

REVEGETATION AND BIRD USE TRENDS, SILVER BOW CREEK REMEDICATION





1988





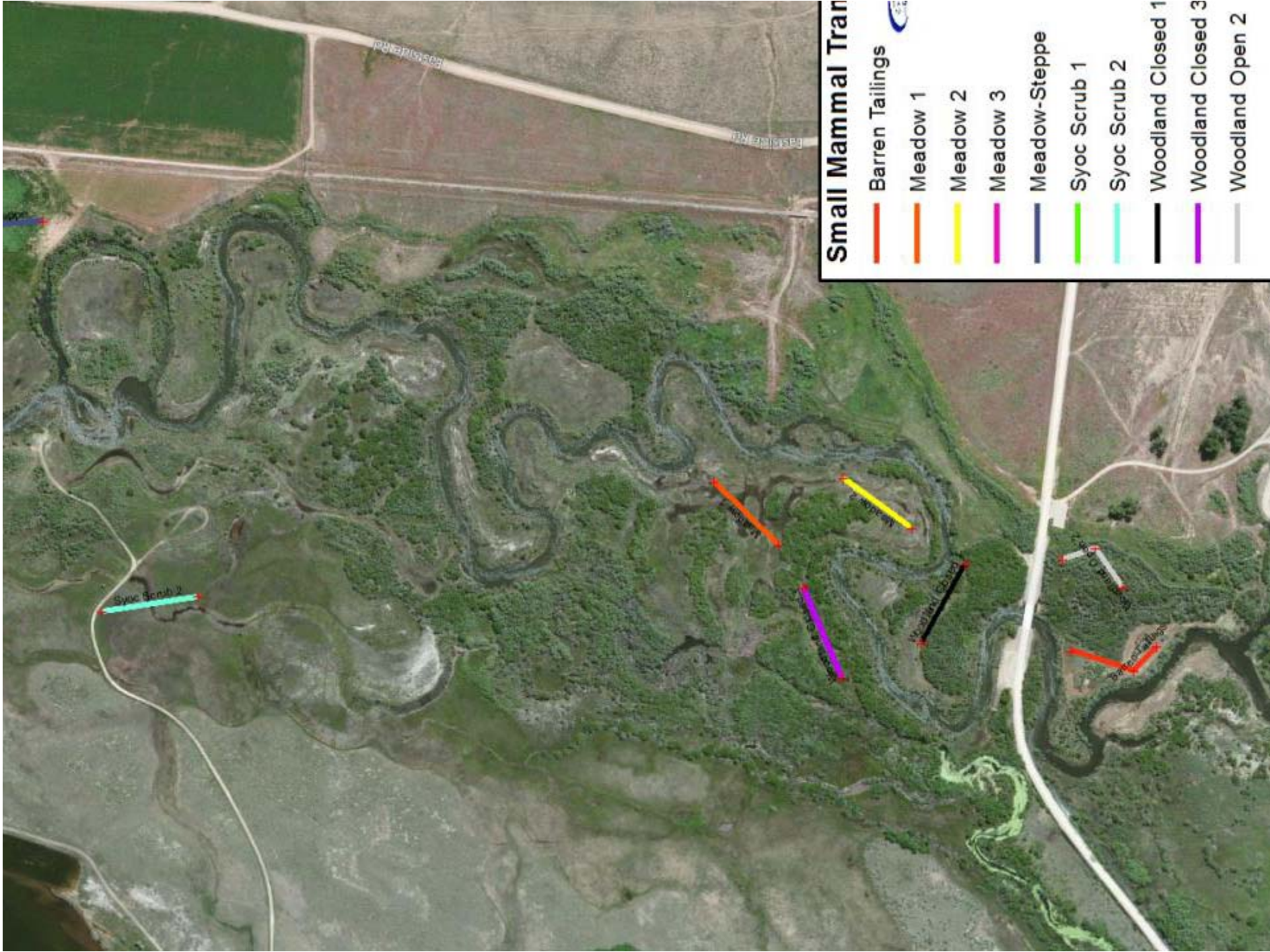

















Reach H



Reach R





5.5 MM cy Mine Waste Removed
(4.2 MM m³)

1,650 Acres Revegetated
(688 ha)



Under Budget

SMCRA 1977 REQUIRES

establish a
permanent vegetative
cover in the
affected area.



PERMANENT MEANS

EVALUATE AFTER TEN

YEARS IN THE WEST





FOCUS TODAY:
REACHES D AND E MOSTLY

SEEDED and PLANTED
MAINLY 2003



About 90 acres

SSTOU Revegetation Standards and 2013 Monitoring Results in Reaches D and E, Subarea 1.

HYDROLOGIC ZONE	REQUIRED PERENNIAL CANOPY COVERAGE*	REACHES D AND E 2013
Uplands, Subirrigated	60%	88%
Streambanks, Transition Zone	80%	95%
Wetlands (not open water)	100%	114%

•Excluding annuals and noxious weeds.

•LET'S LOOK AT THE REVEGETATION MONIITORING TRANSECTS NEXT.







Ley cin, Alo aru,
Mesa





2/3s Elci
1/5 Alar

<4% Alo aru in 2009

64% Alo aru 2013

46
BACK

Species richness
declined from 19 to 11



60% Ley cin
30% alfalfa

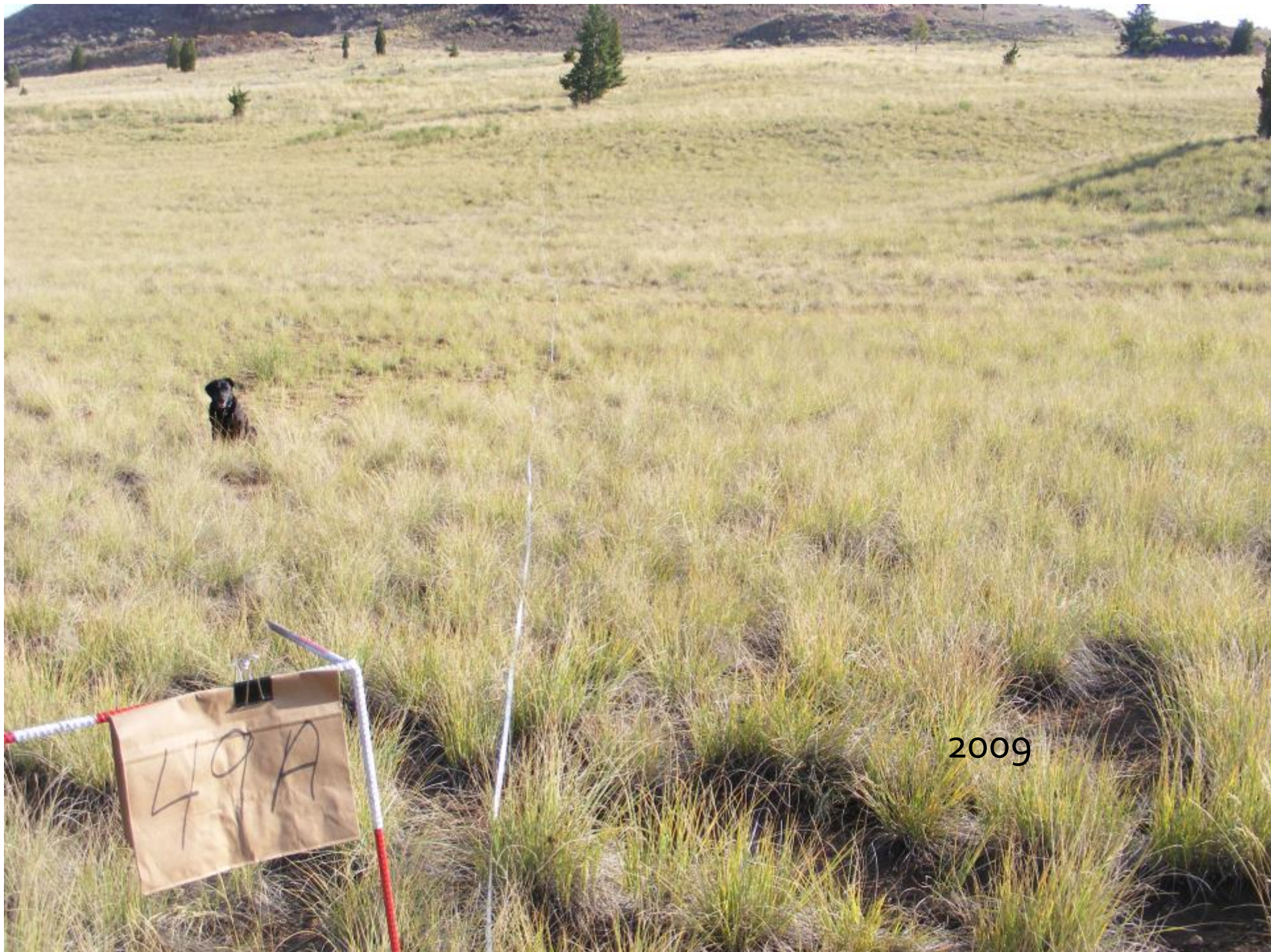




2006 Ely jun 77%
Fes ovi 10%

2013 49% Ely jun
50% Fes ovi

49A



2009



49B





COVER 2006 38%
2009 65%
2013 85%



2013
67% Alo aru



MEASURE :

CANOPY COVERAGE AND
SHRUB DENSITY

100-METER TRANSECTS

20 $\frac{1}{2}$ M² PLOTS/TRANSECT.

ONE CONSISTENT TREND:

The moister the site, the greater the changes in species composition and the less relevant the initial seeding or planting.



77
SWAMP



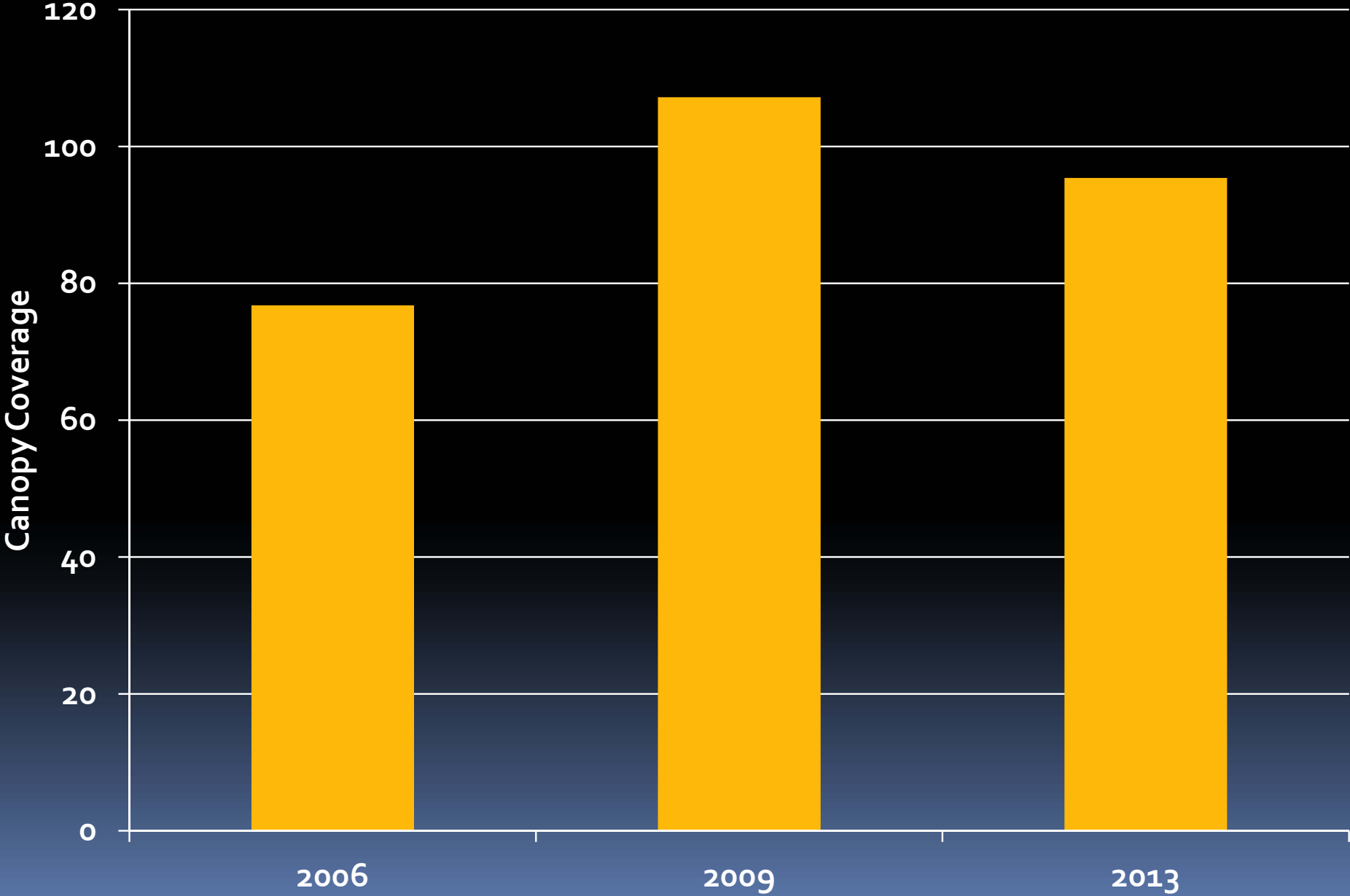




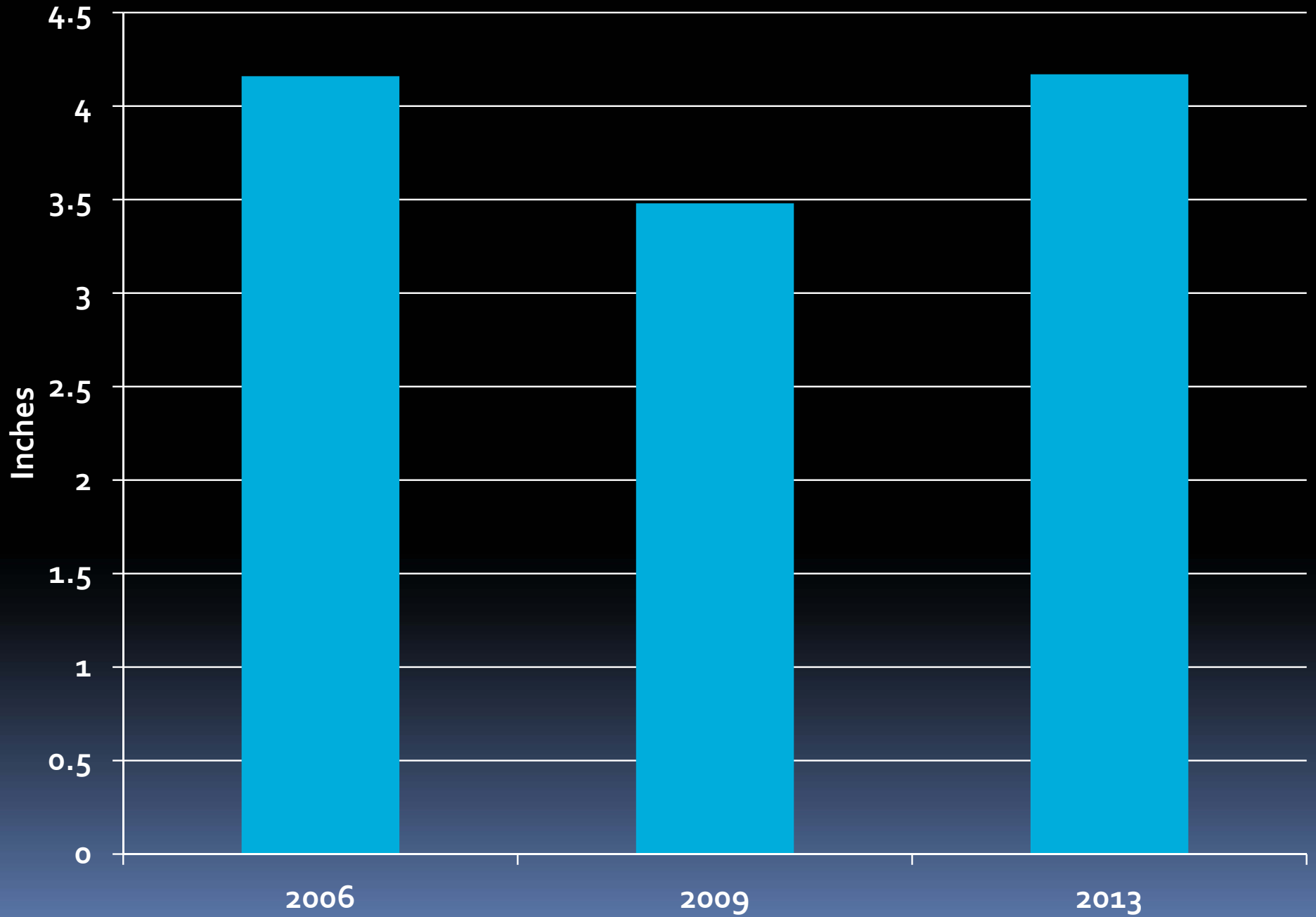
ANOTHER TREND:

Classical plant succession, if it ever actually existed, has been replaced largely by successive waves of noxious weeds.

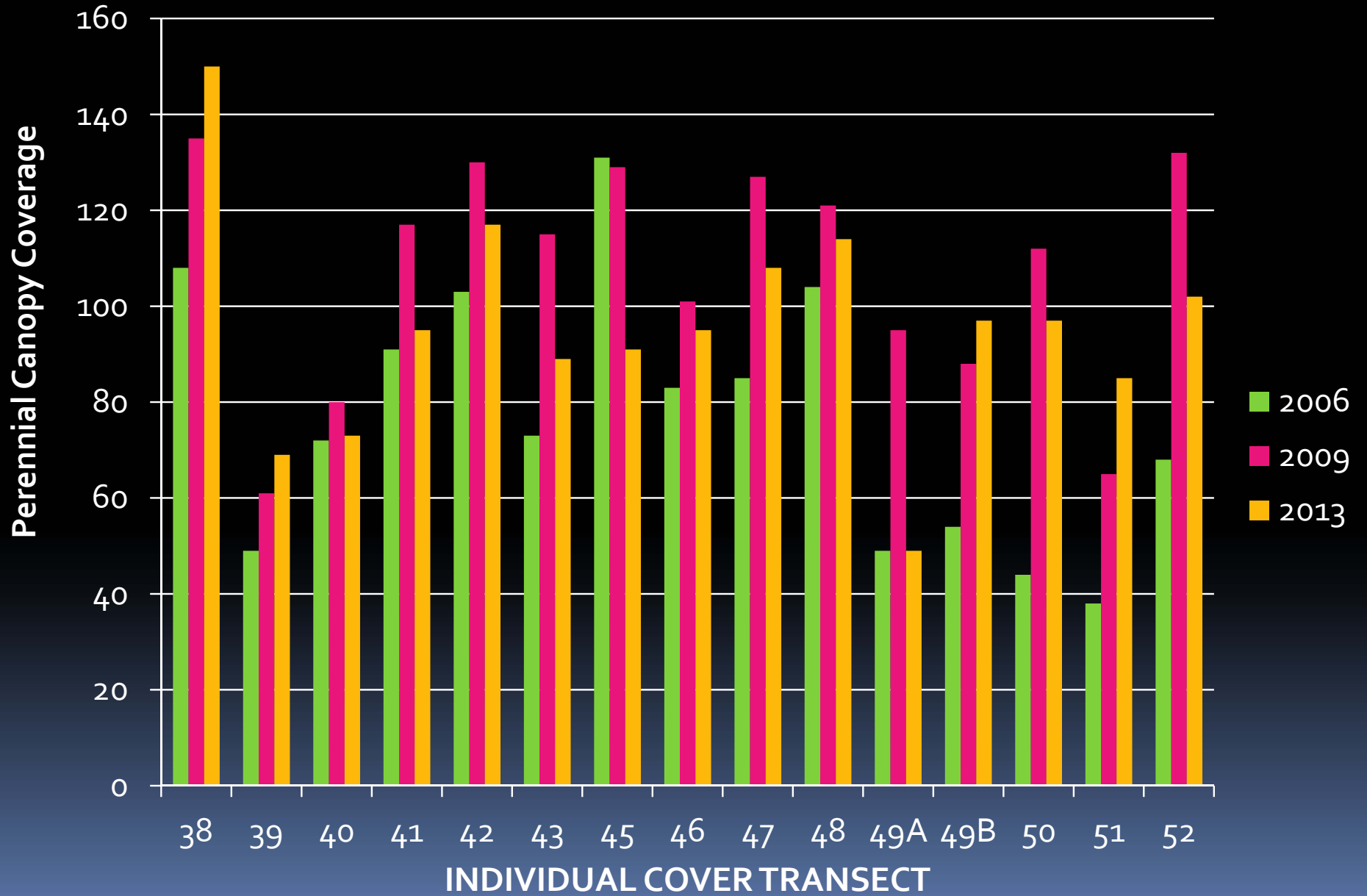
Mean Perennial Canopy Coverage Reaches D and E



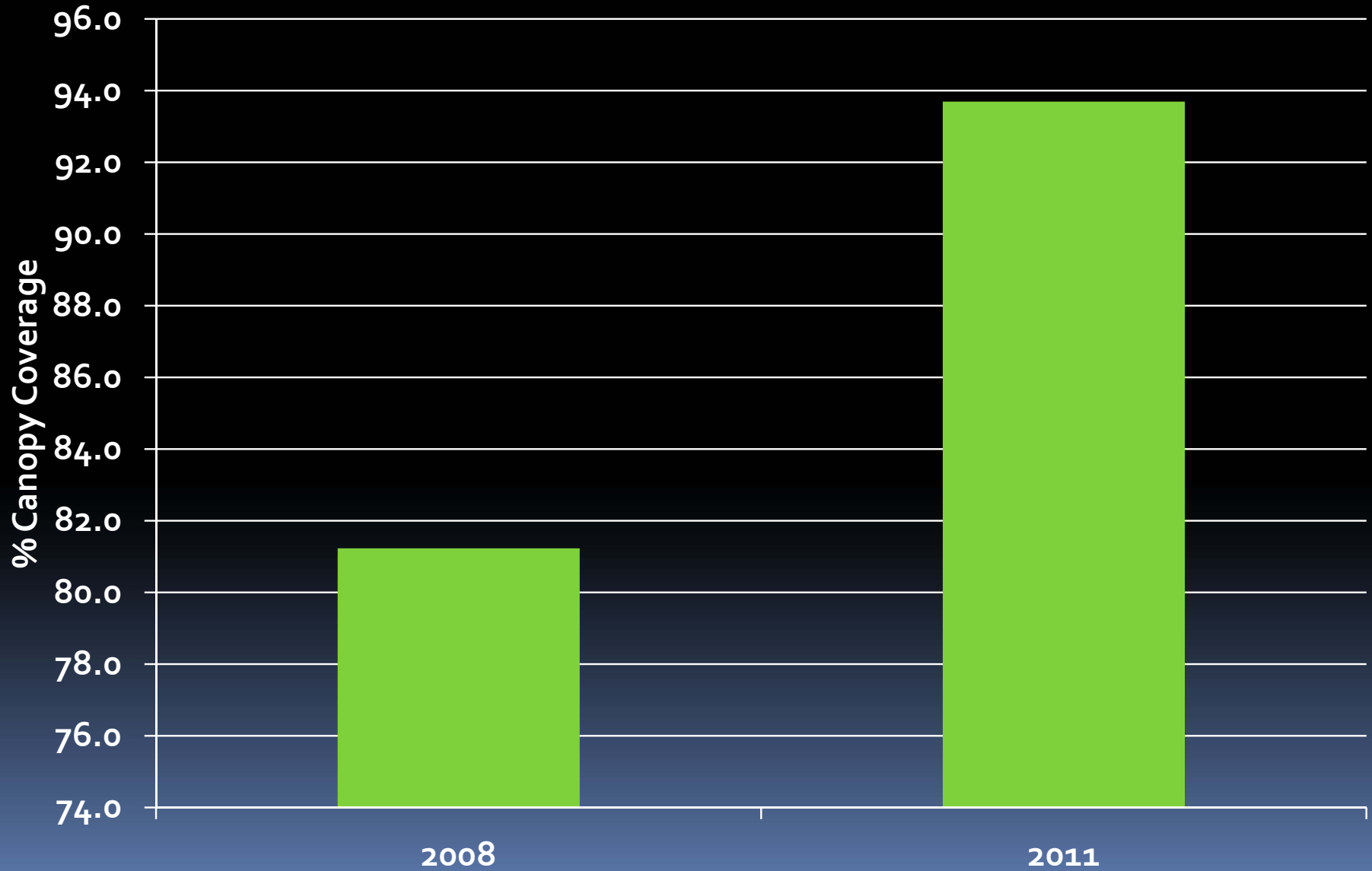
May-June Precipitation, Butte



Perennial Canopy Coverage Reaches D and E



Perennial Canopy Coverage Reaches F and G Seeded 2005



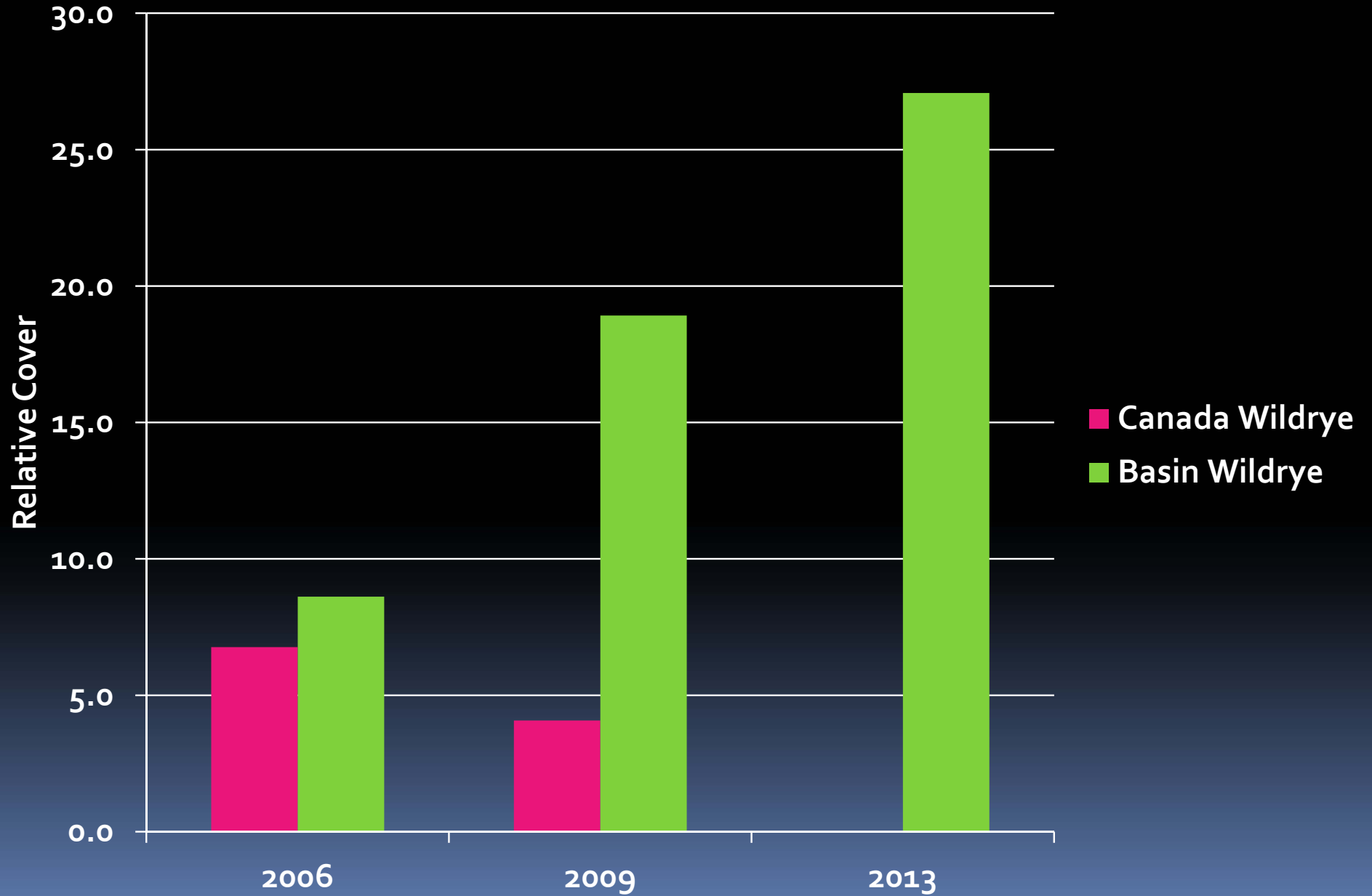


Ley cin, Alo aru,
Mesa



Reach R, 2013
Second Year

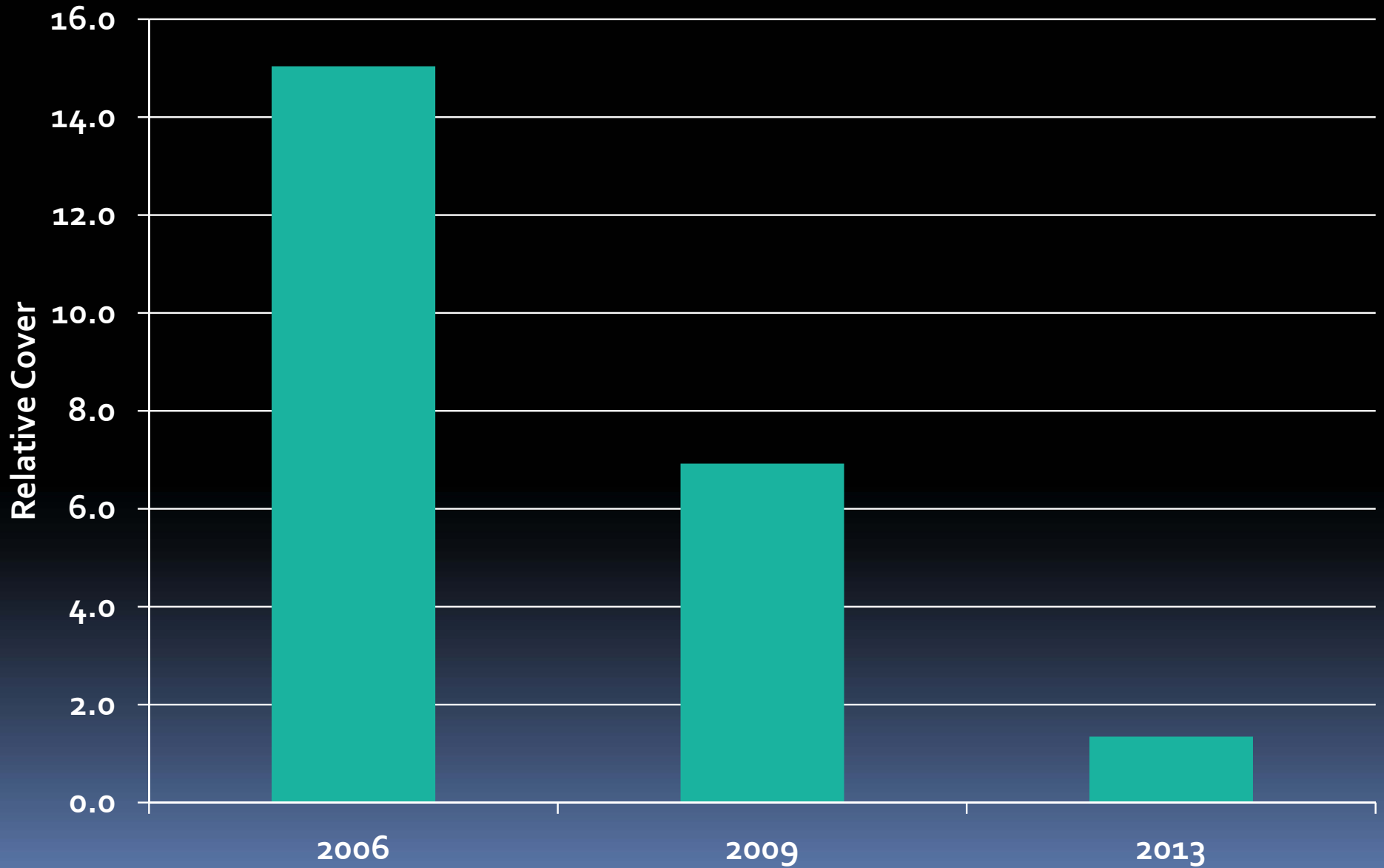
Mean Canada and Basin Wildrye Cover Reaches D & E, Where Present





Equal parts Ag tr and
(Elci + Elca) + Mesa

Mean Slender Wheatgrass Cover Reaches D & E, Where Present





Reach R 2013



Reach A

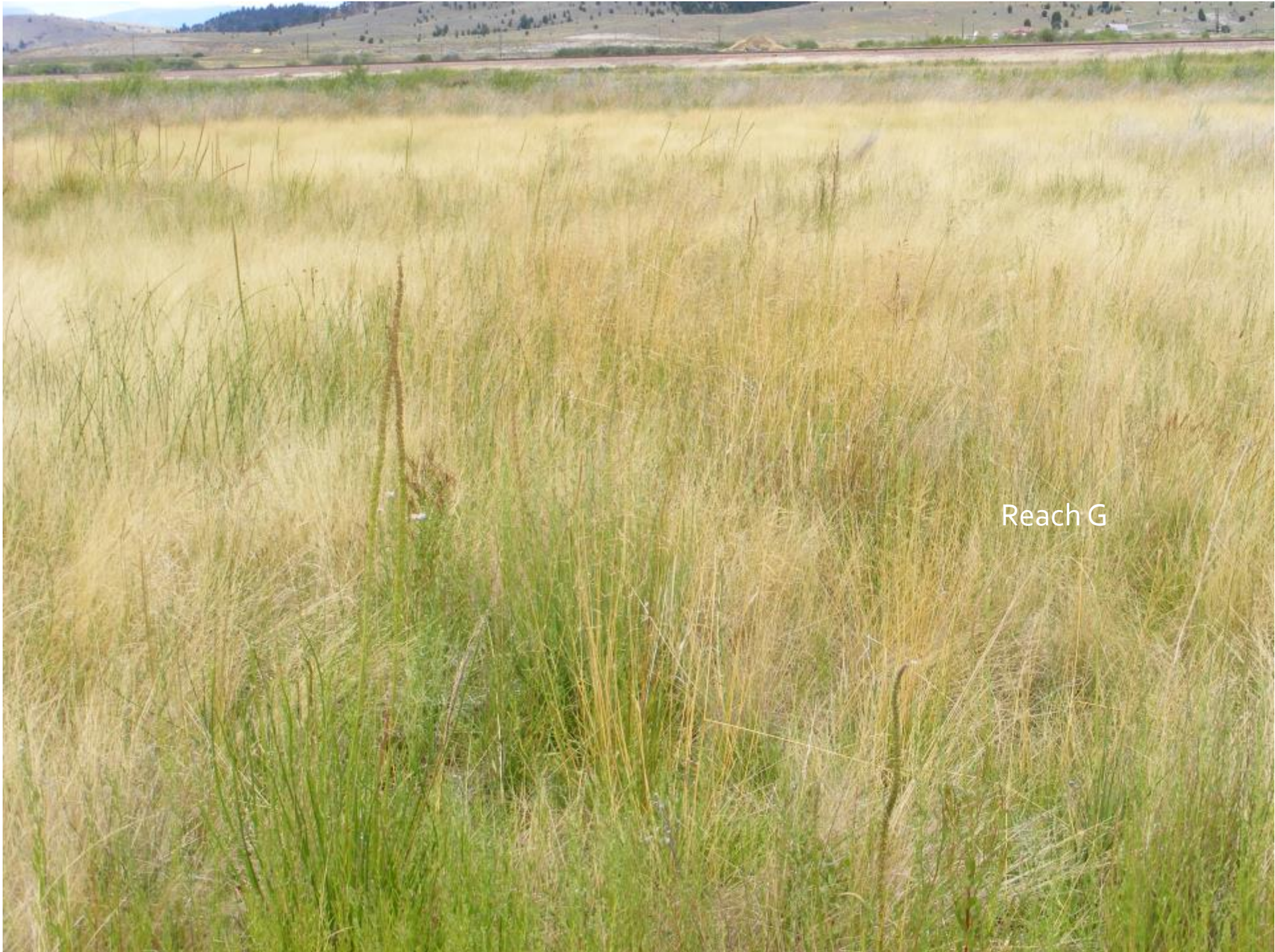


Reach G



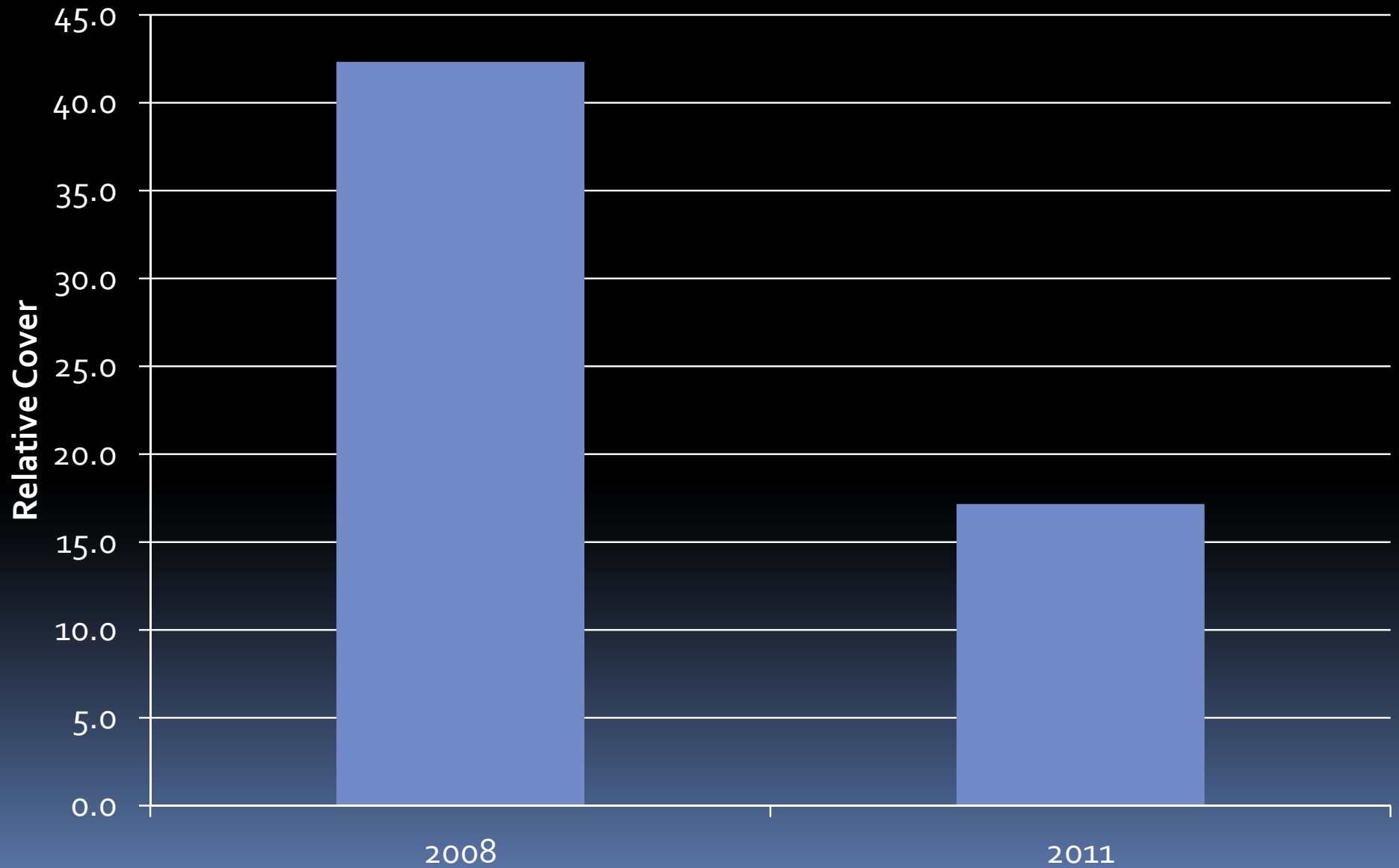


Reach I



Reach G

Alkaligrass Canopy Coverage Reaches F & G

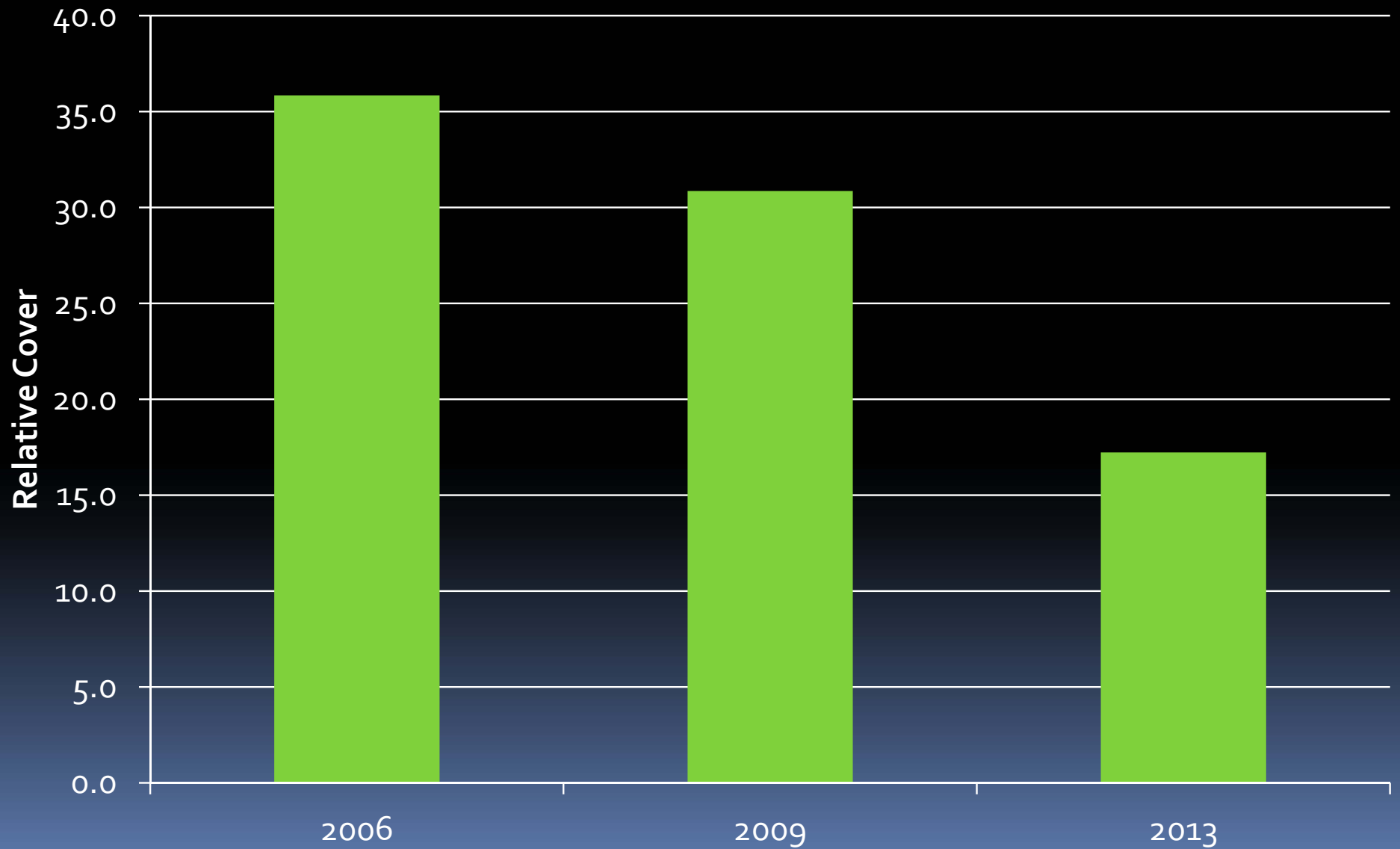




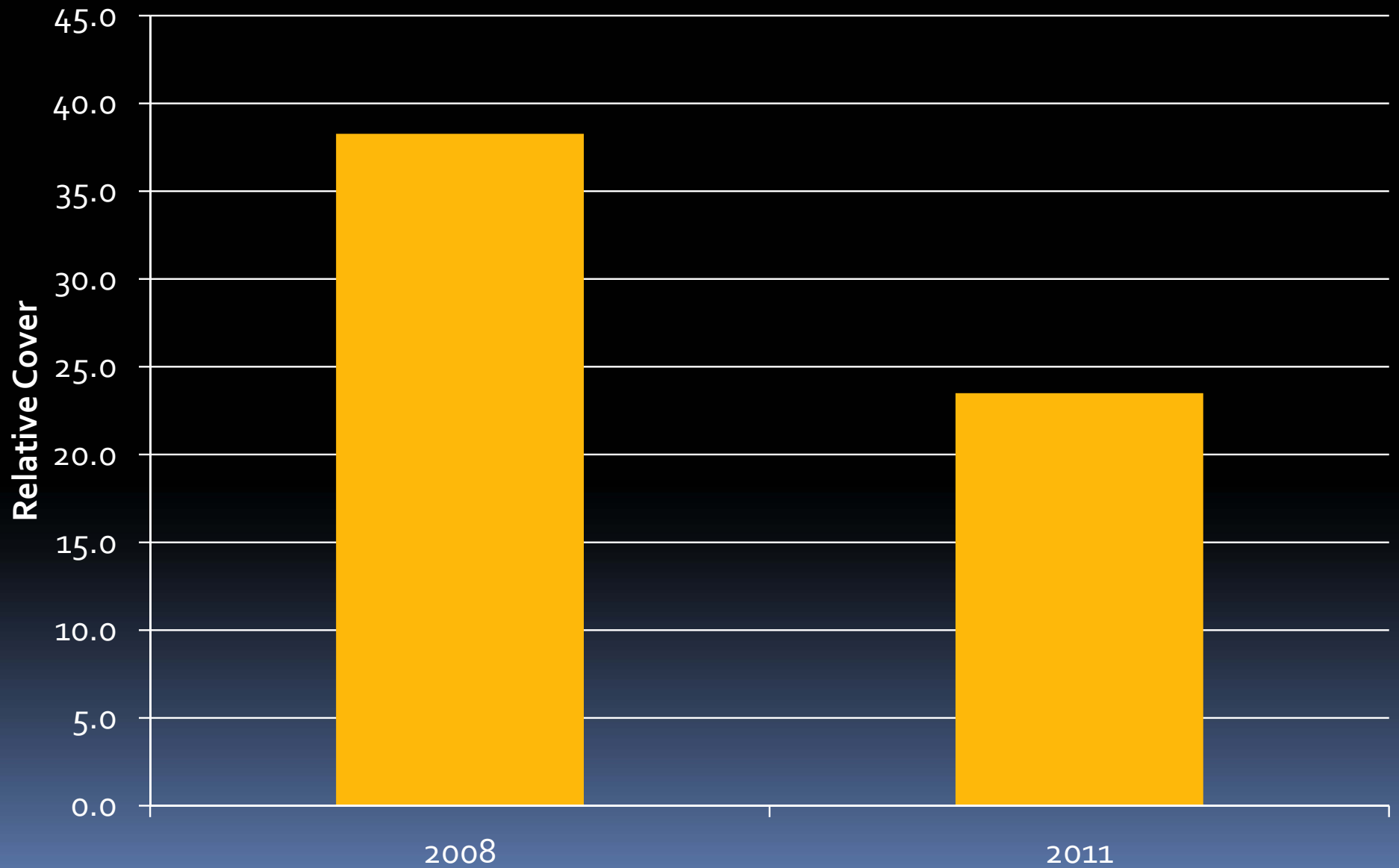




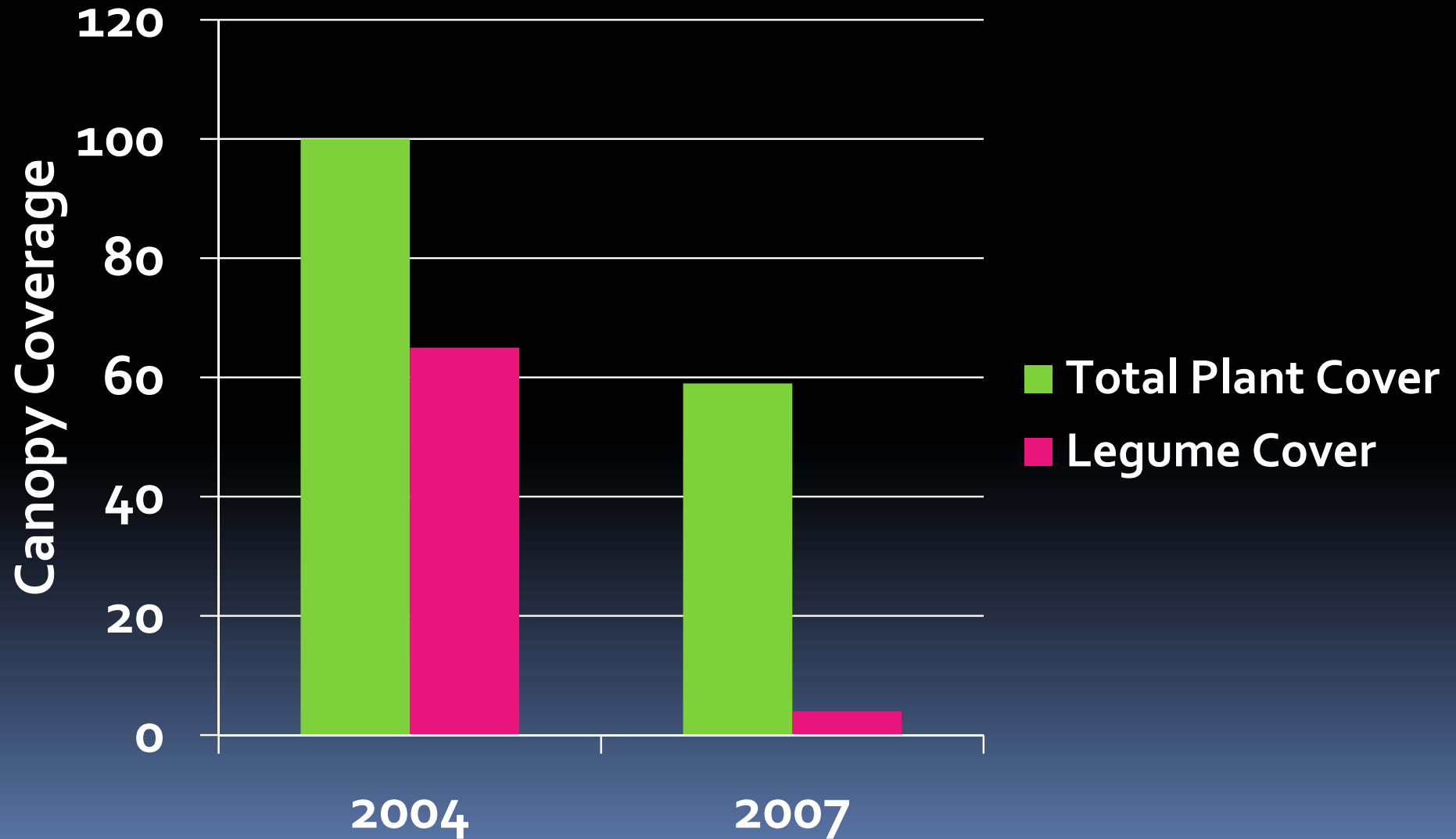
Mean Legume Cover Reaches D and E



Relative Legume Cover Reaches F and G



Changes in Total Plant Cover And Legume Cover, Reach A






Seeded 2.5 pounds/acre alfalfa
94% rel. alfalfa cover 2013



Seeded 1.5 pounds alfalfa
5% alfalfa cover and kochia



**ALFALFA ESTABLISHES
STRONGLY IN WET
YEARS AND WEAKLY IN
DRY YEARS**



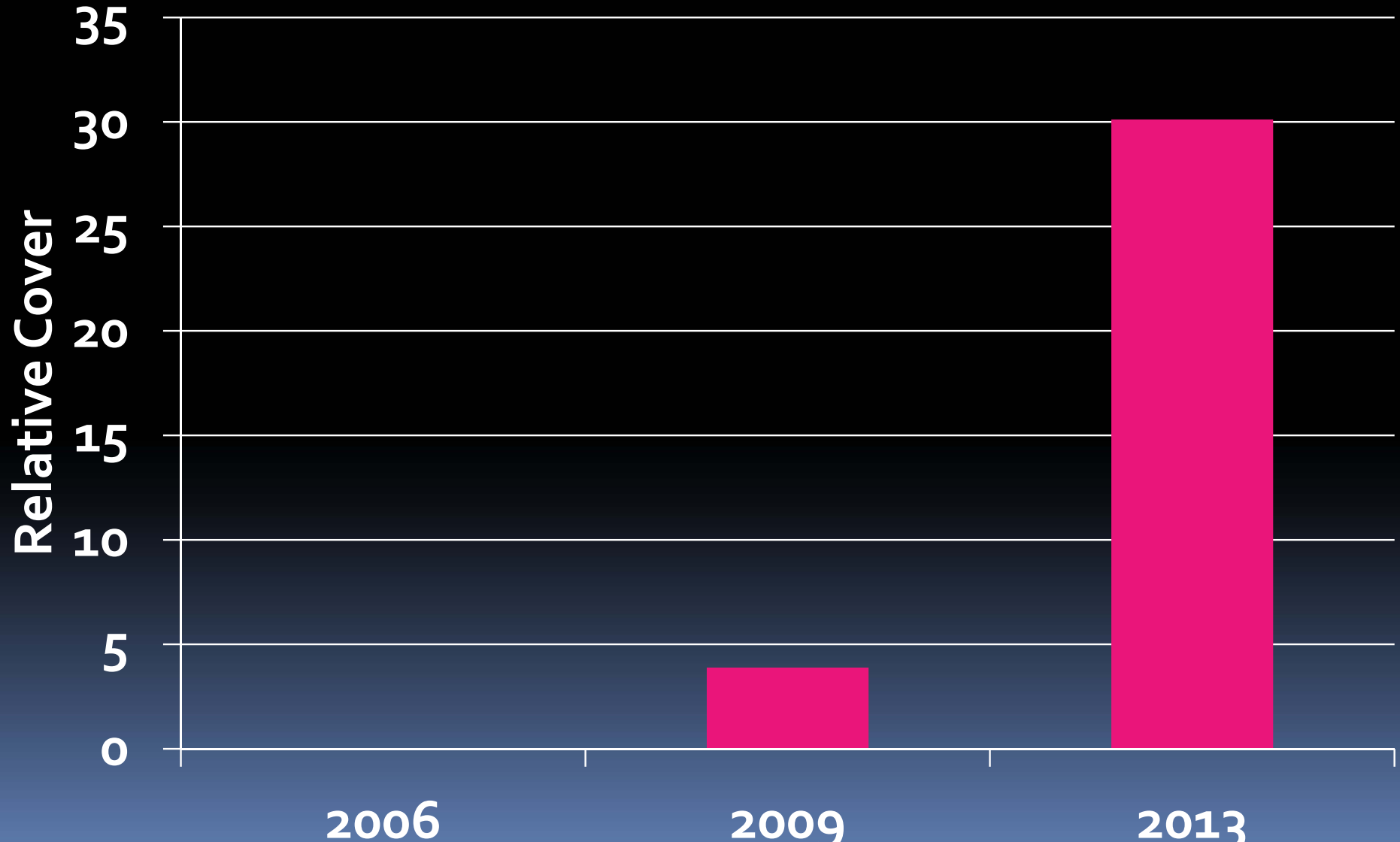
Reach H, 2013





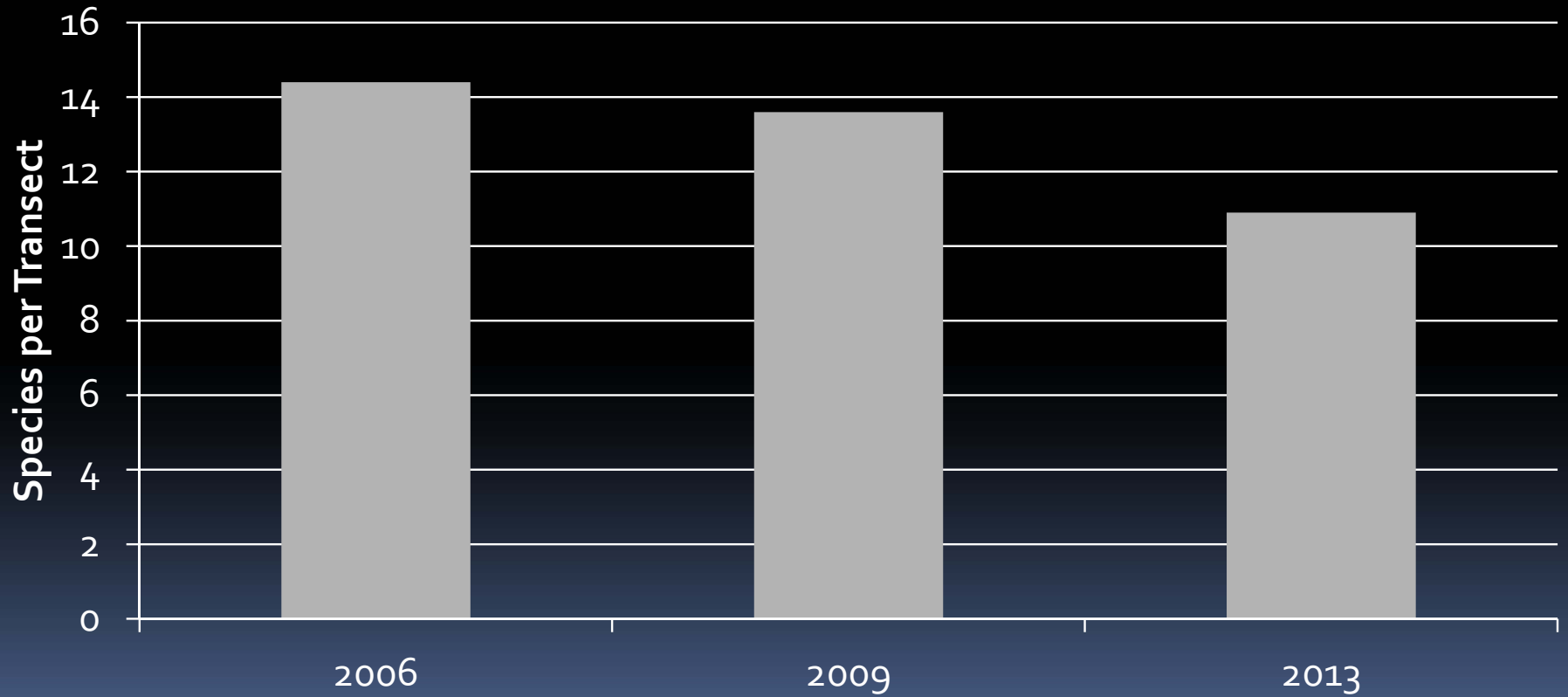


Mean Creeping Foxtail Cover Reaches D and E, Where Present

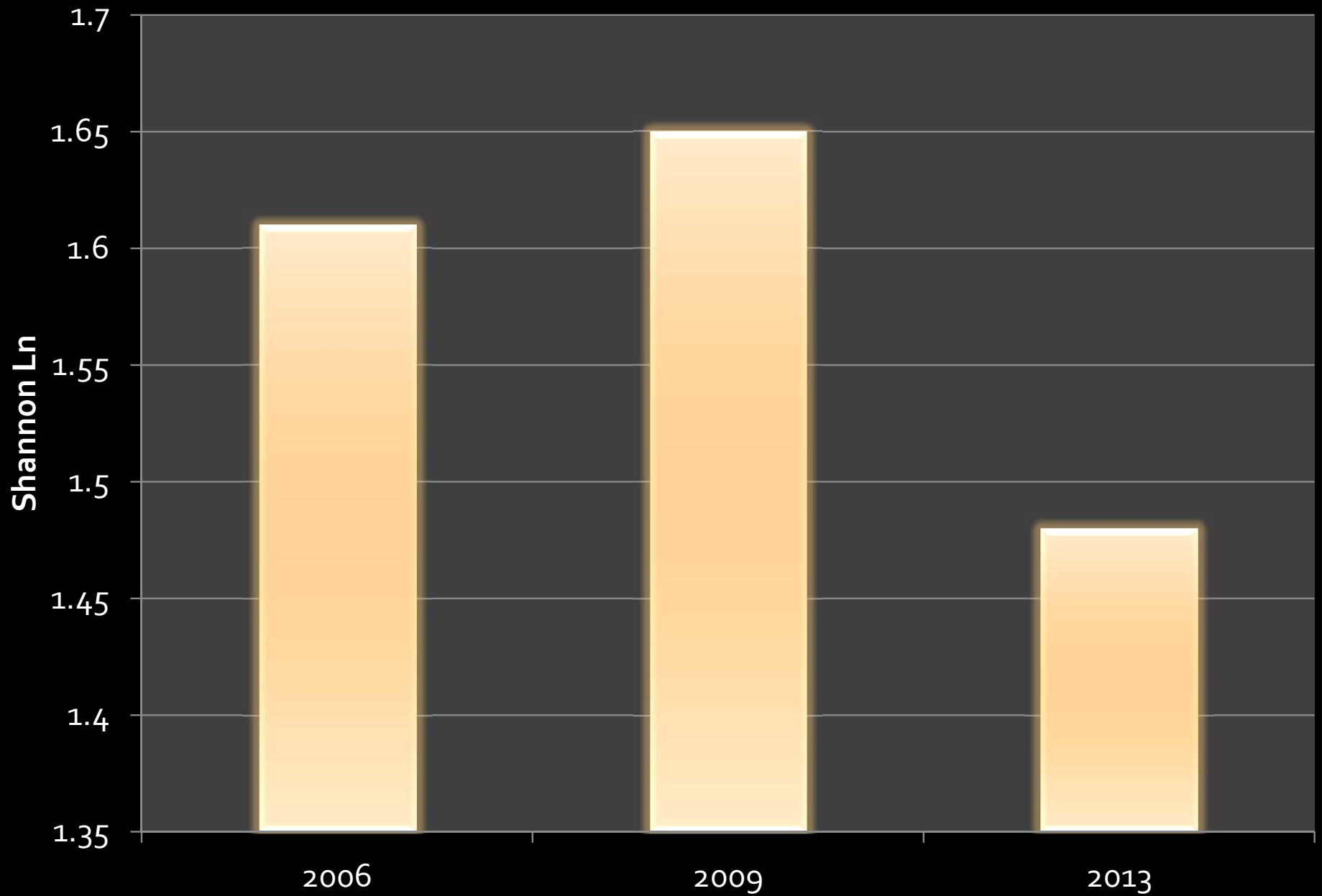


SPECIES RICHNESS

25% REDUCTION



Shannon Ln Equitability



270 VASCULAR
PLANT SPECIES

11%

2500 in MT
2100 Native



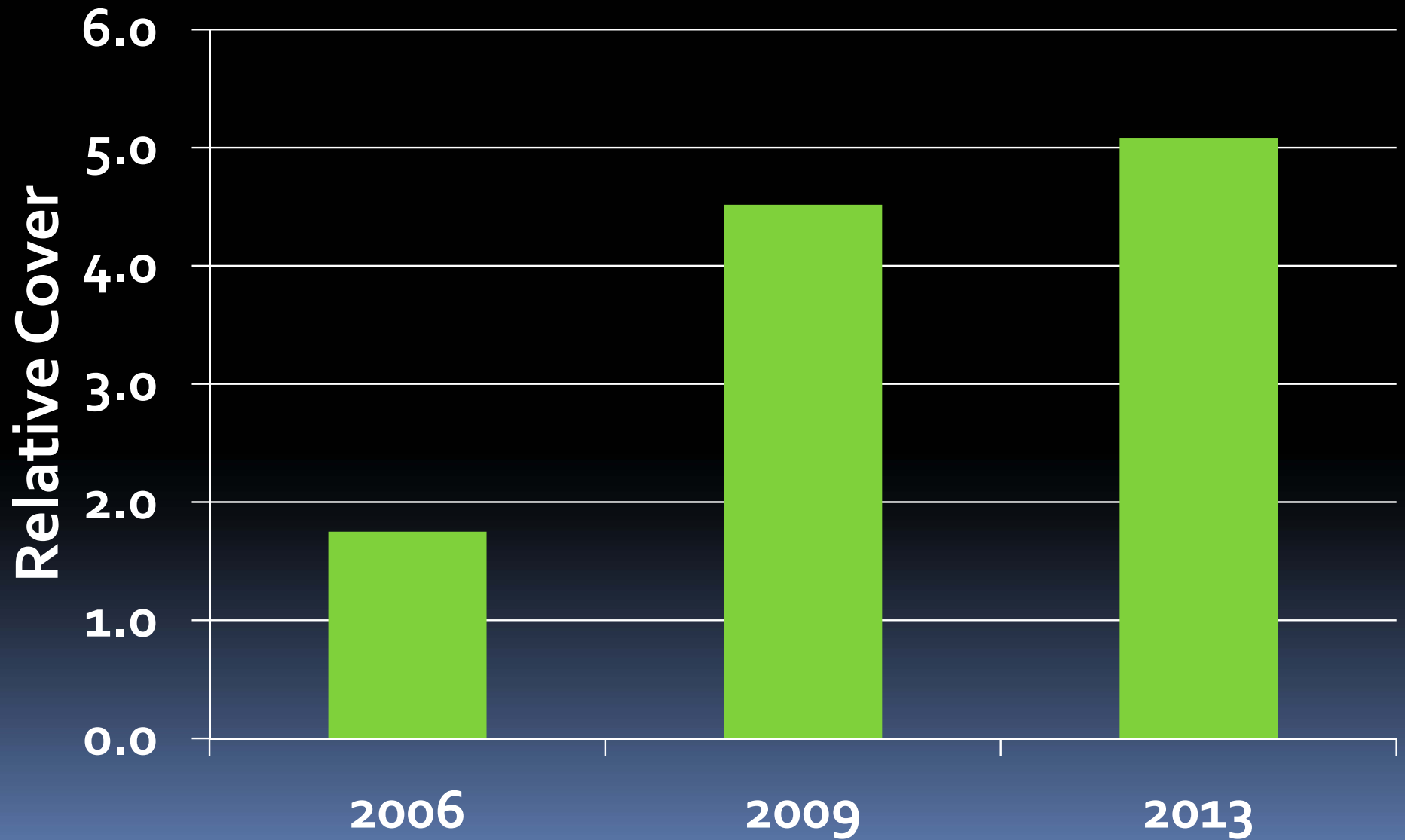




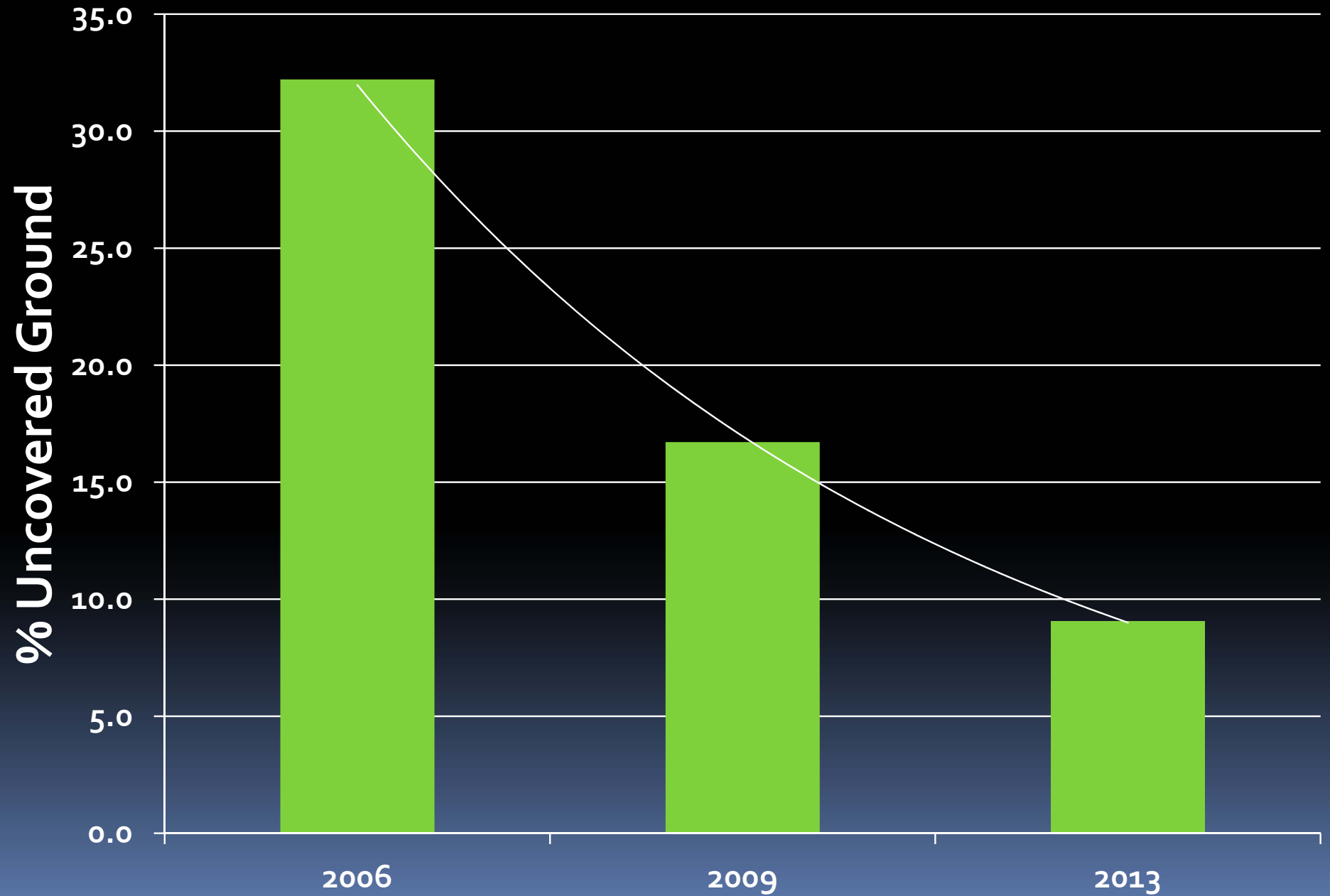
Hand Seeding
Reach F

Shrub Cover

Reaches D & E, Where Present



% Bare Dirt, Reaches D & E



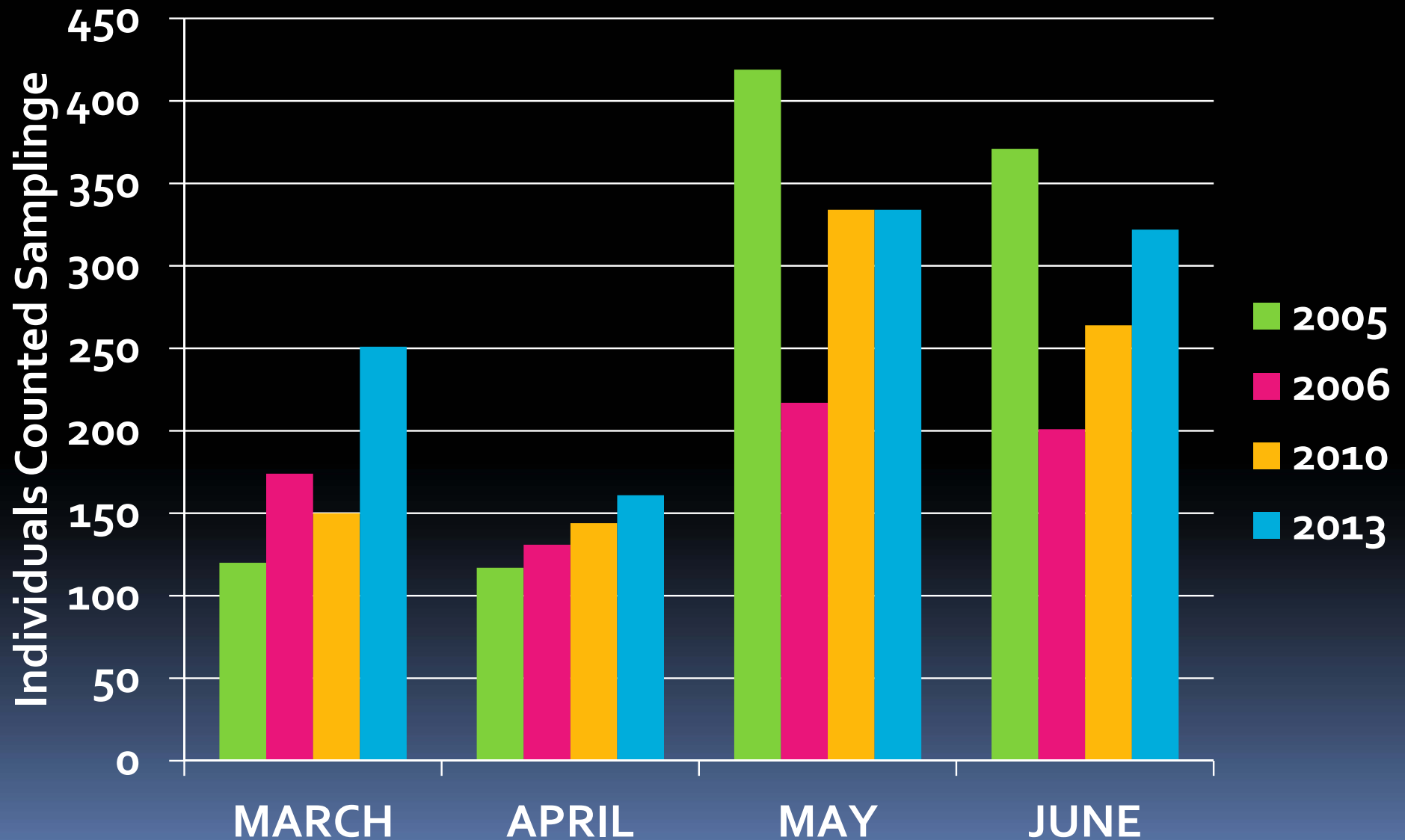




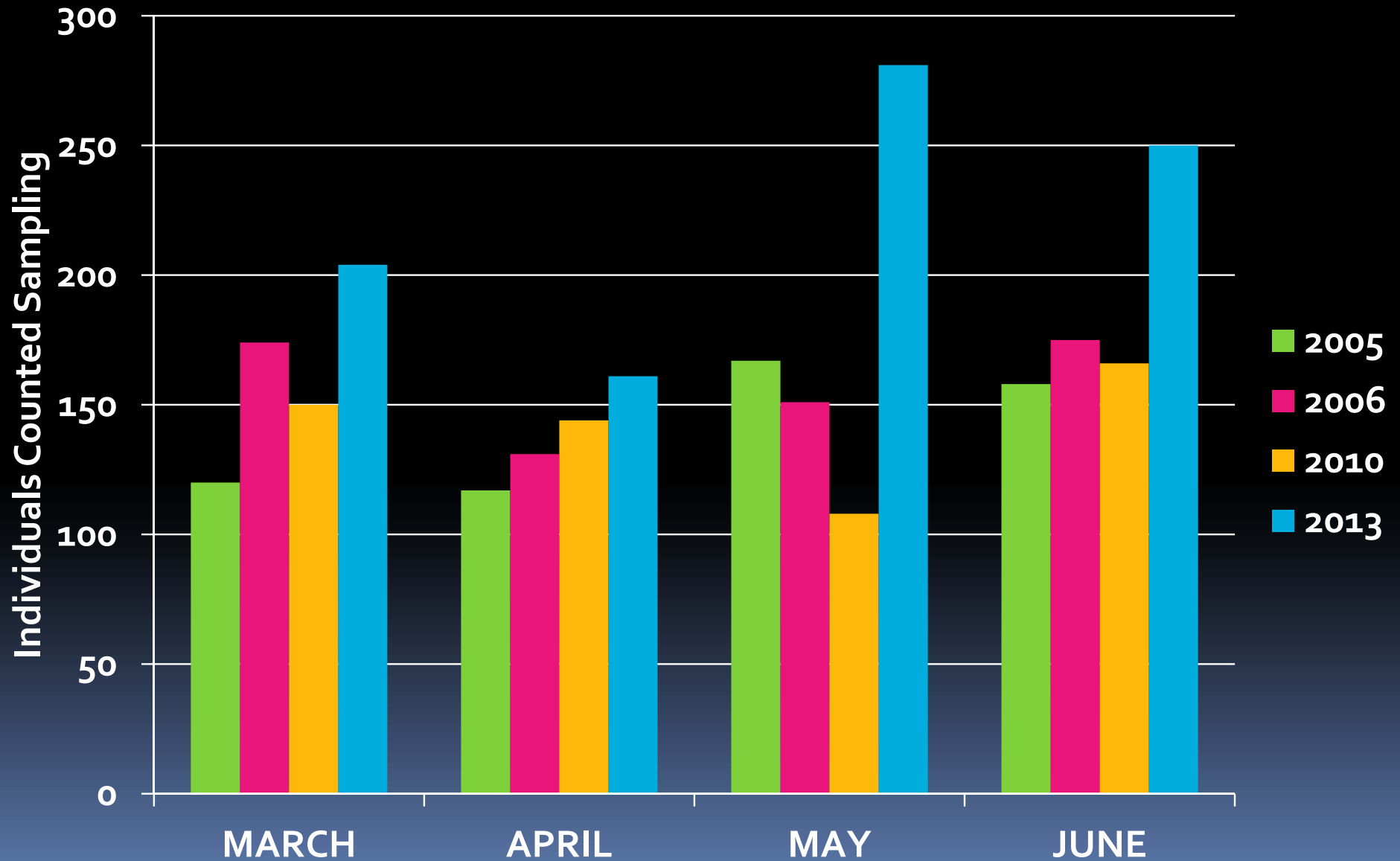




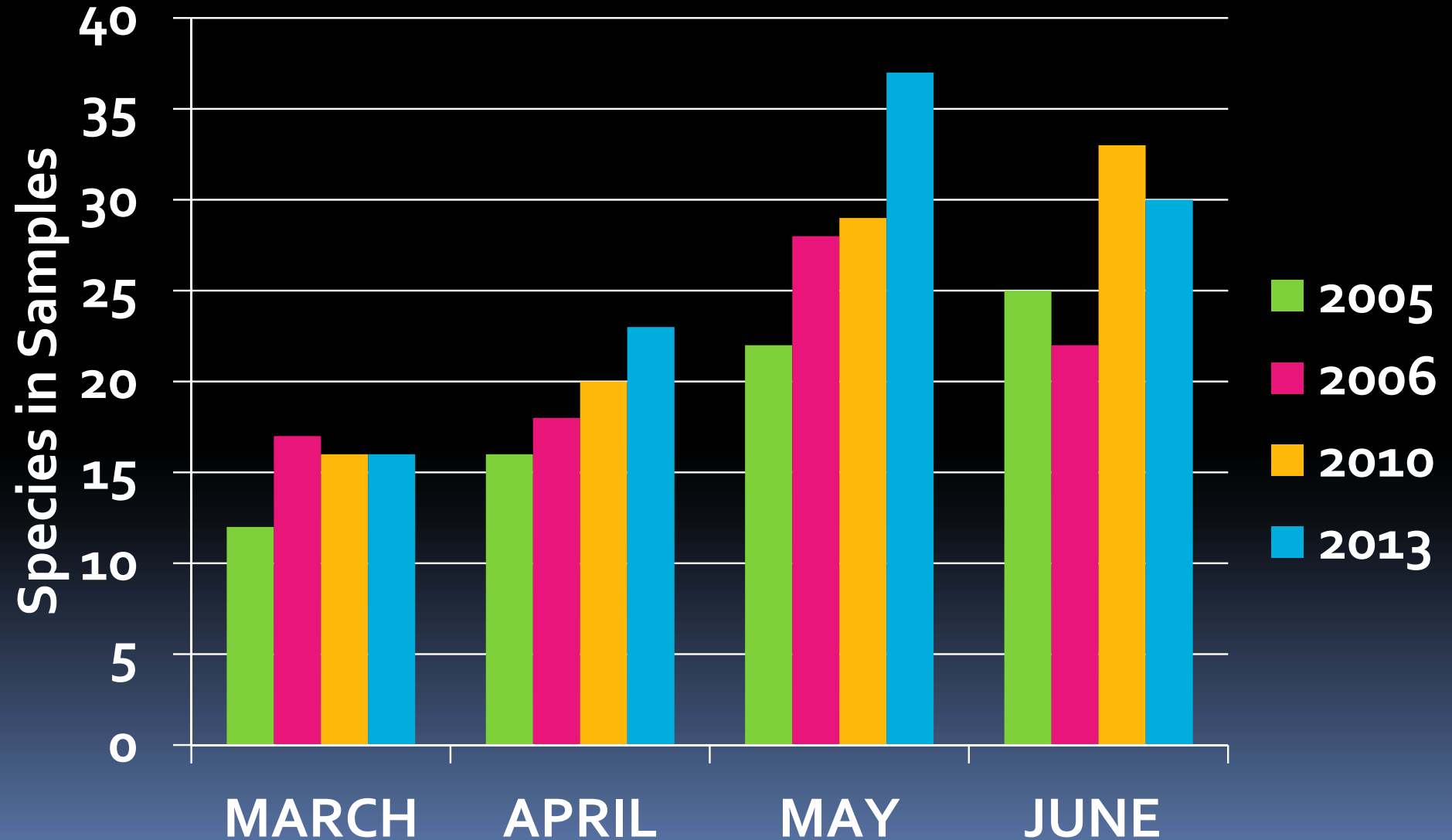
BIRDS COUNTED DURING SAMPLING, SA1, 2005-2013



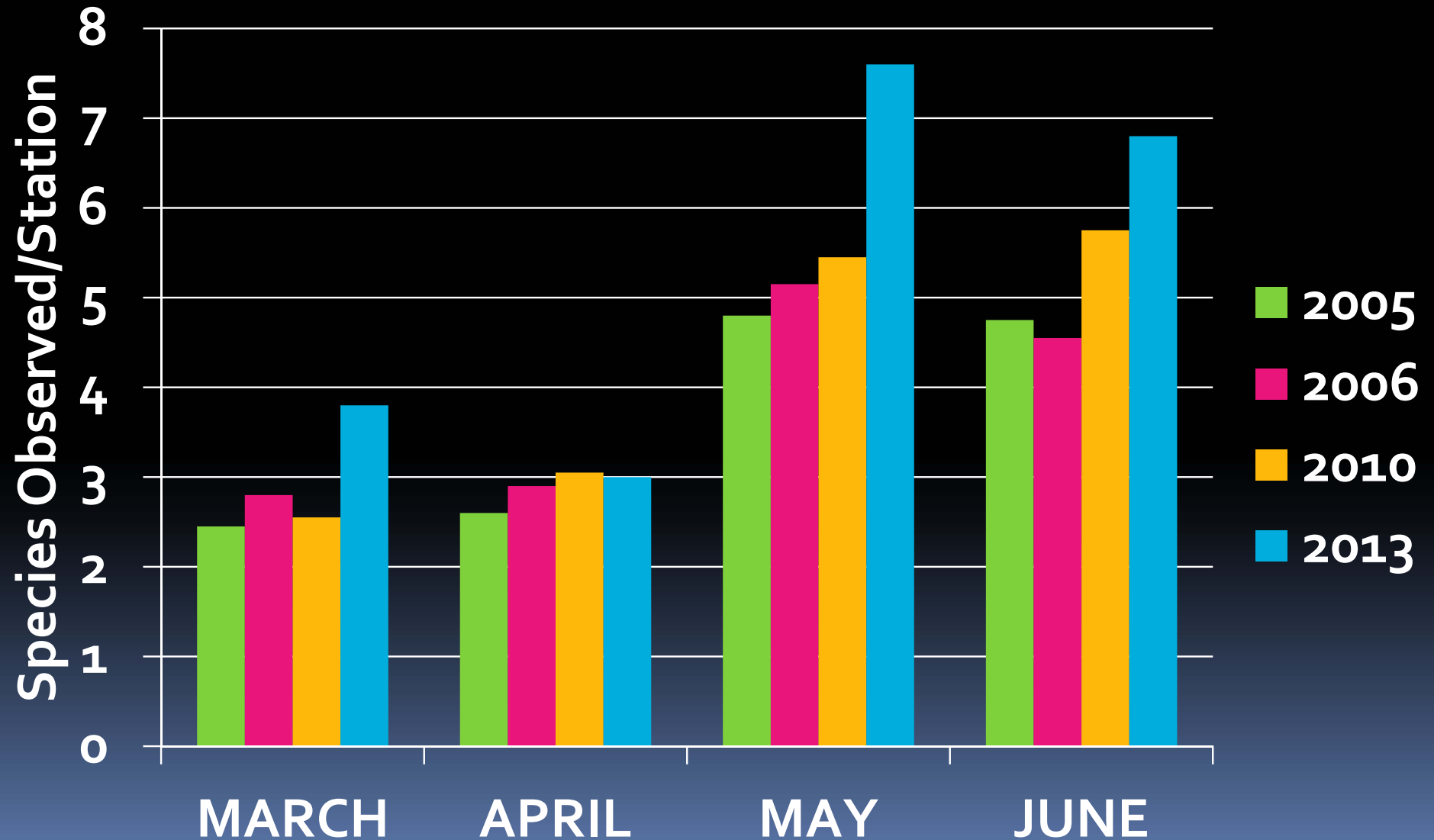
BIRDS COUNTED DURING SAMPLING w/o CLIFF SWALLOWS, 2005-2013



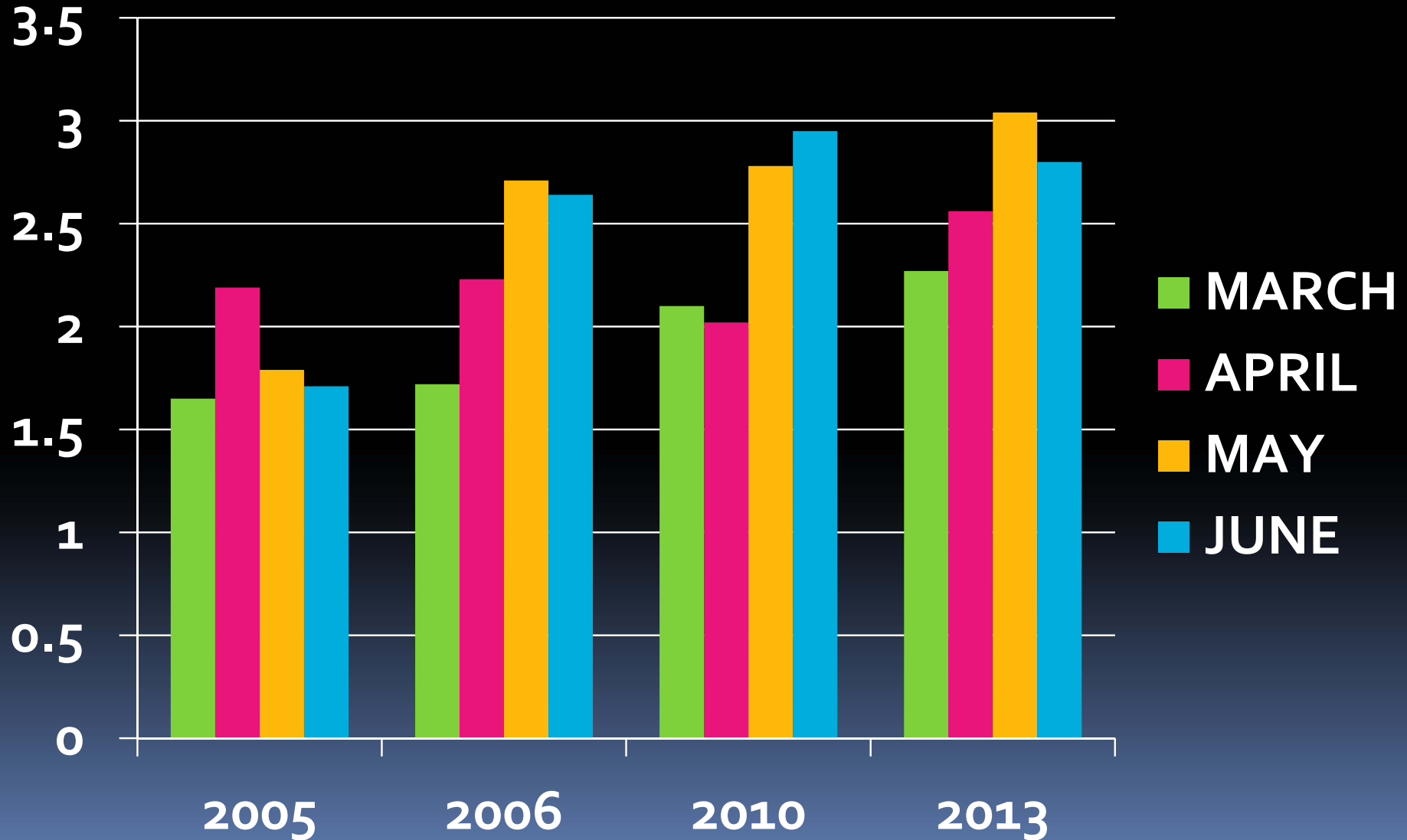
Total Bird Species Sampled, SA 1, 2005-2013



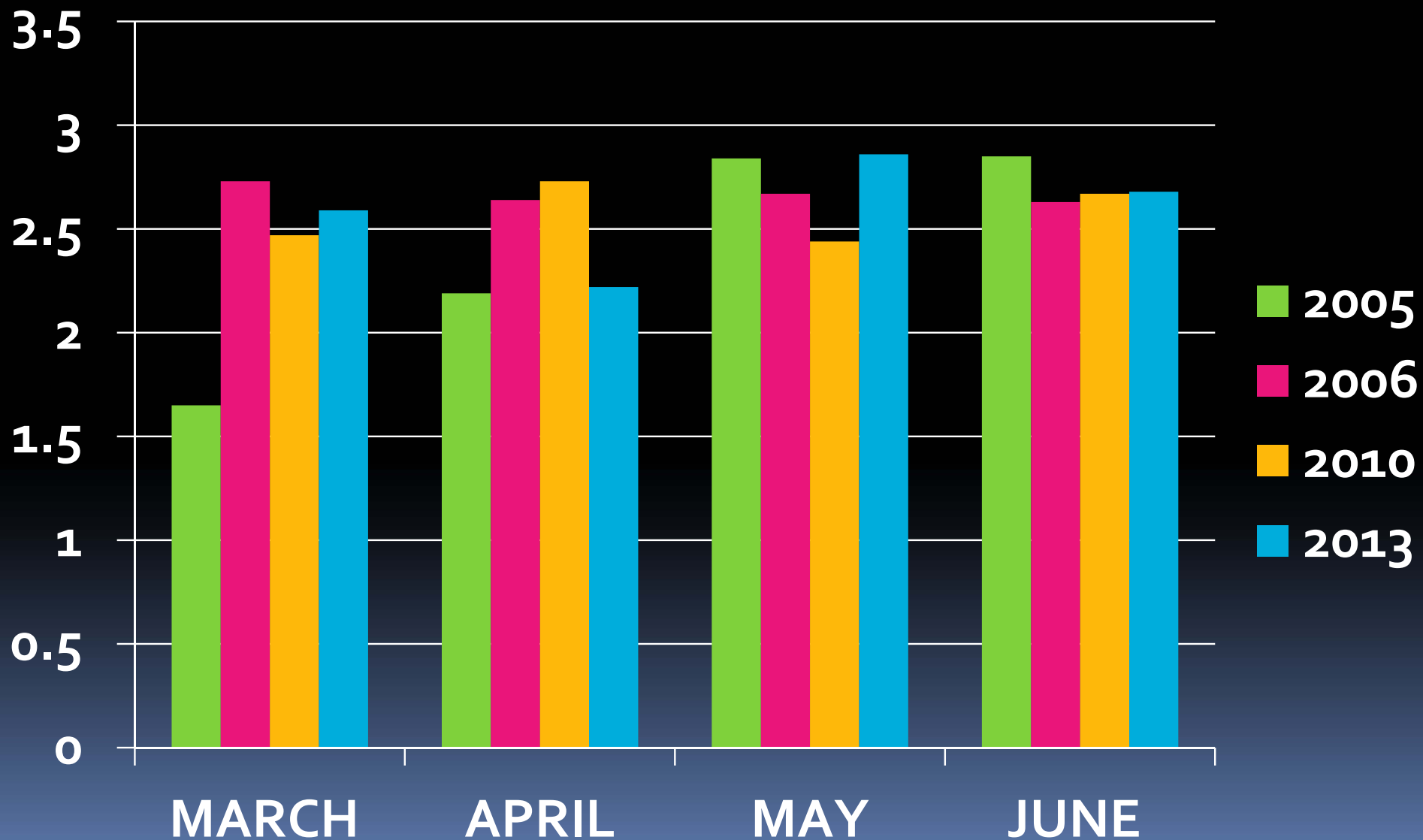
Mean Bird Species/Station Subarea 1, 2005-2013



EQUITABILITY AMONG BIRD SPECIES, SA 1, 2005-2013

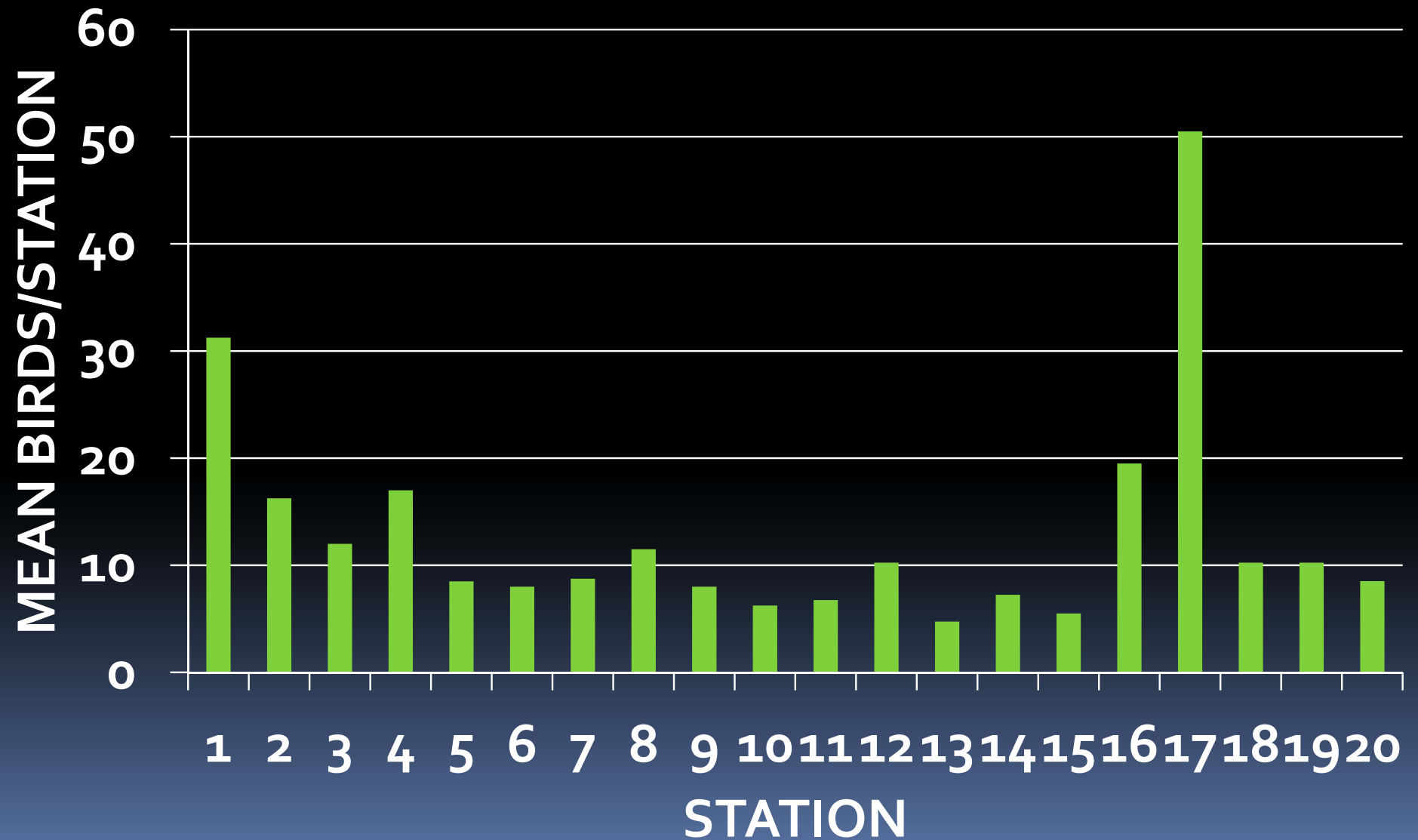


EQUITABILITY AMONG STATIONS, SA 1, 2005-2013



AVERAGE INDIVIDUALS /STATION


SA₁, MARCH-JUNE, 2013,





429 bird spp in MT

98 Bird Species SA 1 or 23%



SSTOU recorded 128 bird species for all subareas collectively or 30%.