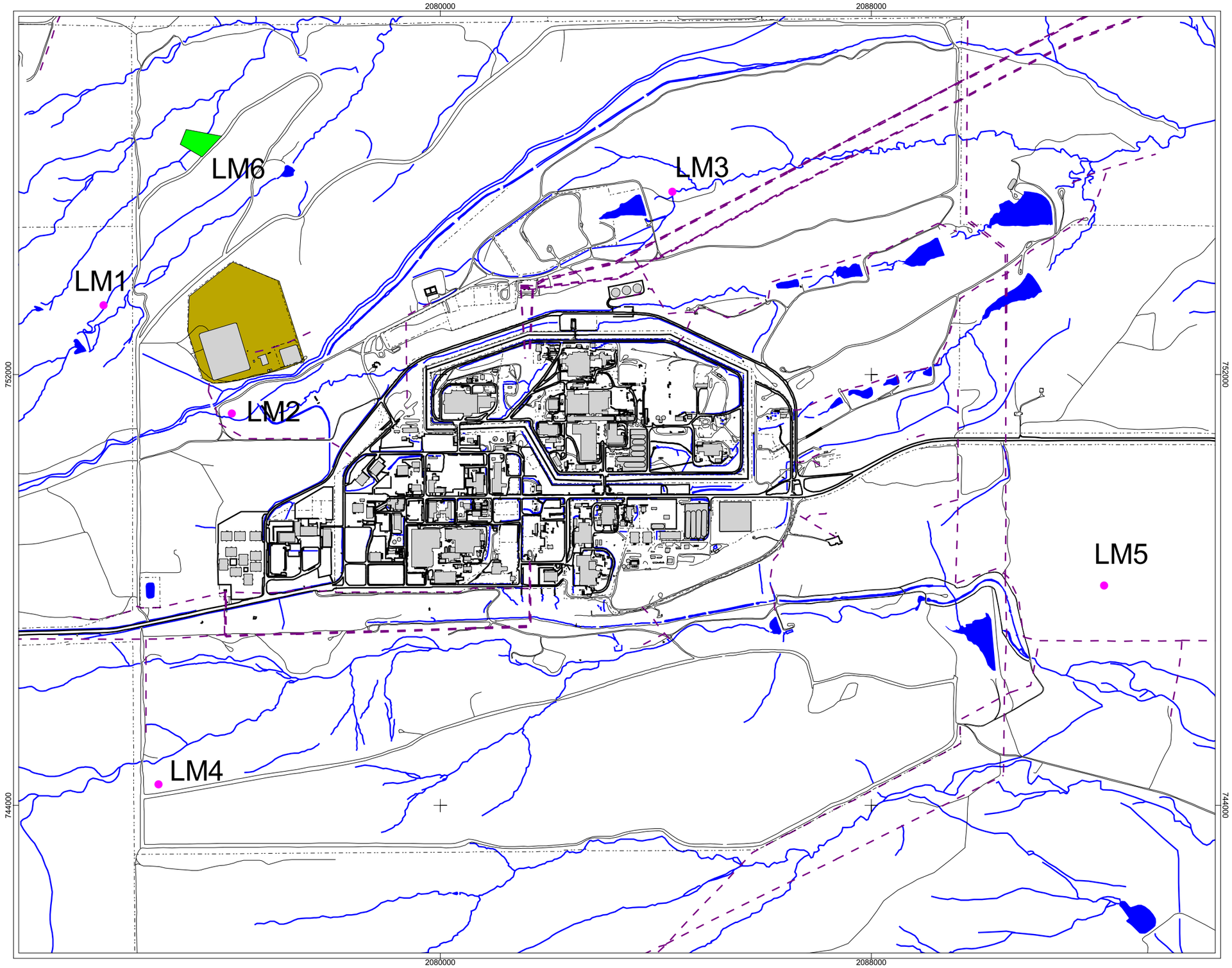


Figure 5-3. Diffuse Knapweed Frequency





Larinus minutus Biocontrol Release and Monitoring Locations 2001

Figure 6-1

LEGEND

- Larinus minutus monitoring locations
- Texas A&M monitoring location

Standard Features

- Buildings
- Lakes & ponds
- New Landfill
- Streams & ditches
- Fences
- Paved roads
- Dirt roads
- Contours (20 ft)
- Power Lines

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
Hypsography derived from digital elevation model (DEM) data by Morrison Knudsen (MK) using ESRI Arc TIN and LATTICE to process the DEM data to create 5-foot contours.
The DEM data was captured by the Remote Sensing Lab, Las Vegas, NV, 1994 Aerial Flyover at ~10 meter resolution.
The DEM post-processing performed by MK, Winter 1997.

Data Source Ecology Features:
Location data provided by Exponent.
K-H Ecology Group POC; Karan North 303-966-9876.

N

1:16129

1000 0 1000 Feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: Exponent®

For: Kaiser-Hill Company, LLC

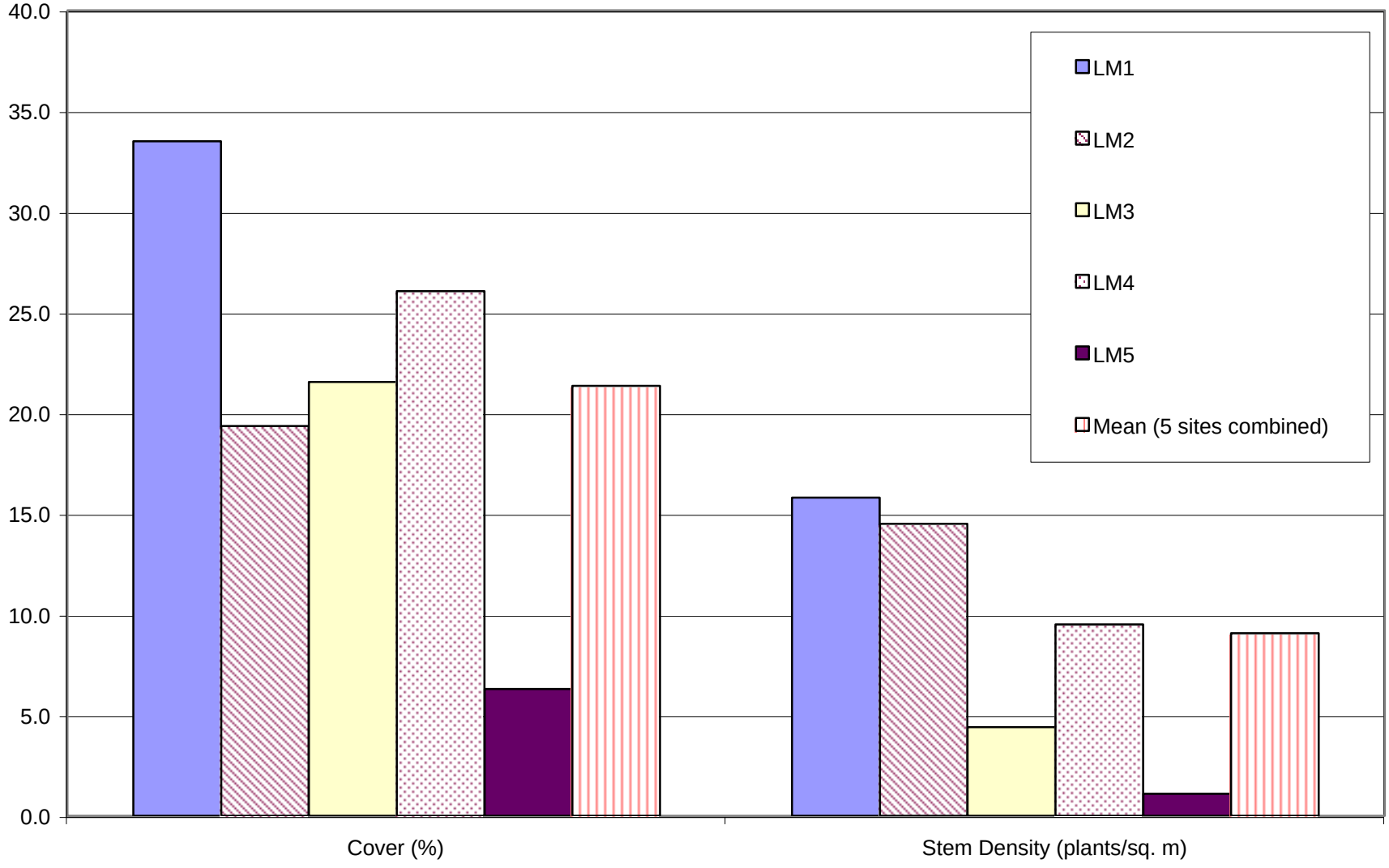
RFETS GIS Dept. 303-966-7707

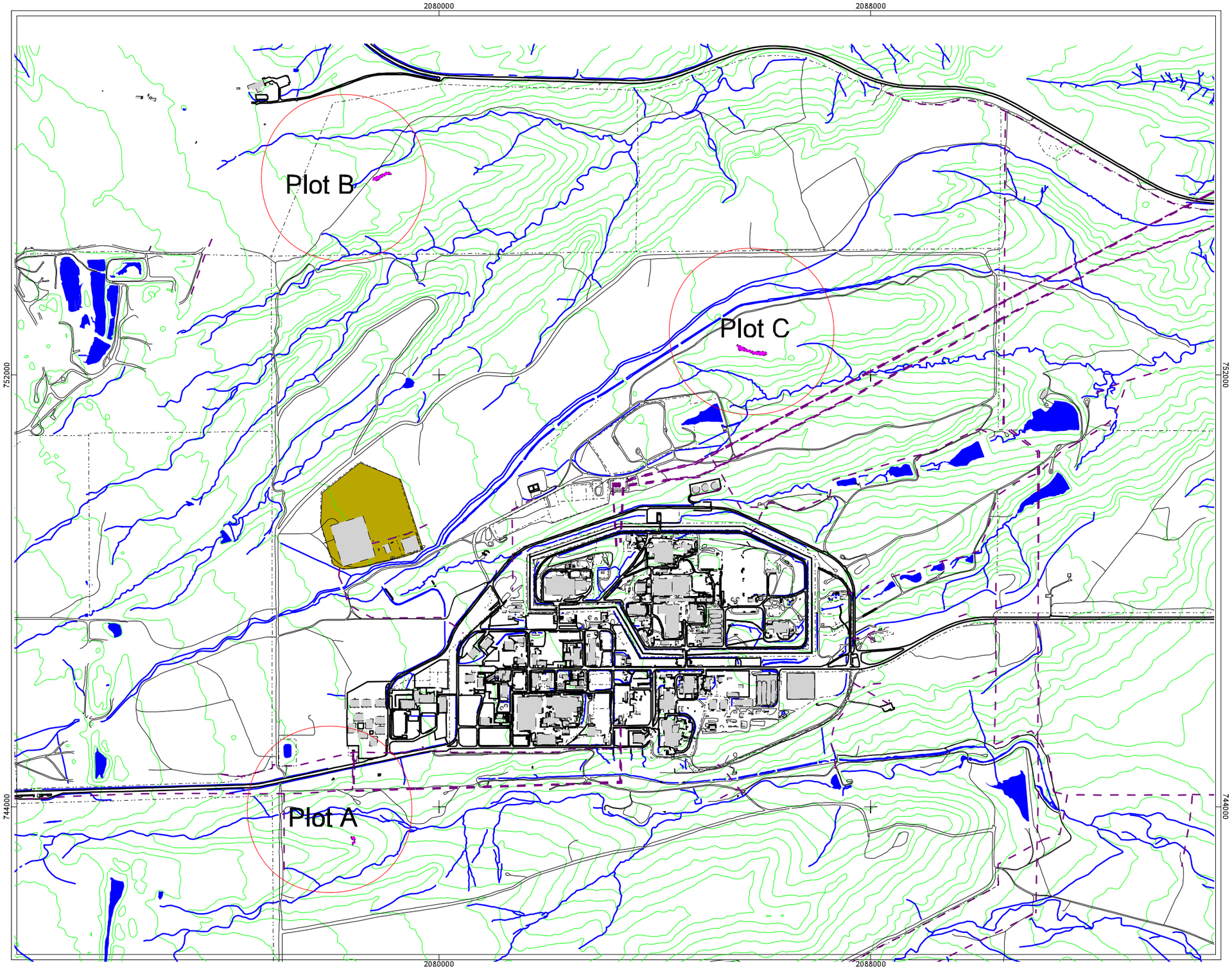
MAP ID: 02-0067

November 26, 2001

\\Gissrv\GIS\ECO-projects\projects\02-0067\2001biocontrol.apr

Figure 6-2. Diffuse Knapweed Cover and Density - Biocontrol Release Locations





Diffuse Knapweed Movement Study Plot Locations

Figure 7-1

LEGEND

Diffuse Knapweed Plots

Standard Features

- Buildings
- Lakes & ponds
- Landfill
- Streams & ditches
- Fences
- Paved roads
- Dirt roads
- Contours (20 ft)
- Power Lines

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
Hypsography derived from digital elevation model (DEM) data by Morrison Knudsen (MK) using ESRI Arc TIN and LATTICE to process the DEM data to create 5-foot contours.
The DEM data was captured by the Remote Sensing Lab, Las Vegas, NV, 1994 Aerial Flyover at ~10 meter resolution.
The DEM post-processing performed by MK, Winter 1997.

Data Source Ecology Features:
Location data provided by Exponent.
K-H Ecology Group POC; Karan North 303-966-9876.

N

1:18429

1000 0 1000 2000 Feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: Exponent®

For: Kaiser-Hill Company, LLC

RFETS GIS Dept. 303-966-7707

MAP ID: 01-0096

February 14, 2002

\\Gisserv\GIS\ECO-projects\projects\01-0096\cedlimovement.apr\Plot Locations

a)

b)

Figure 7-2. Painted diffuse knapweed plants. a) An individual diffuse knapweed plant after marking with red spray paint and pink flagging. b) A patch of marked diffuse knapweed plants waiting to be blown away in the winter winds.

Figure 7-3. Percentage of Diffuse Knapweed Plants That Blew Away

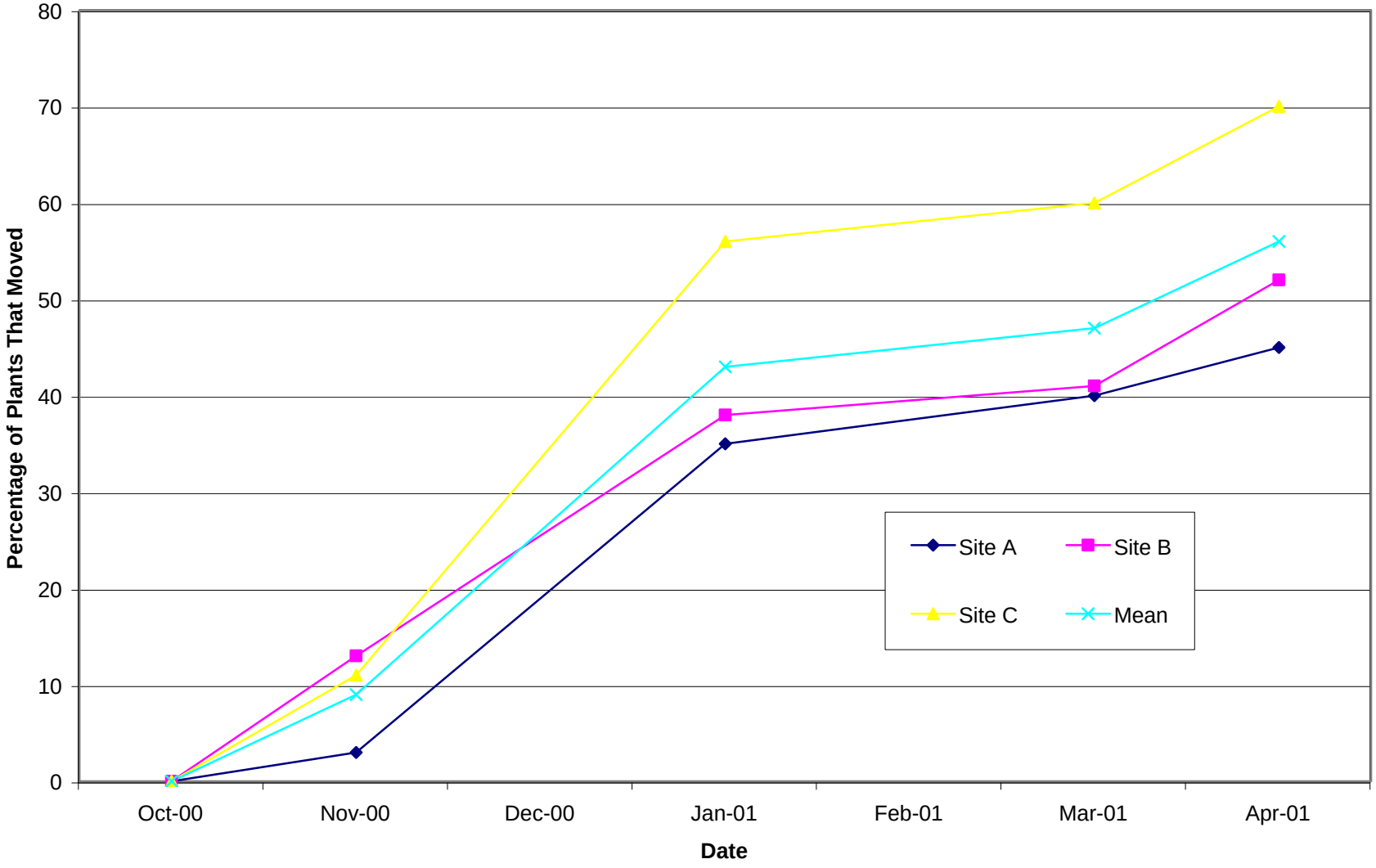


Figure 7-4. Number of 15 Minute Time Periods with >50mph Maximum Wind Speed

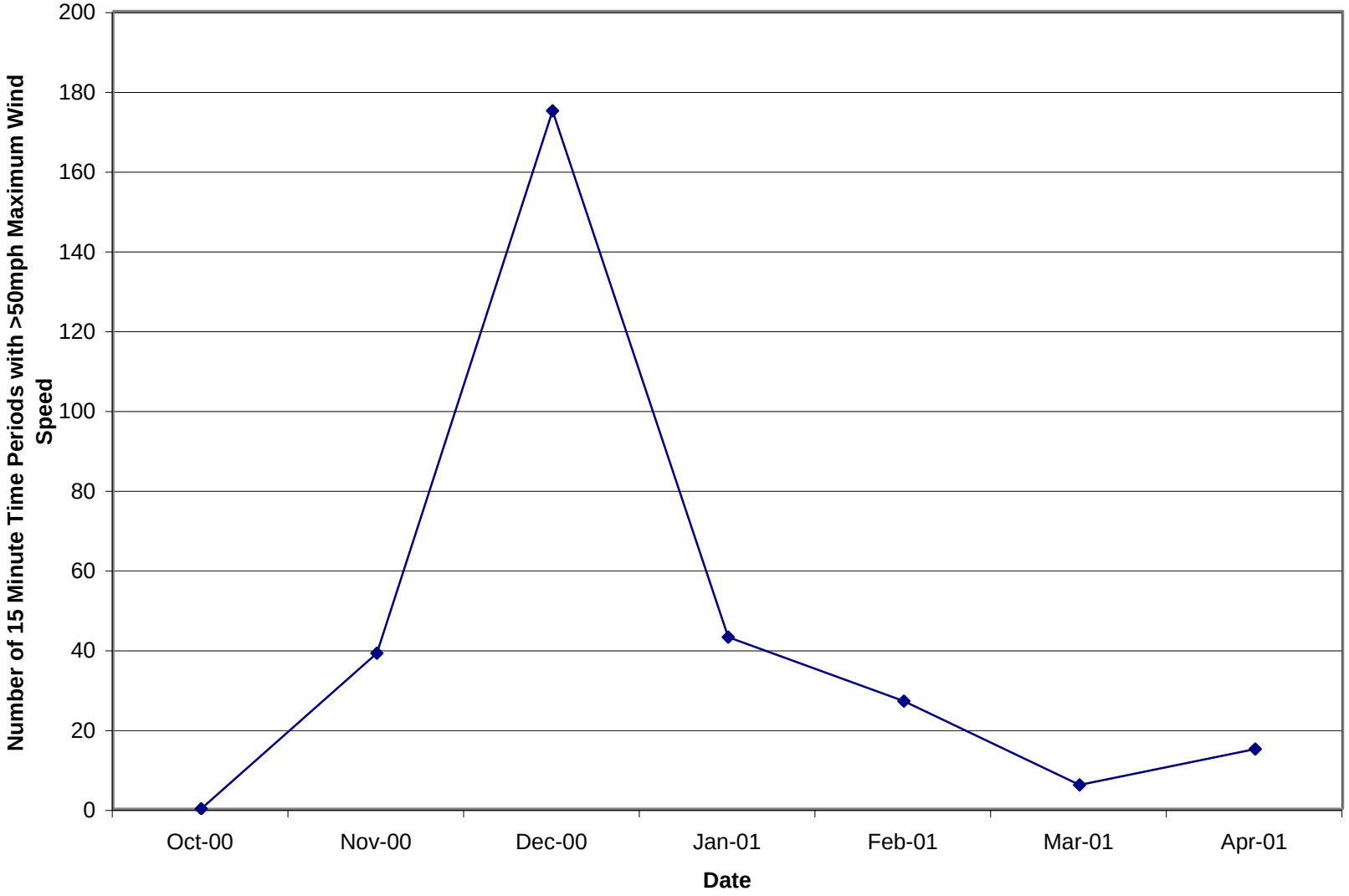
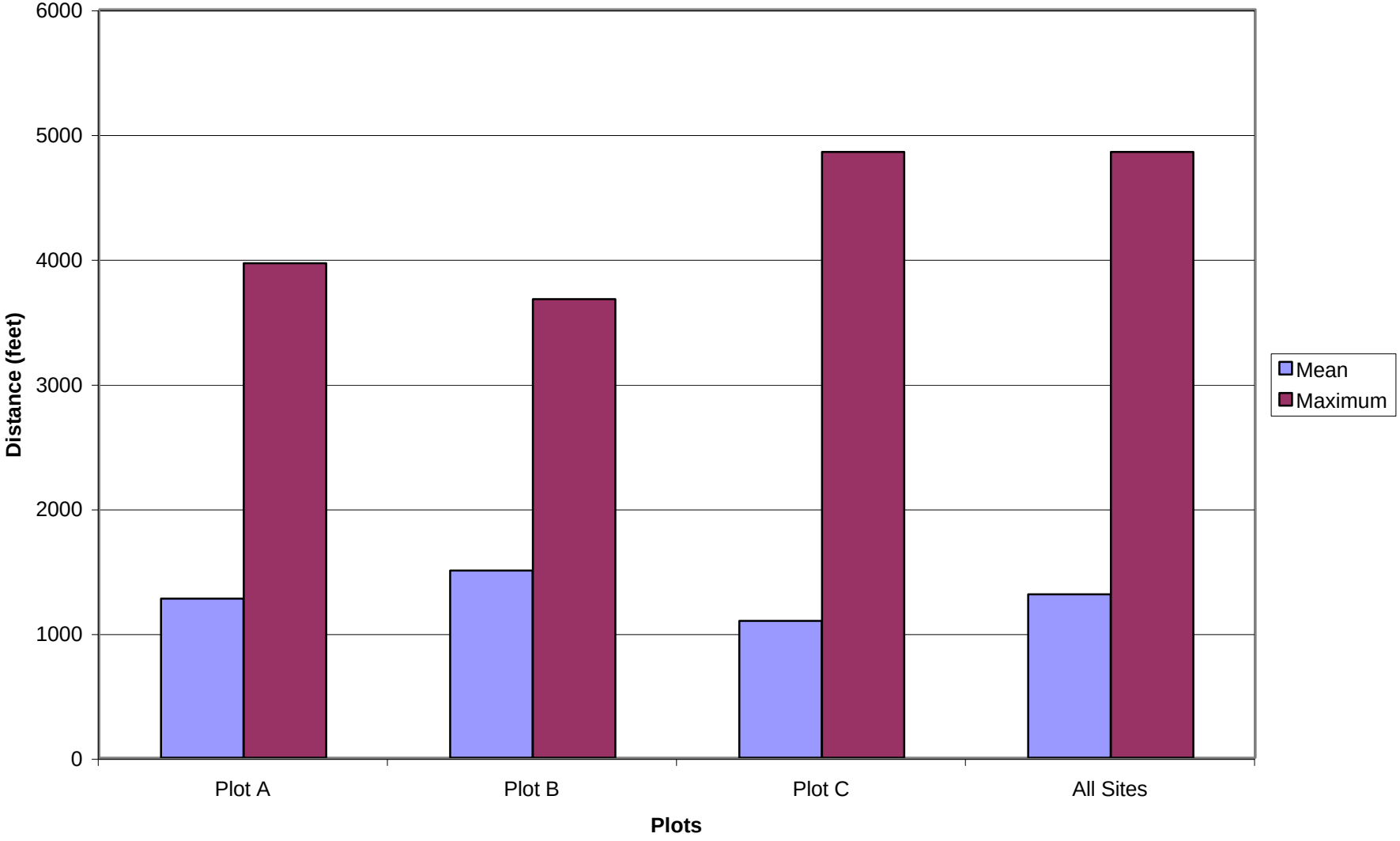
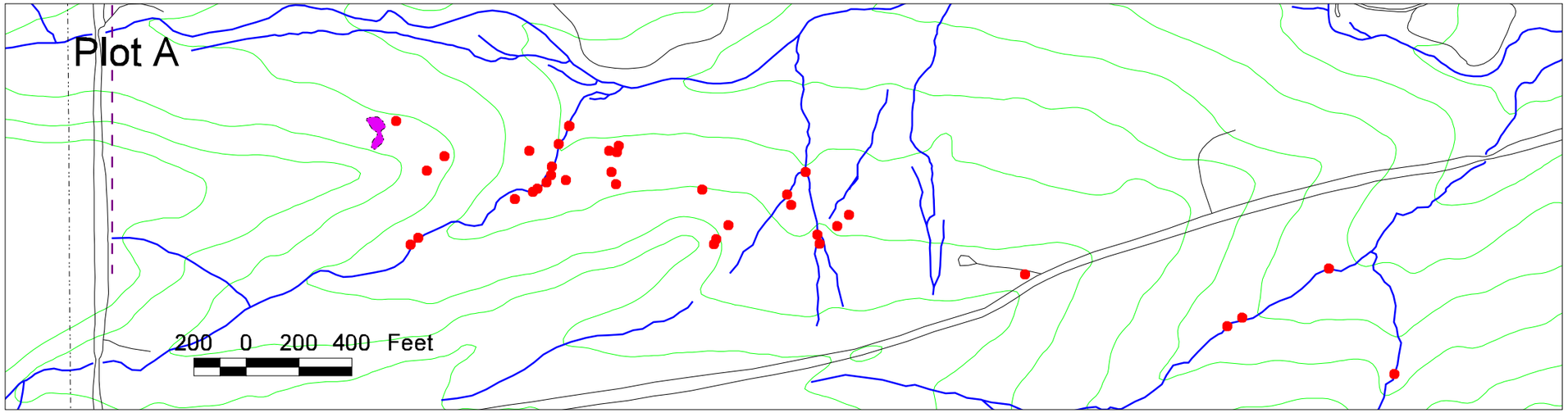
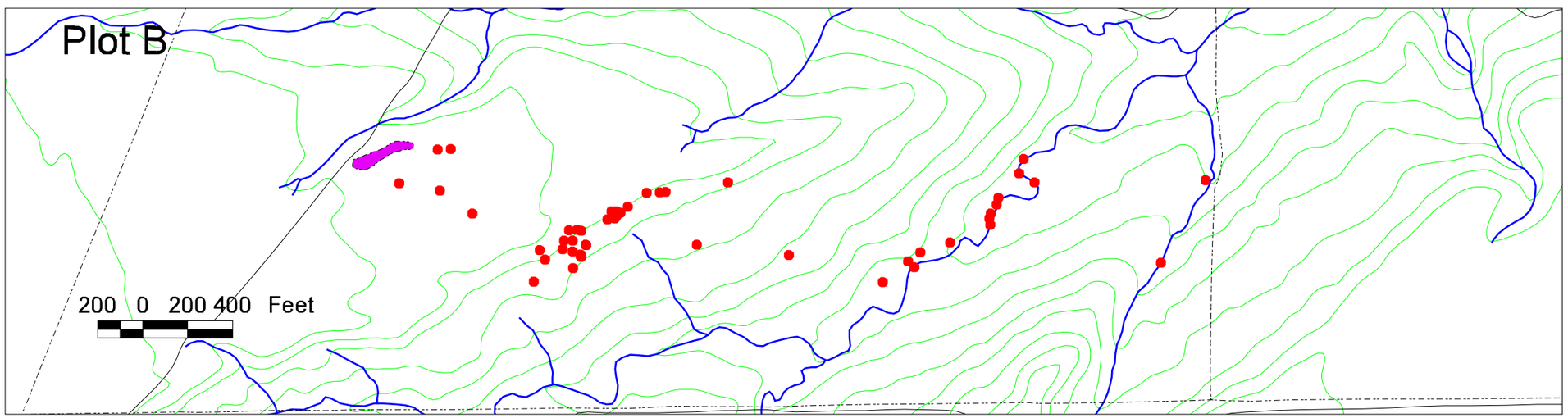
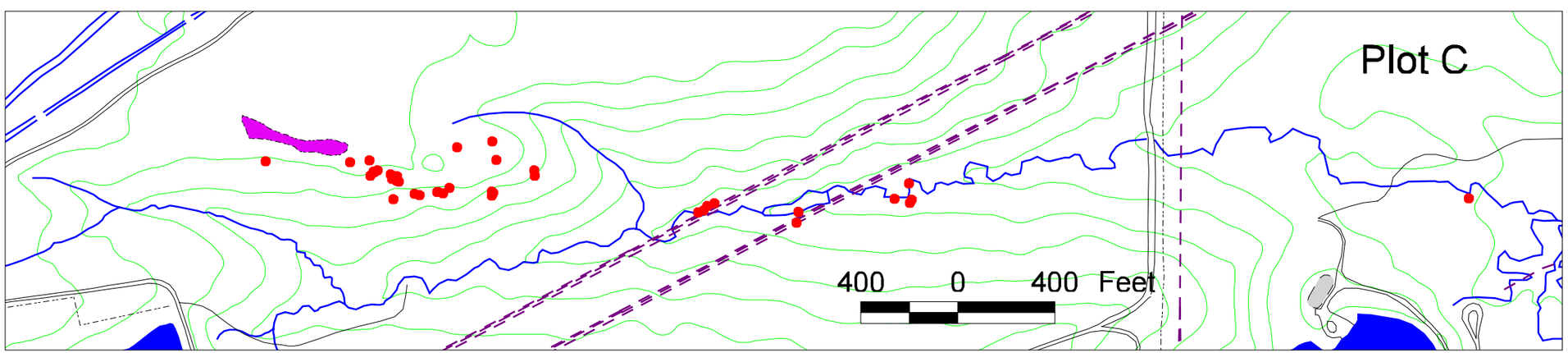


Figure 7-5. Diffuse Knapweed Movement Summary









Diffuse Knapweed Movement Distributions

Figure 7-6

LEGEND

- Diffuse Knapweed Plots
- Diffuse Knapweed Plant Downwind Locations
- Plot Centerpoint

Standard Features

- Buildings
- Lakes & ponds
- Landfill
- Streams & ditches
- Fences
- Paved roads
- Dirt roads
- Contours (20 ft)
- Power Lines

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
Hypsography derived from digital elevation model (DEM) data by Morrison Knudsen (MK) using ESRI Arc TIN and LATTICE to process the DEM data to create 5-foot contours.
The DEM data was captured by the Remote Sensing Lab, Las Vegas, NV, 1994 Aerial Flyover at ~10 meter resolution.
The DEM post-processing performed by MK, Winter 1997.

Data Source Ecology Features:
Location data provided by Exponent.
K-H Ecology Group POC; Karan North 303-966-9876.

N

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

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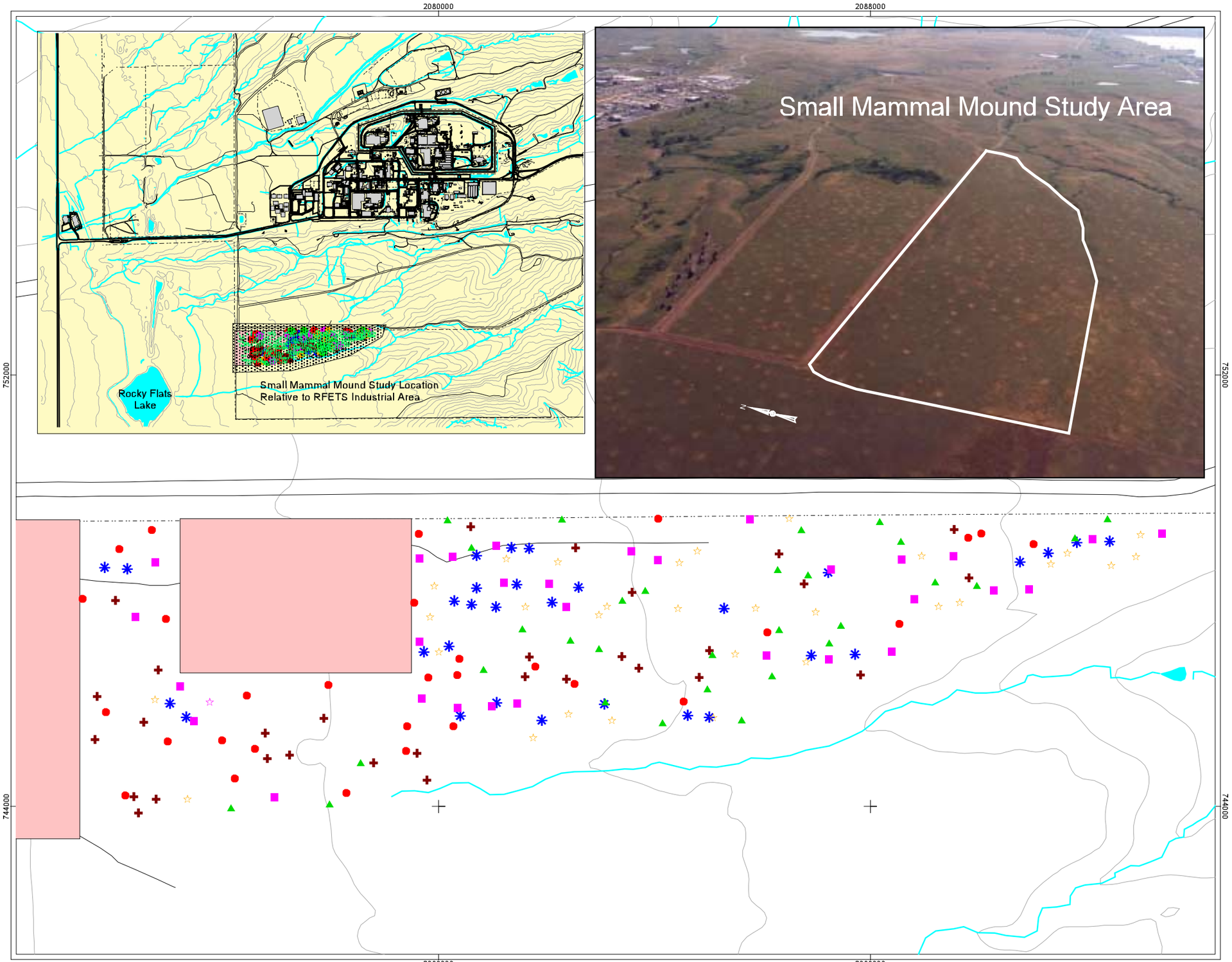
MAP ID: 01-0096

February 14, 2002

\\Gissrv\GIS\ECO-projects\projects\01-0096\sedimovement.apr\Plots A B C

Figure 7-7. Diffuse knapweed “captured” by a typical 4-strand barbed wire fence. Note the area on the left where the knapweed plants have been cleared away.



Small Mammal Mound Sampling Locations

Figure 8-1

LEGEND

- Treated/Active
- Treated/NotActive
- NotTreated/Active
- NotTreated/NotActive
- Intermound/Treated
- Intermound/NotTreated
- Double Sprayed Exclusion Areas

Standard Features

- Buildings
- Lakes & ponds
- Landfill
- Streams & ditches
- Fences
- Paved roads
- Dirt roads
- Contours (20 ft)
- Power Lines

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
Hypsography derived from digital elevation model (DEM) data by Morrison Knudsen (MK) using ESRI Arc TIN and LATTICE to process the DEM data to create 5-foot contours.
The DEM data was captured by the Remote Sensing Lab, Las Vegas, NV, 1994 Aerial Flyover at ~10 meter resolution.
The DEM post-processing performed by MK, Winter 1997.

Data Source Ecology Features:
Location data provided by Exponent.
K-H Ecology Group POC; Karan North 303-966-9876.

N

1:13583

200 0 200 400 Meters

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

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\\Gissrv\GIS\ECO-projects\projects\01-0154\by01\pmjm.apr\mound and intermound locations

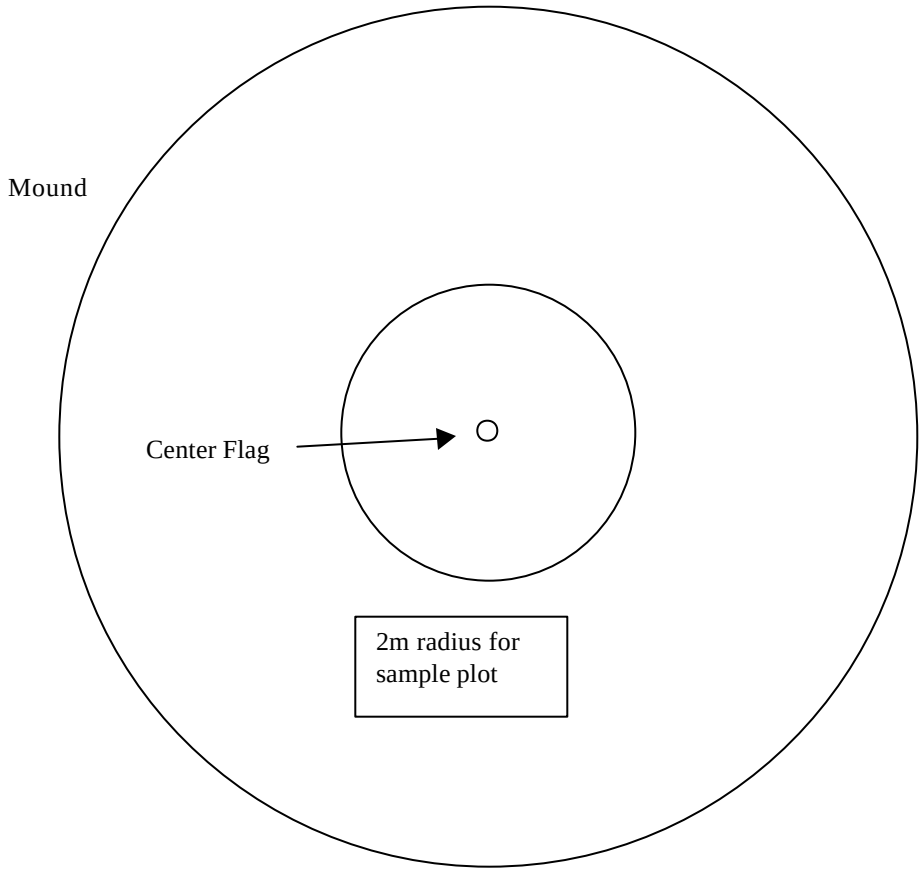
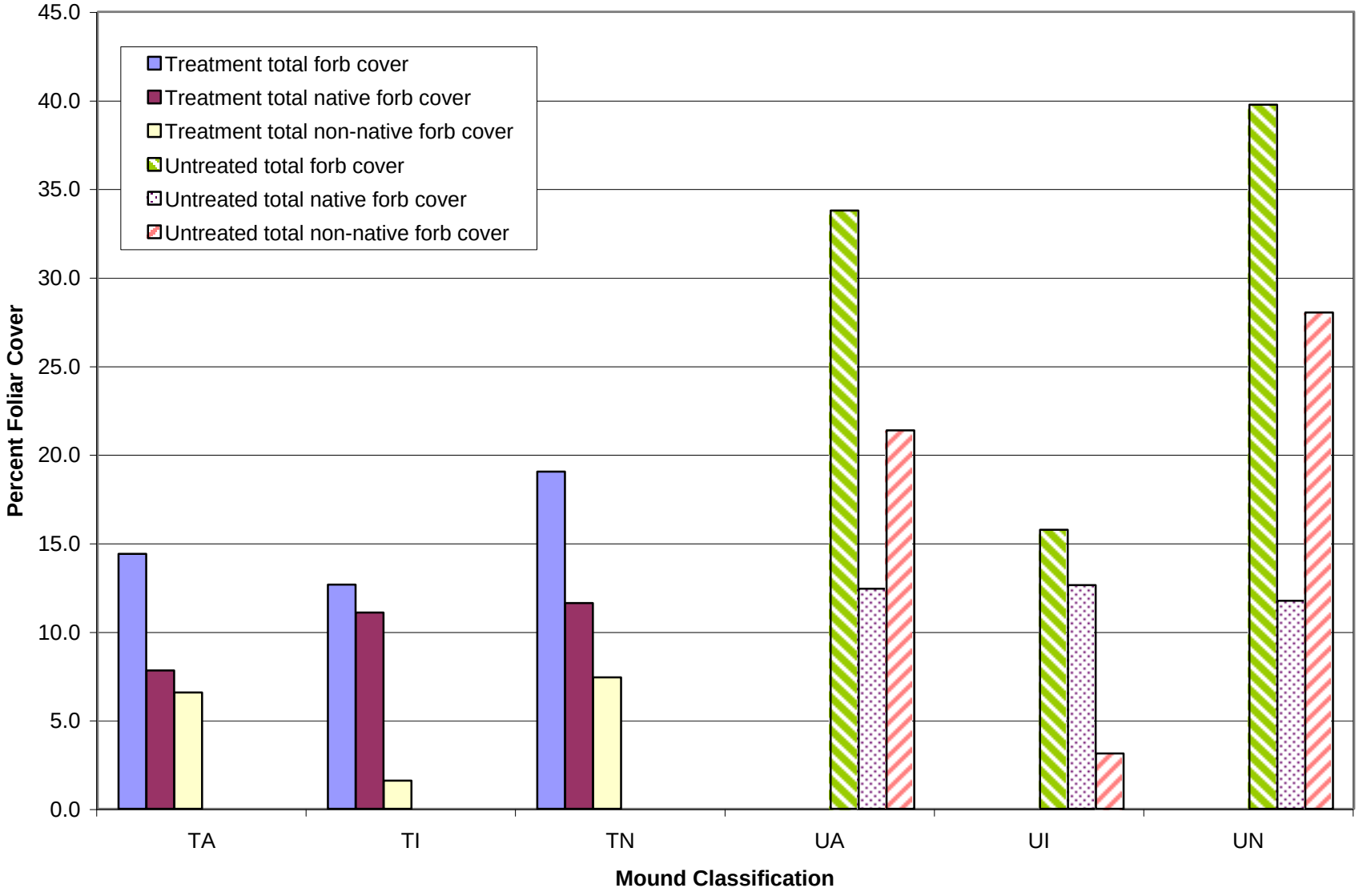


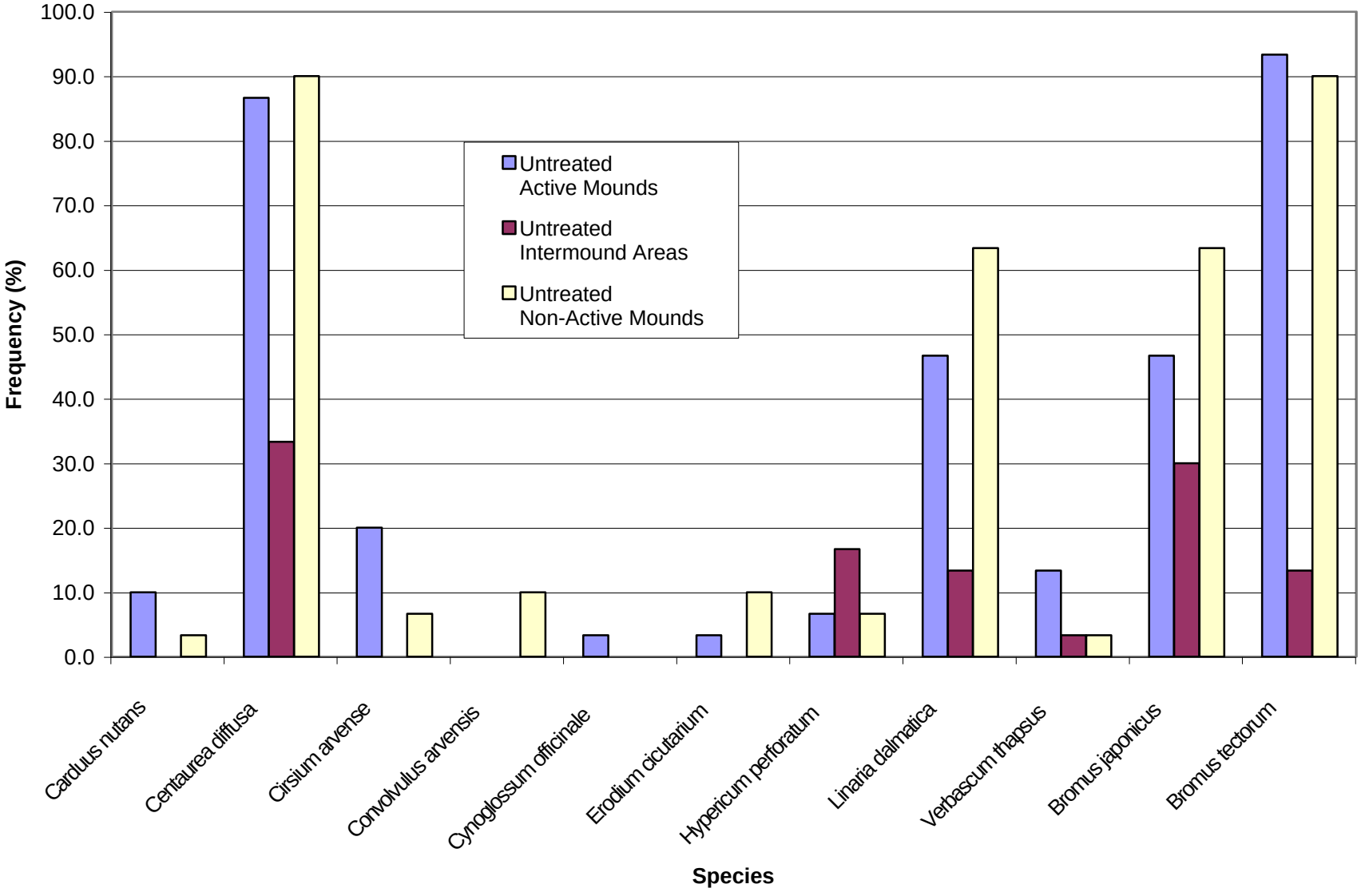
Figure 8-2. Mound vegetation characterization plot sampling design. Intermound sampling will use same pattern for the plot layout, but will be placed between the mounds.

Figure 8-3. Small Mammal Mound Total Forb, Native Forb, and Non-Native Forb Cover Summary



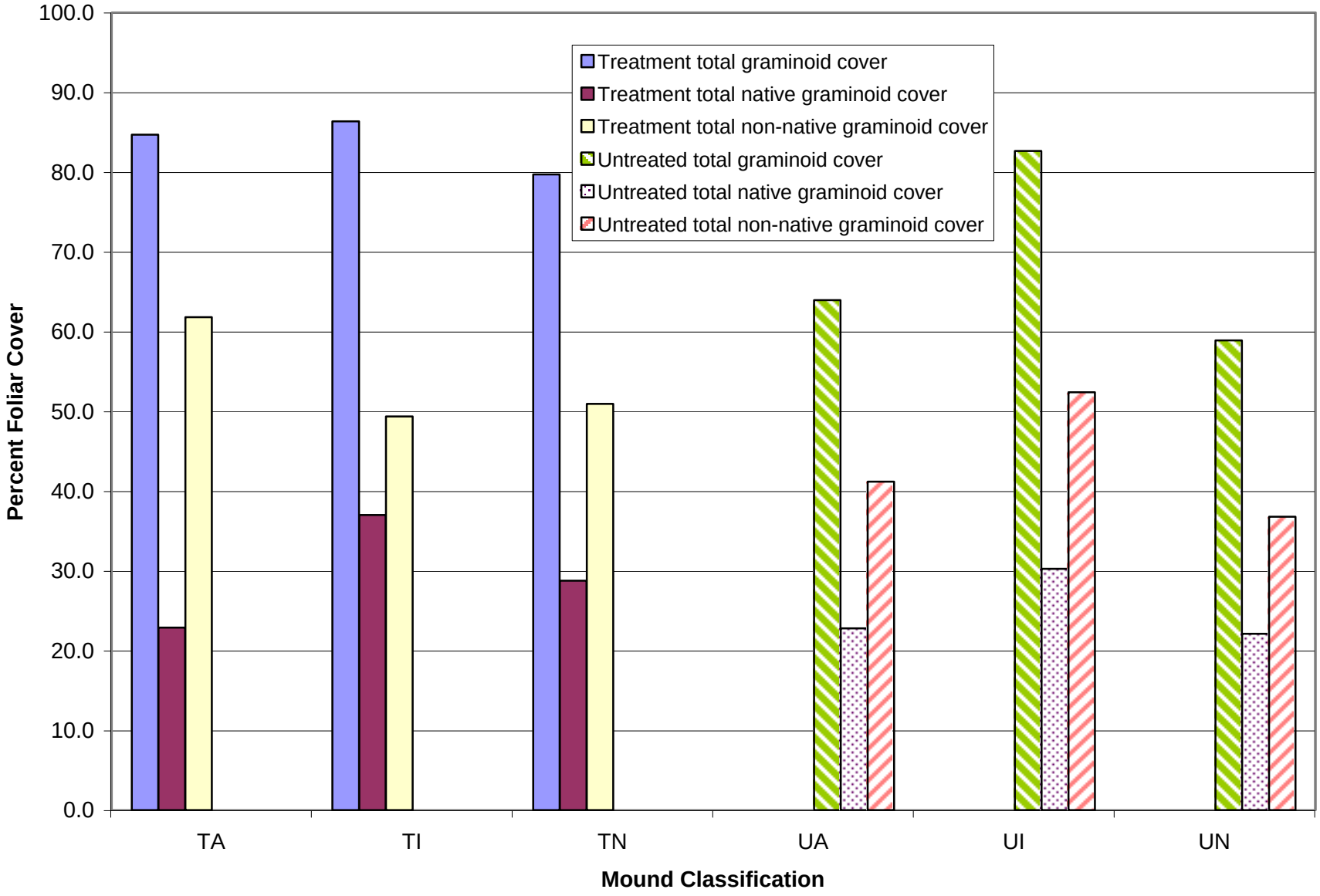
TA = treated active, TI = treated intermound, TN = treated not active, UA = untreated active, UI = untreated intermound, UN = untreated not active

Figure 8-4. Small Mammal Mound Noxious Weed Frequency Summary



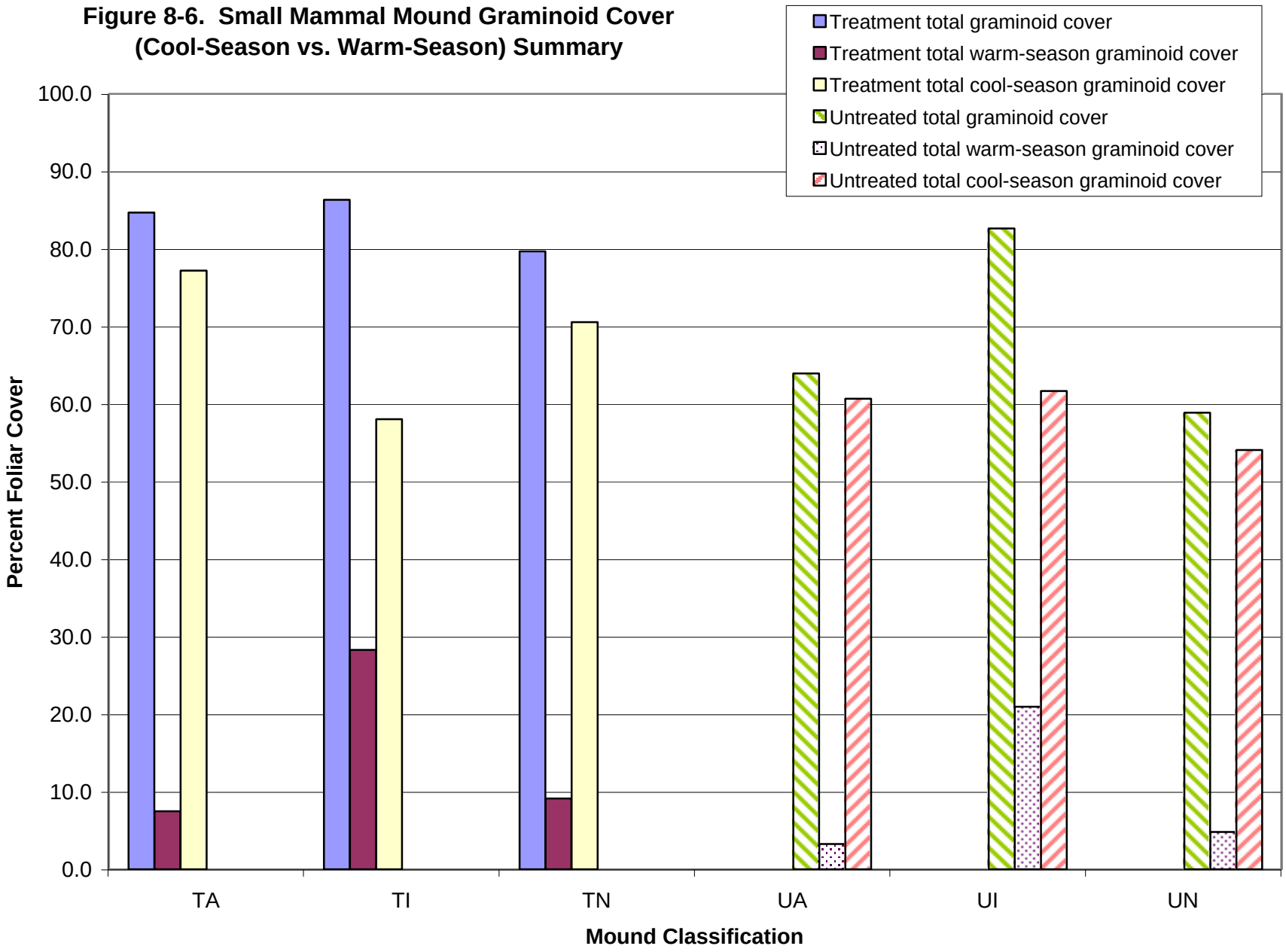
Bromus japonicus is a non-native cheatgrass, but is not on the State of Colorado list of noxious weeds.

Figure 8-5. Small Mammal Mound Graminoid (Native vs. Non-Native) Foliar Cover Summary



TA = treated active, TI = treated intermound, TN = treated not active, UA = untreated active, UI = untreated intermound, UN = untreated not active

Figure 8-6. Small Mammal Mound Graminoid Cover (Cool-Season vs. Warm-Season) Summary



TA = treated active, TI = treated intermound, TN = treated not active, UA = untreated active, UI = untreated intermound, UN = untreated not active

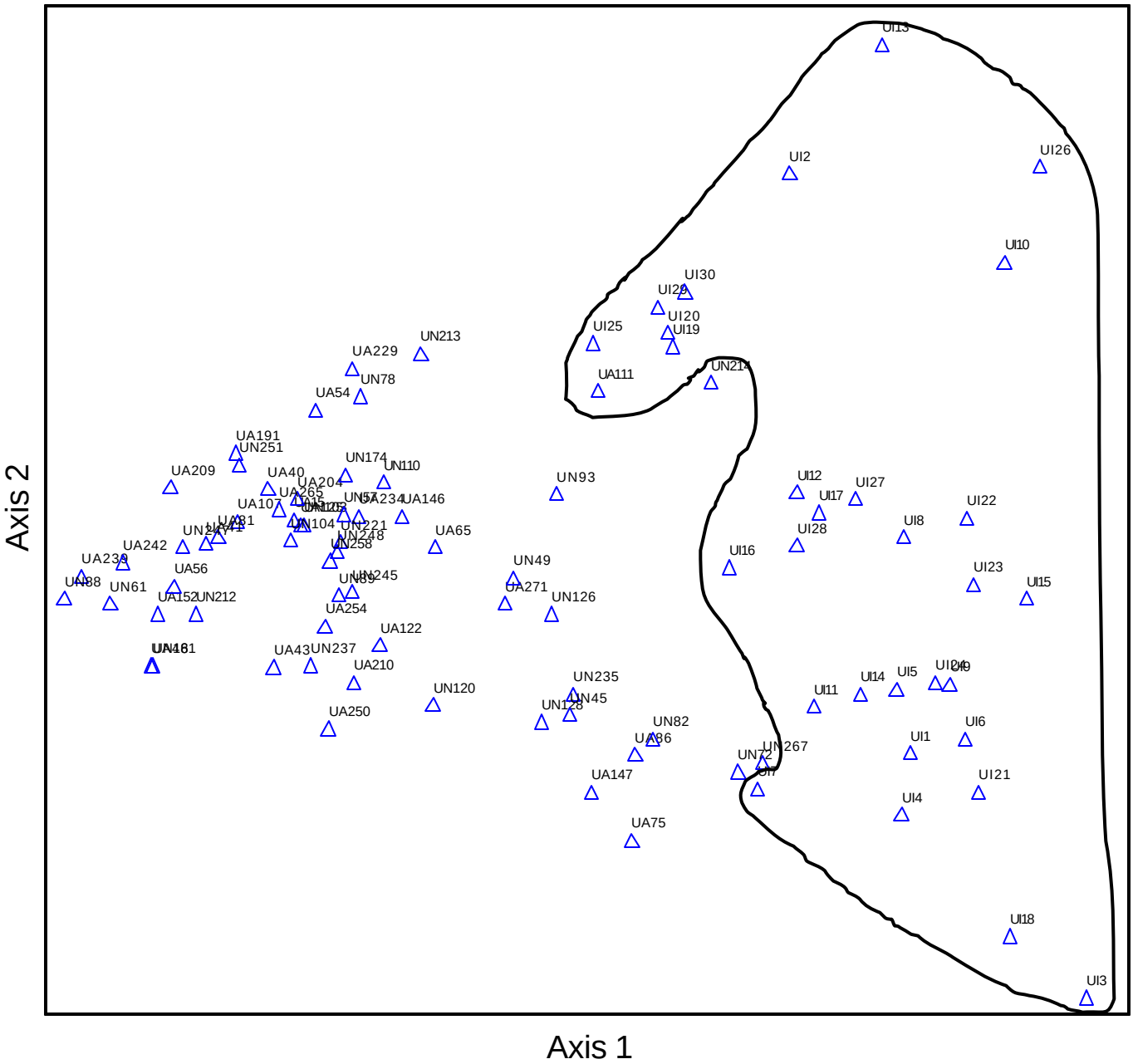


Figure 8-7. Detrended Correspondence Analysis (DCA) Using Small Mammal Mound Study Full Species Lists and Cover Values For Untreated Classifications.
(Mound Classifications: UA = untreated active, UI = untreated intermound, UN = untreated non-active; numbers refer to actual plot numbers).

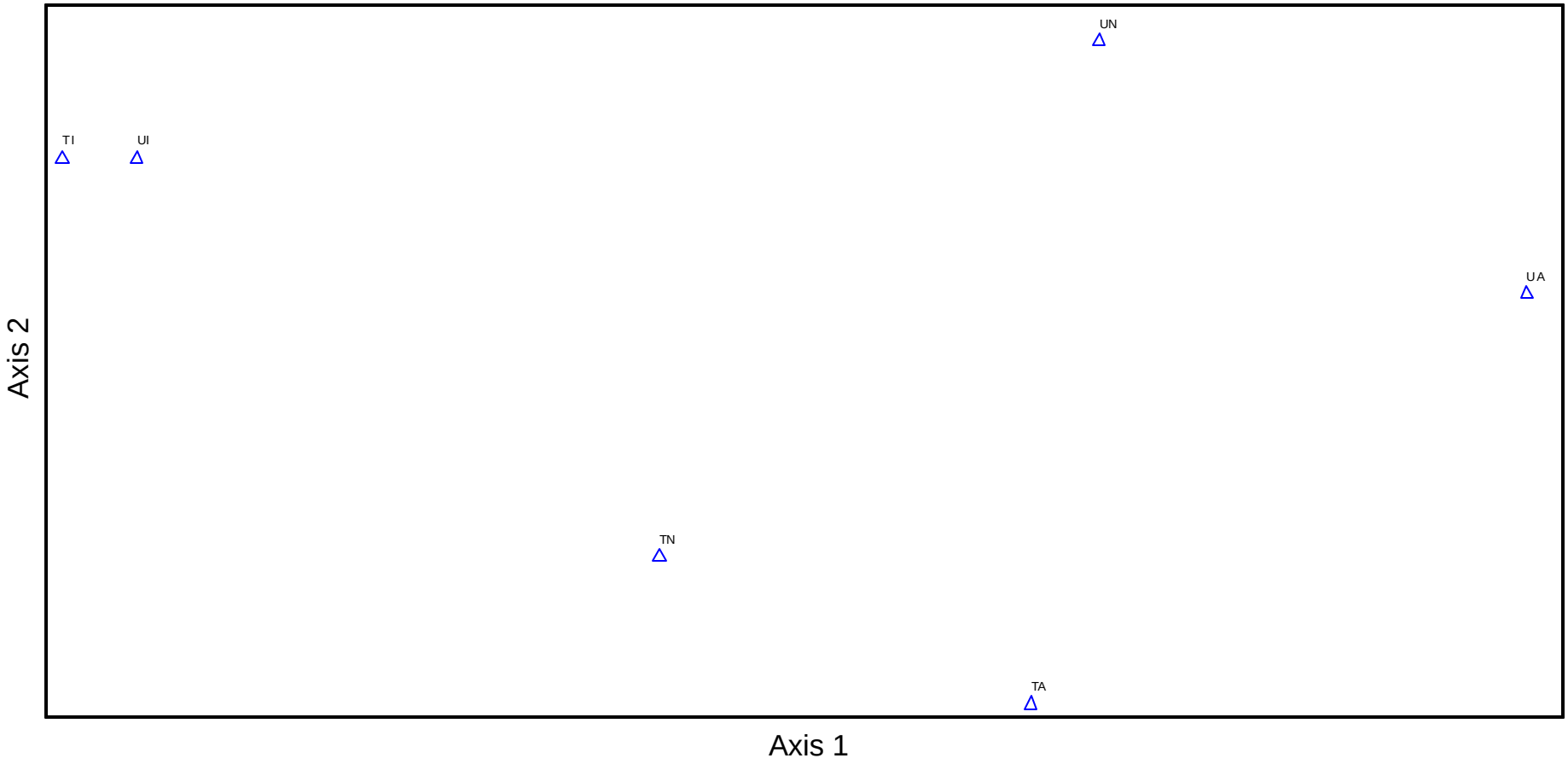


Figure 8-8. Detrended Correspondence Analysis (DCA) Using Small Mammal Mound Study Dominant Species and Cover Values.
(Mound Classifications: TA = treated active, TI = treated intermound, TN = treated non-active, UA = untreated active, UI = untreated intermound, UN = untreated non-active).

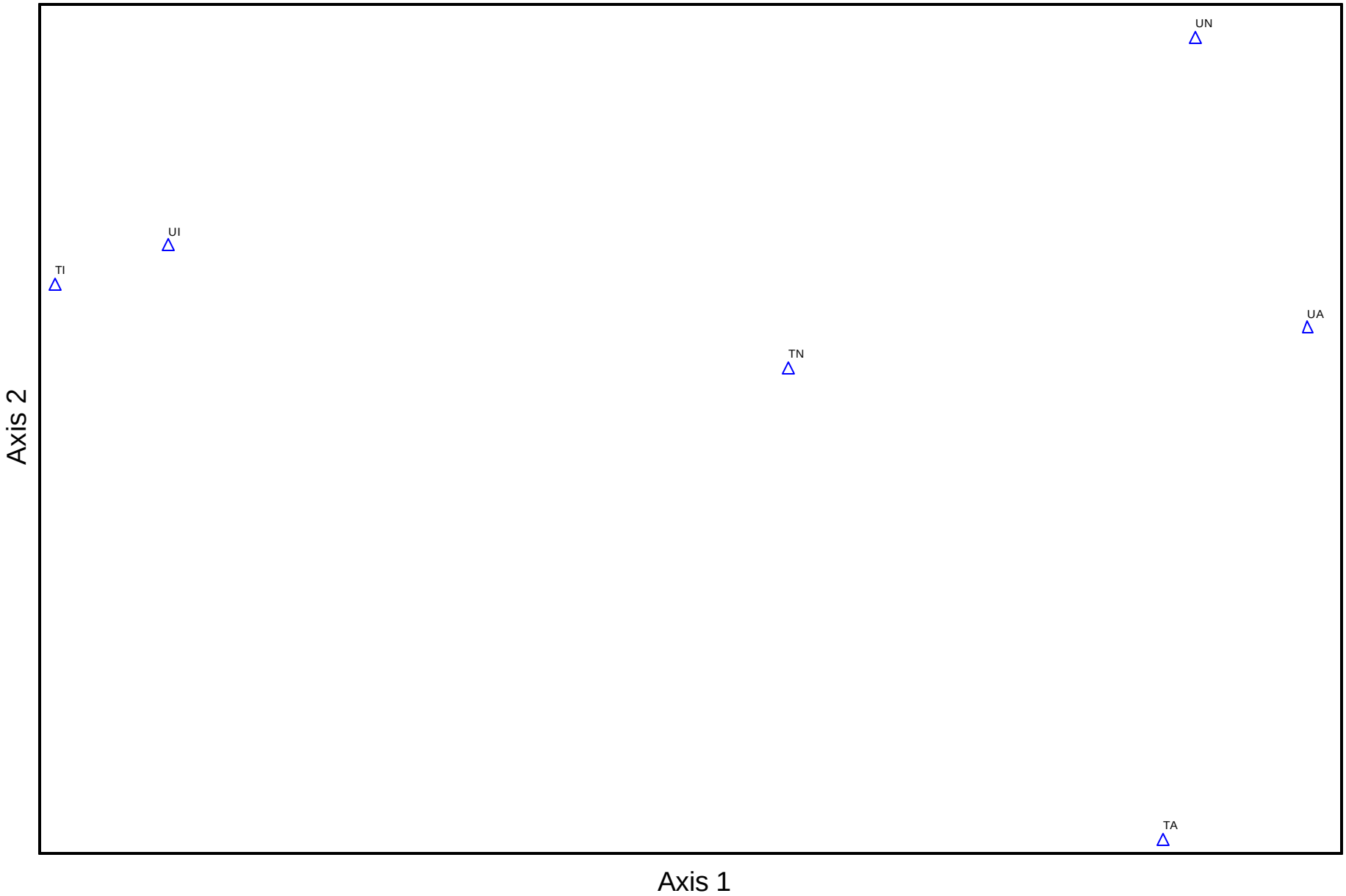
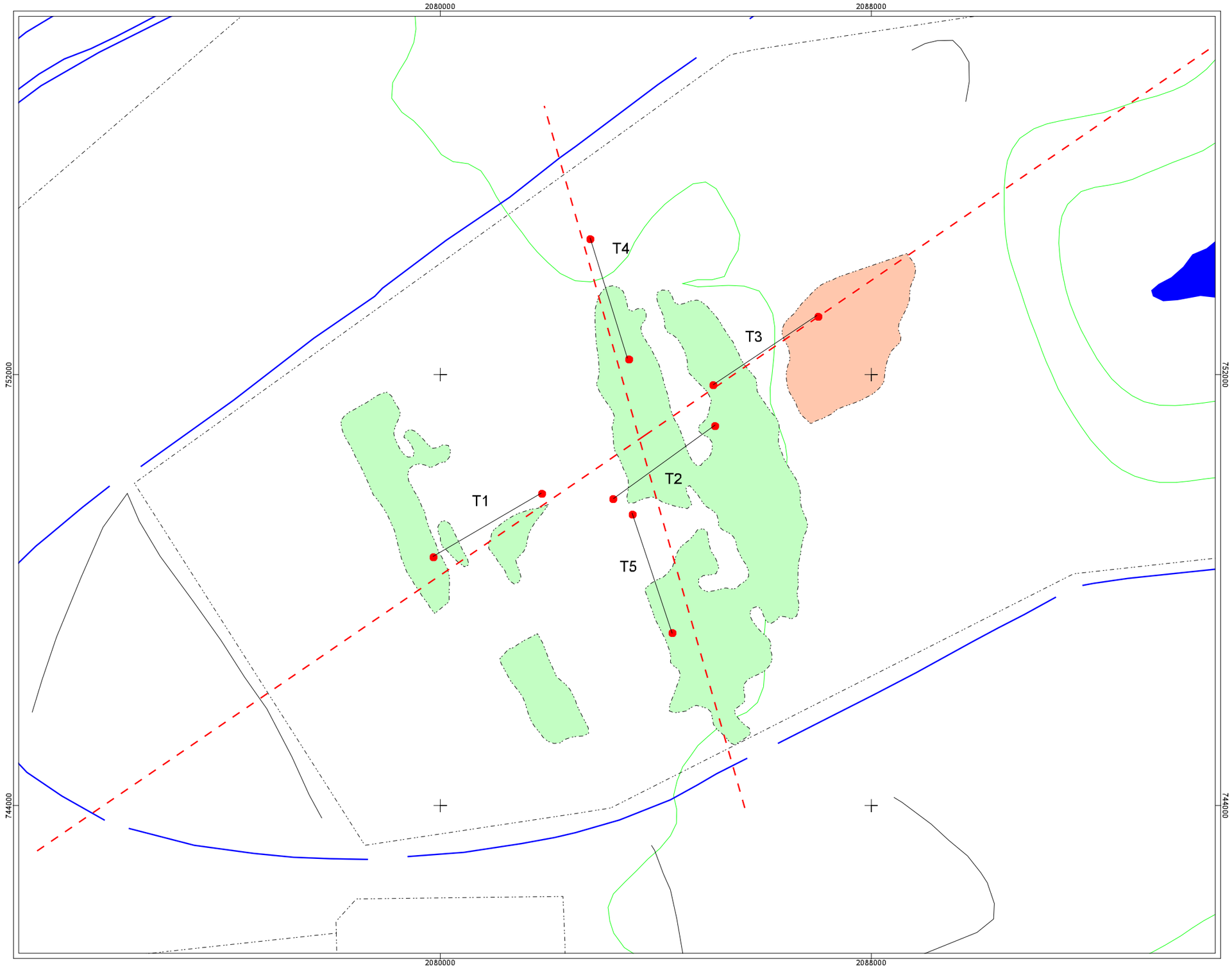


Figure 8-9. Detrended Correspondence Analysis (DCA) Using Small Mammal Mound Study Full Species Lists and Cover Values.
(Mound Classifications: TA = treated active, TI = treated intermound, TN = treated non-active, UA = untreated active, UI = untreated intermound, UN = untreated non-active).

2001 Landfill Monitoring Vegetation Transect Locations

Figure 9-1



LEGEND

- Tall Vegetation (not seeded)
- Tall Vegetation (seeded)
- Vegetation Transects
- Methane Sampling Transects

Standard Features

- Buildings
- Lakes & ponds
- Streams & ditches
- Fences
- Paved roads
- Dirt roads
- Contours (20 ft)

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
Hypsography derived from digital elevation model (DEM) data by Morrison Knudsen (MK) using ESRI Arc TIN and LATTICE to process the DEM data to create 5-foot contours.
The DEM data was captured by the Remote Sensing Lab, Las Vegas, NV, 1994 Aerial Flyover at ~10 meter resolution.
The DEM post-processing performed by MK, Winter 1997.

Data Source Ecology Features:
Location data provided by Exponent.
K-H Ecology Group POC; Karan North 303-966-9876.

N

1:1656

100 0 100 200 Feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
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RFETS GIS Dept. 303-966-7707

MAP ID: 01-0980

February 14, 2002

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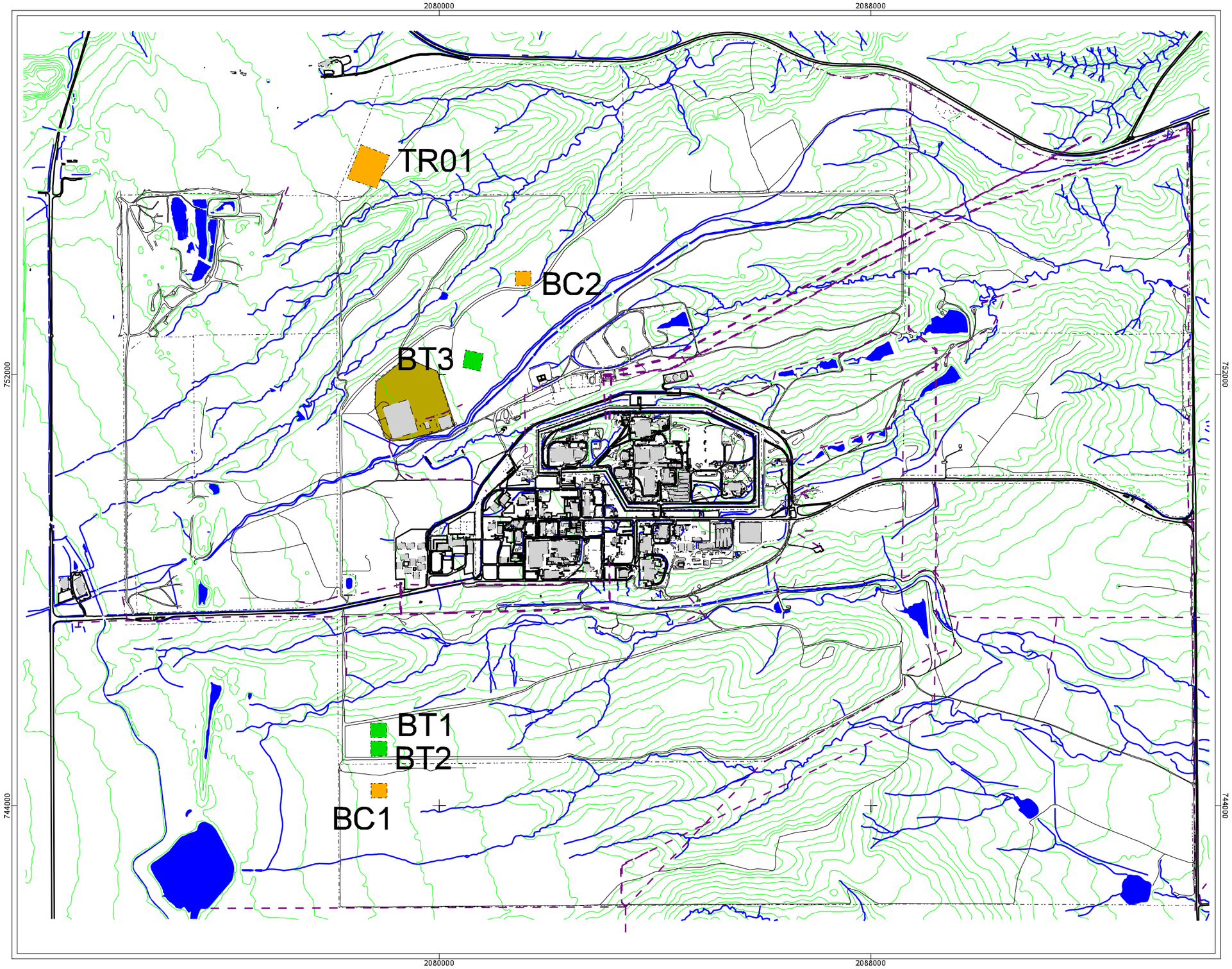


Prescribed Burn Monitoring Plot Locations

Figure 10-1

LEGEND

- Control Plots
- Treatment Plots

Standard Features

- Buildings
- Lakes & ponds
- New Landfill
- Streams & ditches
- Fences
- Paved roads
- Dirt roads
- Contours (20 ft)
- Power Lines

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
Hypsography derived from digital elevation model (DEM) data by Morrison Knudsen (MK) using ESRI Arc TIN and LATTICE to process the DEM data to create 5-foot contours.
The DEM data was captured by the Remote Sensing Lab, Las Vegas, NV, 1994 Aerial Flyover at ~10 meter resolution.
The DEM post-processing performed by MK, Winter 1997.

Data Source Ecology Features:
Location data provided by Exponent.
K-H Ecology Group POC; Karan North 303-966-9876.

N

1:23552

1000 0 1000 Feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: Exponent®

For: Kaiser-Hill Company, LLC

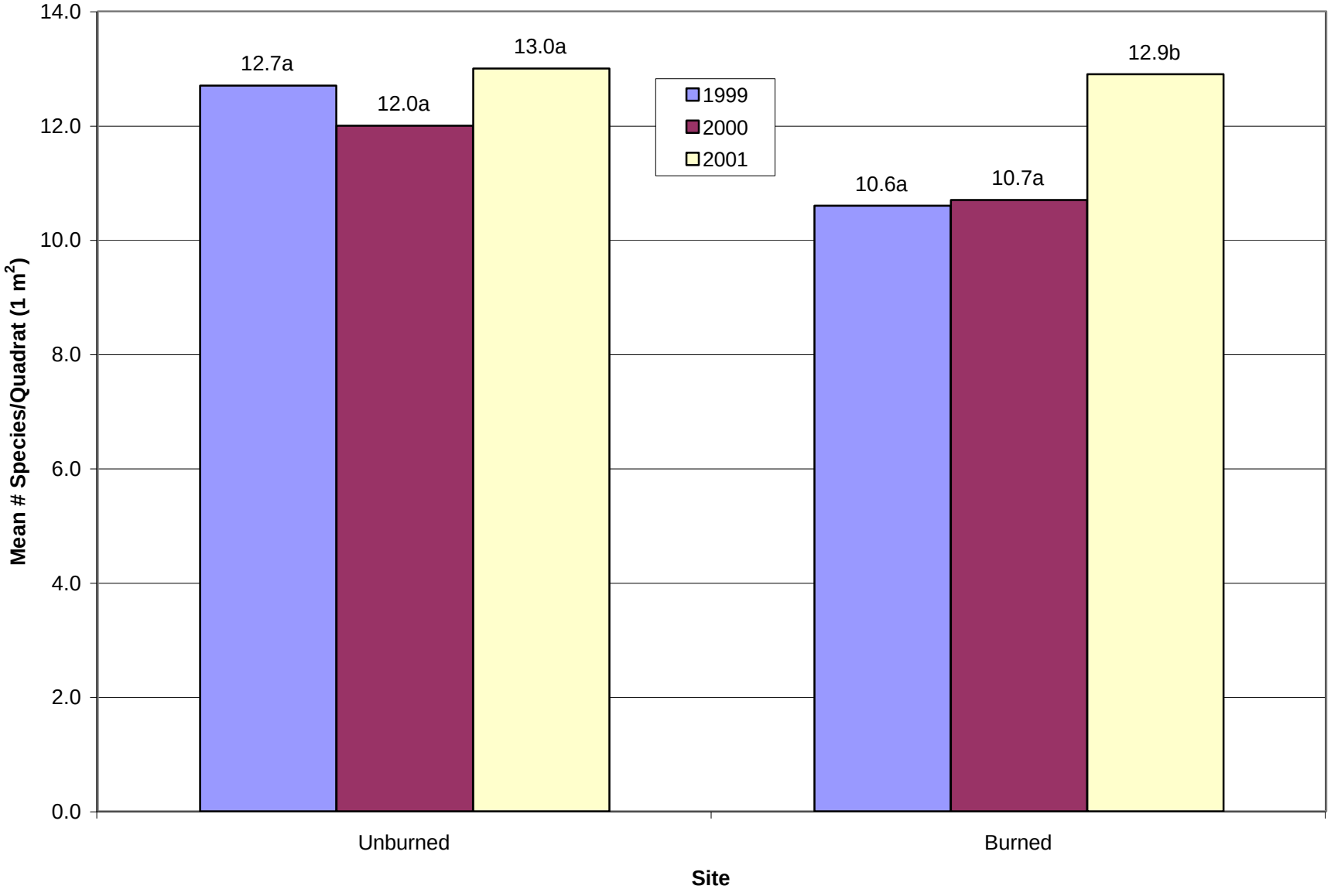
RFETS GIS Dept. 303-966-7707

MAP ID: 2k-0038

February 14, 2002

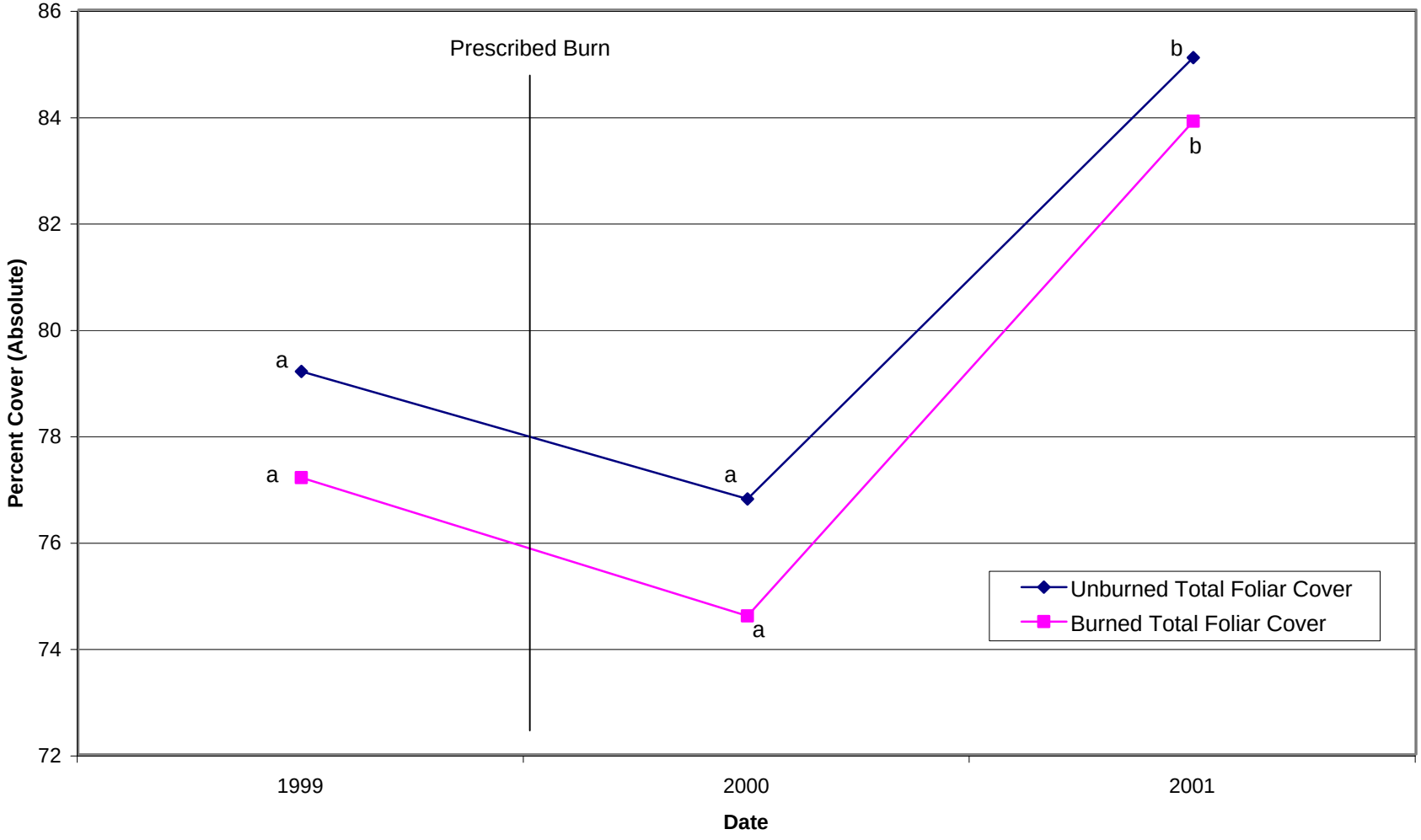
\\GisrvVGIS\ECO-projects\projects\2k-0038\veg monitoring locations 2001.apr/Burn plots

Figure 10-2. Mean # Species/Quadrat - Prescribed Burn Monitoring



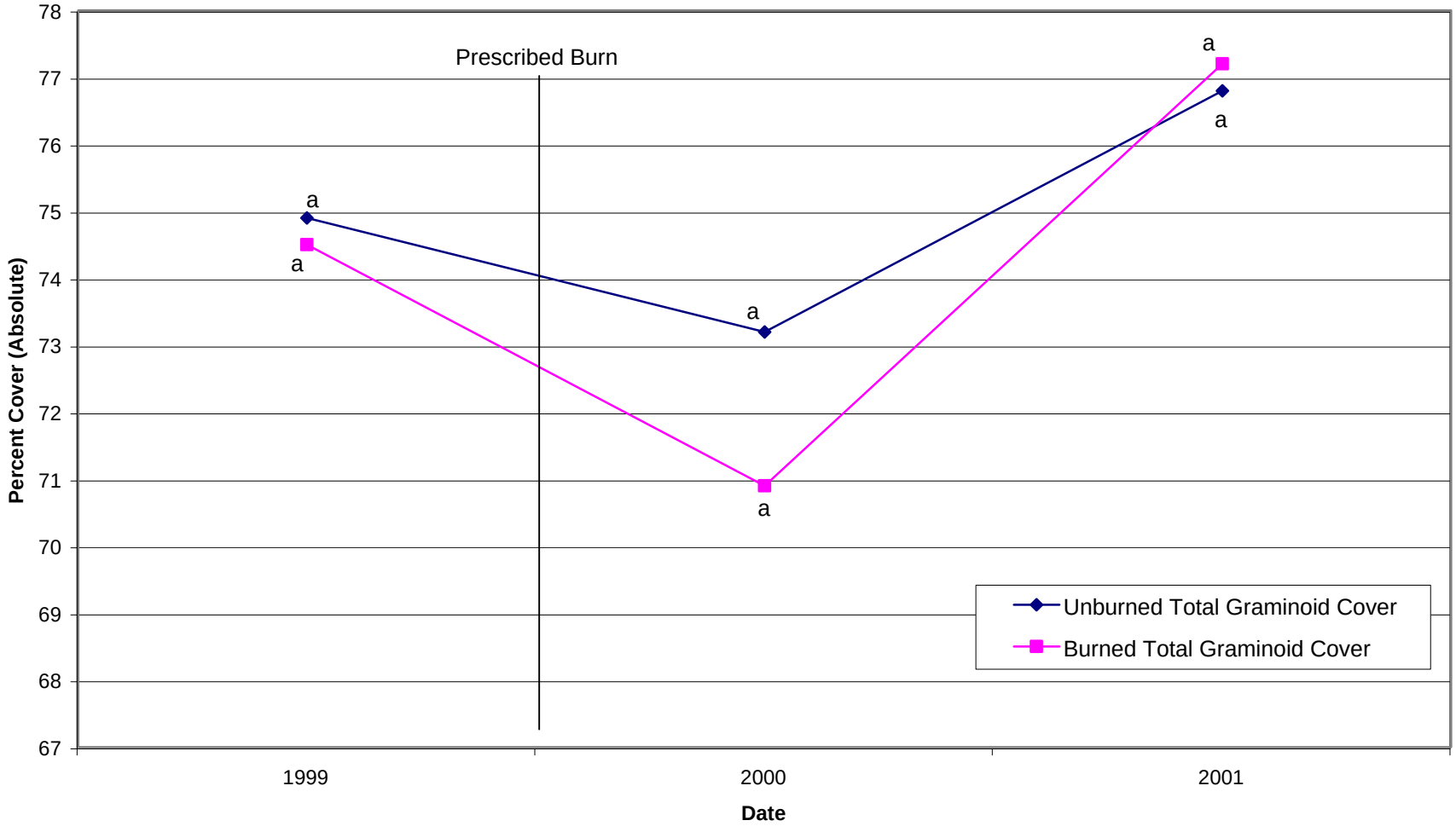
Means within the same treatment having the same letter are not significantly different from the 1999 data (P > 0.05).

Figure 10-3. Total Foliar Cover - Prescribed Burn Monitoring



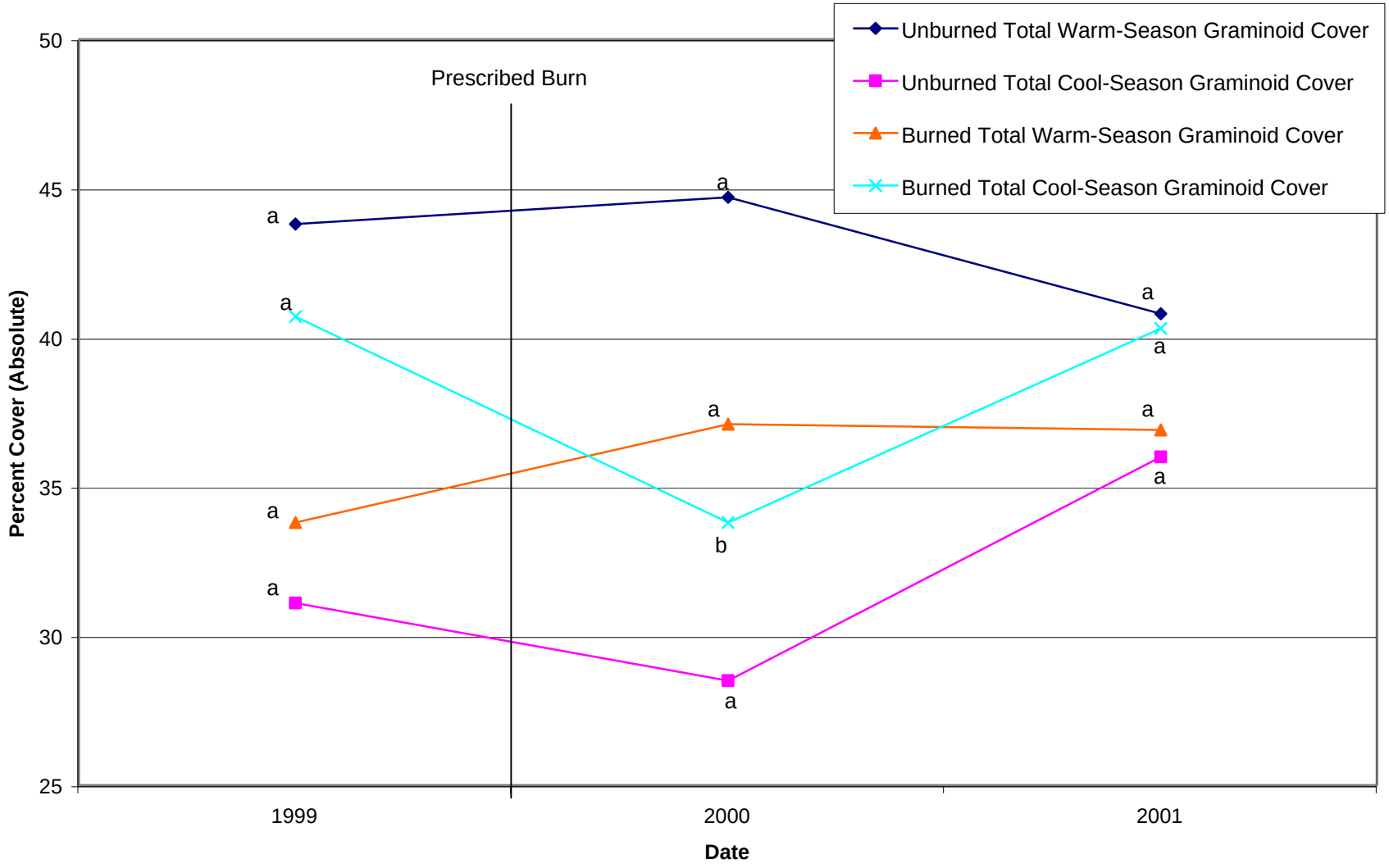
Means within the same treatment having the same letter are not significantly different from the 1999 data (P > 0.05).

Figure 10-4. Total Graminoid Cover - Prescribed Burn Monitoring



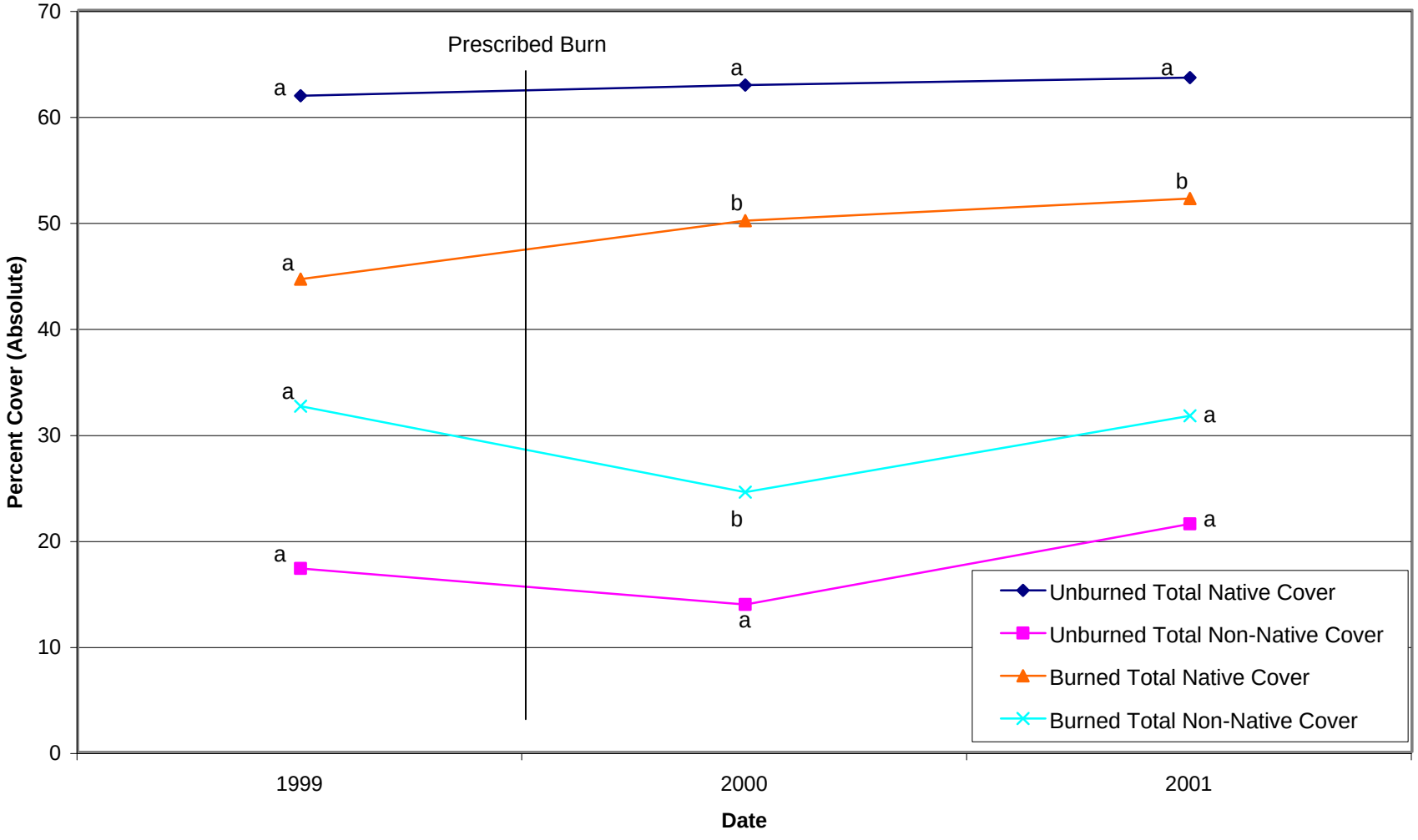
Means within the same treatment having the same letter are not significantly different from the 1999 data (P > 0.05).

Figure 10-5. Warm- vs. Cool-Season Graminoid Cover - Prescribed Burn Monitoring



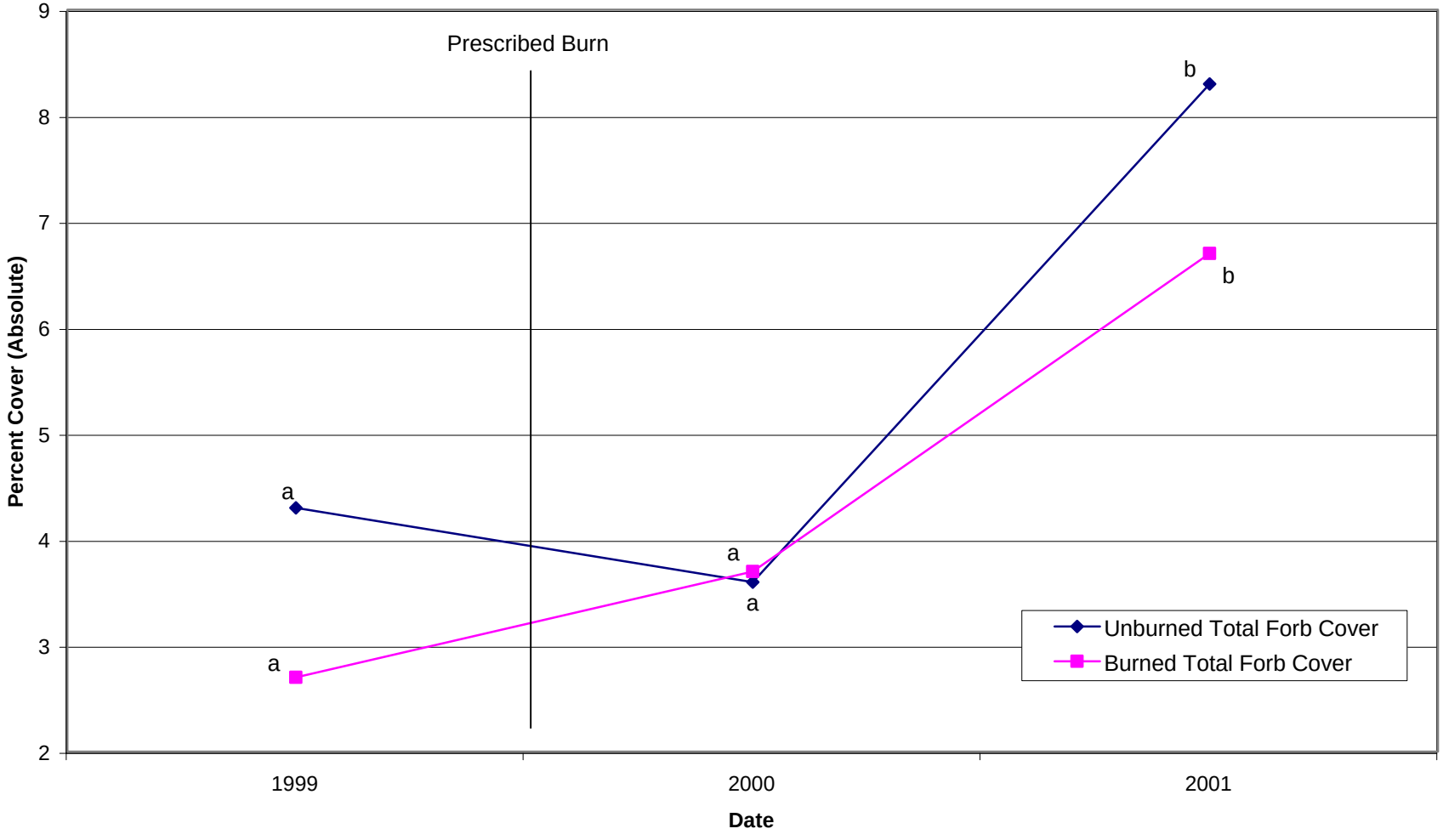
Means within the same treatment having the same letter are not significantly different from the 1999 data (P > 0.05).

Figure 10-6. Native and Non-native Foliar Cover - Prescribed Burn Monitoring



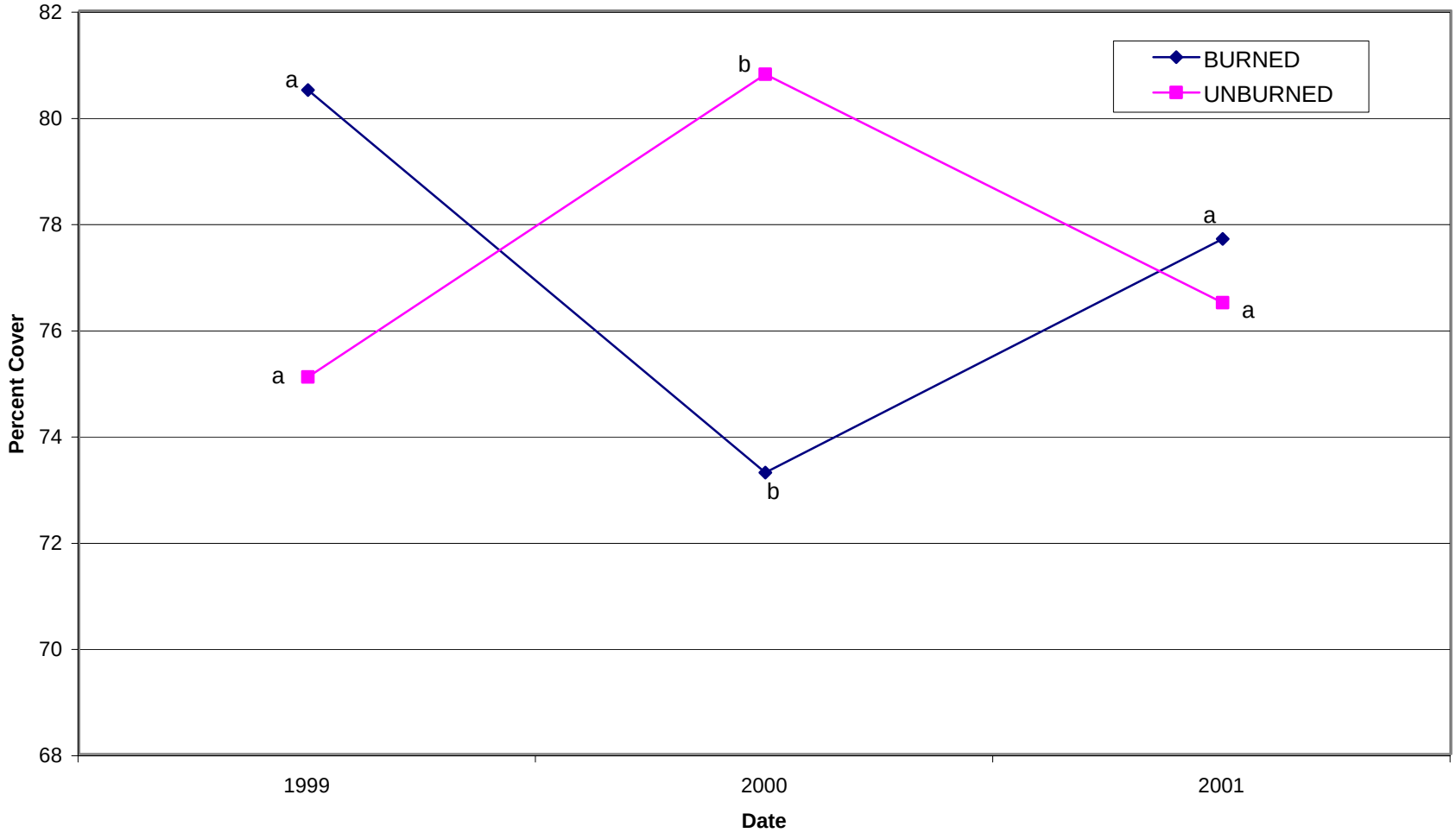
Means within the same treatment having the same letter are not significantly different from the 1999 data (P > 0.05).

Figure 10-7. Total Forb Cover - Prescribed Burn Monitoring



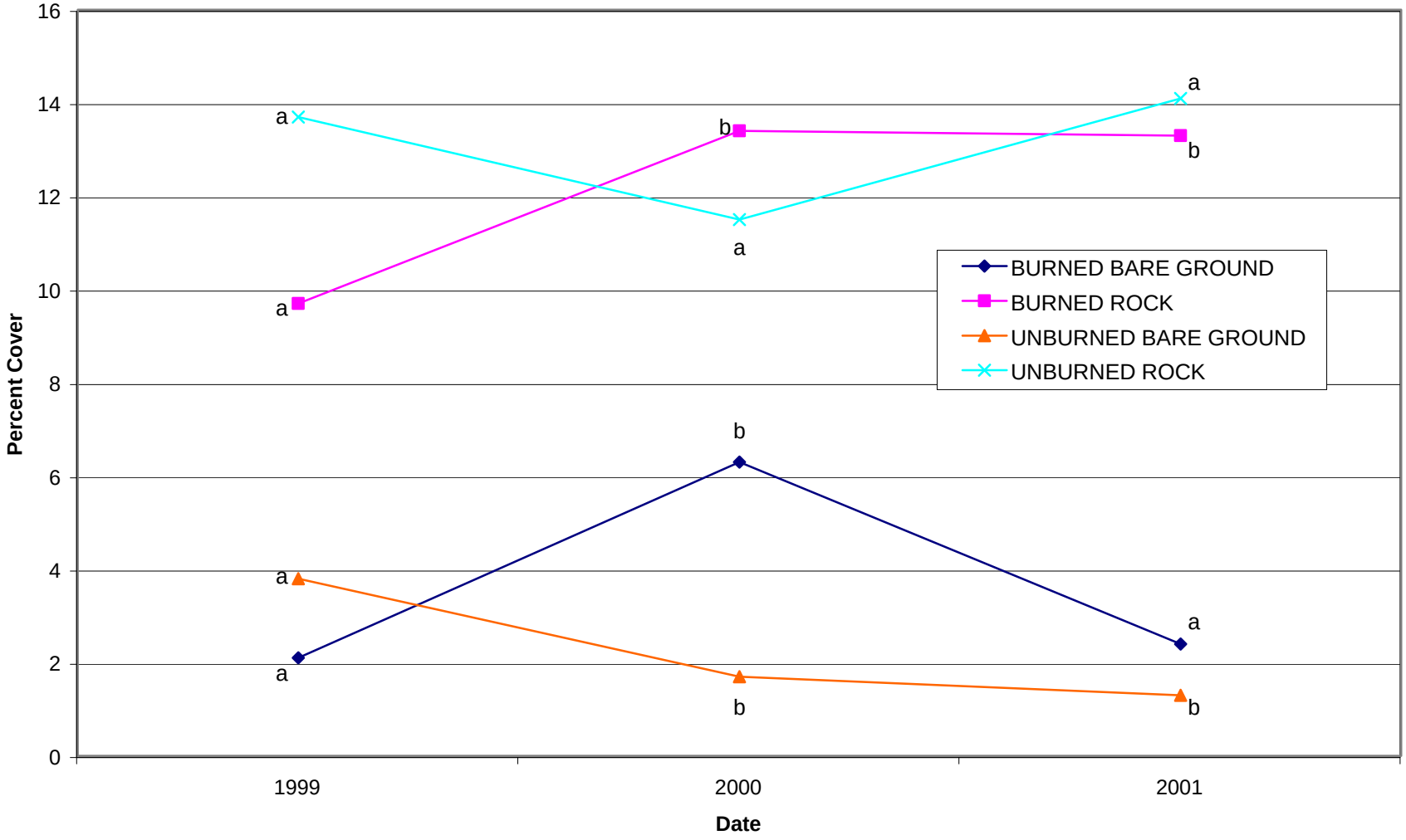
Means within the same treatment having the same letter are not significantly different from the 1999 data (P > 0.05).

Figure 10-8. Litter Cover - Prescribed Burn Monitoring



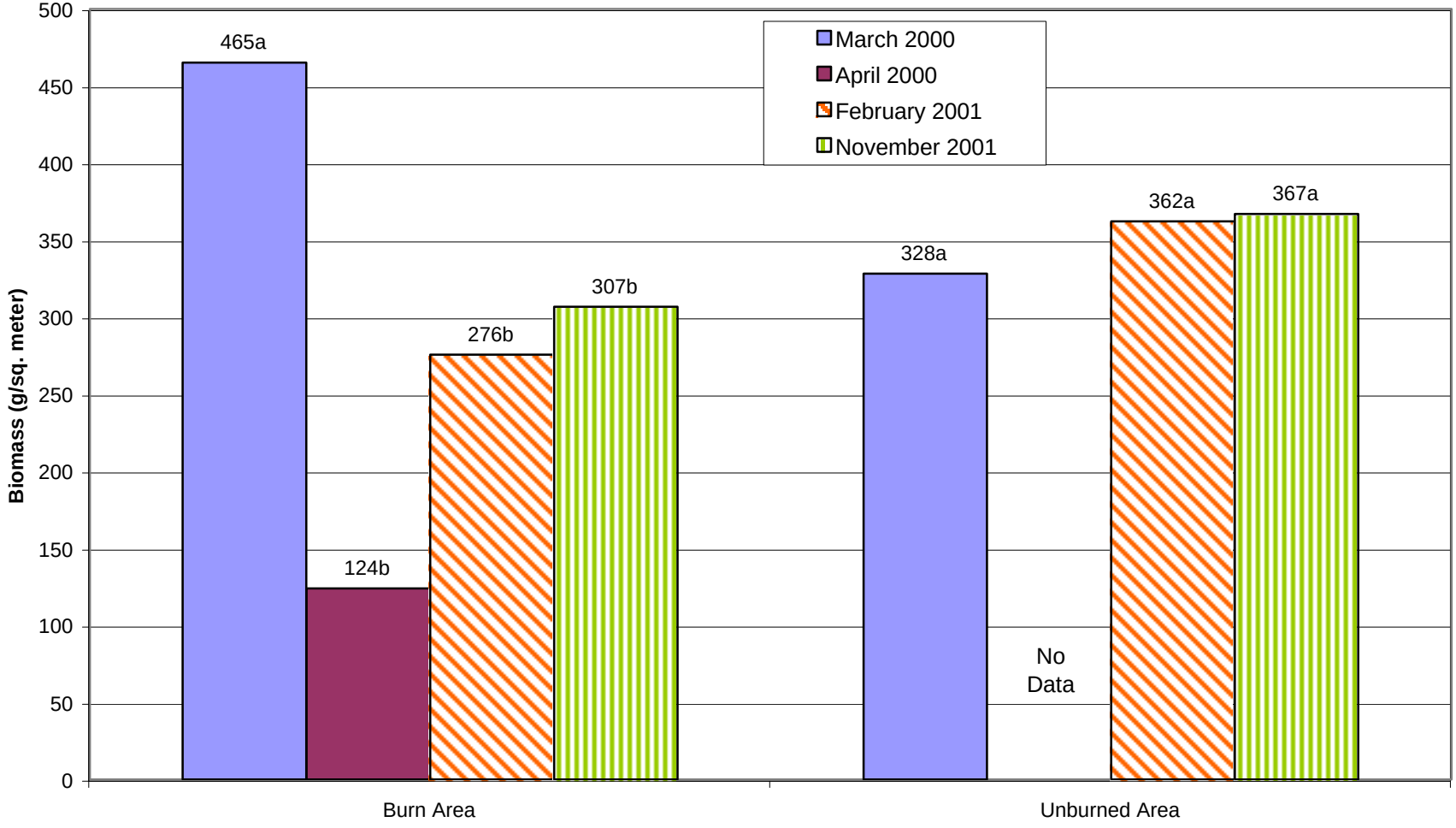
Means within the same treatment having the same letter are not significantly different from the 1999 data (P > 0.05).

Figure 10-9. Rock and Bare Ground Cover - Prescribed Burn Monitoring



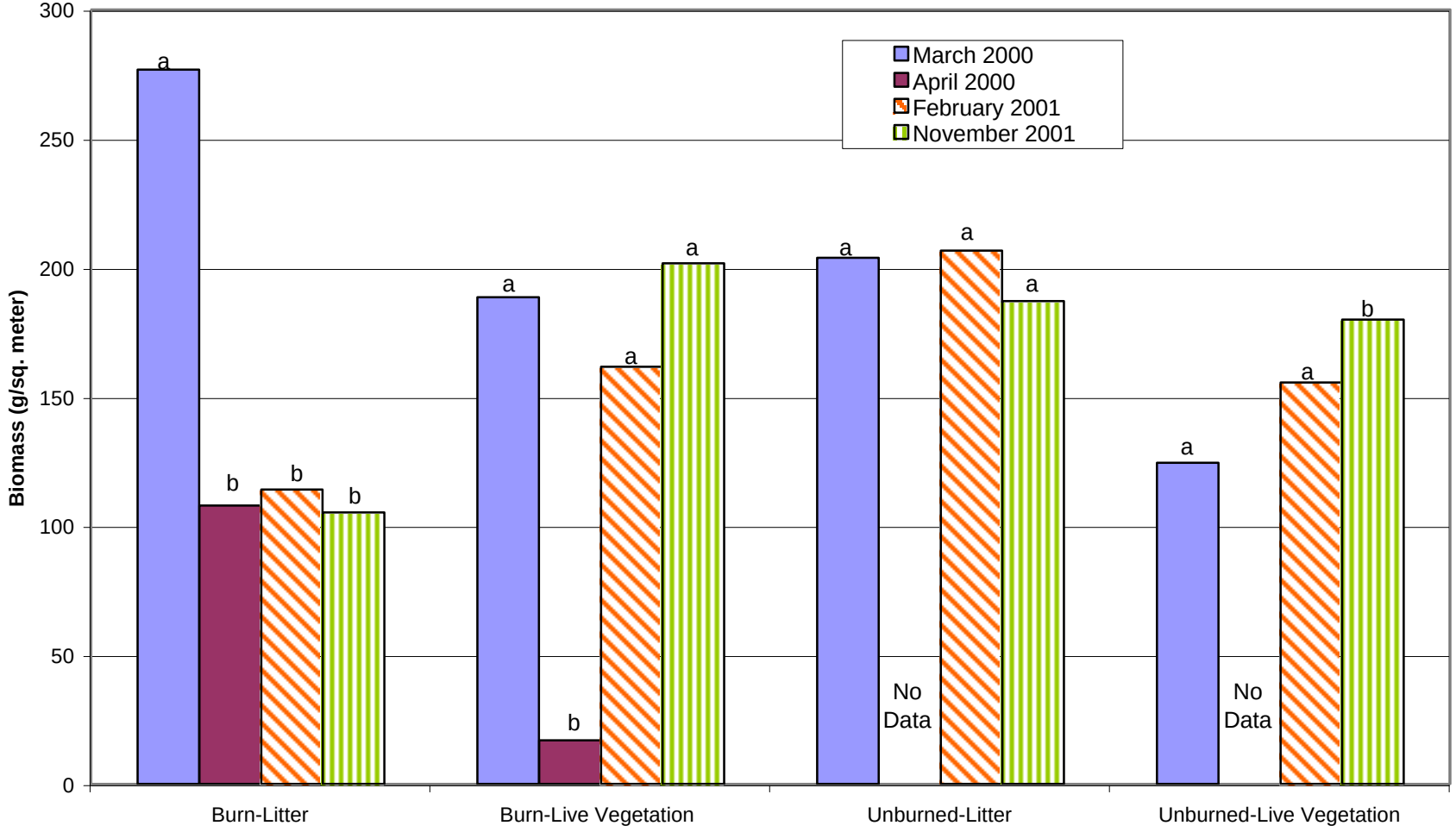
Means within the same treatment having the same letter are not significantly different from the 1999 data (P > 0.05).

Figure 10-10. Prescribed Burn Total Biomass Change



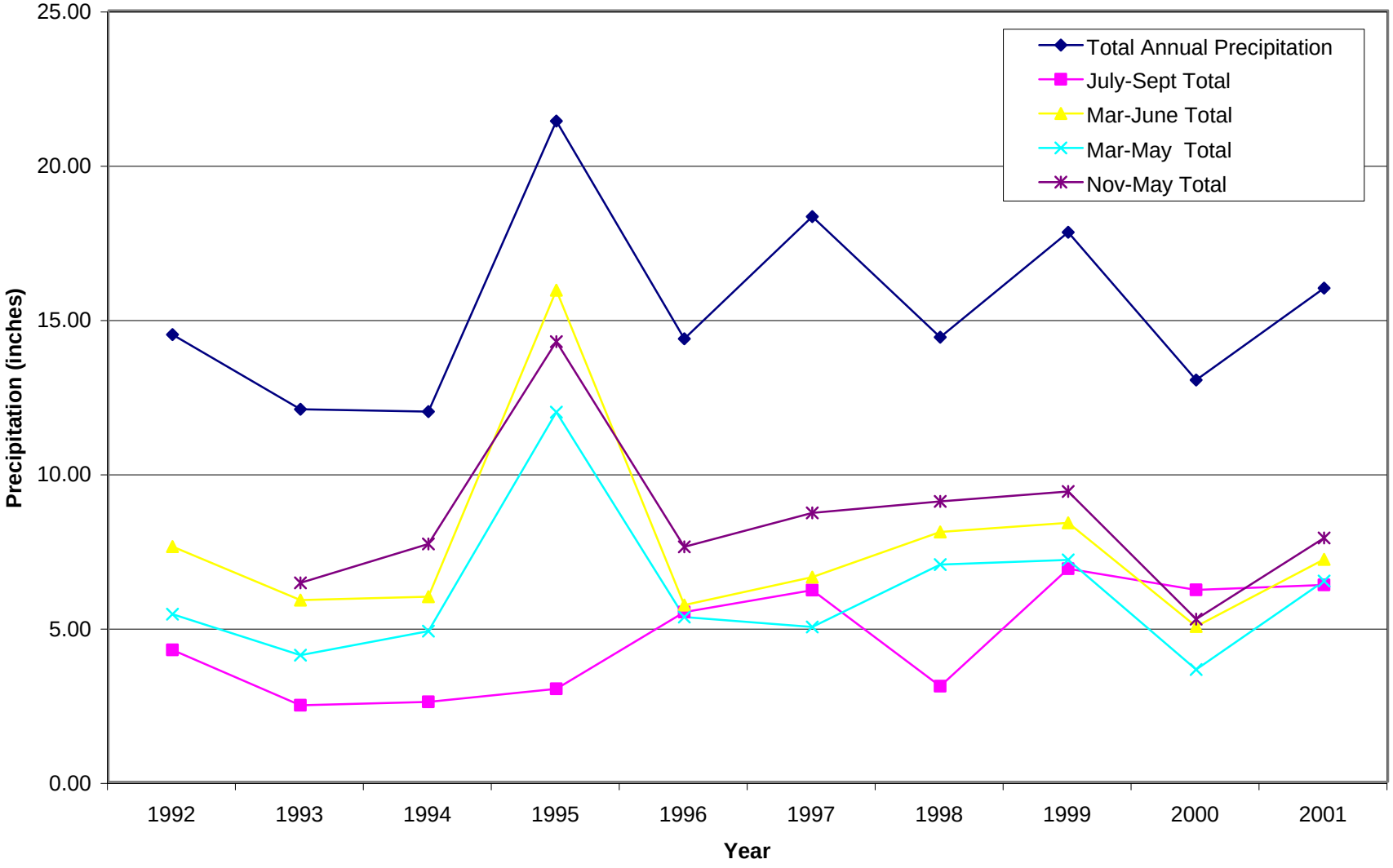
Means within the same treatment having the same letter are not significantly different from the March 2000 data (P > 0.05).

Figure 10-11. Prescribed Burn Biomass Changes



Means within the same treatment having the same letter are not significantly different from the March 2000 data (P > 0.05).

Figure 10-12. Annual Precipitation at Rocky Flats (1992-2001)



Tables

Table 1-1. 1997 and 1998 Xeric Tallgrass Prairie Species Richness Summary

Family	Scientific Name	Speccode	Native	1997	1998	2001
AGAVACEAE	Yucca glauca Nutt.	YUGL1	Y	X	X	X
ANACARDIACEAE	Rhus aromatica Ait. var. trilobata (Nutt.) A. Gray	RHAR1	Y	X	X	X
ANACARDIACEAE	Toxicodendron rydbergii (Small) Greene	TORY1	Y		X	
APIACEAE	Daucus carota L.	DACA2	N	X		
APIACEAE	Harbouria trachypleura (Gray) C. & R.	HATR1	Y	X	X	X
APIACEAE	Lomatium orientale Coult. & Rose	LOOR1	Y	X	X	X
APIACEAE	Musineon divaricatum (Pursh.) Nutt. var. hookeri T. & G.	MUDI1	Y	X	X	X
APOCYNACEAE	Apocynum cannabinum L.	APCA1	Y	X	X	X
ASCLEPIADACEAE	Asclepias pumila (Gray) Vail	ASPU1	Y	X	X	X
ASCLEPIADACEAE	Asclepias speciosa Torr.	ASSP1	Y	X	X	X
ASCLEPIADACEAE	Asclepias stenophylla A. Gray	ASST1	Y	X	X	X
ASCLEPIADACEAE	Asclepias viridiflora Raf.	ASVI1	Y	X	X	X
ASTERACEAE	Achillea millefolium L. ssp. lanulosa (Nutt.) Piper	ACMI1	Y	X	X	X
ASTERACEAE	Ambrosia psilostachya DC.	AMPS1	Y	X	X	X
ASTERACEAE	Antennaria microphylla Rydb.	ANMI1	Y	X	X	X
ASTERACEAE	Antennaria parvifolia Nutt.	ANPA1	Y	X	X	X
ASTERACEAE	Arnica fulgens Pursh.	ARFU1	Y	X	X	X
ASTERACEAE	Artemisia campestris L. ssp. caudata (Michx.) Hall & Clem.	ARCA1	Y	X	X	X
ASTERACEAE	Artemisia dracunculus L.	ARDR1	Y	X	X	X
ASTERACEAE	Artemisia frigida Willd.	ARFR1	Y	X	X	X
ASTERACEAE	Artemisia ludoviciana Nutt. var. ludoviciana	ARLU1	Y	X	X	X
ASTERACEAE	Aster campestris Nutt.	ASCA2	Y			X
ASTERACEAE	Aster falcatus Lindl.	ASFA1	Y	X	X	X
ASTERACEAE	Aster fendleri A. Gray	ASFE1	Y	X		
ASTERACEAE	Aster porteri Gray	ASPO1	Y	X	X	X
ASTERACEAE	Carduus nutans L. ssp. macrolepis (Peterm.) Kazmi	CANU1	N	X	X	X
ASTERACEAE	Centaurea diffusa Lam.	CEDI1	N	X	X	X
ASTERACEAE	Chrysopsis fulcrata Greene	CHFU1	Y	X	X	X
ASTERACEAE	Chrysopsis villosa Pursh.	CHVI1	Y	X	X	X
ASTERACEAE	Chrysothamnus nauseosus (Pall.) Britt. ssp. graveolens (Nutt.) Piper	CHNA1	Y	X	X	
ASTERACEAE	Chrysothamnus nauseosus (Pall.) Britt. ssp. nauseosus	CHNA2	Y		X	X
ASTERACEAE	Cichorium intybus L.	CIIN1	N	X	X	X
ASTERACEAE	Cirsium arvense (L.) Scop.	CIAR1	N	X	X	X
ASTERACEAE	Cirsium undulatum (Nutt.) Spreng.	CIUN1	Y	X	X	X
ASTERACEAE	Cirsium vulgare (Savi) Ten.	CIVU1	N		X	X
ASTERACEAE	Conyza canadensis (L.) Cronq.	COCA1	Y	X	X	X
ASTERACEAE	Dyssodia papposa (Vent) Hitchc.	DYPA1	N	X	X	X
ASTERACEAE	Erigeron canus A. Gray	ERCA1	Y	X	X	X
ASTERACEAE	Erigeron compositus Pursh var. dicoideus A. Gray	ERCO1	Y	X	X	X
ASTERACEAE	Erigeron divergens T. & G.	ERDI1	Y	X	X	X
ASTERACEAE	Erigeron flagellaris A. Gray	ERFL1	Y	X	X	X
ASTERACEAE	Erigeron strigosus Muhl. ex Willd.	ERST1	Y			X
ASTERACEAE	Erigeron vetensis Rydb.	ERVE1	Y	X	X	X
ASTERACEAE	Gaillardia aristata Pursh.	GAAR1	Y	X	X	X
ASTERACEAE	Grindelia squarrosa (Pursh.) Dun.	GRSQ1	Y	X	X	X
ASTERACEAE	Gutierrezia sarothrae (Pursh.) Britt. & Rusby	GUSA1	Y	X	X	X
ASTERACEAE	Happlopappus spinulosus (Pursh) DC.	HASP1	Y	X		
ASTERACEAE	Helianthus annuus L.	HEAN1	Y	X	X	X
ASTERACEAE	Helianthus petiolaris Nutt.	HEPE1	Y	X	X	X
ASTERACEAE	Helianthus pumilus Nutt.	HEPU1	Y	X	X	X
ASTERACEAE	Helianthus rigidus (Cass.) Desf. ssp. subrhomboideus (Rydb.) Heiser	HERI1	Y	X	X	X
ASTERACEAE	Hymenopappus filifolius Hook. var. cinereus (Rydb.) I. M. Johnst.	HYFI1	Y	X	X	X
ASTERACEAE	Kuhnia chlorolepis Woot. & Standl.	KUCH1	Y		X	X
ASTERACEAE	Kuhnia eupatorioides L.	KUEU1	Y	X	X	X
ASTERACEAE	Lactuca oblongifolia Nutt.	LAOB1	Y		X	
ASTERACEAE	Lactuca serriola L.	LASE1	N	X	X	X
ASTERACEAE	Leucelene ericoides (Torr.) Greene	LEER1	Y	X	X	X
ASTERACEAE	Liatris punctata Hook.	LIPU1	Y	X	X	X
ASTERACEAE	Machaeranthera canescens (Pursh) A. Gray	MACA1	Y	X	X	
ASTERACEAE	Microseris cuspidata (Pursh.) Sch. Bip.	MICU1	Y	X	X	X
ASTERACEAE	Onopordum acanthium L.	ONAC1	N			X
ASTERACEAE	Ratibida columnifera (Nutt.) Woot. & Standl.	RACO1	Y	X	X	X

Table 1-1. (cont.)

Family	Scientific Name	Speccode	Native	1997	1998	2001
ASTERACEAE	Scorzonera laciniata L.	SCLA1	N	X	X	X
ASTERACEAE	Senecio fendleri Gray	SEFE1	Y	X	X	X
ASTERACEAE	Senecio integerrimus Nutt.	SEIN1	Y	X	X	
ASTERACEAE	Senecio plattensis Nutt.	SEPL1	Y	X	X	X
ASTERACEAE	Senecio spartioides T. & G.	SESP1	Y	X	X	X
ASTERACEAE	Senecio tridenticulatus Rydb.	SETR1	Y		X	
ASTERACEAE	Solidago missouriensis Nutt.	SOMI1	Y	X	X	X
ASTERACEAE	Solidago mollis Bart.	SOMO1	Y	X	X	X
ASTERACEAE	Solidago rigida L.	SORI1	Y	X	X	X
ASTERACEAE	Sonchus asper (L.) Hill	SOAS1	N		X	
ASTERACEAE	Taraxacum officinale Weber	TAOF1	N	X	X	X
ASTERACEAE	Thelesperma megapotanicum (Spreng.) O. Ktze.	THME1	Y	X	X	X
ASTERACEAE	Townsendia grandiflora (Nutt.)	TOGR1	Y		X	X
ASTERACEAE	Townsendia hookeri Beaman	TOHO1	Y	X	X	X
ASTERACEAE	Tragopogon dubius Scop.	TRDU1	N	X	X	X
ASTERACEAE	Tragopogon porrifolius L.	TRPO1	N			X
ASTERACEAE	Xanthium strumarium L.	XAST1	Y			X
BERBERIDACEAE	Berberis repens Lindl.	BERE1	Y		X	X
BORAGINACEAE	Cryptantha virgata (Porter) Payson	CRVI1	Y	X	X	X
BORAGINACEAE	Cynoglossum officinale L.	CYOF1	N		X	X
BORAGINACEAE	Lappula redowskii (Hornem.) Greene	LARE1	Y	X	X	X
BORAGINACEAE	Lithospermum incisum Lehm.	LIIN1	Y	X	X	X
BORAGINACEAE	Mertensia lanceolata (Pursh.) A. DC.	MELA1	Y	X	X	X
BORAGINACEAE	Onosmodium molle Michx. var. occidentale (Mack.) Johnst.	ONMO1	Y	X	X	X
BORAGINACEAE	Plagiobothrys scouleri (H. & A.) I. M. Johnst.	PLSC1	Y		X	
BRASSICACEAE	Alyssum alyssoides (L.) L.	ALAL1	N	X	X	X
BRASSICACEAE	Alyssum minus (L.) Rothmaler var. micranthus (C. A. Mey.) Dudley	ALMI1	N	X	X	X
BRASSICACEAE	Arabis fendleri (S. Wats.) Greene var. fendleri	ARFE3	Y	X	X	X
BRASSICACEAE	Arabis glabra (L.) Bernh.	ARGL1	N		X	
BRASSICACEAE	Arabis hirsuta (L.) Scop. var. pynocarpa (Hopkins) Rollins	ARHI1	Y	X	X	X
BRASSICACEAE	Barbarea vulgaris R. Br.	BAVU1	N	X	X	X
BRASSICACEAE	Camelina microcarpa Andrz. ex DC.	CAMI1	N	X	X	X
BRASSICACEAE	Descurainia pinnata (Walt.) Britt.	DEPI1	Y	X	X	X
BRASSICACEAE	Descurainia richardsonii (Sweet) Schultz	DERI1	Y	X		X
BRASSICACEAE	Descurainia sophia (L.) Webb ex Prantl.	DESO1	N		X	
BRASSICACEAE	Draba nemorosa L.	DRNE1	Y	X	X	
BRASSICACEAE	Draba reptans (Lam.) Fern.	DRRE1	Y	X	X	X
BRASSICACEAE	Erysimum capitatum (Nutt.) DC.	ERCA2	Y	X	X	X
BRASSICACEAE	Lepidium campestre (L.) R. Br.	LECA1	N	X	X	X
BRASSICACEAE	Lepidium densiflorum Schrad.	LEDE1	Y	X	X	X
BRASSICACEAE	Lesquerella montana (A. Gray) Wats.	LEMO1	Y	X	X	X
BRASSICACEAE	Sisymbrium altissimum L.	SIAL1	N	X	X	X
BRASSICACEAE	Thlaspi arvense L.	THAR1	N			X
CACTACEAE	Coryphantha missouriensis (Sweet) Britt. & Rose	COMI1	Y	X	X	X
CACTACEAE	Echinocereus viridiflorus Engelm.	ECVI1	Y	X	X	X
CACTACEAE	Opuntia fragilis (Nutt.) Haw.	OPFR1	Y	X	X	
CACTACEAE	Opuntia macrorhiza Engelm.	OPMA1	Y	X	X	X
CACTACEAE	Pediocactus simpsonii (Engelm.) Britt. & Rose	PESI1	Y	X	X	X
CAMPANULACEAE	Campanula rotundifolia L.	CARO1	Y	X	X	X
CAPPARACEAE	Cleome serrulata Pursh.	CLSE1	Y			X
CAPRIFOLIACEAE	Symphoricarpos occidentalis Hook.	SYOC1	Y	X	X	X
CARYOPHYLLACEAE	Arenaria fendleri A. Gray	ARFE2	Y	X	X	X
CARYOPHYLLACEAE	Cerastium arvense L.	CEAR1	Y	X	X	X
CARYOPHYLLACEAE	Paronychia jamesii T. & G.	PAJA1	Y	X	X	X
CARYOPHYLLACEAE	Silene antirrhina L.	SIAN1	Y	X	X	X
CARYOPHYLLACEAE	Silene drummondii Hook.	SIDR1	Y	X	X	X
CARYOPHYLLACEAE	Spergularia rubra (L.) K. Presl.	SPRU1	N	X	X	X
CARYOPHYLLACEAE	Vaccaria pyramidata Medic.	VAPY1	N		X	
CHENOPODIACEAE	Chenopodium album L.	CHAL1	N		X	X
CHENOPODIACEAE	Chenopodium atrovirens Nutt.	CHAT1	Y		X	
CHENOPODIACEAE	Chenopodium leptophyllum Nutt. ex Moq.	CHLE2	Y	X	X	X
CHENOPODIACEAE	Kochia scoparia (L.) Schrad.	KOSC1	N			X

Table 1-1. (cont.)

Family	Scientific Name	Speccode	Native	1997	1998	2001
CHENOPODIACEAE	Salsola iberica Senn. & Pau.	SAIB1	N	X		X
CLUSIACEAE	Hypericum perforatum L.	HYPE1	N	X	X	X
COMMELINACEAE	Tradescantia occidentalis (Britt.) Smyth	TROC1	Y	X	X	X
CONVOLVULACEAE	Convolvulus arvensis L.	COAR1	N	X	X	X
CONVOLVULACEAE	Evolvulus nuttallianus R. & S.	EVNU1	Y	X	X	X
CRASSULACEAE	Sedum lanceolatum Torr.	SELA1	Y	X	X	X
CUPRESSACEAE	Juniperus communis L.	JUCO1	Y	X	X	X
CUPRESSACEAE	Juniperus scopulorum Sarg.	JUSC1	Y	X	X	X
CYPERACEAE	Carex sp.	CAR1				X
CYPERACEAE	Carex brevior (Dew.) Mack. ex Lunell.	CABR1	Y		X	X
CYPERACEAE	Carex eleocharis Bailey	CAEL1	Y	X	X	X
CYPERACEAE	Carex filifolia Nutt.	CAFI1	Y	X		X
CYPERACEAE	Carex heliophila Mack.	CAHE1	Y	X	X	X
CYPERACEAE	Carex interior Bailey	CAIN1	Y	X		X
CYPERACEAE	Carex oreocharis Holm.	CAOR1	Y	X	X	X
CYPERACEAE	Carex praegracilis W. Boott.	CAPR1	Y	X		X
CYPERACEAE	Eleocharis compressa Sulliv.	ELCO1	Y	X	X	X
CYPERACEAE	Eleocharis macrostachya Britt.	ELMA1	Y	X	X	X
EUPHORBIACEAE	Euphorbia fendleri T. & G.	EUFE1	Y	X	X	X
EUPHORBIACEAE	Euphorbia robusta (Engelm.) Small	EURO1	Y	X	X	X
EUPHORBIACEAE	Euphorbia serpyllifolia Pers.	EUSE1	Y		X	X
EUPHORBIACEAE	Euphorbia spathulata Lam.	EUSP1	Y	X	X	X
EUPHORBIACEAE	Tragia ramosa Nutt.	TRRA1	Y	X	X	
FABACEAE	Amorpha fruticosa L.	AMFR1	Y	X	X	X
FABACEAE	Astragalus adsurgens Pall. var. robustior Hook.	ASAD1	Y	X	X	X
FABACEAE	Astragalus agrestis Dougl. ex G. Don	ASAG1	Y	X	X	X
FABACEAE	Astragalus crassicarpus Nutt.	ASCR1	Y		X	
FABACEAE	Astragalus drummondii Dougl. ex Hook.	ASDR1	Y	X	X	X
FABACEAE	Astragalus flexuosus (Hook.) G. Don	ASFL1	Y	X	X	X
FABACEAE	Astragalus shortianus Nutt. ex T.&G.	ASSH1	Y	X	X	X
FABACEAE	Astragalus spathulatus Sheld.	ASSP2	Y		X	
FABACEAE	Astragalus tridactylicus Gray	ASTR1	Y	X	X	X
FABACEAE	Dalea candida Michx. ex Willd. var. oligophylla (Torr.) Shinners.	DACA1	Y	X	X	X
FABACEAE	Dalea purpurea Vent	DAPU1	Y	X	X	X
FABACEAE	Glycyrrhiza lepidota Pursh.	GLLE1	Y	X	X	X
FABACEAE	Lupinus argenteus Pursh var. argenteus	LUAR1	Y	X	X	X
FABACEAE	Medicago lupulina L.	MELU1	N			X
FABACEAE	Medicago sativa L. ssp. sativa	MESA1	N	X	X	
FABACEAE	Melilotus alba Medic.	MEAL1	N		X	
FABACEAE	Melilotus officinalis (L.) Pall.	MEOF1	N	X	X	X
FABACEAE	Oxytropis lambertii Pursh.	OXLA1	Y	X	X	X
FABACEAE	Psoralea tenuiflora Pursh.	PSTE1	Y	X	X	X
FABACEAE	Robinia pseudo-acacia L.	ROPS1	N	X	X	
FABACEAE	Thermopsis rhombifolia var. divaricarpa (Nels.) Isely	THRH1	Y	X	X	X
FABACEAE	Trifolium pratense L.	TRPR1	N		X	
FABACEAE	Vicia americana Muhl. ex Willd.	VIAM1	Y		X	
GENTIANACEAE	Gentiana affinis Griseb.	GEAF1	Y	X	X	X
GENTIANACEAE	Swertia radiata (Kell.) O. Ktze.	SWRA1	Y	X	X	X
GERANIACEAE	Erodium cicutarium (L.) L'Her.	ERCI1	N	X	X	X
GERANIACEAE	Geranium caespitosum James ssp. caespitosum	GECA1	Y	X	X	X
GROSSULARIACEAE	Ribes aureum Pursh	RIAU1	Y	X	X	
GROSSULARIACEAE	Ribes cereum Dougl.	RICE1	Y	X		X
HYDROPHYLLACEAE	Hydrophyllum fendleri (Gray) Heller	HYFE1	Y		X	
HYDROPHYLLACEAE	Phacelia heterophylla Pursh.	PHHE1	Y	X	X	X
IRIDACEAE	Iris missouriensis Nutt.	IRMI1	Y	X	X	X
IRIDACEAE	Sisyrinchium montanum Greene	SIMO1	Y	X	X	X
JUNCACEAE	Juncus balticus Willd.	JUBA1	Y	X	X	X
JUNCACEAE	Juncus dudleyi Wieg.	JUDU1	Y	X		
JUNCACEAE	Juncus interior Wieg.	JUIN1	Y	X	X	X
JUNCACEAE	Juncus longistylis Torr.	JULO1	Y	X		
LAMIACEAE	Hedeoma hispidum Pursh.	HEHI1	Y	X		X
LAMIACEAE	Marrubium vulgare L.	MAVU1	N	X	X	X

Table 1-1. (cont.)

Family	Scientific Name	Speccode	Native	1997	1998	2001
LAMIACEAE	Monarda fistulosa L. var. menthifolia (Grah.) Fern.	MOFI1	Y	X	X	X
LAMIACEAE	Monarda pectinata Nutt.	MOPE1	Y			X
LAMIACEAE	Nepeta cataria L.	NECA1	N		X	X
LAMIACEAE	Prunella vulgaris L.	PRVU1	Y		X	
LAMIACEAE	Scutellaria brittonii Porter	SCBR1	Y	X	X	
LILIACEAE	Allium cernuum Roth	ALCE1	Y	X	X	X
LILIACEAE	Allium geyeri S. Wats.	ALGE1	Y	X	X	X
LILIACEAE	Allium textile A. Nels. & Macbr.	ALTE1	Y	X	X	X
LILIACEAE	Calochortus gunnisonii S. Wats.	CAGU1	Y	X	X	X
LILIACEAE	Leucocrinum montanum Nutt.	LEMO2	Y	X	X	X
LILIACEAE	Zigadenus venenosus Wats. var. gramineus (Rydb.) Walsh ex Peck	ZIVE1	Y	X		X
LINACEAE	Linum perenne L. var. lewisii (Pursh.) Eat. & Wright	LIPE1	Y	X	X	X
LINACEAE	Linum pratense (Nort.) Small	LIPR1	Y			X
MALVACEAE	Malva neglecta Wallr.	MANE1	N	X		
MALVACEAE	Sphaeralcea coccinea (Pursh.) Rydb.	SPCO1	Y	X	X	X
NYCTAGINACEAE	Mirabilis hirsuta (Pursh.) MacM.	MIHI1	Y	X	X	X
NYCTAGINACEAE	Mirabilis linearis (Pursh.) Heimerl	MILI1	Y	X	X	X
ONAGRACEAE	Calylophus serrulatus (Nutt.) Raven	CASE2	Y	X	X	X
ONAGRACEAE	Epilobium paniculatum Nutt.	EPPA1	Y		X	
ONAGRACEAE	Gaura coccinea Pursh.	GACO1	Y	X	X	X
ONAGRACEAE	Oenothera howardii (A. Nels.) W. L. Wagner	OEHO1	Y	X	X	X
ONAGRACEAE	Oenothera villosa Thunb. ssp. strigosa (Rydb.) Dietrich & Raven	OEVI1	Y	X	X	X
OROBANCHACEAE	Orobanche fasciculata Nutt.	ORFA1	Y	X	X	X
OXALIDACEAE	Oxalis dillenii Jacq.	OXDI1	N	X	X	X
PAPAVERACEAE	Argemone polyanthemos (Fedde) G. Ownbey	ARPO1	Y	X	X	X
PINACEAE	Pinus ponderosa Laws	PIPO1	Y	X	X	X
PINACEAE	Pseudotsuga menziesii (Mirb.) Franco	PSME1	Y	X	X	X
PLANTAGINACE	Plantago lanceolata L.	PLLA1	N	X	X	X
PLANTAGINACE	Plantago patagonica Jacq.	PLPA1	Y	X	X	X
POACEAE	Aegilops cylindrica Host	AECY1	N		X	X
POACEAE	Agropyron caninum (L.) Beauv. ssp. majus (Vasey) C. L. Hitchc.	AGCA1	Y	X	X	X
POACEAE	Agropyron cristatum (L.) Gaertn.	AGCR1	N	X	X	X
POACEAE	Agropyron desertorum (Fisch.) Schult.	AGDE1	N	X	X	X
POACEAE	Agropyron elongatum (Host) Beauv.	AGEL1	N		X	X
POACEAE	Agropyron griffithsii Scribn. & Smith	AGGR1	Y	X	X	X
POACEAE	Agropyron intermedium (Host) Beauv.	AGIN1	N	X	X	X
POACEAE	Agropyron smithii Rydb.	AGSM1	Y	X	X	X
POACEAE	Agrostis scabra Willd.	AGSC1	Y	X		X
POACEAE	Agrostis stolonifera L.	AGST1	N			X
POACEAE	Alopecurus geniculatus L.	ALGE2	Y	X		X
POACEAE	Andropogon gerardii Vitman	ANGE1	Y	X	X	X
POACEAE	Andropogon scoparius Michx.	ANSC1	Y	X	X	X
POACEAE	Aristida basiramea Engelm. ex Vasey var. basiramea	ARBA1	Y	X	X	
POACEAE	Aristida purpurea Nutt. var. longiseta (Steud.) Vasey	ARFE1	Y	X	X	X
POACEAE	Aristida purpurea Nutt. var. robusta (Merrill) A. Holmgren & N. Holmgr	ARLO1	Y	X	X	X
POACEAE	Bouteloua curtipendula (Michx.) Torr.	BOCU1	Y	X	X	X
POACEAE	Bouteloua gracilis (H. B. K.) Lag ex Griffiths	BOGR1	Y	X	X	X
POACEAE	Bouteloua hirsuta Lag	BOHI1	Y	X	X	X
POACEAE	Bromus inermis Leyss. ssp. inermis	BRIN1	N	X	X	X
POACEAE	Bromus japonicus Thunb. ex Murr.	BRJA1	N	X	X	X
POACEAE	Bromus tectorum L.	BRTE1	N	X	X	X
POACEAE	Buchloe dactyloides (Nutt.) Engelm.	BUDA1	Y	X	X	X
POACEAE	Dactylis glomerata L.	DAGL1	N	X	X	X
POACEAE	Danthonia spicata (L.) Beauv. ex R. & S.	DASP1	Y	X	X	X
POACEAE	Dichanthelium linearifolium (Scribn.) Gould	DILI1	Y			X
POACEAE	Dichanthelium oligosanthes (Schultz) Gould var. scribnerianum (Nash) G	DIOL1	Y	X	X	X
POACEAE	Echinochloa crusgallii (L.) Beauv.	ECCR1	N		X	X
POACEAE	Elymus canadensis L.	ELCA1	Y	X		X
POACEAE	Elymus juncea Fisch.	ELJU1	N	X		
POACEAE	Festuca octoflora Walt.	FEOC1	Y			X
POACEAE	Festuca ovina L. var. rydbergii St. Yves	FEOV1	Y	X	X	X
POACEAE	Festuca pratensis Huds.	FEPR1	Y			X

Table 1-1. (cont.)

Family	Scientific Name	Speccode	Native	1997	1998	2001
POACEAE	Hordeum brachyantherum Nevski	HOBR1	Y			X
POACEAE	Hordeum jubatum L.	HOJU1	Y		X	X
POACEAE	Koeleria pyramidata (Lam.) Beauv.	KOPY1	Y	X	X	X
POACEAE	Lolium perenne L. var. aristatum Willd.	LOPE1	N	X		
POACEAE	Lycurus phleoides H.B.K.	LYPH1	Y			X
POACEAE	Muhlenbergia montana (Nutt.) Hitchc.	MUMO1	Y	X	X	X
POACEAE	Muhlenbergia wrightii Vasey	MUWR1	Y		X	X
POACEAE	Oryzopsis hymenoides (R. & S.) Ricker	ORHY1	Y	X	X	X
POACEAE	Panicum capillare L.	PACA1	Y		X	X
POACEAE	Panicum virgatum L.	PAVI1	Y	X	X	X
POACEAE	Phleum pratense L.	PHPR1	N	X	X	X
POACEAE	Poa bulbosa L.	POBU1	N		X	X
POACEAE	Poa canbyi (Scribn.) Piper	POCA1	Y	X	X	X
POACEAE	Poa compressa L.	POCO1	N	X	X	X
POACEAE	Poa fendleriana (Steud.) Vasey	POFE1	Y	X	X	X
POACEAE	Poa pratensis L.	POPR1	N	X	X	X
POACEAE	Schedonnardus paniculatus (Nutt.) Trel.	SCPA2	N		X	
POACEAE	Secale cereale L.	SECE1	N	X	X	X
POACEAE	Setaria viridis (L.) Beauv.	SEVI1	N	X	X	
POACEAE	Sitanion hystrix (Nutt.) Sm. var. brevifolium (Sm.) Hitchc.	SIHY1	Y	X	X	X
POACEAE	Sorghastrum nutans (L.) Nash	SONU1	Y	X	X	X
POACEAE	Sporobolus asper (Michx.) Kunth	SPAS1	Y	X	X	X
POACEAE	Sporobolus cryptandrus (Torr.) A. Gray	SPCR1	Y	X	X	X
POACEAE	Sporobolus heterolepis (A. Gray) A. Gray	SPHE1	Y	X	X	X
POACEAE	Stipa comata Trin. & Rupr.	STCO1	Y	X	X	X
POACEAE	Stipa neomexicana (Thur.) Scribn.	STNE1	Y		X	X
POACEAE	Stipa robusta (Vasey) Scribn.	STRO1	Y			X
POACEAE	Stipa spartea Trinius	STSP1	Y	X	X	X
POACEAE	Stipa viridula Trin.	STVI1	Y	X	X	X
POACEAE	Triticum aestivum L.	TRAE1	N		X	
POLEMONIACEAE	Collomia linearis Nutt.	COLI1	Y			X
POLEMONIACEAE	Gilia opthalmoides Brand. ssp. clokeyi (Mason) A. & V. Grant	GIOP1	Y		X	
POLEMONIACEAE	Ipomopsis spicata (Nutt.) V. Grant ssp. spicata	IPSP1	Y	X	X	X
POLEMONIACEAE	Navarretia minima Nutt.	NAMI1	N	X	X	
POLYGONACEAE	Eriogonum alatum Torr.	ERAL1	Y	X	X	X
POLYGONACEAE	Eriogonum effusum Nutt.	EREF1	Y	X	X	X
POLYGONACEAE	Eriogonum umbellatum Torr.	ERUM1	Y	X	X	X
POLYGONACEAE	Polygonum arenastrum Jord. ex Bor.	POAR1	N		X	X
POLYGONACEAE	Polygonum convolvulus L.	POCO2	N	X	X	X
POLYGONACEAE	Polygonum douglasii Greene	PODO1	Y		X	
POLYGONACEAE	Polygonum persicaria L.	POPE2	N			X
POLYGONACEAE	Polygonum ramosissimum Michx.	PORA1	Y	X		X
POLYGONACEAE	Polygonum sawatchense Small	POSA1	Y		X	
POLYGONACEAE	Rumex acetosella L.	RUAC1	N	X	X	X
POLYGONACEAE	Rumex crispus L.	RUCR1	N	X	X	X
POLYGONACEAE	Rumex salicifolius Weinm. ssp. triangulivalvis Danser	RUSA1	Y	X	X	
PORTULACACEAE	Claytonia rosea Rydb.	CLRO1	Y		X	
PORTULACACEAE	Portulaca oleracea L.	POOL1	N			X
PORTULACACEAE	Talinum parviflorum Nutt.	TAPA1	Y	X	X	X
PRIMULACEAE	Androsace occidentalis Pursh.	ANOC1	Y	X	X	X
RANUNCULACEAE	Anemone patens L.	ANPA2	Y	X	X	X
RANUNCULACEAE	Clematis ligusticifolia Nutt.	CLLI1	Y	X		
RANUNCULACEAE	Delphinium nuttalianum Pritz. ex Walpers	DENU1	Y	X	X	X
RANUNCULACEAE	Delphinium virescens Nutt. ssp. penardii (Huth) Ewan	DEVI1	Y	X	X	X
RANUNCULACEAE	Myosurus minimus L.	MYMI1	Y	X	X	
ROSACEAE	Amelanchier alnifolia Nutt.	AMAL1	Y	X	X	X
ROSACEAE	Crataegus erythropoda Ashe	CRER1	Y	X	X	X
ROSACEAE	Geum macrophyllum Willd.	GEMA1	Y	X		X
ROSACEAE	Potentilla fissa Nutt.	POFI1	Y	X	X	X
ROSACEAE	Potentilla gracilis Dougl. ex Hook. var. glabrata (Lehm.) C. L. Hitchc.	POGR1	Y	X	X	X
ROSACEAE	Potentilla hippiana Lehm.	POHI1	Y	X	X	X
ROSACEAE	Potentilla pensylvanica L.	POPE4	Y	X	X	X

Table 1-1. (cont.)

Family	Scientific Name	Speccode	Native	1997	1998	2001
ROSACEAE	Prunus pumila L. var. besseyi (Bailey) Gl.	PRPU1	Y	X	X	X
ROSACEAE	Prunus virginiana L. var. melanocarpa (A. Nels.) Sarg.	PRVI1	Y	X	X	X
ROSACEAE	Rosa acicularis Lindl.	ROAC1	Y		X	
ROSACEAE	Rosa arkansana Porter	ROAR1	Y	X	X	X
ROSACEAE	Rosa woodsii Lindl.	ROWO1	Y		X	
ROSACEAE	Sanguisorba minor Scop.	SAMI1	N			X
RUBIACEAE	Galium aparine L.	GAAP1	Y	X	X	X
RUBIACEAE	Galium septentrionale Roemer & Schultes	GASE1	Y		X	
SALICACEAE	Populus alba L.	POAL1	Y			X
SALICACEAE	Populus deltoides Marsh. ssp. monilifera (Ait.) Eckenw.	PODE1	Y	X	X	X
SALICACEAE	Salix amygdaloides Anderss.	SAAM1	Y			X
SANTALACEAE	Comandra umbellata (L.) Nutt.	COUM1	Y	X	X	X
SAXIFRAGACEAE	Heuchera parvifolia Nutt. ex T.& G.	HEPA1	Y	X	X	X
SAXIFRAGACEAE	Saxifraga rhomoidea Greene	SARH1	Y	X	X	
SCROPHULARIACEAE	Castilleja integra A. Gray	CAIN2	Y	X	X	X
SCROPHULARIACEAE	Castilleja sessiliflora Pursh.	CASE3	Y	X	X	X
SCROPHULARIACEAE	Collinsia parviflora Doug. ex Lindl.	COPA1	Y	X	X	
SCROPHULARIACEAE	Linaria dalmatica (L.) Mill.	LIDA1	N	X	X	X
SCROPHULARIACEAE	Linaria vulgaris Hill	LIVU1	N	X		X
SCROPHULARIACEAE	Penstemon secundiflorus Benth.	PESE1	Y	X	X	X
SCROPHULARIACEAE	Penstemon strictus Bentham in De Candolle	PEST1	Y	X		
SCROPHULARIACEAE	Penstemon virens Penn.	PEVI1	Y	X	X	X
SCROPHULARIACEAE	Penstemon virgatus Gray ssp. asa-grayi Crosswhite	PEVI2	Y	X		
SCROPHULARIACEAE	Scrophularia lanceolata Pursh.	SCLA2	Y		X	
SCROPHULARIACEAE	Verbascum blattaria L.	VEBL1	N	X	X	X
SCROPHULARIACEAE	Verbascum thapsus L.	VETH1	N	X	X	X
SCROPHULARIACEAE	Veronica peregrina L. var. xalapensis (H. B. K.) St. John & Warren	VEPE1	Y	X	X	X
SELAGINELLACEAE	Selaginella densa Rydb.	SEDE1	Y	X	X	X
SOLANACEAE	Physalis heterophylla Nees	PHHE2	Y	X	X	X
SOLANACEAE	Physalis pumila Nutt. ssp. Hispida (Waterfall) Hinton	PHPU1	Y			X
SOLANACEAE	Physalis virginiana P. Mill.	PHVI2	Y	X	X	X
SOLANACEAE	Solanum rostratum Dun.	SORO1	Y		X	
SOLANACEAE	Solanum triflorum Nutt.	SOTR1	Y	X		X
TYPHACEAE	Typha latifolia L.	TYLA1	Y			X
ULMACEAE	Ulmus pumila L.	ULPU1	N	X	X	X
VERBENACEAE	Lippia cuneifolia (Torr.) Steud.	LICU1	Y	X	X	X
VERBENACEAE	Verbena bracteata Lag. & Rodr.	VEBR1	Y	X	X	X
VIOLACEAE	Viola nuttallii Pursh.	VINU1	Y	X	X	X
	Total number of species			274	295	292
	Percent native species			81	79	79

Table 1-2. 2001 Estimated Weed Infestation Acreage Summary for the Rocky Flats Environmental Technology Site

	2001 Acreage				
		Density Level			
Common Name	**Site Total**	**High**	**Medium**	**Low**	**Scattered**
Diffuse Knapweed	1957	381	525	674	377
Musk Thistle	869	9	84	430	346
Mullein	1357	47	183	627	500
Jointed Goatgrass	69	NA	NA	NA	NA
Annual Rye	62	NA	NA	NA	NA
Scotch Thistle	4	NA	NA	NA	NA
Dame's Rocket	1	NA	NA	NA	NA
Russian Knapweed	<1	NA	NA	NA	NA
Bouncingbet	<1	NA	NA	NA	NA

All values are approximate acreages. NA = Data not collected by density level.

See text for density level descriptions.

Table 1-3. Comparison of 1997-2001 Weed Infestation Extents at the Rocky Flats Environmental Technology Site

			Density Level			
Weed Species	**Year**	**Site Total**	**High**	**Medium**	**Low**	**Scattered**
Diffuse Knapweed	1997	2678	696	893	658	431
	1998	2913	761	778	987	388
	1999	2295	466	613	873	343
	2000	2223	510	531	771	412
	2001	1957	381	525	674	377
Musk Thistle	1997	474	2	270	202	0
	1998	1685	32	515	1035	102
	1999	1353	1	311	684	357
	2000	792	0	55	242	494
	2001	869	9	84	430	346
Mullein	1997	575	117	238	203	17
	1998	867	168	225	460	13
	1999	1068	130	204	450	284
	2000	1010	69	184	451	307
	2001	1357	47	183	627	500

All values are approximate acreages.

See text for density level descriptions.

Table 2-1. 1993-2001 Xeric Mixed Grassland Species Richness Summary

				TR01					TR06					TR12				
Family	**Scientific Name**	**Speccode**	**Native**	**1993**	**1994**	**1995**	**1998**	**2001**	**1993**	**1994**	**1995**	**1998**	**2001**	**1993**	**1994**	**1995**	**1998**	**2001**
AGAVACEAE	Yucca glauca Nutt.	YUGL1	Y						X	X	X	X	X					
ANACARDIACEAE	Rhus aromatica Ait. var. trilobata (Nutt.) A. Gray	RHAR1	Y	X	X	X	X	X										
APIACEAE	Harbouria trachypleura (Gray) C. & R.	HATR1	Y											X				
APIACEAE	Lomatium orientale Coult. & Rose	LOOR1	Y		X	X	X	X		X	X	X	X		X	X	X	X
ASCLEPIADACEAE	Asclepias stenophylla A. Gray	ASST1	Y					X										
ASCLEPIADACEAE	Asclepias viridiflora Raf.	ASVI1	Y	X	X	X	X	X						X	X	X	X	X
ASTERACEAE	Achillea millefolium L. ssp. lanulosa (Nutt.) Piper	ACMI1	Y	X	X	X	X							X	X	X	X	
ASTERACEAE	Ambrosia psilostachya DC.	AMPS1	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ASTERACEAE	Antennaria microphylla Rydb.	ANMI1	Y	X	X	X								X	X	X		
ASTERACEAE	Antennaria parvifolia Nutt.	ANPA1	Y				X	X									X	X
ASTERACEAE	Antennaria sp.	ANT1				X												
ASTERACEAE	Arnica fulgens Pursh.	ARFU1	Y			X												
ASTERACEAE	Artemisia campestris L. ssp. caudata (Michx.) Hall & Clem.	ARCA1	Y		X						X	X	X					
ASTERACEAE	Artemisia dracunculus L.	ARDR1	Y						X	X	X	X	X					
ASTERACEAE	Artemisia frigida Willd.	ARFR1	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ASTERACEAE	Artemisia ludoviciana Nutt. var. ludoviciana	ARLU1	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ASTERACEAE	Aster ericoides L.	ASER1	Y	X	X	X				X					X			
ASTERACEAE	Aster falcatus Lindl.	ASFA1	Y				X											
ASTERACEAE	Aster porteri Gray	ASPO1	Y	X	X	X	X	X						X	X	X	X	X
ASTERACEAE	Aster sp.	AST1								X								
ASTERACEAE	Carduus nutans L. ssp. macrolepis (Peterm.) Kazmi	CANU1	N						X	X	X	X	X			X		
ASTERACEAE	Centaurea diffusa Lam.	CEDI1	N		X	X	X	X			X			X	X	X	X	X
ASTERACEAE	Chrysanthemum leucanthemum L.	CHLE1	N						X									
ASTERACEAE	Chrysopsis fulcrata Greene	CHFU1	Y	X	X	X	X	X					X	X	X	X	X	X
ASTERACEAE	Chrysopsis villosa Pursh.	CHVI1	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ASTERACEAE	Cirsium arvense (L.) Scop.	CIAR1	N						X	X	X	X						
ASTERACEAE	Cirsium undulatum (Nutt.) Spreng.	CIUN1	Y	X	X	X	X		X	X	X	X	X	X	X	X		
ASTERACEAE	Conyza canadensis (L.) Cronq.	COCA1	Y					X										X
ASTERACEAE	Erigeron canus A. Gray	ERCA1	Y					X				X						
ASTERACEAE	Erigeron divergens T. & G.	ERDI1	Y			X	X		X	X	X	X			X		X	X
ASTERACEAE	Erigeron flagellaris A. Gray	ERFL1	Y	X		X			X	X	X			X	X	X	X	X
ASTERACEAE	Erigeron sp.	ERI1								X								
ASTERACEAE	Gaillardia aristata Pursh.	GAAR1	Y	X	X	X	X	X			X			X	X	X	X	X
ASTERACEAE	Gutierrezia sarothrae (Pursh.) Britt. & Rusby	GUSA1	Y						X	X	X			X	X	X	X	X
ASTERACEAE	Helianthus annuus L.	HEAN1	Y										X					
ASTERACEAE	Helianthus petiolaris Nutt.	HEPE1	Y		X						X							
ASTERACEAE	Helianthus pumilus Nutt.	HEPU1	Y	X	X	X	X	X	X	X	X	X	X					
ASTERACEAE	Helianthus rigidus (Cass.) Desf. ssp. subrhomboideus (Rydb.) Heiser	HERI1	Y			X	X	X										
ASTERACEAE	Helianthus sp.	HEL1									X							
ASTERACEAE	Hymenopappus filifolius Hook. var. cinereus (Rydb.) I. M. Johnst.	HYFI1	Y						X									
ASTERACEAE	Lactuca serriola L.	LASE1	N	X			X	X	X	X	X	X	X	X	X	X	X	X
ASTERACEAE	Liatris punctata Hook.	LIPU1	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ASTERACEAE	Microseris cuspidata (Pursh.) Sch. Bip.	MICU1	Y		X	X	X			X	X	X	X		X	X	X	X
ASTERACEAE	Ratibida columnifera (Nutt.) Woot. & Standl.	RACO1	Y	X	X		X				X			X	X	X	X	X
ASTERACEAE	Scorzonera laciniata L.	SCLA1	N		X					X	X	X	X	X	X	X	X	X
ASTERACEAE	Senecio integerrimus Nutt.	SEIN1	Y												X			
ASTERACEAE	Senecio plattensis Nutt.	SEPL1	Y		X	X	X	X			X	X		X	X	X	X	X
ASTERACEAE	Senecio spartioides T. & G.	SESP1	Y							X	X			X	X	X	X	X
ASTERACEAE	Solidago missouriensis Nutt.	SOMI1	Y	X	X													

Table 2-1. (cont.)

				TR01					TR06					TR12				
Family	**Scientific Name**	**Speccode**	**Native**	**1993**	**1994**	**1995**	**1998**	**2001**	**1993**	**1994**	**1995**	**1998**	**2001**	**1993**	**1994**	**1995**	**1998**	**2001**
ASTERACEAE	Solidago mollis Bart.	SOMO1	Y	X		X	X							X	X	X	X	X
ASTERACEAE	Solidago nana Nutt.	SONA1	Y														X	
ASTERACEAE	Solidago nemoralis Ait.	SONE1	Y												X	X		
ASTERACEAE	Solidago sp.	SOL2				X												
ASTERACEAE	Taraxacum officinale Weber	TAOF1	N		X	X		X	X	X	X	X	X	X	X	X	X	X
ASTERACEAE	Thelesperma megapotanicum (Spreng.) O. Ktze.	THME1	Y			X				X	X	X	X					
ASTERACEAE	Townsendia grandiflora (Nutt.)	TOGR1	Y							X								
ASTERACEAE	Townsendia hookeri Beaman	TOHO1	Y		X	X												
ASTERACEAE	Tragopogon dubius Scop.	TRDU1	N	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
BORAGINACEAE	Lappula redowskii (Hornem.) Greene	LARE1	Y			X		X		X	X		X					X
BORAGINACEAE	Lithospermum incisum Lehm.	LIIN1	Y						X	X	X	X	X	X		X	X	X
BORAGINACEAE	Mertensia lanceolata (Pursh.) A. DC.	MELA1	Y		X	X	X			X					X	X		
BORAGINACEAE	Onosmodium molle Michx. var. occidentale (Mack.) Johnst.	ONMO1	Y									X						
BRASSICACEAE		BR1				X				X								
BRASSICACEAE	Alyssum alyssoides (L.) L.	ALAL1	N			X	X											
BRASSICACEAE	Alyssum minus (L.) Rothmaler var. micranthus (C. A. Mey.) Dudley	ALMI1	N	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
BRASSICACEAE	Arabis glabra (L.) Bernh.	ARGL1	N		X	X												
BRASSICACEAE	Arabis hirsuta (L.) Scop. var. pynocarpa (Hopkins) Rollins	ARHI1	Y			X	X											X
BRASSICACEAE	Arabis sp.	ARA1			X													
BRASSICACEAE	Barbarea vulgaris R. Br.	BAVU1	N															X
BRASSICACEAE	Barbarea vulgaris R. Br.	BAOR1	N													X		
BRASSICACEAE	Camelina microcarpa Andrz. ex DC.	CAMI1	N	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
BRASSICACEAE	Descurainia pinnata (Walt.) Britt.	DEPI1	Y		X	X		X	X	X	X	X	X		X	X	X	X
BRASSICACEAE	Descurainia richardsonii (Sweet) Schultz	DERI1	Y							X	X	X	X					X
BRASSICACEAE	Descurainia sophia (L.) Webb ex Prantl.	DESO1	N						X	X								
BRASSICACEAE	Draba nemorosa L.	DRNE1	Y		X													
BRASSICACEAE	Draba reptans (Lam.) Fern.	DRRE1	Y		X	X		X		X	X	X	X		X	X	X	X
BRASSICACEAE	Erysimum capitatum (Nutt.) DC.	ERAS1	Y	X	X	X			X	X	X				X	X		
BRASSICACEAE	Erysimum capitatum (Nutt.) DC.	ERCA2	Y				X	X				X	X				X	X
BRASSICACEAE	Lepidium densiflorum Schrad.	LEDE1	Y					X								X	X	X
BRASSICACEAE	Lepidium sp.	LEP1													X			
BRASSICACEAE	Lesquerella montana (A. Gray) Wats.	LEMO1	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
BRASSICACEAE	Sisymbrium altissimum L.	SIAL1	N					X	X	X	X	X	X	X	X	X		X
CACTACEAE	Coryphantha missouriensis (Sweet) Britt. & Rose	COMI1	Y	X	X	X	X		X	X	X	X	X				X	
CACTACEAE	Echinocereus viridiflorus Engelm.	ECVI1	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CACTACEAE	Opuntia fragilis (Nutt.) Haw.	OPFR1	Y		X	X												
CACTACEAE	Opuntia macrorhiza Engelm.	OPHU1	Y	X	X	X			X	X	X			X	X	X		
CACTACEAE	Opuntia macrorhiza Engelm.	OPMA1	Y				X	X				X	X				X	X
CACTACEAE	Pediocactus simpsonii (Engelm.) Britt. & Rose	PESI1	Y							X	X	X	X		X			
CARYOPHYLLACEAE	Arenaria fendleri A. Gray	ARFE2	Y	X	X	X	X	X				X		X	X	X	X	X
CARYOPHYLLACEAE	Paronychia jamesii T. & G.	PAJA1	Y	X	X	X	X	X	X	X	X	X		X	X	X	X	X
CARYOPHYLLACEAE	Silene antirrhina L.	SIAN1	Y		X	X	X	X				X	X		X		X	X
CARYOPHYLLACEAE	Silene drummondii Hook.	SIDR1	Y	X	X	X	X	X	X	X	X			X	X	X	X	X
CARYOPHYLLACEAE	Stellaria longifolia Muhl. ex Willd.	STLO1	Y	X														
CHENOPODIACEAE		CH1									X							
CHENOPODIACEAE	Chenopodium album L.	CHAL1	N								X							
CHENOPODIACEAE	Chenopodium leptophyllum Nutt. ex Moq.	CHLE2	Y					X	X	X	X	X				X	X	
CHENOPODIACEAE	Kochia scoparia (L.) Schrad.	KOSC1	N					X										
CHENOPODIACEAE	Salsola iberica Senn. & Pau.	SAIB1	N					X										

Table 2-1. (cont.)

				TR01					TR06					TR12				
Family	**Scientific Name**	**Speccode**	**Native**	**1993**	**1994**	**1995**	**1998**	**2001**	**1993**	**1994**	**1995**	**1998**	**2001**	**1993**	**1994**	**1995**	**1998**	**2001**
CLUSIACEAE	Hypericum perforatum L.	HYPE1	N	X	X	X	X	X	X	X	X	X		X	X	X	X	X
COMMELINACEAE	Tradescantia occidentalis (Britt.) Smyth	TROC1	Y			X	X	X			X	X	X					
CONVOLVULACEAE	Convolvulus arvensis L.	COAR1	N								X	X	X					
CONVOLVULACEAE	Evolvulus nuttallianus R. & S.	EVNU1	Y						X		X						X	
CRASSULACEAE	Sedum lanceolatum Torr.	SELA1	Y			X	X											
CYPERACEAE	Carex eleocharis Bailey	CAEL1	Y	X					X			X		X	X			
CYPERACEAE	Carex filifolia Nutt.	CAFI1	Y							X	X	X	X					
CYPERACEAE	Carex heliophila Mack.	CAHE1	Y		X	X	X	X		X	X	X	X		X	X	X	X
CYPERACEAE	Carex oreocharis Holm.	CAOR1	Y											X	X			
EUPHORBIACEAE	Euphorbia robusta (Engelm.) Small	EURO1	Y												X	X	X	X
EUPHORBIACEAE	Euphorbia sp.	EUP1												X				
FABACEAE		FA1									X							
FABACEAE	Astragalus agrestis Dougl. ex G. Don	ASAG1	Y	X	X	X	X			X	X	X						
FABACEAE	Astragalus crassicarpus Nutt.	ASCR1	Y												X			
FABACEAE	Astragalus flexuosus (Hook.) G. Don	ASFL1	Y	X					X	X	X	X	X					
FABACEAE	Astragalus missouriensis Nutt.	ASMI1	Y		X													
FABACEAE	Astragalus shortianus Nutt. ex T.&G.	ASSH1	Y	X	X		X		X	X	X	X	X	X	X	X	X	X
FABACEAE	Astragalus sp.	AST2			X	X					X							
FABACEAE	Astragalus tridactylicus Gray	ASTR1	Y									X	X					
FABACEAE	Astragalus tridactylicus Gray	ASSE1	Y							X	X							
FABACEAE	Dalea purpurea Vent	DAPU1	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
FABACEAE	Oxytropis lambertii Pursh.	OXLA1	Y	X	X	X	X		X	X	X	X	X	X	X	X	X	X
FABACEAE	Psoralea tenuiflora Pursh.	PSTE1	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
FABACEAE	Vicia americana Muhl. ex Willd.	VIAM1	Y	X														
GERANIACEAE	Erodium cicutarium (L.) L'Her.	ERCI1	N					X									X	X
HYDROPHYLLACEAE	Phacelia heterophylla Pursh.	PHHE1	Y	X	X			X	X	X	X	X		X	X	X	X	X
JUNCACEAE	Juncus dudleyi Wieg.	JUDU1	Y			X												
JUNCACEAE	Juncus interior Wieg.	JUIN1	Y				X										X	
LAMIACEAE	Hedeoma hispidum Pursh.	HEHI1	Y	X														
LILIACEAE	Allium textile A. Nels. & Macbr.	ALTE1	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
LILIACEAE	Calochortus gunnisonii S. Wats.	CAGU1	Y								X		X			X		
LILIACEAE	Leucocrinum montanum Nutt.	LEMO2	Y	X						X	X	X	X		X	X	X	X
LINACEAE	Linum perenne L. var. lewisii (Pursh.) Eat. & Wright	LIPE1	Y						X	X	X	X	X					X
MALVACEAE	Sphaeralcea coccinea (Pursh.) Rydb.	SPCO1	Y							X	X		X		X			
NYCTAGINACEAE	Mirabilis linearis (Pursh.) Heimerl	MILI1	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ONAGRACEAE	Calylophus serrulatus (Nutt.) Raven	CASE2	Y	X	X	X	X							X	X	X	X	
ONAGRACEAE	Gaura coccinea Pursh.	GACO1	Y	X	X	X			X	X	X	X	X	X		X		
ONAGRACEAE	Oenothera coronopifolia T. & G.	OECO1	Y	X										X	X			
ONAGRACEAE	Oenothera howardii (A. Nels.) W. L. Wagner	OEBR1	Y							X	X							
ONAGRACEAE	Oenothera howardii (A. Nels.) W. L. Wagner	OEHO1	Y									X						
ONAGRACEAE	Oenothera sp.	OEN1													X			
OROBANCHACEAE	Orobanche fasciculata Nutt.	ORFA1	Y		X	X	X			X	X				X	X	X	X
PLANTAGINACE	Plantago patagonica Jacq.	PLPA1	Y							X	X		X					
POACEAE	Agropyron smithii Rydb.	AGSM1	Y			X	X	X	X	X	X	X	X		X			
POACEAE	Andropogon gerardii Vitman	ANGE1	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
POACEAE	Andropogon scoparius Michx.	ANSC1	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
POACEAE	Aristida purpurea Nutt. var. longiseta (Steud.) Vasey	ARFE1	Y		X			X	X	X	X		X	X	X	X		
POACEAE	Aristida purpurea Nutt. var. robusta (Merrill) A. Holmgren & N. Holmgr	ARLO1	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
POACEAE	Aristida sp.	ARI1								X								

Table 2-1. (cont.)

				TR01					TR06					TR12				
Family	**Scientific Name**	**Speccode**	**Native**	**1993**	**1994**	**1995**	**1998**	**2001**	**1993**	**1994**	**1995**	**1998**	**2001**	**1993**	**1994**	**1995**	**1998**	**2001**
POACEAE	Bouteloua curtipendula (Michx.) Torr.	BOCU1	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
POACEAE	Bouteloua gracilis (H. B. K.) Lag ex Griffiths	BOGR1	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
POACEAE	Bouteloua hirsuta Lag	BOHI1	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
POACEAE	Bromus inermis Leyss. ssp. inermis	BRIN1	N										X					
POACEAE	Bromus japonicus Thunb. ex Murr.	BRJA1	N	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
POACEAE	Bromus tectorum L.	BRTE1	N	X	X	X	X	X	X	X	X	X	X		X	X	X	X
POACEAE	Buchloe dactyloides (Nutt.) Engelm.	BUDA1	Y		X	X	X	X	X	X	X	X	X	X	X	X	X	X
POACEAE	Festuca octoflora Walt.	FEOC1	Y					X										
POACEAE	Koeleria pyramidata (Lam.) Beauv.	KOPY1	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
POACEAE	Muhlenbergia montana (Nutt.) Hitchc.	MUMO1	Y	X	X	X	X	X						X	X	X	X	X
POACEAE	Muhlenbergia torreyi (Kunth) Hitchc. ex Bush	MUTO1	Y	X														
POACEAE	Poa canbyi (Scribn.) Piper	POCA1	Y							X	X		X					
POACEAE	Poa compressa L.	POCO1	N	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
POACEAE	Poa pratensis L.	POPR1	N	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
POACEAE	Sitanion hystrix (Nutt.) Sm. var. brevifolium (Sm.) Hitchc.	SIHY1	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
POACEAE	Sorghastrum nutans (L.) Nash	SONU1	Y	X	X	X	X	X						X	X	X	X	X
POACEAE	Sporobolus asper (Michx.) Kunth	SPAS1	Y					X					X					X
POACEAE	Sporobolus cryptandrus (Torr.) A. Gray	SPCR1	Y				X					X					X	
POACEAE	Sporobolus heterolepis (A. Gray) A. Gray	SPHE1	Y		X	X	X	X							X			
POACEAE	Stipa comata Trin. & Rupr.	STCO1	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
POACEAE	Stipa neomexicana (Thur.) Scribn.	STNE1	Y							X	X	X	X					
POACEAE	Stipa sp.	STI1								X								
POACEAE	Stipa viridula Trin.	STVI1	Y	X	X													
POACEAE	Triticum aestivum L.	TRAE1	N		X													
POLEMONIACEAE	Ipomopsis spicata (Nutt.) V. Grant ssp. spicata	IPSP1	Y	X	X	X	X	X										
POLYGONACEAE	Eriogonum alatum Torr.	ERAL1	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
POLYGONACEAE	Eriogonum umbellatum Torr.	ERFL2	Y	X														
POLYGONACEAE	Polygonum aviculare L.	POAV1	N						X									
POLYGONACEAE	Polygonum ramosissimum Michx.	PORA1	Y					X					X					
POLYGONACEAE	Polygonum sawatchense Small	POSA1	Y								X							
POLYGONACEAE	Polygonum sp.	POL1						X										
PORTULACACEAE	Talinum parviflorum Nutt.	TAPA1	Y	X	X	X	X	X			X					X		X
PRIMULACEAE	Androsace occidentalis Pursh.	ANOC1	Y							X	X		X					X
RANUNCULACEAE	Delphinium nuttalianum Pritz. ex Walpers	DENU1	Y														X	X
RANUNCULACEAE	Delphinium virescens Nutt. ssp. penardii (Huth) Ewan	DEVI1	Y								X							
ROSACEAE	Potentilla fissa Nutt.	POFI1	Y			X	X	X							X	X	X	X
ROSACEAE	Potentilla gracilis Dougl. ex Hook. var. glabrata (Lehm.) C. L. Hitchc.	POGR1	Y	X	X									X				
ROSACEAE	Potentilla hippiana Lehm.	POHI1	Y	X	X	X	X	X							X			
SANTALACEAE	Comandra umbellata (L.) Nutt.	COUM1	Y	X	X	X	X	X		X		X	X		X		X	X
SCROPHULARIACEAE	Castilleja integra A. Gray	CAIN2	Y	X														
SCROPHULARIACEAE	Castilleja sessiliflora Pursh.	CASE3	Y		X	X	X	X							X		X	X
SCROPHULARIACEAE	Linaria dalmatica (L.) Mill.	LIDA1	N	X	X	X		X	X	X	X	X	X	X	X	X	X	X
SCROPHULARIACEAE	Penstemon angustifolius Nutt. ex Pursh	PEAN1	Y												X			
SCROPHULARIACEAE	Penstemon secundiflorus Benth.	PESE1	Y							X	X	X	X					
SCROPHULARIACEAE	Penstemon virens Penn.	PEVI1	Y		X	X	X	X							X	X	X	X
SCROPHULARIACEAE	Verbascum blattaria L.	VEBL1	N						X	X	X							
SCROPHULARIACEAE	Verbascum thapsus L.	VETH1	N						X	X	X	X	X					
SCROPHULARIACEAE	Veronica peregrina L. var. xalapensis (H. B. K.) St. John & Warren	VEPE1	Y			X												
SOLANACEAE	Physalis heterophylla Nees	PHHE2	Y	X					X					X				
SOLANACEAE	Solanum triflorum Nutt.	SOTR1	Y														X	

VIOLACEAE	Viola nuttallii Pursh.	VINU1	Y		X	X	X	X		X	X	X	X		X	X	X	X
VIOLACEAE	Viola sororia Willd.	VINE1	Y													X		
	Total Number of Species			76	88	90	81	82	68	89	98	83	81	68	91	83	84	85
	Percent Native			87	84	86	86	80	72	80	80	81	80	81	84	81	83	81

Table 2-2. Xeric Mixed Grassland Woody Stem and Cactus Density Summary (1993-2001)

	Cactus Density (plants/sq. meter)					Woody Stem Density (stems/sq. meter)				
Site	**1993**	**1994**	**1995**	**1998**	**2001**	**1993**	**1994**	**1995**	**1998**	**2001**
TR01	0.52	0.79	1.72	0.68	0.24	0.004	0.002	0.002	0.004	0.010
TR06	0.19	0.21	0.24	0.11	0.14	0.160	0.110	0.240	0.268	0.318
TR12	1.09	0.95	1.21	1.16	0.24	0.000	0.000	0.000	0.000	0.000

Site values are based on n=5.

	Opuntia macorhiza Density (plants/sq. meter)						
Site	**1993**	**1994**	**1995**	**1998**	**1999**	**2000**	**2001**
TR01	0.15	0.25	0.24	0.14	0.16	0.07	0.02
TR06	0.12	0.12	0.12	0.06	NA	NA	0.05
TR12	0.53	0.47	0.48	0.58	NA	NA	0.08

Site values are based on n=5.

	Echinocereus viridiflorus Density (plants/sq. meter)						
Site	**1993**	**1994**	**1995**	**1998**	**1999**	**2000**	**2001**
TR01	0.37	0.53	1.41	0.53	0.59	0.29	0.22
TR06	0.07	0.07	0.12	0.05	NA	NA	0.09
TR12	0.56	0.48	0.73	0.57	NA	NA	0.16

Site values are based on n=5.

Table 2-3. 1993-2001 Xeric Mixed Grassland Foliar Cover Summary

					TR01														TR06										TR12									
					Absolute Cover (%)							Relative Cover (%)							Absolute Cover (%)					Relative Cover (%)					Absolute Cover (%)					Relative Cover (%)				
Scientific Name	Speccode	Growth Form	Native	Cool/Warm Season	1993	1994	1995	1998	1999	2000	2001	1993	1994	1995	1998	1999	2000	2001	1993	1994	1995	1998	2001	1993	1994	1995	1998	2001	1993	1994	1995	1998	2001	1993	1994	1995	1998	2001
Yucca glauca Nutt.	YUGL1	S	Y																0.2					0.3														
Echinocereus viridiflorus Engelm.	ECVI1	C	Y																											0.2					0.2			
Opuntia macrorhiza Engelm.	OPHU1	C	Y																											0.4					0.4			
Lepidium sp.	LEP1	F	N																											0.2					0.2			
Alyssum minus (L.) Rothmaler var. micranthus (C. A. Mey.) Dudley	ALMI1	F	N		0.2	1.6	0.4	0.2		0.2		0.3	2.0	0.5	0.2		0.3			1.4	1.2	1.4	1.0		1.6	1.3	1.6	1.2	0.6	5.0	11.2	0.8	1.4	0.7	5.5	12.6	1.0	1.7
Camelina microcarpa Andrz. ex DC.	CAMI1	F	N																	0.8	4.6		2.8		0.9	5.0		3.3	0.8	1.0	1.8			1.0	1.1	2.0		
Carduus nutans L. ssp. macrolepis (Peterm.) Kazmi	CANU1	F	N																1.0	0.2	0.4	0.2		1.3	0.2	0.4	0.2											
Centaurea diffusa Lam.	CEDI1	F	N					0.2			0.4				0.2			0.5													0.2		0.2			0.2		0.2
Cirsium arvense (L.) Scop.	CIAR1	F	N																0.2					0.3														
Hypericum perforatum L.	HYPE1	F	N		0.2	0.6	0.2					0.3	0.7	0.2															0.2		0.2			0.2		0.2		
Lactuca serriola L.	LASE1	F	N								0.2							0.2			0.2					0.2						0.2	0.2				0.2	0.2
Linaria dalmatica (L.) Mill.	LIDA1	F	N								0.2							0.2	7.0	7.2	11.0	9.2	4.0	9.2	8.1	11.9	10.8	4.8	0.8	1.0	0.4			1.0	1.1	0.4		
Scorzonera laciniata L.	SCLA1	F	N																	0.4					0.4						0.2		0.2			0.2		0.2
Sisymbrium altissimum L.	SIAL1	F	N								0.4							0.5		0.6	1.8		0.4		0.7	1.9		0.5		0.2					0.2		
Tragopogon dubius Scop.	TRDU1	F	N		0.2		0.4					0.3		0.5					0.2		0.8	0.2		0.3		0.9	0.2		0.2	0.2	0.6		0.4	0.2	0.2	0.7		0.5
Verbascum thapsus L.	VETH1	F	N																0.2	0.2	0.2			0.3	0.2	0.2												
Achillea millefolium L. ssp. lanulosa (Nutt.) Piper	ACMI1	F	Y																										0.2					0.2				
Allium textile A. Nels. & Macbr.	ALTE1	F	Y			0.2							0.2								0.2					0.2												
Ambrosia psilostachya DC.	AMPS1	F	Y		0.2		0.2	0.2			0.2	0.3		0.2	0.2			0.2	0.4			1.0		0.5			1.2		0.4	0.2	0.6	0.4		0.5	0.2	0.7	0.5	
Antennaria microphylla Rydb.	ANMI1	F	Y																											0.2					0.2			
Antennaria parvifolia Nutt.	ANPA1	F	Y					0.2							0.2																							
Arenaria fendleri A. Gray	ARFE2	F	Y		6.4	5.4	2.8	4.0	0.4	0.4	0.6	9.0	6.7	3.3	4.9	0.5	0.5	0.7											4.2	5.6	2.2	1.0	0.2	5.2	6.2	2.5	1.2	0.2
Artemisia frigida Willd.	ARFR1	F	Y			0.2		0.2					0.2		0.2				0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2										
Artemisia ludoviciana Nutt. var. ludoviciana	ARLU1	F	Y								0.2							0.2	0.2					0.3					0.4		1.2	0.8	1.0	0.5		1.3	1.0	1.2
Asclepias viridiflora Raf.	ASVI1	F	Y																										0.2					0.2				
Aster porteri Gray	ASPO1	F	Y		2.8	8.4	21.2	11.8	0.6			3.9	10.3	25.1	14.5	0.8													0.8	0.4	3.2	1.2	0.2	1.0	0.4	3.6	1.4	0.2
Calylophus serrulatus (Nutt.) Raven	CASE2	F	Y				0.2	0.2						0.2	0.2														0.6	0.4	0.2			0.7	0.4	0.2		
Chrysopsis fulcrata Greene	CHFU1	F	Y		0.2	0.8	0.2					0.3	1.0	0.2																0.4				0.4			
Chrysopsis villosa Pursh.	CHVI1	F	Y		4.2	3.4	2.0	0.4	0.4			5.9	4.2	2.4	0.5	0.5				0.2					0.2				1.6	0.8	0.4		0.4	2.0	0.9	0.4		0.5
Comandra umbellata (L.) Nutt.	COUM1	F	Y					0.4							0.5																							
Dalea purpurea Vent	DAPU1	F	Y		0.6			0.2				0.8			0.2																							
Descurainia pinnata (Walt.) Britt.	DEPI1	F	Y																				0.2					0.2				0.2					0.2	
Descurainia richardsonii (Sweet) Schultz	DERI1	F	Y																		0.4					0.4												
Draba reptans (Lam.) Fern.	DRRE1	F	Y																														0.2					0.2
Erigeron flagellaris A. Gray	ERFL1	F	Y																0.2					0.3							0.4		0.4			0.4		0.5
Eriogonum alatum Torr.	ERAL1	F	Y		0.6	0.6		0.4			0.2	0.8	0.7		0.5			0.2		0.2					0.2													
Erysimum capitatum (Nutt.) DC.	ERAS1	F	Y		0.2	0.2						0.3	0.2						0.2	0.6				0.3	0.7													
Euphorbia robusta (Engelm.) Small	EURO1	F	Y																											0.2	0.2	0.4	0.6		0.2	0.2	0.5	0.7
Gaillardia aristata Pursh.	GAAR1	F	Y								0.2							0.2																				
Helianthus pumilus Nutt.	HEPU1	F	Y																0.2			0.2		0.3			0.2											
Ipomopsis spicata (Nutt.) V. Grant ssp. spicata	IPSP1	F	Y								0.2							0.2																				
Lepidium densiflorum Schrad.	LEDE1	F	Y																														0.2					0.2
Lesquerella montana (A. Gray) Wats.	LEMO1	F	Y			0.4	0.4	0.2		0.2	1.0		0.5	0.5	0.2		0.3	1.2		0.2					0.2													
Liatris punctata Hook.	LIPU1	F	Y		5.4	3.6	2.0	2.4	3.0	3.2	5.6	7.6	4.4	2.4	3.0	4.0	4.4	6.8											1.4	2.8	2.2	2.2	2.4	1.7	3.1	2.5	2.7	2.9
Linum perenne L. var. lewisii (Pursh.) Eat. & Wright	LIPE1	F	Y																0.6	0.2	0.6	0.4		0.8	0.2	0.6	0.5											
Lithospermum incisum Lehm.	LIIN1	F	Y																													0.2	0.2				0.2	0.2
Lomatium orientale Coult. & Rose	LOOR1	F	Y			0.2							0.2																			0.2					0.2	
Mertensia lanceolata (Pursh.) A. DC.	MELA1	F	Y				0.2							0.2																								
Mirabilis linearis (Pursh.) Heimerl	MILI1	F	Y																0.2	0.2				0.3	0.2				0.2					0.2				
Oenothera coronopifolia T. & G.	OECO1	F	Y																										0.2					0.2				
Oxytropis lambertii Pursh.	OXLA1	F	Y																													0.2					0.2	
Paronychia jamesii T. & G.	PAJA1	F	Y		0.4	0.2	0.6	0.4		0.2	0.6	0.6	0.2	0.7	0.5		0.3	0.7																				
Penstemon virens Penn.	PEVI1	F	Y						0.2							0.3																						
Phacelia heterophylla Pursh.	PHHE1	F	Y																										0.2				0.2	0.2				0.2
Potentilla fissa Nutt.	POFI1	F	Y																												0.2					0.2		
Potentilla gracilis Dougl. ex Hook. var. glabrata (Lehm.) C. L. Hitchc.	POGR1	F	Y		0.2							0.3																										
Potentilla hippiana Lehm.	POHI1	F	Y		0.2	0.2	0.2					0.3	0.2	0.2																								
Psoralea tenuiflora Pursh.	PSTE1	F	Y		3.0	2.4	2.0	1.4	0.6	0.6	1.2	4.2	3.0	2.4	1.7	0.8	0.8	1.5	1.2	0.2	1.0		1.2	1.6	0.2	1.1		1.4	3.4	2.2	1.4	0.2	0.8	4.2	2.4	1.6	0.2	1.0
Senecio spartioides T. & G.	SESP1	F	Y																														0.4					0.5
Silene antirrhina L.	SIAN1	F	Y																				0.2					0.2										
Talinum parviflorum Nutt.	TAPA1	F	Y					0.2							0.2																							
Thelesperma megapotanicum (Spreng.) O. Ktze.	THME1	F	Y																		0.2					0.2												
Bromus inermis Leyss. ssp. inermis	BRIN1	G	N	C																			0.4					0.5										
Bromus japonicus Thunb. ex Murr.	BRJA1	G	N	C			0.8	0.4	0.6					0.9	0.5	0.8			0.6	2.2	5.6	7.4	10.4	0.8	2.5	6.1	8.7	12.4		0.2	1.0	1.8	2.4		0.2	1.1	2.2	2.9
Bromus tectorum L.	BRTE1	G	N	C		0.2	0.4	0.4	0.8	0.4	0.4		0.2	0.5	0.5	1.1	0.5	0.5		0.4	0.2		0.4		0.4	0.2		0.5				0.8	3.4				1.0	4.1
Poa compressa L.	POCO1	G	N	C	3.6	3.6	7.6	6.6	7.4	5.4	8.4	5.0	4.4	9.0	8.1	9.8	7.4	10.2	2.8	4.8	5.8	4.2	4.4	3.7	5.4	6.3	4.9	5.3	3.0	2.2	5.2	6.2	6.0	3.7	2.4	5.8	7.5	7.2
Poa pratensis L.	POPR1	G	N	C	2.0	3.6	1.4	5.0	6.0	6.2	3.4	2.8	4.4	1.7	6.2	7.9	8.4	4.1	3.4	5.2	2.8	6.8	7.4	4.5	5.8	3.0	8.0	8.9	0.2	1.0	0.4	1.4	2.8	0.2	1.1	0.4	1.7	3.3
Agropyron smithii Rydb.	AGSM1	G	Y	C															0.6	0.2	0.6		0.2	0.8	0.2	0.6		0.2										

Table 2-3. (cont.)

					TR01														TR06										TR12									
					Absolute Cover (%)							Relative Cover (%)							Absolute Cover (%)					Relative Cover (%)					Absolute Cover (%)					Relative Cover (%)				
Scientific Name	**Speccode**	**Growth Form**	**Native**	**Cool/Warm Season**	**1993**	**1994**	**1995**	**1998**	**1999**	**2000**	**2001**	**1993**	**1994**	**1995**	**1998**	**1999**	**2000**	**2001**	**1993**	**1994**	**1995**	**1998**	**2001**	**1993**	**1994**	**1995**	**1998**	**2001**	**1993**	**1994**	**1995**	**1998**	**2001**	**1993**	**1994**	**1995**	**1998**	**2001**
Aristida purpurea Nutt. var. longiseta (Steud.) Vasey	ARFE1	G	Y	C															0.2	0.6				0.3	0.7													
Aristida purpurea Nutt. var. robusta (Merrill) A. Holmgren & N. Holmgr	ARLO1	G	Y	C	1.0	0.4	0.8	0.2	0.8	0.6	1.0	1.4	0.5	0.9	0.2	1.1	0.8	1.2	1.2		0.6	0.6	0.8	1.6		0.6	0.7	1.0	0.8	0.8	1.0		0.2	1.0	0.9	1.1		0.2
Carex eleocharis Bailey	CAEL1	G	Y	C	5.2							7.3							3.2					4.2					7.4					9.2				
Carex filifolia Nutt.	CAFI1	G	Y	C																0.4	0.2	0.2			0.4	0.2	0.2											
Carex heliophila Mack.	CAHE1	G	Y	C		5.2	5.0	5.8	4.2	4.8	4.4		6.4	5.9	7.1	5.5	6.5	5.3		2.2	2.8	1.6	0.6		2.5	3.0	1.9	0.7		9.4	5.0	4.0	7.8		10.4	5.6	4.8	9.3
Koeleria pyramidata (Lam.) Beauv.	KOPY1	G	Y	C	3.2	3.6	1.6	1.6	5.8	5.6	3.8	4.5	4.4	1.9	2.0	7.7	7.6	4.6	1.0	0.2				1.3	0.2				2.0	0.4	0.6	1.2	2.0	2.5	0.4	0.7	1.4	2.4
Sitanion hystrix (Nutt.) Sm. var. brevifolium (Sm.) Hitchc.	SIHY1	G	Y	C		0.2	0.6	0.8		0.2	0.6		0.2	0.7	1.0		0.3	0.7				0.4					0.5			0.2		0.2			0.2		0.2	
Stipa comata Trin. & Rupr.	STCO1	G	Y	C	1.2	5.2	7.4	4.0	5.0	5.0	8.8	1.7	6.4	8.7	4.9	6.6	6.8	10.7	47.0	55.8	45.6	43.4	38.2	61.5	62.4	49.4	50.8	45.7	28.0	35.6	31.0	36.2	22.6	34.9	39.4	34.8	43.7	27.0
Stipa neomexicana (Thur.) Scribn.	STNE1	G	Y	C																		3.6	5.2				4.2	6.2										
Stipa viridula Trin.	STVI1	G	Y	C	1.0	0.2						1.4	0.2																									
Andropogon gerardii Vitman	ANGE1	G	Y	W	11.0	9.4	9.0	9.6	16.4	13.4	13.8	15.4	11.6	10.6	11.8	21.6	18.3	16.7	0.6	0.8	1.0	0.8	0.8	0.8	0.9	1.1	0.9	1.0	11.8	10.2	11.8	12.2	14.2	14.7	11.3	13.2	14.7	17.0
Andropogon scoparius Michx.	ANSC1	G	Y	W	8.4	8.4	4.6	1.4	2.4	1.2	1.8	11.8	10.3	5.4	1.7	3.2	1.6	2.2	0.6	0.8	1.4	0.4	0.8	0.8	0.9	1.5	0.5	1.0	4.4	2.6	0.8		0.4	5.5	2.9	0.9		0.5
Bouteloua curtipendula (Michx.) Torr.	BOCU1	G	Y	W	0.4	2.2	2.2	3.0	5.2	4.4	4.0	0.6	2.7	2.6	3.7	6.9	6.0	4.8	1.0	0.6	1.2	1.6	2.8	1.3	0.7	1.3	1.9	3.3	2.2	2.0	2.0	3.6	4.8	2.7	2.2	2.2	4.3	5.7
Bouteloua gracilis (H. B. K.) Lag ex Griffiths	BOGR1	G	Y	W	0.4	1.4	0.6	1.6	2.6	3.0	3.0	0.6	1.7	0.7	2.0	3.4	4.1	3.6	1.2	2.4	1.8	1.6	1.0	1.6	2.7	1.9	1.9	1.2	1.2	1.4	1.0	3.0	2.4	1.5	1.5	1.1	3.6	2.9
Bouteloua hirsuta Lag	BOHI1	G	Y	W	0.4	1.4	0.2	1.0	1.4	1.4	0.8	0.6	1.7	0.2	1.2	1.8	1.9	1.0	0.8			0.2	1.0					0.2	0.2	0.4	0.8	0.4	1.0	0.2	0.4	0.9	0.5	1.2
Buchloe dactyloides (Nutt.) Engelm.	BUDA1	G	Y	W																									0.2	0.2			0.2	0.2	0.2			0.2
Muhlenbergia montana (Nutt.) Hitchc.	MUMO1	G	Y	W	7.0	6.8	7.4	14.8	8.8	13.8	14.0	9.8	8.4	8.7	18.2	11.6	18.8	16.9											1.2	2.0	0.6	2.2	2.6	1.5	2.2	0.7	2.7	3.1
Muhlenbergia torreyi (Kunth) Hitchc. ex Bush	MUTO1	G	Y	W	0.6							0.8																										
Sorghastrum nutans (L.) Nash	SONU1	G	Y	W	1.0	0.4	1.0	1.2	2.0	1.8	1.8	1.4	0.5	1.2	1.5	2.6	2.5	2.2											1.2	0.2	1.2	1.6	1.2	1.5	0.2	1.3	1.9	1.4
Sporobolus heterolepis (A. Gray) A. Gray	SPHE1	G	Y	W		0.6	1.0	0.8	1.2	1.4	1.4		0.7	1.2	1.0	1.6	1.9	1.7												0.2					0.2			
Total foliar cover					71.4	81.2	84.6	81.2	75.8	73.4	82.6	100.0	100.0	100.0	100.0	100.0	100.0	100.0	76.4	89.4	92.4	85.4	83.6	100.0	100.0	100.0	100.0	100.0	80.2	90.4	89.2	82.8	83.6	100.0	100.0	100.0	100.0	100.0
Total forb cover					25.0	28.4	33.0	23.0	5.2	4.8	11.2	35.0	35.0	39.0	28.3	6.9	6.5	13.6	12.0	12.8	22.8	12.8	10.0	15.7	14.3	24.7	15.0	12.0	16.4	20.8	26.8	8.0	9.6	20.4	23.0	30.0	9.7	11.5
Total native forb cover					24.4	26.2	32.0	22.6	5.2	4.6	10.0	34.2	32.3	37.8	27.8	6.9	6.3	12.1	3.4	2.0	2.6	1.8	1.8	4.5	2.2	2.8	2.1	2.2	13.6	13.2	12.2	7.0	7.2	17.0	14.6	13.7	8.5	8.6
Total non-native forb cover					0.6	2.2	1.0	0.4	0.0	0.2	1.2	0.8	2.7	1.2	0.5	0.0	0.3	1.5	8.6	10.8	20.2	11.0	8.2	11.3	12.1	21.9	12.9	9.8	2.6	7.6	14.6	1.0	2.4	3.2	8.4	16.4	1.2	2.9
Total graminoid cover					46.4	52.8	51.6	58.2	70.6	68.6	71.4	65.0	65.0	61.0	71.7	93.1	93.5	86.4	64.2	76.6	69.6	72.6	73.6	84.0	85.7	75.3	85.0	88.0	63.8	69.0	62.4	74.8	74.0	79.6	76.3	70.0	90.3	88.5
Total native graminoid cover					40.8	45.4	41.4	45.8	55.8	56.6	59.2	57.1	55.9	48.9	56.4	73.6	77.1	71.7	57.4	64.0	55.2	54.2	50.6	75.1	71.6	59.7	63.5	60.5	60.6	65.6	55.8	64.6	59.4	75.6	72.6	62.6	78.0	71.1
Total non-native graminoid cover					5.6	7.4	10.2	12.4	14.8	12.0	12.2	7.8	9.1	12.1	15.3	19.5	16.3	14.8	6.8	12.6	14.4	18.4	23.0	8.9	14.1	15.6	21.5	27.5	3.2	3.4	6.6	10.2	14.6	4.0	3.8	7.4	12.3	17.5
Total native cover					65.2	71.6	73.4	68.4	61.0	61.2	69.2	91.3	88.2	86.8	84.2	80.5	83.4	83.8	61.0	66.0	57.8	56.0	52.4	79.8	73.8	62.6	65.6	62.7	74.4	79.4	68.0	71.6	66.6	92.8	87.8	76.2	86.5	79.7
Total non-native cover					6.2	9.6	11.2	12.8	14.8	12.2	13.4	8.7	11.8	13.2	15.8	19.5	16.6	16.2	15.4	23.4	34.6	29.4	31.2	20.2	26.2	37.4	34.4	37.3	5.8	11.0	21.2	11.2	17.0	7.2	12.2	23.8	13.5	20.3
Total warm-season graminoid cover					29.2	30.6	26.0	33.4	40.0	40.4	40.6	40.9	37.7	30.7	41.1	52.8	55.0	49.2	4.2	4.6	5.4	4.4	5.6	5.5	5.1	5.8	5.2	6.7	22.4	19.2	18.2	23.0	26.8	27.9	21.2	20.4	27.8	32.1
Total cool-season graminoid cover					17.2	22.2	25.6	24.8	30.6	28.2	30.8	24.1	27.3	30.3	30.5	40.4	38.4	37.3	60.0	72.0	64.2	68.2	68.0	78.5	80.5	69.5	79.9	81.3	41.4	49.8	44.2	51.8	47.2	51.6	55.1	49.6	62.6	56.5

Absolute cover = Absolute foliar cover is the percentage of the number of hits on a species out of the total number of hits possible (500).
Relative cover = Relative foliar cover was the number of hits a species had relative to the total number of all vegetative hits recorded per site (i.e., the percent of vegetative cover the species represented).
All cover values presented are means (n = 5).
Native categories: Y = Native, N = Non-Native
Form categories: C = Cactus, F = Forb, G = Graminoid, S = Shrub
Cool/Warm Season categories: C = Cool season species, W = Warm season species

Table 2-4. 1998-2001 Xeric Mixed Grassland Species Frequency Summary

				TR01							TR06				TR12			
				Spring	Summer	Summer	Spring	Summer	Spring	Summer	Spring	Summer	Spring	Summer	Spring	Summer	Spring	Summer
Family	**Scientific Name**	**Speccode**	**Native**	**1998**	**1998**	**1999**	**2000**	**2000**	**2001**	**2001**	**1998**	**1998**	**2001**	**2001**	**1998**	**1998**	**2001**	**2001**
AGAVACEAE	Yucca glauca Nutt.	YUGL1	Y								20	12	12	12				
APIACEAE	Lomatium orientale Coult. & Rose	LOOR1	Y	92	28	12	8		32		72	4	32		100	48	60	
ASCLEPIADACEAE	Asclepias viridiflora Raf.	ASVI1	Y	4	4	4	4	4		4					4	4		
ASTERACEAE	Achillea millefolium L. ssp. lanulosa (Nutt.) Piper	ACMI1	Y	4	4	4												
ASTERACEAE	Ambrosia psilostachya DC.	AMPS1	Y	28	16				8		12	12		4	24	28	16	12
ASTERACEAE	Antennaria parvifolia Nutt.	ANPA1	Y	4	4										4	4		
ASTERACEAE	Artemisia dracunculus L.	ARDR1	Y											4				
ASTERACEAE	Artemisia frigida Willd.	ARFR1	Y	16	16	4					20	20	4		8	4	4	8
ASTERACEAE	Artemisia ludoviciana Nutt. var. ludoviciana	ARLU1	Y				4	4		4	8				16	12	12	12
ASTERACEAE	Aster falcatus Lindl.	ASFA1	Y	4	4													
ASTERACEAE	Aster porteri Gray	ASPO1	Y	88	88	44			12	4					40	44	16	12
ASTERACEAE	Carduus nutans L. ssp. macrolepis (Peterm.) Kazmi	CANU1	N								24	16	16	20				
ASTERACEAE	Centaurea diffusa Lam.	CEDI1	N	16	4					4					4	8	16	32
ASTERACEAE	Chrysopsis fulcrata Greene	CHFU1	Y	8	8	4	4	4	12	4								
ASTERACEAE	Chrysopsis villosa Pursh.	CHVI1	Y	64	52	32	8	4		8					28	32	4	4
ASTERACEAE	Cirsium arvense (L.) Scop.	CIAR1	N								8	8						
ASTERACEAE	Cirsium undulatum (Nutt.) Spreng.	CIUN1	Y								8	4						
ASTERACEAE	Conyza canadensis (L.) Cronq.	COCA1	Y							4							8	32
ASTERACEAE	Erigeron canus A. Gray	ERCA1	Y						4									
ASTERACEAE	Erigeron divergens T. & G.	ERDI1	Y														16	4
ASTERACEAE	Erigeron flagellaris A. Gray	ERFL1	Y												20			24
ASTERACEAE	Gaillardia aristata Pursh.	GAAR1	Y	28	16	4	16	20	24	20					12	4	8	8
ASTERACEAE	Helianthus pumilus Nutt.	HEPU1	Y	4	4	4	4	4	4	4	4	4	4	4				
ASTERACEAE	Lactuca serriola L.	LASE1	N						4	8	52	28	4	4			16	20
ASTERACEAE	Liatris punctata Hook.	LIPU1	Y	76	72	76	84	84	72	80		4			68	76	52	72
ASTERACEAE	Microseris cuspidata (Pursh.) Sch. Bip.	MICU1	Y	8											12			
ASTERACEAE	Scorzonera laciniata L.	SCLA1	N								8		4			4	4	4
ASTERACEAE	Senecio plattensis Nutt.	SEPL1	Y	40	20	4	8	4	12									
ASTERACEAE	Senecio spartioides T. & G.	SESP1	Y												8	8	8	8
ASTERACEAE	Solidago mollis Bart.	SOMO1	Y	4	4													
ASTERACEAE	Taraxacum officinale Weber	TAOF1	N						4		12	4			8		4	
ASTERACEAE	Tragopogon dubius Scop.	TRDU1	N	20	20				20	20	68	40		8	8	12	24	24
BORAGINACEAE	Lappula redowskii (Hornem.) Greene	LARE1	Y						8				12				16	
BORAGINACEAE	Lithospermum incisum Lehm.	LIIN1	Y									12		8		4		
BORAGINACEAE	Mertensia lanceolata (Pursh.) A. DC.	MELA1	Y	4														
BRASSICACEAE	Alyssum alyssoides (L.) L.	ALAL1	N	12	4			4										
BRASSICACEAE	Alyssum minus (L.) Rothmaler var. micranthus (C. A. Mey.) Dudley	ALMI1	N	20	16	12	16	8	16	12	36	40	52	36	80	72	56	52
BRASSICACEAE	Camelina microcarpa Andrz. ex DC.	CAMI1	N		4				4	4	76	24	64	56	44	24	56	36
BRASSICACEAE	Descurainia pinnata (Walt.) Britt.	DEPI1	Y						12		16		56				56	24
BRASSICACEAE	Draba reptans (Lam.) Fern.	DRRE1	Y	16			36	4	76	4	8		52	12	28	12	64	12
BRASSICACEAE	Erysimum capitatum (Nutt.) DC.	ERCA2	Y	40	20	8	16	8	52	44	12	4	28	32		4		
BRASSICACEAE	Lepidium densiflorum Schrad.	LEDE1	Y												4	4	24	20
BRASSICACEAE	Lesquerella montana (A. Gray) Wats.	LEMO1	Y	68	56	44	60	48	92	84	32	20	40	28	44	36	52	40
BRASSICACEAE	Sisymbrium altissimum L.	SIAL1	N						24	8	4		8	12				
CACTACEAE	Coryphantha missouriensis (Sweet) Britt. & Rose	COMI1	Y										4					
CACTACEAE	Echinocereus viridiflorus Engelm.	ECVI1	Y	40	52	48	40	36	28	36		4	4	4	60	52	28	36
CACTACEAE	Opuntia macrorhiza Engelm.	OPMA1	Y	28	20	16	8	8		4	12	12	8		32	36	8	8
CARYOPHYLLACEAE	Arenaria fendleri A. Gray	ARFE2	Y	76	80	32	32	20	24	20		4			72	72	36	48
CARYOPHYLLACEAE	Paronychia jamesii T. & G.	PAJA1	Y	48	52	32	40	36	32	40					8	8	4	4
CARYOPHYLLACEAE	Silene antirrhina L.	SIAN1	Y	12					28	20							8	8
CARYOPHYLLACEAE	Silene drummondii Hook.	SIDR1	Y	4	4										4	4		
CHENOPODIACEAE	Chenopodium leptophyllum Nutt. ex Moq.	CHLE2	Y						4	4								
CLUSIACEAE	Hypericum perforatum L.	HYPE1	N	4	40				40	28						4	40	16
COMMELINACEAE	Tradescantia occidentalis (Britt.) Smyth	TROC1	Y	4							8		16					
CYPERACEAE	Carex filifolia Nutt.	CAFI1	Y								8	4	8	8				

Table 2-4. (cont.)

				TR01							TR06				TR12			
				Spring	Summer	Summer	Spring	Summer	Spring	Summer	Spring	Summer	Spring	Summer	Spring	Summer	Spring	Summer
Family	**Scientific Name**	**Speccode**	**Native**	**1998**	**1998**	**1999**	**2000**	**2000**	**2001**	**2001**	**1998**	**1998**	**2001**	**2001**	**1998**	**1998**	**2001**	**2001**
CYPERACEAE	Carex heliophila Mack.	CAHE1	Y	84	92	96	96	96	92	92	28	32	32	24	100	100	100	92
EUPHORBIACEAE	Euphorbia robusta (Engelm.) Small	EURO1	Y														4	
FABACEAE	Astragalus agrestis Dougl. ex G. Don	ASAG1	Y	4	4													
FABACEAE	Astragalus shortianus Nutt. ex T.&G.	ASSH1	Y								4							
FABACEAE	Astragalus tridactylicus Gray	ASTR1	Y									4						
FABACEAE	Dalea purpurea Vent	DAPU1	Y	16	16	16	12	12	4	8	4	4	4	4	4			
FABACEAE	Psoralea tenuiflora Pursh.	PSTE1	Y	60	56	28	64	60	16	68	12	8	4	12	48	44	4	36
GERANIACEAE	Erodium cicutarium (L.) L'Her.	ERCI1	N						4	4							4	
HYDROPHYLLACEAE	Phacelia heterophylla Pursh.	PHHE1	Y														4	4
JUNCACEAE	Juncus interior Wieg.	JUIN1	Y													4		
LILIACEAE	Allium textile A. Nels. & Macbr.	ALTE1	Y	20		8			20	4	12		20		28	20	8	
LILIACEAE	Leucocrinum montanum Nutt.	LEMO2	Y								4		4					
LINACEAE	Linum perenne L. var. lewisii (Pursh.) Eat. & Wright	LIPE1	Y								48	32	48	28				4
NYCTAGINACEAE	Mirabilis linearis (Pursh.) Heimerl	MILI1	Y		4					8						12		4
ONAGRACEAE	Gaura coccinea Pursh.	GACO1	Y								4		4					
OROBANCHACEAE	Orobanche fasciculata Nutt.	ORFA1	Y	4											32		4	
POACEAE	Agropyron smithii Rydb.	AGSM1	Y		4						4							
POACEAE	Andropogon gerardii Vitman	ANGE1	Y	68	76	76	80	72	64	80	8	4	4	8	60	60	68	60
POACEAE	Andropogon scoparius Michx.	ANSC1	Y	60	68	64	64	56	44	56	4	4	8	4		4		8
POACEAE	Aristida purpurea Nutt. var. longiseta (Steud.) Vasey	ARFE1	Y						4									
POACEAE	Aristida purpurea Nutt. var. robusta (Merrill) A. Holmgren & N. Holmgr	ARLO1	Y		4	20	12	20	16	20	8	12	12	16		16	8	16
POACEAE	Bouteloua curtipendula (Michx.) Torr.	BOCU1	Y	52	60	72	76	56	68	60	60	72	76	76	60	84	64	76
POACEAE	Bouteloua gracilis (H. B. K.) Lag ex Griffiths	BOGR1	Y	52	68	80	60	64	60	60	44	72	60	88	64	84	60	88
POACEAE	Bouteloua hirsuta Lag	BOHI1	Y	40	68	60	72	68	32	68		12	8	16	36	28	36	32
POACEAE	Bromus inermis Leyss. ssp. inermis	BRIN1	N											4				
POACEAE	Bromus japonicus Thunb. ex Murr.	BRJA1	N	20	8	8			4		68	60	72	80	40	52	36	44
POACEAE	Bromus tectorum L.	BRTE1	N	8	4	4	4	4	4	8			20	8	4	8	16	16
POACEAE	Buchloe dactyloides (Nutt.) Engelm.	BUDA1	Y	8		4	8	4							16	24	20	16
POACEAE	Koeleria pyramidata (Lam.) Beauv.	KOPY1	Y	76	76	76	88	80	72	76	16	12	8	20	56	48	36	32
POACEAE	Muhlenbergia montana (Nutt.) Hitchc.	MUMO1	Y	60	64	68	68	72	68	68					4	8	8	8
POACEAE	Poa compressa L.	POCO1	N	36	36	44	40	40	44	44	20	16	32	24	36	44	48	48
POACEAE	Poa pratensis L.	POPR1	N	28	24	36	32	32	32	32	32	28	44	36	20	16	28	24
POACEAE	Sitanion hystrix (Nutt.) Sm. var. brevifolium (Sm.) Hitchc.	SIHY1	Y	48	44	20	48	24	40	20	8	4	8	8				4
POACEAE	Sorghastrum nutans (L.) Nash	SONU1	Y	4	12	8	12	8	4	8					4	8	4	8
POACEAE	Sporobolus asper (Michx.) Kunth	SPAS1	Y											4				
POACEAE	Sporobolus heterolepis (A. Gray) A. Gray	SPHE1	Y	16	16	16	16	16	16	20								
POACEAE	Stipa comata Trin. & Rupr.	STCO1	Y	24	32	36	48	40	28	48	88	92	100	92	100	100	96	96
POACEAE	Stipa neomexicana (Thur.) Scribn.	STNE1	Y								20	20	20	20				
POLYGONACEAE	Eriogonum alatum Torr.	ERAL1	Y	68	68	36	16	16	16	16		4		4	4	4		
PORTULACACEAE	Talinum parviflorum Nutt.	TAPA1	Y	24	32	8	12	20	20	16								
PRIMULACEAE	Androsace occidentalis Pursh.	ANOC1	Y										4				4	
ROSACEAE	Potentilla fissa Nutt.	POFI1	Y	4	4	4	4	4	4	4								
ROSACEAE	Potentilla hippiana Lehm.	POHI1	Y	8	8	4	4	4	4									
SANTALACEAE	Comandra umbellata (L.) Nutt.	COUM1	Y	28	28	12	28	32	20	16								
SCROPHULARIACEAE	Castilleja sessiliflora Pursh.	CASE3	Y	12	4	4	4	4	4	4								
SCROPHULARIACEAE	Linaria dalmatica (L.) Mill.	LIDA1	N								100	100	80	88	12		4	8
SCROPHULARIACEAE	Penstemon secundiflorus Benth.	PESE1	Y								4		4	4				
SCROPHULARIACEAE	Penstemon virens Penn.	PEVI1	Y	8		12	8		8	4								
SOLANACEAE	Solanum triflorum Nutt.	SOTR1	Y												4			
VIOLACEAE	Viola nuttallii Pursh.	VINU1	Y	16					4		48		20		56		16	

Table 2-5. Species Cover Change From 1998 To 2001

TR01	TR06	TR12
Increasers	**Increasers**	**Increasers**
Muhlenbergia montana	Bromus japonicus	Andropogon gerardii
Poa compressa	Poa pratensis	Bouteloua curtipendula
		Poa compressa
Decreasers		**Decreasers**
Andropogon scoparius		Andropogon scoparius
Arenaria fendleri		Arenaria fendleri
Chrysopsis villosa		Psorelea tenuiflora
H-L-H pattern		**H-L-H pattern**
Andropogon gerardii		Carex heliophila
Koleria pyrimidata		
Liatris punctata		
L-H-L pattern	**L-H-L pattern**	**L-H-L pattern**
Aster porteri	Camelina microcarpa	Alyssum minus
Bouteloua curtipendula	Linaria dalmatica	Aster porteri
Poa pratensis	Poa compressa	Stipa comata
	Stipa comata	

Based on n=5. Minimum of 3% minimum-maximum change of absolute cover during study period.

Table 4-1. 1997-2000 Diffuse Knapweed Herbicide Monitoring Data Summary

	Spring97	Summer97	Spring98	Summer98	Spring99	Summer99	Spring00	Summer00	Spring01	Summer01
Species Richness Variables										
# species										
DKC - Control	68	65	70	65	67	58	64	59	69	68
DKT - Treatment	74	62	70	68	72	73	71	69	81	73
% natives										
DKC - Control	75	74	74	77	76	76	78	81	75	75
DKT - Treatment	73	77	77	79	75	76	75	75	75	75
mean # species/quadrat										
DKC - Control	13.8	12.8	14.0	12.1	14.0	11.4	12.9	11.6	14.1	12.4
DKT - Treatment	12.2	10.1	11.9	9.1	12.3	10.3	10.2	9.1	11.8	10.4
Shannon-Weaver Diversity Index										
DKC - Control	0.79	0.81	0.76	0.73	0.78	0.79	0.82	0.84	0.85	0.83
DKT - Treatment	0.83	0.66	0.63	0.56	0.64	0.67	0.69	0.64	0.73	0.71
Diffuse Knapweed Density (mean # stems/m2)										
DKC - Control	5.6	3.6	14.5	1.7	26.1	6.2	5.6	7.1	16.4	7.2
DKT - Treatment	23.0	6.1	2.2	1.1	1.7	1.4	1.8	1.9	41.4	15.0
Diffuse Knapweed Frequency (%)										
DKC - Control	76	76	76	60	96	64	68	64	80	76
DKT - Treatment	80	60	52	20	44	44	44	48	72	56
Cactus Densities (mean # stems/m2)										
Twistspine prickly pear cactus										
DKC - Control	0.62		0.54		0.71		0.65		0.61	
DKT - Treatment	0.79		0.24		0.10		0.07		0.04	
Hedgehog cactus										
DKC - Control	0.06		0.05		0.08		0.04		0.40	
DKT - Treatment	0.20		0.14		0.09		0.06		0.01	

Table 4-2. 1997-2001 Control and Treatment Species Richness Summary

				Control										Treatment									
Family	Scientific Name	Speccode	Native	Spring 1997	Summer 1997	Spring 1998	Summer 1998	Spring 1999	Summer 1999	Spring 2000	Summer 2000	Spring 2001	Summer 2001	Spring 1997	Summer 1997	Spring 1998	Summer 1998	Spring 1999	Summer 1999	Spring 2000	Summer 2000	Spring 2001	Summer 2001
APIACEAE	Lomatium orientale Coult. & Rose	LOOR1	Y	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X
ASCLEPIADACEAE	Asclepias stenophylla A. Gray	ASST1	Y	X	X	X	X	X	X	X	X	X	X	X			X	X	X	X	X	X	X
ASCLEPIADACEAE	Asclepias viridiflora Raf.	ASVI1	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ASTERACEAE	Achillea millefolium L. ssp. lanulosa (Nutt.) Piper	ACMI1	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ASTERACEAE	Ambrosia psilostachya DC.	AMPS1	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ASTERACEAE	Antennaria parvifolia Nutt.	ANPA1	Y	X	X	X		X	X			X	X	X	X	X	X	X	X	X	X	X	X
ASTERACEAE	Arnica fulgens Pursh.	ARFU1	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ASTERACEAE	Artemisia campestris L. ssp. caudata (Michx.) Hall & Clem.	ARCA1	Y	X	X		X			X	X	X	X	X	X	X						X	X
ASTERACEAE	Artemisia frigida Willd.	ARFR1	Y											X									
ASTERACEAE	Artemisia ludoviciana Nutt. var. ludoviciana	ARLU1	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ASTERACEAE	Aster porteri Gray	ASPO1	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ASTERACEAE	Carduus nutans L. ssp. macrolepis (Peterm.) Kazmi	CANU1	N	X	X	X	X							X					X	X	X	X	X
ASTERACEAE	Centaurea diffusa Lam.	CEDI1	N	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ASTERACEAE	Chrysopsis fulcrata Greene	CHFU1	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ASTERACEAE	Chrysopsis villosa Pursh.	CHVI1	Y			X	X			X						X	X						
ASTERACEAE	Cirsium arvense (L.) Scop.	CIAR1	N										X	X		X		X					
ASTERACEAE	Conyza canadensis (L.) Cronq.	COCA1	Y																X		X		X
ASTERACEAE	Erigeron divergens T. & G.	ERDI1	Y				X	X		X		X	X	X	X		X	X		X	X	X	
ASTERACEAE	Erigeron flagellaris A. Gray	ERFL1	Y	X	X	X	X		X		X		X	X	X	X					X		X
ASTERACEAE	Gaillardia aristata Pursh.	GAAR1	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ASTERACEAE	Grindelia squarrosa (Pursh.) Dun.	GRSQ1	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ASTERACEAE	Lactuca serriola L.	LASE1	N	X	X	X	X	X	X			X	X	X	X		X	X	X	X	X	X	X
ASTERACEAE	Liatris punctata Hook.	LIPU1	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ASTERACEAE	Microseris cuspidata (Pursh.) Sch. Bip.	MICU1	Y	X		X		X				X		X		X		X		X		X	
ASTERACEAE	Scorzonera laciniata L.	SCLA1	N	X	X	X		X		X		X	X	X	X						X	X	X
ASTERACEAE	Senecio plattensis Nutt.	SEPL1	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ASTERACEAE	Senecio spartioides T. & G.	SESP1	Y												X		X	X	X	X	X	X	X
ASTERACEAE	Solidago mollis Bart.	SOMO1	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X
ASTERACEAE	Solidago rigida L.	SORI1	Y		X	X	X	X	X	X	X												
ASTERACEAE	Sonchus arvensis L. ssp. arvensis L.	SOAR1	N																	X	X		
ASTERACEAE	Taraxacum officinale Weber	TAOF1	N	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ASTERACEAE	Tragopogon dubius Scop.	TRDU1	N	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
BORAGINACEAE	Lappula redowskii (Hornem.) Greene	LARE1	Y																			X	X
BORAGINACEAE	Lithospermum incisum Lehm.	LIIN1	Y	X	X	X		X		X	X		X										
BORAGINACEAE	Mertensia lanceolata (Pursh.) A. DC.	MELA1	Y			X		X			X			X									
BRASSICACEAE	Alyssum alyssoides (L.) L.	ALAL1	N			X						X		X									
BRASSICACEAE	Alyssum minus (L.) Rothmaler var. micranthus (C. A. Mey.) Dudley	ALMI1	N	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
BRASSICACEAE	Arabis hirsuta (L.) Scop. var. pynocarpa (Hopkins) Rollins	ARHI1	Y			X	X							X	X			X	X	X	X	X	X
BRASSICACEAE	Barbarea vulgaris R. Br.	BAVU1	N											X	X	X		X	X	X	X	X	X
BRASSICACEAE	Camelina microcarpa Andrz. ex DC.	CAMI1	N	X	X	X	X	X	X			X	X	X		X	X	X	X	X		X	X
BRASSICACEAE	Draba reptans (Lam.) Fern.	DRRE1	Y	X	X	X		X				X	X				X					X	
BRASSICACEAE	Erysimum capitatum (Nutt.) DC.	ERCA2	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
BRASSICACEAE	Lepidium campestre (L.) R. Br.	LECA1	N	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
BRASSICACEAE	Lepidium densiflorum Schrad.	LEDE1	Y	X	X									X	X	X	X		X	X		X	X
BRASSICACEAE	Lesquerella montana (A. Gray) Wats.	LEMO1	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
BRASSICACEAE	Sisymbrium altissimum L.	SIAL1	N	X	X							X				X		X	X			X	X
BRASSICACEAE	Thlaspi arvense L.	THAR1	N										X										
CACTACEAE	Coryphantha missouriensis (Sweet) Britt. & Rose	COMI1	Y	X				X						X								X	
CACTACEAE	Echinocereus viridiflorus Engelm.	ECVI1	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CACTACEAE	Opuntia macrorhiza Engelm.	OPMA1	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CAMPANULACEAE	Triodanis perfoliata (L.) Nieuw.	TRPE1	Y																			X	
CARYOPHYLLACEAE	Arenaria fendleri A. Gray	ARFE2	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CARYOPHYLLACEAE	Paronychia jamesii T. & G.	PAJA1	Y	X			X			X		X	X	X	X	X	X	X	X	X	X	X	X
CARYOPHYLLACEAE	Silene antirrhina L.	SIAN1	Y	X	X	X		X		X		X	X	X	X	X	X	X	X	X	X	X	X
CLUSIACEAE	Hypericum perforatum L.	HYPE1	N	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
COMMELINACEAE	Tradescantia occidentalis (Britt.) Smyth	TROC1	Y	X										X		X	X	X	X	X		X	X
CRASSULACEAE	Sedum lanceolatum Torr.	SELA1	Y											X	X	X	X	X	X	X	X	X	X
CYPERACEAE	Carex heliophila Mack.	CAHE1	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CYPERACEAE	Eleocharis compressa Sulliv.	ELCO1	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
FABACEAE	Dalea purpurea Vent	DAPU1	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
FABACEAE	Medicago lupulina L.	MELU1	N											X									
FABACEAE	Oxytropis lambertii Pursh.	OXLA1	Y	X					X			X											
FABACEAE	Psoralea tenuiflora Pursh.	PSTE1	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
HYDROPHYLLACEAE	Phacelia heterophylla Pursh.	PHHE1	Y												X	X	X	X	X	X	X	X	X
JUNCACEAE	Juncus interior Wieg.	JUIN1	Y		X	X	X	X	X	X	X	X	X			X	X	X	X		X	X	X
LAMIACEAE	Hedeoma hispidum Pursh.	HEHI1	Y													X				X		X	X
LILIACEAE	Allium textile A. Nels. & Macbr.	ALTE1	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
LILIACEAE	Leucocrinum montanum Nutt.	LEMO2	Y	X		X		X				X											
NYCTAGINACEAE	Mirabilis linearis (Pursh.) Heimerl	MILI1	Y								X												
ONAGRACEAE	Oenothera villosa Thunb. ssp. strigosa (Rydb.) Dietrich & Raven	OEVI1	Y	X	X	X	X	X	X	X	X	X	X					X	X	X	X	X	X
OROBANCHACEAE	Orobanche fasciculata Nutt.	ORFA1	Y	X				X		X		X	X		X	X	X	X		X	X	X	
PLANTAGINACE	Plantago lanceolata L.	PLLA1	N	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Table 4-2. (cont.)

				Control										Treatment									
Family	Scientific Name	Speccode	Native	Spring 1997	Summer 1997	Spring 1998	Summer 1998	Spring 1999	Summer 1999	Spring 2000	Summer 2000	Spring 2001	Summer 2001	Spring 1997	Summer 1997	Spring 1998	Summer 1998	Spring 1999	Summer 1999	Spring 2000	Summer 2000	Spring 2001	Summer 2001
PLANTAGINACE	Plantago patagonica Jacq.	PLPA1	Y											X									
POACEAE	Agropyron smithii Rydb.	AGSM1	Y	X							X					X		X					
POACEAE	Andropogon gerardii Vitman	ANGE1	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
POACEAE	Andropogon scoparius Michx.	ANSC1	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
POACEAE	Aristida purpurea Nutt. var. robusta (Merrill) A. Holmgren & N. Holmgr	ARLO1	Y		X				X	X	X	X	X						X		X		X
POACEAE	Bouteloua curtipendula (Michx.) Torr.	BOCU1	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
POACEAE	Bouteloua gracilis (H. B. K.) Lag ex Griffiths	BOGR1	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
POACEAE	Bouteloua hirsuta Lag	BOHI1	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
POACEAE	Bromus inermis Leyss. ssp. inermis	BRIN1	N	X	X	X	X	X	X	X	X	X	X										
POACEAE	Bromus japonicus Thunb. ex Murr.	BRJA1	N	X	X	X	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X
POACEAE	Bromus tectorum L.	BRTE1	N									X		X	X	X	X	X	X	X	X	X	X
POACEAE	Buchloe dactyloides (Nutt.) Engelm.	BUDA1	Y											X	X		X	X	X	X	X		
POACEAE	Koeleria pyramidata (Lam.) Beauv.	KOPY1	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
POACEAE	Muhlenbergia montana (Nutt.) Hitchc.	MUMO1	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
POACEAE	Muhlenbergia wrightii Vasey	MUWR1	Y							X			X			X	X	X		X	X	X	
POACEAE	Panicum capillare L.	PACA1	Y																X				
POACEAE	Poa compressa L.	POCO1	N	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
POACEAE	Poa pratensis L.	POPR1	N	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
POACEAE	Sitanion hystrix (Nutt.) Sm. var. brevifolium (Sm.) Hitchc.	SIHY1	Y	X	X		X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X
POACEAE	Sorghastrum nutans (L.) Nash	SONU1	Y		X	X	X		X	X	X	X	X		X	X	X		X	X	X	X	X
POACEAE	Sporobolus heterolepis (A. Gray) A. Gray	SPHE1	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
POACEAE	Stipa comata Trin. & Rupr.	STCO1	Y				X		X			X	X			X							
POLEMONIACEAE	Collomia linearis Nutt.	COLI1	Y											X		X	X	X	X			X	X
POLYGONACEAE	Eriogonum alatum Torr.	ERAL1	Y			X	X			X	X		X	X	X	X	X	X	X	X	X	X	X
POLYGONACEAE	Polygonum arenastrum Jord. ex Bor.	POAR1	N															X					
POLYGONACEAE	Polygonum convolvulus L.	POCO2	N			X																	
POLYGONACEAE	Polygonum ramosissimum Michx.	PORA1	Y			X	X									X	X	X	X				
POLYGONACEAE	Rumex crispus L.	RUCR1	N											X		X	X	X	X	X		X	
PORTULACACEAE	Talinum parviflorum Nutt.	TAPA1	Y		X	X	X	X	X	X	X	X		X				X	X	X	X	X	X
RANUNCULACEAE	Delphinium nuttalianum Pritz. ex Walpers	DENU1	Y																			X	
ROSACEAE	Potentilla gracilis Dougl. ex Hook. var. glabrata (Lehm.) C. L. Hitchc.	POGR1	Y											X									
ROSACEAE	Prunus virginiana L. var. melanocarpa (A. Nels.) Sarg.	PRVI1	Y	X	X	X	X	X	X	X	X	X	X										
SCROPHULARIACEAE	Linaria dalmatica (L.) Mill.	LIDA1	N					X		X		X	X							X	X	X	X
SCROPHULARIACEAE	Penstemon virens Penn.	PEVI1	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
SCROPHULARIACEAE	Verbascum blattaria L.	VEBL1	N	X	X	X	X	X	X	X	X												
SCROPHULARIACEAE	Veronica peregrina L. var. xalapensis (H. B. K.) St. John & Warren	VEPE1	Y			X	X	X								X	X	X	X			X	X
VIOLACEAE	Viola nuttallii Pursh.	VINU1	Y					X				X											
	Unknown species	UNKN																	X			X	

Table 4-3. 1997-2001 Diffuse Knapweed Monitoring Study Species Frequency Summary

			CONTROL FREQUENCY (%)										TREATMENT FREQUENCY (%)									
Scientific Name	**Speccode**	**Native**	**Spring 1997**	**Summer 1997**	**Spring 1998**	**Summer 1998**	**Spring 1999**	**Summer 1999**	**Spring 2000**	**Summer 2000**	**Spring 2001**	**Summer 2001**	**Spring 1997**	**Summer 1997**	**Spring 1998**	**Summer 1998**	**Spring 1999**	**Summer 1999**	**Spring 2000**	**Summer 2000**	**Spring 2001**	**Summer 2001**
Achillea millefolium L. ssp. lanulosa (Nutt.) Piper	ACMI1	Y	8	8	8	4	8	4	4	4	4	4							4			4
Allium textile A. Nels. & Macbr.	ALTE1	Y	20	4	8		8				20	16	36	12	24	12	28	16			12	
Alyssum minus (L.) Rothmaler var. micranthus (C. A. Mey.) Dudley	ALMI1	N	28	20	12	16	20	8	4	4	8	4	4	4	16	4	8	4	4	4	4	4
Ambrosia psilostachya DC.	AMPS1	Y	72	68	64	68	64	60	60	64	76	72	32	32	12	16	16	12	28	28	36	32
Andropogon gerardii Vitman	ANGE1	Y	88	88	88	84	88	92	84	84	76	84	68	64	64	64	64	68	64	60	56	64
Andropogon scoparius Michx.	ANSC1	Y	28	28	20	24	16	36	48	52	24	36	20	40	20	20	20	28	28	32	16	32
Arabis hirsuta (L.) Scop. var. pynocarpa (Hopkins) Rollins	ARHI1	Y											4				4	4	4	4		
Arenaria fendleri A. Gray	ARFE2	Y	32	44	20	44	32	36	32	36	36	24	52	40	28	28	28	24	28	16	28	28
Aristida purpurea Nutt. var. robusta (Merrill) A. Holmgren & N. Holmgr	ARLO1	Y								4	4	8										
Arnica fulgens Pursh.	ARFU1	Y	36	16	40	28	40	12	32	8	40	28	16	12	16	12	20	8	20	8	20	20
Artemisia campestris L. ssp. caudata (Michx.) Hall & Clem.	ARCA1	Y											4	4	4							
Artemisia ludoviciana Nutt. var. ludoviciana	ARLU1	Y	68	68	68	64	68	64	68	68	68	64	36	36	32	16	24	16	20	16	20	20
Asclepias stenophylla A. Gray	ASST1	Y	8	4			4	4		4	8	12										
Asclepias viridiflora Raf.	ASVI1	Y	8	12	8	8	12	12	8	8	4	4										
Aster porteri Gray	ASPO1	Y	76	76	84	76	76	76	52	40	52	44	80	84	80	72	80	72	44	48	56	56
Barbarea vulgaris R. Br.	BAVU1	N											4									
Bouteloua curtipendula (Michx.) Torr.	BOCU1	Y	36	40	28	28	40	40	60	44	48	52	8	32	28	12	24	32	20	36	28	24
Bouteloua gracilis (H. B. K.) Lag ex Griffiths	BOGR1	Y		16	8	8	8	20	28	24	24	32	16	28	16	24	36	48	36	48	36	44
Bouteloua hirsuta Lag	BOHI1	Y	16	16	16	28	16	20	24	28	20	24	16			4	8	20	12	12	8	4
Bromus japonicus Thunb. ex Murr.	BRJA1	N			4	4	4						36	32	32	36	40	24	24	12	44	36
Bromus tectorum L.	BRTE1	N											8	4	12	8		12	12	8	12	8
Camelina microcarpa Andrz. ex DC.	CAMI1	N	8				8	4			12						4					
Carex heliophila Mack.	CAHE1	Y	64	72	72	68	56	60	68	76	72	64	32	40	52	40	36	28	36	36	28	32
Centaurea diffusa Lam.	CEDI1	N	76	76	76	60	96	64	68	64	80	76	80	60	52	20	44	44	44	48	72	56
Chrysopsis fulcrata Greene	CHFU1	Y	8	8	8	4	4	4	4	8	4	4					4	4	4			
Collomia linearis Nutt.	COLI1	Y											4		4	4	4	4			4	4
Dalea purpurea Vent	DAPU1	Y	8	4	8	8	8	8	8	8	8	8	12	12	8	12	12	12	16	16	12	12
Draba reptans (Lam.) Fern.	DRRE1	Y	16	4	4		12				32					4					8	
Echinocereus viridiflorus Engelm.	ECVI1	Y	16	16	20	8	8	4	4	12	4	4	40	36	28	32	28	24	20	20	8	16
Erigeron divergens T. & G.	ERDI1	Y					4		4		4		4						4		4	
Erigeron flagellaris A. Gray	ERFL1	Y	4	4	4	4		4		4		4		4						4		4
Erysimum capitatum (Nutt.) DC.	ERCA2	Y	8	4	8		4				8		4				8	8	12	4	12	8
Gaillardia aristata Pursh.	GAAR1	Y	12	4	8	4	12	8	4	8	8	4	8	4		4	4	4	4	8	4	4
Grindelia squarrosa (Pursh.) Dun.	GRSQ1	Y	56	48	68	40	40	32	32	20	8	12	20	16	12		12	4	4	4	8	8
Hypericum perforatum L.	HYPE1	N	52	64	44	16	24	16	20	28	28	36	16	8	72	12	36	24	20	36	12	20
Juncus interior Wieg.	JUIN1	Y		4		4		4		4		4				4						
Koeleria pyramidata (Lam.) Beauv.	KOPY1	Y	40	32	28	20	28	24	40	24	36	20	36	20	28	20	20	32	24	24	24	20
Lactuca serriola L.	LASE1	N	12	12	28	8	20	4			4		20	8			28	16	4		28	16
Lappula redowskii (Hornem.) Greene	LARE1	Y																			4	
Lepidium campestre (L.) R. Br.	LECA1	N		4	4	4	12	8	4		32	20	16	8	16	12	20	12	4		28	28
Lepidium densiflorum Schrad.	LEDE1	Y	4	4									12	8							20	4
Lesquerella montana (A. Gray) Wats.	LEMO1	Y	8	8	12	16	28	16	12	12	16	20	12	16	12	12	20	20	12	12	12	12
Liatris punctata Hook.	LIPU1	Y	16	20	20	28	24	24	16	24	16	16	20	20	28	20	28	24	28	16	16	16
Lithospermum incisum Lehm.	LIIN1	Y	4	4						4												
Lomatium orientale Coult. & Rose	LOOR1	Y	92		92	48	100		96	4	96	32	80	8	92	72	92	24	88	16	84	52
Mertensia lanceolata (Pursh.) A. DC.	MELA1	Y			4								4									
Microseris cuspidata (Pursh.) Sch. Bip.	MICU1	Y	4		8		4				12		4		4		8				12	
Mirabilis linearis (Pursh.) Heimerl	MILI1	Y								4												
Muhlenbergia montana (Nutt.) Hitchc.	MUMO1	Y	100	100	96	100	96	100	100	100	88	96	96	96	92	92	96	100	96	96	100	100
Oenothera villosa Thunb. ssp. strigosa (Rydb.) Dietrich & Raven	OEVI1	Y			4												4	4	4	4		
Opuntia macrorhiza Engelm.	OPMA1	Y	40	40	40	40	36	32	48	44	40	44	64	76	20	32	24	28	16	20	12	20
Orobanche fasciculata Nutt.	ORFA1	Y					4		12		12	4		4	4	4	20		40	12		
Paronychia jamesii T. & G.	PAJA1	Y										4	12	12	4	4	4	4	4	4	4	4
Penstemon virens Penn.	PEVI1	Y	4		4	4	4	4	4	4	4	4	16		28	12	28	24	20	16	20	16
Poa compressa L.	POCO1	N	92	100	100	100	100	96	100	100	100	100	96	96	100	100	100	100	100	100	100	96
Poa pratensis L.	POPR1	N	8	8	8	8	4	4	8	8	8	4			4	4	8	4				
Polygonum ramosissimum Michx.	PORA1	Y				8									4	8	8	4				
Psoralea tenuiflora Pursh.	PSTE1	Y	32	40	44	36	36	44	44	36	24	28	20	8	16	16	12	16	20	20	20	16
Rumex crispus L.	RUCR1	N											4									
Scorzonera laciniata L.	SCLA1	N											4	4								
Senecio plattensis Nutt.	SEPL1	Y	8	4	4		16	4	4	8	8	4	24	12	20	4	12	4	4	4	8	4
Senecio spartioides T. & G.	SESP1	Y																				4
Silene antirrhina L.	SIAN1	Y	8	8	4		12		8		20	16	4		28		24	8	12	4	48	28
Sisymbrium altissimum L.	SIAL1	N									4											
Sitanion hystrix (Nutt.) Sm. var. brevifolium (Sm.) Hitchc.	SIHY1	Y	8	12			8	12				4						4	4	4		
Solidago mollis Bart.	SOMO1	Y	24	24	28	28	28	24	28	24	28	32										
Sorghastrum nutans (L.) Nash	SONU1	Y		4	4	4		4	4	4	4	4				4		4		4	4	4
Sporobolus heterolepis (A. Gray) A. Gray	SPHE1	Y	20	20	20	24	20	20	20	20	20	20										
Stipa comata Trin. & Rupr.	STCO1	Y				4		4			8	4										
Talinum parviflorum Nutt.	TAPA1	Y		4	4		8	4	4		4						12	28	4	20	16	20
Taraxacum officinale Weber	TAOF1	N											4								8	4
Tradescantia occidentalis (Britt.) Smyth	TROC1	Y											4		4		4	4	4		4	4
Tragopogon dubius Scop.	TRDU1	N	8	16	44	32	32	20	24	32	40	44	12	8		4	8	4	20	28	40	36
Triodanis perfoliata (L.) Nieuw.	TRPE1	Y																			4	
Veronica peregrina L. var. xalapensis (H. B. K.) St. John & Warren	VEPE1	Y			4										72	32	60	16			20	
Viola nuttallii Pursh.	VINU1	Y									4											
Unknown species	UNKN																	4				

Frequency based on n=25.

Table 4-4. 1997-2001 Diffuse Knapweed Monitoring Study Species Frequency Changes Summary

			Frequency Changes (%)		
Scientific Name	**Speccode**	**Native**	**Control Change**	**Treatment Change**	**Control vs. Treatment Change**
Opuntia macrorhiza Engelm.	OPMA1	Y	0	-52	-52
Arenaria fendleri A. Gray	ARFE2	Y	4	-24	-28
Allium textile A. Nels. & Macbr.	ALTE1	Y	0	-24	-24
Echinocereus viridiflorus Engelm.	ECVI1	Y	-12	-32	-20
Lepidium campestre (L.) R. Br.	LECA1	N	32	12	-20
Artemisia ludoviciana Nutt. var. ludoviciana	ARLU1	Y	0	-16	-16
Senecio plattensis Nutt.	SEPL1	Y	0	-16	-16
Bouteloua hirsuta Lag	BOHI1	Y	4	-8	-12
Carex heliophila Mack.	CAHE1	Y	8	-4	-12
Centaurea diffusa Lam.	CEDI1	N	4	-8	-12
Orobanche fasciculata Nutt.	ORFA1	Y	12	0	-12
Lepidium densiflorum Schrad.	LEDE1	Y	-4	8	12
Talinum parviflorum Nutt.	TAPA1	Y	4	16	12
Lactuca serriola L.	LASE1	N	-8	8	16
Muhlenbergia montana (Nutt.) Hitchc.	MUMO1	Y	-12	4	16
Alyssum minus (L.) Rothmaler var. micranthus (C. A. Mey.) Dudley	ALMI1	N	-20	0	20
Hypericum perforatum L.	HYPE1	N	-24	-4	20
Veronica peregrina L. var. xalapensis (H. B. K.) St. John & Warren	VEPE1	Y	0	20	20
Silene antirrhina L.	SIAN1	Y	12	44	32
Grindelia squarrosa (Pursh.) Dun.	GRSQ1	Y	-48	-12	36

Frequency based on n=25.

Values are based on Spring 1997 vs. Spring 2001 comparisons.

Table 4-5. 1997-2001 Diffuse Knapweed Monitoring Study Foliar Cover Summary - Control Plot

					Frequency (%)										Absolute Cover (%)										Relative Cover (%)									
Scientific Name	Speccode	Growth Form	Native	Cool/ Warm Season	Spring 1997	Summer 1997	Spring 1998	Summer 1998	Spring 1999	Summer 1999	Spring 2000	Summer 2000	Spring 2001	Summer 2001	Spring 1997	Summer 1997	Spring 1998	Summer 1998	Spring 1999	Summer 1999	Spring 2000	Summer 2000	Spring 2001	Summer 2001	Spring 1997	Summer 1997	Spring 1998	Summer 1998	Spring 1999	Summer 1999	Spring 2000	Summer 2000	Spring 2001	Summer 2001
Camelina microcarpa Andrz. ex DC.	CAMI1	F	N					20										0.2										0.2						
Centaurea diffusa Lam.	CEDI1	F	N		100	100	40	80	40	60	100	100	100	100	2.6	4.8	0.4	1.0	0.6	2.0	3.2	4.8	5.2	5.8	3.8	6.1	0.5	1.2	0.9	2.4	4.8	6.6	7.6	6.9
Hypericum perforatum L.	HYPE1	F	N			20										0.2										0.3								
Lepidium campestre (L.) R. Br.	LECA1	F	N		20	20	20	20		40			20	20	0.4	0.2	0.2	0.2		0.2			0.2	0.2	0.6	0.3	0.3	0.2		0.2			0.3	0.2
Tragopogon dubius Scop.	TRDU1	F	N		40	20	60		40	20	60	40	20		0.4	0.2	0.6		0.2	0.2	0.6	0.8	0.2		0.6	0.3	0.8		0.3	0.2	0.9	1.1	0.3	
Achillea millefolium L. ssp. lanulosa (Nutt.) Piper	ACMI1	F	Y								20		20								0.2		0.2								0.3		0.3	
Ambrosia psilostachya DC.	AMPS1	F	Y		60	60	100	80	80	60	40	100	80	80	1.2	0.6	1.2	1.4	1.8	1.4	1.0	2.4	1.2	3.2	1.8	0.8	1.6	1.6	2.8	1.7	1.5	3.3	1.7	3.8
Arenaria fendleri A. Gray	ARFE2	F	Y		40	20		40	20	40	40		40		0.4	0.2		0.4	0.6	0.4	0.6		0.6		0.6	0.3		0.5	0.9	0.5	0.9		0.9	
Arnica fulgens Pursh.	ARFU1	F	Y		20		20			20			20		0.2		0.2			0.2			0.2		0.3		0.3			0.2			0.3	
Artemisia ludoviciana Nutt. var. ludoviciana	ARLU1	F	Y		100	20	40	40	40	40	40	60	40	60	1.0	0.2	0.6	0.4	0.6	0.4	0.6	1.2	0.6	1.0	1.5	0.3	0.8	0.5	0.9	0.5	0.9	1.6	0.9	1.2
Asclepias stenophylla A. Gray	ASST1	F	Y		20	20				40	20				0.2	0.2				0.4	0.2				0.3	0.3				0.5	0.3			
Asclepias viridiflora Raf.	ASVI1	F	Y										20										0.2										0.3	
Aster porteri Gray	ASPO1	F	Y		100	100	100	100	100	100	20	40	40	80	2.6	2.0	5.4	4.6	4.6	5.6	0.4	0.6	0.4	1.0	3.8	2.5	7.1	5.4	7.1	6.7	0.6	0.8	0.6	1.2
Chrysopsis fulcrata Greene	CHFU1	F	Y								20	20	20								0.2	0.2	0.2								0.3	0.3	0.3	
Dalea purpurea Vent	DAPU1	F	Y			20	20		20	20						0.2	0.2		0.2	0.2						0.3	0.3		0.3	0.2				
Draba reptans (Lam.) Fern.	DRRE1	F	Y										20										0.2										0.3	
Erigeron divergens T. & G.	ERDI1	F	Y						40										0.4										0.6					
Erigeron flagellaris A. Gray	ERFL1	F	Y			20	20									0.2	0.2									0.3	0.3							
Gaillardia aristata Pursh.	GAAR1	F	Y			20			20				20			0.2			0.2				0.2			0.3			0.3				0.3	
Grindelia squarrosa (Pursh.) Dun.	GRSQ1	F	Y		40	80		20			20				0.4	1.2		0.2			0.2				0.6	1.5		0.2			0.3			
Liatris punctata Hook.	LIPU1	F	Y		20							40			0.2							0.4			0.3							0.5		
Lomatium orientale Coult. & Rose	LOOR1	F	Y				60		40		40		100				0.8		0.4		0.6		1.8				1.1		0.6		0.9		2.6	
Penstemon virens Penn.	PEVI1	F	Y										20	20									0.2	0.2									0.3	0.2
Psoralea tenuiflora Pursh.	PSTE1	F	Y		40	80	40	80	20	100	80	100	60	100	0.8	1.4	0.8	1.6	0.2	1.4	1.4	2.6	1.2	3.0	1.2	1.8	1.1	1.9	0.3	1.7	2.1	3.6	1.7	3.6
Silene antirrhina L.	SIAN1	F	Y		20										0.2										0.3									
Solidago mollis Bart.	SOMO1	F	Y											60										0.6										0.7
Poa compressa L.	POCO1	G	N	C	100	100	100	100	100	100	100	100	100	100	17.2	20.8	25.4	31.8	19.2	24.2	19.6	11.8	20.4	26.6	25.2	26.4	33.5	37.1	29.5	28.9	29.6	16.1	29.7	31.7
Poa pratensis L.	POPR1	G	N	C	20	40	40	20				40	60	20	0.4	0.6	0.8	0.2				0.4	1.0	0.2	0.6	0.8	1.1	0.2				0.5	1.5	0.2
Aristida purpurea Nutt. var. robusta (Merrill) A. Holmgren & N. Holmgr	ARLO1	G	Y	C										20										0.2										0.2
Carex heliophila Mack.	CAHE1	G	Y	C	60	100	80	80	60	60	80	80	100	100	0.6	1.6	2.0	2.0	2.0	1.2	1.6	2.0	1.4	2.0	0.9	2.0	2.6	2.3	3.1	1.4	2.4	2.7	2.0	2.4
Eleocharis compressa Sulliv.	ELCO1	G	Y	C	20		20			20		20		20	0.4		0.2			0.2		0.2		0.2	0.6		0.3			0.2		0.3		0.2
Koeleria pyramidata (Lam.) Beauv.	KOPY1	G	Y	C	40	20	20	20	40	40	20		60	20	0.4	0.2	0.2	0.2	0.4	0.4	0.2		0.8	0.2	0.6	0.3	0.3	0.2	0.6	0.5	0.3		1.2	0.2
Sitanion hystrix (Nutt.) Sm. var. brevifolium (Sm.) Hitchc.	SIHY1	G	Y	C		20			20							0.2			0.2							0.3			0.3					
Andropogon gerardii Vitman	ANGE1	G	Y	W	100	100	100	100	100	100	100	100	100	100	8.6	11.0	7.2	12.2	6.6	12.0	8.8	14.2	3.8	11.0	12.6	14.0	9.5	14.3	10.2	14.4	13.3	19.4	5.5	13.1
Andropogon scoparius Michx.	ANSC1	G	Y	W	20	20	20			60	80	40	60	60	0.4	0.2	0.2			0.6	1.2	0.8	0.8	0.6	0.6	0.3	0.3			0.7	1.8	1.1	1.2	0.7
Bouteloua curtipendula (Michx.) Torr.	BOCU1	G	Y	W	40	80	40	80	40	60	60	40	60	80	0.4	1.8	1.0	0.8	1.2	2.0	1.4	1.0	1.6	1.6	0.6	2.3	1.3	0.9	1.8	2.4	2.1	1.4	2.3	1.9
Bouteloua gracilis (H. B. K.) Lag ex Griffiths	BOGR1	G	Y	W	20			20	20	20	60	60	40		0.4			0.2	0.2	0.4	0.4	0.8	0.6		0.6			0.2	0.3	0.5	0.6	1.1	0.9	
Bouteloua hirsuta Lag	BOHI1	G	Y	W			20		20	40	40			20			0.2		0.2	0.4	0.4			0.2			0.3		0.3	0.5	0.6			0.2
Muhlenbergia montana (Nutt.) Hitchc.	MUMO1	G	Y	W	100	100	100	100	100	100	100	100	100	100	23.2	24.4	23.2	22.2	19.6	23.4	18.4	22.6	20.8	20.6	34.0	31.0	30.6	25.9	30.2	28.0	27.8	30.9	30.2	24.6
Sporobolus heterolepis (A. Gray) A. Gray	SPHE1	G	Y	W	100	100	100	100	100	100	100	100	100	100	5.6	6.2	4.8	6.0	5.6	6.4	5.0	6.4	4.8	5.4	8.2	7.9	6.3	7.0	8.6	7.7	7.6	8.7	7.0	6.4
Total foliar cover															68.2	78.8	75.8	85.6	65.0	83.6	66.2	73.2	68.8	83.8	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total forb cover															10.6	11.8	10.6	10.0	9.8	12.4	9.2	13.0	12.8	15.0	15.5	15.0	14.0	11.7	15.1	14.8	13.9	17.8	18.6	17.9
Total native forb cover															7.2	6.4	9.4	8.6	9.0	10.0	5.4	7.4	7.2	9.0	10.6	8.1	12.4	10.0	13.8	12.0	8.2	10.1	10.5	10.7
Total non-native forb cover															3.4	5.4	1.2	1.4	0.8	2.4	3.8	5.6	5.6	6.0	5.0	6.9	1.6	1.6	1.2	2.9	5.7	7.7	8.1	7.2
Total graminoid cover															57.6	67.0	65.2	75.6	55.2	71.2	57.0	60.2	56.0	68.8	84.5	85.0	86.0	88.3	84.9	85.2	86.1	82.2	81.4	82.1
Total native graminoid cover															40.0	45.6	39.0	43.6	36.0	47.0	37.4	48.0	34.6	42.0	58.7	57.9	51.5	50.9	55.4	56.2	56.5	65.6	50.3	50.1
Total non-native graminoid cover															17.6	21.4	26.2	32.0	19.2	24.2	19.6	12.2	21.4	26.8	25.8	27.2	34.6	37.4	29.5	28.9	29.6	16.7	31.1	32.0
Total native cover															47.2	52.0	48.4	52.2	45.0	57.0	42.8	55.4	41.8	51.0	69.2	66.0	63.9	61.0	69.2	68.2	64.7	75.7	60.8	60.9
Total non-native cover															21.0	26.8	27.4	33.4	20.0	26.6	23.4	17.8	27.0	32.8	30.8	34.0	36.1	39.0	30.8	31.8	35.3	24.3	39.2	39.1
Total warm-season graminoid cover															38.6	43.6	36.6	41.4	33.4	45.2	35.6	45.8	32.4	39.4	56.6	55.3	48.3	48.4	51.4	54.1	53.8	62.6	47.1	47.0
Total cool-season graminoid cover															19.0	23.4	28.6	34.2	21.8	26.0	21.4	14.4	23.6	29.4	27.9	29.7	37.7	40.0	33.5	31.1	32.3	19.7	34.3	35.1

Absolute cover = Absolute foliar cover is the percentage of the number of hits on a species out of the total number of hits possible (500).
Relative cover = Relative foliar cover was the number of hits a species had relative to the total number of all vegetative hits recorded per site (i.e., the percent of vegetative cover the species represented).
All cover values presented are means (n = 5).
Native categories: Y = Native, N = Non-Native
Form categories: C = Cactus, F = Forb, G = Graminoid
Cool/Warm Season categories: C = Cool season species, W = Warm season species

Table 4-6. 1997-2001 Diffuse Knapweed Monitoring Study Foliar Cover Summary - Treatment Plot

					Frequency (%)										Absolute Cover (%)										Relative Cover (%)									
Scientific Name	Speccode	Growth Form	Native	Cool/ Warm Season	Spring 1997	Summer 1997	Spring 1998	Summer 1998	Spring 1999	Summer 1999	Spring 2000	Summer 2000	Spring 2001	Summer 2001	Spring 1997	Summer 1997	Spring 1998	Summer 1998	Spring 1999	Summer 1999	Spring 2000	Summer 2000	Spring 2001	Summer 2001	Spring 1997	Summer 1997	Spring 1998	Summer 1998	Spring 1999	Summer 1999	Spring 2000	Summer 2000	Spring 2001	Summer 2001
Alyssum minus (L.) Rothmaler var. micranthus (C. A. Mey.) Dudley	ALMI1	F	N						20	20	20		20	20					0.2	0.2	0.2		0.2	0.2					0.3	0.3	0.3		0.3	0.2
Centaurea diffusa Lam.	CEDI1	F	N		100	100				20	40	60	20	60	4.4	4.8				0.6	0.4	1.2	0.8	1.2	6.6	6.8				0.8	0.6	1.7	1.1	1.4
Hypericum perforatum L.	HYPE1	F	N		20	20					20	20			0.2	0.2					0.2	0.2			0.3	0.3					0.3	0.3		
Lactuca serriola L.	LASE1	F	N							20			40	20						0.2			0.4	0.2						0.3			0.5	0.2
Lepidium campestre (L.) R. Br.	LECA1	F	N		20								20	20	0.2								0.2	0.2	0.3								0.3	0.2
Plantago lanceolata L.	PLLA1	F	N		20										0.2										0.3									
Tragopogon dubius Scop.	TRDU1	F	N		20					40	40	20	60	40	0.2					0.4	0.4	0.2	0.6	0.6	0.3					0.5	0.6	0.3	0.8	0.7
Allium textile A. Nels. & Macbr.	ALTE1	F	Y		20	20	20								0.2	0.2	0.2								0.3	0.3	0.3							
Ambrosia psilostachya DC.	AMPS1	F	Y		80					20	40	60	60	80	1.6					0.2	0.6	1.0	0.6	1.8	2.4					0.3	1.0	1.4	0.8	2.2
Arenaria fendleri A. Gray	ARFE2	F	Y		20								20	20	0.4								0.2	0.2	0.6								0.3	0.2
Arnica fulgens Pursh.	ARFU1	F	Y		60	20	20	40	40		20		60	40	0.6	0.2	0.4	0.4	0.8		0.6		0.6	0.4	0.9	0.3	0.5	0.5	1.3		1.0		0.8	0.5
Artemisia ludoviciana Nutt. var. ludoviciana	ARLU1	F	Y		20	60		60		60	40	20	20	20	0.4	1.0		0.6		0.6	0.6	0.2	0.2	0.2	0.6	1.4		0.7		0.8	1.0	0.3	0.3	0.2
Asclepias stenophylla A. Gray	ASST1	F	Y		20			20							0.2			0.2							0.3			0.2						
Aster porteri Gray	ASPO1	F	Y		80	100	60	60	60	80	20	40	40	20	2.0	2.0	1.8	2.6	2.6	3.2	0.6	0.4	0.8	0.2	3.0	2.8	2.4	3.2	4.1	4.0	1.0	0.6	1.1	0.2
Collomia linearis Nutt.	COLI1	F	Y										20										0.2										0.3	
Dalea purpurea Vent	DAPU1	F	Y			20	20				20		20			0.2	0.2				0.2		0.2			0.3	0.3				0.3		0.3	
Grindelia squarrosa (Pursh.) Dun.	GRSQ1	F	Y		60	20	20		20		20	20			0.6	0.2	0.2		0.2		0.4	0.2			0.9	0.3	0.3		0.3		0.6	0.3		
Lepidium densiflorum Schrad.	LEDE1	F	Y										40										0.4										0.5	
Lesquerella montana (A. Gray) Wats.	LEMO1	F	Y							20	40		20							0.2	0.4		0.2							0.3	0.6		0.3	
Liatris punctata Hook.	LIPU1	F	Y		20		20			40	60	40	40	20	0.2		0.2			0.6	0.8	0.4	1.0	0.2	0.3		0.3			0.8	1.3	0.6	1.4	0.2
Lomatium orientale Coult. & Rose	LOOR1	F	Y		60		80		80		40		60		0.8		1.6		1.2		0.4		1.4		1.2		2.1		1.9		0.6		1.9	
Penstemon virens Penn.	PEVI1	F	Y				20					20					0.2					0.2					0.3					0.3		
Psoralea tenuiflora Pursh.	PSTE1	F	Y										20	40									0.2	0.4									0.3	0.5
Senecio plattensis Nutt.	SEPL1	F	Y				20										0.2										0.3							
Senecio spartioides T. & G.	SESP1	F	Y							20	20	20	20							0.2	0.4	0.4	0.2							0.3	0.6	0.6	0.3	
Silene antirrhina L.	SIAN1	F	Y											20										0.2										0.2
Talinum parviflorum Nutt.	TAPA1	F	Y									20										0.2										0.3		
Tradescantia occidentalis (Britt.) Smyth	TROC1	F	Y						20										0.4										0.6					
Veronica peregrina L. var. xalapensis (H. B. K.) St. John & Warren	VEPE1	F	Y						20										0.2										0.3					
Bromus japonicus Thunb. ex Murr.	BRJA1	G	N	C	60	80	40	60	40	40	20		60	20	2.2	2.4	2.0	2.2	1.2	0.8	0.2		0.6	0.2	3.3	3.4	2.7	2.7	1.9	1.0	0.3		0.8	0.2
Bromus tectorum L.	BRTE1	G	N	C	20		40	40		20			20		1.8		1.2	0.6		0.6			0.2		2.7		1.6	0.7		0.8			0.3	
Poa compressa L.	POCO1	G	N	C	100	100	100	100	100	100	100	100	100	100	12.2	12.4	25.0	31.6	23.8	22.8	20.4	13.0	23.0	25.2	18.4	17.5	33.2	38.7	37.9	28.6	32.6	18.8	31.4	30.3
Poa pratensis L.	POPR1	G	N	C	20	20	20					20	20		0.2	0.4	0.2					0.2	0.2		0.3	0.6	0.3					0.3	0.3	
Aristida purpurea Nutt. var. robusta (Merrill) A. Holmgren & N. Holmgr	ARLO1	G	Y	C										20										0.2										0.2
Carex heliophila Mack.	CAHE1	G	Y	C	60	40	60	40	40	40	20	60	80	60	0.8	1.2	0.8	0.8	0.6	0.8	1.0	2.0	2.6	2.2	1.2	1.7	1.1	1.0	1.0	1.0	1.6	2.9	3.6	2.6
Koeleria pyramidata (Lam.) Beauv.	KOPY1	G	Y	C	40	20			20		20		40	20	0.2	0.2			0.2		0.2		0.4	0.2	0.3	0.3			0.3		0.3		0.5	0.2
Sitanion hystrix (Nutt.) Sm. var. brevifolium (Sm.) Hitchc.	SIHY1	G	Y	C				20		20				40				0.2		0.2				0.4				0.2		0.3				0.5
Andropogon gerardii Vitman	ANGE1	G	Y	W	80	100	80	100	100	100	100	100	100	100	5.0	8.2	5.4	7.8	4.6	10.2	5.4	9.4	5.4	11.2	7.5	11.5	7.2	9.6	7.3	12.8	8.6	13.6	7.4	13.5
Andropogon scoparius Michx.	ANSC1	G	Y	W	80	60	80	60	40	40	60	80	40	80	1.6	1.0	1.0	1.0	0.8	1.4	1.8	1.2	1.4	3.0	2.4	1.4	1.3	1.2	1.3	1.8	2.9	1.7	1.9	3.6
Bouteloua curtipendula (Michx.) Torr.	BOCU1	G	Y	W	60	40	60	20	60	80	40	80	60	60	0.8	0.4	1.4	0.2	1.6	2.0	0.6	2.4	1.0	2.2	1.2	0.6	1.9	0.2	2.5	2.5	1.0	3.5	1.4	2.6
Bouteloua gracilis (H. B. K.) Lag ex Griffiths	BOGR1	G	Y	W	40	20	80			80	60	40	40	40	0.6	0.2	1.2			0.8	1.0	1.2	0.6	1.2	0.9	0.3	1.6			1.0	1.6	1.7	0.8	1.4
Bouteloua hirsuta Lag	BOHI1	G	Y	W	80			20	40		80	20		20	0.8			0.2	0.6		1.0	0.2		0.2	1.2			0.2	1.0		1.6	0.3		0.2
Muhlenbergia montana (Nutt.) Hitchc.	MUMO1	G	Y	W	100	100	100	100	100	100	100	100	100	100	26.4	35.2	31.6	32.6	23.0	32.6	24.2	34.4	29.0	30.4	39.8	49.6	41.9	40.0	36.6	40.9	38.7	49.7	39.6	36.5
Sorghastrum nutans (L.) Nash	SONU1	G	Y	W						20	20			20						0.2	0.2			0.2						0.3	0.3			0.2
Sporobolus heterolepis (A. Gray) A. Gray	SPHE1	G	Y	W	60	20	40	40	40	40	20	40	20	40	1.6	0.6	0.6	0.6	0.8	1.0	0.4	0.6	0.4	0.4	2.4	0.8	0.8	0.7	1.3	1.3	0.6	0.9	0.5	0.5
Total foliar cover															66.4	71.0	75.4	81.6	62.8	79.8	62.6	69.2	73.2	83.2	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total forb cover															12.2	8.8	5.0	3.8	5.6	6.4	6.2	4.6	8.4	6.0	18.4	12.4	6.6	4.7	8.9	8.0	9.9	6.6	11.5	7.2
Total native forb cover															7.0	3.8	5.0	3.8	5.4	5.0	5.0	3.0	6.2	3.6	10.5	5.4	6.6	4.7	8.6	6.3	8.0	4.3	8.5	4.3
Total non-native forb cover															5.2	5.0	0.0	0.0	0.2	1.4	1.2	1.6	2.2	2.4	7.8	7.0	0.0	0.0	0.3	1.8	1.9	2.3	3.0	2.9
Total graminoid cover															54.2	62.2	70.4	77.8	57.2	73.4	56.4	64.6	64.8	77.2	81.6	87.6	93.4	95.3	91.1	92.0	90.1	93.4	88.5	92.8
Total native graminoid cover															37.8	47.0	42.0	43.4	32.2	49.2	35.8	51.4	40.8	51.8	56.9	66.2	55.7	53.2	51.3	61.7	57.2	74.3	55.7	62.3
Total non-native graminoid cover															16.4	15.2	28.4	34.4	25.0	24.2	20.6	13.2	24.0	25.4	24.7	21.4	37.7	42.2	39.8	30.3	32.9	19.1	32.8	30.5
Total native cover															44.8	50.8	47.0	47.2	37.6	54.2	40.8	54.4	47.0	55.4	67.5	71.5	62.3	57.8	59.9	67.9	65.2	78.6	64.2	66.6
Total non-native cover															21.6	20.2	28.4	34.4	25.2	25.6	21.8	14.8	26.2	27.8	32.5	28.5	37.7	42.2	40.1	32.1	34.8	21.4	35.8	33.4
Total warm-season graminoid cover															36.8	45.6	41.2	42.4	31.4	48.2	34.6	49.4	37.8	48.8	55.4	64.2	54.6	52.0	50.0	60.4	55.3	71.4	51.6	58.7
Total cool-season graminoid cover															17.4	16.6	29.2	35.4	25.8	25.2	21.8	15.2	27.0	28.4	26.2	23.4	38.7	43.4	41.1	31.6	34.8	22.0	36.9	34.1

Absolute cover = Absolute foliar cover is the percentage of the number of hits on a species out of the total number of hits possible (500).
Relative cover = Relative foliar cover was the number of hits a species had relative to the total number of all vegetative hits recorded per site (i.e., the percent of vegetative cover the species represented).
All cover values presented are means (n = 5).
Native categories: Y = Native, N = Non-Native
Form categories: C = Cactus, F = Forb, G = Graminoid
Cool/Warm Season categories: C = Cool season species, W = Warm season species

Table 5-1. Cover Class System

Cover Class	Visually Estimated Cover Range	Midpoint
1	<5%	2.50%
2	5-25%	15.00%
3	26-50%	37.50%
4	51-75%	62.50%
5	>76%	87.50%

Table 6-1. 2001 *Larinus minutus* Release Numbers By Location

SAMPSITE	# Insects Released
LM1	250
LM2	125
LM3	100
LM4	85
LM5	125
LM6	1500
Total	2185

Table 6-2. 2001 Diffuse Knapweed Biocontrol Release Location Monitoring Summary

SAMPSITE	Cover (%)	Stem Density (plants/sq. m)
LM1	33.5	15.8
LM2	19.4	14.5
LM3	21.6	4.4
LM4	26.1	9.5
LM5	6.3	1.1
Mean (5 sites combined)	21.4	9.1

Table 7-1. Diffuse Knapweed Location Marking Identifiers

SiteID	Paint Color	Flag Color	# of Plant Marked
A	Red	Pink	88
B	Orange	Orange	69
C	Blue	Green	80

Table 7-2. Diffuse Knapweed Movement Summary By Date

Site	Original number of marked plants October 2000	November 2000	January 2001	March 2001	April 2001
Site A	88	3/3	31/35	35/40	40/45
Site B	69	9/13	26/38	28/41	36/52
Site C	80	9/11	45/56	48/60	56/70
Mean (all plots)	237	21/9	102/43	111/47	132/56
% Movement between time periods (all plots)	NA	9	34	4	9

x/y = # of plants blown away/%of plants blown away

Table 7-3. Diffuse Knapweed Movement Summary

	Distance Moved (meters [feet])	
Site	**Mean**	**Maximum**
Plot A	389 (1276)	1209 (3965)
Plot B	458 (1501)	1120 (3676)
Plot C	334 (1096)	1480 (4857)
All Sites	399 (1310)	1480 (4857)

Table 7-4. Estimates of Diffuse Knapweed Movement at Rocky Flats

2000 Data Initial Assumptions	
Total acres of high and medium categories of diffuse knapweed (Based on the 2000 Site-wide weed mapping effort. Used only high and medium categories since these are quite dense infestations. In the low and scattered categories plants are more spread out.)	1041 acres
Adult diffuse knapweed density in high and medium categories (Used a conservative estimate of 1 plant/ m^2. This area was previously mapped as high and medium categories. It has had from 4 to 7 plants/m^2 each of the last 4 summers based on quantative studies. I have chosen to use a conservative estimate of 1 adult plant/ m^2 for this estimation.)	1 plant/m^2
Total number of square meters per acre	4047 m^2/acre
Total number of plants in high and medium categories in 2000 (Based on above assumptions.)	4,212,927 plants
Estimate of the number of plants that blew away in winter 2000-2001 (Based on 56% of plants observed to have moved on Site during this study)	2,359,239 plants
Average distance moved by plants in winter 2000-2001	399 m (1310 feet)
Maximum distance moved by plants in winter 2000-2001	1480 m (4857 feet)

2000 source data (K-H 2001).

Table 8-1. Small Mammal Mound Species Richness Summary

Plot Type	Total # Species	Percent Native	Mean # Species	Shannon-Weaver Diversity Index
TA	61	74	10.7	1.075
TI	58	76	13.1	1.095
TN	69	72	13.6	1.224
UA	75	69	15	1.277
UI	62	76	14.9	1.128
UN	73	71	16.6	1.274

TA = treated active mound, TI = treated intermound, TN = treated not active mound
UA = untreated active mound, UI = untreated intermound, UN = untreated not active mound

Table 8-2. Sorensen Coefficient of Similarity Summary

Comparison	Similarity Coefficient
UI - UA	0.66
UI - UN	0.73
UI - TA	0.60
UI - TI	0.83
UI - TN	0.75

TA = treated active mound, TI = treated intermound, TN = treated not active mound
UA = untreated active mound, UI = untreated intermound, UN = untreated not active mound

Table 8-3. Small Mammal Mound Species Frequency and Cover Summary

					Frequency (%)						Relative Cover (%)					
Scientific Name	**Speccode**	**Growth Form**	**Native**	**Cool/Warm Season**	**TA**	**TI**	**TN**	**UA**	**UI**	**UN**	**TA**	**TI**	**TN**	**UA**	**UI**	**UN**
Coryphantha missouriensis (Sweet) Britt. & Rose	COMI1	C	Y		3.3						0.1					
Echinocereus viridiflorus Engelm.	ECVI1	C	Y		10.0	10.0	10.0	20.0	16.7	13.3	0.2	0.3	0.2	0.4	0.4	0.2
Opuntia macrorhiza Engelm.	OPMA1	C	Y		30.0	30.0	43.3	80.0	50.0	56.7	0.7	0.7	1.1	1.8	1.2	1.1
Alyssum alyssoides (L.) L.	ALAL1	F	N							3.3						0.1
Alyssum minus (L.) Rothmaler var. micranthus (C. A. Mey.) Dudley	ALMI1	F	N		16.7		10.0	33.3	3.3	20.0	1.3		1.0	1.1	0.1	0.7
Arabis glabra (L.) Bernh.	ARGL1	F	N					3.3						0.1		
Camelina microcarpa Andrz. ex DC.	CAMI1	F	N		16.7	3.3	40.0	16.7	10.0	23.3	0.4	0.1	0.9	0.4	0.2	0.5
Carduus nutans L. ssp. macrolepis (Peterm.) Kazmi	CANU1	F	N					10.0		3.3				0.2		0.1
Centaurea diffusa Lam.	CEDI1	F	N		33.3	16.7	30.0	86.7	33.3	90.0	0.9	0.4	1.0	11.5	0.8	18.5
Cirsium arvense (L.) Scop.	CIAR1	F	N		13.3		6.7	20.0		6.7	0.7		0.1	0.4		0.1
Cirsium vulgare (Savi) Ten.	CIVU1	F	N				3.3						0.1			
Convolvulus arvensis L.	COAR1	F	N		3.3	3.3	6.7			10.0	0.1	0.1	0.6			0.2
Cynoglossum officinale L.	CYOF1	F	N					3.3						0.1		
Erodium cicutarium (L.) L'Her.	ERCI1	F	N				3.3	3.3		10.0			0.1	0.1		0.2
Hypericum perforatum L.	HYPE1	F	N			10.0		6.7	16.7	6.7		0.3		0.1	0.4	0.1
Lactuca serriola L.	LASE1	F	N		30.0	6.7	23.3	66.7	20.0	76.7	0.6	0.2	0.8	2.8	0.5	2.7
Lepidium campestre (L.) R. Br.	LECA1	F	N				3.3	3.3	3.3				0.5	0.1	0.1	
Linaria dalmatica (L.) Mill.	LIDA1	F	N		16.7		23.3	46.7	13.3	63.3	0.8		0.5	1.9	0.3	2.7
Rumex acetosella L.	RUAC1	F	N			3.3						0.1				
Rumex crispus L.	RUCR1	F	N					6.7		3.3				0.2		0.1
Scorzonera laciniata L.	SCLA1	F	N					3.3		13.3				0.1		0.3
Sisymbrium altissimum L.	SIAL1	F	N		23.3	3.3	16.7	10.0			1.1	0.1	0.4	0.2		
Taraxacum officinale Weber	TAOF1	F	N			3.3	3.3	13.3	3.3	26.7		0.1	0.1	0.3	0.1	0.6
Tragopogon dubius Scop.	TRDU1	F	N		33.3	13.3	30.0	40.0	26.7	53.3	0.7	0.3	0.7	0.9	0.6	1.1
Verbascum blattaria L.	VEBL1	F	N		3.3	3.3	6.7	6.7	3.3	3.3	0.1	0.1	0.1	0.2	0.1	0.1
Verbascum thapsus L.	VETH1	F	N				6.7	13.3	3.3	3.3			0.5	0.7	0.1	0.1
Achillea millefolium L. ssp. lanulosa (Nutt.) Piper	ACMI1	F	Y				3.3		3.3				0.1		0.1	
Allium textile A. Nels. & Macbr.	ALTE1	F	Y			6.7	6.7	3.3	13.3	10.0		0.1	0.1	0.1	0.3	0.2
Ambrosia psilostachya DC.	AMPS1	F	Y		13.3	30.0	23.3	46.7	43.3	56.7	0.8	0.7	0.5	1.4	1.7	1.1
Arabis hirsuta (L.) Scop. var. pynocarpa (Hopkins) Rollins	ARHI1	F	Y			16.7	3.3		16.7	6.7		0.4	0.1		0.4	0.2
Arenaria fendleri A. Gray	ARFE2	F	Y			33.3	26.7		60.0	6.7		0.8	0.6		1.4	0.1
Arnica fulgens Pursh.	ARFU1	F	Y						3.3						0.1	
Artemisia campestris L. ssp. caudata (Michx.) Hall & Clem.	ARCA1	F	Y					10.0		13.3				0.2		0.3
Artemisia dracunculus L.	ARDR1	F	Y		3.3			6.7		3.3	0.1			0.1		0.1
Artemisia frigida Willd.	ARFR1	F	Y		3.3		6.7	23.3		30.0	0.1		0.1	0.9		0.9
Artemisia ludoviciana Nutt. var. ludoviciana	ARLU1	F	Y		13.3	6.7	10.0	20.0	26.7	10.0	1.1	0.2	0.2	0.9	1.3	0.5
Asclepias speciosa Torr.	ASSP1	F	Y		6.7	3.3		3.3			0.6	0.1		0.4		
Aster falcatus Lindl.	ASFA1	F	Y						3.3						0.1	
Aster porteri Gray	ASPO1	F	Y			13.3		3.3	3.3	10.0		0.3		0.1	0.1	0.2
Astragalus agrestis Dougl. ex G. Don	ASAG1	F	Y				3.3		6.7				0.1		0.2	
Castilleja sessiliflora Pursh.	CASE3	F	Y							3.3						0.1
Chenopodium leptophyllum Nutt. ex Moq.	CHLE2	F	Y		6.7			10.0			0.1			0.2		
Chrysopsis fulcrata Greene	CHFU1	F	Y			3.3			3.3	3.3		0.1			0.1	0.1
Chrysopsis villosa Pursh.	CHVI1	F	Y				3.3	10.0		16.7			0.9	0.2		0.4
Cirsium undulatum (Nutt.) Spreng.	CIUN1	F	Y					3.3						0.1		
Conyza canadensis (L.) Cronq.	COCA1	F	Y			6.7	16.7	6.7	6.7			0.1	0.4	0.1	0.2	
Dalea candida Michx. ex Willd. var. oligophylla (Torr.) Shinners.	DACA1	F	Y							6.7						0.1
Dalea purpurea Vent	DAPU1	F	Y		13.3	13.3	30.0	20.0	16.7	26.7	0.3	0.3	0.7	0.5	0.4	0.6

Table 8-3. (cont.)

					Frequency						Relative Cover					
Scientific Name	**Speccode**	**Growth Form**	**Native**	**Cool/Warm Season**	**TA**	**TI**	**TN**	**UA**	**UI**	**UN**	**TA**	**TI**	**TN**	**UA**	**UI**	**UN**
Delphinium nuttalianum Pritz. ex Walpers	DENU1	F	Y							3.3						0.1
Descurainia pinnata (Walt.) Britt.	DEPI1	F	Y		3.3		6.7	3.3			0.4		0.1	0.1		
Draba reptans (Lam.) Fern.	DRRE1	F	Y		3.3	20.0	6.7	3.3	13.3	6.7	0.1	0.5	0.2	0.1	0.3	0.1
Erigeron divergens T. & G.	ERDI1	F	Y		3.3		3.3	6.7		20.0	0.1		0.1	0.2		0.4
Eriogonum alatum Torr.	ERAL1	F	Y			3.3	10.0	3.3	10.0	10.0		0.1	0.2	0.1	0.2	0.2
Erysimum capitatum (Nutt.) DC.	ERCA2	F	Y			3.3	3.3	6.7	13.3	3.3		0.1	0.1	0.1	0.3	0.1
Evolvulus nuttallianus R. & S.	EVNU1	F	Y				3.3						0.1			
Gaillardia aristata Pursh.	GAAR1	F	Y		10.0	16.7	13.3	13.3	33.3	6.7	0.2	0.4	0.3	0.3	0.7	0.2
Grindelia squarrosa (Pursh.) Dun.	GRSQ1	F	Y			6.7	3.3	6.7	3.3	3.3		0.2	0.1	0.2	0.1	0.1
Helianthus petiolaris Nutt.	HEPE1	F	Y		6.7						0.2					
Lappula redowskii (Hornem.) Greene	LARE1	F	Y				3.3	3.3					0.1	0.1		
Lepidium densiflorum Schrad.	LEDE1	F	Y		13.3					3.3	0.3					0.1
Lesquerella montana (A. Gray) Wats.	LEMO1	F	Y		3.3	33.3	20.0	13.3	20.0	10.0	0.1	0.8	0.5	0.3	0.5	0.2
Liatris punctata Hook.	LIPU1	F	Y		6.7	40.0	23.3		46.7	20.0	0.1	1.3	0.5		1.0	0.4
Lithospermum incisum Lehm.	LIIN1	F	Y					3.3						0.1		
Lomatium orientale Coult. & Rose	LOOR1	F	Y		6.7	23.3	10.0		20.0	36.7	0.2	0.5	0.2		0.5	0.7
Mertensia lanceolata (Pursh.) A. DC.	MELA1	F	Y		3.3			3.3			0.0			0.1		
Microseris cuspidata (Pursh.) Sch. Bip.	MICU1	F	Y				3.3						0.1			
Mirabilis linearis (Pursh.) Heimerl	MILI1	F	Y		3.3		3.3	3.3			0.1		0.1	0.1		
Oenothera villosa Thunb. ssp. strigosa (Rydb.) Dietrich & Raven	OEVI1	F	Y		6.7	6.7	10.0	6.7	3.3		0.2	0.2	0.2	0.1	0.1	
Orobanche fasciculata Nutt.	ORFA1	F	Y							10.0						0.2
Oxytropis lambertii Pursh.	OXLA1	F	Y							3.3						0.1
Paronychia jamesii T. & G.	PAJA1	F	Y			6.7			10.0	3.3		0.2			0.2	0.1
Penstemon virens Penn.	PEVI1	F	Y		13.3	6.7	16.7	16.7		23.3	0.3	0.1	0.4	0.4		0.5
Phacelia heterophylla Pursh.	PHHE1	F	Y		3.3			3.3			0.0			0.1		
Physalis virginiana P. Mill.	PHVI2	F	Y		3.3		6.7	13.3			0.1		0.5	0.6		
Plantago patagonica Jacq.	PLPA1	F	Y				13.3	6.7		6.7			0.3	0.1		0.2
Polygonum ramosissimum Michx.	PORA1	F	Y		3.3	10.0	3.3	6.7			0.1	0.2	0.1	0.2		
Potentilla gracilis Dougl. ex Hook. var. glabrata (Lehm.) C. L. Hitchc.	POGR1	F	Y			3.3						0.1				
Potentilla hippiana Lehm.	POHI1	F	Y		3.3	10.0	3.3		3.3		0.5	1.5	0.1		0.5	
Potentilla pensylvanica L.	POPE4	F	Y					3.3						0.1		
Psoralea tenuiflora Pursh.	PSTE1	F	Y		50.0	43.3	60.0	53.3	43.3	70.0	1.1	1.1	1.9	2.3	1.3	2.1
Ratibida columnifera (Nutt.) Woot. & Standl.	RACO1	F	Y				10.0	13.3	3.3	13.3			0.2	0.3	0.1	0.3
Senecio plattensis Nutt.	SEPL1	F	Y		3.3			6.7	3.3	3.3	0.1			0.2	0.1	0.1
Senecio spartioides T. & G.	SESP1	F	Y				6.7	6.7		3.3			0.1	0.1		0.1
Silene antirrhina L.	SIAN1	F	Y		36.7	10.0	60.0	53.3	6.7	50.0	0.8	0.2	1.4	1.2	0.2	1.0
Silene drummondii Hook.	SIDR1	F	Y		3.3	3.3	10.0				0.1	0.1	0.2			
Solidago mollis Bart.	SOMO1	F	Y						6.7						0.2	
Talinum parviflorum Nutt.	TAPA1	F	Y			3.3			6.7			0.1			0.1	
Tradescantia occidentalis (Britt.) Smyth	TROC1	F	Y		3.3						0.1					
Veronica peregrina L. var. xalapensis (H. B. K.) St. John & Warren	VEPE1	F	Y			13.3			3.3			0.3			0.1	
Viola nuttallii Pursh.	VINU1	F	Y					3.3		3.3				0.1		0.1
Aegilops cylindrica Host	AECY1	G	N	C	3.3						0.1					
Bromus inermis Leyss. ssp. inermis	BRIN1	G	N	C	3.3						0.5					
Bromus japonicus Thunb. ex Murr.	BRJA1	G	N	C	6.7	26.7	33.3	46.7	30.0	63.3	0.1	0.6	1.1	1.3	0.7	1.3
Bromus tectorum L.	BRTE1	G	N	C	90.0	13.3	73.3	93.3	13.3	90.0	35.5	0.3	13.4	22.8	0.3	14.3
Poa compressa L.	POCO1	G	N	C	46.7	93.3	86.7	56.7	96.7	70.0	8.3	37.3	28.1	7.9	39.2	13.2

Table 8-3. (cont.)

					Frequency						Relative Cover					
Scientific Name	**Speccode**	**Growth Form**	**Native**	**Cool/Warm Season**	**TA**	**TI**	**TN**	**UA**	**UI**	**UN**	**TA**	**TI**	**TN**	**UA**	**UI**	**UN**
Poa pratensis L.	POPR1	G	N	C	73.3	60.0	60.0	70.0	76.7	63.3	17.4	11.1	8.4	9.2	12.2	8.0
Agropyron smithii Rydb.	AGSM1	G	Y	C	6.7		6.7	10.0		6.7	0.9		1.2	1.0		0.5
Aristida purpurea Nutt. var. robusta (Merrill) A. Holmgren & N. Holmgr	ARLO1	G	Y	C	10.0	13.3	13.3	13.3	30.0	13.3	0.2	0.3	0.3	0.3	1.4	0.3
Carex heliophila Mack.	CAHE1	G	Y	C	73.3	70.0	70.0	73.3	60.0	83.3	4.6	1.7	3.5	11.7	1.3	8.0
Juncus interior Wieg.	JUIN1	G	Y	C		23.3			13.3	3.3		0.6			0.3	0.1
Koeleria pyramidata (Lam.) Beauv.	KOPY1	G	Y	C	20.0	70.0	33.3	10.0	80.0	30.0	0.4	2.1	0.8	0.2	2.9	0.7
Sitanion hystrix (Nutt.) Sm. var. brevifolium (Sm.) Hitchc.	SIHY1	G	Y	C	36.7	33.3	33.3	36.7	26.7	16.7	0.8	0.8	1.2	1.2	0.6	0.7
Stipa comata Trin. & Rupr.	STCO1	G	Y	C	66.7	33.3	76.7	63.3	46.7	76.7	8.5	3.2	12.7	5.1	2.8	7.1
Andropogon gerardii Vitman	ANGE1	G	Y	W	30.0	66.7	20.0	13.3	83.3	13.3	3.0	10.6	2.1	0.6	8.0	1.0
Andropogon scoparius Michx.	ANSC1	G	Y	W	3.3	36.7	13.3	10.0	36.7	10.0	0.1	0.9	0.3	0.2	0.9	0.2
Bouteloua curtipendula (Michx.) Torr.	BOCU1	G	Y	W	53.3	53.3	56.7	23.3	63.3	46.7	2.4	1.3	3.9	1.1	2.2	2.1
Bouteloua gracilis (H. B. K.) Lag ex Griffiths	BOGR1	G	Y	W	40.0	56.7	46.7	40.0	60.0	40.0	0.9	1.4	1.6	0.9	1.4	0.8
Bouteloua hirsuta Lag	BOHI1	G	Y	W	6.7	43.3	16.7	16.7	20.0	23.3	0.1	1.1	1.2	0.3	0.5	0.5
Buchloe dactyloides (Nutt.) Engelm.	BUDA1	G	Y	W					10.0						0.3	
Muhlenbergia montana (Nutt.) Hitchc.	MUMO1	G	Y	W		70.0	3.3		46.7			8.9	0.1		5.3	
Sorghastrum nutans (L.) Nash	SONU1	G	Y	W	6.7	43.3		3.3	36.7	3.3	0.9	4.1		0.1	2.4	0.1
Sporobolus asper (Michx.) Kunth	SPAS1	G	Y	W	6.7					3.3	0.1					0.1
Total foliar cover											100.00	100.00	100.00	100.00	100.00	100.00
Total forb cover											14.39	12.66	19.04	33.78	15.75	39.75
Total native forb cover											7.81	11.08	11.62	12.42	12.62	11.74
Total non-native forb cover											6.57	1.58	7.42	21.36	3.12	28.01
Total graminoid cover											84.69	86.34	79.68	63.94	82.64	58.88
Total native graminoid cover											22.89	36.99	28.75	22.78	30.25	22.11
Total non-native graminoid cover											61.80	49.36	50.92	41.16	52.39	36.77
Total native cover											31.62	49.06	41.66	37.48	44.49	35.22
Total non-native cover											68.38	50.94	58.34	62.52	55.51	64.78
Total warm-season graminoid cover											7.48	28.29	9.13	3.28	20.97	4.82
Total cool-season graminoid cover											77.21	58.05	70.54	60.67	61.67	54.06
Total cactus cover											0.93	1.00	1.28	2.28	1.62	1.37

Frequency = The percentage of plots a species occurred in (n = 30).
Relative cover = Relative foliar cover is the cover a species had relative to the total cover of all vegetation (i.e., the percent of vegetative cover the species represented).
All cover values presented are means (n = 30).
Native categories: Y = Native, N = Non-Native
Form categories: C = Cactus, F = Forb, G = Graminoid
Cool/Warm Season categories: C = Cool season species, W = Warm season species
TA = treated active, TI = treated intermound, TN = treated not active, UA = untreated active, UI = untreated intermound, UN = untreated not active.

Table 8-4. Small Mammal Mound Dominant Species by Mound Classification

UN - Untreated Non-Active Mounds

Scientific Name	Speccode	Relative Cover
Centaurea diffusa Lam.	CEDI1	18.5
Bromus tectorum L.	BRTE1	14.3
Poa compressa L.	POCO1	13.2
Poa pratensis L.	POPR1	8.0

UI - Untreated Intermound Areas

Scientific Name	Speccode	Relative Cover
Poa compressa L.	POCO1	39.2
Poa pratensis L.	POPR1	12.2
Andropogon gerardii Vitman	ANGE1	8.0
Muhlenbergia montana (Nutt.) Hitchc.	MUMO1	5.3

UA - Untreated Active Mounds

Scientific Name	Speccode	Relative Cover
Bromus tectorum L.	BRTE1	22.8
Carex heliophila Mack.	CAHE1	11.7
Centaurea diffusa Lam.	CEDI1	11.5
Poa pratensis L.	POPR1	9.2

TN - Treated Non-Active Mounds

Scientific Name	Speccode	Relative Cover
Poa compressa L.	POCO1	28.1
Bromus tectorum L.	BRTE1	13.4
Stipa comata Trin. & Rupr.	STCO1	12.7
Poa pratensis L.	POPR1	8.4

TI - Treated Intermound Areas

Scientific Name	Speccode	Relative Cover
Poa compressa L.	POCO1	37.3
Poa pratensis L.	POPR1	11.1
Andropogon gerardii Vitman	ANGE1	10.6
Muhlenbergia montana (Nutt.) Hitchc.	MUMO1	8.9

TA - Treated Active Mounds

Scientific Name	Speccode	Relative Cover
Bromus tectorum L.	BRTE1	35.5
Poa pratensis L.	POPR1	17.4
Stipa comata Trin. & Rupr.	STCO1	8.5
Poa compressa L.	POCO1	8.3

Table 8-5. Small Mammal Mound Study Species Affinities For Disturbed And Undisturbed Areas

Species with Affinities for Undisturbed Areas

Scientific Name	Speccode	Growth Form	Native	Cool/Warm Season
Andropogon gerardii Vitman	ANGE1	G	Y	W
Andropogon scoparius Michx.	ANSC1	G	Y	W
Arenaria fendleri A. Gray	ARFE2	F	Y	
Aristida purpurea Nutt. var. robusta (Merrill) A. Holmgren & N. Holmgr	ARLO1	G	Y	C
Bouteloua curtipendula (Michx.) Torr.	BOCU1	G	Y	W
Bouteloua gracilis (H. B. K.) Lag ex Griffiths	BOGR1	G	Y	W
Buchloe dactyloides (Nutt.) Engelm.	BUDA1	G	Y	W
Gaillardia aristata Pursh.	GAAR1	F	Y	
Hypericum perforatum L.	HYPE1	F	N	
Juncus interior Wieg.	JUIN1	G	Y	C
Koeleria pyramidata (Lam.) Beauv.	KOPY1	G	Y	C
Liatris punctata Hook.	LIPU1	F	Y	
Muhlenbergia montana (Nutt.) Hitchc.	MUMO1	G	Y	W
Poa compressa L.	POCO1	G	N	C
Sorghastrum nutans (L.) Nash	SONU1	G	Y	W

Species with Affinities for Disturbed Areas

Scientific Name	Speccode	Growth Form	Native	Cool/Warm Season
Alyssum minus (L.) Rothmaler var. micranthus (C. A. Mey.) Dudley	ALMI1	F	N	
Artemisia campestris L. ssp. caudata (Michx.) Hall & Clem.	ARCA1	F	Y	
Artemisia frigida Willd.	ARFR1	F	Y	
Bromus japonicus Thunb. ex Murr.	BRJA1	G	N	C
Bromus tectorum L.	BRTE1	G	N	C
Carex heliophila Mack.	CAHE1	G	Y	C
Centaurea diffusa Lam.	CEDI1	F	N	
Chrysopsis villosa Pursh.	CHVI1	F	Y	
Lactuca serriola L.	LASE1	F	N	
Linaria dalmatica (L.) Mill.	LIDA1	F	N	
Penstemon virens Penn.	PEVI1	F	Y	
Psoralea tenuiflora Pursh.	PSTE1	F	Y	
Ratibida columnifera (Nutt.) Woot. & Standl.	RACO1	F	Y	
Silene antirrhina L.	SIAN1	F	Y	
Stipa comata Trin. & Rupr.	STCO1	G	Y	C
Taraxacum officinale Weber	TAOF1	F	N	
Tragopogon dubius Scop.	TRDU1	F	N	

Native categories: Y = Native, N = Non-Native
Form categories: C = Cactus, F = Forb, G = Graminoid
Cool/Warm Season categories: C = Cool season species, W = Warm season species

Table 9-1. Seed Mix for Landfill Cover

Scientific Name	Common Name	Application Rate (PLS lbs/ac)
Agropyron smithii	Western Wheatgrass	12.0
Bouteloua gracilis	Blue Grama Grass	8.0
Buchloe dactlyoides	Buffalo Grass	8.0
Andropogon gerardii	Big Bluestem	8.0
Bouteloua curtipendula	Side-Oats Grama Grass	8.0
Andropogon scoparius	Little Bluestem	8.0
Linum perenne	Blue Flax	4.0
Total PLS per acre application		56.0

PLS = pure live seed

Table 9-2. 2001 Landfill Revegetation Cover Summary

Scientific Name	Speccode	Growth Form	Native	Cool/ Warm Season	Frequency	Percent Absolute Cover	Percent Relative Cover
Centaurea diffusa Lam.	CEDI1	F	N		40	1.2	1.7
Dyssodia papposa (Vent) Hitchc.	DYPA1	F	N		20	0.2	0.3
Melilotus alba Medic.	MEAL1	F	N		20	0.2	0.3
Melilotus officinalis (L.) Pall.	MEOF1	F	N		60	1.8	2.5
Plantago lanceolata L.	PLLA1	F	N		20	0.2	0.3
Ambrosia psilostachya DC.	AMPS1	F	Y		100	1.4	2.0
Grindelia squarrosa (Pursh.) Dun.	GRSQ1	F	Y		40	0.6	0.8
Helianthus annuus L.	HEAN1	F	Y		40	0.4	0.6
Bromus japonicus Thunb. ex Murr.	BRJA1	G	N	C	20	1.2	1.7
Bromus tectorum L.	BRTE1	G	N	C	60	1.6	2.2
Dactylis glomerata L.	DAGL1	G	N	C	20	0.2	0.3
Schedonnardus paniculatus (Nutt.) Trel.	SCPA2	G	N	C	20	0.4	0.6
Echinochloa crusgallii (L.) Beauv.	ECCR1	G	N	W	20	0.2	0.3
Setaria viridis (L.) Beauv.	SEVI1	G	N	W	40	0.8	1.1
Agropyron smithii Rydb.	AGSM1	G	Y	C	100	9	12.6
Sitanion hystrix (Nutt.) Sm. var. brevifolium (Sm.) Hitchc.	SIHY1	G	Y	C	20	0.2	0.3
Andropogon gerardii Vitman	ANGE1	G	Y	W	60	1	1.4
Andropogon scoparius Michx.	ANSC1	G	Y	W	40	0.4	0.6
Bouteloua curtipendula (Michx.) Torr.	BOCU1	G	Y	W	100	6	8.4
Bouteloua gracilis (H. B. K.) Lag ex Griffiths	BOGR1	G	Y	W	100	33.2	46.6
Buchloe dactyloides (Nutt.) Engelm.	BUDA1	G	Y	W	100	7	9.8
Panicum capillare L.	PACA1	G	Y	W	40	0.8	1.1
Panicum virgatum L.	PAVI1	G	Y	W	40	0.4	0.6
Sporobolus asper (Michx.) Kunth	SPAS1	G	Y	W	40	1.4	2.0
Sporobolus neglectus Nash	SPNE1	G	Y	W	40	1.4	2.0
Total foliar cover						71.2	100.0
Total forb cover						6	8.4
Total native forb cover						2.4	3.4
Total non-native forb cover						3.6	5.1
Total graminoid cover						65.2	91.6
Total native graminoid cover						60.8	85.4
Total non-native graminoid cover						4.4	6.2
Total native cover						63.2	88.8
Total non-native cover						8	11.2
Total warm-season graminoid cover						52.6	73.9
Total cool-season graminoid cover						12.6	17.7

Absolute cover = Absolute foliar cover is the percentage of the number of hits on a species out of the total number of hits possible (500).
Relative cover = Relative foliar cover was the number of hits a species had relative to the total number of all vegetative hits recorded per site (i.e., the percent of vegetative cover the species represented).
All cover values presented are means (n = 5).
Native categories: Y = Native, N = Non-Native
Form categories: C = Cactus, F = Forb, G = Graminoid
Cool/Warm Season categories: C = Cool season species, W = Warm season species

Table 9-3. Reference Root Depths

Common Name	Max. Depth (in feet)	Working Depth (in feet)	Lateral Spread (in feet)
Little Bluestem	3.5-8.0	3.0-6.7	1.2-3.0
Blue Grama	2.3-4.3	1.7-3.6	0.3-2.1
Buffalo Grass	4.5-7.2	3.0-5.0	0.8-1.7
Big Bluestem	9.3	5	0.7-1.2
Side-Oats Grama	5.5	4.0-4.5	0.7-1.5

Information source: Weaver, J.E. 1920. Root development in the grassland formation: A correlation of the root systems of native vegetation and crop plants. Carnegie Institution of Washington. Washington, DC.
Note: These data represent the range of values found for these species under varying soil and other environmental conditions.

Table 10-1. 1999-2001 Prescibed Burn Species Richness Summary

				Unburned			Burned		
Family	**Scientific Name**	**Speccode**	**Native**	**1999**	**2000**	**2001**	**1999**	**2000**	**2001**
ANACARDIACEAE	Rhus aromatica Ait. var. trilobata (Nutt.) A. Gray	RHAR1	Y	X	X	X			
APIACEAE	Lomatium orientale Coult. & Rose	LOOR1	Y	X		X	X		X
ASCLEPIADACEAE	Asclepias speciosa Torr.	ASSP1	Y				X	X	X
ASCLEPIADACEAE	Asclepias stenophylla A. Gray	ASST1	Y	X	X	X	X	X	X
ASCLEPIADACEAE	Asclepias viridiflora Raf.	ASVI1	Y	X	X	X	X	X	X
ASTERACEAE	Achillea millefolium L. ssp. lanulosa (Nutt.) Piper	ACMI1	Y	X	X	X			
ASTERACEAE	Ambrosia psilostachya DC.	AMPS1	Y	X	X	X	X	X	X
ASTERACEAE	Antennaria parvifolia Nutt.	ANPA1	Y	X	X	X	X	X	X
ASTERACEAE	Artemisia campestris L. ssp. caudata (Michx.) Hall & Clem.	ARCA1	Y			X	X	X	X
ASTERACEAE	Artemisia frigida Willd.	ARFR1	Y	X	X	X	X	X	X
ASTERACEAE	Artemisia ludoviciana Nutt. var. ludoviciana	ARLU1	Y	X	X	X	X	X	X
ASTERACEAE	Aster porteri Gray	ASPO1	Y	X	X	X	X	X	X
ASTERACEAE	Carduus nutans L. ssp. macrolepis (Peterm.) Kazmi	CANU1	N					X	X
ASTERACEAE	Centaurea diffusa Lam.	CEDI1	N	X	X	X	X	X	X
ASTERACEAE	Chrysopsis fulcrata Greene	CHFU1	Y	X	X	X	X	X	X
ASTERACEAE	Chrysopsis villosa Pursh.	CHVI1	Y	X	X	X	X	X	X
ASTERACEAE	Cirsium undulatum (Nutt.) Spreng.	CIUN1	Y				X	X	X
ASTERACEAE	Conyza canadensis (L.) Cronq.	COCA1	Y			X		X	X
ASTERACEAE	Erigeron divergens T. & G.	ERDI1	Y	X			X	X	X
ASTERACEAE	Erigeron flagellaris A. Gray	ERFL1	Y			X		X	X
ASTERACEAE	Gaillardia aristata Pursh.	GAAR1	Y	X	X	X	X	X	X
ASTERACEAE	Grindelia squarrosa (Pursh.) Dun.	GRSQ1	Y		X	X	X	X	X
ASTERACEAE	Helianthus annuus L.	HEAN1	Y					X	
ASTERACEAE	Helianthus pumilus Nutt.	HEPU1	Y	X	X	X			
ASTERACEAE	Helianthus rigidus (Cass.) Desf. ssp. subrhomboideus (Rydb.) Heiser	HERI1	Y	X	X	X			
ASTERACEAE	Lactuca serriola L.	LASE1	N		X	X	X	X	X
ASTERACEAE	Liatris punctata Hook.	LIPU1	Y	X	X	X	X	X	X
ASTERACEAE	Ratibida columnifera (Nutt.) Woot. & Standl.	RACO1	Y					X	X
ASTERACEAE	Senecio plattensis Nutt.	SEPL1	Y	X	X	X	X	X	X
ASTERACEAE	Senecio spartioides T. & G.	SESP1	Y			X	X	X	X
ASTERACEAE	Solidago mollis Bart.	SOMO1	Y	X	X	X	X		
ASTERACEAE	Taraxacum officinale Weber	TAOF1	N		X	X	X	X	X
ASTERACEAE	Tragopogon dubius Scop.	TRDU1	N	X	X	X	X	X	X
BORAGINACEAE	Cryptantha virgata (Porter) Payson	CRVI1	Y				X	X	
BORAGINACEAE	Lithospermum incisum Lehm.	LIIN1	Y				X	X	X
BRASSICACEAE	Alyssum alyssoides (L.) L.	ALAL1	N		X				
BRASSICACEAE	Alyssum minus (L.) Rothmaler var. micranthus (C. A. Mey.) Dudley	ALMI1	N	X	X	X	X	X	X
BRASSICACEAE	Arabis fendleri (S. Wats.) Greene var. fendleri	ARFE3	Y		X				
BRASSICACEAE	Arabis hirsuta (L.) Scop. var. pynocarpa (Hopkins) Rollins	ARHI1	Y	X	X	X	X	X	X
BRASSICACEAE	Camelina microcarpa Andrz. ex DC.	CAMI1	N			X			X
BRASSICACEAE	Descurainia pinnata (Walt.) Britt.	DEPI1	Y						X
BRASSICACEAE	Draba reptans (Lam.) Fern.	DRRE1	Y		X	X			X
BRASSICACEAE	Erysimum capitatum (Nutt.) DC.	ERCA2	Y	X	X	X	X	X	X
BRASSICACEAE	Lepidium densiflorum Schrad.	LEDE1	Y		X	X		X	
BRASSICACEAE	Lesquerella montana (A. Gray) Wats.	LEMO1	Y	X	X	X	X	X	X
BRASSICACEAE	Sisymbrium altissimum L.	SIAL1	N			X			X
CACTACEAE	Echinocereus viridiflorus Engelm.	ECVI1	Y	X	X	X	X	X	X
CACTACEAE	Opuntia macrorhiza Engelm.	OPMA1	Y	X	X	X	X	X	X
CARYOPHYLLACEAE	Arenaria fendleri A. Gray	ARFE2	Y	X	X	X	X	X	X
CARYOPHYLLACEAE	Paronychia jamesii T. & G.	PAJA1	Y	X	X	X	X	X	X
CARYOPHYLLACEAE	Silene antirrhina L.	SIAN1	Y			X		X	X
CARYOPHYLLACEAE	Silene drummondii Hook.	SIDR1	Y	X	X	X			
CHENOPODIACEAE	Chenopodium leptophyllum Nutt. ex Moq.	CHLE2	Y			X			X
CHENOPODIACEAE	Kochia scoparia (L.) Schrad.	KOSC1	N		X	X			
CHENOPODIACEAE	Salsola iberica Senn. & Pau.	SAIB1	N		X	X			
CLUSIACEAE	Hypericum perforatum L.	HYPE1	N	X	X	X	X	X	X
CONVOLVULACEAE	Convolvulus arvensis L.	COAR1	N					X	X
CYPERACEAE	Carex eleocharis Bailey	CAEL1	Y						X
CYPERACEAE	Carex heliophila Mack.	CAHE1	Y	X	X	X	X	X	X
EUPHORBIACEAE	Euphorbia robusta (Engelm.) Small	EURO1	Y				X	X	X
FABACEAE	Astragalus agrestis Dougl. ex G. Don	ASAG1	Y		X	X	X	X	X
FABACEAE	Dalea purpurea Vent	DAPU1	Y	X	X	X	X	X	X
FABACEAE	Melilotus alba Medic.	MEAL1	N						X
FABACEAE	Melilotus officinalis (L.) Pall.	MEOF1	N					X	
FABACEAE	Psoralea tenuiflora Pursh.	PSTE1	Y	X	X	X	X	X	X
GERANIACEAE	Erodium cicutarium (L.) L'Her.	ERCI1	N			X	X	X	
HYDROPHYLLACEAE	Phacelia heterophylla Pursh.	PHHE1	Y			X			X

Table 10-1. (cont.)

				Unburned			Burned		
Family	**Scientific Name**	**Speccode**	**Native**	**1999**	**2000**	**2001**	**1999**	**2000**	**2001**
JUNCACEAE	Juncus interior Wieg.	JUIN1	Y	X	X	X	X	X	X
LILIACEAE	Allium textile A. Nels. & Macbr.	ALTE1	Y	X	X	X	X		X
NYCTAGINACEAE	Mirabilis linearis (Pursh.) Heimerl	MILI1	Y	X	X	X	X	X	X
ONAGRACEAE	Calylophus serrulatus (Nutt.) Raven	CASE2	Y	X		X			
OROBANCHACEAE	Orobanche fasciculata Nutt.	ORFA1	Y	X					X
PLANTAGINACE	Plantago lanceolata L.	PLLA1	N				X	X	X
POACEAE	Aegilops cylindrica Host	AECY1	N				X		
POACEAE	Agropyron smithii Rydb.	AGSM1	Y			X	X	X	X
POACEAE	Andropogon gerardii Vitman	ANGE1	Y	X	X	X	X	X	X
POACEAE	Andropogon scoparius Michx.	ANSC1	Y	X	X	X	X	X	X
POACEAE	Aristida purpurea Nutt. var. robusta (Merrill) A. Holmgren & N. Holmgr	ARLO1	Y	X	X	X	X	X	X
POACEAE	Bouteloua curtipendula (Michx.) Torr.	BOCU1	Y	X	X	X	X	X	X
POACEAE	Bouteloua gracilis (H. B. K.) Lag ex Griffiths	BOGR1	Y	X	X	X	X	X	X
POACEAE	Bouteloua hirsuta Lag	BOHI1	Y	X	X	X	X	X	X
POACEAE	Bromus japonicus Thunb. ex Murr.	BRJA1	N	X	X	X	X	X	X
POACEAE	Bromus tectorum L.	BRTE1	N	X	X	X	X	X	X
POACEAE	Buchloe dactyloides (Nutt.) Engelm.	BUDA1	Y	X	X	X		X	X
POACEAE	Festuca octoflora Walt.	FEOC1	Y			X			
POACEAE	Koeleria pyramidata (Lam.) Beauv.	KOPY1	Y	X	X	X	X	X	X
POACEAE	Muhlenbergia montana (Nutt.) Hitchc.	MUMO1	Y	X	X	X	X	X	X
POACEAE	Muhlenbergia wrightii Vasey	MUWR1	Y	X	X				X
POACEAE	Panicum capillare L.	PACA1	Y				X	X	
POACEAE	Poa compressa L.	POCO1	N	X	X	X	X	X	X
POACEAE	Poa pratensis L.	POPR1	N	X	X	X	X	X	X
POACEAE	Setaria viridis (L.) Beauv.	SEVI1	N				X	X	
POACEAE	Sitanion hystrix (Nutt.) Sm. var. brevifolium (Sm.) Hitchc.	SIHY1	Y	X	X	X	X	X	X
POACEAE	Sorghastrum nutans (L.) Nash	SONU1	Y	X	X	X	X	X	X
POACEAE	Sporobolus asper (Michx.) Kunth	SPAS1	Y				X	X	X
POACEAE	Sporobolus cryptandrus (Torr.) A. Gray	SPCR1	Y				X	X	X
POACEAE	Sporobolus heterolepis (A. Gray) A. Gray	SPHE1	Y	X	X	X	X	X	X
POACEAE	Stipa comata Trin. & Rupr.	STCO1	Y	X	X	X	X	X	X
POLEMONIACEAE	Ipomopsis spicata (Nutt.) V. Grant ssp. spicata	IPSP1	Y	X	X	X			
POLYGONACEAE	Eriogonum alatum Torr.	ERAL1	Y	X	X	X	X	X	X
POLYGONACEAE	Polygonum ramosissimum Michx.	PORA1	Y			X			
PORTULACACEAE	Talinum parviflorum Nutt.	TAPA1	Y	X	X	X	X	X	X
ROSACEAE	Potentilla fissa Nutt.	POFI1	Y	X	X	X			
ROSACEAE	Potentilla hippiana Lehm.	POHI1	Y	X	X	X			
SANTALACEAE	Comandra umbellata (L.) Nutt.	COUM1	Y	X	X	X			X
SCROPHULARIACEAE	Castilleja sessiliflora Pursh.	CASE3	Y	X	X	X	X		
SCROPHULARIACEAE	Linaria dalmatica (L.) Mill.	LIDA1	N	X	X	X	X	X	X
SCROPHULARIACEAE	Penstemon virens Penn.	PEVI1	Y	X	X	X	X	X	X
SCROPHULARIACEAE	Verbascum thapsus L.	VETH1	N				X	X	X
SCROPHULARIACEAE	Veronica peregrina L. var. xalapensis (H. B. K.) St. John & Warren	VEPE1	Y						X
SELAGINELLACEAE	Selaginella densa Rydb.	SEDE1	Y					X	
	Total Species Richness			66	72	84	73	79	85
	Percent Native Species			86	81	81	78	77	79
	Mean # Species/Quadrat (1 sq. meter)			12.7	12.0	13.0	10.6	10.7	12.9

Table 10-2. Pre- and Post-Burn Cactus Densities

		Density (plants/m^2)		
Scientific Name	**Site**	**1999**	**2000**	**2001**
Opuntia macorhiza	Unburned	0.254a	0.1b	0.039b
	Burned	0.98a	0.37b	0.107b
Echinocereus viridiflorus	Unburned	0.44a	0.31a	0.16a
	Burned	0.55a	0.74a	0.25b

Sample size (n=10)

Means within the same treatment having the same letter are not significantly different from the 1999 data ($P > 0.05$)

Table 10-3. 1999-2001 Prescibed Burn Control (Unburned Area) Foliar Cover Summary

					Frequency			Absolute Cover			Relative Cover		
Scientific Name	**Speccode**	**Growth**	**Native**	**Cool/Warm**	**1999**	**2000**	**2001**	**1999**	**2000**	**2001**	**1999**	**2000**	**2001**
Alyssum minus (L.) Rothmaler var. micranthus (C. A. Mey.) Dudley	ALMI1	F	N			10			0.1			0.1	
Centaurea diffusa Lam.	CEDI1	F	N				20			0.2			0.2
Lactuca serriola L.	LASE1	F	N				10			0.1			0.1
Linaria dalmatica (L.) Mill.	LIDA1	F	N		30	20	30	0.4	0.2	0.6	0.5	0.3	0.7
Sisymbrium altissimum L.	SIAL1	F	N				20			0.2			0.2
Tragopogon dubius Scop.	TRDU1	F	N				10			0.1			0.1
Ambrosia psilostachya DC.	AMPS1	F	Y				10			0.1			0.1
Arenaria fendleri A. Gray	ARFE2	F	Y		20	30	50	0.2	0.4	0.5	0.3	0.5	0.6
Arabis hirsuta (L.) Scop. var. pynocarpa (Hopkins) Rollins	ARHI1	F	Y		10			0.1			0.1		
Artemisia ludoviciana Nutt. var. ludoviciana	ARLU1	F	Y				10			0.1			0.1
Aster porteri Gray	ASPO1	F	Y		10		10	0.3		0.1	0.4		0.1
Chrysopsis villosa Pursh.	CHVI1	F	Y		20			0.2			0.3		
Eriogonum alatum Torr.	ERAL1	F	Y		10		20	0.2		0.2	0.3		0.2
Gaillardia aristata Pursh.	GAAR1	F	Y				10			0.1			0.1
Ipomopsis spicata (Nutt.) V. Grant ssp. spicata	IPSP1	F	Y				10			0.1			0.1
Lesquerella montana (A. Gray) Wats.	LEMO1	F	Y			10	30		0.1	0.5		0.1	0.6
Liatris punctata Hook.	LIPU1	F	Y		80	90	100	2.2	2.3	3.7	2.8	3.0	4.3
Lomatium orientale Coult. & Rose	LOOR1	F	Y				10			0.1			0.1
Paronychia jamesii T. & G.	PAJA1	F	Y			10	40		0.1	0.4		0.1	0.5
Penstemon virens Penn.	PEVI1	F	Y		10			0.1			0.1		
Psoralea tenuiflora Pursh.	PSTE1	F	Y		40	30	80	0.5	0.4	1.1	0.6	0.5	1.3
Silene antirrhina L.	SIAN1	F	Y				10			0.1			0.1
Solidago mollis Bart.	SOMO1	F	Y		10			0.1			0.1		
Bromus japonicus Thunb. ex Murr.	BRJA1	G	N	C	30			0.4			0.5		
Bromus tectorum L.	BRTE1	G	N	C	20	20	20	0.5	0.5	0.3	0.6	0.7	0.4
Poa compressa L.	POCO1	G	N	C	90	100	100	10.2	7.5	12.8	12.9	9.8	15.0
Poa pratensis L.	POPR1	G	N	C	80	70	80	5.8	5.6	7.2	7.3	7.3	8.5
Aristida purpurea Nutt. var. robusta (Merrill) A. Holmgren & N. Holm	ARLO1	G	Y	C	60	20	40	0.9	0.3	0.6	1.1	0.4	0.7
Carex heliophila Mack.	CAHE1	G	Y	C	90	100	100	4.9	5.3	4.6	6.2	6.9	5.4
Juncus interior Wieg.	JUIN1	G	Y	C	10			0.1			0.1		
Koeleria pyramidata (Lam.) Beauv.	KOPY1	G	Y	C	100	90	80	4.0	3.9	2.6	5.1	5.1	3.1
Sitanion hystrix (Nutt.) Sm. var. brevifolium (Sm.) Hitchc.	SIHY1	G	Y	C		30	60		0.4	0.6		0.5	0.7
Stipa comata Trin. & Rupr.	STCO1	G	Y	C	80	90	90	4.3	5.0	7.3	5.4	6.5	8.6
Andropogon gerardii Vitman	ANGE1	G	Y	W	100	100	100	14.3	13.4	11.6	18.1	17.4	13.6
Andropogon scoparius Michx.	ANSC1	G	Y	W	60	50	70	1.8	0.9	1.1	2.3	1.2	1.3
Bouteloua curtipendula (Michx.) Torr.	BOCU1	G	Y	W	80	90	80	3.0	3.3	2.5	3.8	4.3	2.9
Bouteloua gracilis (H. B. K.) Lag ex Griffiths	BOGR1	G	Y	W	90	100	100	2.5	2.7	2.5	3.2	3.5	2.9
Bouteloua hirsuta Lag	BOHI1	G	Y	W	40	80	40	0.8	1.1	0.9	1.0	1.4	1.1
Muhlenbergia montana (Nutt.) Hitchc.	MUMO1	G	Y	W	90	90	90	18.5	20.3	19.0	23.4	26.4	22.3
Sorghastrum nutans (L.) Nash	SONU1	G	Y	W	80	70	90	2.3	2.3	2.5	2.9	3.0	2.9
Sporobolus heterolepis (A. Gray) A. Gray	SPHE1	G	Y	W	30	30	40	0.6	0.7	0.7	0.8	0.9	0.8
Total foliar cover								79.2	76.8	85.1	100.0	100.0	100.0
Total forb cover								4.3	3.6	8.3	5.4	4.7	9.8
Total native forb cover								3.9	3.3	7.1	4.9	4.3	8.3
Total non-native forb cover								0.4	0.3	1.2	0.5	0.4	1.4
Total graminoid cover								74.9	73.2	76.8	94.6	95.3	90.2
Total native graminoid cover								58.0	59.6	56.5	73.2	77.6	66.4
Total non-native graminoid cover								16.9	13.6	20.3	21.3	17.7	23.9
Total warm-season graminoid cover								43.8	44.7	40.8	55.3	58.2	47.9
Total cool-season graminoid cover								31.1	28.5	36.0	39.3	37.1	42.3
Total native cover								61.9	62.9	63.6	78.2	81.9	74.7
Total non-native cover								17.3	13.9	21.5	21.8	18.1	25.3

Absolute cover = Absolute foliar cover is the percentage of the number of hits on a species out of the total number of hits possible (1000).
Relative cover = Relative foliar cover was the number of hits a species had relative to the total number of all vegetative hits recorded per site (i.e., the percent of vegetative cover the species represented).
All cover values presented are means (n = 10).
Native categories: Y = Native, N = Non-Native
Form categories: C = Cactus, F = Forb, G = Graminoid
Cool/Warm Season categories: C = Cool season species, W = Warm season species

Table 10-4. 1999-2001 Prescibed Burn Treatment (Burned Area) Foliar Cover Summary

					Frequency			Absolute Cover			Relative Cover		
Scientific Name	**Speccode**	**Growth**	**Native**	**Cool/Warm Season**	**1999**	**2000**	**2001**	**1999**	**2000**	**2001**	**1999**	**2000**	**2001**
Alyssum minus (L.) Rothmaler var. micranthus (C. A. Mey.) Dudley	ALMI1	F	N		10		20	0.1		0.3	0.1		0.4
Centaurea diffusa Lam.	CEDI1	F	N		10	30	20	0.1	0.3	0.4	0.1	0.4	0.5
Hypericum perforatum L.	HYPE1	F	N				10			0.1			0.1
Lactuca serriola L.	LASE1	F	N				10			0.1			0.1
Linaria dalmatica (L.) Mill.	LIDA1	F	N		10	10	10	0.1	0.1	0.1	0.1	0.1	0.1
Verbascum thapsus L.	VETH1	F	N			10	10		0.1	0.1		0.1	0.1
Ambrosia psilostachya DC.	AMPS1	F	Y				20			0.2			0.2
Arenaria fendleri A. Gray	ARFE2	F	Y		10		30	0.1		0.2	0.1		0.2
Artemisia frigida Willd.	ARFR1	F	Y		10			0.1			0.1		
Artemisia ludoviciana Nutt. var. ludoviciana	ARLU1	F	Y		10	30	50	0.1	0.4	0.6	0.1	0.5	0.7
Aster porteri Gray	ASPO1	F	Y				20			0.2			0.2
Asclepias viridiflora Raf.	ASVI1	F	Y				10			0.1			0.1
Chrysopsis fulcrata Greene	CHFU1	F	Y				10			0.1			0.1
Chrysopsis villosa Pursh.	CHVI1	F	Y		10			0.1			0.1		
Cirsium undulatum (Nutt.) Spreng.	CIUN1	F	Y				10			0.1			0.1
Eriogonum alatum Torr.	ERAL1	F	Y				10			0.1			0.1
Erigeron flagellaris A. Gray	ERFL1	F	Y				10			0.2			0.2
Lesquerella montana (A. Gray) Wats.	LEMO1	F	Y				40			0.9			1.1
Liatris punctata Hook.	LIPU1	F	Y		80	90	80	1.6	2.2	1.9	2.1	2.9	2.3
Penstemon virens Penn.	PEVI1	F	Y		10			0.1			0.1		
Psoralea tenuiflora Pursh.	PSTE1	F	Y		20	50	60	0.3	0.6	0.8	0.4	0.8	1.0
Silene antirrhina L.	SIAN1	F	Y				20			0.2			0.2
Aegilops cylindrica Host	AECY1	G	N	C	10			0.1			0.1		
Bromus japonicus Thunb. ex Murr.	BRJA1	G	N	C	40		10	0.9		0.1	1.2		0.1
Bromus tectorum L.	BRTE1	G	N	C	10	20	20	0.3	0.5	0.4	0.4	0.7	0.5
Poa compressa L.	POCO1	G	N	C	100	100	100	23.3	17.6	24.1	30.2	23.6	28.7
Poa pratensis L.	POPR1	G	N	C	100	90	90	7.7	5.9	6.0	10.0	7.9	7.2
Agropyron smithii Rydb.	AGSM1	G	Y	C			10			0.1			0.1
Aristida purpurea Nutt. var. robusta (Merrill) A. Holmgren & N. Holmg	ARLO1	G	Y	C	20	30	40	0.2	0.3	0.4	0.3	0.4	0.5
Carex heliophila Mack.	CAHE1	G	Y	C	90	90	90	3.3	2.9	2.3	4.3	3.9	2.7
Koeleria pyramidata (Lam.) Beauv.	KOPY1	G	Y	C	60	50	80	0.8	0.8	1.2	1.0	1.1	1.4
Sitanion hystrix (Nutt.) Sm. var. brevifolium (Sm.) Hitchc.	SIHY1	G	Y	C		20			0.2			0.3	
Stipa comata Trin. & Rupr.	STCO1	G	Y	C	80	90	90	4.1	5.6	5.7	5.3	7.5	6.8
Andropogon gerardii Vitman	ANGE1	G	Y	W	100	100	100	14.4	17.4	16.6	18.7	23.3	19.8
Andropogon scoparius Michx.	ANSC1	G	Y	W	70	80	80	1.8	2.0	1.9	2.3	2.7	2.3
Bouteloua curtipendula (Michx.) Torr.	BOCU1	G	Y	W	40	90	80	1.0	2.3	1.8	1.3	3.1	2.1
Bouteloua gracilis (H. B. K.) Lag ex Griffiths	BOGR1	G	Y	W	80	90	60	1.3	1.9	1.1	1.7	2.5	1.3
Bouteloua hirsuta Lag	BOHI1	G	Y	W	30	10	30	0.3	0.1	0.3	0.4	0.1	0.4
Muhlenbergia montana (Nutt.) Hitchc.	MUMO1	G	Y	W	100	100	100	13.2	11.8	13.4	17.1	15.8	16.0
Sorghastrum nutans (L.) Nash	SONU1	G	Y	W	50	50	60	1.6	1.5	1.7	2.1	2.0	2.0
Sporobolus heterolepis (A. Gray) A. Gray	SPHE1	G	Y	W	10	10	10	0.2	0.1	0.1	0.3	0.1	0.1
Total foliar cover								77.2	74.6	83.9	100.0	100.0	100.0
Total forb cover								2.7	3.7	6.7	3.5	5.0	8.0
Total native forb cover								2.4	3.2	5.6	3.1	4.3	6.7
Total non-native forb cover								0.3	0.5	1.1	0.4	0.7	1.3
Total graminoid cover								74.5	70.9	77.2	96.5	95.0	92.0
Total native graminoid cover								42.2	46.9	46.6	54.7	62.9	55.5
Total non-native graminoid cover								32.3	24.0	30.6	41.8	32.2	36.5
Total warm-season graminoid cover								33.8	37.1	36.9	43.8	49.7	44.0
Total cool-season graminoid cover								40.7	33.8	40.3	52.7	45.3	48.0
Total native cover								44.6	50.1	52.2	57.8	67.2	62.2
Total non-native cover								32.6	24.5	31.7	42.2	32.8	37.8

Absolute cover = Absolute foliar cover is the percentage of the number of hits on a species out of the total number of hits possible (1000).
Relative cover = Relative foliar cover was the number of hits a species had relative to the total number of all vegetative hits recorded per site (i.e., the percent of vegetative cover the species represented).
All cover values presented are means (n = 10).
Native categories: Y = Native, N = Non-Native
Form categories: C = Cactus, F = Forb, G = Graminoid
Cool/Warm Season categories: C = Cool season species, W = Warm season species

Table 10-5. 1999-2001 Prescibed Burn Species Frequency Summary

				Unburned			Burned		
Family	**Scientific Name**	**Speccode**	**Native**	**1999**	**2000**	**2001**	**1999**	**2000**	**2001**
APIACEAE	Lomatium orientale Coult. & Rose	LOOR1	Y	16		2	16		4
ASCLEPIADACEAE	Asclepias stenophylla A. Gray	ASST1	Y					2	
ASCLEPIADACEAE	Asclepias viridiflora Raf.	ASVI1	Y	2	2	2			
ASTERACEAE	Achillea millefolium L. ssp. lanulosa (Nutt.) Piper	ACMI1	Y	6	4	4			
ASTERACEAE	Ambrosia psilostachya DC.	AMPS1	Y	2	2	6	8	10	36
ASTERACEAE	Artemisia campestris L. ssp. caudata (Michx.) Hall & Clem.	ARCA1	Y				2		16
ASTERACEAE	Artemisia frigida Willd.	ARFR1	Y	6	2		8	4	8
ASTERACEAE	Artemisia ludoviciana Nutt. var. ludoviciana	ARLU1	Y	4	8	8	26	24	30
ASTERACEAE	Aster porteri Gray	ASPO1	Y	30	2	10	10	6	18
ASTERACEAE	Carduus nutans L. ssp. macrolepis (Peterm.) Kazmi	CANU1	N					2	4
ASTERACEAE	Centaurea diffusa Lam.	CEDI1	N		2	8	6	16	22
ASTERACEAE	Chrysopsis fulcrata Greene	CHFU1	Y	8	8	10	2	2	2
ASTERACEAE	Chrysopsis villosa Pursh.	CHVI1	Y	26	12	12	2		
ASTERACEAE	Cirsium undulatum (Nutt.) Spreng.	CIUN1	Y				2	2	2
ASTERACEAE	Conyza canadensis (L.) Cronq.	COCA1	Y			2		2	14
ASTERACEAE	Erigeron divergens T. & G.	ERDI1	Y				4		6
ASTERACEAE	Erigeron flagellaris A. Gray	ERFL1	Y			2		6	26
ASTERACEAE	Gaillardia aristata Pursh.	GAAR1	Y	8	18	18	12	8	12
ASTERACEAE	Grindelia squarrosa (Pursh.) Dun.	GRSQ1	Y				8	8	24
ASTERACEAE	Helianthus pumilus Nutt.	HEPU1	Y	2	2	2			
ASTERACEAE	Lactuca serriola L.	LASE1	N			4		2	20
ASTERACEAE	Liatris punctata Hook.	LIPU1	Y	82	86	80	52	60	58
ASTERACEAE	Ratibida columnifera (Nutt.) Woot. & Standl.	RACO1	Y						2
ASTERACEAE	Senecio plattensis Nutt.	SEPL1	Y	6	6	2	4	4	4
ASTERACEAE	Solidago mollis Bart.	SOMO1	Y	6	6	6			
ASTERACEAE	Taraxacum officinale Weber	TAOF1	N			2	2	10	4
ASTERACEAE	Tragopogon dubius Scop.	TRDU1	N		2	16	2	10	12
BORAGINACEAE	Lithospermum incisum Lehm.	LIIN1	Y						2
BRASSICACEAE	Alyssum alyssoides (L.) L.	ALAL1	N		2				
BRASSICACEAE	Alyssum minus (L.) Rothmaler var. micranthus (C. A. Mey.) Dudley	ALMI1	N	8	4	6	18		12
BRASSICACEAE	Arabis hirsuta (L.) Scop. var. pynocarpa (Hopkins) Rollins	ARHI1	Y	8	4	8	8	2	2
BRASSICACEAE	Camelina microcarpa Andrz. ex DC.	CAMI1	N			2			
BRASSICACEAE	Draba reptans (Lam.) Fern.	DRRE1	Y		2	2			16
BRASSICACEAE	Erysimum capitatum (Nutt.) DC.	ERCA2	Y	4	4	22	4	2	32
BRASSICACEAE	Lesquerella montana (A. Gray) Wats.	LEMO1	Y	34	48	66	54	80	74
BRASSICACEAE	Sisymbrium altissimum L.	SIAL1	N			4			2
CACTACEAE	Echinocereus viridiflorus Engelm.	ECVI1	Y	46	34	30	48	46	40
CACTACEAE	Opuntia macrorhiza Engelm.	OPMA1	Y	28	12	8	58	36	26
CARYOPHYLLACEAE	Arenaria fendleri A. Gray	ARFE2	Y	32	22	20	14	10	14
CARYOPHYLLACEAE	Paronychia jamesii T. & G.	PAJA1	Y	22	20	24	4		2
CARYOPHYLLACEAE	Silene antirrhina L.	SIAN1	Y			26		2	34
CHENOPODIACEAE	Chenopodium leptophyllum Nutt. ex Moq.	CHLE2	Y			2			
CLUSIACEAE	Hypericum perforatum L.	HYPE1	N	4	6	26	2	2	14
CYPERACEAE	Carex eleocharis Bailey	CAEL1	Y						2
CYPERACEAE	Carex heliophila Mack.	CAHE1	Y	94	96	90	84	82	78
FABACEAE	Astragalus agrestis Dougl. ex G. Don	ASAG1	Y				4	4	4
FABACEAE	Dalea purpurea Vent	DAPU1	Y	10	10	6	4	6	4
FABACEAE	Psoralea tenuiflora Pursh.	PSTE1	Y	26	40	44	18	20	18
GERANIACEAE	Erodium cicutarium (L.) L'Her.	ERCI1	N			2			
JUNCACEAE	Juncus interior Wieg.	JUIN1	Y	4	4	4	8	2	4
LILIACEAE	Allium textile A. Nels. & Macbr.	ALTE1	Y	4		12			
NYCTAGINACEAE	Mirabilis linearis (Pursh.) Heimerl	MILI1	Y			4			
OROBANCHACEAE	Orobanche fasciculata Nutt.	ORFA1	Y						2
POACEAE	Agropyron smithii Rydb.	AGSM1	Y				2	2	2
POACEAE	Andropogon gerardii Vitman	ANGE1	Y	64	64	66	76	76	78
POACEAE	Andropogon scoparius Michx.	ANSC1	Y	56	54	44	38	40	38
POACEAE	Aristida purpurea Nutt. var. robusta (Merrill) A. Holmgren & N. Holmgr	ARLO1	Y	14	12	12	4	14	8
POACEAE	Bouteloua curtipendula (Michx.) Torr.	BOCU1	Y	74	66	62	44	50	46
POACEAE	Bouteloua gracilis (H. B. K.) Lag ex Griffiths	BOGR1	Y	78	60	62	58	68	44
POACEAE	Bouteloua hirsuta Lag	BOHI1	Y	52	60	48	18	30	18
POACEAE	Bromus japonicus Thunb. ex Murr.	BRJA1	N	4			14	2	8
POACEAE	Bromus tectorum L.	BRTE1	N	2	2	8	4	4	8

Table 10-5. (cont.)

				Unburned			Burned		
Family	**Scientific Name**	**Speccode**	**Native**	**1999**	**2000**	**2001**	**1999**	**2000**	**2001**
POACEAE	Buchloe dactyloides (Nutt.) Engelm.	BUDA1	Y	2	2				
POACEAE	Koeleria pyramidata (Lam.) Beauv.	KOPY1	Y	62	74	72	28	32	46
POACEAE	Muhlenbergia montana (Nutt.) Hitchc.	MUMO1	Y	76	78	78	76	64	64
POACEAE	Poa compressa L.	POCO1	N	56	52	52	84	88	82
POACEAE	Poa pratensis L.	POPR1	N	38	38	36	48	50	48
POACEAE	Sitanion hystrix (Nutt.) Sm. var. brevifolium (Sm.) Hitchc.	SIHY1	Y	18	22	22		6	6
POACEAE	Sorghastrum nutans (L.) Nash	SONU1	Y	24	22	20			
POACEAE	Sporobolus heterolepis (A. Gray) A. Gray	SPHE1	Y	8	8	10			
POACEAE	Stipa comata Trin. & Rupr.	STCO1	Y	34	42	48	50	58	66
POLYGONACEAE	Eriogonum alatum Torr.	ERAL1	Y	38	22	20	12	10	8
PORTULACACEAE	Talinum parviflorum Nutt.	TAPA1	Y	4	10	8			
ROSACEAE	Potentilla fissa Nutt.	POFI1	Y	2	2	2			
ROSACEAE	Potentilla hippiana Lehm.	POHI1	Y	2	2				
SANTALACEAE	Comandra umbellata (L.) Nutt.	COUM1	Y	6	16	8			2
SCROPHULARIACEAE	Castilleja sessiliflora Pursh.	CASE3	Y	2	2	2			
SCROPHULARIACEAE	Linaria dalmatica (L.) Mill.	LIDA1	N	14	14	14	2	2	4
SCROPHULARIACEAE	Penstemon virens Penn.	PEVI1	Y	8	2	4	2	4	2
SCROPHULARIACEAE	Verbascum thapsus L.	VETH1	N				2		
SCROPHULARIACEAE	Veronica peregrina L. var. xalapensis (H. B. K.) St. John & Warren	VEPE1	Y						2

Appendices

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