2010 SynMon Field Studies
NE Nevada Wyoming Big Sagebrush Event Sites

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University of Nevada Cooperative Extension

Studied and Benchmarked Sites

MLRA 25 (-2)

Natural Event Sites
- Wildfire: 14
- Aroga Moth: 5

Planned Preventative Treatment Sites: 31
- Mowing
- NE Nevada Stewardship Group Demo Area
  - (Aerate, disk, spray, burn sites)

Key Collaborator Inputs

Northeastern Nevada a priority area of interest

“We’ve pretty much figured out how to manage the mid- to upper-elevation sagebrush sites.....it’s at the lower end” (Wyoming Big Sagebrush) “where the questions exist”

Rehab events well-studied…preventative events not

Goal

Characterize many individual NE NV sites, in their unique ecological states and settings…..

….. to identify how they responded to various forms of wildfire and land treatment disturbance….

…..and (hopefully) why.

6/29/10
PEQUOP
WF
TRAN 2W2
22.06.2010

D 6/29/10
PEQUOP
WF
TRAN 1W2
22.06.2010

Approach

Use existing (versus “created”) events

Low-intensity, multi-site sampling method

Design and benchmark for future use

Paired (“Event” and “Control”) Sampling

D 7/21/10
OWYHE
GS
TRAN 3T2
21.07.2010

D 7/21/10
OWYHE
GS
TRAN 3C1
21.07.2010

Drivers: Event Selection

- 2001-2009 Time Period
- Range of Events
- Range of Soil Associations, Elevations, etc
- Geographic Dispersion
- Adjacency: Wildfire/Land Treatments

Drivers: Sampling Area Selection

- Homogeneity
- Range of ecological states
- No unique noise
- Absence of apparent rehab (incl seeding)
- Wildfires: Apparent non-ecological barriers to fire spread
- Ease of physical access/future site re-visits

Driver: Study Site Selection

Random Number Table

01. 09. 2010

6/16/10
TOANO
GS
2C1
16. 06. 2010

6/16/10
TOANO
GS
TRAN 2T2
16.06.2010

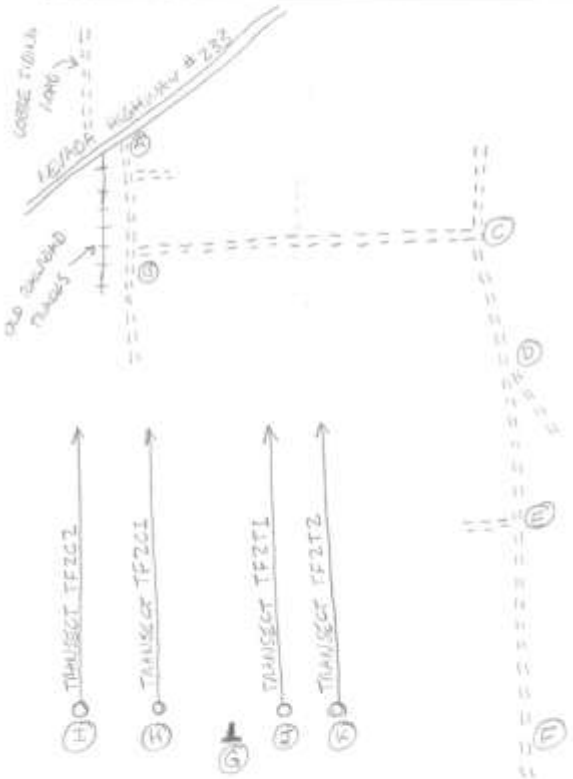
01.09.2010

21.05.2010

Transect Locator/Layout

Event Name TOANO GREENSTRIP (SITE 2)
County ELKO Transect Numbers TF2T1+2 TF2C1+2
Event Area Portion MOWED AREA (TF2T1+T2) AND ADJACENT UNMOWED AREA (TF2C1+C2)
Established By: John Swanson, NRES, University of Nevada Date Established 6/16/10
Locator Post Location (UTM) 11T0720588 4546775
Locator Post Location (Legal Description) T37N R67E SEC 34 SE 1/4
Ecological Site 035X019 Soil Type PEKO-ENKO-IZAR ASSOCIATION
Aspect SOUTH Slope Position LOWER Elevation 6060
Record on back anything of importance

Map Showing How to Get to the Event and Control Transects:



DISTANCES

A TO B = 0.6 MILES
B TO C = 1.55 MILES
C TO D = 1.2 MILES
D TO E = 0.9 MILES
E TO F = 0.8 MILES
F TO G = APPROX 220 FEET
G TO H = 25 FEET
H TO I = 13 FEET
G TO J = 25 FEET
J TO K = 10 FEET

↑ NORTH

(NOT TO SCALE)

⊥ = FENCE POST FOUND TODAY

o = REBAR INSTALLED TODAY

Land Treatment/Wildfire Event Cover Data

Event Name TOANO GREENSTRIP (SITE 2) County ELKO
Transect No TF2C2 Type: Pre-Event ___ Post-Event ___ Control X
Location: UTM 11T 0720588 4546775 Legal T37N R67 SEC 34 SE¼
Field Data Collected By: John Swanson, NRES, University of Nevada Date 6/16/10

Ground-Level Cover

	B Bare Soil	**L** Litter	**R** Rock>5mm	Vascular Veg (Live)	**C** Cryptogam	Tot
Dot Count	⊠⊠⊠⊠ ⊠:	⊠⊠⊠ ::	:		⊠:'	
% Cover	52	33	2	0	13	100

Vegetation Foliar Cover

Basal Hit	Level 1 Hit	Level 2 Hit	Level 3 Hit	Total Dots	% Cover
L	ELEL5			'	1
L	ARTR			⊠⊠	19
B	ARTR			⊡	6
B	ARTR (D)			:	2
C	ARTR			::	4
L	ARTR (D)			:	2
L	ELEL5	ARTR		:	2
L	ARTR (DC)			:	2
					38
TOTAL LIVE COVER					
ELEL5-3		ARTR-33			
TOTAL HITS, DEAD PLANTS					
ARTR-4					
TOTAL HITS, DECADENT PLANTS					
ARTR-2					

Note: (D) = Dead Plant (DC) = Decadent Plant

Shrub Canopy Dimensions

Event Name TOANO GREENSTRIP (SITE 2) County ELKO
Transect No TF2C1+C2 Type: Pre-Event ___ Post-Event ___ Control X
Location: UTM 11T 0720588 4546775 Legal T37 R67 SEC34 SE¼
Shrub Event/Treatment NONE
Data Collected By: John Swanson, NRES, University of Nevada Date 6/16/10

Species	TC	BC	WC	90	Species	TC	BC	WC	90
AMR	28	1	48	38					
	20	5	18	15					
	26	1	35	15					
	23	0	33	25					
	22	2	29	26					
	21	3	26	21					
	22	1	31	23					
	22	4	33	23					
	23	1	54	36					
	26	4	39	26					
TOTAL	233	22	346	248					
MEAN	23.3	2.2	34.6	24.8					

TC = Inches from soil surface to top of live canopy portion (Vertical)
BC = Inches from soil surface to bottom of live canopy portion (Vertical)
WC = Inches between widest two points of live canopy (Horizontal)
90 = Greatest inches of canopy width, at a 90 degree angle to axis of WC (Horizontal)

1Field_Data

File Edit View Favorites Tools Help

Back Search Folders

Address Z:\Swanson_Work\Field_Studies\2010\1Field_Data

File and Folder Tasks

- Make a new folder
- Publish this folder to the Web

Other Places

- 2010
- My Documents
- My Computer
- My Network Places

Details

1Data_Summ_Tables
Adobe_WF
Double_Mtn_GS
Double_Mtn_WF
Elburz_WF
Emigrant_WF
Hepworth_WF
Long_Field_GS
Metropolis_Moth
Mohala_Cr_Moth
Mudd_WF
N_Ruby_Valley_Moth
Osino_FB
Owyhee_GS
Pequop_Sp_WF
Ryndon_FB
Silver_Lake_FT
Silver_Lake_WF
Tabor_Creek_Aerate
Tabor_Creek_Burn
Tabor_Creek_Disk
Tabor_Creek_FB
Tabor_Creek_Moth
Tabor_Creek_Spray
Ten_Mile_GS
Toano_GS
Tuscarora_GS
Winters_WF

Collab_Note1
Text Document
3 KB

CollabNote2
Text Document
2 KB

Back Search Folders

Address Z:\Other_Info\Ecosystem_Sagebrush\WyoSageSite_Plants Go

Picture Tasks

- View as a slide show
- Order prints online
- Print pictures
- Copy all items to CD

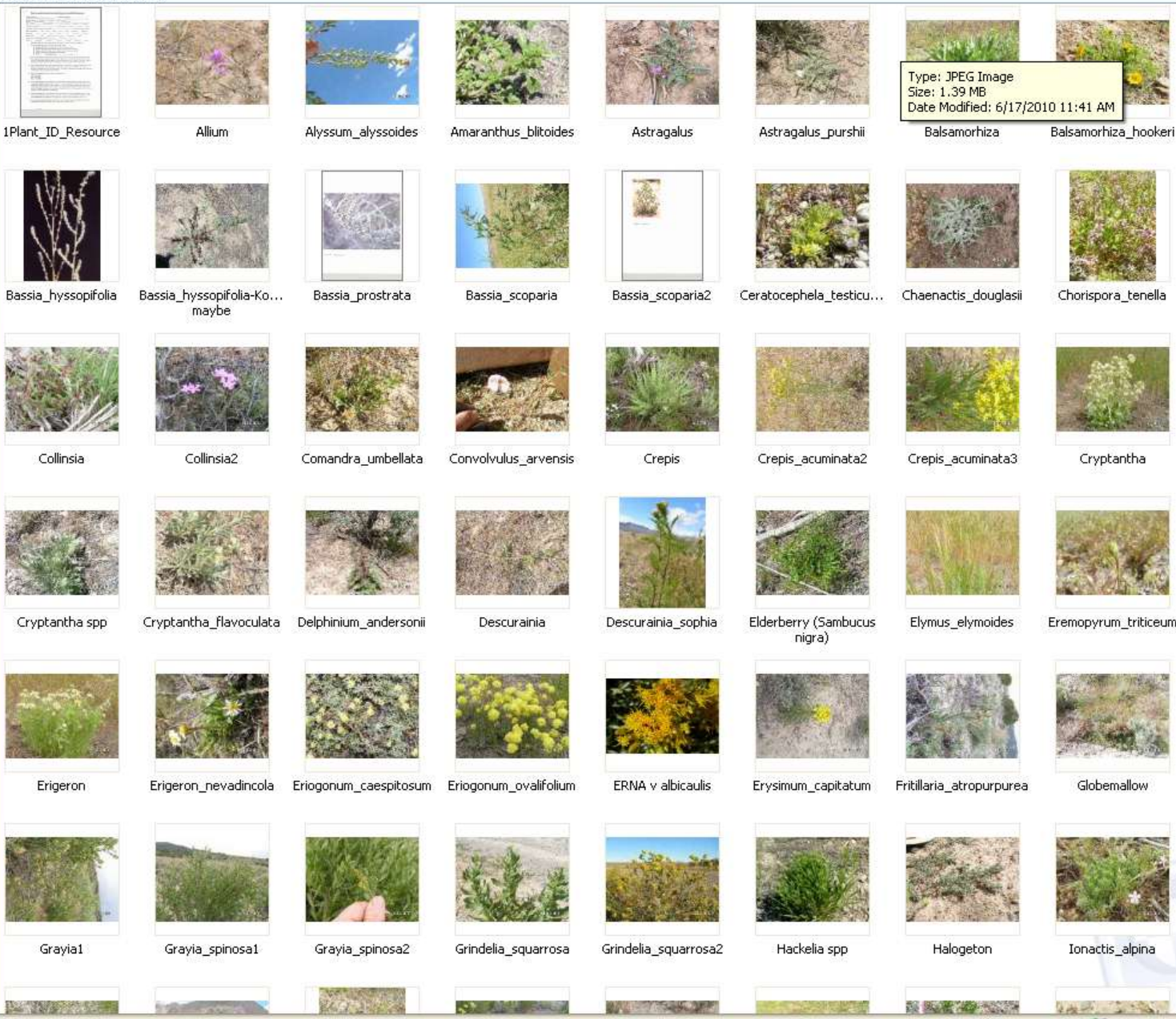
File and Folder Tasks

- Make a new folder
- Publish this folder to the Web

Other Places

- Ecosystem_Sagebrush
- My Pictures
- My Computer
- My Network Places

Details



95 objects 127 MB Local intranet

start Packages WyoSageSite_Plants 2011_Science_Delivery 10:01 AM

a Summary
yoming Sagebrush Sites
7, 2011
UNR

ed - Internal Use Only

ological Site	Soil Association	Elevation	Aspect	Slope Position	Event	Event Year	Bare Soil (Control)	Bare Soil (Event)	Difference	Litter (Control)	Litter (Event)	Diff
5XY014 (Ecotone Area)	McIvey-Short Creek-Cotant	6410	East	Middle	Double Mountain Greenstrip Mow Site	2005	20.0	10.5	-9.5	73.0	84.5	11.5
5XY014 (Ecotone Area)	McIvey-Short Creek-Cotant	6340	East	Middle	Double Mountain Wildfire Site	2002	27.5	32.5	5.0	60.5	54.5	-6.0
025XY014	Donna-Stampede	6010	South	Lower	Tuscaroroa Greenstrip Mow Site 1 Mow & Re-Mow	2001 & 10	30.5	30.5	0.0	63.5	64.0	0.5
025XY014	Donna-Stampede	6040	South	Lower	Tuscarora Greenstrip Mow Site 2	2001	27.5	26.5	-1.0	64.5	66.0	1.5
025XY014	Donna-Stampede	6040	South	Lower	Tuscarora Greenstrip Mow Site 2 Mow and Re-Mow	2001 & 10	27.5	30.5	3.0	64.5	64.0	-0.5
5XY019 (Ecotone Area)	Donna-Stampede-Gance	5520	North	Lower	Mudd Wildfire Site 1	2006	59.5	56.0	-3.5	32.5	38.5	6.0
5XY019 (Ecotone Area)	Donna-Stampede-Gance	5650	Flat	Top	Mudd Wildfire Site 2	2006	44.0	39.5	-4.5	46.5	43.0	-3.5
5XY019 (Ecotone Area)	Tustell-Gance-Mahala	6070	South	Top	Mohala Creek Aroga Moth Visit Site 1	2004-06	19.5	23.5	4.0	56.0	54.0	-2.0
5XY019 (Ecotone Area)	Tustell-Gance-Mahala	5990	North	Upper	Mohala Creek Aroga Moth Visit Site 2	2004-06	26.5	34.5	8.0	53.5	44.5	-9.0
025XY019	Chiara-Chiara Moderately Eroded	5440	South	Lower	Owyhee Greenstrip Mow Site 1	2001	44.0	33.5	-10.5	46.5	55.5	9.0
025XY019	Shabliss-Bartome	5430	South	Lower	Owyhee Greenstrip Mow Site 2	2001	25.5	25.5	0.0	59.0	69.0	10.0
025XY019	Shabliss-Bartome	5430	South	Lower	Owyhee Greenstrip Mow Site 2 Mow & Re-Mow	2001 & ??	25.5	34.5	9.0	59.0	59.5	0.5
025XY019	Chiara, Very Cobbly Chiara	5360	South	Lower	Owyhee Greenstrip Mow Site 3	2001	45.0	38.0	-7.0	41.0	52.5	11.5
025XY019	McCleary Cobbly Silt Loam	5360	South	Lower	Silver Lake Fuel Treatment Mow Site 1	2008	35.5	28.5	-7.0	38.0	55.0	17.0
025XY019	Kelk-Clurde	5400	East	Lower	Silver Lake Fuel Treatment Mow Site 2	2008	39.0	30.0	-9.0	56.5	67.0	10.5
025XY019	Bartome-Chiara	5340	East	Lower	Silver Lake Fuel Treatment Mow Site 3	2008	55.0	28.0	-27.0	20.0	56.0	36.0
025XY019	McCleary Cobbly Silt Loam	5360	South	Lower	Silver Lake Wildfire Site	2006	35.5	71.5	36.0	38.0	23.0	-15.0
025XY019	Chiara-Chiara Moderately Eroded	5440	South	Lower	Winters Wildfire Site 1	2006	44.0	47.0	3.0	46.5	48.0	1.5
025XY019	Kelk-Clurde	5400	East	Lower	Winters Wildfire Site 2	2006	30.0	63.5	33.5	47.0	26.5	-20.5
025XY019	Chiara-Wieland-Enko	5760	SW	Middle	Hepworth Wildfire Site 1	2007	41.0	27.5	-13.5	51.0	57.5	6.5
025XY019	Hunnton-Wieland	5730	Flat	Top	Hepworth Wildfire Site 2	2007	32.0	38.0	6.0	65.5	53.5	-12.0
025XY019	Orovada-Puett-Chiara	5260	East	Middle	Osino Fuel Break Mow Site 1	2003	54.0	37.5	-16.5	41.5	59.5	18.0
025XY019	Orovada-Puett-Chiara	5240	East	Upper	Osino Fuel Break Mow Site 2	2003	53.5	28.0	-25.5	41.5	68.0	26.5
025XY019	Bioya-Orovada	5300	South	Upper	Ryndon Fuel Break Mow & Supp Treatment A	2003 & ??	37.5	27.5	-10.0	55.5	65.0	9.5
025XY019	Bioya-Orovada	5300	South	Upper	Ryndon Fuel Break Mow & Supp Treatment B	2003 & ??	37.5	31.0	-6.5	55.5	65.0	9.5
025XY019	Bioya-Orovada	5640	West	Lower	Tabor Creek Aroga Moth Visit	2006-08	35.0	26.5	-8.5	59.5	63.0	3.5
025XY019	Hunnton-Wieland-Hunewill	5690	Flat	Bottom	Metropolis Aroga Moth Visit	2006-08	38.0	33.0	-5.0	59.5	57.5	-2.0
025XY019	Hunnton-Wieland-Gance	6130	Flat	Top	Tabor Creek Prescribed Burn Site 1	2002	33.5	40.0	6.5	51.0	50.5	-0.5

Getting Acquainted With The Data

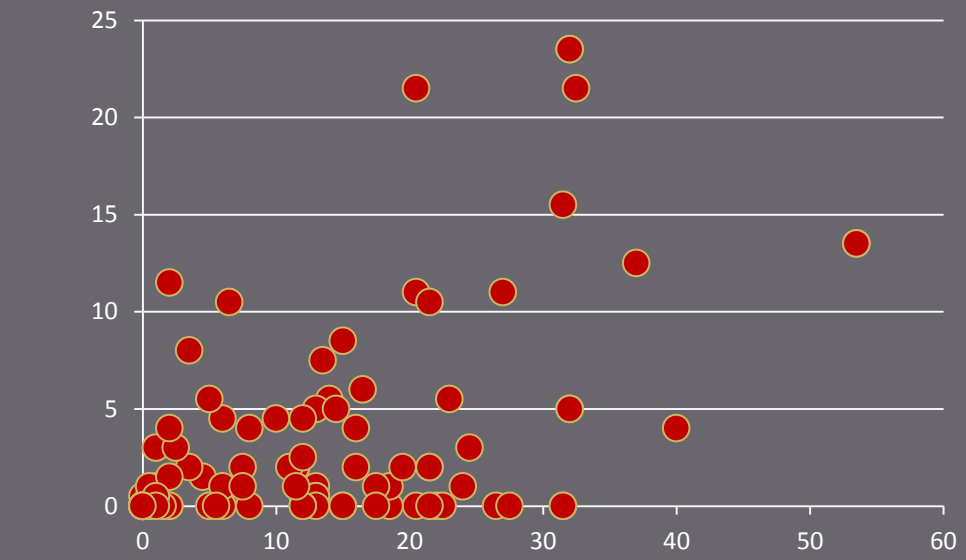
Study Approach: Strengths & Weaknesses

Ecological Responses

New Insights

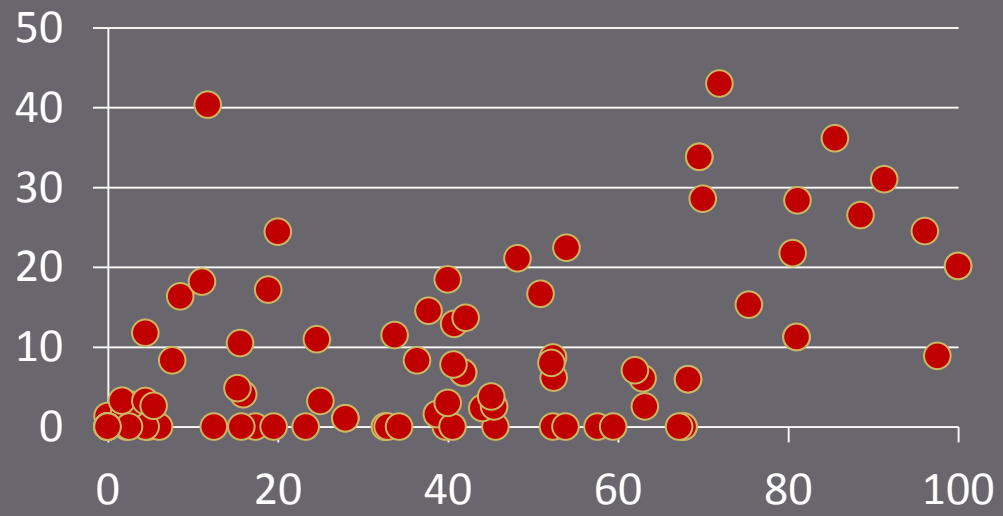
Study Approach Strengths and Weaknesses

(Summary: All Events)



Foliar Cover

Cryptogams (Mosses -)



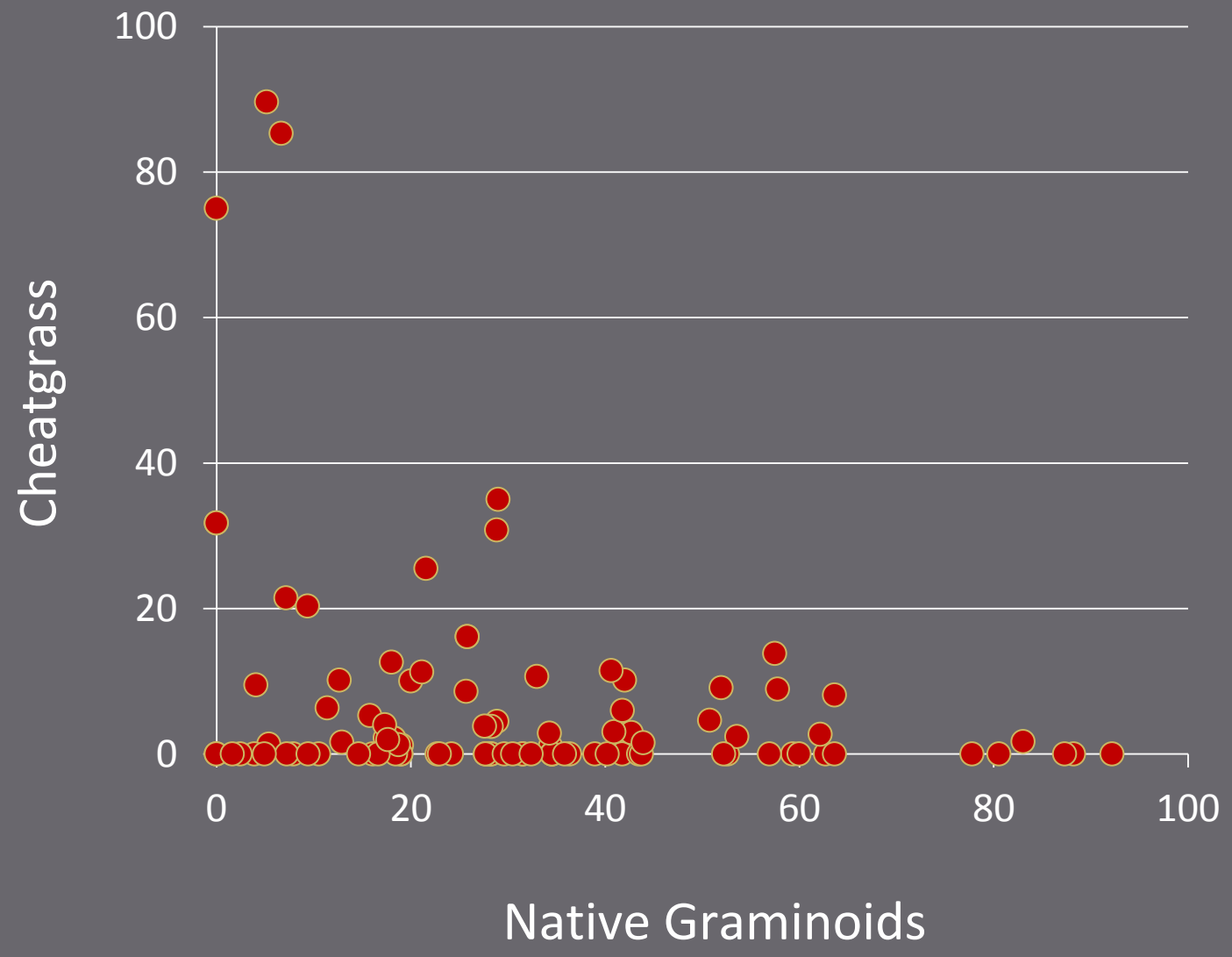
Relative Cover

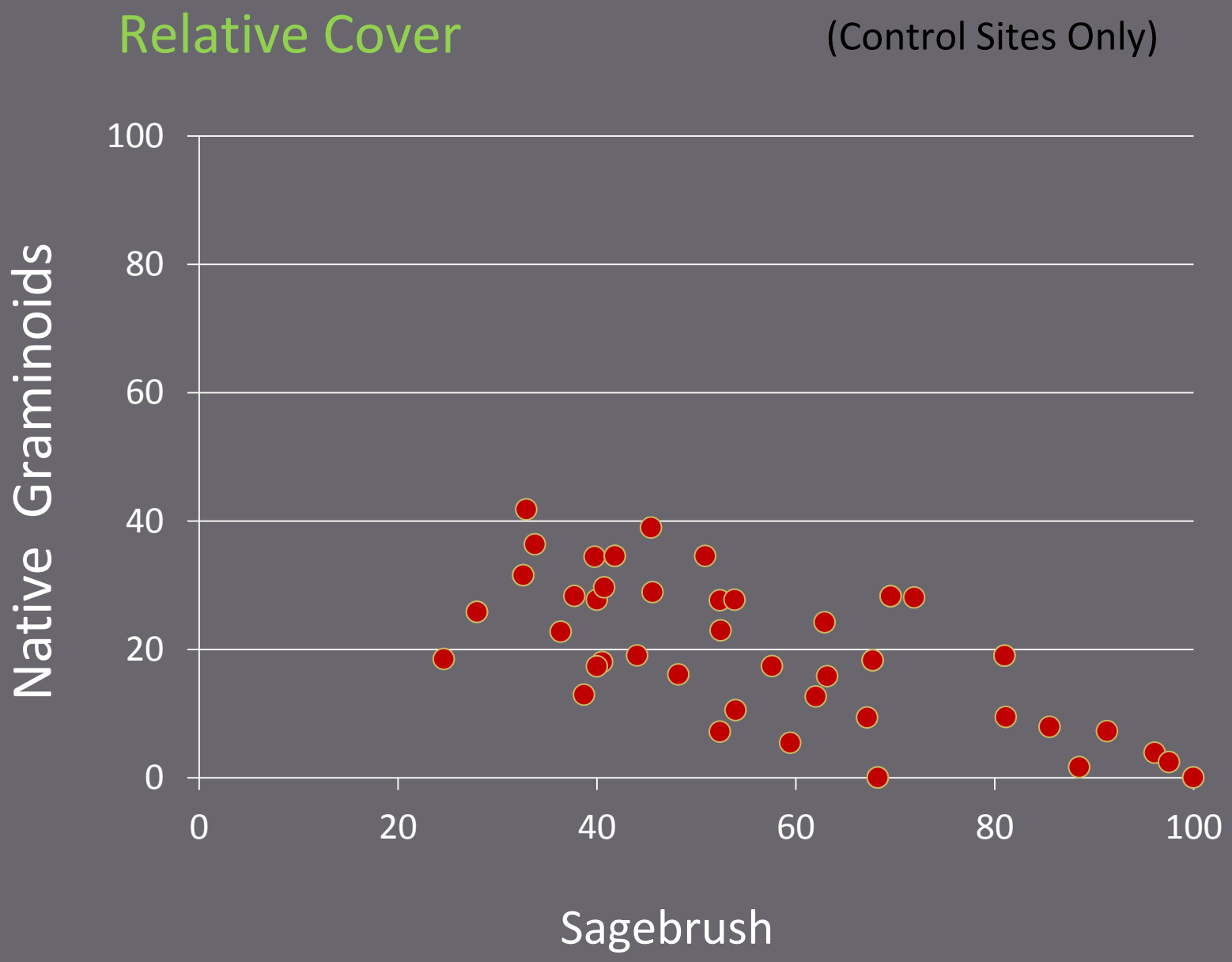
Sagebrush

(Control & Event Sites)

Relative Cover

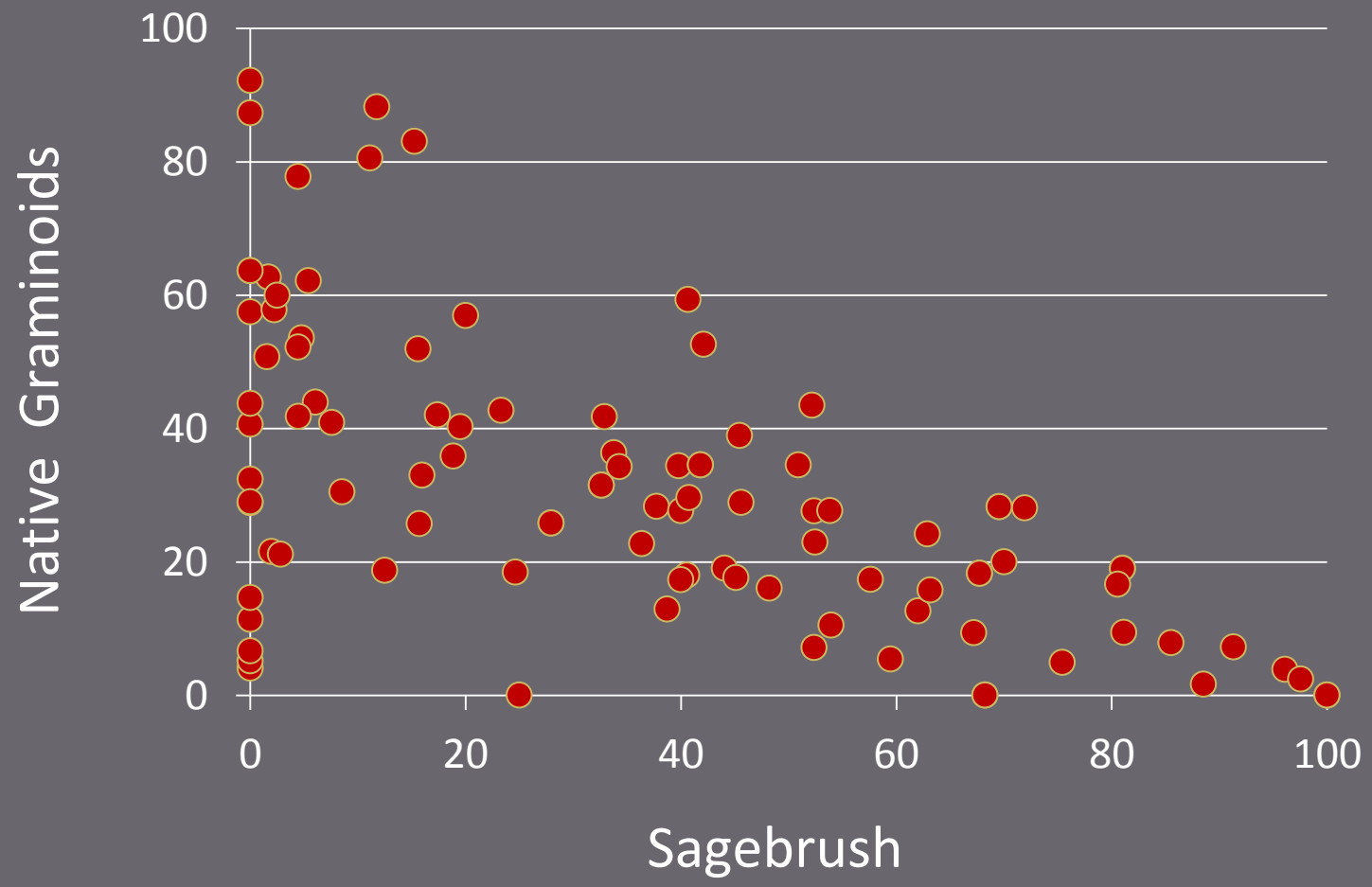
(Control & Event Sites)




Relative Cover
(Control Sites Only)
Native Graminoids
100
80
60
40
20
0
0
20
40
60
80
100
Sagebrush

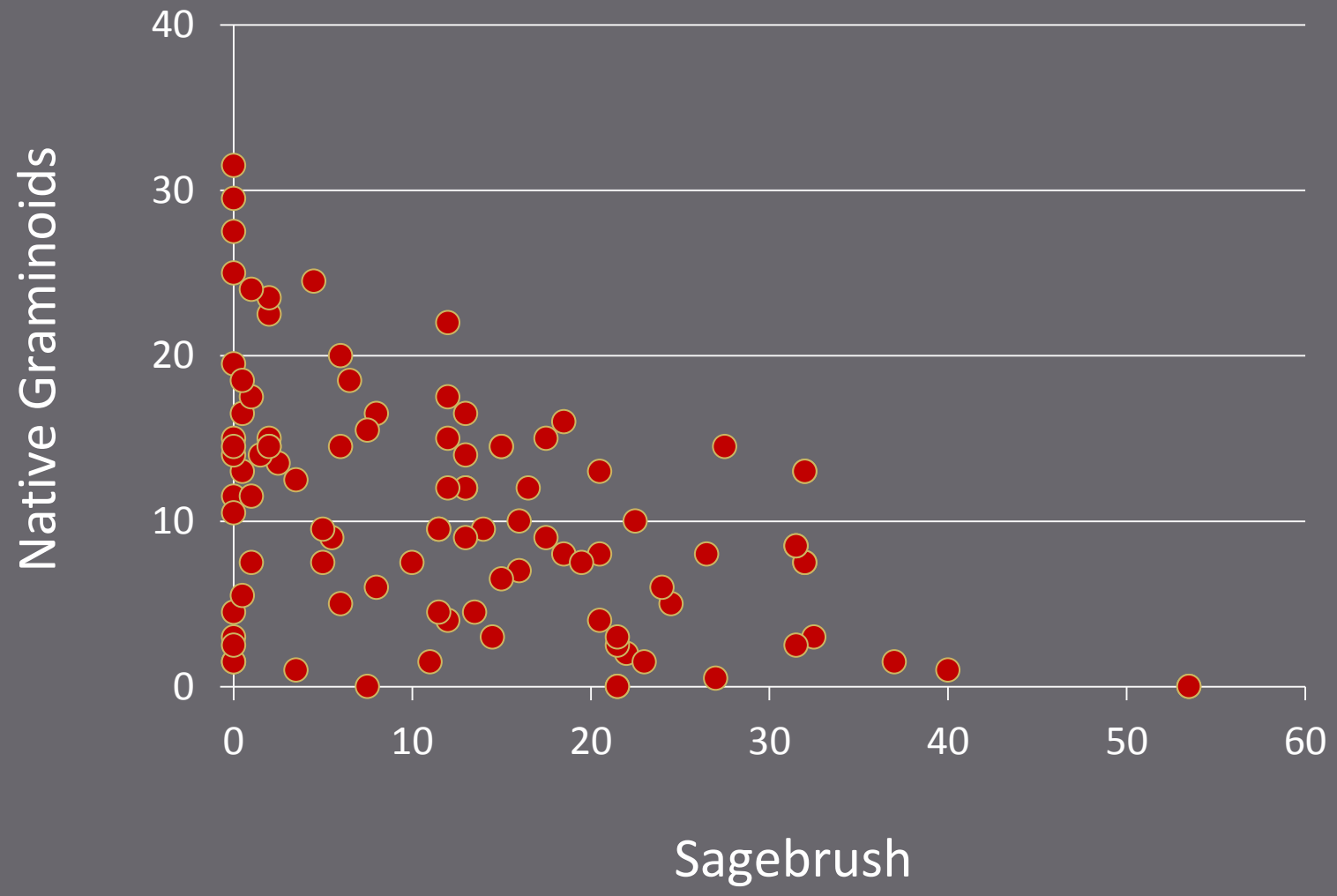
Relative Cover

(Control & Event Sites)

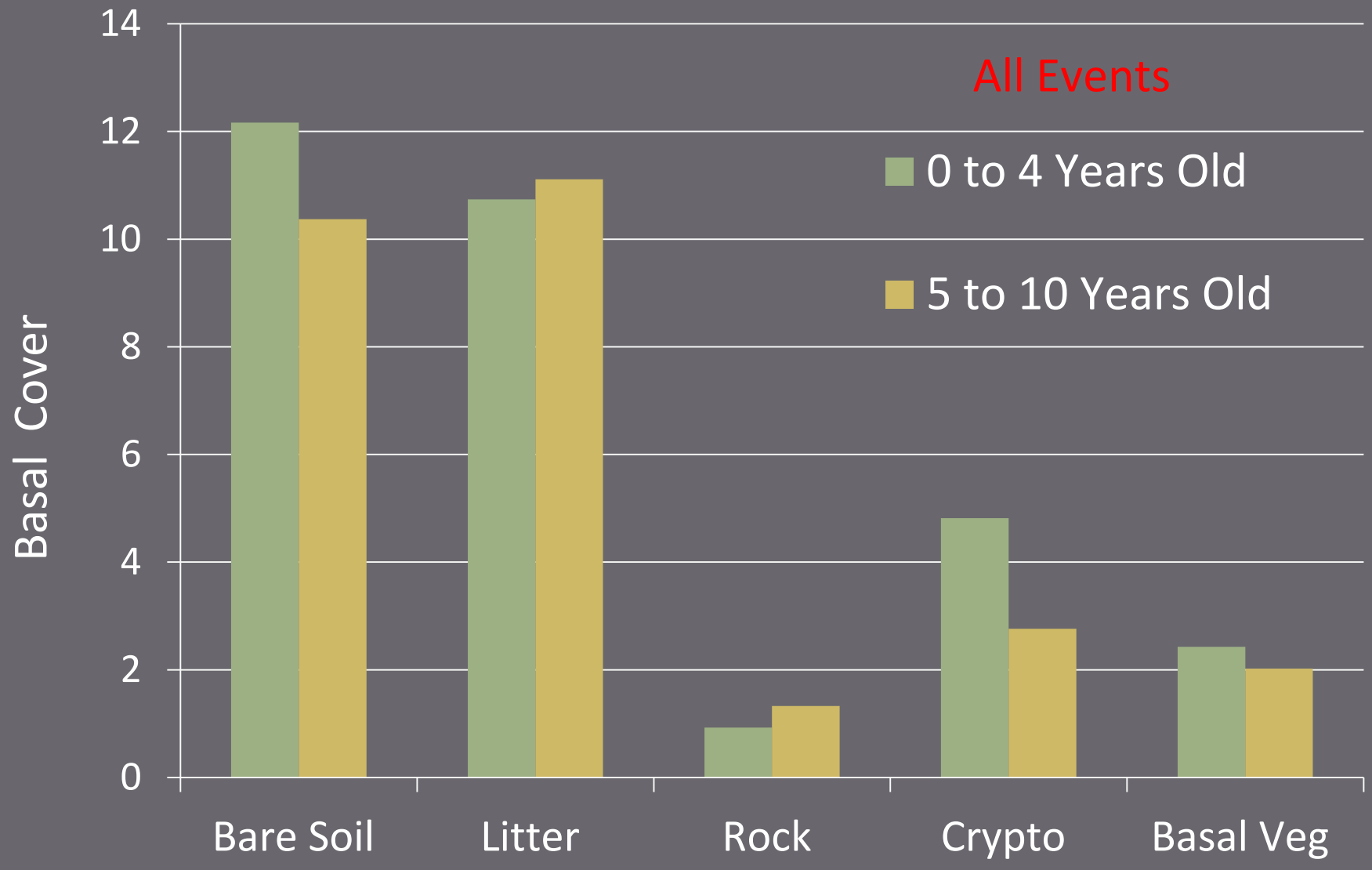


Foliar Cover

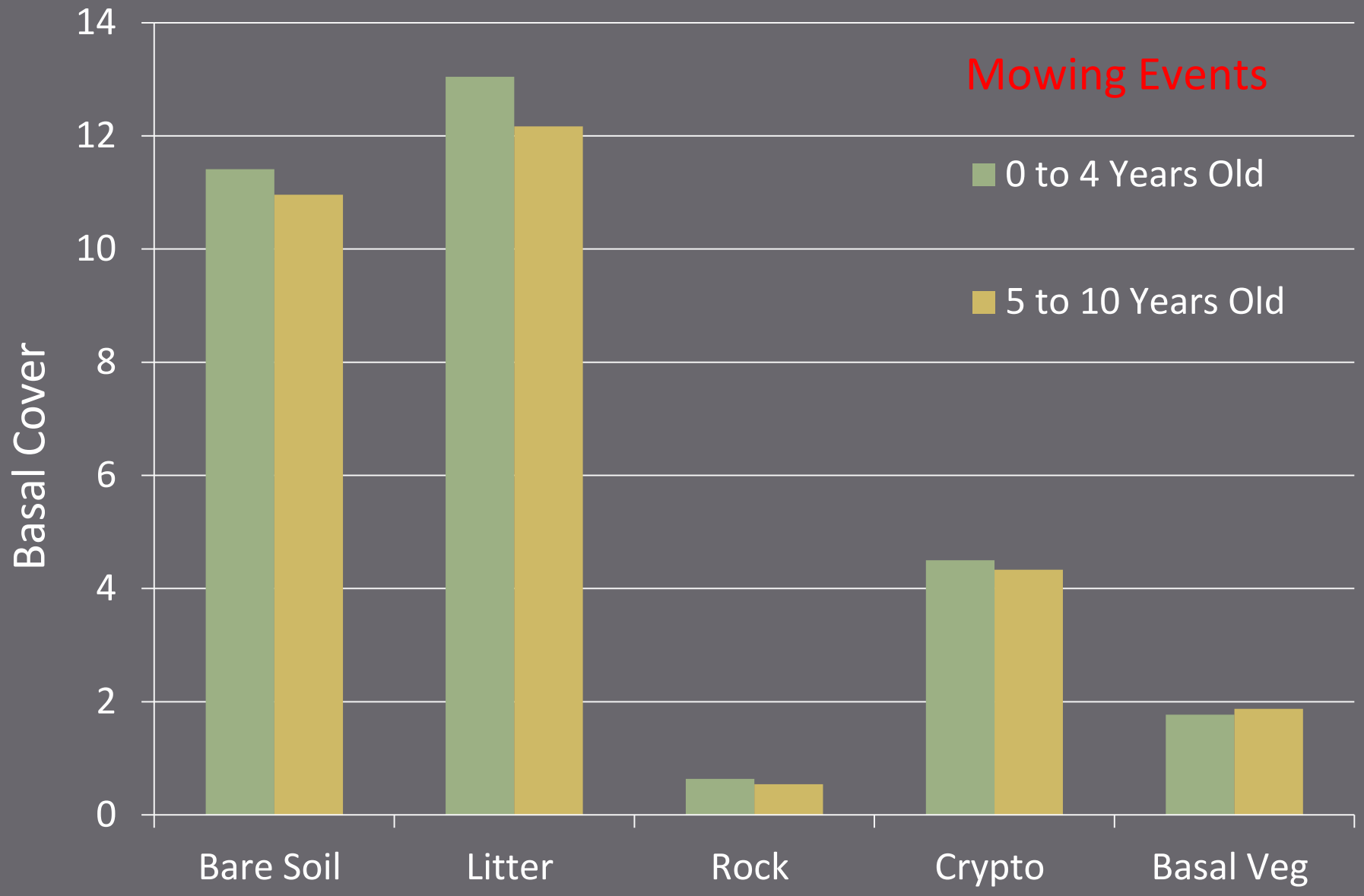
(Control & Event Sites)



Duration of Responses/Effects



Absolute Differences: Control and Event Site Values

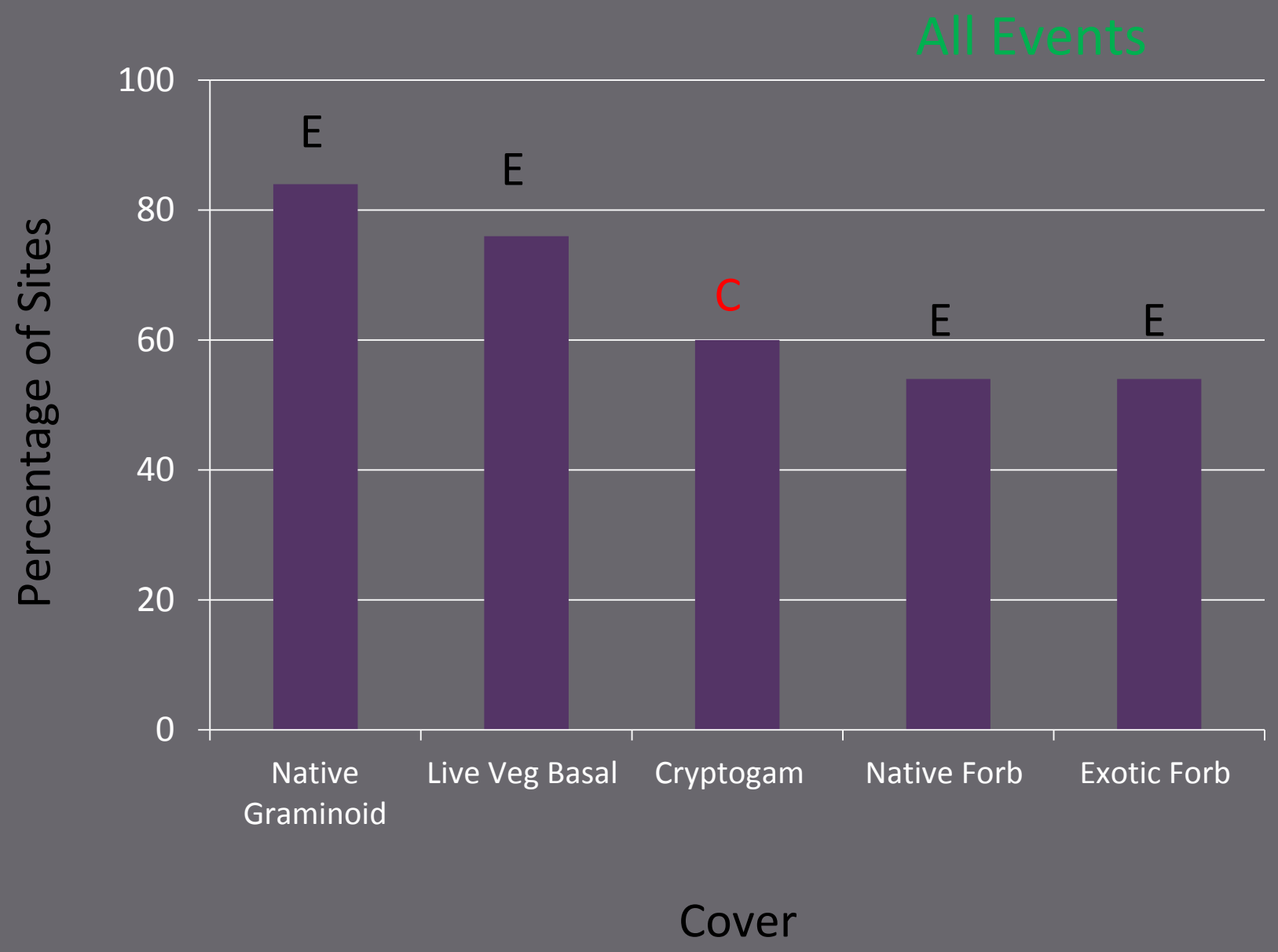


Absolute Differences: Control vs. Event

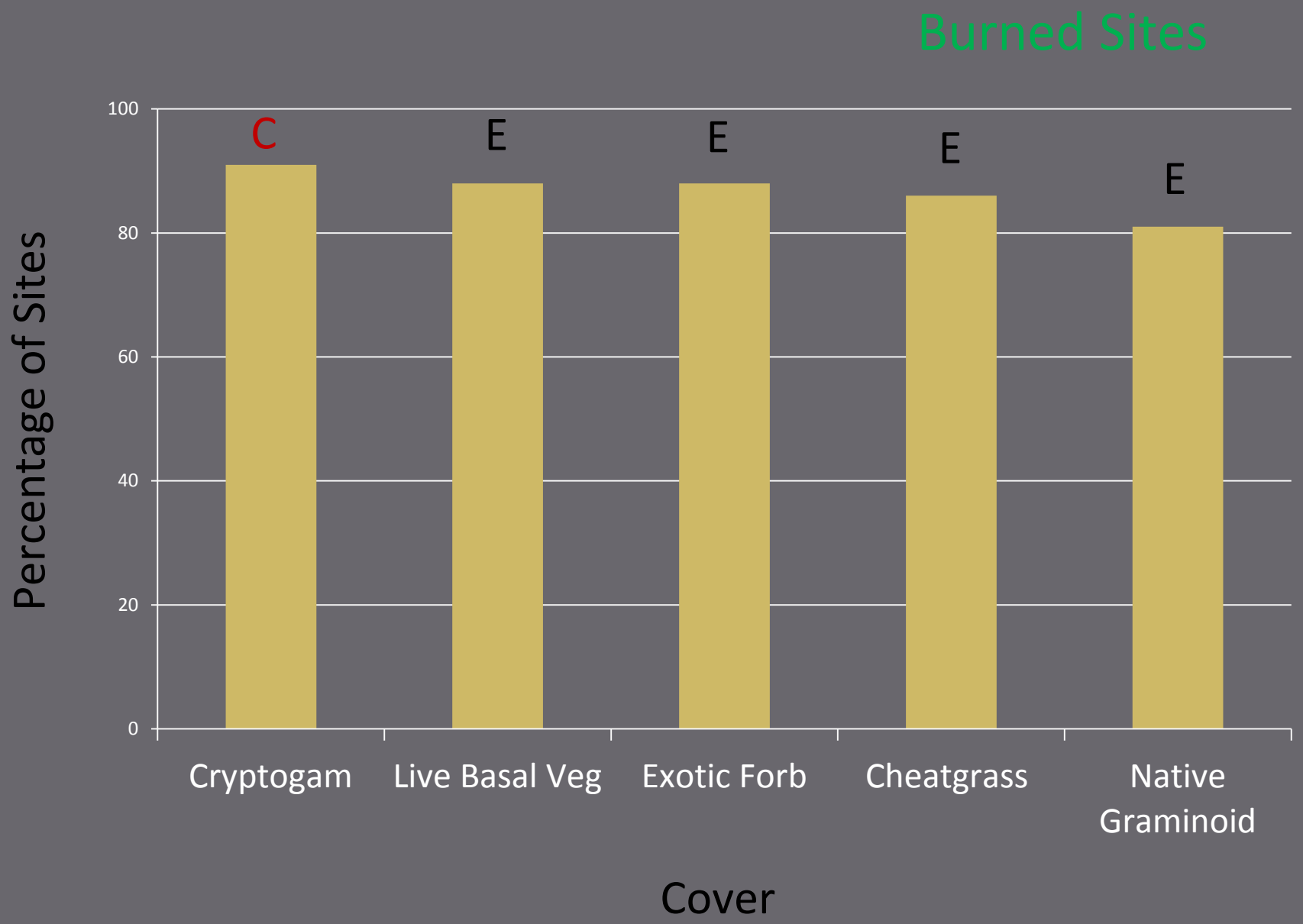
Top 5 Differences

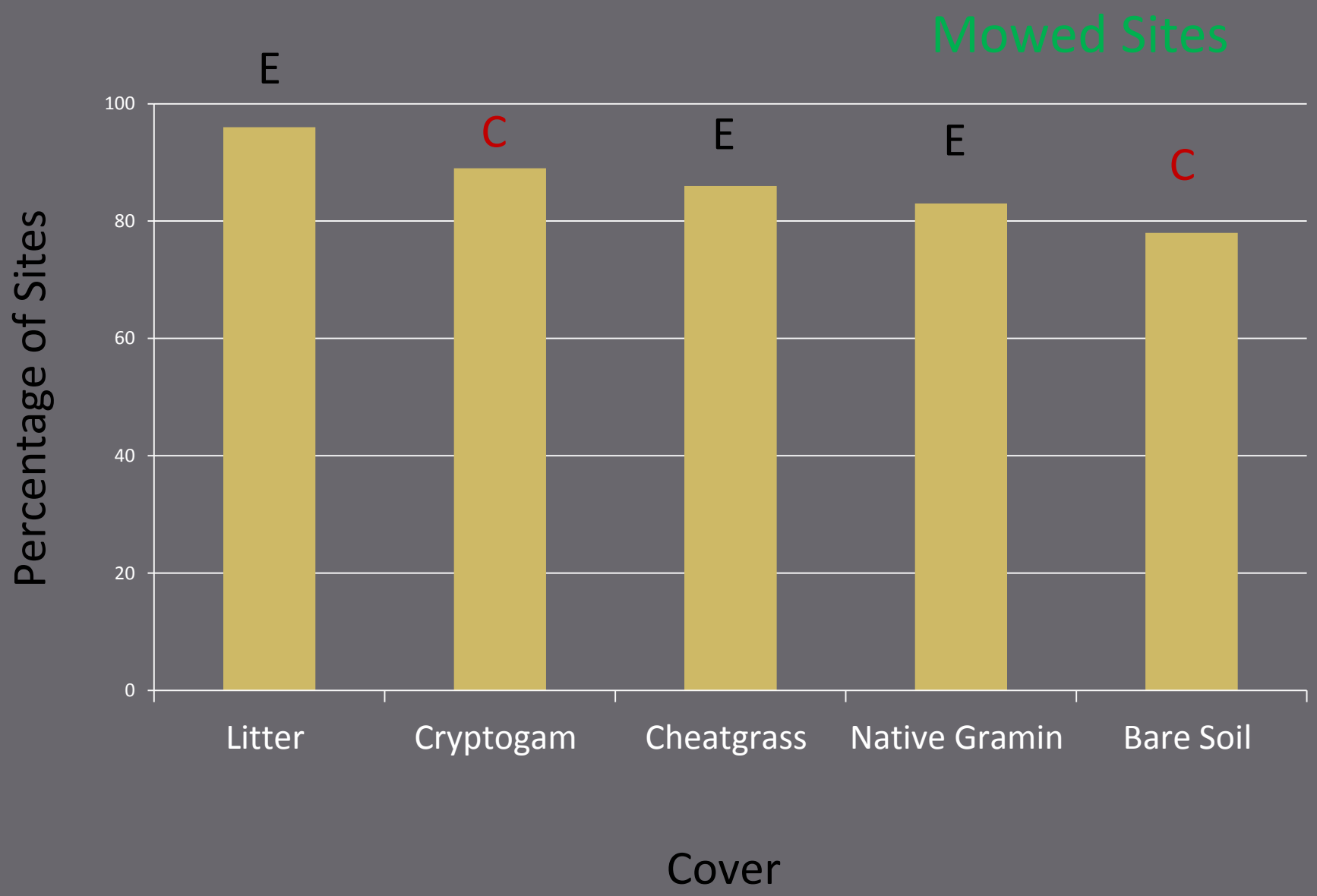
Control vs. Event

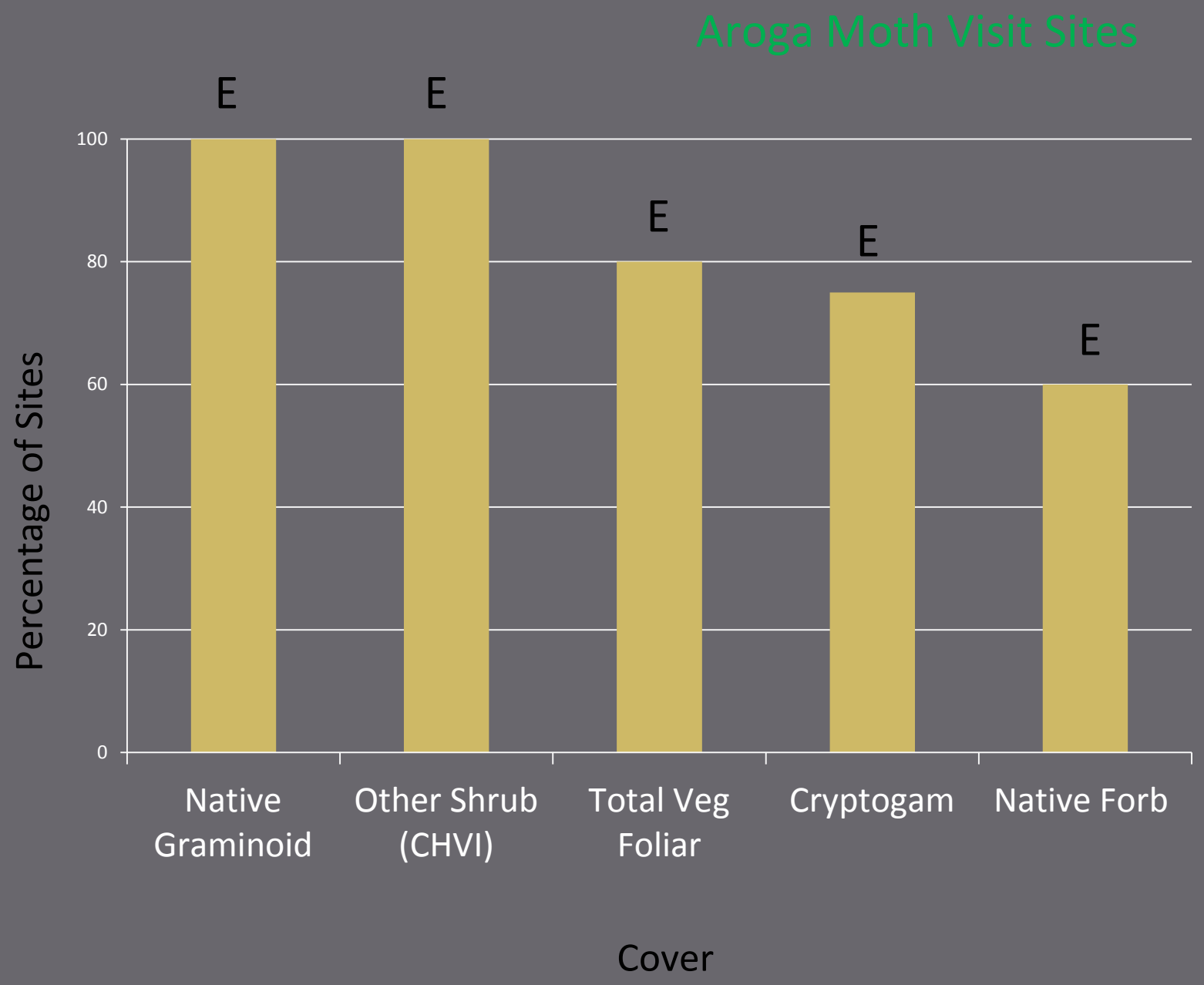
(Sagebrush Data Omitted)


All Events
100
80
60
40
20
0
Percentage of Sites
E
E
C
E
E
Native Graminoid
Live Veg Basal
Cryptogam
Native Forb
Exotic Forb
Cover

When “Hit” in Control


Burned Sites
Percentage of Sites
100
80
60
40
20
0
C
E
E
E
E
Cryptogam
Live Basal Veg
Exotic Forb
Cheatgrass
Native Graminoid
Cover


Mowed Sites
E
C
E
E
C
100
80
60
40
20
0
Percentage of Sites
Litter
Cryptogam
Cheatgrass
Native Gramin
Bare Soil
Cover


Aroga Moth Visit Sites
E
E
E
E
E
100
80
60
40
20
0
Percentage of Sites
Native Graminoid
Other Shrub (CHVI)
Total Veg Foliar
Cryptogam
Native Forb
Cover

Tabor Creek Area Events

Marys River Ranch/NNSG Demo Site
(Chemical, Disk, Aerate, Prescribed Burn)

BLM Mowing

Hepworth Wildfire

Aroga Moth Visits

Tabor Creek Sites
Percentage of Sites
100
80
60
40
20
0
E
E
E
E
C
Basal Live Veg
Native Graminoid
Native Forb
Exotic Forb
Cryptogam
Cover

Outside Look

Math Sciences Department

UNR

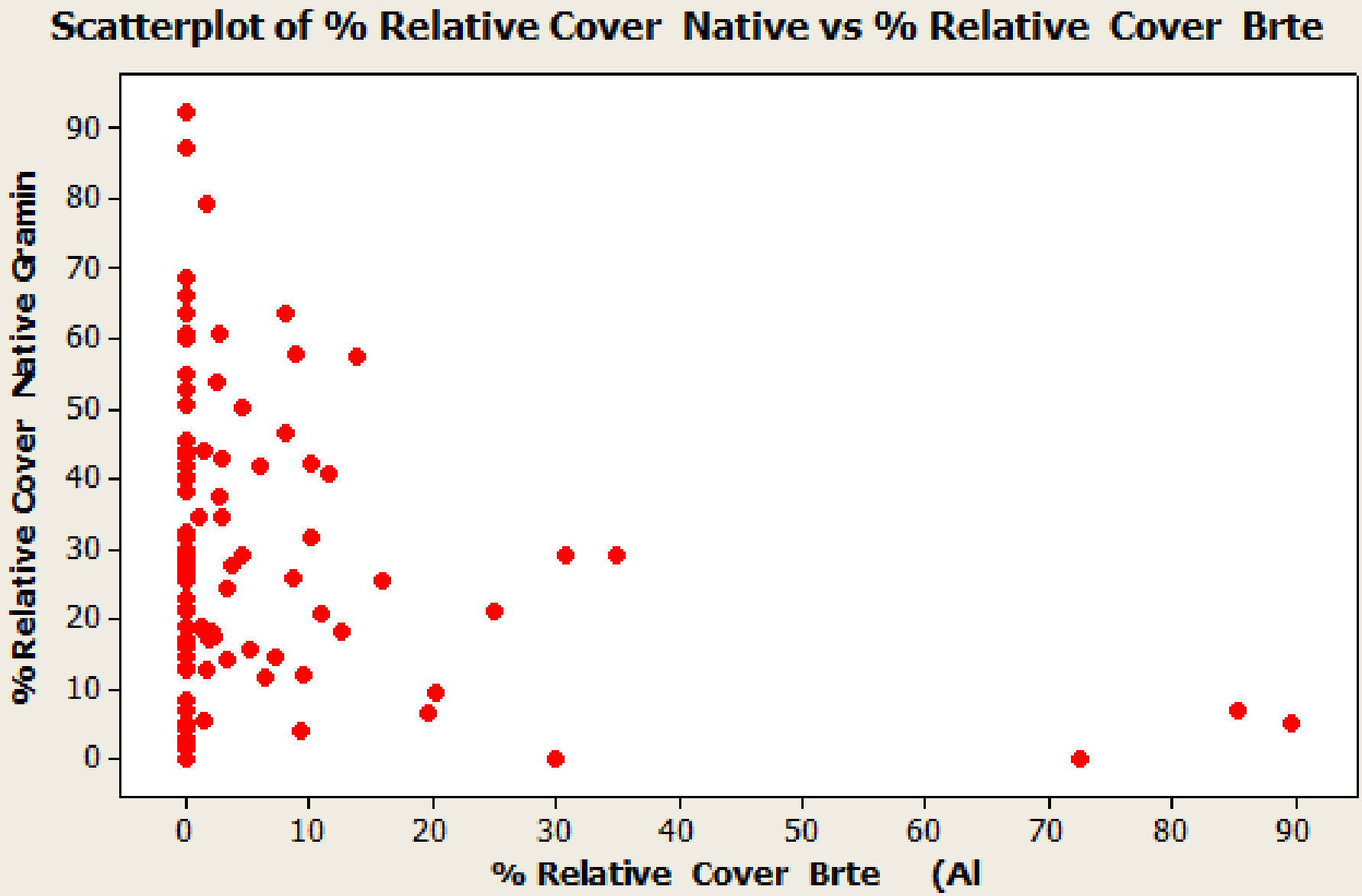
Relative Cover Data Positions

Control & Event Sites

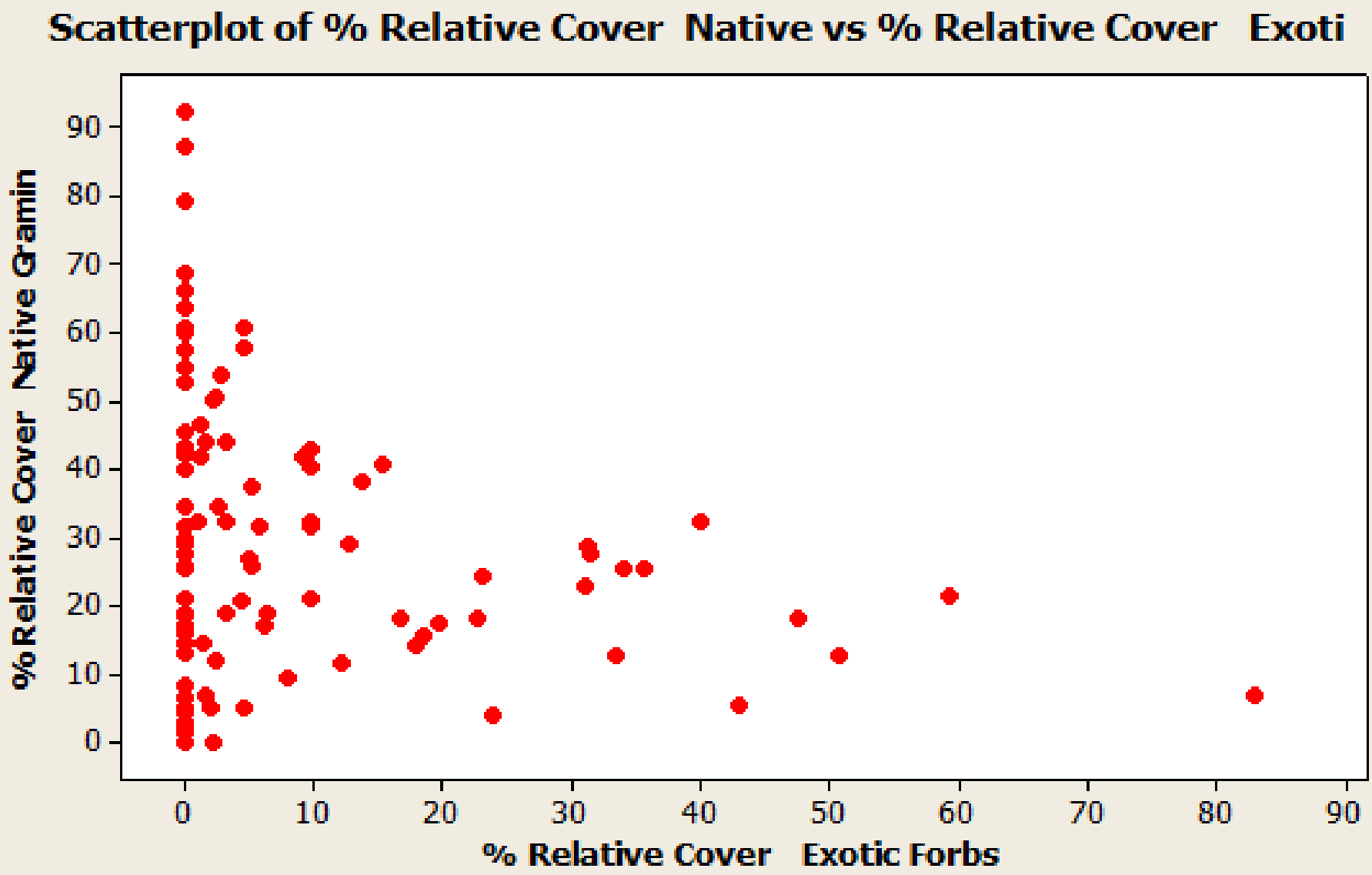
All Events

Native Graminoids

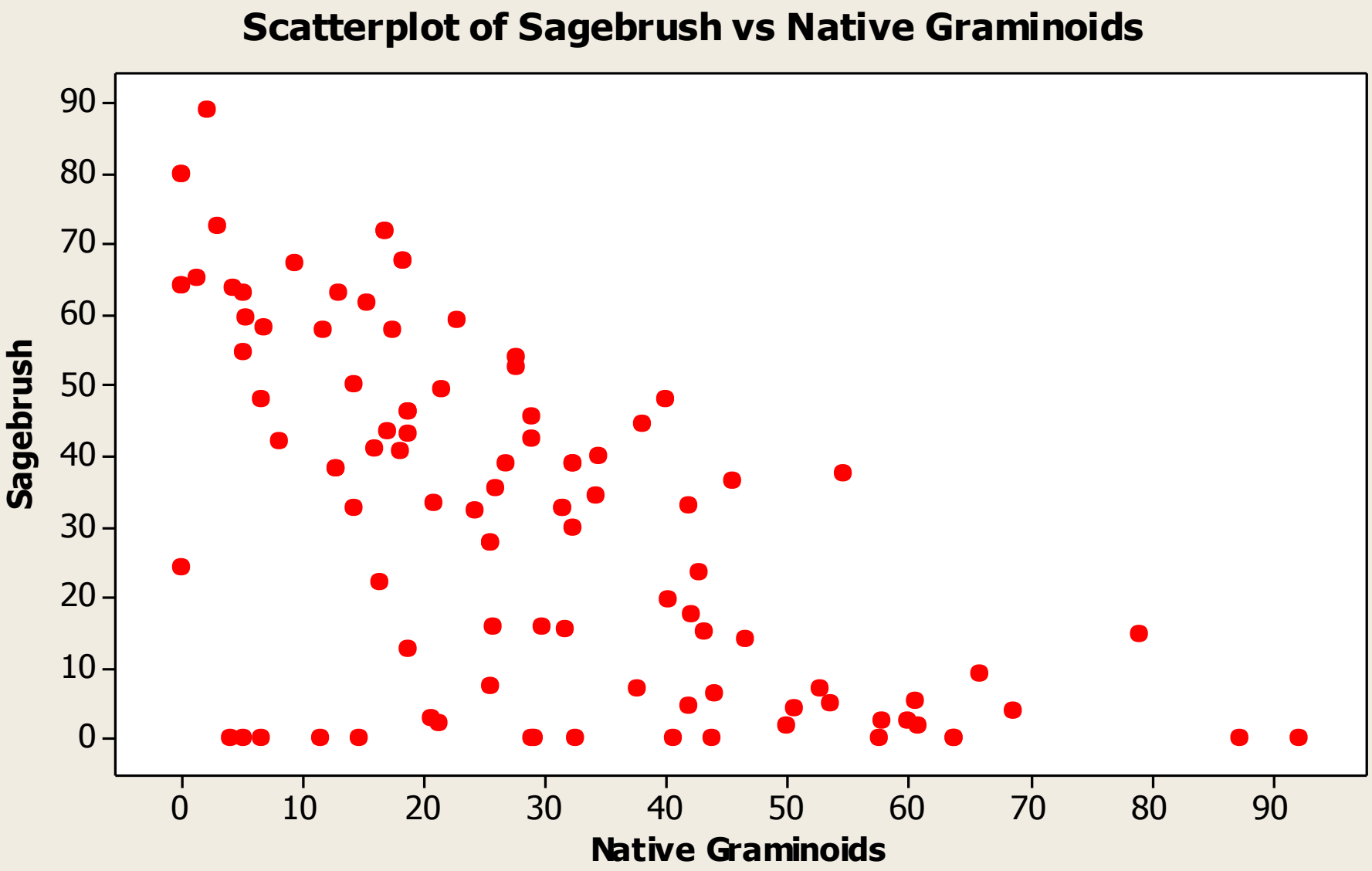
Cheatgrass


Scatterplot of % Relative Cover Native vs % Relative Cover Brte
% Relative Cover Native Gramin
0
10
20
30
40
50
60
70
80
90
% Relative Cover Brte (Al

Exotic Forbs



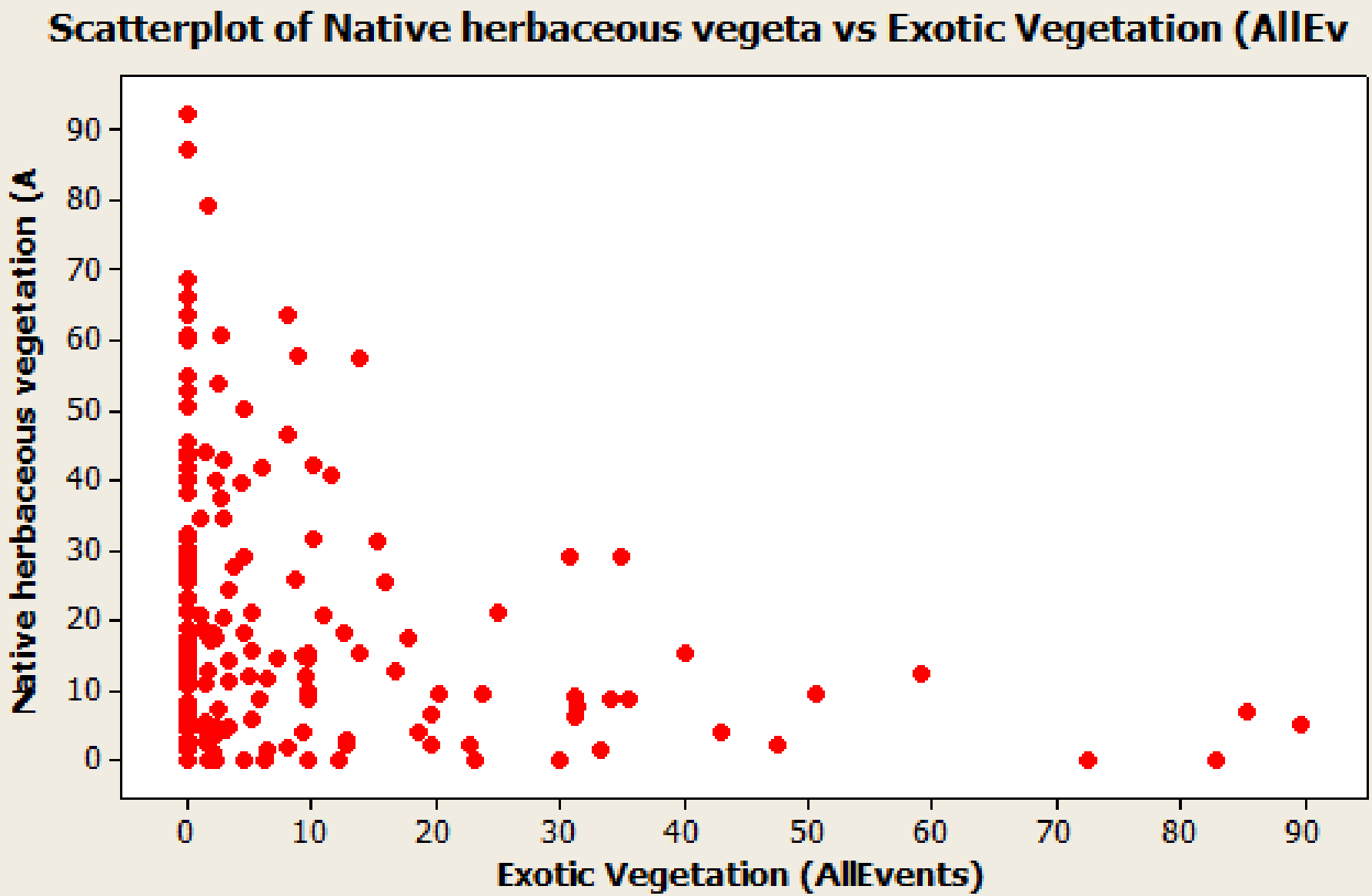
Sagebrush


Scatterplot of Sagebrush vs Native Graminoids
Sagebrush
Native Graminoids
0
10
20
30
40
50
60
70
80
90

Native Herbaceous

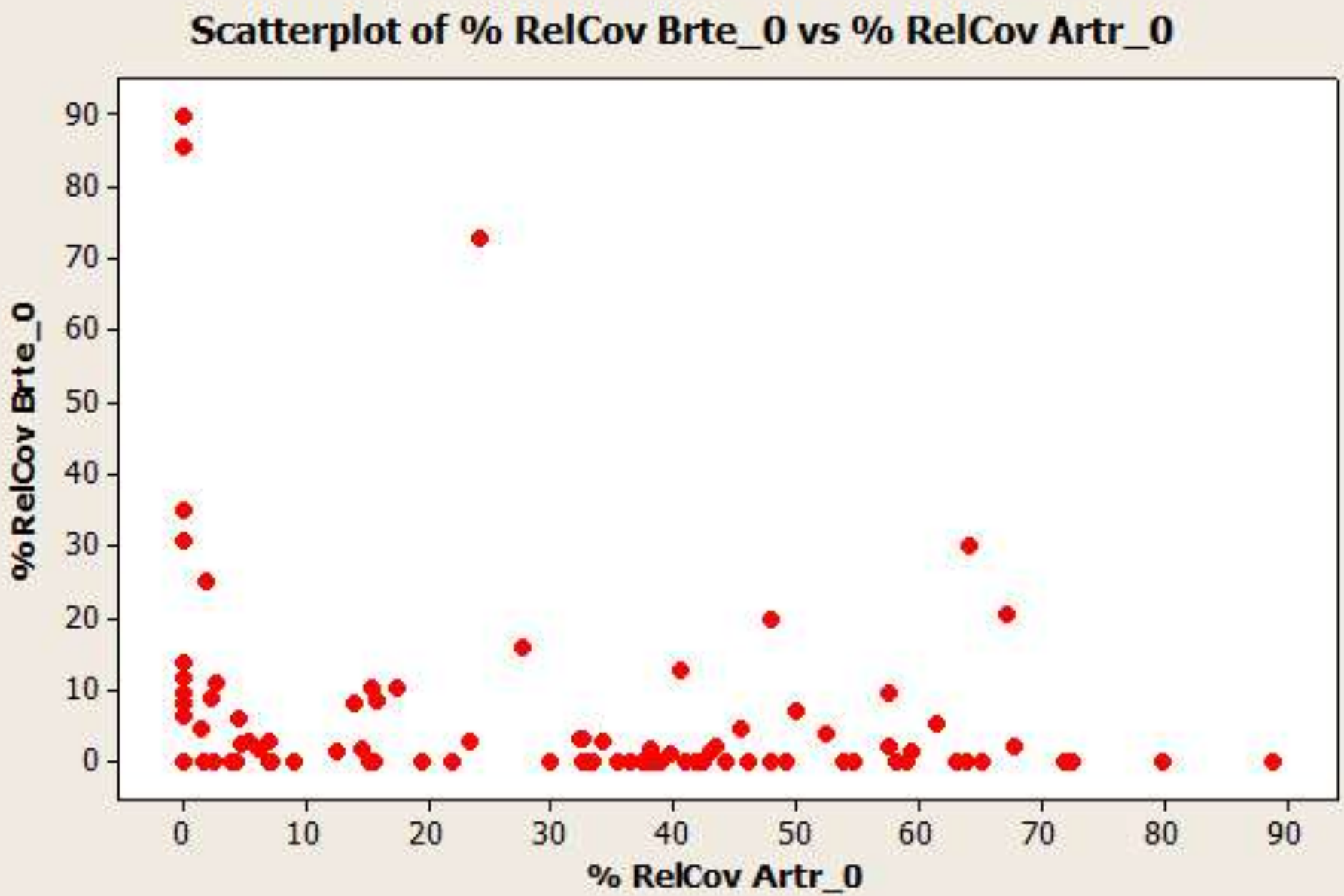
(Graminoids + Forbs)

Exotic Vegetation

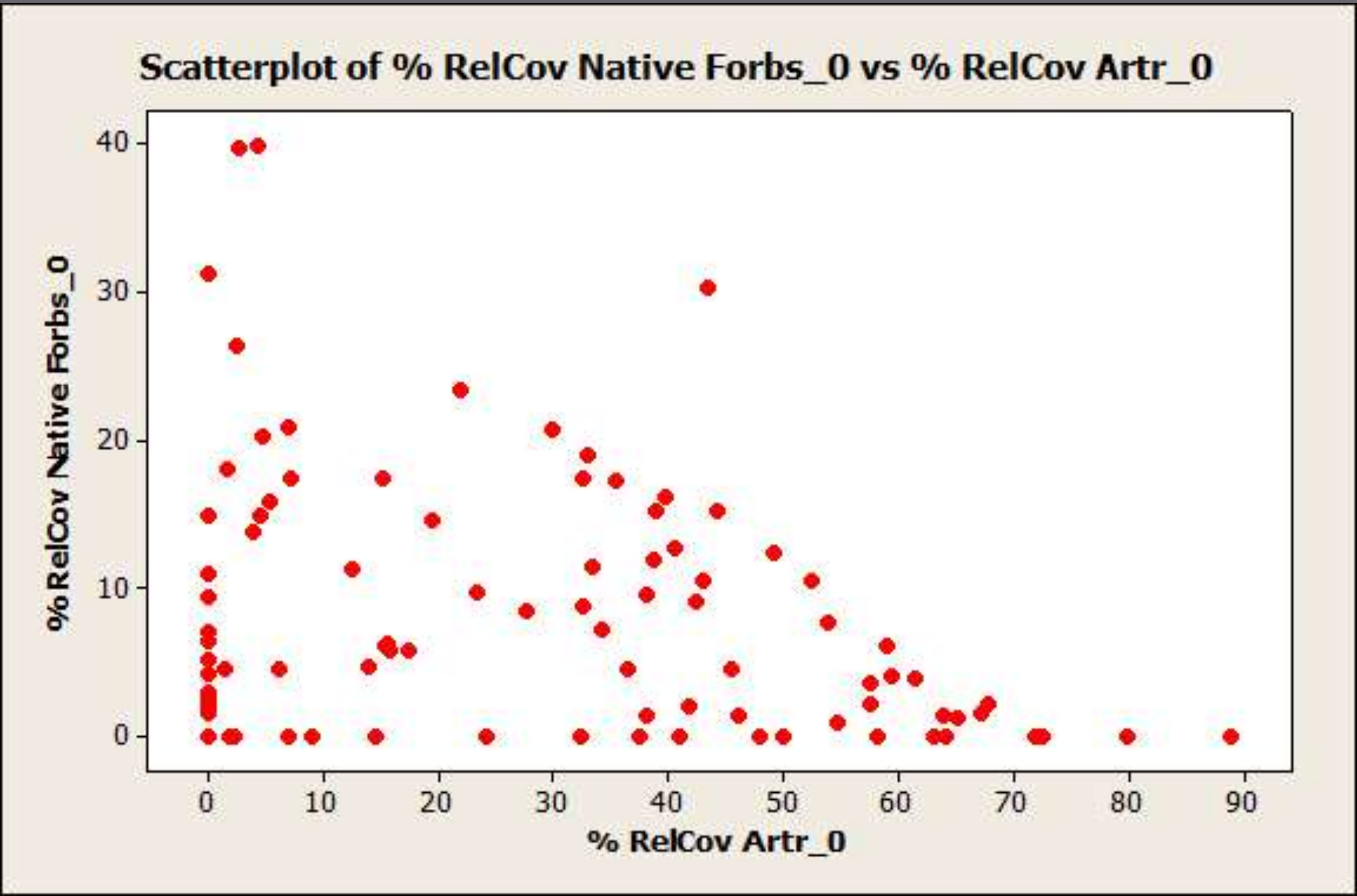


Sagebrush

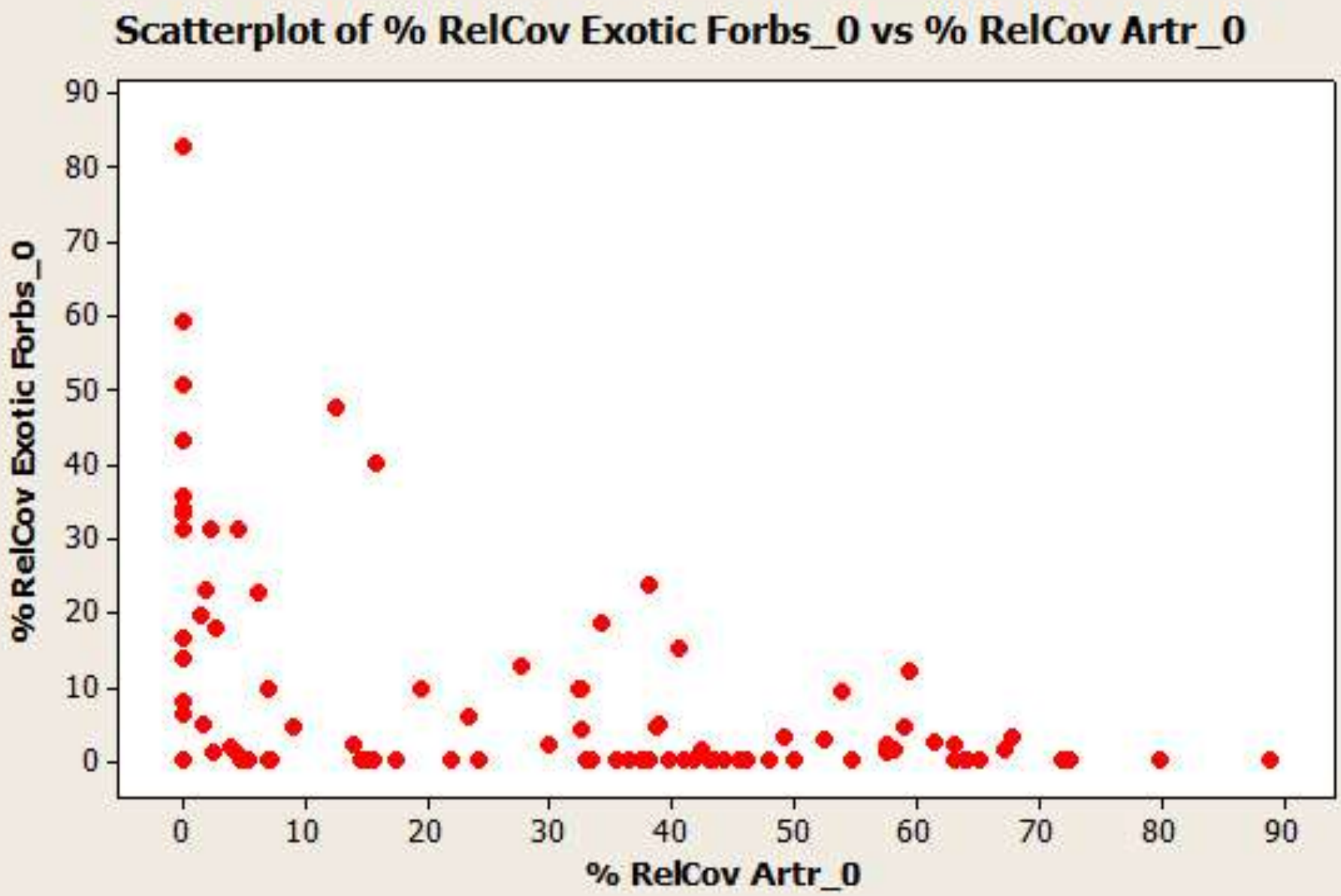
Cheatgrass


Scatterplot of % RelCov Brte_0 vs % RelCov Artr_0
% RelCov Brte_0
% RelCov Artr_0
0
10
20
30
40
50
60
70
80
90

Native Forbs



Exotic Forbs



Now Underway

Statistical Analysis

Manuscript Preparation

Same Studies: MLRA 23 & 24 (Humboldt, Lassen, Modoc, Pershing, Washoe Counties)

D 6/24/10
TEN MI
GS
TRAN 1C2
24.06.2010

6/24/10
TEN MI
GS
TRAN 1T1
24.06.2010

D 6/24/10
EMIGR
WF
TRAN 1W2
24.06.2010

D 7/14/10
SILVER
FT
TRAN 1C1
14.07.2010

7/14/10
SILVER
FT
TRAN 1T2
14.07.2010

D 7/14/10
S. LAKE
WF
TRAN 1W1
14.07.2010

TOISTIO
TABOR
DISK
2C2
05.10.2010

10/5/10
TABOR
SPRAY
2T1
05. 10. 2010

D 9/15/10
TABOR
AERATE
TRAN 1C2
15.09.2010

D 9/15/10
TABOR
AERATE
TRAN 1T1
15.09.2010

D 10/15/10
MOHALA
AROGA
TRAN 2C1
15.10.2010

10/15/10
MOHALA
AROGA
TRAN 2M1
15. 10. 2010

9/1/10
METRO
AM
TRAN 1C2
01.09.2010

D 9/1/10
METRO
AM
TRAN 1M1
01.09.2010

D 6/8/10
LONGFLD
GS
TRAN 2C2
08.06.2010

8/8/10
LONGFLD
GS
2T2
08.06.2010

D 6/16/10
TOANO
GS
TRAN IC2
16.06.2010

6/16/10
TOANO
GS
TRAN 1T1
16.06.2010

7/20/10
OWYHE
GS
TRAN 2C1
20.07.2010

7/20/10
OWYHE
GS
TRAN 2TB1
20.07.2010

D 7/20/10
OWYHE
GS
TRAN 2C2
20.07.2010

Ecological Resilience, Resistance, Functioning, Health, Diversity
Wyoming Big Sagebrush Sites

"Best way" to build these?

What will happen if we do nothing….
and wildfire, aroga moth visit, etc. occurs?

“It Depends”….

“Most anything will work in at least one place

….but no one thing will work every place”.

Bill Krueger
Oregon State University

Null Hypotheses

No native perennial vegetation, soil surface responses from events

No relationships: Pre-event relative sagebrush cover and post-event vegetation responses

No relationships: Pre-event exotics cover and post-event vegetation responses

No native perennial vegetation, soil surface response differences among ecological sites

No native vegetation, soil surface response differences among different land management, other site setting scenarios

No predictability in native vegetation, soil surface response times, duration