Photo. J Lautenbach

Prairies, People, and Chickens too: a retrospective from nearly a decade of voluntary conservation

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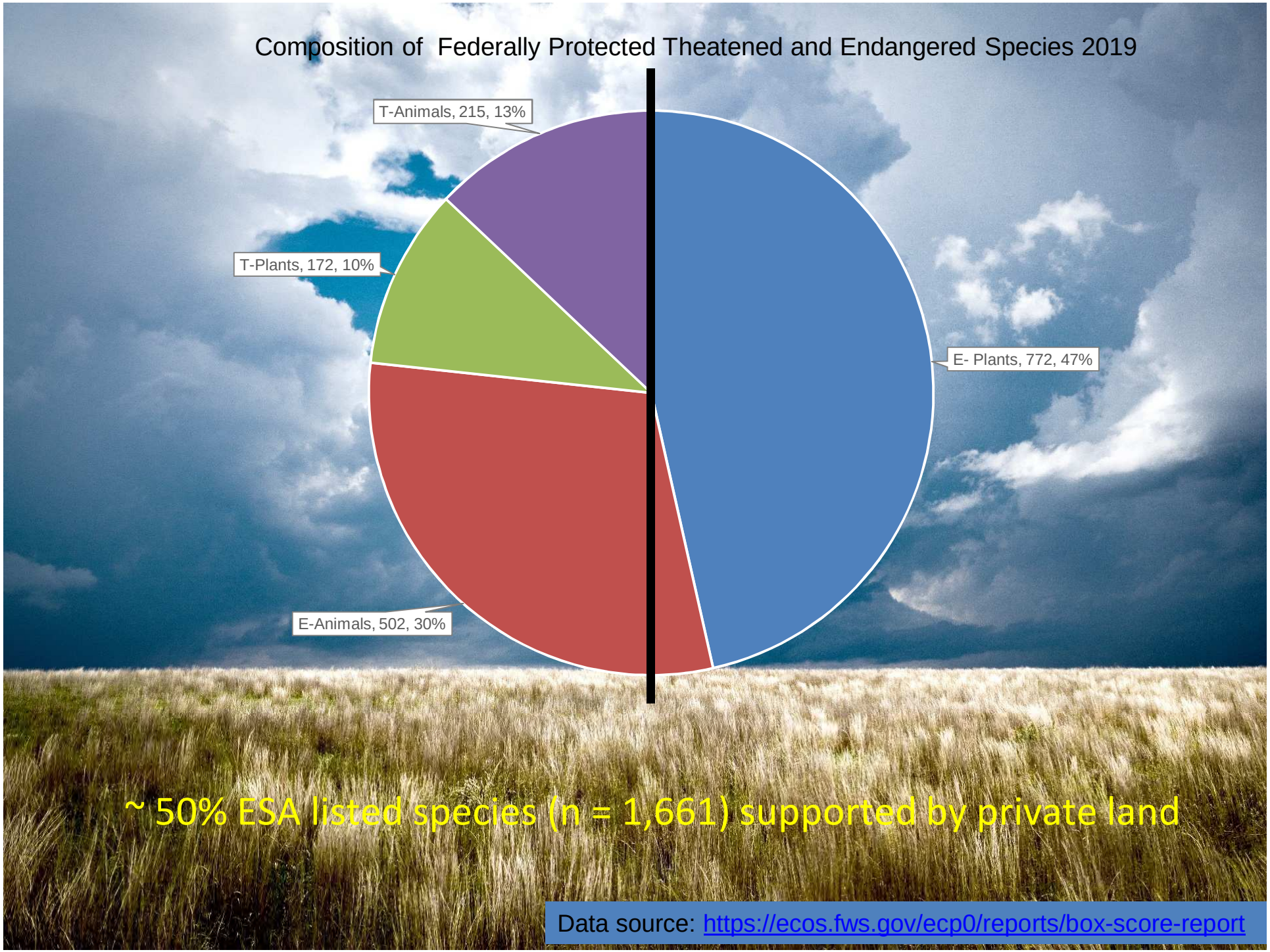
Natural Resrouces Conservation Service
Western Working Lands Coordinator


Voluntary Programs (CCAA, Partners, WLFW)
Regulatory mechanisms (ESA)
Tools of conservation
Captive Breeding
Augmentation
Reintroduction


Composition of Federally Protected Theatened and Endangered Species 2019
T-Animals, 215, 13%
T-Plants, 172, 10%
E- Plants, 772, 47%
E-Animals, 502, 30%
~ 50% ESA listed species (n = 1,661) supported by private land
Data source: https://ecos.fws.gov/ecp0/reports/box-score-report

Voluntary Conservation Provides Solution

traditional regulatory approach

Policy Change = Recovery

conservation-reliant species

Policy Change + Voluntary Action = Recovery

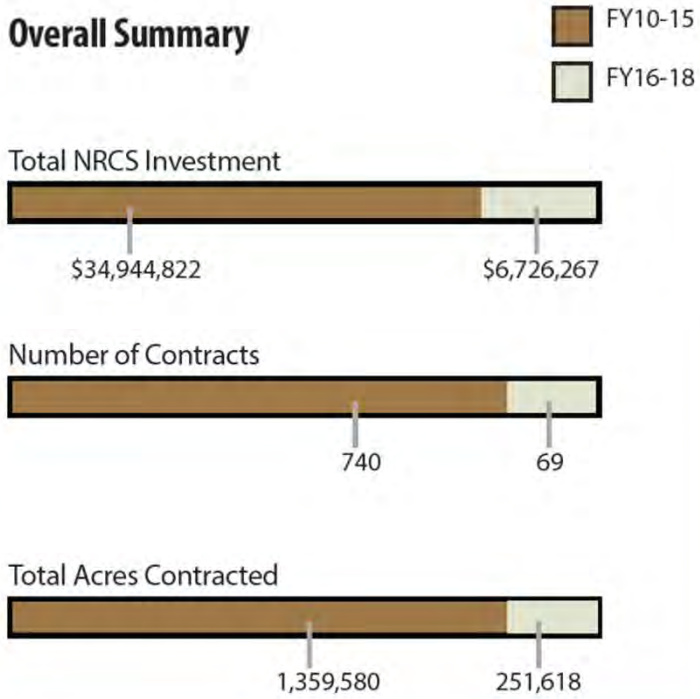
WORKING LANDS FOR WILDLIFE


• 809 Landowners
• 1.6 mil Acres
• $$$ 46.1 mil dollars

NRCS Goals

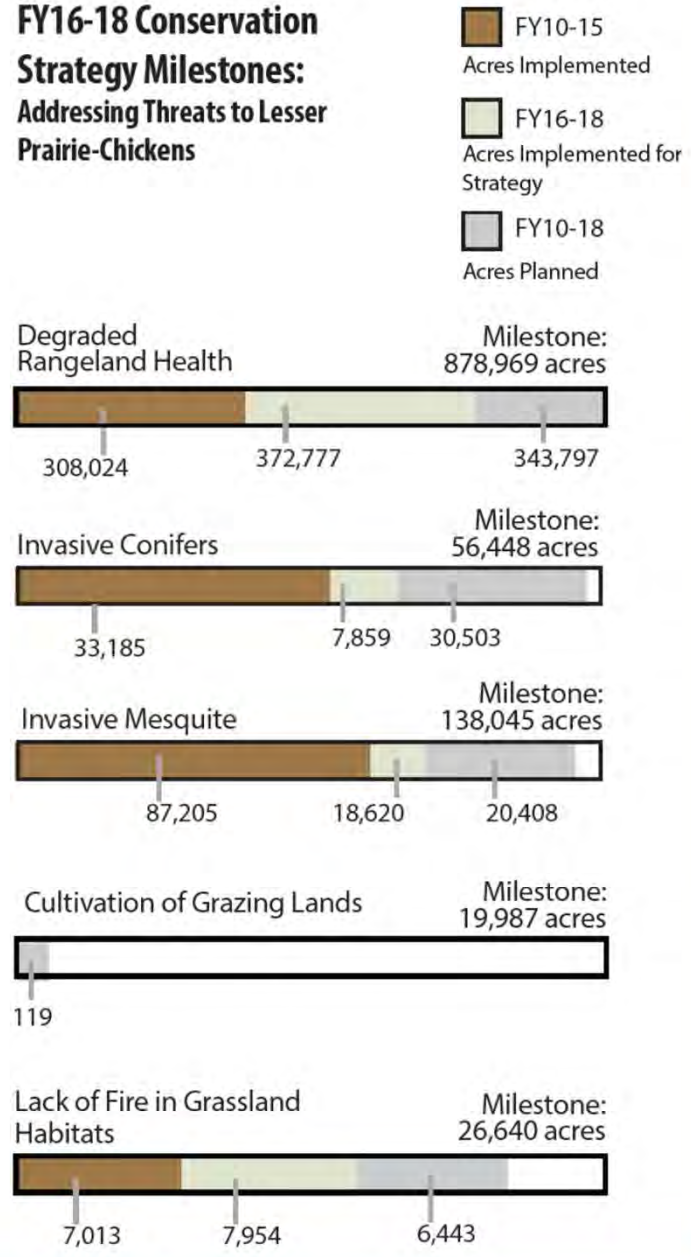
Through LPCI, NRCS works with producers to restore habitat for lesser prairie-chicken to increase populations, provide habitat for other grassland and prairie species, and provide predictability to producers, ensuring they can continue managing their working lands. NRCS is working to address the following threats to prairie chicken: degraded rangeland health, invasive conifers, invasive mesquite, cultivation of grazing lands, and lack of fire in grassland habitats.

Overall Summary



FY16-18 Conservation Strategy Milestones:

Addressing Threats to Lesser Prairie-Chickens



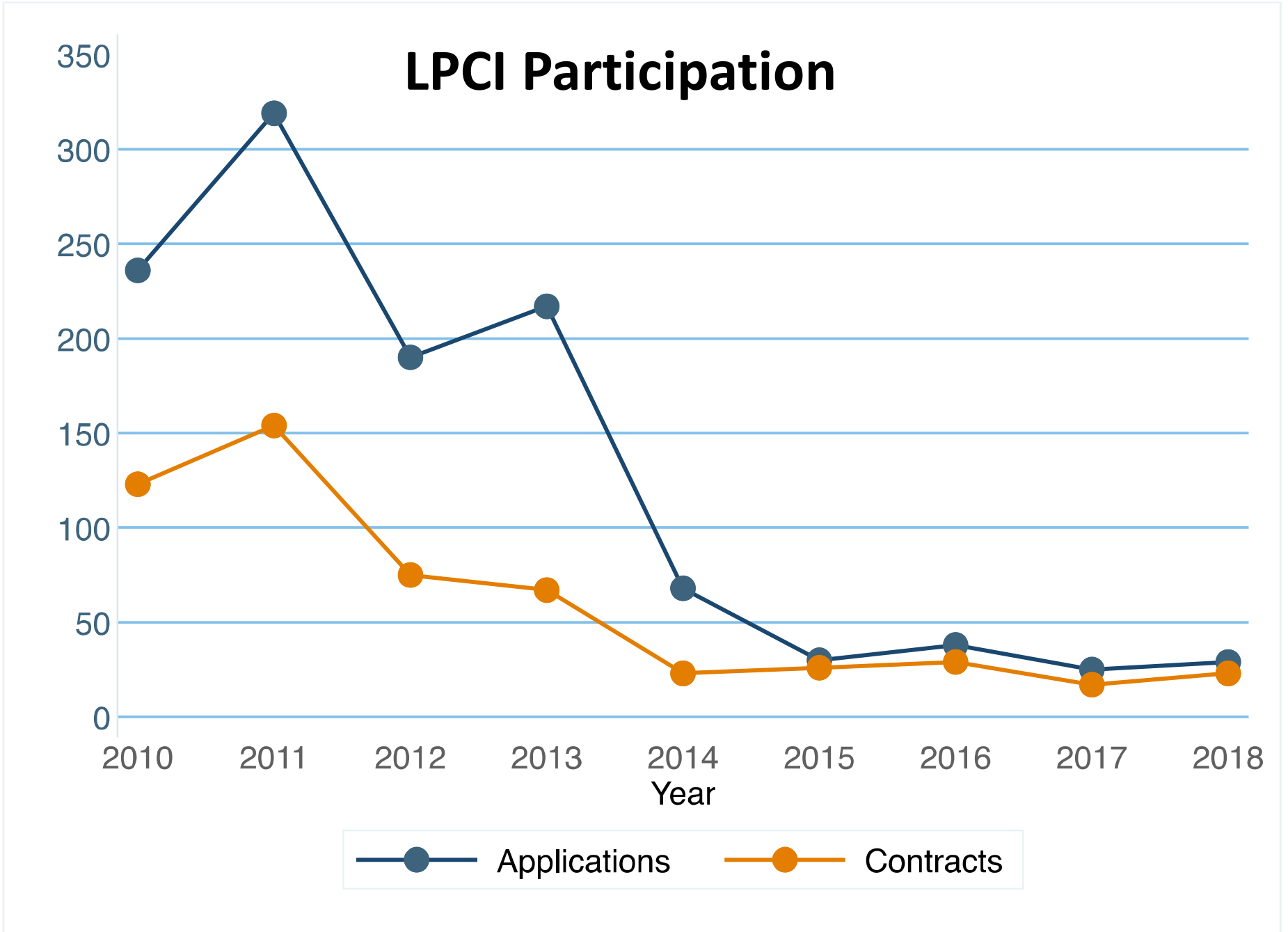
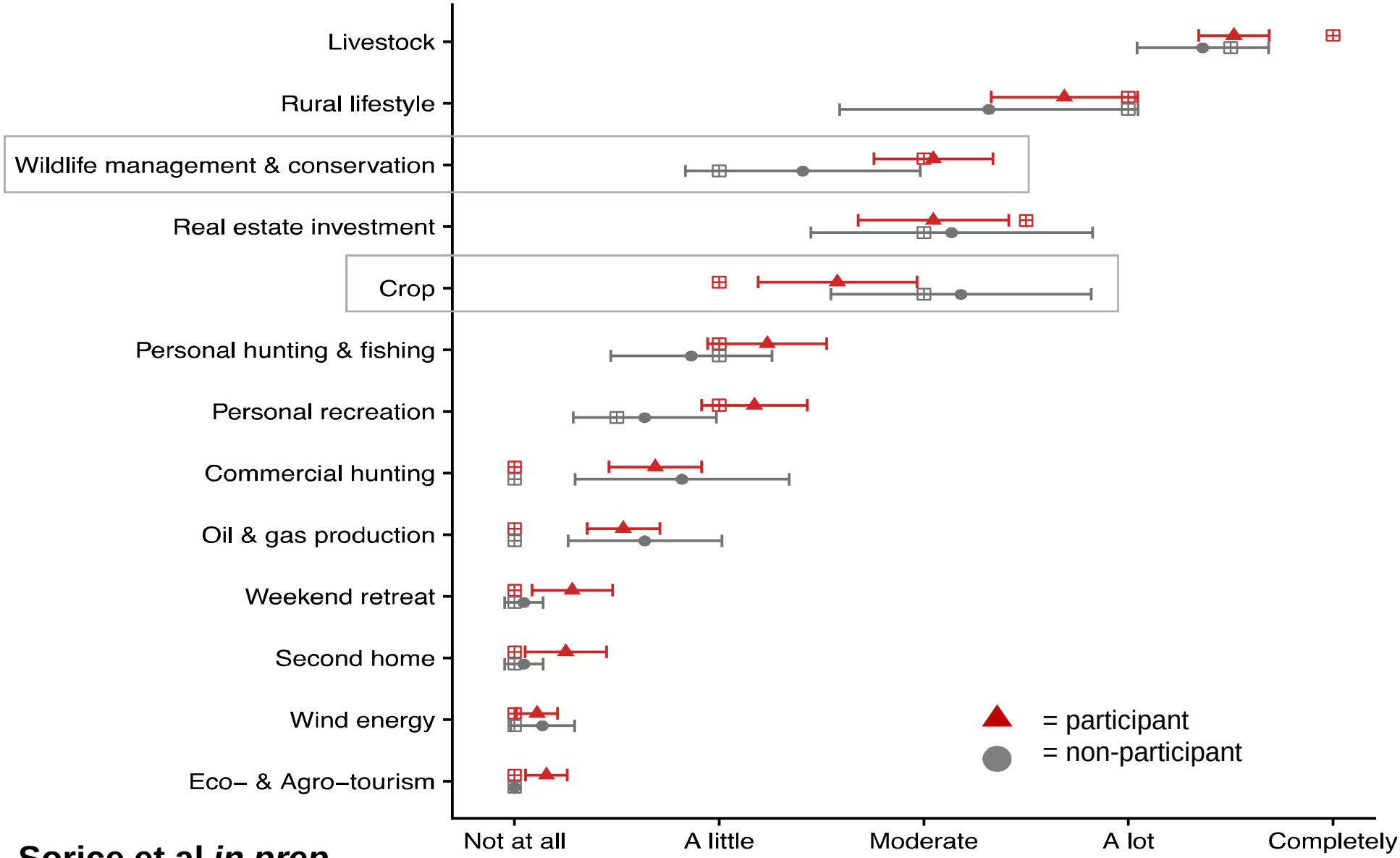

LPCI Participation
350
300
250
200
150
100
50
0
2010
2011
2012
2013
2014
2015
2016
2017
2018
Year
Applications
Contracts

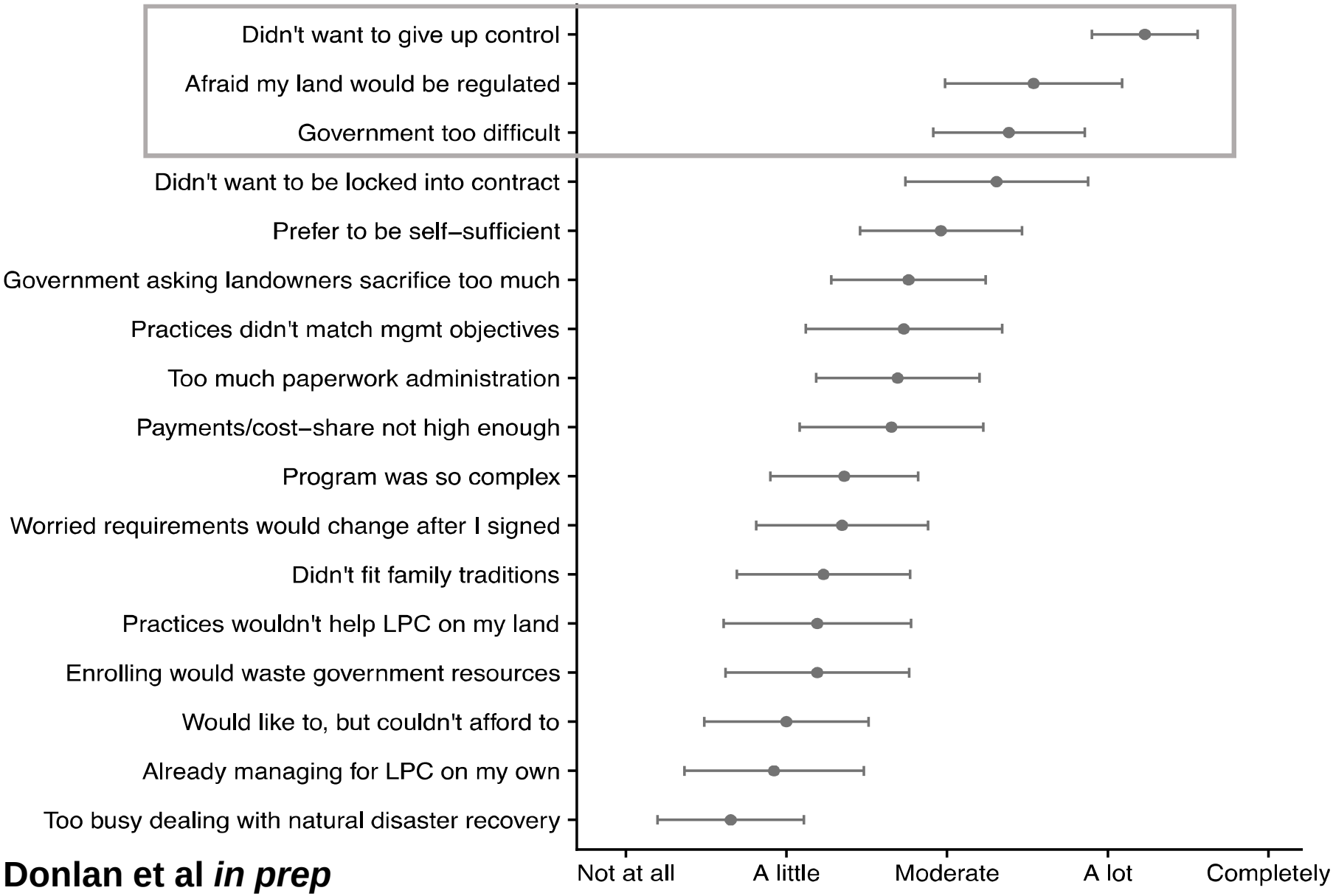
Photo: S. Manes

Profiles of (Non)Participants in Incentive Based Conservation

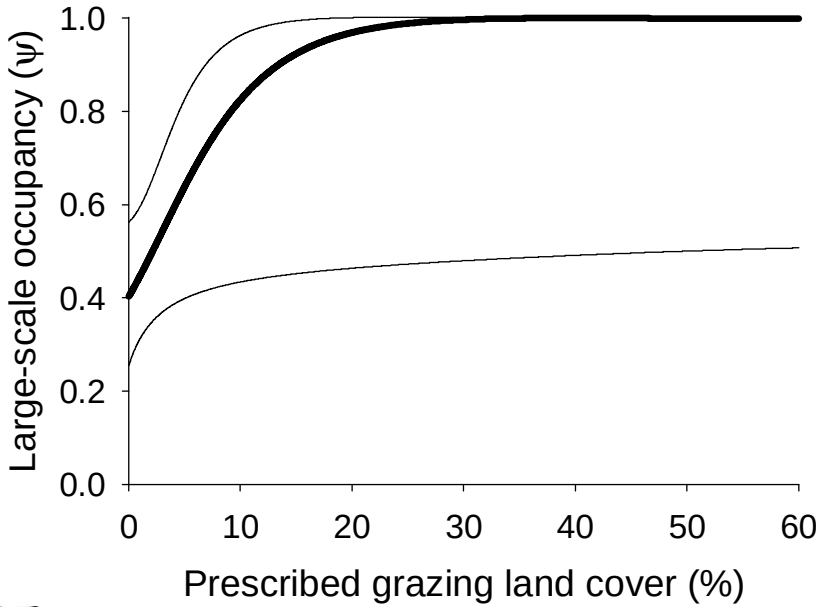


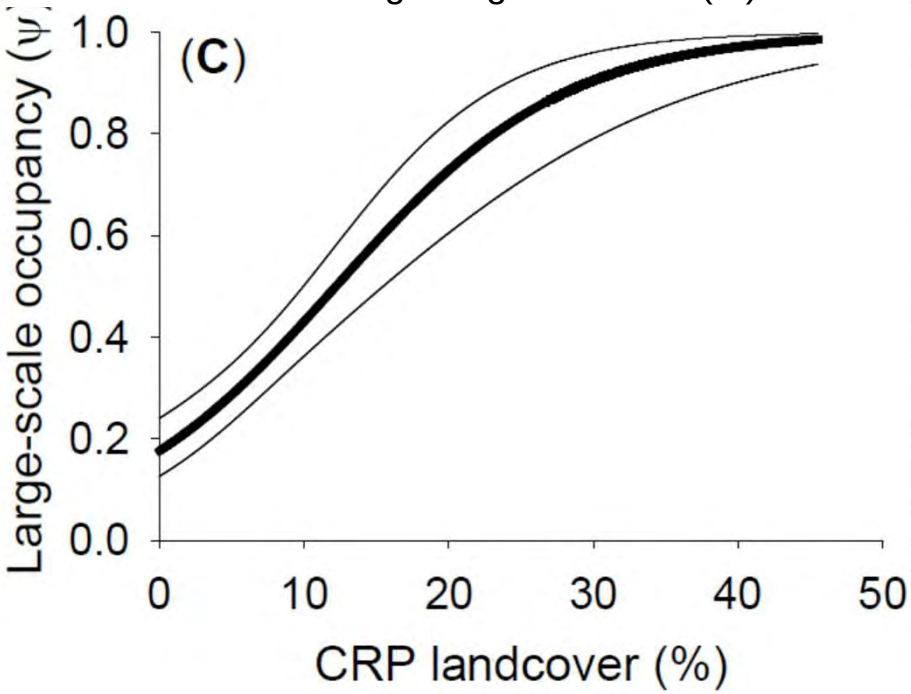
Sorice et al *in prep*

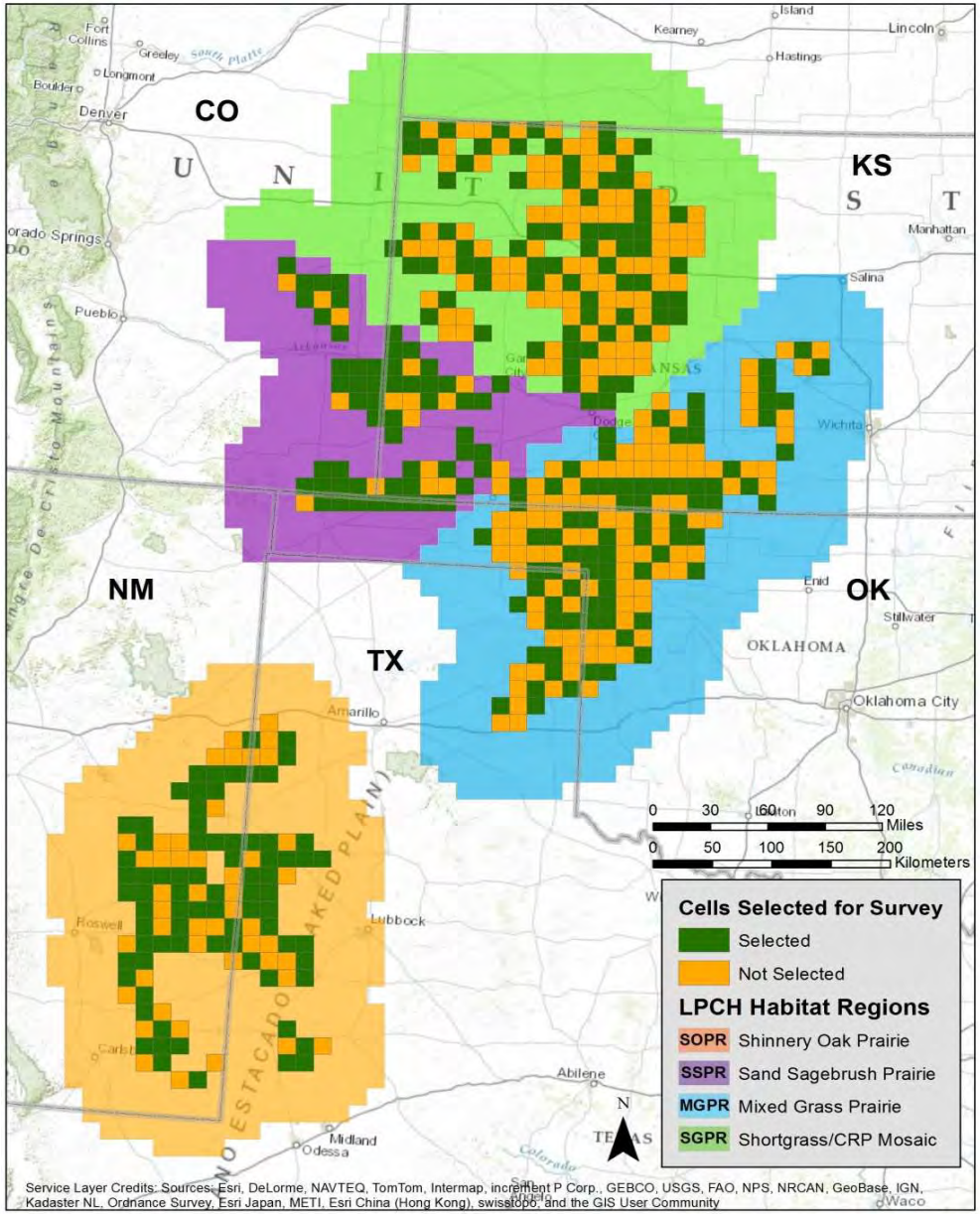
Reasons NOT to Participate in Incentive Based Conservation



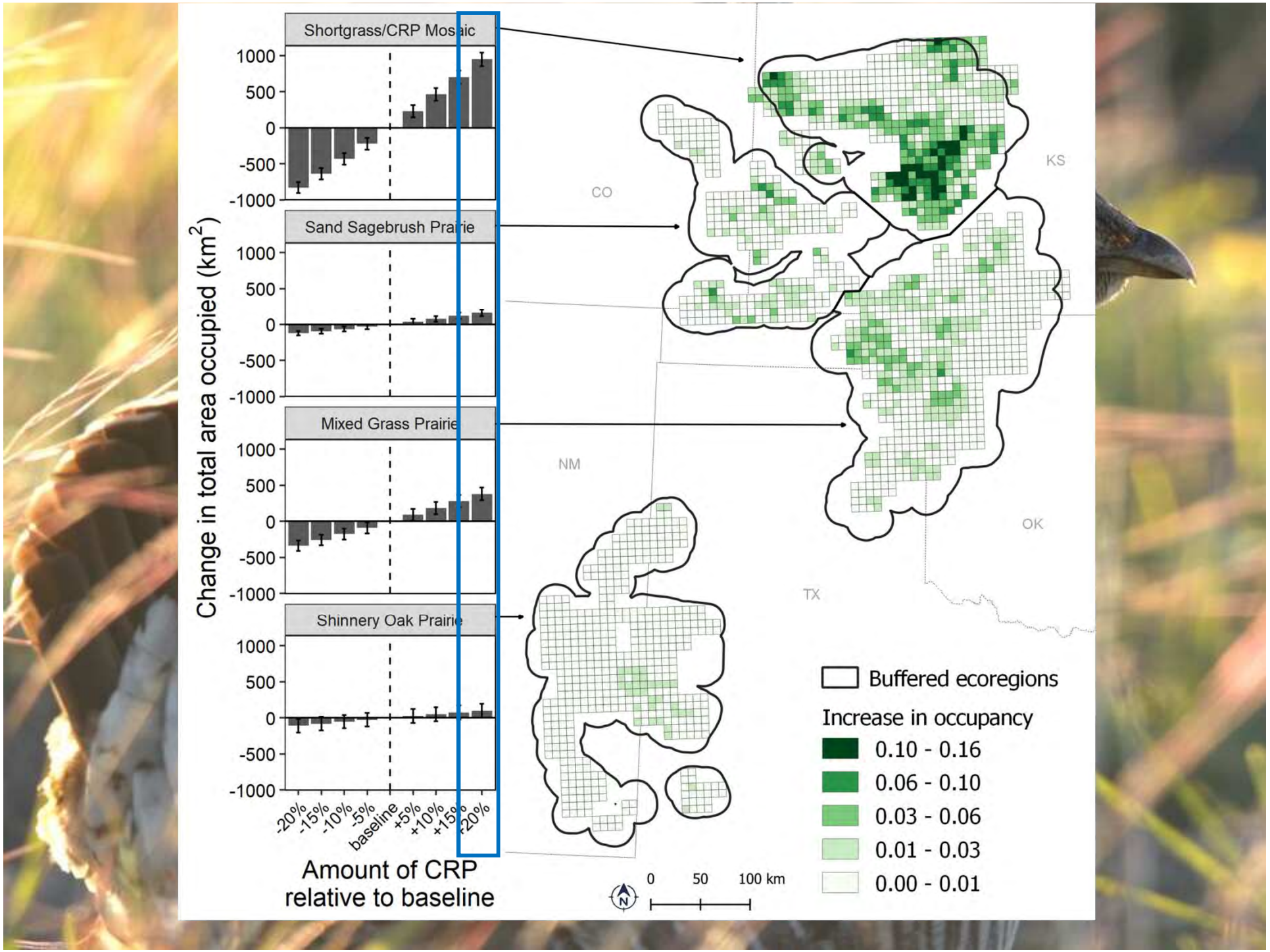
Donlan et al *in prep*



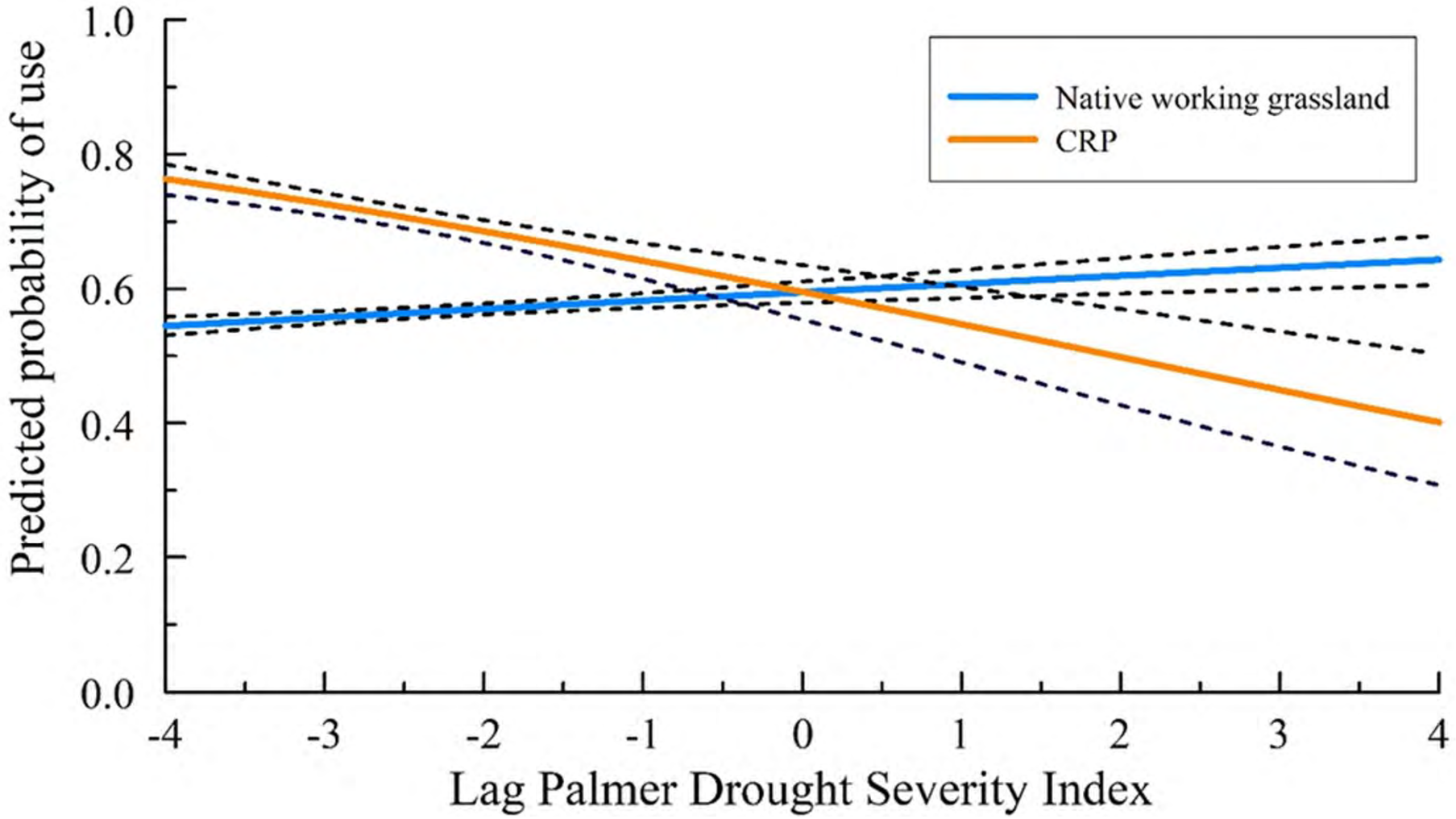


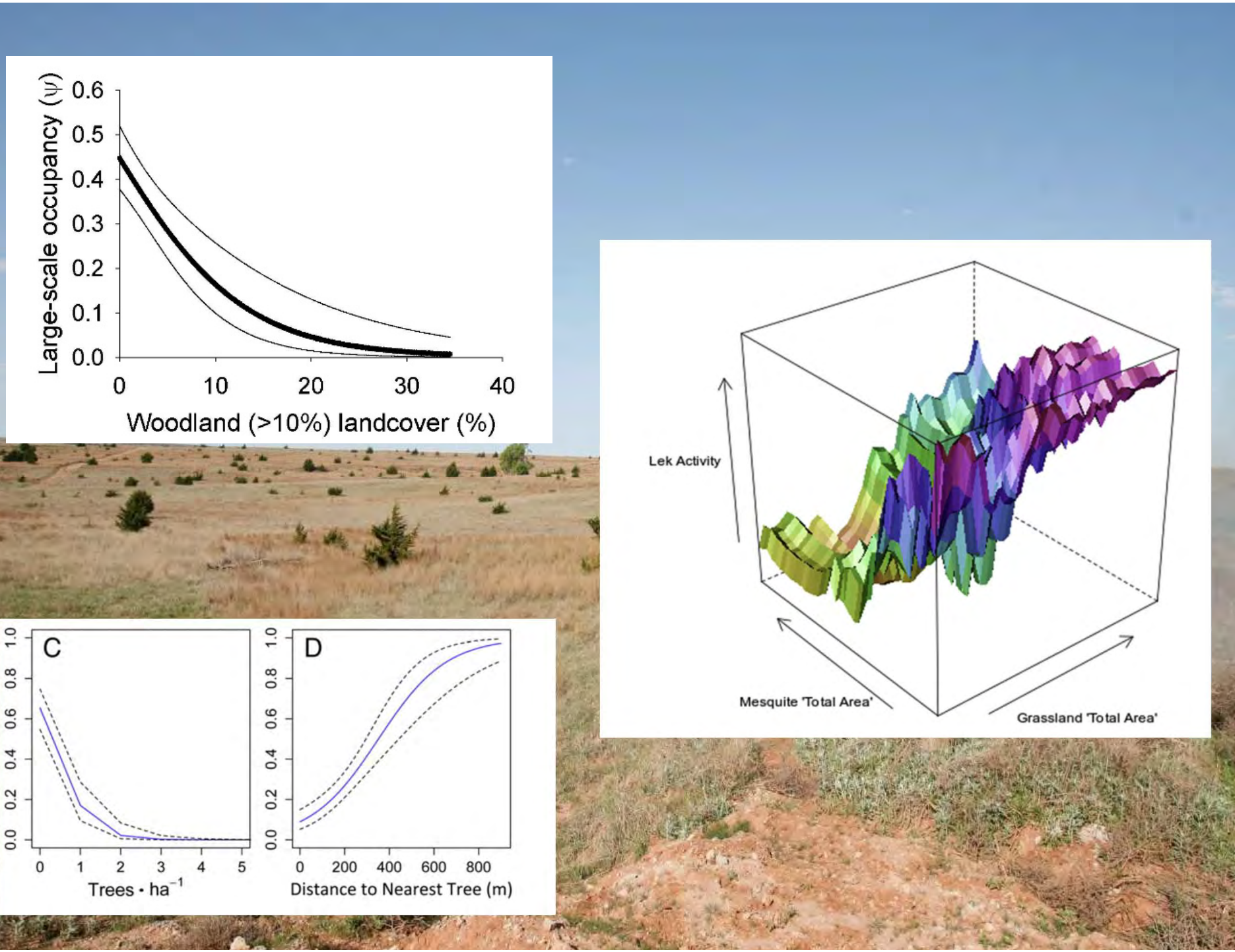


Hagen et al. *in review;* & 2016 *Condor*

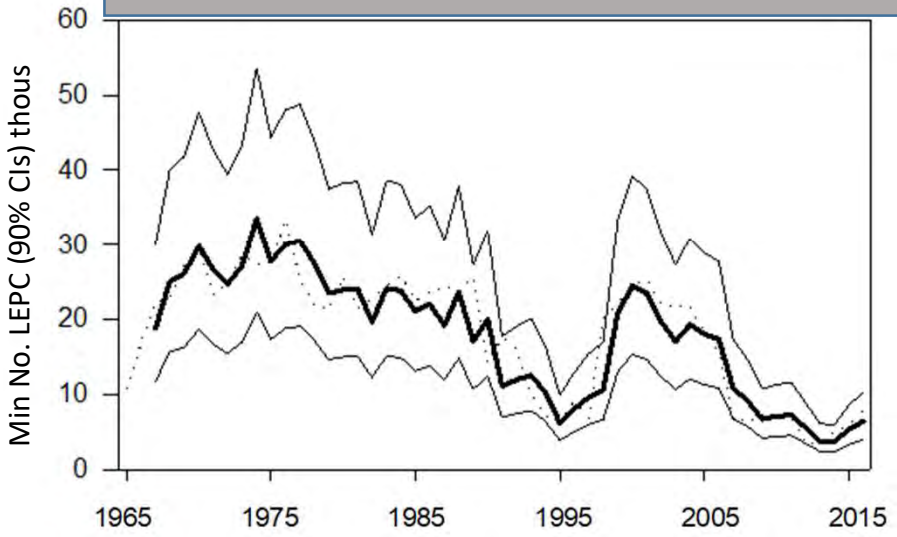

Shortgrass/CRP Mosaic
Sand Sagebrush Prairie
Mixed Grass Prairie
Shinnery Oak Prairie
1000
500
0
-500
-1000
Change in total area occupied (km2)
-20%
-15%
-10%
-5%
baseline
+5%
+10%
+15%
+20%
Amount of CRP relative to baseline
CO
KS
NM
OK
TX
Buffered ecoregions
Increase in occupancy
0.10 - 0.16
0.06 - 0.10
0.03 - 0.06
0.01 - 0.03
0.00 - 0.01
0
50
100 km

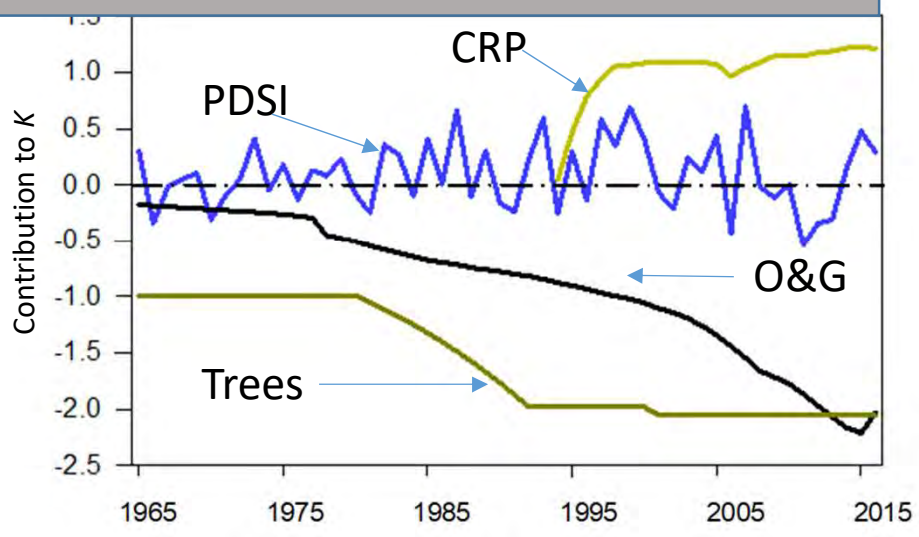
	Nests/1000ha
Native Grasslands	1.7 (SE = 0.62)
CRP	6.0 (SE = 1.29)



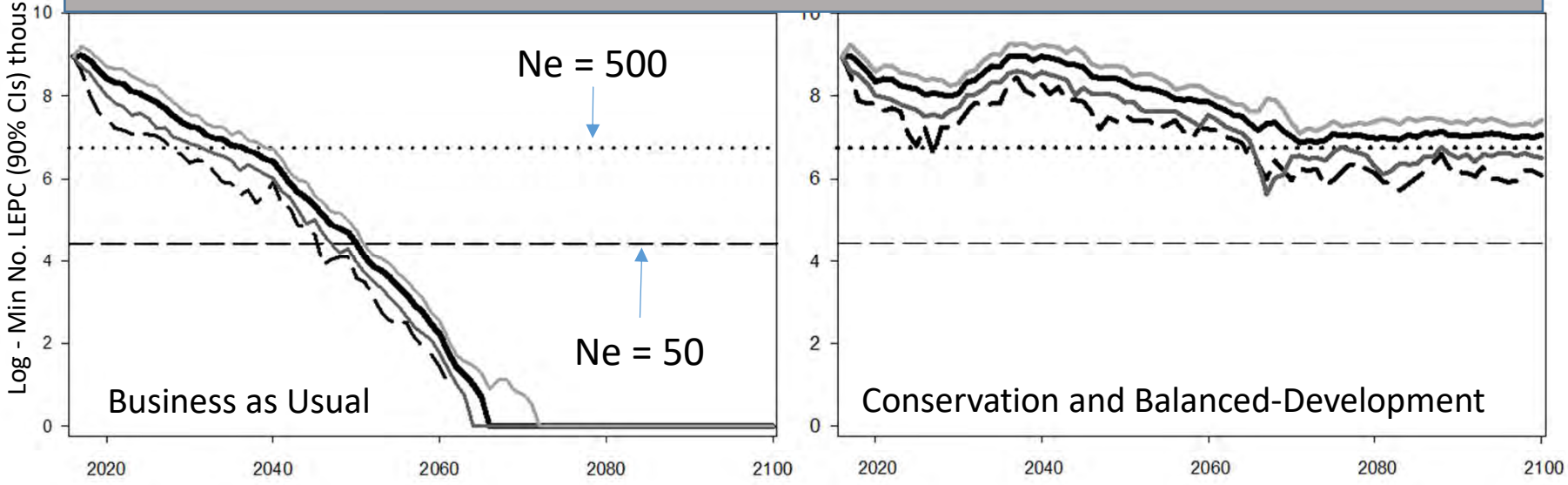

Large-scale occupancy (ψ)
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0
10
20
30
40
Woodland (>10%) landcover (%)
Lek Activity
Mesquite 'Total Area'
Grassland 'Total Area'
C
D
0.0
0.2
0.4
0.6
0.8
1.0
0
1
2
3
4
5
Trees • ha^{-1}
0
200
400
600
800
Distance to Nearest Tree (m)

Factors driving LEPC population dynamics from the past



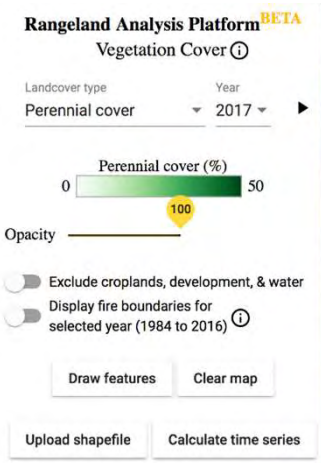


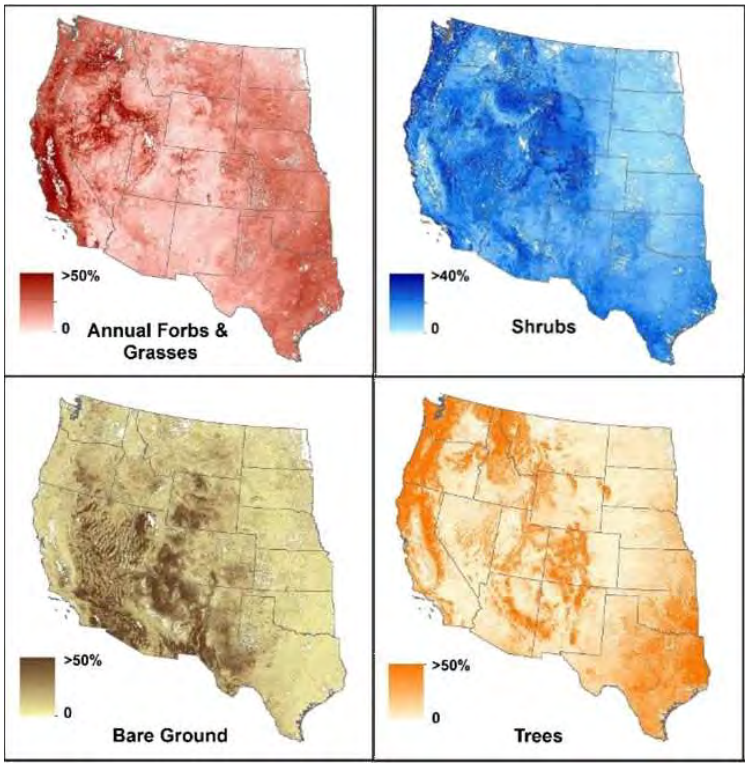
Forecasting the future?



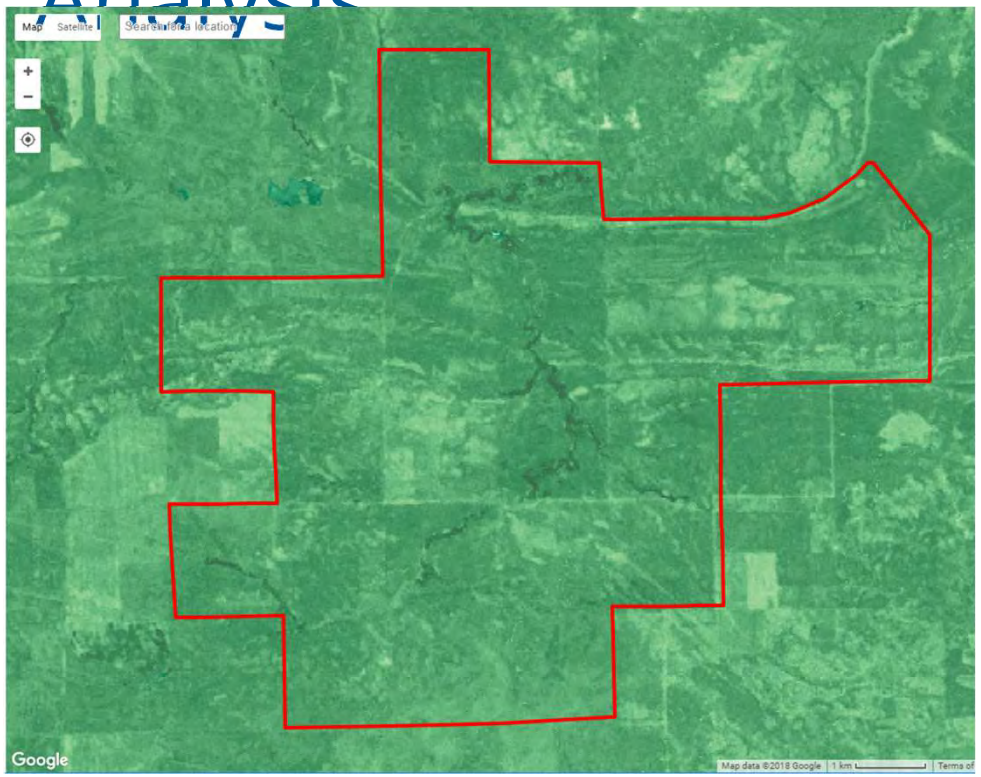
Garton et al. *in prep*

Great Plains to Pacific Coast



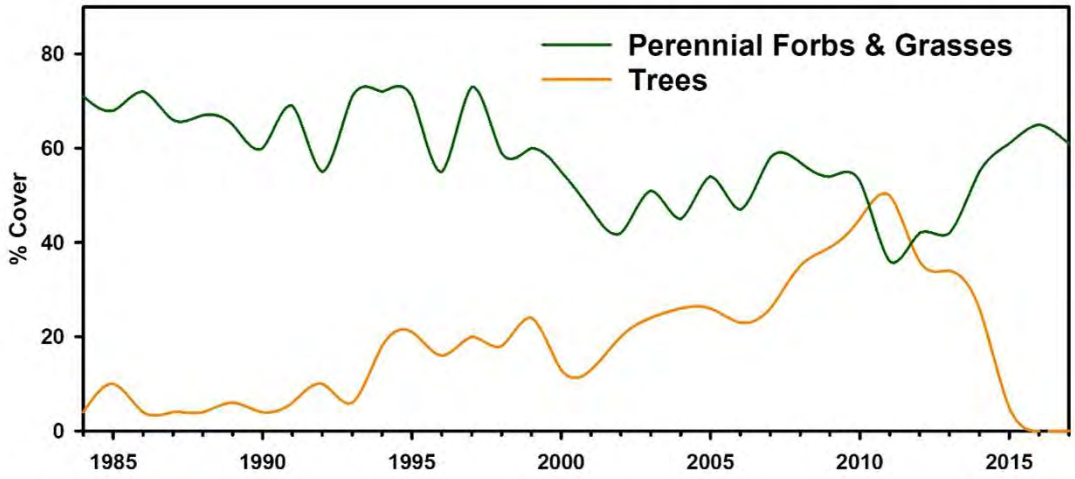


Customer Focused Analysis



'I've waited my whole career for this kind of tool. It provides the context for landscape planning that's been lacking in the rangeland profession.'
-Shane Green, NRCS Range Management Specialist

Quantifying USDA Outcomes



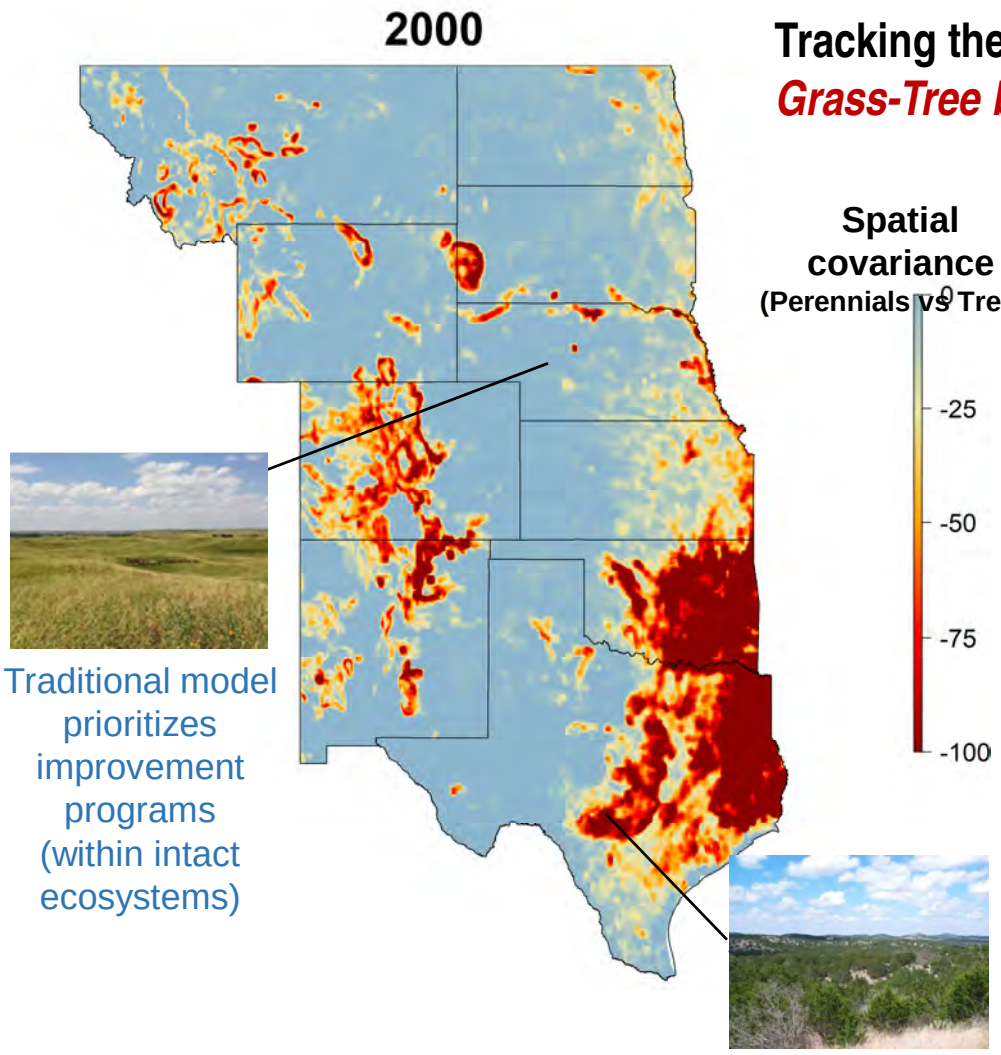
'From a landowner's perspective, the economic value of trees is absolutely zero'
-Rancher Scott Stout, Curtis, Nebraska

'RAP's ability to quantify outcomes empowers a whole new age in landscape restoration'
-Dirac Twidwell, University of Nebraska, Lincoln

https://rangelands.app

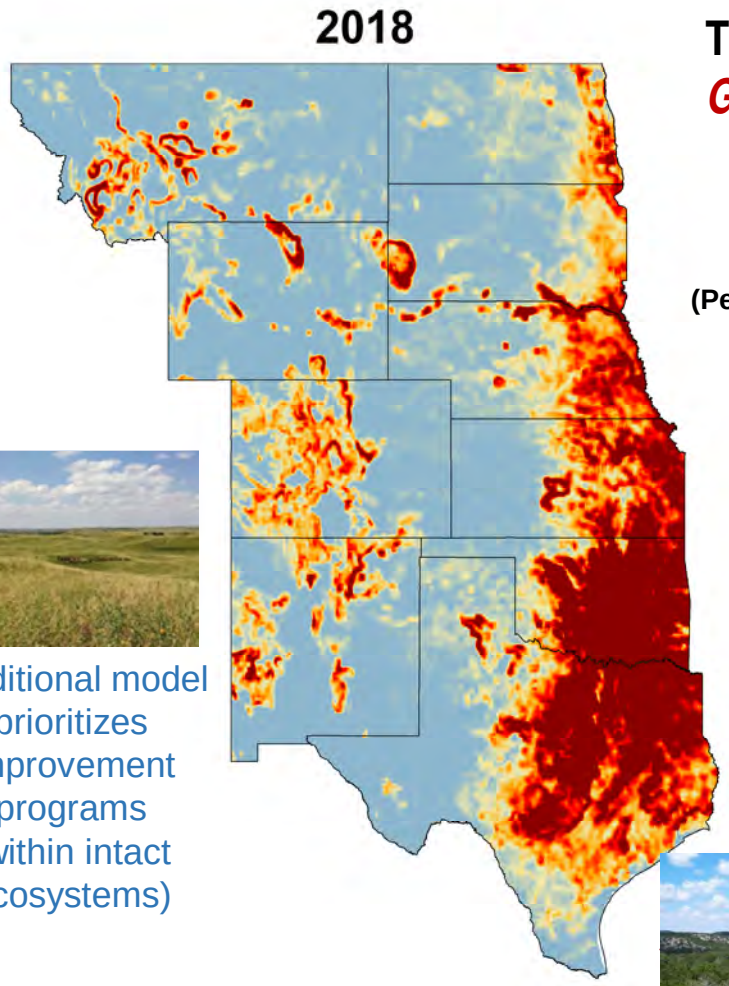
Tracking the collapse of a terrestrial biome

Grass-Tree boundary in 2000



Traditional model prioritizes improvement programs (within intact ecosystems)

Traditional model prioritizes control programs (after ecosystems are compromised)



Tracking the collapse of a terrestrial biome

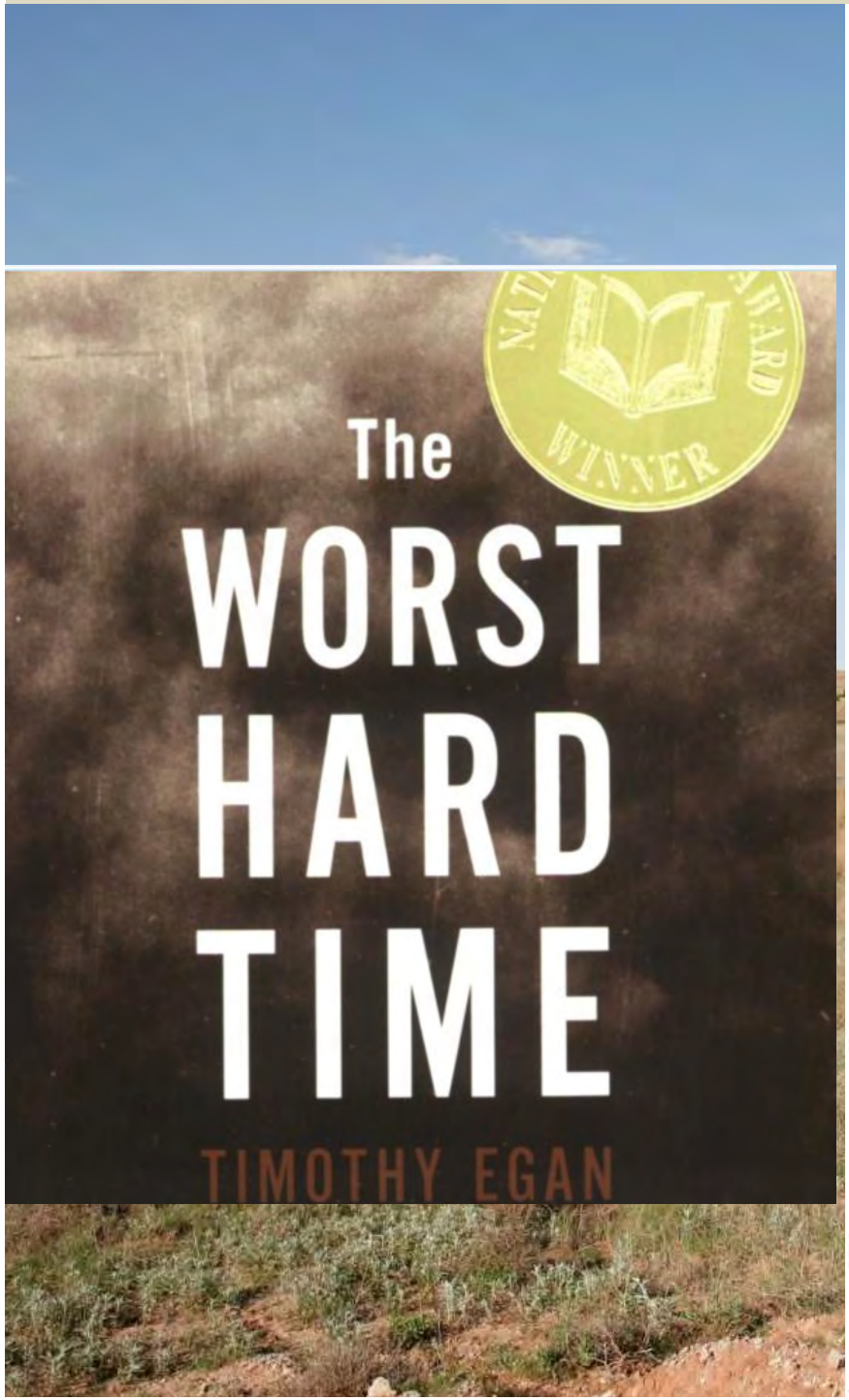
Grass-Tree boundary in 2018

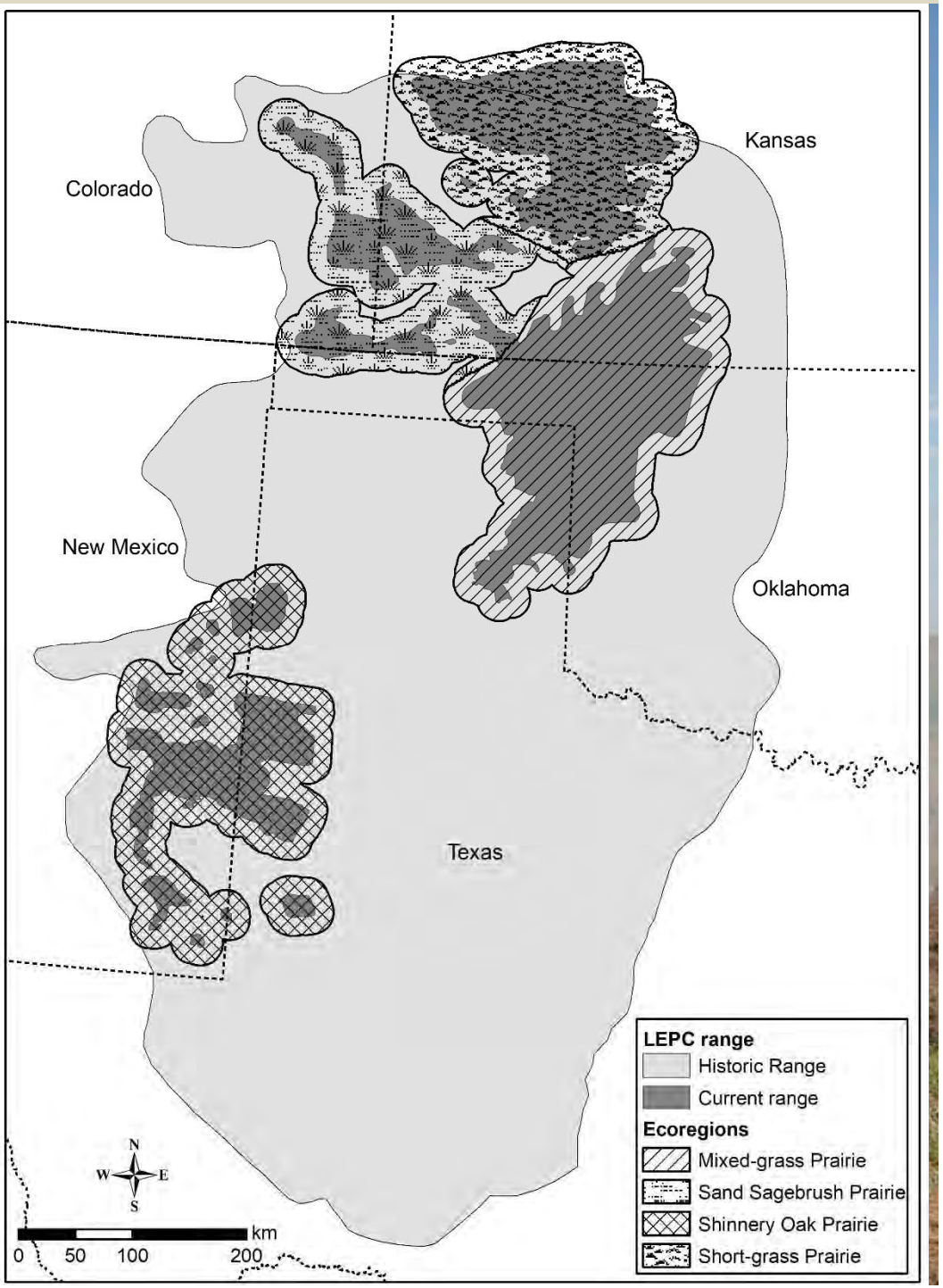
$ 25 Million = mean annual conservation expenditures for brush management from 2004-2008 (NRCS CEAP)

Little progress sustaining resources despite over 80 years of science on impacts and decades of conservation expenditures

Traditional model prioritizes improvement programs (within intact ecosystems)

Traditional model prioritizes control programs (after ecosystems are compromised)


The
WORST
HARD
TIME
TIMOTHY EGAN
WINNER


Kansas
Colorado
New Mexico
Oklahoma
Texas
LEPC range
Historic Range
Current range
Ecoregions
Mixed-grass Prairie
Sand Sagebrush Prairie
Shinnery Oak Prairie
Short-grass Prairie
N
W
E
S
km
0
50
100
200

Acknowledgments

Landowners and NRCS field staff west of the Mississippi without there willingness and dedication none of this work would be possible

Colleagues provided access to pre-published data, M. Sorice, J. Donlan, E. O. Garton, A. Olsen, D. Pavlacky

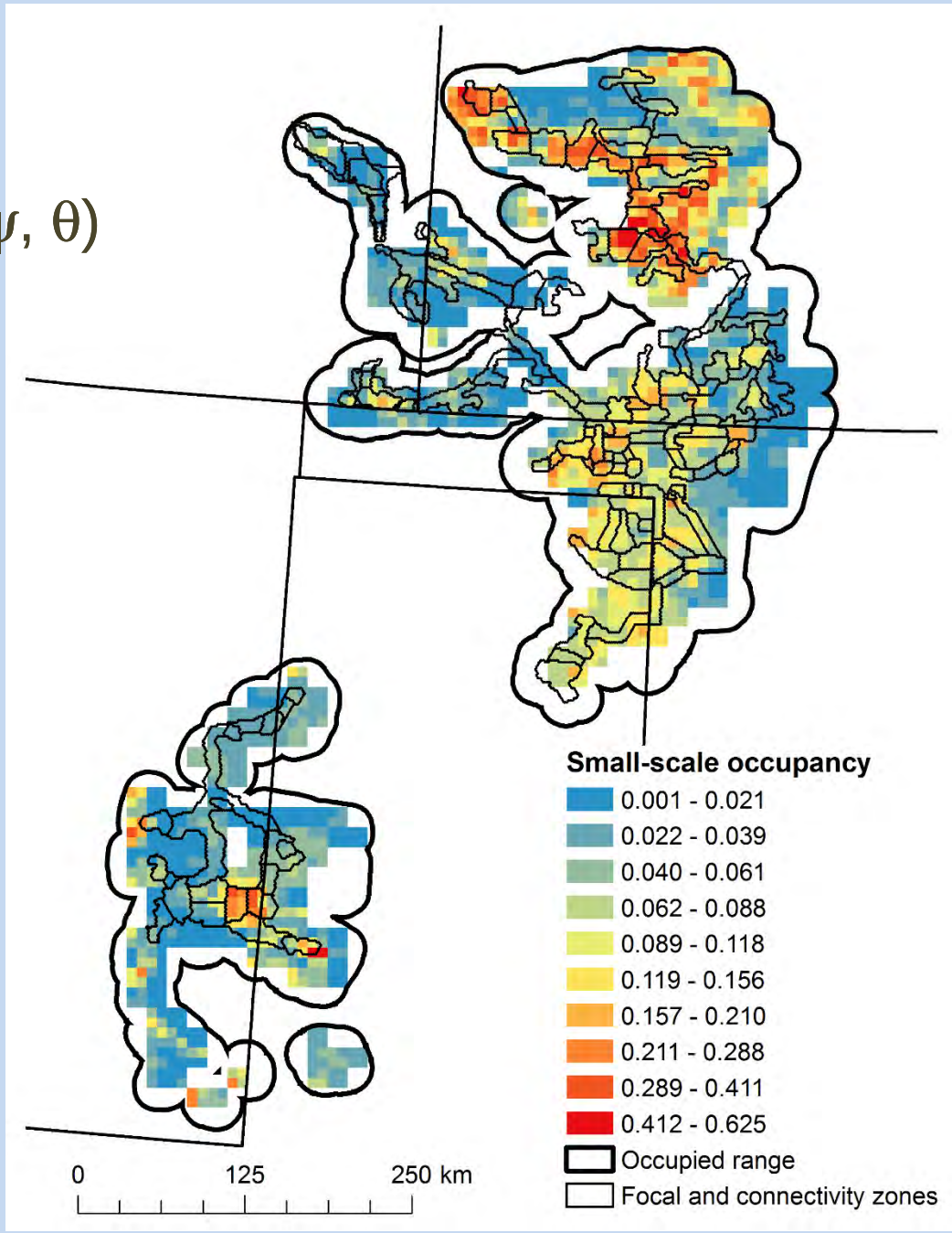
Working Lands for Wildlife Team, D. Naugle, T. Griffiths, J. Maestas, T. Heater, G. Hall, B. Allred, D. Twidwell

Lesser Prairie-Chicken folks – too many to name here

Current and former grad students!!!

Outcomes

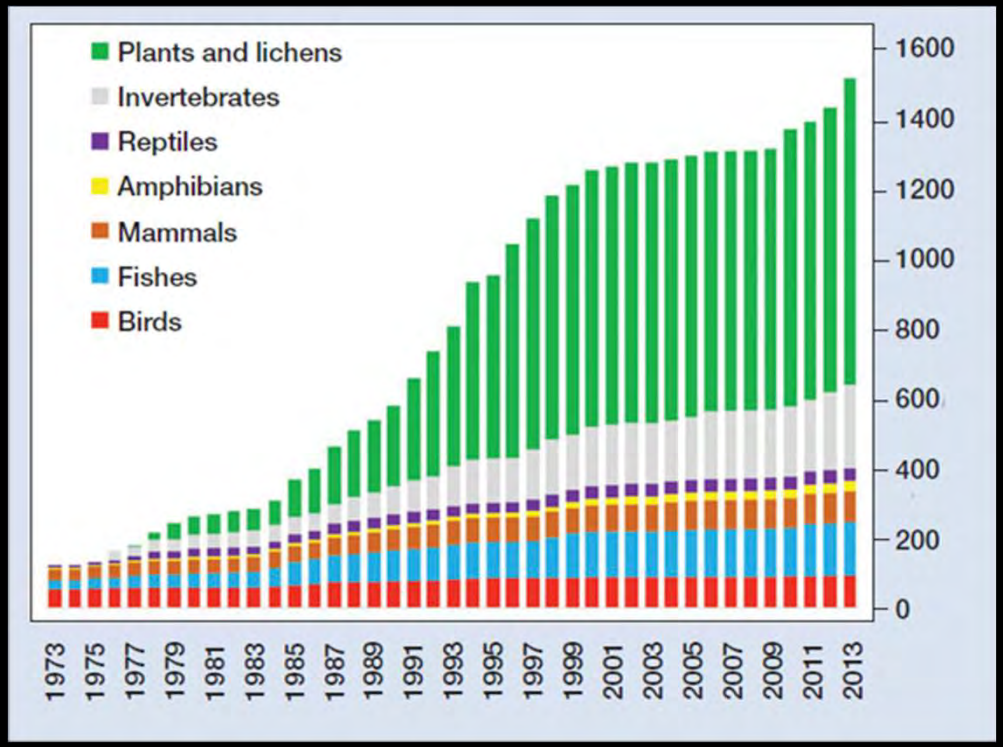
- Annual variation minimal (ψ, θ)
- Large patches of native vegetation (+ ψ, θ)
- Woody cover (- ψ)
- Development (- θ)
- CRP (+ ψ, θ)
- Temporal covariates
  - Annual change
  - Climate
  - Conservation practices



Bird Conservancy of the Rockies

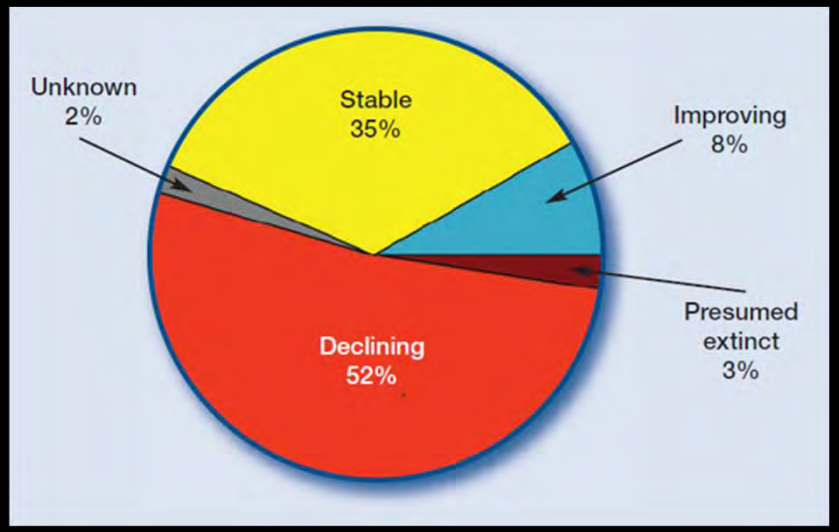
WEST Inc.

Status quo Acceptable?



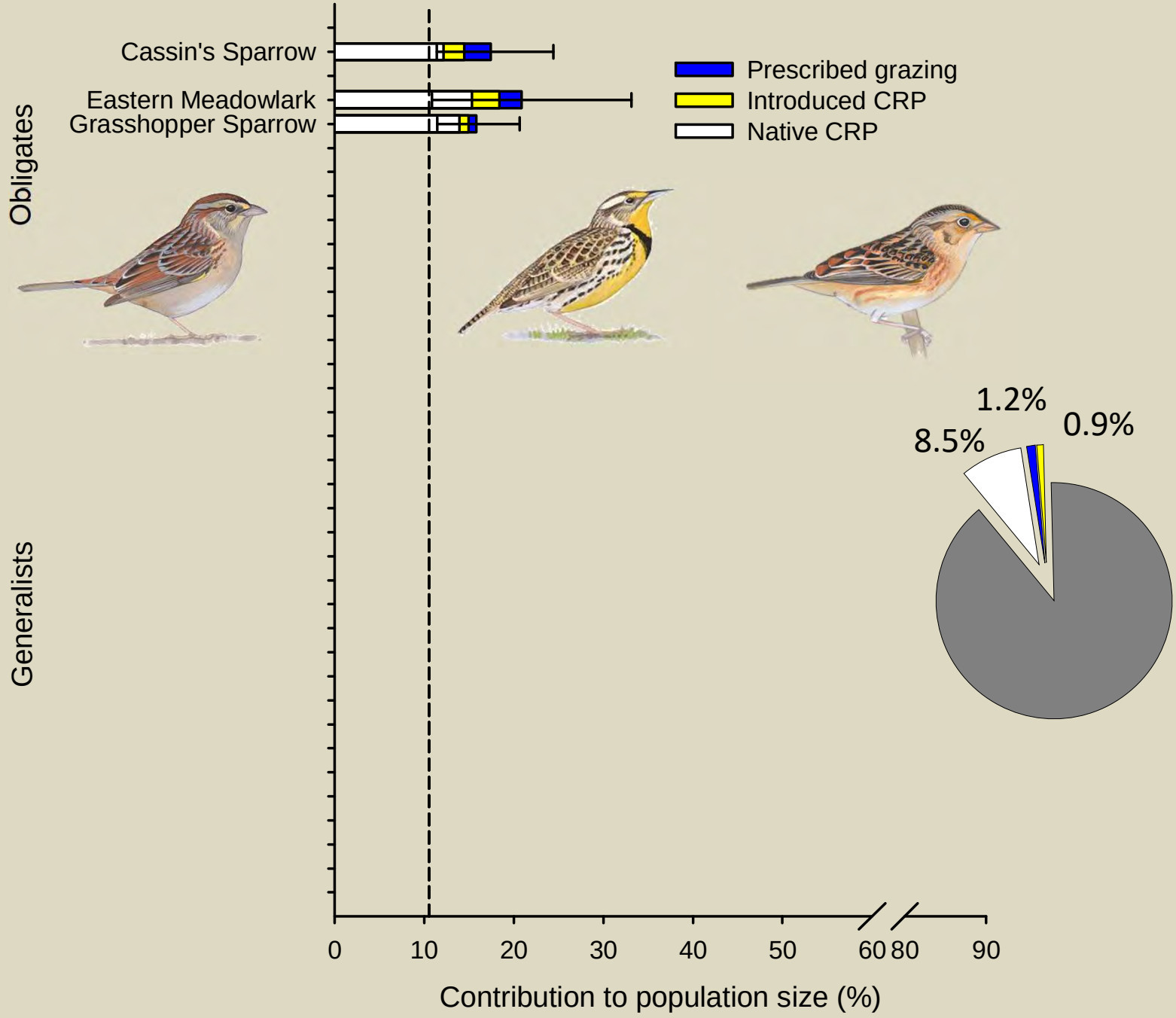
Number of listed species increases

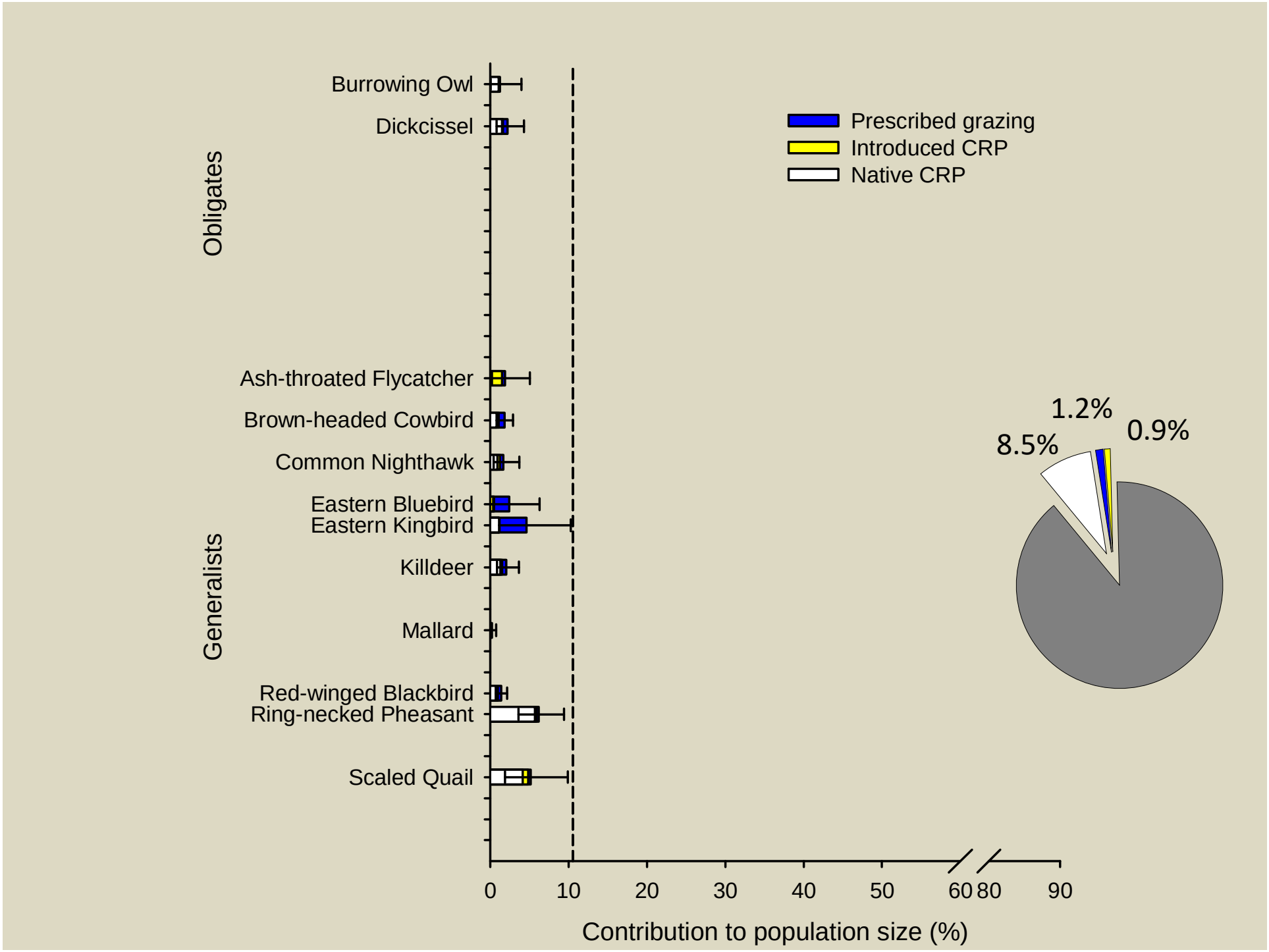
Few species are improving

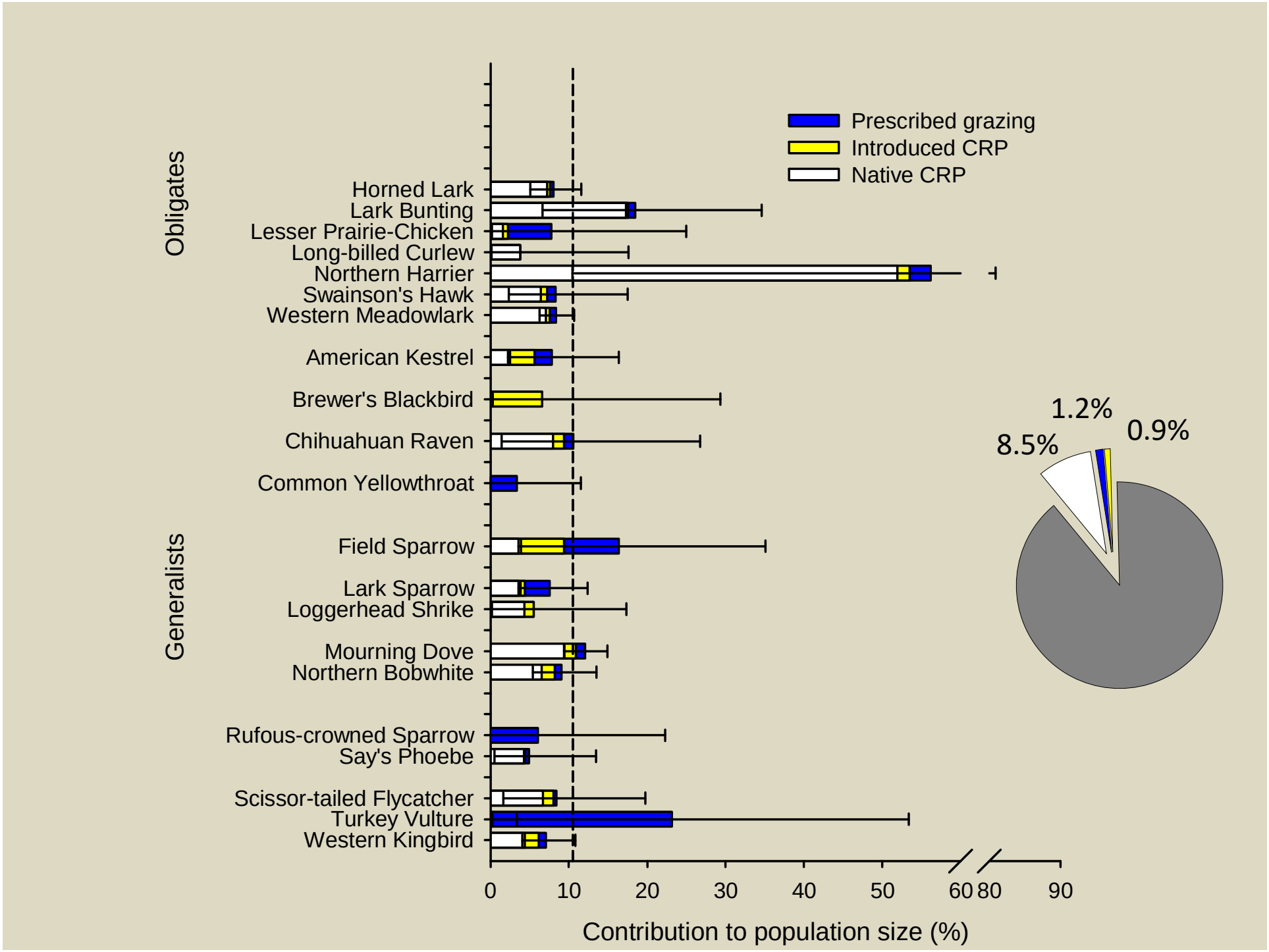


Trends in recovery status for 1,292 listed species, 1990-2010

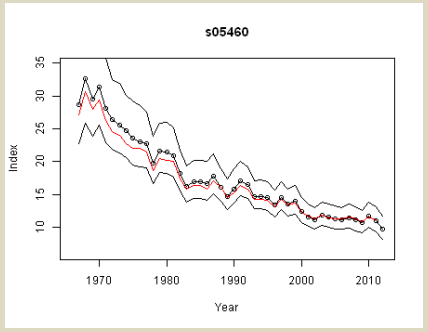
Evans et al. 2016 *Issues in Ecology*


Cassin's Sparrow
Eastern Meadowlark
Grasshopper Sparrow
Prescribed grazing
Introduced CRP
Native CRP
Obligates
Generalists
1.2%
0.9%
8.5%
0
10
20
30
40
50
60
80
90
Contribution to population size (%)


Obligates
Generalists
Burrowing Owl
Dickcissel
Ash-throated Flycatcher
Brown-headed Cowbird
Common Nighthawk
Eastern Bluebird
Eastern Kingbird
Killdeer
Mallard
Red-winged Blackbird
Ring-necked Pheasant
Scaled Quail
Prescribed grazing
Introduced CRP
Native CRP
0
10
20
30
40
50
60
80
90
Contribution to population size (%)
1.2%
0.9%
8.5%

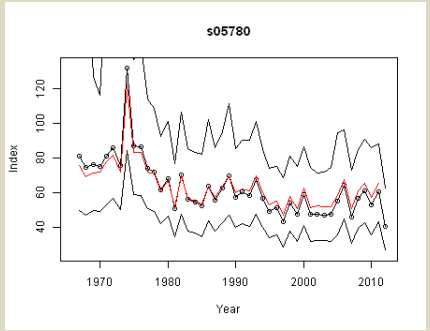

Prescribed grazing
Introduced CRP
Native CRP
Obligates
Generalists
Horned Lark
Lark Bunting
Lesser Prairie-Chicken
Long-billed Curlew
Northern Harrier
Swainson's Hawk
Western Meadowlark
American Kestrel
Brewer's Blackbird
Chihuahuan Raven
Common Yellowthroat
Field Sparrow
Lark Sparrow
Loggerhead Shrike
Mourning Dove
Northern Bobwhite
Rufous-crowned Sparrow
Say's Phoebe
Scissor-tailed Flycatcher
Turkey Vulture
Western Kingbird
0
10
20
30
40
50
60
80
90
Contribution to population size (%)
1.2%
0.9%
8.5%

Do Farm Bill programs contribute to grassland bird populations?



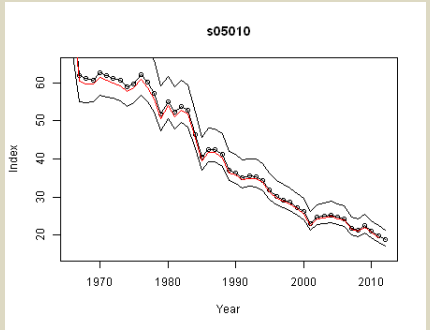
grasshopper sparrow

- 16% of the population
- $\hat{N}$ = 1,625,000, CV = 0.12



Cassin's sparrow

- 17% of the population
- $\hat{N}$ = 518,000, CV = 0.12



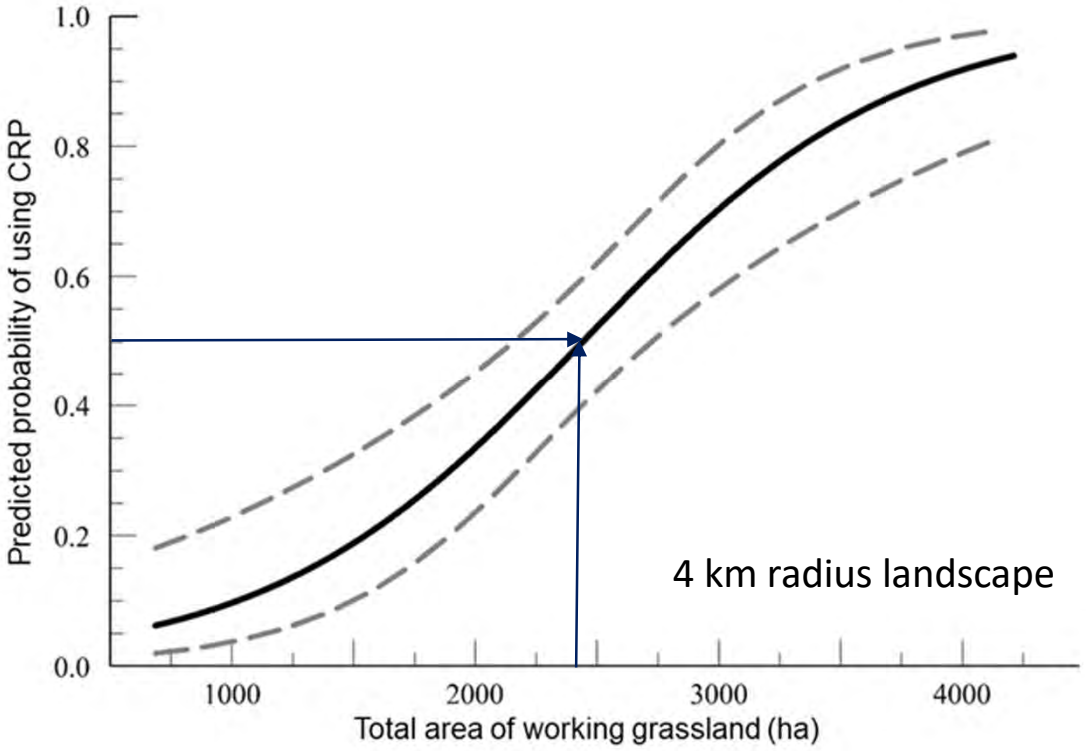
eastern meadowlark

- 21% of the population
- $\hat{N}$ = 244,000, CV = 0.23

Pavlacky et al. *in prep*

Landscape Structure

- Large contiguous grasslands
- Grasslands that are heterogeneous in structure
- Pairing of grazed native working grasslands and CRP can provide this heterogeneity
- In occupied strongholds,
  - 30% nesting habitat
  - 30% brooding



Sullins et al. 2018